Technical Specification Group Services and System Aspects **TSGS#22(03)0562**

Meeting #22, Hawaii, USA, 15-18 December 2003

LIAISON STATEMENT

Title:	Reply LS to 3GPP on principles for overlapping issues with OMA regarding PoC
To:	3GPP TSG-SA
Copy:	3GPP SA1, SA2, CN1, CN3, CN4, OMA PAG WG
Response to:	TSGS#21(03)0530
Source:	OMA Req WG (with input from OMA PoC WG)
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Attachments:	OMA-RD_PoC-V1_0-20031015-D Draft Version 1.0 PoC RD OMA-REQ-2003-0672R01-REQ Group PoC Presentation to 3GPP OMA-POC-2003-0043R01-PoC Architecture Presentation

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1 Overview

OMA thanks 3GPP for the LS on principles for overlapping issues regarding PoC.

OMA would like to provide following responses to the six points highlighted in the original 3GPP LS:

1. "*3GPP understands that OMA will develop an application enabler for PoC. 3GPP assumes that this application enabler will be based upon IMS and services such as presence and conferencing that are derived from IMS*"

   OMA PoC application service enabler will utilize SIP/IP core based on capabilities from IMS as specified in 3GPP and 3GPP2. We recognize the desire to align on Presence service and suggest OMA Presence and Availability Group (PAG) to collaborate with 3GPP to provide a common Presence solution for PoC. PoC group service seems to be a special kind of conferencing service; OMA would like 3GPP to provide additional information on its work on conferencing service and its applicability to PoC.

2. "*OMA is requested to present its requirements and architectural assumptions in terms of functionality required from a cellular or IP multimedia network. 3GPP will analyze which requirements are currently supportable within our release 6 plans and what work must be done to remedy any deficiencies*."

   Enclosed in the LS please find the latest OMA PoC requirement document and two powerpoint presentations on PoC requirements and PoC architecture overview that can be presented at next 3GPP

meeting. 3GPP is encouraged to analyse its impact to underlining cellular and IP multimedia networks and to develop any necessary enhancements in Release 6 in order to support PoC implementation.

3. "*3GPP can most efficiently address the OMA requirements through the normal 3GPP workflow. This means that PoC requirements should be introduced through SA1 which will perform the appropriate requirements analysis. SA2 will perform the analysis and any changes required with respect to IMS architecture. The CN1, CN3, and CN4 working groups will perform the necessary protocol analysis and development when appropriate. Other 3GPP groups may also be involved*."

   Noted. We would encourage relevant 3GPP groups to liaise directly with OMA PoC WG on technical issues and OMA Req WG for PoC requirements. OMA Req WG would welcome SA1 requirements analysis towards improving the RD for its finalisation in a timely manner. To maintain the momentum driven by operators and vendors in OMA towards a standards-based PoC enabler within 2004, priority has been placed on completion of the RD. Currently, the formal review of the RD is scheduled for 12th of Nov. with targeted final agreement by Reg WG by the end of Nov. 2003. Comments from SA1 received by 12th of Nov. would be much appreciated.

4. "*Work within 3GPP to address any enhancements required for PoC is expected to be driven by 3GPP member companies (many of which are also members of OMA). This work is subject to the standard 3GPP work item definition and approval process. 3GPP intends to address this topic expeditiously and a work item already exists within 3GPP to address architectural impacts due to PoC*."

   OMA takes note of and thank 3GPP for its commitments as shown by the SA2 initiative on architecture impact assessment WID..

5. "*3GPP TSG-CN should be the single point of contact with IETF in addressing PoC extensions to IETF protocols*."

   OMA recognize the on-going collaboration between 3GPP and IETF on IMS. If OMA identifies that new IMS extensions to IETF protocols are needed for PoC, these will be communicated to 3GPP and 3GPP2.

6. "*OMA is requested to give a presentation of preliminary PoC requirements, architecture, and timelines during the meetings of SA1, SA2, and the CN WGs to be held from 27 to 31 October in Bangkok, Thailand. This collocated meeting of 3GPP working groups provides an excellent opportunity to acquaint the 3GPP experts with the OMA PoC plans*."

   Agreed. Representatives from OMA Req WG and OMA PoC WG will be in the Bangkok 3GPP meeting for the presentations.

2 Proposal

N/A

3 Requested Action(s)

On Q1. above, OMA would request 3GPP to kindly provide additional information on its work on conferencing service and its applicability to PoC.

On Q2., 3GPP is requested to analyse its impact to underlining cellular and IP multimedia networks and to develop any necessary enhancements in Release 6 in order to support PoC implementation.

On Q3., SA1 is kindly requested to provide comments on the attached draft PoC RD by 12th of Nov.2003 for consideration in the final RD review within November.

Push to Talk over Cellular Requirements

Draft Version 1.0 – 15 October 2003

Open Mobile Alliance
OMA-RD_PoC-V1_0-20031015-D

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 shall be used in this document to refer the Push to Talk over Cellular enabler offered via an OMA compatible environment.

2. References

2.1 Normative References

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

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2.2 Informative References

[REF] "RefTitle", Source, URL

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None.

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3. Terminology and Conventions

3.1 Conventions

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

All sections and appendixes, except “**Error! Reference source not found.**” and “Introduction”, are normative, unless they are explicitly indicated to be informative.

3.2 Definitions

Administrator	A person(s) or an entity that creates and maintains PoC for the specific group.
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 Group	A defined set of PoC participants to whom a PoC call may be placed by a member of that group.
PoC group member	PoC subscriber who has been added to a PoC group through an administrative action.
PoC Host	A PoC participant who has authority to administrate the group.
PoC Participant	A PoC subscriber who is actively participating in PoC communication.
PoC session	This is an established connection between PoC users where the users can communicate using voice one at a time.
PoC service administrator	Has the authority to define, delete or modify PoC groups. PoC service administration privileges may be provided as part of the service offering, for example in the case of service provisioning for large organizations or corporations. The PoC service administrator may be a participant of all, some or none of the PoC groups.
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).
Speaking	An activity to send voice messages to the participants. (media other than audio is for further study)
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.
Talk Button	One of the buttons or keys on the mobile terminal preset to allow the participant talking to the PoC participant(s).

3.3 Abbreviations

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

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 she 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.

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 acceptance, a common standard defining service in sufficient detail to allow interworking 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.

- 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 called subscriber.
- 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.
- Personal alert feature enables a subscriber to alert another subscriber. The alert expresses the calling subscriber's wish to communicate and to request the called subscriber to "call back". A personal alert may carry a text message.

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 calls 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 calls, either with another PoC user or with a PoC group. As a PoC participant, the user is not limited to being a member of only one group at a time

The user is able to receive notifications of PoC groups available to participate in and hence request to join those groups, or she may receive invitations to participate in other PoC groups. She is able to identify which group she is participating in and retrieve a list of PoC members participating in each group. Changes to group status are propagated to the PoC user such as when a new user joins a group or when an existing user leaves a group.

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

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

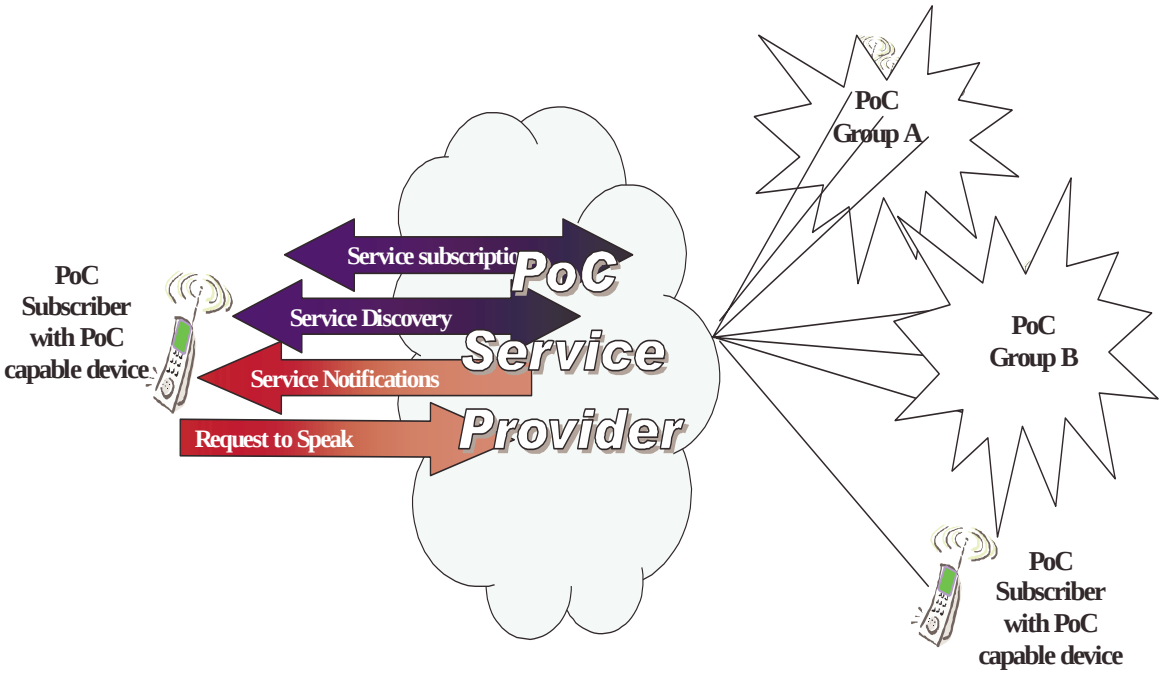


Figure 1: Basic User Experience

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

5. Use Cases (Informative)

A number of use cases have been identified but some more may be developed.

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 begining 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 setup 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.

