OMA PoC System Description

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Open Mobile Alliance

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1. Scope

The scope of the Push to talk over Cellular (PoC) V2.0 system description document is to define the system concepts and high level procedures for the PoC service enabler V2.0. This system description is backward compatible with the PoC AD V1.0 of clause 8 and 9 of [PoC AD V1.0]. It is based on the requirements listed for the system in the PoC requirements document [PoC RD V1.0] and [PoC RD V2.0].

The system description of the SIP/IP Core and the underlying access network for PoC is out of scope of this document. When SIP/IP Core corresponds to the 3GPP IMS the architecture the 3GPP enablers for OMA PoC services are described in [3GPP TR 23.979].

Local policies referred in this document are out of scope of this specification.

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3. Terminology and Conventions

3.1 Conventions

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

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

3.2 Definitions

For the purposes of the PoC specifications, the terms and definitions given in [OMA Dictionary] and the following terms and definitions apply.

1-1 PoC Session	A feature enabling a PoC User to establish a PoC Session with another PoC User.
1-many PoC Group Session	A PoC Session with many Participants and in which all Participants can communicate with each other.
1-many-1 PoC Group Session	A PoC Session established by a PoC User to a Pre-arranged PoC Group, in which one Participant is a Distinguished Participant and other Participants are Ordinary Participants.
Access Control	PoC User specified rules that define the interactions with other PoC Users, e.g. rules restricting other PoC Users that may try to establish PoC Session to the PoC User.
Ad-hoc PoC Group Session	A PoC Group Session established by a PoC User to PoC Users listed on the invitation. The list includes PoC Users or PoC Groups or both.
Advanced Revocation Alert	An alert to the PoC User that the Media transmit time will end within the time specified by the Alert Margin.
Alert Margin	The amount of time between the moment when the Advanced Revocation Alert is notifies the PoC User and the moment when the granted Media Burst for the PoC User is to be revoked.
Answer Mode	A PoC Client mode of operation for the terminating PoC Session invitation handling.
Answer Mode Indication	A PoC Service Setting indicating the current Answer Mode of the PoC Client.
Application Server	In 3GPP/3GPP2 IMS, a functional entity that implements the service logic for SIP sessions. When the SIP/IP Core used for the PoC service is according to 3GPP/3GPP2 IMS, the PoC Server implements the Application Server functionality.
Audio	General communication of sound with the exception of PoC Speech.
Automatic Answer Mode	Answer Mode where the PoC Client accepts a PoC Session establishment request without manual intervention from the PoC User. The Media is immediately played when received.
Charging Correlation ID	See [OMA Charging AD].
Charging Data Function	3GPP network entity that receives charging events from the Charging Trigger Function via the Rf reference point. It then uses the information contained in the charging events to construct CDRs.
Charging Event	See [OMA Charging AD].
Chat PoC Group	A persistent PoC Group in which a PoC User individually joins to have a PoC Session with other joined PoC Users, i.e., the establishment of a PoC Session to a Chat PoC Group does not result in other PoC Users being invited. NOTE: A Chat PoC Group is a persistent PoC Group where the <invite-members> element is set to "false" as specified in the [OMA-PoC-Document-Mgmt] "PoC Group".
Chat PoC Group Identity	PoC Group Identity of a Chat PoC Group.
Chat PoC Group Session	A PoC Session established to a Chat PoC Group.

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Confirmed Indication	A signalling message returned by the PoC Server to confirm that the PoC Server, all other network elements intermediary to the PoC Server and a terminating PoC Client are able and willing to receive Media.
Contact List	A list available to the PoC User that contains the PoC Addresses and/or PoC Group Identities.
Continuous Media	Media with an inherent notion of time (e.g., PoC Speech, audio, and video).
Control Plane	The specification of the signalling between PoC Client and PoC Server, between PoC Box and PoC Server and between PoC Servers for the Push to talk over Cellular (PoC) service.
Controlling PoC Function	A function implemented in a PoC Server, providing centralized PoC Session handling, which includes Media distribution, Talk Burst Control, Media Burst Control, policy enforcement for participation in the PoC Group Sessions, and the Participant information.
Conversation	A series of Media Bursts within a PoC Session in which the inter-arrival spacing of the Media Bursts is less than a defined time interval; typically, the Media Bursts are associated to a logical exchange between two or more PoC Users.
Correlation	See [OMA Charging AD].
Discrete Media	Media that itself does not contain an element of time (e.g. images, text).
Discrete Media Transfer Final Report	A report sent to the sending PoC Client to indicate final status of the Discrete Media transfer to the receiving PoC Clients.
Discrete Media Transfer Progress Report	A report sent to the sending PoC Client to indicate progress of the Discrete Media transfer to the receiving PoC Clients.
Dispatch PoC Group	A Pre-arranged PoC Group in which one member is assigned the role of PoC Dispatcher and the other member(s) are assigned the role of PoC Fleet Members.
Dispatch PoC Session	The PoC Session of a Dispatch PoC Group, or a subset of the Dispatch PoC Group, in which the 1-many-1 communication method is used.
Distinguished Participant	A Participant in a 1-many-1 Session that sends Media to all Ordinary Participants, and that receives Media from any Ordinary Participant. NOTE: The <is-key-participant> is set to "true" as specified in [OMA-PoC-Document-Mgmt] to indicate who is the Distinguished Participant.
External P2T Networks	Private or public circuit switched or packet switched network that provide push-to-talk services similar to PoC services.
Full Duplex Call Follow-on Proceed	A feature which allows PoC Session Participant to request the other PoC Session Participants to set up another independent full duplex voice call (either a circuit switched voice call or voice-over-IP call, subject to Service Provider Policy and configuration). The full duplex voice call set up is out of the scope of this specification.
Group	A predefined set of Users together with its policies and attributes. A Group is identified by a SIP URI.
Group Advertisement	A feature that provides the capability to inform other PoC Users of the existence of a PoC Group.
Group List	A list of members in a Pre-arranged PoC Group or restricted Chat PoC Group. Each member is identified by a SIP URI or a TEL URI.
Home PoC Network	A network comprising of a Home PoC Server and SIP/IP Core operated by the PoC User's PoC service provider. The Home PoC Network is the same as the Home Network defined in 3GPP/3GPP2 IMS specifications.
Home PoC Server	The PoC Server of the PoC Service Provider that provides PoC service to the PoC User.
ID Notification Indication	An indication for a PoC Address of an Invited PoC User to be presented to, or hidden from, the other Invited PoC Users on the terminating PoC Clients. An initiator of an Ad-hoc PoC Group Session sets the indications for all the Invited PoC Users within invitation requests. Each indication takes either "SHOWN" or "HIDDEN" as its value.
Identified PoC User	A PoC User whose PoC Sessions have been lawfully authorized to be intercepted and delivered to a Law Enforcement Agency.
Included Media Content	Media content included in an invitation to a PoC Session or in a Group Advertisement.

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Incoming Instant Personal Alert Barring	A PoC Service Setting for the PoC Client that indicates the PoC User's desire for the PoC service to block all incoming Instant Personal Alerts.
Incoming PoC Session Barring	A PoC Service Setting for the PoC Client that indicatesthe PoC User's desire for the PoC service to block all incoming PoC Session requests.
Instant Personal Alert	A feature in which a PoC User sends a SIP based instant message to a PoC User requesting a 1-1 PoC Session.
Invited Parties Identity Information Mode	A PoC Service Setting for the PoC Server that indicates that the PoC Client is able and PoC User is willing to receive invited parties identity information.
Invited PoC Client	A PoC Client that is invited to a PoC Session.
Invited PoC User	The PoC User who has been invited to a PoC Session.
Inviting PoC Client	A PoC Client that invites other PoC User(s) to a PoC Session.
Law Enforcement Agency	An organization authorized by a lawful authorization based on a national law to request interception measures and to receive the results of telecommunications interceptions.
Limited Segment Media Buffer	A PoC Client buffer that contains a small initial segment of the total buffered Media that can be transmitted to the PoC Server before the called PoC Client answers in order to minimise the delay due to the Media transmit delay latency.
Local Granted Mode	A permission for a PoC User to start sending Media prior to receiving the MBCP Media Burst Grant message.
Local QoE Profile	QoE Profile that a PoC Client locally applies for a given PoC Session. The Local QoE Profile is intended to be equal to the QoE Profile assigned for the PoC Session but it may differ based on restrictions associated to the subscription of the local PoC User (e.g. 'Basic' PoC Users participate with 'Basic' Local QoE Profile in PoC Sessions with 'Professional' QoE Profile).
Manual Answer Mode	A mode of operation in which the PoC Client requires the PoC User to manually accept the PoC Session invitation before the PoC Session is established.
Media	Forms of information that are exchanged between Participants. Media may come in different forms, which are referred to as Media Types.
Media Burst	Flow of Media from a PoC Client that has the permission to send Media to the receiving PoC Client(s).
Media Burst Control	Media Burst Control is a control mechanism that arbitrates requests from the PoC Clients, for the right to send Media and Multimedia
Media Burst Control Protocol	Media Burst Control Protocol (MBCP) is a protocol for performing Media Burst Control, and is defined in these specifications.
Media Burst Control Schemes	Way of using Media Burst Control according to predefined rules and procedures.
Media Filtering	A procedure of the PoC Server performing the Participating PoC Function in order to determine the Media Burst retrieval priority in case of Simultaneous PoC Sessions.
Media Parameters	SIP/SDP based information exchanged between the PoC Server and the PoC Client that specify the characteristics of the Media for a PoC Session being established or that already exists.
Media Stream	A Media Stream is an instance of the transmission of a Media Type. Multiple Media Streams can be combined to transmit multimedia.
Media Time Compression	A PoC Client operation on Media data to be transmitted, which compresses the Media in time such that the compressed Media data will be played out in a shorter time duration than the original uncompressed Media data.
Media Type	Media Types share a characteristic of human perception. Media Types are either realtime or non-realtime, like: • PoC Speech • Audio (e.g. music) • Video • Discrete Media (e.g. still image, formatted and non-formatted text, file)

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Media-floor Control	The mechanism to control separate Media Streams.
Media-floor Control Entity	A Media Control resource shared by Participants in a PoC Session. The Media-floor Control Entity is controlled by a state machine to ensure that only one Participant can access the Media resource at the same time. One Media-floor Control Entity can handle one or more Media Streams according to negotiation.
Multimedia	Multimedia is the simultaneous existence of multiple Media Types like • audiovisual • video plus subtitles Multimedia from a single source that involves real-time Media Types are assumed to be synchronized.
Nick Name	A user-friendly display name that might be associated to a PoC User or a PoC Group. The Nick Name can either be provided as a "display-name" in a SIP header or in the <display-name> child element of the <entry> element for the PoC User or for the PoC Group as specified in [OMA-PoC-Document-Mgmt] or generated by PoC Server performing the Controlling PoC Function if unique Nick Names are supported and PoC User requested privacy.
NW PoC Box	A PoC functional entity in the PoC Network where PoC Session Data and PoC Session Control Data can be stored.
On-demand Session	A PoC Session set-up mechanism in which all Media Parameters are negotiated at PoC Session establishment.
Online Charging Function	3GPP entity that performs real-time credit control. Its functionality includes transaction handling, rating, online correlation and management of subscriber accounts/balances. The Online Charging Function (OCF) consists of two distinct modules, namely the Session Based Charging Function (SBCF) and the Event Based Charging Function (EBCF).
Ordinary Participant	A Participant in a 1-many-1 PoC Group Session that is only able to send and receive Media to and from the Distinguished Participant.
P2T Address	A P2T Address identifying a P2T User. The P2T Address can be used by PoC Users to communicate with P2T Users. The P2T Address used in a PoC Network points to the PoC Interworking Agent of the P2T User in the PoC Interworking service.
P2T User	A P2T User is a user of the P2T service provided by an External P2T Network.
Participant	A Participant is a PoC User in a PoC Session.
Participant Information	Information about the PoC Session and its Participants.
Participating PoC Function	A function implemented in a PoC Server, which provides PoC Session handling, which includes policy enforcement for incoming PoC Sessions and relays Talk Burst Control and Media Burst Control messages between the PoC Client and the PoC Server performing the Controlling PoC Function. The Participating PoC Function may also relay RTP Media between the PoC Client and the PoC Server performing the Controlling PoC Function.
PoC Address	An address identifying a PoC User. The PoC Address can be used by one PoC User to request communication with other PoC Users. If SIP/IP Core is the 3GPP/3GPP2 IMS the PoC Address is a public user identity.
PoC Box	A PoC functional entity where PoC Session Data and PoC Session Control Data can be stored. It can be a NW PoC Box or a UE PoC Box.
PoC Charging Event	A Chargeable Event sent by the PoC Server to the O-CTF for further processing.
PoC Client	A functional entity that resides on the User Equipment that supports the PoC service.
PoC Dispatcher	The Participant in a Dispatch PoC Session that sends Media to all PoC Fleet Members and that receives Media from any PoC Fleet Member. NOTE: The PoC Dispatcher is an enhancement to the PoC 1 Distinguished Participant.