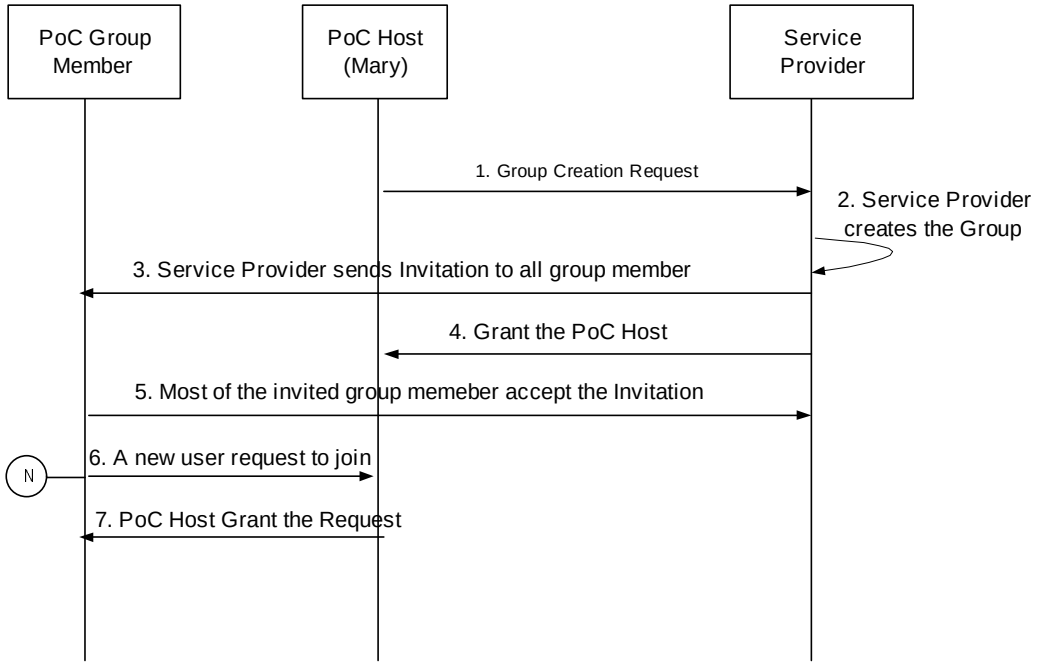
5.1.4 Post-conditions

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.

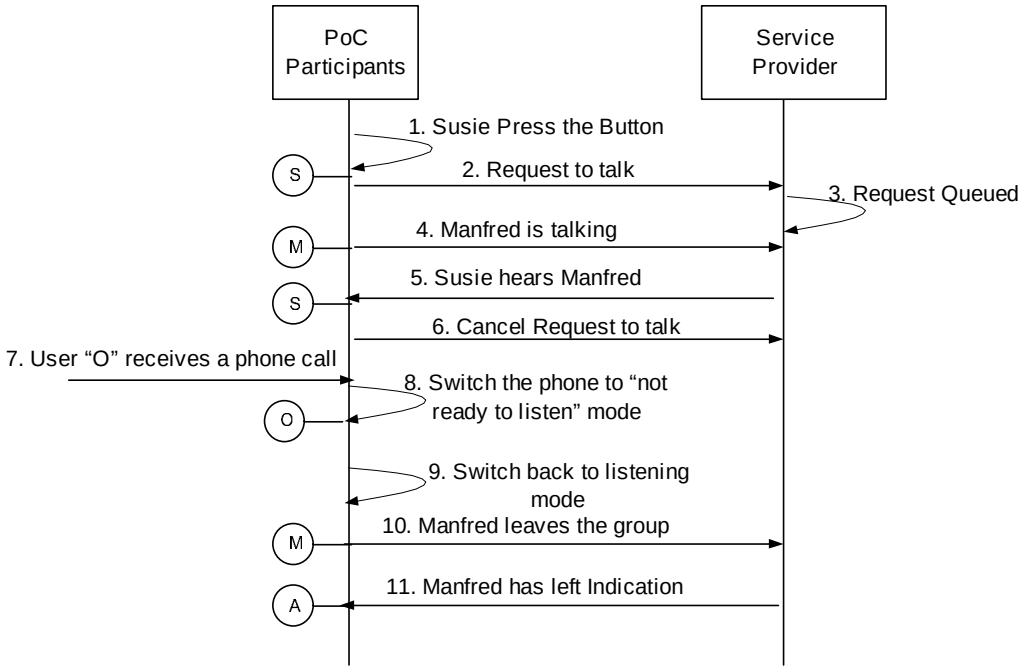
1. A PoC subscriber (Mary) sends a request to create a PoC Group to the Service Provider.
2. Service Provider creates the group according to the request.
3. Service Provider advertises the PoC group to all the invited group members with the group name and the PoC Host for the group.
4. The Service Provider 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 Alternative Flow

<Alternative flows are needed to make the description complete, if a single flow of events does not cover the use case completely. However, avoid going into detail and do not describe all the exception handling as alternative flows. Exception handling shall be described only, if it leads to specific requirements for the overall system. (optional)>

5.1.7 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 subclause, 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 aditonal 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.

5.2.7 Operational and Quality of Experience Requirements

<text to be added (optional)>

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 setup (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 setup 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 playout 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 enqueued 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 users 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 can not 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 an name or handle, which can then be then referenced in the owners contact list.

If group members are in a 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 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 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 leave 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 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.

5.10.1 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).

5.10.2 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.

5.10.2.1 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

5.10.2.2 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

5.10.3 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".

5.10.4 Post-conditions

Receptionist has found a cleaned room.

5.10.5 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.

5.10.6 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.

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

5.11.1 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.

5.11.2 Actors

Participants

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

Network operator

Service provider

5.11.3 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

5.11.4 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

5.11.5 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.

5.11.6 Post-conditions

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

5.11.7 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

5.11.8 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.

5.11.9 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.

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

5.12.1 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

5.12.2 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.

5.12.2.1 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

[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.

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.
    - *His nickname may be displayed*

5.12.2.2 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.

5.12.3 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.

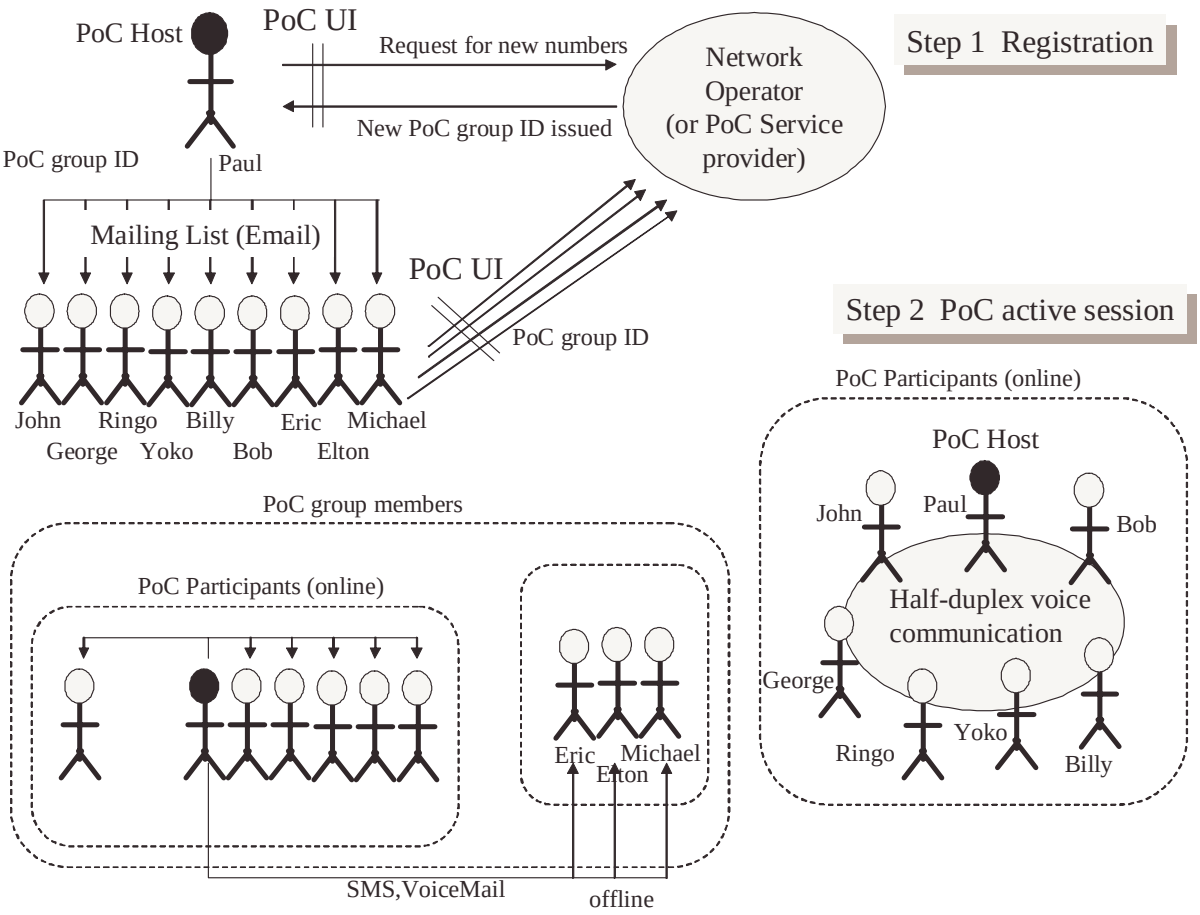
5.12.4 Post-conditions

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.

5.12.5 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".**

5.12.6 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.
- Anonym 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.

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

5.13.1 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.

5.13.2 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.

5.13.2.1 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.

5.13.2.2 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.

5.13.3 Pre-conditions

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

5.13.4 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.

5.13.5 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.

5.13.6 Alternative Flows

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

5.13.7 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.

5.14 Open Issues

<Anything that the author(s) want to mention and which needs further clarification. (optional)>

6. Requirements (Normative)

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 user may either join an existing PoC group or he may create a PoC session spontaneously. A user who wants to speak, typically press a talk button on its terminal and starts to speak. Other participants of the PoC group 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 user at a time SHALL be granted the right to transmit their speech communication (i.e., to speak), while the others on the PoC call MAY receive the speech communication (e.g., listen).
- Users MAY communicate in a one-to-one fashion (Private Call), one-to-many fashion (Group Call), and using Call Alert methods. *Group Chat is similar to Group Call except that Chat Rooms are manually joined and exited by the members*.
- A PoC subscriber MAY create a PoC group. PoC subscribers becoming members of a PoC group are PoC group members.
- A PoC group MAY either be created by administrative means, i.e. a pre-arranged PoC group, or by inviting and adding PoC subscribers to a PoC group session in ad-hoc manner, i.e. an ad-hoc PoC group. An ad-hoc group exists only the duration of an ad-hoc PoC group session.
- PoC Participant sets up a chat room and users register themselves.
- Other users may be allowed to join this PoC group, or existing members may choose to leave this group.
- When a user wishes to speak to the others, he pushes the talk button to request the right to speak.
- The right to speak is granted by the PoC service entity. As an option, further requests to speak may be queued.
- In case more than one request is queued, optionally it may be possible for the PoC service entity to prioritise requests in the queue.
- The voice SHALL be immediately delivered to other PoC participants who are permitted to receive it.
- Current talker identities MAY be provided to all users during PoC calls, unless the caller identity is restricted.
- PoC sessions may be terminated by the PoC Host.
- The PoC service provider may terminate PoC sessions based on its policy.
- The PoC service entity may provide the originating user with an early indication to start to speak even before invited users accept the call. The PoC subscriber SHALL receive a notification if no participants receive the talk burst.