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PoC Fleet Member	A Participant in a Dispatch PoC Session that is only able to send Media to the PoC Dispatcher, and that likewise is only able to receive Media from the PoC Dispatcher. NOTE: PoC Fleet Member is the same as Ordinary Participant in PoC 1.
PoC Group	A Group supporting the PoC service. PoC User uses PoC Groups e.g. to establish PoC Group Sessions.
PoC Group Identity	A SIP URI identifying a Pre-arranged PoC Group or a Chat PoC Group. A PoC Group Identity is used by the PoC Client e.g. to establish PoC Group Sessions to the Pre-arranged PoC Groups and Chat PoC Groups.
PoC Group Session	A Pre-arranged PoC Group Session, Ad-hoc PoC Group Session or Chat PoC Group Session.
PoC Interworking Agent	Abstract entity implemented in the PoC Interworking Function, acting as a PoC Client on behalf of a PoC Remote Access User or a P2T User.
PoC Interworking Function	Part of the PoC Interworking Service, it provides conversion between PoC Network based SIP signaling, Talk Burst Control and Media Burst Control Protocol, and Media packet transport, and External P2T Network based session signaling, floor control, and media transport protocol.
PoC Interworking Service	A means to extend the PoC User experience beyond the OMA defined PoC Service and PoC Network boundaries, accomplished by interworking with other networks and systems, while not PoC compliant, being able to provide a reasonably comparable capability, involving simplex media based conferencing.
PoC Remote Access	A method of providing a compliant PoC User access to a SIP/IP Core and PoC Network via an potentially non-SIP/IP based network.
PoC Remote Access User	A user of the PoC Service accessing the service potentially via a non IMS enabled SIP/IP based network, not necessarily using a PoC Client (e.g. a PoC User, with a valid subscription, accessing PoC Services via a PSTN terminal).
PoC Server	A network element, which implements the 3GPP/3GPP2 IMS application level network functionality for the PoC service. A PoC Server can perform the role of the Controlling PoC Function or Participating PoC Function, or both at the same time.
PoC Service Provider	A PoC Service Provider provides PoC Service – on its own or in conjunction with other Value Added Services – to his PoC Subscribers.
PoC Service Setting	A set of parameters indicating the capability of the PoC Client and the willingness of the PoC User to support related PoC Client and PoC Server functionalities, e.g. Answer Mode Indication, Incoming PoC Session Barring, Incoming Instant Personal Alert Barring and Simultaneous PoC Sessions Support.
PoC Session	A PoC Session is a SIP Session established by the procedures of this specification. This specification supports the following types of PoC Sessions: 1-1 PoC Session, Ad-hoc PoC Group Session, Pre-arranged PoC Group Session, or Chat PoC Group Session.
PoC Session Charging Correlation	Making a Correlation between PoC Charging Events that belong to the same PoC Session.
PoC Session Control Data	Information about PoC Session Data e.g. time and date, PoC Session initiator.
PoC Session Data	Media Bursts and Media Burst Control information exchanged during a PoC Session e.g. Video frames, an image or Talk Burst.
PoC Session Identity	SIP URI, which identifies the PoC Session and which can be used for routing initial SIP requests. It is received by the PoC Client during the PoC Session establishment in the Contact header and/or in the MBCP Connect message in case of using Pre-established Session.
PoC Session Media Types	Media Types used in PoC Session by at least one PoC Session Participant.
PoC Session Owner	The PoC Session Owner in the case of 1-1 PoC Session and Ad-hoc PoC Group Session is the initiator of the PoC Session. In the case of a Chat PoC Group Session and a Pre-arranged PoC Group Session, the PoC Session Owner is the creator of the PoC Group.

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PoC Session Precedence A level of priority determined based on the Service Provider Policy and the QoE Profile associated with the PoC Session. It controls how the PoC Session is treated under competing situations with other PoC Sessions and may result in a preferred treatment for those PoC Sessions with a higher PoC Session Precedence. The definition of different levels to be applied for this feature is a decision that belongs to the PoC Service Provider.

NOTE: A level of priority can be determined for each of four existing QoE Profiles. When 'Official Government Use' QoE Profile is used, five sub-levels of priority are determined for this QoE Profile, according to rules in [RFC4412] and WPS namespace.

PoC Speech Communication of speech as defined by PoC version 1.0.

PoC Subscriber Is one whose service subscription includes the PoC service. A PoC Subscriber can be the same person as a PoC User.

NOTE: In [PoC RD V1.0] the term "PoC Subscriber" is sometimes used to mean the same as term "PoC User" in [OMA PoC AD], [OMA PoC CP] and [OMA PoC UP].

PoC User A User of the PoC service. A PoC User can be the same person as a PoC Subscriber. A PoC User uses the PoC features through the User Equipment.

Pre-arranged PoC Group A persistent PoC Group. The establishment of a PoC Session to a Pre-arranged PoC Group results in the members being invited.

NOTE: A Pre-arranged PoC Group is a persistent PoC Group, where the <invite-members> element is set to "true" as specified in the [OMA-PoC-Document-Mgmt]"PoC Group".

Pre-arranged PoC Group Identity PoC Group Identity of a Pre-arranged PoC Group.

Pre-arranged PoC Group Session A PoC Session established by a PoC User to a Pre-arranged PoC Group.

Pre-established Session The Pre-established Session is a SIP Session established between the PoC Client and the Home PoC Server containing at least one Media Stream bound to a Media-floor Control Entity. The PoC Client establishes the Pre-established Session prior to making requests for PoC Sessions to other PoC Users. To establish a PoC Session based on a SIP request from the PoC User, the PoC Server conferences other PoC Servers/Users to the Pre-established Session so as to create an end-to-end connection.

Primary PoC Session A PoC Session that the PoC User selects in preference to other PoC Sessions. When the PoC User has Simultaneous PoC Sessions, the Primary PoC Session has a priority over Secondary PoC Sessions.

Push To Talk Service (P2T) Non OMA PoC "walkie-talkie" service.

QoE Profile Set of parameters that define, from a high level point of view, the end PoC User experience in a given PoC Session. The QoE Profile is part of the PoC User's subscription and can also be specified for PoC Groups. Each QoE Profile is associated with certain rules for underlying resource usage and potential prioritization procedures.

Receive Media Processing Capability The capability of the PoC Client to handle Media received from the PoC Server.

Referenced Media Content Reference(s) to Media content to be included in an invitation to a PoC Session or in a Group Advertisement.

Remote PoC Client PoC Client that resides on the User Equipment that supports the PoC service while accessing the PoC Network via a potentially non IMS enabled SIP/IP based network.

Request with Media Content An invitation to a PoC Session or a Group Advertisement that includes embedded media e.g. Included Media Content, Referenced Media Content or Text Content

Restricted Group A Group that can be joined only by a PoC User that is a member of the Group. A Restricted Group has a Group List.

RTP Media The Media carried in an RTP payload.

Secondary PoC Session A PoC Session for which the PoC User receives Media when there is no Media present on the Primary PoC Session.

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Sender Identification	The procedure by which the identity of the current Media sender is determined and made known to receivers on the PoC Session.
Served PoC User	A PoC User that obtains a PoC service from a Home PoC Server.
Service Instance	A Service Instance is the instantiation of a logical connection across the radio interface associated with a particular protocol stack. Service Instances, as logical connections, are mapped onto the physical layer radio connections. A Service Instance may be closely tied to a single application level flow, e.g., a voice service instance, or may support multiple application level flows, e.g., a best effort packet data service instance.
Service Provider Policy	Service Provider Policy refers to the overall policy conditions actually selected by a service provider(s) for commercial implementation of a PoC service. Service Provider Policy is established based on commercial considerations, which may concern, e.g. support/non-support of certain network or client capabilities or service features within a network. Service Provider Policy is applicable only to the network or subscribers over which the service provider has control.
SigComp	A signalling compression mechanism specified in [RFC3320]; SigComp in PoC provides for the compression of SIP requests and responses.
Simultaneous PoC Session	Functionality, where Home PoC Server discards Media for keeping conversation uninterrupted, in case a PoC User is a Participant in more than one PoC Session simultaneously using the same PoC Client.
Simultaneous PoC Sessions Support (SSS)	A PoC Service Setting for the PoC Client that indicates that the PoC Client is able and PoC User is willing to use Simultaneous PoC Sessions.
SIP Session	A SIP dialog. From [RFC3261], a SIP dialog is defined as follows: A dialog is a peer-to-peer SIP relationship between two UAs that persists for some time. A dialog is established by SIP messages, such as a 2xx response to an INVITE request. A dialog is identified by a call identifier, local tag, and a remote tag. A dialog was formerly known as a call leg in [RFC2543].
SIP URI	From RFC 3261: "A SIP or SIPS URI identifies a communications resource" and "follows the guidelines in RFC 2396 [5]". PoC uses SIP URIs to identify PoC Clients, PoC Servers, and PoC Sessions, resource lists that point to URI lists, etc.
Talk Burst	A flow of PoC Speech from a PoC Client having the permission to send PoC Speech as specified in [OMA PoC V1.0].
Talk Burst Control	A control mechanism that arbitrates requests from the PoC Clients for the right to send PoC Speech as specified in [OMA PoC V1.0].
Talk Burst Control Protocol	A protocol for performing Talk Burst Control defined in [OMA PoC UP].
Text Content	Text included in an invitation to a PoC Session or in a Group Advertisement.
Transmit Media Buffering	A PoC Client mode of operation where the PoC Client buffers Media in a buffer in the PoC Client prior to the PoC Server instructing the PoC Client to transmit the Media.
UE PoC Box	A functional entity co-located with the PoC Client in the User Equipment where PoC Session Data and PoC Session Control Data can be stored.
Unconfirmed Indication	An indication returned by the PoC Server to confirm that it is able to receive Media and believes the PoC Client is able to accept Media. The PoC Server sends the Unconfirmed Indication prior to determining that all elements on the forward path are ready or even able to receive Media.
Unrestricted Group	An Unrestricted Group is a PoC Group that any PoC User may join.
User	Any entity that uses the described features through the User Equipment.
User Equipment	A hardware device that supports a PoC Client e.g., a wireless phone.
User Plane	The User Plane includes the Media and Media control signaling (e.g., Talk Burst Control Protocol) between the PoC Client and PoC Server, between the PoC Box and the PoC Server as well as between PoC Servers.
Video	Communication of live-streamed pictures without any Audio component.

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3.3 Abbreviations

For the purposes of the PoC specifications, the abbreviations given in [OMA Dictionary] and the following abbreviations apply:

3GPP 3rd Generation Partnership Project

3GPP2 3rd Generation Partnership Project 2

AMR Adaptive Multi Rate

CDR Charging Data Record

CS Circuit-switched

DM Device Management

EBCF Event Based Charging Function

EVRC Enhanced Variable Rate Codec

GPRS General Packet Radio Service

IAB Incoming Instant Personal Alert Barring

IMS IP Multimedia Subsystem

IMSI International Mobile Subscriber Identity

IP Internet Protocol

IPIIM Invited Party Identity Information Mode

ISB Incoming PoC Session Barring

MAO Manual Answer Override

MIME Multipurpose Internet Mail Extensions

MSISDN Mobile Subscriber ISDN Number

MSRP Message Session Relay Protocol

NOTE: The base Message Session Relay Protocol is defined in [RFC4975].

NW Network

O-CTF OMA Charging Trigger Function

OMA Open Mobile Alliance

P2T Push To Talk

PDP Packet Data Protocol

PoC Push to talk over Cellular

QoE Quality of Experience

QoS Quality of Service

RTCP RTP Control Protocol

RTP Real-time Transport Protocol

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SDP	Session Description Protocol
SIP	Session Initiation Protocol
SSS	Simultaneous PoC Session Support
TBCP	Talk Burst Control Protocol
UE	User Equipment
UP	User Plane
URI	Uniform Resource Identifier
URL	Uniform Resource Locator
WPS	Wireless Priority Service
XDM	XML Document Management
XDMC	XDM Client
XDMS	XDM Server
XML	Extensible Mark-up Language

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4. System concepts

4.1 Identification

4.1.1 PoC Address

Each PoC User SHALL have one or more PoC Addresses. A PoC Address SHALL be used by any PoC User to request communication with other PoC Users, PoC Remote Access Users or P2T Users. A PoC Address is in the format of either a SIP URI or a TEL URI. At least one PoC Address SHALL be in the format of a SIP URI. The PoC Address SHALL comply either with the specification of a SIP URI in [RFC 3261], or with the specification of a TEL URI in [RFC3966]. Note that the SIP/IP Core will translate a TEL URI to a SIP URI for routing.

A PoC Address SHALL be registered with the SIP/IP Core as described in subclause 4.5 *"Registration"*. Registration of one PoC Address associated with a PoC User MAY imply registration of other PoC Addresses associated with the same PoC User.

When the PoC Client registers multiple PoC Addresses, all PoC Addresses registered with the same SIP/IP Core identify the same PoC User.

The PoC Address is used for PoC and other SIP based service.

Examples of PoC Addresses are:

- sip:joe.doe@operator.net;
- sip:buss2.city@operator.net;
- sip:buss2.city@poc.operator.net;
- tel:+16195551212;
- tel:5551212; phone-context = pbx.net.

4.1.2 Private user identity

When the SIP/IP Core corresponds with 3GPP/3GPP2 IMS, the private user identity SHALL be used as described in [3GPP TS 24.229] and [3GPP2 X.S0013.4].

4.1.3 PoC Group Identities

A PoC Group SHALL be identified with a PoC Group Identity. The PoC Client SHALL use PoC Group Identities for addressing PoC Groups. The PoC Group Identity is associated with individual PoC Addresses of all the PoC Group members, but it can also contain an association to other PoC Group Identities, i.e. a PoC Group inside a PoC Group. The PoC Group Identity SHALL take the form of SIP URI as defined in [RFC3261] and [RFC2396]. It SHALL be possible to create a PoC Group Identity statically and dynamically.

- An operator SHALL be able to create a static PoC Group identity which is stored in the Shared Groups XDMS as described in [OMA-XDM] for use in PoC Group Sessions.
- A PoC User SHALL be able to create a PoC Group which is stored in the Shared Groups XDMS for use in PoC Group Sessions.
- A PoC User SHALL be able to create and store a Group List as a URI List in the Shared List XDMS.

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4.2 Addressing

4.2.1 Phone numbers

Phone numbers MAY be used as a PoC Address. A PoC User MAY address another PoC User, a P2T User or a PoC Remote Access User by a phone number. The PoC Client SHALL send the phone number to the SIP/IP Core in a TEL URI [RFC3966].

NOTE: Pre-arranged PoC Groups and Chat PoC Groups are addressed with SIP URIs.

The phone number MAY use the international E.164 [ITU-T E.164] format (prefixed with a '+' sign), or a local format according to rules and procedures of [RFC3966]. The SIP/IP Core shall interpret the phone number with a leading '+' to be an E.164 number.

When addressing by TEL URI is used for a PoC Session the PoC Server MAY resolve the TEL URI to a SIP URI, for instance by using DNS/ENUM or other local data base. A phone number in a local format SHALL be converted to the E.164 format before DNS/ENUM is used.

4.2.2 SIP URI

A PoC User MAY address another PoC User, a P2T User, a PoC Remote Access User by a SIP URI and SHALL address a Pre-arranged PoC Group and a Chat PoC Group by a SIP URI.

4.3 Identification of inviting PoC User

The PoC Server SHALL maintain the PoC Address of the inviting PoC User used in the originating request (SIP URI, TEL URI, Nick Name or combination SIP URI + Nick Name). The PoC Server SHALL identify the PoC Groups by SIP URI and MAY identify them by Nick Name.

In the case of the PoC Group Session the PoC Server SHALL provide the PoC Group Identity to the Invited PoC Client(s).

The Home PoC Server SHALL replace the Nick Name provided by the Inviting PoC Client, if the Nick Name is configured in the Home PoC Server of the inviting PoC User.

In the case the PoC Address is restricted subclause 4.8 *"Privacy"* applies.

4.4 Talker Identification

The Talker Identification has been extended to also include the identity of the Participant sending a Media Burst, see subclause 4.4.1 "*Sender Identification"*.

4.4.1 Sender Identification

In order to provide the PoC Address and Nick Name of the Participant who is sending a Media Burst to Participants in the PoC Session the PoC Server SHALL support Sender Identification.

The PoC Server performing the Controlling PoC Function SHALL collect the PoC Addresses and Nick Names of the Participants engaged in the PoC Session when in the process of establishing the PoC Session with PoC Clients, including the initiator's PoC Address and Nick Name, which is received in the initial PoC Session establishment phase.

The PoC Server performing the Controlling PoC Function SHALL provide the PoC Address and the Nick Name, if a Nick Name is available, of the Participant at the sending PoC Client to the receiving PoC Client in the receiving Talk Burst message or, in case of other Media Type than PoC Speech, in the receiving Media Burst message.

In the case the PoC Address is restricted subclause 4.8 "*Privacy*" applies.

The Sender Identification of the Discrete Media is specified in the subclause 4.42.4 "*Discrete Media Sender Identification*".

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4.5 Registration

4.5.1 General

Prior to using the PoC service the UE hosting the PoC Client SHALL perform SIP registration to the SIP/IP Core according to rules and procedures of [RFC3261], which indicates the support of PoC service in the REGISTER request. The registration function is provided in the SIP/IP Core and the registration/deregistration MAY be visible to the PoC Server via the POC-2 reference point. After a successful PoC service registration the PoC Client SHALL publish its PoC Service Settings to the PoC Server according to subclause 4.26 "*PoC Service Settings*" for each PoC Address that is registered with the SIP/IP core either explicitly or implicitly for the PoC Client that the PoC User intends to use for the PoC Service.

After a successful registration and a successful PoC Service Settings publish the PoC User is able to use the registered PoC Addresses:

- to originate PoC communication including session and session unrelated procedures;
- to receive PoC communication including session and session unrelated procedures.

When the SIP/IP Core corresponds with 3GPP/3GPP2 IMS then it is possible for the network on behalf of PoC UE to register additional PoC Addresses during a SIP registration of a single PoC Address. Registering multiple PoC Addresses at once is called implicit registration. The PoC Address that is used in the registration SHALL be SIP URI according to [RFC3261] while the PoC Addresses to be registered implicitly MAY be SIP URIs or TEL URIs.

The PoC Client is responsible for maintaining its registration active by using a re-registration procedure. If the PoC Client fails to perform a successful re-registration before a registration timer expires the registration is terminated.

The PoC Client SHALL be able to terminate its registration for the PoC service at any point of time by using a deregistration procedure. The SIP/IP Core MAY terminate PoC User's registration at any point of time by using a network initiated deregistration procedure.

NOTE 1: Network initiated de-registration is out of scope of the PoC specification.

The PoC Client SHALL indicate in the REGISTER request that this is a PoC registration so that it is possible for the SIP/IP Core to route the terminating requests to the PoC Client.

If the UE incorporates UE PoC Box functionality the UE SHALL include in the REGISTER request the contact address for the UE PoC Box along with an indication that this is a UE PoC Box whenever the UE PoC Box function is available to record Media Streams.

NOTE 2: When the UE hosts both the UE PoC Box and the PoC Client both the UE PoC Box and the PoC Client share the same PoC Address of the served PoC User. No registration is needed for the NW PoC Box.

When the SIP/IP Core corresponds with 3GPP/3GPP2 IMS, the PoC Client SHALL use 3GPP/3GPP2 IMS registration mechanisms as defined in [3GPP TS 24.229]/ [3GPP2 X.S0013.4].

4.6 Session establishment

4.6.1 General

The originating procedures as specified the subclause 4.6.1.1 "*Originating procedures*" describe how requests are transported from the originating PoC User to the PoC Server performing the Controlling PoC Function.

The terminated procedures as specified the subclause 4.6.1.2 "*Terminated procedures*" describe how requests are transported from the PoC Server performing the Controlling PoC Function to the terminating PoC User.

Both originated and terminated procedures also define how Media Types and Media-floor Control Entities can be offered when sending a request to establish a PoC Session.

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NOTE: PoC Server performing the Controlling PoC Function may locate in the originating PoC network, in the terminating PoC network or in another PoC network.

The PoC Client, SIP/IP Core and PoC Server SHOULD be able to use 3GPP/3GPP2 IMS routing mechanisms as defined in [3GPP TS 24.229] and [3GPP2 X.S0013.4].

4.6.1.1 Originating procedures

The PoC Client SHALL send all requests to the SIP/IP Core. The PoC Client SHALL indicate in the request that it communicates using PoC service so that it is possible for the SIP/IP Core to route the request to the PoC Server.

In its request, the PoC Client MAY offer one or more Media Types when establishing a PoC Session. The Media Types offered for a PoC Session MAY be any of the Media Types that are supported by the PoC Client.

NOTE 1: In order to ensure a common Media Type in the PoC Group Session, the PoC Client offers at least PoC Speech.

When the PoC Server in the originating network receives the request it performs the necessary originating service control. If the service control determines that the PoC Session establishment continues and the PoC Session is hosted by another PoC Server, then the originating PoC Server SHALL route the request to the PoC Server performing the Controlling PoC Function via the originating SIP/IP Core.

NOTE 2: The originating PoC Server can be the PoC Server performing the Participating PoC Function and the Controlling PoC Function in 1-1 PoC Session or Ad-hoc PoC Session.

NOTE 3: Routing of requests between domains is a function of the SIP/IP Core and is out of the scope of this specification.

4.6.1.2 Terminated procedures

The PoC Server SHALL send all requests to the same SIP/IP Core that the PoC Server received the originating request from. The PoC Server SHALL indicate in the request that it communicates using PoC service so that it is possible for the SIP/IP Core to route the request to the PoC Client.

When the PoC Server in the terminating network receives the request it performs the necessary terminating service control. If the service control determines that the PoC Session establishment continues then the terminating PoC Server SHALL route the request to the terminating PoC Client via the terminating SIP/IP Core.

When the PoC Server in the terminating network sends the request to establish a PoC Session towards the terminating PoC Client, the request SHALL either contain the same Media Types or subset of the Media Types contained in the initial received request.

The procedure for attempting to ensure a common media type is specified in subclause 4.27.2.1 "*Ensuring a common Media Type*".

4.6.1.3 Session modification

During a PoC Session, either the PoC Server or the PoC Client MAY initiate a session modification procedure. Session modification MAY be e.g. due to adding or removing Media Types and Media-floor Control Entities from the PoC Session or due to updating the Media Parameters.

Initiation of PoC Session modification SHOULD be avoided during the transfer of a Media Burst. All the modified Media Parameters SHALL be applied from the next Media Burst transfer after PoC Session modification is completed.

4.6.2 Pre-established Session

The PoC Client MAY establish one or more Pre-established Sessions with Home PoC Server prior to initiating PoC Sessions to other PoC Users. When establishing a Pre-established Session, PoC Client SHALL negotiate the Media Types and Media Parameters, which later can be used in PoC Sessions. The PoC Client MAY modify the existing Pre-established Session.

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The PoC Server MAY support a Pre-established Session. The PoC Server SHALL reject the initiation of the Pre-established Session, if the Pre-established Session is not supported by the PoC Server.

Upon receiving an INVITE request from the PoC Server performing Controlling PoC Function, the PoC Server performing Participating PoC Function MAY use the existing Pre-established Session, when

- the offered Media Streams and the offered Media-floor Control Entities are same or subset of those in the existing Pre-established Session;
- the Media-floor Control Entity binding of each offered Media Stream is the same as the Media-floor Control Entity binding of the Media Stream of the same Media Type in the existing Pre-established Session; and,
- the Media Parameters of each offered Media Stream are compliant with the Media Parameters of the Media Stream of the same Media Type in the existing Pre-established Session.

NOTE: If Inviting PoC Client or PoC Server performing Participating PoC Function is not able to use an existing Pre-established Session, then it can either use the On-demand Session or make session modification for the existing Pre-established Session to get Media Types and Media Parameters to match between the invitation request and the existing Pre-established Session.

4.7 Security

The Security concepts are described in [PoC AD V2.0] *"Security Considerations"*.

4.8 Privacy

A PoC User MAY request privacy for the identity of the PoC User meaning that the PoC Address of the PoC User is hidden from other PoC Users. The PoC Client SHALL use mechanisms defined in [RFC3325] to request privacy for the identity, i.e. the PoC User's PoC Address.

The PoC Server SHALL apply the privacy in the TBCP or MBCP message, if the privacy is requested.

If an inviting, invited or joining PoC User requests privacy of his PoC Address then the following procedures SHALL take place in the system operating in the trusted domain(s):

- The PoC Server performing the Controlling PoC Function SHALL retain privacy information of the Participants for the duration of the PoC Session.
- The SIP/IP Core serving the Invited PoC User SHALL provide the privacy of the PoC Address of the inviting PoC User on Control Plane at the POC-1 reference point.
- The PoC Server performing the Controlling PoC Function SHALL provide the privacy of the PoC Addresses of Participants when providing the Participant information notifications.
- The PoC Server performing the Controlling PoC Function SHALL provide the privacy of the PoC Address of the sending PoC User at the POC-3 and POC-4 reference points.
- The PoC Server performing the Participating PoC Function SHALL provide the privacy of the PoC Address of the PoC User sending Media at the POC-3 and POC-4 reference points, if negotiated with the PoC Server performing the Controlling PoC Function or published as privacy value PoC Service Setting or invited parties identity information PoC Service Setting by the PoC Client.

If privacy for the identity is not requested then PoC Servers and SIP/IP Core passes the PoC Address of the inviting PoC User to the Invited PoC User.

If privacy for the identity is not allowed in the PoC Group authorization rules as specified in [OMA-XDM], the involved entity SHALL reject the request.

If PoC Server or SIP/IP Core is sending or receiving SIP signalling or Media traffic to/from a party which is not trusted then the involved entity SHALL remove the PoC User's PoC Address prior sending the SIP signalling or Media traffic further.

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When SIP/IP Core corresponds with 3GPP/3GPP2 IMS then privacy mechanisms as defined in [3GPP TS 24.229]/[3GPP2 X.S0013.4] are used.

4.9 Talk Burst Control

Talk Burst Control is described in [PoC AD V1.0] and MAY be used for Media-floor Control Entities containing only PoC Speech.

Media Burst Control described in 4.9A "*Media Burst Control*" is an enhanced version of Talk Burst Control that supports Media-floor Control Entities containing multimedia as well as Media-floor Control Entities containing only PoC Speech..

The enhancement in 4.9A "*Media Burst Control*" uses a new set of terminology that can be mapped, using [PoC AD V1.0] terminology, as follows:

- A Media Burst includes Talk Burst as defined in [PoC AD V1.0].
- The Media Burst request includes Talk Burst request as defined in [PoC AD V1.0].
- The Media Burst Confirm response includes Talk Burst Confirm response as defined in [PoC AD V1.0].
- The Media Burst Reject response includes Talk Burst Reject response as defined in [PoC AD V1.0].
- The Media Burst Completed indication includes Talk Burst Completed indication as defined in [PoC AD V1.0].
- The No Media Burst indication includes No Talk Burst indication as defined in [PoC AD V1.0].
- The Receiving Media Burst indication includes Receiving Talk Burst indication as defined in [PoC AD V1.0].
- The Stop Media Burst indication includes Stop Talk Burst indication as defined in [PoC AD V1.0].
- The Connect Media Burst indication includes Connect Talk Burst indication as defined in [PoC AD V1.0].
- The Disconnect Media Burst indication includes Disconnect Talk Burst indication as defined in [PoC AD V1.0].
- The Media Burst Acknowledgement includes Talk Burst Acknowledgement as defined in [PoC AD V1.0].
- The Media Burst queue position request includes Talk Burst queue position request as defined in [PoC AD V1.0].
- The Media Burst request queue position status message includes Talk Burst request queue position status message as defined in [PoC AD V1.0].