6.1.1 Call Setup Methods

The following list is a set of requirements or definitions on PoC call setup methods :

Editors Note: it is proposed and endorsed to incorporate informations flows in addition to the textual description!

Methods for Call Setup are listed below:

- 1-to-1 PoC session.

- 1-to-many Poc session.

Call Setup of 1-to-1 PoC session:

- The originating party selects a target and request PoC session and waits for an indication.
- The PoC service entity invites the target to participate in the PoC session.
- ThePoC service entity SHALL be able to receive a “confirmation” indication from a target.

Editors Note: a common definition for PoC service entity, PoC service enabler, etc shall be worked out. Suat, Nortel, took the action.

- The PoC Service entity SHALL send a confirmation towards the originating party, when a confirmation indication is received from the target.
- In case the “ready-to-speak” indication is received, then she can start to talk, otherwise speaking is not permitted.

Editors note: system behaviour is up to be defined by technical WG´s.

- PoC voice SHALL be possible to be delivered as soon as at least one of the invited members confirms the invitation with the originating party being granted the floor by default.

Editors Note: a description of the user actions during an established PoC session is needed.

- *The receiving participants hear the sender's voice without any action on their part, for example, without having to answer the call. As a further option, the receiving participant will be prompt/alert with an incoming invitation. The receiving participant MAY accept, ignor or reject the invitation manually.*

Call Setup of 1-to-many PoC session:

Case 1: Pre-arraged PoC group session setup.

A pre-arranged PoC group already exists and contains some PoC group members. One of the participants is going to speak members within the group.

- 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.
- Optionally, the PoC service entity may check if at least one of the parties whom the originating party is going to speak to is able to participate.
- The PoC service entity SHALL invite all dedicated PoC group members to participate in the PoC session.
- 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
- ThePoC service entity SHALL be able to receive a “confirmation” indication from each invited member.
- The PoC Service entity SHALL send a confirmation towards the originating party, every time a confirmation indication is received from one of the addressed targets.
- The PoC communication will be possible to commence as soon as at least one of the invited members confirmed the invitation.
- PoC voice SHALL be possible to be delivered as soon as at least one of the invited members confirms the invitation
- A PoC member of the group SHALL be able to join the ongoing PoC session. This SHALL NOT cause any invitations to the members currently not partipating in the PoC session.

Case 2: Ad-hoc PoC group session setup:

- A PoC group does not exist yet and a PoC user wants to establish PoC session with several usersA user SHALL be able to invite selected users to the Ad-hoc PoC group communication.
- The inviting user SHOULD receive notification of the result of the invitation per invited user.
- The invited user SHALL get an identity of the inviting user, subject of privacy rules.
- Depending on the answer setting by the invited user the terminal SHALL either answer automatically or the terminal SHALL ask the user to manually accept or reject the session request.
- When at least one user has accepted the invitation the inviting user and the accepting user SHALL be able to start to communicate.
- The inviting PoC subscriber SHALL receive a notification if none of the invited PoC subscribers accept the invitation.
- There SHALL be a maximum number of invited users, which is operator configurable.
- A user who has been disconnected from the ad-hoc group PoC session SHALL be able to re-join the session if it is still ongoing. Otherwise the re-join procedure SHALL be rejected.

Case 3: Joining a chat group PoC session:

- A user SHALL be able to join a chat group talk by selecting the group identity for instance from the contact list. A user SHALL be able to join a restricted group and an open group.
- A user SHALL get a floor idle, floor granted or start talking indication after the user has successfully joined the chat group.
- If floor is granted, user(s) SHALL receive a granted user identity and starts to receive talk-burst from the granted user.
- The PoC service entity SHALL only allow a member of a restrictes chat group to join the chat group.
- The PoC service entity SHALL allow any PoC subscriber to join open chat group.
- The PoC service entity SHALL reject the joining user because of the following reasons:
    - The user is not a member of the restricted group.
    - The maximum number of users has already joined the group.
    - The requested group does not exist.

  In this case the PoC service entiy SHALL provide reject indication and a cause.

6.1.2 Communication Phase

6.1.2.1 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 inicate that a participant requests to speak,
- To indicate permission to a participant to speak in response to a request,

- To indicate to a participant that a request to speak has been denied,
-
- To indicate by a participant that she has finished speaking,
- To indicate to a participant that her speaking has been forced-released,
- To indicate to all participants that the previous participant has finished speaking and floor is idle,
- To indicate to all participants that the speaking particpant has finished speaking,
- To indicate to all participants that the participant is about to speak (i.e. a participant has been granted the right-to-speak).

The following list MAY be a set of additional requirements on Floor Control if the functions are implemented as described below:

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

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.

6.1.2.2 Joining a PoC session

A PoC user SHALL be able to join an ongoing PoC group session.

6.1.2.3 Participant information

PoC session participant information can be delivered two ways if requested. The mode SHALL be selectable by end user, depending on whether the user wants to

a) Request information on who is participating in the PoC group session just now

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

- a participant leaves the talk session.
- a participant joins or is added to the talk session.

The user interface SHALL convey to the user which of the two modes is currently enabled.

The participant MAY also choose not to request any group participant information.

6.1.2.4 Leaving of PoC session

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

6.1.2.5 Removing a PoC participant from PoC session

The PoC service entity MAY remove a PoC participant from the PoC session.

6.1.2.6 Add user to PoC session

A participant of the PoC session SHALL be able to add new user(s) in to the session. The inviting user SHALL receive notification of the result of the invitation per invited user. The result can be for example:

- A user accepted invitation
- A user rejected invitation
- A user was not reachable

After the session is accepted the invited user SHALL receive the status of the floor.

Adding of user SHALL not affect the ongoing communication.

The added users SHALL be included in the list of participants, which is distributed to those sessions participants who have requested the participant information updates.

There SHALL be a maximum number of added users, which is operator configurable.

6.1.3 PoC session termination

A PoC session SHALL terminate depending on the PoC service provider policy.

If there are still participants left in the PoC session, those participants SHALL be removed from the PoC session and no participant SHALL be able rejoin.

6.1.4 Security

This clause identifies the high level Security needs to support the requirements identified in this specification. Requirements shall be presented at a high level, and not assume or imply the technology or implementation of the requirements.

Prior to any PoC service interactions (e.g. PoC sessions, PoC adminstration,etc) the PoC service entity and the user SHALL be mutually authenticated.

The speech communication and the signalling in the PoC shall be transported in a secure manner.

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

6.1.5 Charging

This clause identifies the high level charging needs to support the requirements identified in this specification. Requirements shall be presented at a high level, and not assume or imply the technology or implementation of the requirements

The PoC service entiy SHALL be able to charge both types of users, prepaid subscribers and postpaid subscribers.

The PoC service entity shall support sufficient mechanism to allow various forms of charging. Information of relevants could be the following items;

- Durtion of a session.
- Duration of speaking time.
- Number of participants, including their ID´s.
- Number of “ready-to-speak” granted.
- Number of sessions initiated.
- Number of session attemps.
- Volume of data., e.g. voice packets, bits.
- Type of PoC call.
- PoC service interactions (e.g. join a PoC group, leave a PoC group, administer PoC groups, etc).

PoC service entity SHALL provide records for failed delivery and/or conditions of exessive latency.

6.1.6 Administration and configuration

PoC users SHALL have the following minimum set of capabilities;

- Generate and mange user defined pre-arranged PoC group lists to be utilised by the PoC service entity.
- Generate and manage user defined contact list of PoC subscribers and groups to be utilised by the PoC service entity.
- Generate and mange user defined chat groups.
- Manage PoC session treatment methods including do-not-disturb, auto accept vs. manual accept and rejection based on identiy of inviting PoC subscribers.

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

- Create and Manage the PoC subscriptions
- Creation, changes and management of pre-arranged group list, contact list, accept/reject lists, DnD, answer mode setting.
- Creation of, changes to and management of chat groups
- PoC client administration and configuration SHOULD be possible using existing OMA Device Management Enablers.

6.1.6.1 Three modes of PoC

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 group:

- A session between pre-arranged PoC group members is established when an individual PoC member of the pre-arranged group invites the PoC group where she is member of.
- The voice communication starts after the first PoC group member accepts the invitation.
- The participation in a pre-arranged PoC group MAY be restricted to the members of the PoC group.
- Members of the group SHALL either be invited when the session is established or SHALL be able to join into an ongoing session.
- Additionally, all members MAY be allowed to invite additional PoC subscribers to the ongoing session.

Attributes applicable to ad-hoc PoC group:

- An ad hoc PoC group session is established when a PoC subscriber selects more than one other PoC subscribers and invites them.
- The voice communication starts after the first PoC subscriber accepts the invitation.
- The participation in a ad-hoc PoC group is not restricted.
- To participate in an ad-hoc PoC group, an invitation from a PoC group participant is needed.

Attributes applicable to chat PoC group:

- A chat PoC group session is established as soon as the first PoC subscriber joins in.
- The voice communication - in principle - is possible at the time the chat session is established.

- Chat PoC group members can either be invited when the session is established or be able to join into the ongoing session.
- Optionally, chat groups MAY be closed and restricted to those participants who receives invitations to participate.

6.1.6.2 Visibilities of PoC groups

When a subscriber searches for available PoC groups, a PoC group may be found or not found according to the pre-defined configuration as follows.

- the PoC group is visible to the pre-defined group only;
- the PoC group is visible to any subscribers.
- PoC groups SHALL be visible to the PoC Host only.

6.1.6.3 Invitation and request to participation in a PoC session

The subscriber listed in the pre-arranged buddy list will be invited to the PoC session when it starts. The invited subscriber shall be able to reject or accept the invitation.

The subscriber may apply for the participation in the PoC session. Depending on the pre-arranged list, the subscriber is automatically accepted, rejected or processed further authorisation.