4.9A Media Burst Control

The half duplex nature of the PoC service requires that before a PoC Client can send a Media Burst the PoC Client SHALL negotiate the permission to send a Media Burst.

Media Burst Control SHALL be used for PoC Speech, Audio and Video. Media Burst Control MAY be used for Discrete Media. Media Burst Control for Discrete Media SHALL be used if negotiated as described in subclause 4.27 "*Media-floor Control procedure*".

If Media Burst Control is used, the following SHALL apply:

The PoC Server performing the Controlling PoC Function SHALL cause Media Bursts to be arbitrated between PoC Clients as follows.

- The PoC Client SHALL send a request for the permission to send a Media Burst to the PoC Server. The request MAY relate to a single Media Type or any combination of the Media Types according to negotiation between the PoC Client and the PoC Server.

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- The PoC Server SHOULD confirm the request to send a Media Burst or Media Bursts if no other PoC Client has the permission to send a corresponding Media Burst. The PoC Server MAY reject a request to send a Media Burst due to local policy decision by the PoC Server.
- The PoC Server SHALL reject the request to send a Media Burst if another PoC Client has the permission to send a Media Burst using the same Media-floor Control Entity and the PoC Server or the PoC Client does not support queuing.
- The PoC Server MAY queue a request to send a Media Burst in an associated Media Burst queue if queuing is supported by the PoC Server and the PoC Client. The PoC Server MAY place a request in the queue depending on the priority and timestamp of the Media Burst Request.
- For a Media-floor Control Entity where queuing has been negotiated, a queue SHALL be assigned by the PoC Server. The PoC Server MAY process the queues for Media-floor Control Entities according to predefined Media Burst Control Scheme, if a Media Burst Control Scheme is defined.

NOTE 1: The PoC Server can accept Media Burst Control Scheme relating to queuing only in case of queuing is also accepted by the PoC Server in the same PoC Session.

- If the PoC Server supports more than one level of priority, the PoC Server SHALL place a request in a Media Burst request queue according to the priority of the Participant at the PoC Client. The priority level SHALL be determined by the PoC Server and SHALL be subject to a priority request received from the PoC Client. Priority levels are defined in subclause 4.9.1A *"Media Burst request priority levels"*.
- The PoC Server MAY limit the number of positions in a Media Burst request queue. The PoC Server SHOULD support a number of queue positions per PoC Session that is at least equal to the number of Participants in a PoC Session, up to the permitted maximum number of Participants.
- At any time there SHALL be at most one request to send a Media Burst queued for each PoC Client in each queue. If a second request is received from a PoC Client when a request is already queued, the PoC Server SHALL update the attributes (i.e. the priority level) of the first request according to the second request. If the priority level of the second request is different to the priority level of the first request, the PoC Server SHALL adjust the first request to a proper position in the Media Burst queue based on the rules of *4.9.1A Media Burst request priority* levels*"*.
- The PoC Server SHALL supervise the length of a Media Burst and SHALL revoke the permission to send a Media Burst if the length exceeds the maximum Media Burst duration. The maximum Media Burst duration MAY depend on local policy, for example it can be calculated based on e.g. size or bandwidth or time.

The PoC Client and the PoC Server SHALL support the following requests/responses/indications:

- Media Burst request:

The request is sent by the PoC Client to the PoC Server in order to request permission to send a Media Burst or Media Bursts. The request MAY include:

  - Priority level request indicator, if the PoC Client requests a priority level

- Media Burst Confirm response:

The response is sent by the PoC Server to the PoC Client in order to confirm that the PoC Client has obtained permission to send one Media Burst.

The Media Burst Confirm response SHALL include:

  - Maximum duration time to send Media Burst before the permission is revoked

The Media Burst Confirm response MAY include:

  - Alert Margin

- Media Burst Reject response:

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The response is sent by the PoC Server to the PoC Client to reject a request to send a Media Burst. The Media Burst reject response SHALL include:

- A reject reason. The possible reject reason MAY be:
  - Another PoC Client already has been given permission to send a Media Burst and no queuing of the request is allowed;
  - The PoC Client is not allowed to request permission to send a Media Burst at the moment;
  - Only one Participant in the PoC Session or only one Participant connected to the requested Media-floor. For example if only one Participant is left in a PoC Session;
  - Internal PoC Server error;
  - Listen only. The Participant is not allowed to request permission to send Media;
  - No resources available e.g. due to congestion; and,
  - Other reason e.g. due to a local policy in the PoC Server.

- Media Burst Completed indication:

The indication is sent by the PoC Client to the PoC Server in order to indicate that the sending of the Media Burst is completed or PoC Client cancels before sending Media Burst or PoC Client requests the PoC Server to cancel the queued Media Burst request when queuing is supported by the PoC Client and PoC Server.

- No Media Burst indication:

The indication is sent by the PoC Server to all PoC Clients in order to inform the PoC Clients that no one has requested for the permission to send a Media Burst at the moment and, if queuing is supported, that there is no one in the queue.

- Receiving Media Burst indication:

The indication is sent by the PoC Server to all PoC Clients (with the exception of the PoC Client with the permission to send a Media Burst) in a PoC Session in order to inform them that another PoC Client has the permission to send a Media Burst and that the PoC Client(s) SHALL prepare for receiving a Media Burst.

The receiving Media Burst indication SHALL include:

- The identity of the Participant at the PoC Client sending the Media Burst. The identity provided SHALL allow the PoC Client to determine the PoC Address in the case the sender doesn't want to be anonymous

Receiving Media Burst indication MAY include:

- Acknowledgement request
- PoC Group Session Identity
- The Nick Name of the Participant at the PoC Client sending a Media Burst

- Stop Media Burst indication:

The indication is sent by the PoC Server to the PoC Client who has the permission to send a Media Burst in order to revoke the permission to send Media Bursts.
The Stop Media Burst indication SHALL include:

- A reject reason. The possible reject reason MAY be:
  - Only one PoC User in the PoC Session, if only one Participant is connected to a Media-floor Control Entity
  - Media Burst too long indicating that the Media Burst has exceeded the maximum duration, including retry after time value

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- No permission to send Media Bursts
- Media Burst pre-empted
- Media-floor occupied too long when a Participant has taken to long time to transfer Discrete Media.
- No resources available e.g. in case of congestion in the PoC Server.
- Other reason when the PoC Server does not any longer grant the Participant to send a Media Burst e.g. due to a local policy.

NOTE 2: The maximum duration time and retry after time are configurable parameters.

- A retry-after time value indicating how long the PoC Client has to wait before a request to send a Media Burst will be confirmed. The parameter is only present if the permission to send a Media Burst is revoked due to "Media Burst is too long".

NOTE 3: The retry-after time is a configurable parameter.

- Connect Media Burst indication

  The indication is sent by the PoC Server performing Participating PoC Function in order to inform PoC Client(s) using Pre-established Session that it has been connected to a PoC Session.

  The Connect Media Burst indication MAY include:
  - A PoC Session Identity.
  - Identity of inviting PoC Client
  - The Nickname provided by the inviting PoC Client
  - The PoC Group name
  - PoC Group Identity
  - Invited parties identity information
  - Indication which Media Streams are used in the PoC Session
  - Indication what burst control protocol the PoC Session uses

- Disconnect Media Burst indication

  The indication is sent by the PoC Server performing the Participating PoC Function to the PoC Client to indicate that the PoC Session using a Pre-established Session has been released.

  The Disconnect Talk Burst indication SHALL include
  - A PoC Session Identity.

- Media Burst Acknowledgement:

  The indication is sent by the PoC Client to the PoC Server as a response to the Receiving Media Burst, e.g. when used as an indication of the incoming PoC Session in case of Pre-established Session.

If the PoC Server and the PoC Client support queuing of the Media Burst request the following requests/responses/indications SHALL be supported:

- Media Burst request queue position status message:

  The message is sent by the PoC Server to the PoC Client to indicate that the Media Burst request is queued, or to indicate changes in the status of the Media Burst request. The indication MAY include:
  - Queue position.

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- Request priority indication

Support for queued Media Burst Control is transparent to a PoC Server performing the Participating PoC Function that is involved in Media processing. The PoC Server performing the Participating PoC Function SHALL relay all messages related to Media Burst Control to the PoC Server performing the Controlling PoC Function or PoC Client, as appropriate, in any PoC Session that is not being filtered by the PoC Server performing the Participating PoC Function, without modification of the content of the messages.

A PoC Server performing Controlling PoC Function capable of supporting queued Media Burst Control SHOULD support queued Media Burst Control for those PoC Clients that request it. A PoC Session MAY include both PoC Clients that do not support or request use of queued Media Burst Control and PoC Clients that request use of queued Media Burst Control.

As a result of a PoC User leaving a PoC Session, if the PoC Session supports queuing and the PoC Session is not released, then the PoC Server SHOULD adjust the queue as necessary (e.g. remove the queued Media Burst request(s) of the PoC User, etc).

4.9.1 Talk Burst request priority levels

The Talk Burst request priority level is enhanced to also include Media Burst request priority level, see subclause 4.9.1A *Media Burst request priority levels*".

4.9.1A Media Burst request priority levels

A PoC Server and PoC Client which supports pre-emption, or queuing, or both of Media Burst requests MAY additionally support prioritisation of Talk Burst requests and Media Burst requests. The priority of a Media Burst request of one PoC Client in one PoC Session MAY be same or different.

The following priority levels are defined:

- Pre-emptive priority: A request to have permission to send Media from a Participant with pre-emptive priority SHALL cause the current Media Burst holder's permission to send Media to be revoked immediately when the request for permission from the Participant with pre-emptive priority is received, unless the current Media Burst holder is also a Participant with pre-emptive priority. When the Media Burst is released or revoked, Participants with pre-emptive priority who have requested to have permission to send Media SHALL be granted the permission to send Media in preference to Participants with high or normal priority.
- High priority: When the Media Burst is released or revoked, Participants with high priority in the queue who have requested to have permission to send Media SHALL be granted the permission to send Media in preference to Participants with normal priority.
- Normal priority: When the Media Burst is released or revoked, Participants with normal priority in the queue who have requested to have permission to send Media SHALL be granted the permission to send Media if and only if there are no outstanding requests from Participants with higher priority in the queue.
- Receive-only. A Participant with this priority is only allowed to receive Media. A request to have permission to send Media from a Participant with receive-only priority SHALL be rejected.

NOTE 1: When there is no request to send Media in the queue, there is no difference between the handling of Media Burst from Participants with high or normal priority.

A PoC Server and PoC Client which supports prioritisation SHALL support normal priority and at least one other priority level.

The PoC Server SHALL determine the highest Media Burst request priority level that can be granted to a PoC Client, when the PoC Client is invited to join the PoC Session. PoC Server SHALL grant the permission to send Media among the PoC Clients of the same priority level in the order of received requests.

The PoC Client MAY request the permission to send Media at a Media Burst request priority level that is the same as or lower than the highest priority permitted to the Participant. A PoC Client authorized for pre-emptive priority SHOULD

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request permission to send Media at a Media Burst request priority level that is lower than pre-emptive priority unless the Participant explicitly requests to pre-empt the current sender of Media.

The PoC Server SHALL determine the highest Media Burst request priority level that can be granted to a PoC Client at the time the PoC Client is invited to join the PoC Session. The highest Media Burst request priority level MAY be based upon the Local QoE Profile of the PoC User for the PoC Session.

PoC Server MAY revoke or reject the Media Burst requests of lower priority. Under high load or other special situations, a PoC Server MAY revoke or reject Media Burst requests within a PoC Session due to low PoC Session Precedence.

NOTE 2: The priority handling between different Media Types relies on the queuing process of Media-floor Control Entities which can e.g. be indicated by a Media Burst Control Scheme, but priority handling of different Media Types is otherwise out of scope of this specification.

4.9.2 Local Granted Mode

PoC Client and PoC Server MAY support Local Granted Mode. The PoC Server SHALL use the Local Granted Mode only towards those PoC Clients, which have proposed the support for Local Granted Mode during the PoC Session establishment or the PoC Session modification.

If the PoC Server performing the Controlling PoC Function uses the Local Granted Mode, the PoC Server SHALL include the Local Granted Mode parameter in the OK response which shows the acceptance of using Local Granted Mode to the PoC Client(s) in the PoC Session.

PoC Client MAY send a Media Burst to the PoC Server before getting Media Burst Confirm response, if Local Granted Mode is negotiated with the PoC Server performing the Controlling PoC Function. The Local Granted Mode SHALL be negotiated at the Control Plane.

The PoC Server SHALL revoke the Media Burst in case another Media Burst in the same PoC Session is already on-going or PoC Server has already granted Media Burst to another PoC Client.

NOTE 1: Local Granted Mode can't be used in case queuing is used.

NOTE 2: Local Granted Mode is fulfilling the requirements specified in [PoC RD V2.0] "*Pre-granted Media Burst Control*"

4.10 Handling of Simultaneous PoC Sessions

4.10.1 General

The Simultaneous PoC Sessions mean functionality, that the Home PoC Server discards Media Bursts of some PoC Sessions for maintaining a single entire Conversation.

A PoC Client and PoC Server MAY be capable of handling Simultaneous PoC Sessions. PoC Clients capable of handling Simultaneous PoC Sessions MAY become involved in Simultaneous PoC Sessions by inviting, joining or accepting more than one PoC Sessions, if handling of Simultaneous PoC Sessions is supported by the Home PoC Server. The PoC Client SHALL be aware if the Home PoC Server supports Simultaneous PoC Sessions. The PoC Client supporting the Simultaneous PoC Sessions SHOULD learn via DM-1 reference point if the Home PoC Server supports Simultaneous PoC Sessions.

NOTE: If the Simultaneous PoC Sessions functionality is not supported, the PoC Client is allowed to handle several PoC Sessions at the same time.

The PoC Client SHALL indicate to the Home PoC Server, if the PoC Client supports Simultaneous PoC Sessions.

Each Simultaneous PoC Session SHALL have a SIP Session, Media Burst Control and Media stream established between the PoC Client and the Home PoC Server.

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4.10.2 Simultaneous PoC Session setup and control

The PoC Client, which is capable of handling Simultaneous PoC Sessions, SHALL be able to select the PoC Session priority of two priority levels (primary and secondary). At most one PoC Session MAY be primary. The rest of the PoC Sessions SHALL be secondary. The session priority is used by the Home PoC Server to filter the Media to be sent to the PoC Client. Additionally the PoC Client MAY lock and unlock itself to the selected PoC Session.

Primary/secondary prioritisation SHALL be PoC User and PoC Session specific. It SHALL be possible to change the prioritisation also while the PoC Client is engaged in multiple PoC Sessions. The Primary or Secondary PoC Session configuration SHALL be stored in the Home PoC Server. The setting MAY be made on the session setup or on the session update. When received the PoC Session priority information SHALL be processed by the Home PoC Server. The lock/unlock information MAY be sent by the PoC Client to the PoC Server performing Participating PoC Function similar way. When PoC Client is locked to one PoC Session, then the Home PoC Server performing Participating PoC Function SHALL not send a Media Burst of any other PoC Session to the PoC Client until unlocked or when PoC Session is ended.

The PoC Server performing Participating PoC Function SHALL identify that the PoC Session priority and/or locking is requested. The PoC Server performing the Participating PoC Function SHALL update the PoC Session priority according to the request, if not prevented by a local policy with pre-configured settings for the priority levels. When the session priority is set primary for the PoC User, the possible previous Primary PoC Session SHALL be automatically changed to the secondary one. If locking is requested and the PoC Server performing the Participating PoC Function allows locking for this PoC Session the PoC Server performing the Participating PoC Function SHALL lock the media stream filtering the way that this PoC Session is by-passed to the PoC Client until the PoC Session ends or it is unlocked. When locked to one PoC Session the PoC Server performing the Participating PoC Function SHALL automatically unlock the possible previous locked PoC Session. The PoC Server performing Participating PoC Function SHALL send the INVITE request to the PoC Server performing the Controlling PoC Function, but without Simultaneous PoC Session specific information elements.

The session priority MAY be set also on the Pre-established Session set-up. Locking to the Pre-established Session is not relevant.

4.10.3 Setting session priority/lock-in during a PoC Session

The PoC Client MAY change the PoC Session priority also during a PoC Session. In this case the PoC Client SHALL send an UPDATE to the PoC Server performing the Participating PoC Function. In this case the UPDATE SHOULD NOT be forwarded to the PoC Server performing the Controlling PoC Function.

In the case the new PoC Session is either initiated or received, when the PoC Client is locked to another PoC Session, the PoC Client SHALL release the locking of another session by adding the unlocking request to the INVITE/UPDATE request to be able to communicate in the new PoC Session.

The PoC Server performing the Participating PoC Function SHALL change the session priority and/or locking according to the PoC Client request, if not permanently pre-configured.

The PoC Session locking has precedence over the PoC Session priority when both apply.

4.10.4 RTP Media filtering of the Simultaneous PoC Sessions (for PoC Speech)

The PoC Client MAY participate in Simultaneous PoC Sessions. If there is RTP Media in more than one PoC Session in which the PoC Client is a Participant at the same time, the Home PoC Server performing the Participating PoC Function SHALL filter the Media Bursts so that the PoC User hears a single Conversation.

The Home PoC Server performing the Participating PoC Function SHALL transfer the Media Bursts from the same PoC Session until the Conversation has ended (PoC Session is inactive long enough), or when the PoC Session is put on hold (deactivate Media Bursts) or a new Primary PoC Session is activated or another PoC Session is locked for talking/listening. The RTP Media filtering SHALL be performed by the PoC User's Home PoC Server performing the Participating PoC Function without affecting to the PoC Server performing the Controlling PoC Function.

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The PoC Server performing the Participating PoC Function SHALL transfer the Media Bursts of the Primary PoC Session immediately when received, even if it was transferring the Media Bursts of the Secondary PoC Session. If the PoC User is currently sending Media in the Secondary PoC Session, the Media Burst SHALL NOT be interrupted, but the Media Burst Control messages of the Primary PoC Session SHOULD be sent to the PoC Client.

Among the Secondary PoC Sessions the PoC Server performing the Participating PoC Function SHOULD transfer the Media Burst of the on-going Conversation. After the silent period the Home PoC Server SHALL select the PoC Session for transferring RTP Media, for which the Media Burst are received first. After the previous Conversation is ended the Home PoC Server SHALL select of the several PoC Sessions with on-going Media Bursts the one according to its local policy. The PoC Client MAY lock itself temporarily into one PoC Session and thus, suspend the listening of any other PoC Session after Conversation has ended, until it is unlocked or the PoC Session is released. The PoC Client MAY send the Media Bursts request to any of the Simultaneous PoC Sessions. The possible locking to the previous PoC Session SHALL be released, when requesting the Media Burst to another PoC Session. The PoC Server performing the Participating PoC Function SHALL be able to relay the Media Burst Confirm response and also to start to transfer Media Bursts of this PoC Session.

4.10.4.1 Simultaneous PoC Session association

The PoC Server performing the Participating PoC Function SHALL select for the RTP Media filtering the Simultaneous PoC Sessions established by the same PoC Client using any registered PoC Address as determined in the subclause 4.X "Multiple registered PoC Address determination".

4.10.4.2 Media filtering of other Media Types than PoC Speech

For each PoC Session the PoC Server performing the Participating PoC Function SHALL either send all Continuous Media Types (i.e. PoC Speech, Audio, Video) to the PoC Client or discard all Continuous Media Types using the rules as described for PoC Speech in the subclause 4.10.4 *"RTP Media filtering of the Simultaneous PoC Sessions"*, when there is any overlapping Continuous Media Type in another PoC Session.

NOTE: Media filtering does not affect Discrete Media.

4.10.5 Participant information delivery

The possible changes in the RTP Media filtering selection in the PoC Server (from one PoC Session to another) SHALL NOT affect the distribution of the Participant information.

When the PoC Server changes the PoC Session being delivered to the PoC Client, the PoC Server SHALL indicate on the User Plane which PoC Session is being delivered to the PoC User. The PoC Client SHALL identify each Simultaneous PoC Session with a unique identifier allocated by the Home PoC Server (Participating PoC Function).

4.10.6 Monitoring

The PoC Server performing the Participating PoC Function SHOULD send the Media Burst Control messages of all Simultaneous PoC Sessions to the PoC Client.

4.10.7 Authorisation

PoC Clients MAY be provisioned an attribute to tell how many Simultaneous PoC Sessions they are allowed to participate.

NOTE 1: The PoC Client provisioned value is lower or equal to the maximum amount of Simultaneous PoC Sessions provisioned at the PoC Server.

The PoC Client SHOULD avoid establishing more PoC Sessions, if the maximum amount of Simultaneous PoC Sessions is reached. In case the maximum number of PoC Sessions is reached, the PoC Server performing the Participating PoC Function SHALL interpret the Invited PoC Client as busy, or respectively SHALL reject an invitation from an Inviting PoC Client.

NOTE 2: The provisioning of the maximum number of the Simultaneous PoC Sessions to the PoC Server is out of scope of this specification.

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4.11 Quality feedback

The PoC Client and the PoC Server MAY send quality feedback reports to each other during a PoC Session.

Quality feedback includes the following quality feedback reports:

- Sender Report:

  The sender of a MediaBurst sends the sender report. The sender report includes:
  - Accumulated number of sent media packets since the start of the PoC Session.

- Receiver Report:

  The receiver of a Media Burst sends the receiver report. The receiver report includes:
  - Information that allows the calculation of lost media packets since the start of the PoC Session.

If the quality feedback reports are supported, the PoC Client and the PoC Server:

- SHALL send the quality feedback reports for each Continuous Media according to rules and procedures of [RFC3550];
- SHALL consider the bandwidth limitations when sending the quality feedback reports for PoC Speech; and,
- MAY consider the bandwidth limitations when sending the quality feedback reports for Continuous Media other than PoC Speech.

4.12 User Plane adaptation

The available bit rate of the radio interface is influenced by: the type of the access network, different configurative means (e.g. support for IP header compression) and the current conditions on the radio access link.

In order to guarantee a sufficient Media quality (e.g. voice or Video), the Media Burst (User Plane) bit rate must be reduced in case the Media Burst bit rate is higher than the available end-to-end bit rate. The Media Burst bit rate SHOULD be reduced if necessary by re-negotiation within the Control Plane.

Renegotiation SHOULD be avoided during a Media Burst.

User Plane adaptation describes a set of SIP methods to renegotiate parameters that change the needed throughput for the Media by either changing the coding (e.g. speech codec, Video codec, codec mode) or the packetizing of encoded frames. The PoC Client and the PoC Server performing the Controlling PoC Function SHALL support the User Plane adaptation procedure, if initiated by the other functional entity.

Both the PoC Client and the PoC Server performing the Controlling PoC Function MAY initiate the User Plane adaptation procedure.

4.13 Codecs

For optimum voice quality, end-to-end media coding is recommended for the RTP Media whenever feasible. In case a common PoC Speech codec is not utilized (e.g. in inter system communication), the PoC Server or some other network element SHOULD perform the transcoding function. The network entity which performs the transcoding SHALL also alter the RTCP reports sent to it so that the outgoing RTCP report packets reflects the changes in the RTP Media stream imposed by the transcoding. To minimize delay and voice quality reduction, it is recommended only one transcoding function occurs between the talker and any listener in the PoC Session

3GPP mandates the AMR narrowband codec as the default codec for PoC Speech, see [TS 26.235]. Further, 3GPP mandates support of the AMR wideband codec, if the User Equipment on which the PoC Client is implemented uses 16 kHz sampling frequency of the PoC Speech, see [TS 26.235].

3GPP2 mandates the EVRC codec as the default codec for PoC Speech, see [3GPP2 S.R0100-0].

For recommended Audio codecs with 3GPP Networks, see [TS 26.234] and [TS 26.235].

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For recommended Audio codecs with 3GPP2 Networks, see [3GPP2 C.S0046-0].

For recommended Video codecs with 3GPP Networks, see [TS 26.235].

For recommended Video codecs with 3GPP2 Networks, see [3GPP2 C.S0046-0].

4.14 Signalling compression

The SIP/IP Core SHALL support signalling compression (SigComp) according to rules and procedures of [RFC 3320], [RFC 3485] and [RFC 3486] to reduce the transmission delays.

The PoC Client SHOULD compress the SIP signalling according to rules and procedures of [RFC 3320], [RFC 3485] and [RFC 3486] to reduce the transmission delays.

If the PoC Client initiate the signalling compression according to rules and procedures of [RFC 3320], [RFC 3485] and [RFC 3486], then the SIP/IP Core SHALL compress the SIP signalling according to [RFC 3320], [RFC 3485] and [RFC 3486].

It is RECOMMENDED that the PoC Client and the SIP/IP Core supports dynamic compression or other SigComp extended operations to improve the compression efficiency and to further reduce transmission delays (for a definition of dynamic compression and a description of other SigComp extended operations see [RFC 3321]).

NOTE: Dynamic compression can be implemented without using the extended operations mechanisms of [RFC 3321] which is referenced here in the interest of thoroughness.

When the SIP/IP Core corresponds with 3GPP/3GPP2 IMS, then the signalling compression procedures in [3GPP TS 24.229] /[3GPP2 X.S0013.4] SHALL be used.

4.15 Charging

PoC Charging architecture supports both subscription based charging and traffic based charging as specified in [3GPP TS 32.272].

For the subscription based charging, subscription events like service activation time and subscriber PoC service profile are provided to the charging infrastructure. For subscription based charging, the identification of a PoC User includes the assigned IMSI, MSISDN or equivalents thereof, allowing the reuse of existing charging infrastructure.

For the traffic based charging, data is provided to the charging infrastructure in time to support both online and off-line billing models. Correlation between the PoC service charging data and the packet data services used is realized by adding to the PoC service CDR the appropriate identification of the packet service as generated by the underlying network. Correlation between PoC service charging data for sessions spanning multiple operator domains is realized by storing the network identification of the involved networks and charging identifiers in the generated PoC service CDRs.