It shall be possible to authenticate a PoC participant and authorise her to become a member.

6.1.6.4 Participation to more than one PoC groups

A user may participate in more than one PoC groups at the same time.

6.1.6.5 Termination of PoC

The service provider SHOULD be able to choose the cause of triggering of the termination of the PoC session for example from a list below or as a combination of them:

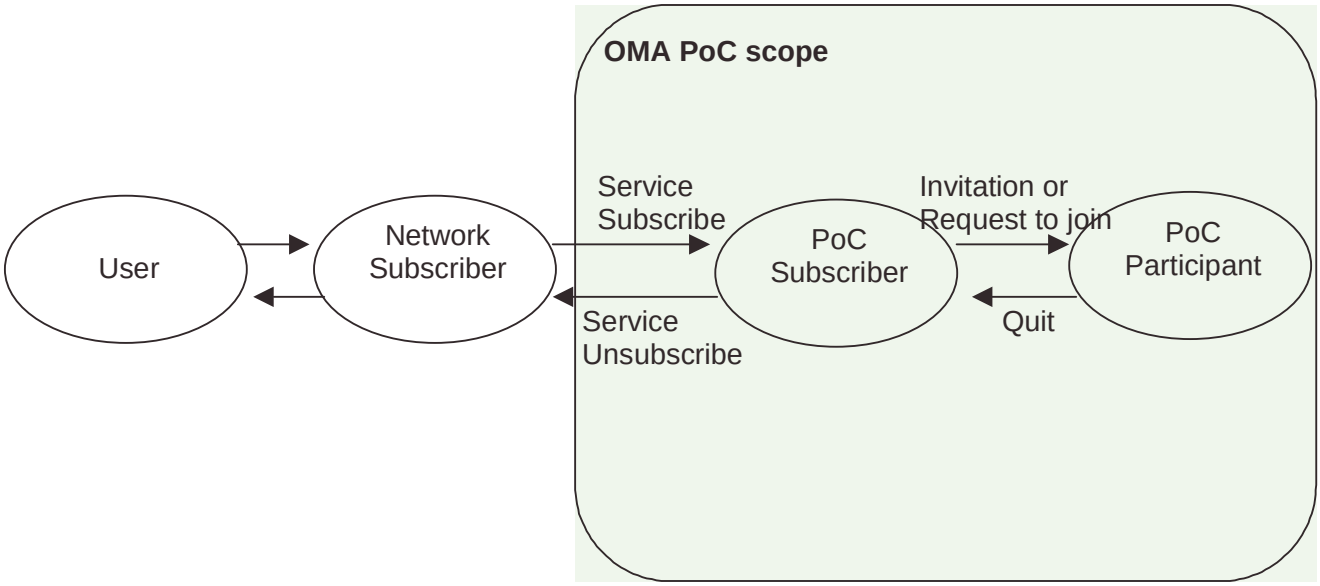
- termination by administrator;
- termination upon leaving the last participant;
- termination upon leaving of the second last participant;
- termination upon leaving of the initiator of the PoC session;
- termination after pre-defined time;
- termination after pre-defined time without speaking.

A PoC Host shall be able to choose the termination of the PoC as described below.

- Termination of group by date or date/time

6.1.6.6 State transition of the actors

- Before an individual user can take part in PoC communication, she 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, she becomes a PoC subscriber.
- Before a PoC subscriber can become a PoC Participant she SHALL either "be invited to the PoC communication and accept the invitation" or "request to participate in the PoC communication and have the request accepted. When she becomes a PoC participant, she is able to listen to the conversation in the PoC communication.



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.

6.1.6.7 PoC group and contact list management

The PoC subscriber uses a pre-arranged group as a means to establish PoC session where the group attributes control the session type and who MAY participate in the session. A pre-arranged 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 and pre-arranged PoC groups in order to use that information to contact them using PoC features. For this purpose a user SHOULD have at least one contact list.

6.1.6.8 PoC access / reject list and answer mode management

On the reject list the user maintains users and/or groups from whom the user does not accept to receive instant talk session requests.

On the accept list the user maintains users and/or groups from whom the user accepts to receive instant talk session requests. In addition to the accept list there is a single auto answer mode flag which is applicable for users and/or groups on the accept list. If the user sets auto answer mode flag on, the sessions from the accept list users are utilizing auto answer mode. If the auto answer mode flag is off, then the manual answer mode is applied.

A user SHALL have the ability to either accept or reject requests from “all other users” that is users not specifically listed in either of the lists. For these "all other users" manual answer mode is used.

6.1.7 Usability

- The PoC shall not prevent the user's operation of other OMA compatible services.
- The PoC service provider may decide the number of participants to one PoC service.
- An option shall exists to apply administrative controlling rights to a PoC paticipant.
- An option to queu more than one speaking request at the same time shall exist.
- 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 will be supported by the PoC service (e.g., take a telephony call, putting a group call on hold), but may be limited by capabilities of the supporting network or the ability of the handset device. The PoC service will not restrict concurrent service execution.

6.1.8 Interoperability

The most basic PoC service shall not be limited to the PoC dedicated mobile terminal. It shall only be limited to the subscription option.

6.1.9 Privacy

A PoC service entity SHALL allow a PoC participant to hide their identity from some or all of the other participants. .

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

6.1.10 Lawful Intercept

Lawful Intercept requirements vary from region to region and the reader should refer to the appropriate national/regional Lawful Intercept documentation for normative requirements relating to the PoC service. It is anticipated that these requirements may include the obligation to provide a mechanism to enable the Law Enforcement Agents to eavesdrop on PoC sessions without the users of the PoC session being aware of the intercepted.

6.2 Operational Requirements

6.2.1 High Level Requirements

- PoC subscriber shall be able to request the Service Provider to create a group
- Service Provider shall be able to create a group according to the request of a PoC subscriber
- Service Provider shall be able to advertise the group information (e.g., group identify, PoC host of the group, etc.) to all the group members.
- Service provider can grant administrative authority to a PoC subscriber
- A PoC subscriber can join a group by sending the request to PoC Host for the group (any Service Provider action required?)
- PoC Host can remove a malicious participant(s)
- PoC Host can grant request to join the group (any Service Provider action required?)
- Service Provider shall be able to queue the request to talk
- PoC Participant shall be able to cancel a request to talk
- PoC Participant shall be able to receive CS call when in PoC group talk
- PoC Participant shall be able to switch between listening mode and “not ready to listen” mode (Any Service Provider action needed?)
- When a participant leaves the group, all the other participants in the group shall receive an indication the participant has left the group.

6.2.2 Requirements on identity

When a PoC subscriber receives the incoming PoC session request, she SHALL also receive the identity of the inviting PoC subscriber, in the form of user identity and, if provided, the screen name. The screen name MAY be provided either by the inviting user or by the system. The system MAY replace display name provided by the user.

The identity of the PoC participant who has been granted the floor, SHALL be distributed to all the other participants in the talk session. The granted participant SHALL be identified with the user identity and/or the display name depending on the system setting.

Each PoC participant SHALL be identified by an alphanumeric indication (e.g. MSISDN or SIP URI) Additionally,. She shall be able to use her screen name during her PoC participation.

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

6.2.3 Contact list

Each PoC user shall be able to create at least one list of other PoC users and PoC groups which may easily be used to address the users or the groups to whom she would like to speak.

In order to recover from loss or to manage change of the PoC enabled terminal, it shall be possible to store the backup copy of a contact list in the network.

6.2.4 Do-not-disturb feature

In case a PoC subcriber does not want to join a PoC session, the user SHALL be able to activate a setting to discard all incoming talk sessions (Do-not-disturb feature). If a user tries to invite a PoC subscriber whose Do-not-disturb feature is active, the inviting user SHALL receive the busy indication.

Do-not-disturb feature SHALL apply to incoming talk sessions but SHALL not apply to alerting.

6.2.5 Inactivate incoming talk-bursts

A PoC subscriber SHALL be able to discard all incoming talk bursts of the onging PoC sessions.

6.2.6 Requirements on Service mobility

Users shall be able to use the PoC service with other users of the same PoC operator

Users shall be able to use the PoC service when roaming to another operators network.

6.2.7 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, because QoE is highly subjective and very difficult to quantify and validate whereas these factors can be objectively measured and validated against pre-determined targets. For Push to Talk service enabler, the following service characteristics are identified as the factors impacting QoE:

QoE1, Session establishment time: The duration between the initiator pressing the Push to Talk button and receiving a “right-to-speak” indication.

Eitors note: Is there a need for a further subchapter on QoE1 as it is available for the other QoEx requirements?

QoE2, Right-to-speak response time: During a session, two-party or multi-party, the duration between a participant pressing the Push to Talk button and receiving a “right-to-speak” indication or waiting indication or denial.

QoE3, End-to-end channel delay: The duration between one participant, who has the right to speak, starting to speak and another participant starting to hear the speech (in case of multi-party session, each of the participant’s delay must be measured).

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

- End-to-end channel delay
- Transmit and receive levels (loss plan as per telephony)
- Codec characteristics

- RF channel conditions
- Echo does not impact vocei quality in POC because there will be no echo in a half-duplex operation.

Editors Note: QoE5 is proposed as "The Waiting indicator presence: During a multi-party session, it is the indication that the participant has to wait to get the right-to-speak. The presence or absence of this indicator is the QoE metric." The editor believes that the waiting indicator is a core requirement and the absence of the waiting indicator is not acceptable. Due to this reason there is no need for the introduction of QoE5.

These requirements refer to the case when a group of PoC participants is established and ready for voice communication.

6.2.7.1 Response to the start-to-speak (StS) request, QoE2

Start to speak (StS) refers to the time the participant has to wait until he/she has got the permission to start to speak after pressing the push-to-talk button. When a participant makes a request to talk by pressing the talk button and his request is not queued, the StS time shall be less than [1.6] seconds

If his request is queued due to other participants speaking or having already requested to speak, he shall be indicated within [1.6] seconds that his request has been queued.

If his request is rejected for any reason, he shall be indicated within [1.6] seconds that his request has been rejected.

6.2.7.2 End-to-end channel delay, QoE3

FFS

6.2.7.3 Turnaround time (TaT)

TaT refers to the time after a participant stops talking and releases the PoC button until he/she can hear another participant to respond. TaT consists of system delay time plus the response/reaction time from another participant. To allow a fluent communication between participants, the response time shall be acceptably short. In the case another participant replies immediately (i.e. within 1-2 s), the TaT shall not be longer than 4 s.

6.2.8 Voice quality requirements, QoE4

The voice quality shall meet the following limit: `MOS >= 3 at BER <= 2 %.`

Editors note: for the time being it is not agreed to have the MOS as a acceptable QoE metric.

6.2.9 Duration of speaking

The maximum duration of speaking by each participant of a PoC session MAY be configured by service provider for 1-to-1 and 1-to-many communication. If the speaking reaches the maximum time duration, her/his right to speak is automatically removed.

In the case of PoC ad-hoc groups, the PoC Host MAY preset a maximum speaking duration

The speaking participant SHALL be informed, by means of sound, flashing light or graphics, that the speaking limit is reached.

6.2.10 Multiple Group operation

Multiple group operation is an optional feature, the following requirements SHALL be met when this feature is implemented in the PoC system and UE.

- PoC subscriber SHALL be able to participate in more than one PoC group sessions at the same time
- One of the groups MAY be a primary group and the rest secondary groups
- Primary group communication SHALL have priority over secondary group communication as defined in chapter 6.2.9.1 and 6.2.9.2

6.2.10.1 Multiple group operation: no priority groups

- PoC subscriber SHALL start to hear traffic from any group where communication starts first
- The user SHALL get an identification which group is being received
- When the user wants to talk into a group, he/she SHALL be able to select to which group to talk.
- If there is traffic in more than one group at the same time, there SHOULD be a means to filter the traffic so that the user hears a single conversation
- PoC subscriber SHOULD continue hearing traffic from the same group until the discussion has ended.
- When the user is talking, his/her transmission SHOULD not be interrupted because of traffic in another group i.e. transmission SHOULD have higher priority than reception

6.2.10.2 Multiple group operation: one priority group and secondary group(s)

In case the user has a primary group and secondary group(s), the following requirements are additional to the requirements in chapter 6.2.9.1

- If there is no traffic in the primary group, the user SHALL receive traffic from secondary groups according to the requirements described in chapter 6.2.9.1
- Voice in the primary group SHALL be received immediately, even if the user was receiving voice in a secondary group.
- When the user wants to talk into a group, it SHALL be possible to have the primary group as the default target.
- The user MAY be able to change his/her primary group
- The user SHOULD be able to lock herself temporarily into one group and thus, suspend the listening of all other groups
- As long as there is traffic in the primary group, the user SHALL continue hearing it, until the discussion has ended

6.2.11 Separate 1-to-1 PoC call while having a PoC session

Separate 1-to-1 PoC call during a PoC group session and separate 1-to-1 PoC call during a PoC 1-to-1 session are optional features, the following requirements SHALL be met when either one or both of these features are implemented.

- A user, who participates in a PoC session, SHALL be able to initiate and conduct a 1-to-1 PoC call with any PoC group participant or any with any other PoC subscriber
- The separate 1-to-1 PoC call by a group participant SHALL not affect in any way the communication between other group participants
- The 1-to-1 PoC call participants SHALL not hear the previous session communication while having a separate 1-to-1 PoC call
- The first session SHALL be suspended while the user is engaged in the second session, and SHALL be automatically resumed when the second session is terminated, provided that the other session has not been terminated in the meantime.
- Users SHALL be able to receive 1-to-1 PoC calls while taking part in a PoC session
- Users SHALL be able to control the automatic acceptance of 1-to-1 PoC calls while in a PoC session.

6.2.12 Adding Participants to an Ongoing PoC Call

- A user participating in an ongoing PoC session, either a 1:1 call or a group call, MAY be able to add a PoC subscriber who is not currently a participant in the session.
- The party added to the session MAY be notified of the identities of all current participants
- Other participants MAY be notified of the identity of the party added to the session.

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 subscribers to seamlessly interact with each other within a PoC session (i.e. 1-to-1 and group calls) regardless of their service providers.
- PoC subscribers SHALL be able to seamlessly utilise PoC features involving other PoC subscribers regardless of their service provider. For example a PoC Group served by one provider's PoC service entity could include members who are subscribers of another PoC service entity.
- An appropriate interface SHOULD be provided between the PoC service entities of operators that are interconnected to allow the operator to manage the set up, monitoring and maintenance of PoC sessions and groups regardless of the participant's service provider.

6.3.3 Interworking with fixed connections – For Further Study

PoC service interworking with the fixed IP network Instant Messaging services with enhanced streaming audio files (e.g. terminating on desktop PCs) would enable a substantial extended coverage for both PoC and IM users – For Further Study. However, PoC interworking with legacy voice services carried by fixed networks (i.e. PSTN, private CS networks, VoIP) would be out-of-scope with the OMA charter as is currently defined.

6.3.4 Cross Services Interoperability – For Further Study

PoC interworking with other standalone and/or integrated messaging services - For Further Study.

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 interworking 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 terminal.

- If a CS call is ongoing, any incoming PoC call SHOULD be indicated.
- If a PoC session is ongoing, any incoming CS call SHOULD initiate alerting.

- The user SHOULD be able to switch between CS and PoC calls if needed maintaining call context for the non-active call..

Buffering of voice packets for the PoC call should be supported either in the server, or terminal.) For further study in the UE requirements section..

Note: REQ WG to check if priority call handling should be captured in this section.

6.3.6 Roaming Service Support

- A PoC user while roaming SHALL be able to access the PoC service (e.g.. initiate or respond to a PoC session) either as an individual or a group member.
- The visited network SHALL be "transparent" and provide unrestricted user access to his home network PoC service. The user should be able to access all the features of his normal home-based PoC service.
- It MAY be possible to limit some PoC capabilities when a user is in a roaming state by either user preference or operator provisioning. E.g. instant talk may be restricted.

6.3.7 Do Not Disturb

- A user SHALL be able to, indicate that he does not want to receive any calls, e.g. while roaming. This indication can be generic or specific for certain calling parties. In the event that this indication has been set, “invitations” and otherPoC service messages are also suppressed.

6.4 System Elements

This section contains high-level requirements on the basic functionality required by each of the identified system elements that provide PoC. The PoC client interacts with the PoC application service infrastructure to establish sessions and calls. The PoC application service infrastructure will coordinate a reliable half-duplex call discipline between the call originator and other participant(s).

Note that the requirements in this section do not assume any 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 terminals SHALL support functions to set up the call, request the floor, and release the floor.
- The terminal SHALL support a function to manually exit the call.
- PoC enabled terminals SHALL support functions, (e.g. tones) to announce an incoming call, and to properly arbitrate the use of the half duplex service (talk-proceed, floor open, floor rejected).

6.4.1.1 Interfaces to System Element X

<This subsection and the following subsections describe the high level requirements on the interfaces from System Element A to the other Elements in the System.>

6.4.2 PoC Client

The PoC Client SHALL be able to:

- Allow PoC session initiation, (e.g. codec negotiation), participation (e.g., talk, listen etc), and termination
- Perform Registration with the PoC Application Service Infrastructure
- Participate in authentication with the PoC Application Service Infrastructure
- Provide access to different lists in the PoC Application Service Infrastructure, e.g. contact lists, group lists etc.
- 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 configuration data downloaded by the PoC Application Service Infrastructure, e.g. over-the-air activation

The PoC Client MAY: -

- Provide access to manage PoC lists
- Provide access to presence information

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 calls
- Service registration requests from PoC Clients
- Participate in authentication with PoC Clients
- Negotiate the capabilities of the PoC client to be used in the session
- Allow PoC Clients to access different lists, e.g. contact lists, group lists etc.
- Forward talk bursts from the speaker towards designated PoC Clients
- Support floor control
- Dynamically add and remove group members during an active call
- Generate charging records
- Service access control
- Support Lawful Interception

(Note to be added: this requirement should refer to the relevant specifications standardised elsewhere.)

- Perform authorization of PoC client
- Provision service parameters and profiles etc for PoC users
- Store and access group membership information

The PoC Application Service Infrastructure MAY be able to

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

6.4.4 Network interfaces

6.4.2.1 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 communication connections.
- Support the requirements of performance related signaling 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 end-users to update group and contacts lists
- Support secure provisioning of PoC service parameters and features

6.4.2.2 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 group members

6.4.2.3 Interface Between PoC Application Service Infrastructure and OAM&P

The PoC application service infrastructure SHOULD be able to utilize capabilities that allow integration with the network operator's OAM&P

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

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

6.4.2.5 Interface Between PoC Application Service Infrastructure and Law Enforcement Agency

Access to intercepted PoC communications SHALL be possible as required by Law Enforcement Agencies.

(Note to be added: this requirement should refer to the relevant specifications standardised elsewhere).

6.4.2.6 Interface Between PoC Application Service Infrastructure and Law Group/List Management

<FFS>

Appendix A. Change History (Informative)

A.1 Approved Version History

Reference	Date	Description
OMA-RD_PoC-V1_0-20031013-D	13 Oct 2003	Apply new approved templet version to the requirements document. Same content as in the version from 8th of October 2003.
OMA-RD_PoC-V1_0-20031015-D	15 Oct 2003	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

A.2 Draft/Candidate Version <current version> History

<<This section is available in pre-approved versions – it should be removed in the actual approved versions>>

Document Identifier	Date	Sections	Description

Appendix B. Overview of Use Cases (Informative)

The following use cases provide an adequate description of the Push to Talk service requirements to develop service enabler requirements:

1) A person subscribes to a Push to Talk service and becomes a subscriber. Conversely, the subscriber cancels her subscription after which she will not be able to use the service.

2) A POC subscriber initiates a session to another service subscriber, where

- *the requested party is available, so that the initiator receives the indication to speak and start speaking;*
- *the requested party is not-available (for various reasons), so the initiator receives an indication that the requested party is not available for the POC session.*

3) A POC subscriber initiates a session to more than one service subscribers by selecting them (one at a time) from a list on her device (alternatively, the subscriber may create a locally significant group on her device) and pressing a button afterwards, where

a) at least one of the requested parties is available, so that the initiator receives the indication to speak and start speaking; all the participants who were available can hear the voice of the originator;

b) none of the requested parties is available (for various reasons), so the initiator receives an indication that there is no participant to the POC session.