4.15.1 Charging of PoC Sessions

In a PoC Session there can be number of Participants being PoC Subscribers of several different PoC operators. A PoC Server SHALL support to charge the contracted PoC Subscribers by using online and off-line billing models independently of any other PoC Network charging policy. The settlement between the involved PoC Networks is not within the scope of the current document.

The PoC Server SHALL provide the following information for the charging of the Participant:

- Number of sent and received PoC Session invitations with time stamps. The type and size of any Media content included in the invitation SHALL also be considered.
- Number and type of successful PoC Sessions, considering the following information:
  - PoC Session duration.
  - Pre-established or On-demand Session

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- 1-1 PoC Session, Ad-hoc PoC Group Session, Pre-arranged PoC Group Session or Chat PoC Group Session.
- Local QoE Profile used for each PoC Session by the Participant. The underlying QoS parameters negotiated by the Participant SHALL also be considered through the use of charging correlation.

- For PoC Group Sessions, the following SHALL be considered:
  - 1-many or 1-many-1 PoC Session.
  - Number and identity of other Participants.
- Information about the type of Participant, considering:
  - Use of PoC Interworking Service.
  - Role taken by the Participant during the PoC Session (e.g. regular PoC Participant, PoC Dispatcher, etc) and any change to that role during the PoC Session. This information SHALL be time stamped.
  - Use of a PoC Box on behalf of the PoC User. NW and UE PoC Box cases SHALL be distinguished
- Number and type of Media exchanged in the PoC Session by the Participant. The following charging information SHALL be separately available for each Media Type actually exchanged by the Participant:
  - Identity of Participant(s) receiving a Media Burst.
  - Priority of Media Bursts.
  - Duration and volume of transmitted/received Media Bursts.
  - Number of Media Bursts transmitted/received. This information SHOULD be time stamped.
  - Codification used.
- Actions initiated by the Participant in a PoC Session. Following actions SHALL be considered in the information available for charging:
  - Inviting a new Participant into the PoC Session including identity of the Invited PoC User, outcome of the invitation (successful or failed session setup) and time stamp.
  - Adding/removing a Media Type to/from the PoC Session.
  - Connecting/disconnecting a Media Type for the Participant.
  - Expelling other Participant from the PoC Session, with time stamp.
  - Inviting, joining or accepting more than one PoC session
  - Subscription to the Participant information in a PoC Session
  - Amount of Participant information sent to the Participant

In the PoC architecture the Participating PoC Function measures and sends charging reports to the charging system for the charging of the Participant. The PoC Interworking Function, when performing Participating PoC Function, SHALL have the capability to send charging reports for the charging of the Participant.

In a PoC Session there needs to be a PoC Session Owner. The PoC Session Owner in the case of 1-1 PoC Session and Ad-hoc PoC Group Session is the initiator of the PoC Session. In the case of a Chat PoC Group and a Pre-arranged PoC Group Session, the PoC Session Owner is the creator of the PoC Group.

In addition to the information considered for the charging of a Participant, the PoC Server SHALL provide the following information for the charging of the PoC Session Owner:

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- Per PoC Session time: The time that there is at least one Participant in a PoC Session or a period of time independent of PoC Session usage.
- PoC Session type:
  - 1-1 PoC Session, Ad-hoc PoC Group Session, Pre-arranged PoC Group Session or Chat PoC Group Session.
  - QoE Profile assigned to the PoC Session.
- For PoC Group Sessions, the following SHALL be considered:
  - Type of the PoC Group (e.g. Dispatch PoC Groups).
- Information about Participants:
  - Number of Participants as a function of time. This charging information SHALL include the identities of the Participants and a timestamp of the joining or leaving event(s).
  - PoC Interworking Service usage.
  - Role taken by each Participant during the PoC Session (e.g. regular PoC Participant, PoC Dispatcher, etc) and any change to that role during the PoC Session. This information SHALL be time stamped.
- Media Bursts distributed to the Participants:
  - Total volume and duration of distributed Media Bursts. This information SHALL be measured independently for each Media Type exchanged in the PoC Session.
  - Each Media Burst information SHOULD be time stamped to capture the 'Sent Time'/'Receive Time' and contain the address of the source PoC Server and the list of reached Participant(s). Latency of Media Bursts SHOULD be inferable from this information.
- Number of Participant information subscriptions.
- Number of Participant information sent to the Participants.

In the PoC architecture the Controlling PoC Function measures and sends charging reports to the charging enabler for the charging of the PoC Session Owner. PoC Interworking Function, when performing Controlling PoC Function, SHALL have the capability to send charging reports for the charging of the PoC Session Owner.

4.15.2 Charging of other PoC services

A PoC Server SHALL provide the information to charge its PoC Subscriber for the following other actions:

- Number of sent/received PoC Instant Personal Alerts, including the identities of the alerted/alerting PoC Users.
- Sending/Receiving Group Advertisement, including the identities of the sending/receiving PoC Users. Type and size of any Media Content included in the Group Advertisement SHALL be considered.
- Modification of PoC Service Settings.
- Management of PoC Groups (i.e. creation and storage time for PoC Group documents). The type and size of the PoC Group SHALL be considered in the generated charging information.
- Handling of Simultaneous PoC Sessions
- Full Duplex Call Follow-on usage.

4.15.3 Charging architecture

A simplified diagram showing the online charging system, charging collection functions and the PoC related interfaces, is shown in Figure 1 *"Architecture for PoC V2.0 specific charging"*. Charging information, relating to PoC usage, may also be gathered from other access network entities using existing interfaces.

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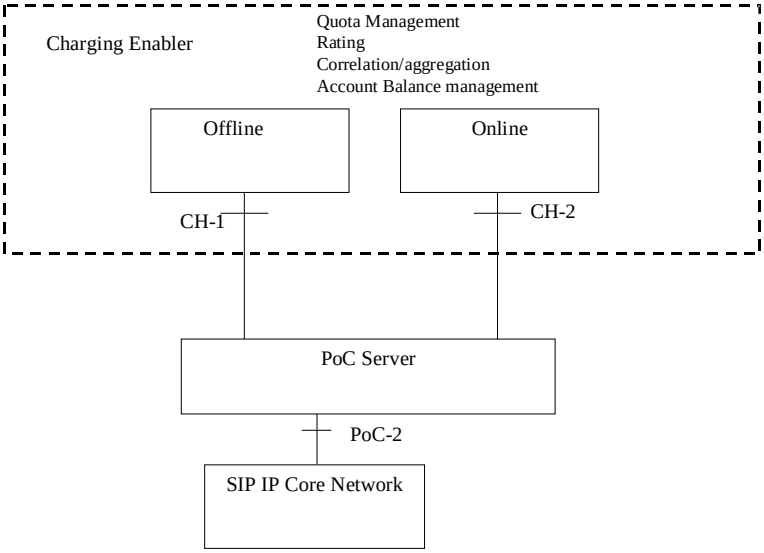

Figure 1: Architecture for PoC V2.0 specific charging

NOTE: The architecture for PoCV1.0 specific charging is described in [PoC AD V1.0]

The Charging Enabler supports both online and offline charging methods. For either method, any of the charging functions listed may be applied by the Charging Enabler, and also provides a method for determining whether online or offline charging should be used in a given situation.

PoC Server SHALL have the capability to send offline accounting information about PoC service events to the charging enabler using CH-1 interface. For 3GPP/3GPP2 IMS compliant core networks the CH-1 interface SHALL conform to the Rf interface as specified in [3GPP TS 32.272]. SIP/IP Core entities, may also use the CH-1 interface to send offline accounting information pertaining to individual PoC Sessions. The address of the Charging Data Function to be used for one side of the PoC Session (either originating or terminating) is distributed in IMS based systems via SIP signalling as described in [3GPP TS 24.229].

PoC Server SHALL have the capability to send online accounting information about PoC service events to the charging enabler using CH-2 interface. It SHALL be possible for the PoC Server to perform credit control interactions using the CH-2 interface to the online charging system. For 3GPP/3GPP2 IMS compliant core networks the CH-2 interface SHALL conform to the Ro interface as specified in [3GPP TS 32.272]. The address of the Online Charging Function to be used for one side of the PoC Session (either originating or terminating) is distributed in IMS based systems via SIP signalling as described in [3GPP TS 24.229].

4.15.4 PoC Session Charging Correlation

The PoC Server SHALL enable PoC Session Charging Correlation. The PoC Charging Events related to a PoC Session generated by the PoC Server SHALL be correlated by a Charging Correlation ID.

PoC Server performing the Controlling PoC Function:

- SHALL create a unique Charging Correlation ID during PoC Session establishment;
- SHALL send the Charging Correlation ID to PoC Servers performing the Participating PoC Function;
- SHALL include the Charging Correlation ID in PoC Charging Events for the associated PoC Session; and,

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- SHALL retire the Charging Correlation ID when the PoC Session is terminated.

The PoC Server performing the Participating PoC Function:

- SHALL save the Charging Correlation ID received from the PoC Server performing the Controlling PoC Function;
- SHALL include the Charging Correlation ID in PoC Charging Events for the associated PoC Session; and,
- SHALL retire the Charging Correlation ID when the PoC Session is terminated at the Participating PoC Function.

4.16 Roaming

The PoC Client SHALL be able to use the home PoC service when roaming.

When roaming, interconnection between operator's networks and communication between the PoC Server and the PoC Client MAY be achieved either

1. through interconnection of the IP access networks; or
2. when a SIP/IP Core exists in the visited network through interconnection of the visited and home SIP/IP Core networks.

The exact mechanisms for interconnection in the roaming scenario are outside the scope of this document. For 3GPP/3GPP2 IMS the roaming scenarios are specified in [3GPP TS 23.228] and [3GPP2 X.S0013.2].

4.17 Presence

The Watcher associated with the PoC Client MAY utilize presence service enabler(s) to determine the PoC presence status of other PoC Clients.

The Presence Source MAY publish presence information to the Presence Server.

The Presence Source supplied presence information is routed to the Presence Server via the PRS-1 and PRS-3 reference points.

The PoC Server MAY publish presence information to the Presence Server based on the state of the PoC Client within the PoC Session.

The PoC Server MAY obtain any presence information it requires on PoC Clients by subscribing to their Presence Status using the functionalities of the Presence Service enabler. The signalling between the Presence Server and the PoC Server SHALL be routed via the SIP/IP Core and the PRS-3 Reference Point.

NOTE: The architecture and functions of the Presence Service enabler are specified in [Presence AD].

4.18 Access Control

4.18.1 Access Control management

Access Control management includes operations that allow the XDMC to reliably manipulate the PoC User access policy located in the Shared Policy XDMS and PoC Group authorization rules located in the Shared Group XDMS. The documents describing PoC User access policy and PoC Group authorization rules MAY include references to Contact Lists or Group Lists stored in the Shared List XDMS as URI lists.

A PoC Subscriber SHALL be able to manipulate the PoC User access policy and PoC Group authorization rules when queried.

Access Control list management uses the XML Document Management operations specified in the [XDM AD V2.0].

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4.18.2 PoC User access policy

PoC User access policy MAY be used by the PoC User as a means of controlling incoming and outgoing PoC Session requests from other PoC Users or PoC Groups.

If multiple PoC Addresses are registered by a PoC Client explicitly or implicitly, the PoC Client SHALL create the PoC User access policy for each PoC Address the PoC User intends to use for the PoC Service.

NOTE 1: The PoC User access policy need not contain any rules.

The PoC User access policies include:

- General access rules;
- Media Type specific access rules; and,
- PoC Box criteria access rules.

In case several access rules, described above, are applicable the following main rule applies:

- If any of the access rules indicates 'block' then 'block' is applied to the request.
- If none of the access rules indicates 'block' and any of the access rules indicates 'manual answer' then 'manual answer' is applied to the request.
- If none of the access rules indicates 'block' or 'manual answer' then 'automatic answer' is applied to the request.
- If access rule is not defined, then 'manual answer' is applied to the request.

NOTE 2: PoC User's Answer Mode Indication setting also affects the Answer Mode applied to the request as described in the subclause 4.30 *"Answer Mode"*.

NOTE 3: PoC User access policies are superseded by the Incoming PoC Session Barring state.

4.18.2.1 General access rules

The PoC User access rules SHALL support the following actions:

- Allow/block PoC User and PoC Groups incoming PoC Session request
- Block anonymous PoC User’s incoming PoC Session request
- Allow PoC Users to be treated in Automatic Answer Mode

The PoC User access rules MAY support the following actions:

- Allow PoC Users to override Manual Answer Mode Indication setting, known as MAO.

The access rules MAY be applied also on the delivery of the Instant Personal Alerts.

4.18.2.2 Media Type specific access rules

The Media Type specific access rules SHALL support following:

- Allow PoC User to configure Automatic or Manual Answer Mode for PoC Session offering Video
- Allow PoC User to configure Automatic or Manual Answer Mode for PoC Session offering Audio
- Allow PoC User to configure Automatic or Manual Answer Mode for PoC Session offering Discrete Media.

NOTE: Manual Answer Mode is applied for PoC Speech, Audio and Video and Automatic Answer Mode is appliedfor Discrete Media, if the corresponding access rule is not defined.

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The Media Type specific access rules SHALL be PoC User specific.

4.18.2.3 PoC Box criteria access rules

The PoC Server MAY support the PoC Box criteria access rules.

The XDMC MAY support configuration of PoC Box criteria access rule conditions.

If the PoC Server supports PoC Box the PoC Server performing the Participating PoC Function of the Invited PoC Client SHALL check the PoC Box criteria access rule conditions defined by the Invited PoC User.