4) A POC service operator defines a POC group by adding the POC subscribers to this group after ensuring that they want to be a member of this group. These POC subscribers become a POC group member and they are provided with the unique group identifier. (A variant of this case would be that the subscribers are business users with more stringent technical requirements such higher security or better performance and robustness)

5) A POC group member initiates a session to a POC group by selecting the group identification on her device and pressing a button afterwards, where

c) at least one of the group members is available, so that the initiator receives the indication to speak and start speaking; all the participants who were available can hear the voice of the originator;

d) none of the group members is available (for various reasons), so the initiator receives an indication that there is no participant to the POC session.

6) During a two-party POC session, one of the parties presses the button and speaks after receiving the "right-to-speak" indication and all other participants hear her voice. (Many variants may be created to capture functionality helping the people with disabilities, such as people with hearing impairment, visual impairment, mobility impairments, cognitive impairments)

7) During a multi-party POC session, one of the participants presses the button, and

e) speaks after receiving the "right-to-speak" indication and all the other participants hear her voice;

f) waits until the arrival of an "right-to-speak" indication (an indication of how many participants are waiting before him may be communicated to him), and then speaks where all the other participants hear his voice.

8) A POC subscriber makes herself unavailable to an incoming POC session. At a later time, the same subscriber changes her mind and makes herself available to an incoming POC session. (Optionally, other POC subscribers who are interested in the status of this particular subscriber may register for and then receive status change indicators with the permission of the subscriber whose status is being monitored.)

9) A POC subscriber receives a bill from the service provider, where the bill is

g) subscription based (optionally, group membership is charged in addition);

h) usage based (per duration of speech conveyed, or per number of sessions initiated, or per number of granted "right-to-speak", or per volume of data conveyed, or a combination of these).

10) An authorized law officer initiates the "lawful intercept" function to listen to an ongoing POC session, whether it is a two-party or a multi-party session.

11) A non law-abiding person tries to eavesdrop to a conversation over an ongoing POC session without success.

12) *A POC service provider signs an SLA with a network provider to ensure that the performance and technical requirements of the POC service are satisfied by the underlying network, including the infrastructure nodes and terminal devices.*

Editors note: the above list of service requirement categories is not yet argreed and still under discussion. However, in case it will be agreed the terminology used herein has to be adapted to the terminology use on other places in the RD. e.g. a PoC subscriber is called “participant”, PTT typically is PoC, SLA is not defined, etc.

OMA REQ Working Group
PoC Requirements Overview

Date: 23th October 2003

Availability: [X] Public [ ] OMA Confidential

Contact: Kennie Kwong
kennie.kwong@cingular.com

Source: OMA REQ Working Group

Purpose

- Provide advance information from the latest draft PoC Requirements Document (RD) dated 15th October, 2003
  - Only an overview & highlights enclosed
- Inform target schedules of PoC RD in OMA
- Invite comments by 3GPP/PP2 for timely completion of the RD

ACKNOWLEDGEMENT

Thanks to Sumio Miyagawa and Manfred Leitgeb of Siemens who provided major input to this presentation

Outline

- OMA PoC Market Drivers
- OMA Work Activityy Process
- OMA Work Activity Process on PoC
- PoC Requirements Overview
  - What is PoC?
  - Use Cases
  - PoC Features
  - Participation
  - Call Setup Methods
  - Communication Phase - Floor Control, Other Operations
  - List/Group Management
  - Charging
  - Requirements - Others
  - Operational, QoE - Performance
  - Overall System Requirements
- PoC RD Schedule

OMA PoC – Market Drivers

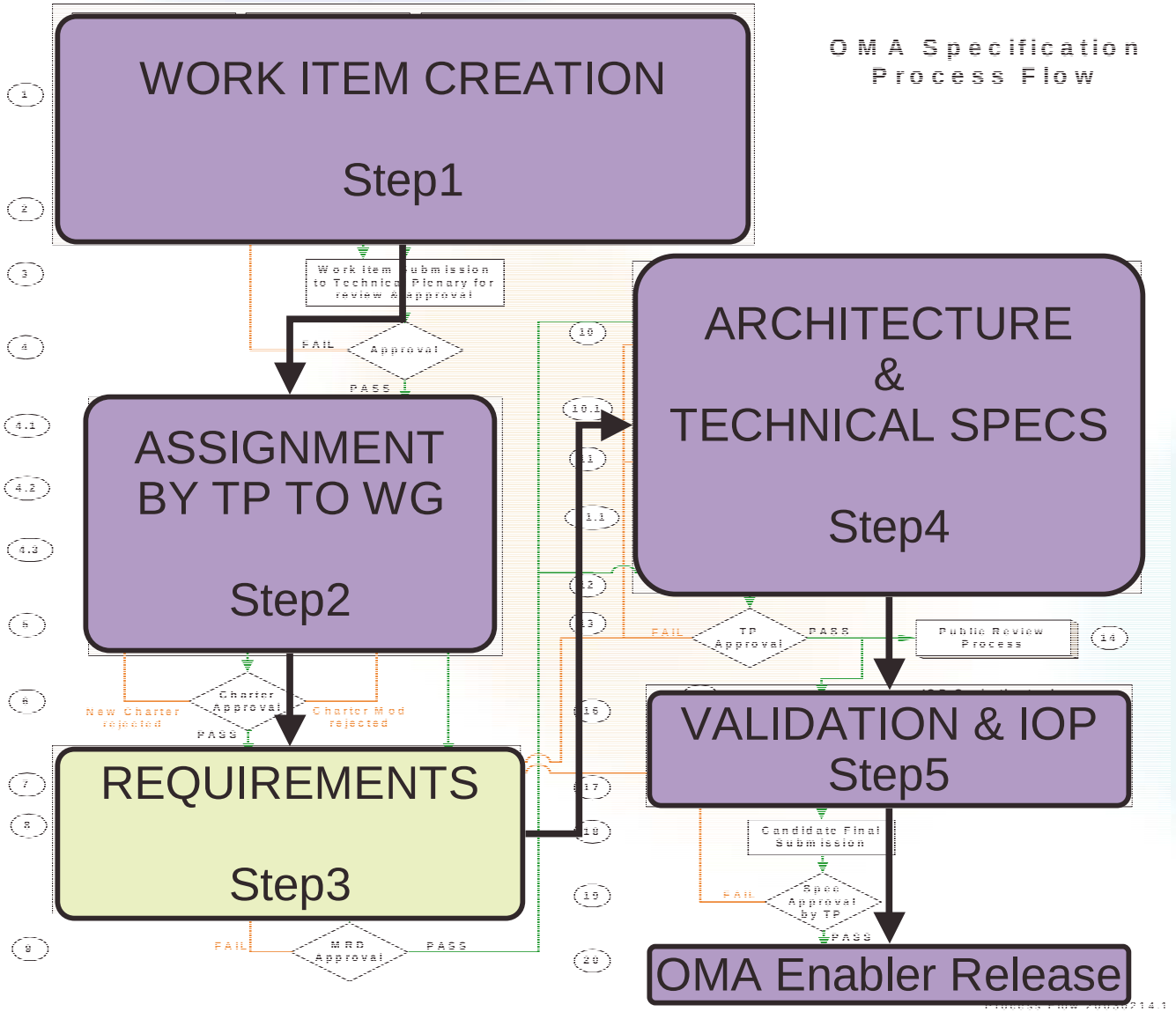
PoC Enables New User Experiences

- "Instant Communications without dialling a call."
  - Instantaneously initiate, Answer or Join a call (with a single key action)
- "On-Demand Group Conferencing"
  - Emulated by PoC Group Calls
  - Cost savings for the group host
- Blue collar PoC applications expanding into new customer segments
  - White collar professionals, mobile work teams, friends & family, teens

New Service Growth leveraging Operators' PS network investments

- Bursty Talk traffic from PoC carried efficiently on PS transport
- Opportunity to extend inter-carrier PoC service with national or global reach utilising interoperable packet switched networks
- OMA PoC service enabler will be interoperable across operators and bearer network technologies

OMA Work Activity Process



OMA Work Activity Process - continue

- Before Work Item (WI) is assigned to a WG
  - WI Creation -> TP approval
  - Assignment of WI to a WG (existing or new)
  - The assigned WG updates (existing WG) or creates (new WG) the charter
- RD (Requirement Document)
  - High Level Requirement Document contains;
    - Use cases (informative); and
    - High-level requirements (normative)
  - Completion of RD -> REQ Group review & agreement -> TP review & approval
- Detailed Specification Creation
  - Architecture Document (AD)
  - Detailed Technical Specification(s)
- And Consistency Review, IOP … towards an Enabler Release Package

OMA Work Activity Process on PoC

- WI approved - REQ had initial responsibility - Apr 2003
  - WI assignment shifted to MAG PoC SubWG - Jun 2003
  - PoC WG formed in Sept. 2003, superceding MAG PoC SWG
  - RD responsibility to stay in REQ WG until its completion; PoC Track had five F2F meetings and in-between conference calls
- REQ Group formal RD review: 12th November 2003, London
- REQ WG final review & agreement of the RD: end of November 2003
- OMA TP review & approval of the RD (via email): December 2003

- Beyond the RD - PoC WG has overall responsibility until completion of the PoC Enabler (Candidate/Final) Release

PoC Requirements: What is PoC?

- Push To Talk over Cellular
  - A form of communications that allows users to engage in immediate communication with one or more users, providing a “walkie-talkie”-like service. However, strong coupling to data capabilities enables key features, such as: Group lists creation & management, Group sessions emulating Conferencing on Demand and, possibly, Presence & Availability.
  - The communication is half-duplex: Only one person can talk at a time and all other participants hear the speech.
  - Other participants can respond to this message once this initial talk-burst is complete.
  - Contention of the Right-to-Speak amongst different participants is managed via **Floor Control** by the PoC “Service Entity”.
  - The receiving participants hear the sender's voice either by **Auto Answer** without any action on their part, or by **Manual Answer,** i.e. being prompted/alerted and accepting the call before hearing the sender's voice.

Use Cases (in current RD)

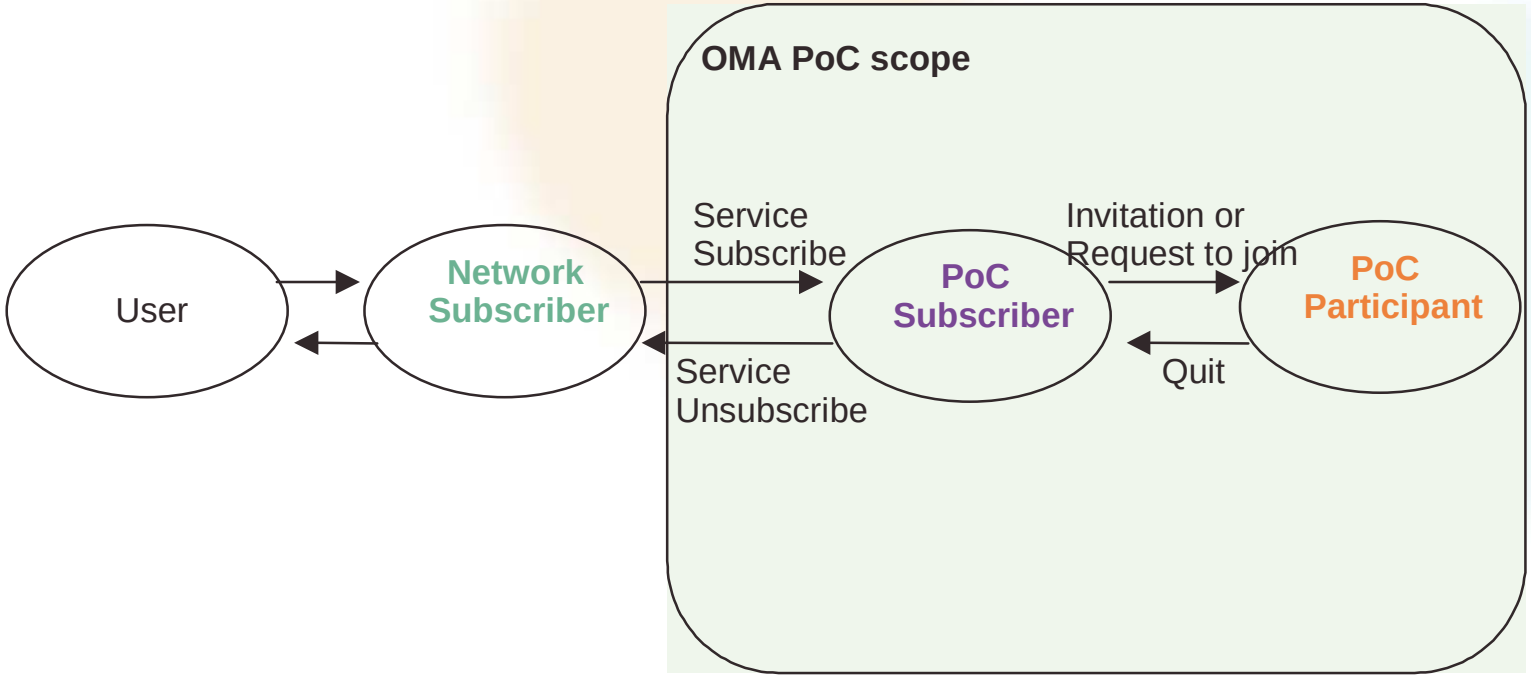
1. Group Call (1-to-many) set up by Service Provider, participants added (“Shop like Crazy”)
2. Basic Call (1-to-1) with Presence Information
3. Basic Call (1-to-1)
4. Pre-arranged Group Call (“Where to eat”)
5. Private Call (1-to-1)
6. Call Alert (1-to-1)
7. User Defined Group Call (1-to-many)
8. Selective Dynamic Group Call (1-to-many)
9. Private Chat Group Support (1-to-many)
10. Multiple group sessions simultaneously (1-to-many)
11. Adding a 1-to-1 session (“Whisper Call”) while on an active group session
12. Ad-hoc Chat Group (1-to-many)
13. Fleet Dispatch (“1-to-many” variant)

PoC Requirements: PoC Features

- Communication Features
  - 1 -to- 1
  - 1 -to- Many
  - Personal Alert
    - Indication of calling subscriber's "wish" to communicate with the called subscriber.
- Creation of PoC Groups (1-to-many)
  - Pre-Arranged
    - PoC group created by Administrative Function before communication
  - Ad Hoc
    - PoC group created by subscriber, who can launch PoC communication.
  - Chat (open or closed)
    - PoC group created by Service Provider or subscriber. Any PoC subscriber can join open groups at any time; session is activated after the first person joins. A PoC subscriber can join a close group if invited by the Host..

PoC Requirements: PoC Participation

- PoC user must first be a **Network Subscriber** of at least one mobile operator.
- Network Subscriber can become a **PoC Subscriber** with additional PoC subscription.
- A PoC subscriber becomes a **PoC Participant** who is either "invited to the PoC session and accepts the invitation“ or has "requested to join in the PoC session and is accepted”.



PoC Requirements: Call Setup

Call Setup Methods

- 1-to-1 Session
- 1-to-many Group Session: Pre-arranged, Ad-hoc and Chat

Example: Ad-hoc Group Session Setup

- A PoC group does not exist yet and a PoC user wants to establish PoC session with several users.
- A user SHALL be able to invite selected users to the Ad-hoc PoC group communication (forming a Group).
- The inviting user SHOULD receive notification of the result of the invitation (per invited user).
- The invited user SHALL get an identity of the inviting user, subject to privacy rules.
- Depending on the 'answer setting' by the invited user, the terminal SHALL either answer automatically or ask the user to manually accept or reject the session request.
- When at least one user has accepted the invitation, the inviting user and the accepting user SHALL be able to start to communicate.
- The inviting PoC subscriber SHALL receive a notification if none of the invited PoC subscribers accepts the invitation.
- There SHALL be a maximum number of invited users (operator configurable).
- A user who has been disconnected from the ad-hoc group PoC session SHALL be able to re-join the session if it is still ongoing; otherwise, the re-join procedure SHALL be rejected.

PoC Requirements: Communication Phase

FLOOR CONTROL

- Minimum (mandatory) indications
  - Request to speak (user -> PoC Server),
  - Permission to speak (user <- PoC Server),
  - Denial of request to speak (user <- PoC Server),
  - Speaking finished (user -> PoC Server),
  - Speaking has been forced-released (user <- PoC Server),
  - Previous participant has finished speaking and floor is idle (all users <- PoC Server),
  - Participant has finished speaking (all users <- PoC Server),
  - Participant is granted the right to speak (all users <- PoC Server).
- Additional (optional) indications
  - Request to speak has been queued (user <- PoC Server),
  - Position of participant in the floor request queue (user <- PoC Server),
  - Identity & position of other participants in the floor request queue (user <- PoC Server),
  - Permit more than one level of priority in access to the floor (user <- PoC Server).

PoC Requirements: Communication Phase

OTHER FUNCTIONS

- Joining a PoC Session
- Participant Information
- Leaving a PoC Session
- Removing a PoC Participant from PoC Session
- Adding a User to PoC Session
- PoC Session Termination
- PoC Group Communications
- Multiple Group (Simultaneous) Operation
- Separate 1-to-1 PoC Call while having a PoC Session

PoC Requirements: Group/List Management

- Pre-arranged Group comprises of a list of selected PoC subscribers; Group Identity will address all PoC subscribers AND initiate the group PoC session
- Group and Contact List management
  - PoC User SHALL be able to:
    - Create & Manage user-defined Contact List, Group Lists, Chat Groups
    - Manage PoC session treatment: Do Not Disturb, Auto/Manual Accept, Rejection based on inviting subscriber's identity
  - PoC Service Provider SHALL be able to:
    - Create & Manage PoC subscriptions, Pre-arranged Group Lists, Contact Lists, Accept/Reject Lists, Do Not Disturb, Answer Mode settings
    - Create & Manage Chat Groups
    - (Should be able to) use OMA Device Management Enablers for PoC Client Admin & Config.
- Access/Reject List Management
  - Reject List – All Instant Talk sessions rejected
  - Accept List - Answer Mode Management
    - Auto Answer, Manual Answer

PoC Requirements: Charging

- Types of Subscription supported
  - Prepaid and Postpaid
- Various Operator Charging Models supported; Charging Mechanisms required based on (examples):
  - Duration of a session
  - Duration of speaking time
  - Number of participants, including their ID´s
  - Number of “ready-to-speak” granted
  - Number of sessions initiated
  - Number of session attempts
  - Volume of data (e.g. voice packets or bytes transmitted)
  - Type of PoC call
  - PoC service interactions (e.g. Join/Leave a group, Administer a group)
  - Records for Failed delivery and/or excessive latency

PoC Requirements: Others

- Do Not Disturb
  - PoC Subscriber SHALL be able to activate a setting to:
    - Discard all incoming talk sessions, but not Alerting

      (Inviting Subscriber SHALL receive a busy indication)
- Deactivate Incoming Talk Bursts
  - PoC Subscriber SHALL be able to activate a setting to:
    - Discard all incoming talk bursts during an ongoing PoC Session
- Duration of Speaking
  - MAY be configurable by PoC Provider (1-to-1 or 1-to-many) or Ad-hoc Group Host
  - Speaking participant SHALL be informed that the time limit is approaching

PoC Requirements: Others

- Identity:
  - I.D. (or Screen Name) of Inviting PoC Subscriber SHALL be indicated to Recipient
  - I.D. (or Screen Name) of PoC Participant granted the floor SHALL be indicated to all others
  - PoC Participant I.D. SHALL be identified by a unique alphanumeric (e.g. MSISDN, SIP URI); Participant SHALL be able to use Screen Name during PoC session
  - PoC Group I.D. SHALL be a unique alphanumeric (e.g. SIP URI); MAY have Screen Name
- Security
  - PoC Service Entity and PoC User SHALL be mutually authenticated
  - Speech transmission SHALL be secure
  - PoC Service Entity SHALL be able to log information about any PoC interactions
- Privacy
  - PoC Service Entity SHALL allow PoC Participant to hide his/her I.D. from some or all others
  - PoC Participant SHALL be able to select a Screen Name to be displayed to the other participants (Nick Name, URI or MSISDN)
- Lawful Intercept
  - As per applicable national/regional requirements

PoC Requirements: Operational, QoE

- Performance
  - Session Establishment Time
    - At the beginning of session, from ‘pressing of button’ by the PoC session initiator to arrival of a RTS indication :FFS
  - Right-to-Speak Response Time
    - In an ongoing session, from ‘pressing of button’ by any Participant to arrival of RTS Wait or Denial indication :within 1.6 sec
  - End-to-end Channel Delay
    - From start of speech from speaker (with RTS) to recipient receiving the talk burst :FFS
  - Voice Quality
    - Impacted by E-to-E Channel Delay, Tx/Rx Levels, Codec Characteristics, RF Channel conditions : Not agreed yet on MOS versus BER/Delay