The PoC Box criteria access rule SHALL support the following action:

- PoC Server unconditional forwarding of invitations to the NW PoC Box when the PoC User is not registered with a PoC Client and UE PoC Box.

NOTE 1: When the PoC Service Setting is expired because, e.g., the PoC User is not registered, the same access rule is applied.

NOTE 2: The PoC Server can identify the non-registered PoC User from the incoming INVITE request from the SIP/IP Core.

- Use the default PoC Box (i.e., UE or NW PoC Box) if both UE and NW PoC Box can be connected.

A local policy MAY be used to determine if all Media Types in an invitation to a PoC Session can be forwarded to the PoC Box or not.

4.18.3 PoC Group authorization rules

The PoC Group owner MAY use authorization rules to control permissions to access a Pre-arranged and Chat PoC Group. The PoC Group authorization rules SHALL support the following actions:

- Allow/block PoC User initiating the PoC Session
- Allow/block PoC User joining the PoC Session
- Allow/block PoC User adding Participants to the PoC Session
- Allow/block PoC User removing Participants from the PoC Session
- Allow/block subscription to the Participant Information
- Allow/forbid the anonymity of certain Participants
- Allow/block PoC User adding Media to and removing Media from the PoC Session
- Allow/block PoC User adopting the PoC Dispatcher role
- Allow/block PoC User transferring the PoC Dispatcher role
- Allow/block PoC User sending the Group Advertisements to the PoC Group
- Allow certain Media Burst Control Schemes for a certain PoC Session initiator

4.19 Incoming PoC Session Barring

If the PoC User has set Incoming PoC Session Barring active and if neither the NW PoC Box nor UE PoC Box is used, then a Participating PoC Function of the Invited PoC Client SHALL NOT send the received incoming PoC Session request to the PoC Client and SHALL send a ‘busy’ response towards the Inviting PoC Client.

If the PoC User has set Incoming PoC Session Barring active and if either the NW PoC Box or UE PoC Box or both are supported, then the incoming PoC Session request SHALL be routed as specified in subclause 4.28 *"PoC Box handling"*.

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4.20 Incoming Instant Personal Alert Barring

If the PoC User has set the Incoming Instant Personal Alert Barring active, then the Participating PoC Function of the recipient PoC Client SHALL NOT send the received Instant Personal Alert to the PoC Client and SHALL send a 'busy' response towards the sending PoC Client.

4.21 Deactivate/reactivate incoming Media Bursts

The deactivation/reactivation of the incoming Media is enhanced also to include Media Bursts, see subclause *4.21.1 "Deactivate/reactivate incoming Media Bursts"*.

4.21.1 Deactivate/reactivate incoming Media Bursts

When a PoC Client wants temporarily to deactivate incoming Media Bursts it SHALL send a request to the PoC Server to place the Media on hold. The PoC Server performing the Controlling PoC Function SHALL stop transmitting Media Bursts to the PoC Client until the corresponding Media Stream is activated again. Deactivation and reactivation are Media Stream specific and SHALL be made via signalling path through reference points POC-1, POC-2 and IP-1.

4.22 PoC communication methods

PoC service allows a PoC User to communicate with a single Participant in a 1-1 PoC Session and communicate with a group of Participants in a 1-many or 1-many-1 PoC Group Session.

Hence, three different methods of communication are supported.

4.22.1 Communication in a 1-1 PoC Session

When communicating in a 1-1 PoC Session, each Continuous or Discrete Media, which is bound to a Media-Floor Control Entity, is transferred between two individual Participants in a half-duplex fashion and each Discrete Media, which is not bound to a Media-Floor Control Entity, can be transferred between two individual Participants in a full-duplex fashion.

4.22.2 Communication in a 1-many PoC Group Session

When communication in a 1-many PoC Session, each Continuous or Discrete Media, which is bound to a Media-Floor Control Entity, is transferred between several Participants in a half-duplex fashion and each Discrete Media, which is not bound to a Media-Floor Control Entity, can be transferred between several Participants in a full-duplex fashion. Each Participant receives all Media Streams that are transmitted by any other Participant in the PoC Session.

This is default method of communication for all types of PoC Group Sessions.

4.22.3 Communication in a 1-many-1 PoC Group Session

When communicating in a 1-many-1 PoC Group Session, each Continuous or Discrete Media, which is bound to a Media-Floor Control Entity, is transferred between several Participants in a half-duplex fashion and each Discrete Media, which is not bound to a Media-Floor Control Entity, can be transferred between several Participants in a full-duplex fashion. The 1-many-1 PoC Group Session consists of one Distinguished Participant (e.g., PoC Dispatcher), that acts as a central node, and a set of Ordinary Participants (e.g., PoC Fleet Members if the PoC Session was initiated by a PoC Dispatcher). All Ordinary Participants receive Media Streams from the Distinguished Participant. Only the Distinguished Participant receives Media Streams from any Ordinary Participant. All Participants receive Media Burst Control signalling.

The 1-many-1 configuration is an optional configuration, which MAY be used by a Pre-arranged PoC Group, or subset of the Dispatch PoC Group.

If the PoC Dispatcher functionality is supported, the 1-many-1 communication topology SHALL be supported.

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Pre-arranged PoC Groups capable of utilizing 1-many-1 PoC Group Sessions SHALL maintain a PoC-specific attribute that indicates whether the Pre-arranged PoC Group is capable of supporting the use of a 1-many-1 PoC Group Session.

If a Pre-arranged PoC Group is capable of utilizing a 1-many-1 PoC Group Session, each member of the Group SHALL be identified as capable of acting as a Distinguished Participant or as an Ordinary Participant.

A Pre-arranged PoC Group member capable of acting as a Distinguished Participant MAY be the initiator of a 1-many-1 PoC Session. If this PoC Session type is selected, the Pre-arranged PoC Group member that initiated the PoC Session SHALL initially act as the Distinguished Participant in the PoC Session.

A Pre-arranged PoC Group member only capable of acting as an Ordinary Participant SHALL NOT be able to initiate a 1-many-1 PoC Group Session.

According to the Service Provider Policy, the 1-many-1 PoC Group Session MAY be limited only to Pre-arranged PoC Groups composed of authorised PoC Users (e.g., the PoC Dispatcher and the rest of PoC Fleet Members to be included in the 1-many-1 PoC Group Session). Details on Dispatch PoC Groups and Dispatch PoC Sessions are covered in subclause 4.38 "*PoC Dispatcher*"

4.23 PoC service provisioning

OMA Device Management [OMA DM] and OMA Client Provisioning [OMA Client Provisioning] provide protocols and data structures to provision and manage a mobile terminal over the air. Either method or a combination of the two methods MAY be used to provision and manage the PoC service feature configurations on a mobile terminal.

The PoC service provider sets up PoC service feature configurations remotely in the User Equipment by using the provisioning mechanisms specified in [OMA Client Provisioning] or in [OMA DM Bootstrap]. The PoC Service provider SHOULD update the PoC service feature configurations remotely in the User Equipment by using [OMA DM].

The PoC Client SHALL be able to receive the provisioning parameters, either via OMA Client Provisioning or via OMA DM profile, and sent by service provider. The exact syntax and definition of parameters needed for PoC service are specified in [OMA Client Provisioning] and in [OMA DM].

NOTE: In cases of networks where the provisioning systems specified in [OMA Client Provisioning] and [OMA DM] are not supported the provisioning system is out of scope of this specification.

Updates to the provisioned parameters SHOULD be done as specified in [OMA DM].

How any PoC Subscriber specific service attributes are provisioned to the PoC Server is out of scope of this specification.

4.24 Quality of Service traffic classes

The selection of QoS traffic classes for the PoC Control and User Plane is dependent on the QoS traffic classes supported by the underlying networks.

When QoE Profiles are used, PoC Clients SHOULD follow the procedures specified in sub-clause 4.41 "*Quality of Experience (QoE)*" for the selection of the appropriate traffic class(es) to be utilized in the underlying network. Otherwise, the following SHALL apply.

For the case when different PDP contexts [3GPP TS 23.060] or Service Instances are used for PoC signalling and User Plane, it is recommended that the PoC Clients SHOULD separately utilize the traffic class that is best suitable for signalling (e.g., Interactive traffic class) and the traffic class that is best suitable for the User Plane (e.g. Streaming or Conversational traffic classes). If the requested level of QoS or traffic classes for the Control Plane and/or User Plane are not available, the system should attempt to use the negotiated QoS or request an alternative QoS traffic class. Additionally, the Media Burst Control MAY be routed over the same PDP context or Service Instance intended for the PoC Signalling. The details of the QoS used are described in [3GPP TS 23.107].

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For the case when one single PDP context or Service Instance is used for both PoC signalling and Media the PoC Client SHOULD utilize the QoS traffic class that is determined to be the best available considering the overall balance between PoC Session Media bearer establishment latency and Media QoS (e.g. interactive traffic class).

4.25 PoC Feature Interaction with Circuit Switched services

The User Equipment supporting the PoC Client MAY support circuit switched (CS) voice communications. In this case, the PoC service and CS voice service modes are co-located in the User Equipment. Supporting notification of incoming CS call during an ongoing PoC Session as well as a notification of an incoming PoC Session set up during an ongoing CS call depends on the capabilities of the UE. Inter-working between CS and PoC services is not supported.

NOTE: The specification of the network notification is out of scope of this specification.

4.26 PoC Service Settings

The PoC Client SHALL control PoC Service Settings via the POC-1 reference point.

The PoC Client SHALL provide to the Home PoC Server the following PoC Service Settings:

- Answer Mode Indication;
    - Incoming PoC Session Barring;
    - Incoming Instant Personal Alert Barring; and
    - Simultaneous PoC Sessions Support.

The PoC Client MAY provide to the Home PoC Server the following PoC Service Settings:

- Invited Parties Identity Information Mode;
- Support for Media Content included in a request;
- Support for Referenced Media Content included in a request;
- Support for Text Content included in a request;
- PoC Box Use; and
- Privacy.

If multiple PoC Addresses are registered by a PoC Client explicitly or implicitly, the PoC Client SHALL publish the PoC Service Setting for each PoC Address.

The PoC Client MAY publish different PoC Service Settings values for each PoC Address.

The PoC Server SHALL apply the PoC Service Settings that the PoC Client publishes for requests involving that specific PoC Address.

The following subclause describes the PoC Service Settings in more detail.

NOTE: PoC Client will get the information about supported optional features that are related to PoC Service Settings by provisioning as specified in subclause 4.23 *"PoC service provisioning"*.

4.26.1 Answer Mode Indication

The PoC Client SHALL provide the Home PoC Server with its current Answer Mode Indication setting. The Home PoC Server SHALL store the Answer Mode Indication setting provided by the PoC Client for the Served PoC User.

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The possible Answer Mode Indication settings are:

- Automatic Answer Mode; and
- Manual Answer Mode.

If the PoC Client supports both the Automatic Answer Mode and the Manual Answer Mode the PoC Client SHALL allow the PoC User to change the Answer Mode Indication setting.

The Home PoC Server SHALL request the Invited PoC Client to answer the PoC Session with a specific Answer Mode by indicating the requested Answer Mode in all initial PoC Session invitations to the Served PoC User based on the Answer Mode Indicationsetting, the Access Rules and any indication indicating the requested Answer Mode specifically included by the Inviting PoC User.

4.26.2 Incoming PoC Session Barring (ISB)

The PoC Client SHALL provide the Home PoC Server with its current Incoming PoC Session Barring setting. The Home PoC Server SHALL store the Incoming PoC Session Barring setting provided by the PoC Client for the Served PoC User.

The PoC Client SHALL allow the PoC User to change the Incoming PoC Session Barring setting.

The possible Incoming PoC Session Barring settings are:

- Incoming PoC Session Barring settings active; or,
- Incoming PoC Session Barring settings not active.

If the Incoming PoC Session Barring is active the Home PoC Server SHALL reject all incoming invitations for the Served PoC User.

4.26.3 Incoming Instant Personal Alert Barring (IAB)

The PoC Client SHALL provide the Home PoC Server with its current Incoming Instant Alert Barring setting. If the Home PoC Network supports Incoming Instant Personal Alert Barring, the Home PoC Server SHALL store the Incoming Instant Personal Alert Barring setting provided by the PoC Client for the Served PoC User.

If the PoC Client supports Incoming Instant Personal Alert Barring, the PoC Client SHALL allow the PoC User to change the Incoming Instant Personal Alert Barring setting in the Home PoC Network.

The possible Incoming Instant Personal Alert Barring settings are:

- Incoming Instant Personal Alert Barring active; or,
- Incoming Instant Personal Alert Barring not active.

If the Incoming Instant Personal Alert Barring is active the PoC Server SHALL reject all incoming Instant Personal Alerts for the Served PoC User.

4.26.4 Simultaneous PoC Sessions Support (SSS)

If the PoC Client supports Simultaneous PoC Sessions, the PoC Client SHALL indicate the Simultaneous PoC Sessions Support setting to the Home PoC Server. If the PoC Client does not support Simultaneous PoC Sessions, the PoC Client SHALL indicate that the Simultaneous PoC Sessions Support setting is not active when providing PoC Service Settings to the Home PoC Server.

If the Home PoC Network supports Simultaneous PoC Sessions, the Home PoC Server SHALL store the Simultaneous PoC Sessions Support setting provided by the PoC Client for the Served PoC User.

The possible Simultaneous PoC Sessions Support settings are:

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- Simultaneous PoC Sessions Support active;or,
- Simultaneous PoC Sessions Support not active.