PoC Requirements: Overall System Reqs

- Overall System Requirements
  - Open Interfaces
    - SHALL be possible to utilise applicable 3GPP/PP2 interfaces
  - Interoperability between PoC Service Providers & Service Entities
    - PoC subs interoperate across different PoC Providers
    - SHALL be able to utilise PoC features across providers, e.g. include group members
    - Operator SHOULD be able to set up, monitor & manage PoC sessions and groups across PoC service entities via an appropriate interface
  - Interworking with Fixed Connections – FFS
  - Cross Service Interoperability – FFS
  - Interaction with CS Call Mode residing on the terminal
    - If a CS call is going, any incoming PoC call SHOULD be indicated
    - If a PoC session is going, any incoming CS call SHOULD initiate alerting
    - SHOULD be able to switch mode between CS and PoC calls, without dropping the other

PoC Requirements: Overall System Reqs

- Overall System Requirements (cont'd)
  - Roaming Service Support
  - Do Not Disturb
    - SHALL be able to set 'Flag' to reject some or all of incoming calls or invitations (e.g. while Roaming)
- System Elements
  - UE
    - SHALL have essential functionalities, such as set up calls, request the floor, release the floor, manual exist the call, support indications (e.g. tones), arbitrate half-duplex service
    - MAY have other User Interface features, such as speaker, volume control, button etc.
  - PoC Client, PoC Application Service Infrastructure, Network Interfaces, etc.

  See details in PoC Architecture Presentation

PoC RD Schedule

- RD Completion: 29th October, 2003; sent to REQ WG
- RD formal review in REQ WG: 12th November 2003, London
- All comments on the RD resolved: November
- REQ WG final review & agreement: end of November
- OMA TP review & approval via email: December

Your comments on the RD are sought, would like to receive any comments by 12th November 2003, so as to influence final agreement of the RD in REQ WG

Q&A

Thank You!

OMA-PoC-2003-0043R1-PoC Architecture Presentation

OMA PoC Architecture Overview

Date: 20 Oct 2003

Availability: [X] Public [ ] OMA Confidential

Contact: Hugh Shieh, hugh.shieh@attws.com

Source: OMA PoC WG

Introduction

- Brief Introduction of OMA PoC Working Group
- PoC Architecture Overview
- Collaboration with 3GPP/3GPP2

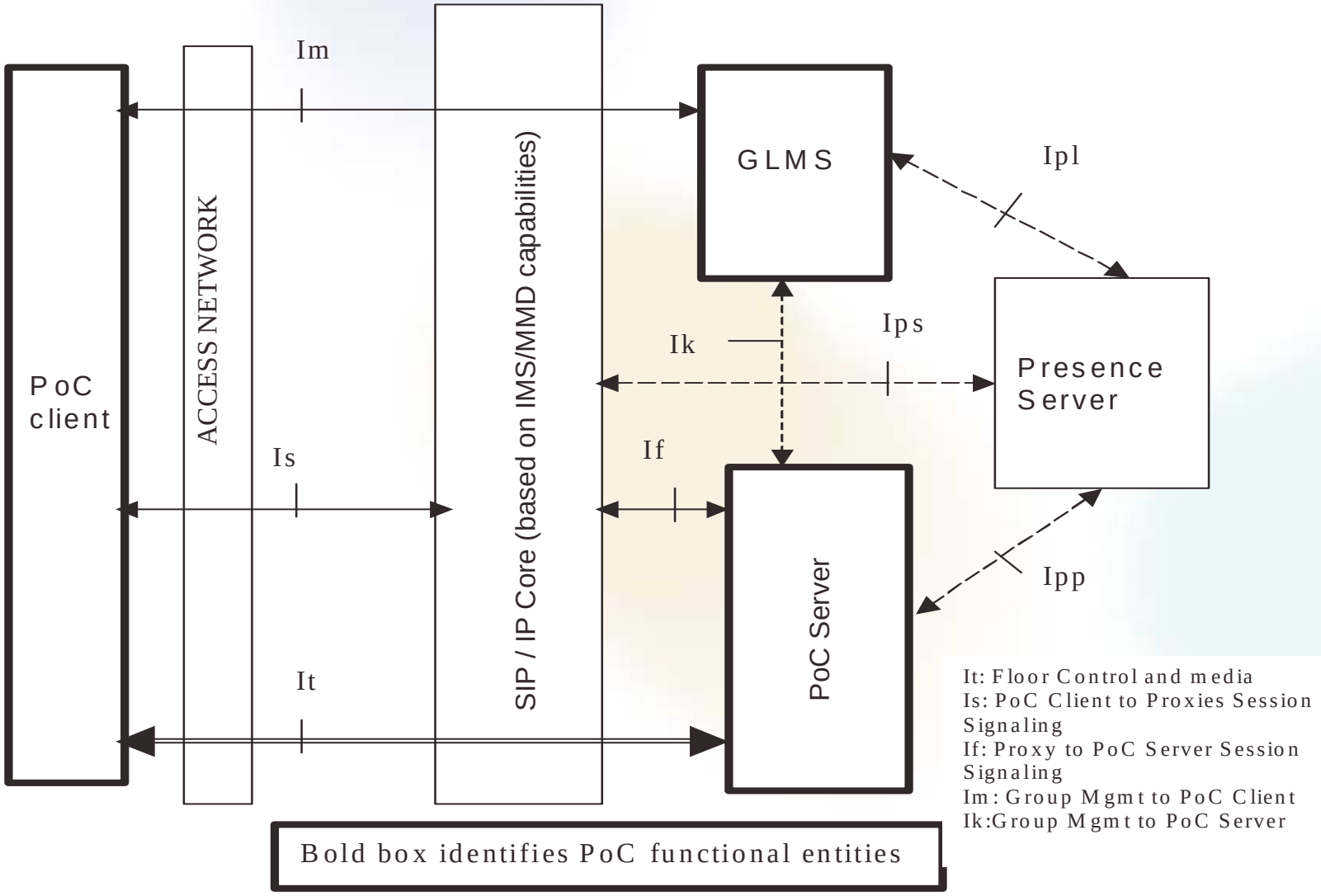
OMA PoC WG

- OMA Technical Plenary Approved PoC Work Item in April this year
  - Requirements WG Started Work on Requirements Shortly Thereafter
- Group Formed to Take on Responsibility of PoC Specs in June
  - Originally Established as a SubWG of Mobile Application Working Group
  - TP Reorganization in September resulted in PoC as full Working Group
- Goals of OMA PoC WG:
  - Develop application enabling specifications to permit the deployment of interoperable PoC services
  - Develop general PoC service enablers using a common application framework that could be deployed over a variety of networks.
    - This application framework will be modeled over the defined capabilities of the 3GPP IMS and 3GPP2 MMD.
    - Any non-IMS based SIP network is assumed to have the same functionality as IMS.
  - The initial focus is to develop an open standard to enable adoption of PoC service over mobile networks.

PoC Architecture

- Work on PoC Architecture Document (AD) Has Recently Begun
  - The material presented is based on current information in draft AD, which is at very early stage. The draft AD has not been approved by OMA and is Subject to Change.
- High-Level Architecture Addresses Several Entities
  - PoC Specific Entities
    - PoC Client
    - PoC Server
    - Group and List Management Server (GLMS)
  - External Entities that PoC Service is Dependent Upon
    - SIP/IP Core
    - Presence Server

PoC Architecture Diagram



PoC Client

- The PoC Client resides on the mobile terminal and is used to access PoC service. The PoC Client performs the following functions:
  - Provide the capabilities for PoC session initiation, participation and termination
  - Perform Registration with the SIP/IP core
  - Participate in authentication with the SIP/IP core
  - Provide access to different lists in GLMS, e.g., contact lists, group lists etc.
  - Support floor control procedures (e.g., make request and respond to commands)
  - Incorporate configuration data downloaded by the PoC Application Service Infrastructure, e.g., over-the-air-activation
  - Provide access to presence information

PoC Server

The PoC Server implements the application level network functionality for the PoC service. The PoC Server performs the following functions:

- Provides PoC session handling
- Provides the Media distribution
- Provides the floor control functionality including talker identification
- Provides SIP session handling, such as SIP session origination, termination, etc.
- Provides policy enforcement for participation in group sessions
- Provides policy handling for incoming PoC session (e.g. access control, availability status, etc)
- Provides the participants information (such as user nicknames)
- Collects and provides media quality information
- Collects and provides the charging information

Group and List Management Server (GLMS)

- PoC users use the GLMS to manage groups and lists (e.g. contact and access lists) that are needed for the PoC service. The GLMS performs the following functions:
  - Provides list management operations to create, modify, retrieve and delete groups and lists
  - Provides storage for groups and lists

External Entities Providing Services to PoC

- SIP/IP Core
  - PoC SHALL utilize SIP/IP Core based on capabilities from IMS as specified in 3GPP and 3GPP2. The SIP/IP Core performs the following functions that are needed in support of the PoC Service:
    - Routes the SIP signaling between the PoC Client and the PoC Server
    - Provides discovery and address resolution services
    - Supports SIP compression
    - Performs authentication and authorization of PoC Client based on user's service profile
    - Maintains the registration state
    - Provides charging information
- Presence Server
  - The Presence Server performs the following functions that are needed in support of the PoC Service:
    - Provides availability information

Collaboration with 3GPP/3GPP2

- OMA PoC application framework will be modeled over IMS capabilities defined by 3GPP/3GPP2. Any non-IMS based SIP network is assumed to have the same functionality as IMS.
  - OMA will not specify network operation or behavior under the domain of 3GPP and 3GPP2
- PoC service has critical performance objectives (e.g., delay requirement, etc.), underline network defining groups such as 3GPP/3GPP2 has to be engaged to satisfy those requirements.
  - OMA will develop binding spec to address specific features from underline network based on published spec, e.g., PDP context handling, Codec issues, etc.
  - OMA will want to work with 3GPP on issues like potential point of delay or latency, expected traffic, any non-obvious service consideration, etc.
- It is proposed to have close liaison relationship between OMA PoC WG and corresponding WGs in 3GPP/3GPP2

Q&A

Thank You!