If the Simultaneous PoC Sessions Support setting is Simultaneous PoC Sessions Support active, the PoC Server behaves as specified in subclause 4.10 "*Handling of Simultaneous PoC Sessions*".

NOTE 1: If there are ongoing PoC Sessions the new value of the Simultaneous PoC Sessions Support setting will not take effect immediately.

4.26.5 Invited Parties Identity Information Mode (IPIIM)

The Home PoC Server SHALL store the Invited Parties Identity Information Mode setting provided by the PoC Client for the Served PoC User in regions where this functionality is not restricted due to regulations.

The PoC Client MAY support the Invited Parties Identity Information Mode. If Invited Parties Identity Information Mode is supported by the PoC Client, the PoC Client SHALL allow the PoC User to change the Invited Parties Identity Information Mode.

The possible Invited Parties Identity Information Mode settings are:

- Invited Parties Identity Information Mode active; or,
- Invited Parties Identity Information Mode not active.

If the Invited Parties Identity Information Mode is active the Home PoC Server SHALL deliver the invited parties identity information to the PoC Client for the Served PoC User.

NOTE: When there is no available service setting for Invited Parties Identity Information Mode, the default for Invited Parties Identity Information Mode is not active".

4.26.6 Support for Media Content included in a request

The PoC Service Settings for Support of Media Content included in a request MAY be indicated by the PoC Client to indicate whether the PoC User is willing to accept requests with Media Content included..

The PoC Client MAY include the following PoC Service Settings:

- Support for Media Content included in a request;
- Support for Referenced Media Content included in a request; and
- Support for Text Content included in a request.

4.26.6.1 Support for Media Content included in a request

The Home PoC Server SHALL store the Support for Media Content included in a request setting if provided by the PoC Client for the Served PoC User.

The PoC Client MAY support Media Content included in a request. If Media Content included in a request is supported by the PoC Client, the PoC Client SHALL allow the PoC User to change the Support for Media Content included in a request.

The possible Support for Media Content included in a request settings are:

- Support for Media Content included in a request supported ; or
- Support for Media Content included in a request not supported

If the Support for Media Content included in a request is not supported the Home PoC Server SHALL remove any Media Content included in the request before forwarding to the PoC Client for the Served PoC User.

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NOTE: When there is no available service setting for Support for Media Content included in a request the default setting is not supported

4.26.6.2 Support for Referenced Media Content included in a request

The Home PoC Server SHALL store the Support for Reference Media Content included in a request setting if provided by the PoC Client for the Served PoC User.

The PoC Client MAY support referenced Media Content included in a request. If referenced Media Content included in a request is supported by the PoC Client, the PoC Client SHALL allow the PoC User to change the Support for Referenced Media Content included in a request.

The possible Support for Referenced Media Content included in a request settings are:

- Support for Referenced Media Content included in a request supported; or
- Support for Referenced Media Content included in a request not supported.

If the Support for Referenced Media Content included in a request is not supported the Home PoC Server SHALL remove any reference to Media Content included in the request before forwarding to the PoC Client for the Served PoC User.

NOTE: When there is no available service setting for Support for Referenced Media Content included in a request the default setting is not supported.

4.26.6.3 Support for Text Content included in a Request

The Home PoC Server SHALL store the Support for Text Content included in a request setting if provided by the PoC Client for the Served PoC User.

The PoC Client MAY support Text Content included in a request. If Text Content included in a request is supported by the PoC Client, the PoC Client SHALL allow the PoC User to change the Support for Text Content included in a request.

The possible Support for Text Content included in a request settings are:

- Support for Text Content included in a request supported; or
- Support for Text Content included in a request not supported.

If the Support for Text Content included in a request is not supported the Home PoC Server SHALL remove any Text Content included in the request before forwarding to the PoC Client for the Served PoC User.

NOTE: When there is no available service setting for Support for Text Content included in a request the default setting is not supported .

4.26.7 PoC Box Use

The PoC Box Use setting describes whether the terminating PoC Client wants to route the incoming PoC Session invitation to the PoC Box or how the terminating PoC Client wants to route the incoming PoC Session invitations.

The Home PoC Server SHALL store the PoC Box Use setting provided by the PoC Client for the Served PoC User.

The PoC Client SHALL allow the PoC User to change the PoC Box Use setting if the PoC Client supports the PoC Box function.

The possible PoC Box Use Settings are:

- unwilling; or
- unconditional; or

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- conditional

If the PoC Box Use setting is unwilling the PoC Server SHALL NOT route the incoming PoC Session invitations to the UE PoC Box or the NW PoC Box of the Served PoC User.

If the PoC Box Use setting is conditional the PoC Server SHALL route the incoming PoC Session invitations to the UE PoC Box or the NW PoC Box of the Served PoC User based on the PoC Box criteria access rules for default PoC Box as specified in subclause 4.18.2.3 *"PoC Box criteria access rules"* only conditionally and those conditions are specified in subclause 4.28.1 *"General"*.

If the PoC Box Use setting is unconditional the PoC Server SHALL route the incoming PoC Session invitations to the UE PoC Box or the NW PoC Box of the Served PoC User based on the PoC Box criteria access rules for default PoC Box as specified in subclause 4.18.2.3 *"PoC Box criteria access rules"* unconditionally.

4.26.8 Privacy

The PoC Server in the Home PoC Network SHALL store the Privacy PoC Service Setting provided by the PoC Client for the Served PoC User if the Privacy PoC Service Setting is supported by the PoC Server.

The PoC Client MAY publish the Privacy PoC Service Settings to indicate whether the PoC Client wants to be anonymous or not during the PoC Session establishment in the case of Automatic Answer Mode of On-demand Session.

The possible Privacy settings are:

- non-anonymous: indicate that the publishing PoC Client does not want to be anonymous when invited; or
- anonymous: indicate that the publishing PoC Client wants to be anonymous when invited.

If the Privacy PoC Service Settings is anonymous, the PoC Server SHALL NOT transfer the identity to the Inviting PoC Client.

4.27 Media-floor Control procedure

4.27.1 General

A PoC Session MAY consist of one or more Media Streams. There MAY be one or more Media Streams for the same Media Type. For those Media Streams that use Media-floor Control, each Media Stream or multiple Media Streams SHALL be controlled by separate Media-floor Control Entity. Each Media-floor Control Entity SHALL use the Media Burst Control procedures described in subclause 4.9A Media *Burst Control*".

The Media-floor Control Entity SHALL reside in the PoC Client and in the PoC Server performing Controlling PoC Function.

The characteristics of Media Types and Media-floor Control Entity SHALL be negotiated during the establishment of a PoC Session and they can be modified during the PoC Session by session modification procedure.

A Media-Floor Control Entity SHALL be identified by a unique identifier.

One, more or all Participants in a PoC Session MAY be connected to a Media-floor Control Entity.

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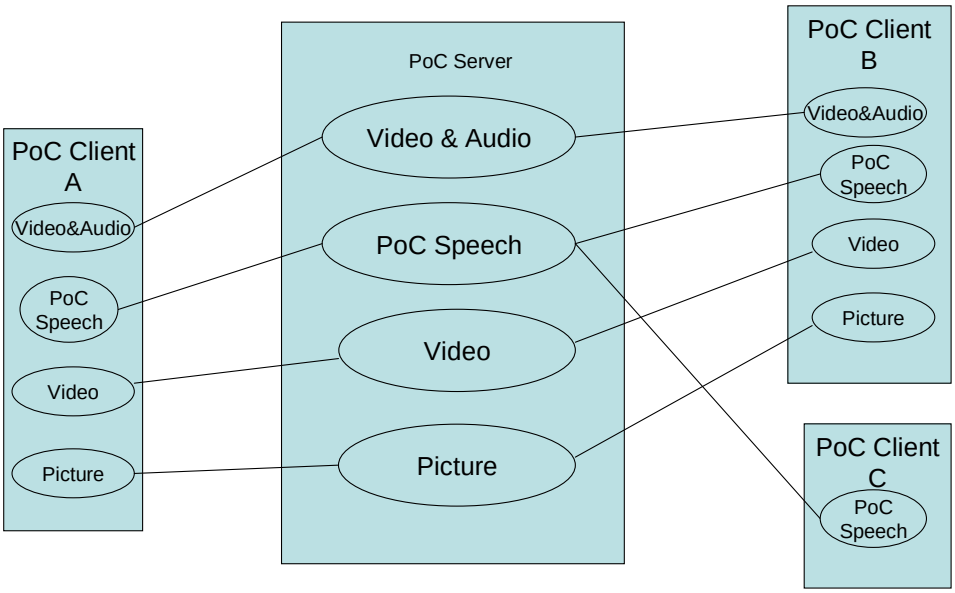

Figure 2: Media-floor Control Entities

In Figure 2 *"Media-floor Control Entities"*, there are four types of Media-floor Control Entities negotiated by PoC Server and PoC Client:

- One Media-floor Control Entity for Video & Audio; and,
- One Media-floor Control Entity for Speech; and,
- One Media-floor Control Entity for Video; and,
- One Media-floor Control Entity for Discrete Media (Optional).

The PoC Client A and the PoC Client B are connected to four Media-floor Control Entities while the PoC Client C is connected only to the Media-floor Control Entity for PoC Speech (the reason may be that PoC Client C is a Version 1 PoC Client). Video is included in two different Media Streams, each controlled by a different Media-floor Control Entity.

4.27.2 Binding between Media Types and Media-floor Control Entities

A PoC Session MAY consist of multiple Media Streams of multiple Media Types such as Audio, Video, PoC Speech and Discrete Media. For Media the use of Media-floor Control entities is described in subclause 4.27.1 "*General*".

The binding between the Media Types and the Media-floor Control Entities SHALL be negotiated between PoC Client and PoC Server at the PoC Session setup. The binding between Media Types and Media-floor Control Entities MAY be negotiated during the PoC Session with session modification procedure.

If a binding between a Media Type and a Media-floor Control Entity is offered and the Media Type is accepted, then the offered Media-floor Control Entity and the offered binding between the Media Types and the Media-floor Control Entities SHALL also be accepted. If a Discrete Media Type is offered without a binding to a Media-floor Control Entity and the Discrete Media Type is accepted, then the accepted Discrete Media Type SHALL NOT be bound to any Media-floor Control Entity.

The PoC Client and PoC Server SHALL include the Media Types and Media-floor Control Entities for the PoC Session together with the binding between Media Types and Media-floor Control Entities, if the binding exists, when sending an offer in INVITE request. When sending INVITE request to the terminating PoC Server, the originating PoC Server SHALL offer the same Media Types and Media-floor Control Entities as offered in the incoming INVITE request received from the

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originating PoC Client unless the originating PoC Server offers less Media Types than those offered in the original INVITE request according to the originating PoC User's PoC service subscription..

The PoC Client and the PoC Server SHALL include the Media Types and Media-floor Control Entities accepted for the PoC Session together with the binding between Media Types and Media-floor Control Entities, if binding exists, when sending an answer in OK response. The PoC Server SHALL send OK response to the originating PoC Client after it has received an acceptance response from one of the terminating PoC Clients in 1-1 PoC Session, Ad-hoc PoC Group Session, and Pre-arranged PoC Group Session.

When sending OK response to the originating PoC Client for a newly created PoC Session, the originating PoC Server SHALL answer either same or subset of Media Types, Media-floor Control Entities and the Media-floor Control Entity bindings, if binding exists, as those offered in the INVITE request received from the originating PoC Client.

The PoC Server SHALL include the same Media Types, Media-floor Control Entities and the Media-floor Control Entity bindings, if binding exists, as those allowed and offered in the INVITE request received from the originating PoC Client, when sending an answer in OK response in Chat PoC Group Session if the PoC Session does not yet exist.

The offer and answer SHALL be used to characterize the Media Types and Media-floor Control Entities together with their binding(s), if binding exists. In case that Media Type is bound to Media-floor Control Entity, the port number defined for Media-floor Control Entity SHALL identify the Media that any Media-floor Control message applies to.

Media-floor Control Entity MAY be bound to one or more Media Types. In case Media-floor Control Entity is bound to more than one Media Type, the Media-floor Control message sent to or received from port number defined for that Media-floor Control Entity applies to all Media Types that are bound to that Media-floor Control Entity.

The PoC Server MAY restrict the number of Media-floor Control Entities in a PoC Session based on its local policy. The PoC Server MAY restrict certain Media Type bindings for a Media-floor Control Entity that can be negotiated in a PoC Session based on the PoC Server local policy.

4.27.2.1 Ensuring a common Media Type

In order to reach a common Media Type during a PoC Group Session establishment, the PoC Speech is handled with precedence over the other Media Types.

When accepting the incoming INVITE request for a PoC Group Session, the terminating PoC Client SHOULD accept at least the offered PoC Speech.

4.28 PoC Box handling

4.28.1 General

The Inviting PoC Client;

- MAY explicitly indicate that a PoC Session is to be established with the Invited PoC User's PoC Box;
- MAY explicitly indicate that a PoC Session is to be established directly with the Invited PoC User without involvement of a PoC Box.

The PoC Client MAY publish the PoC Service Setting for the PoC Box function and the parameters for the PoC Service Setting PoC Box Use SHALL contain the PoC User’s unwillingness to route the incoming PoC Session to the PoC Box or the indication whether the incoming PoC Session is routed to the PoC Box unconditionally or conditionally as specified in subclause 4.26.7 *"PoC Box Use"*.

The conditions for routing the incoming PoC Session to a PoC Box when the PoC Box Use setting indicates conditional SHALL be:

- when the PoC Server does not receive the ringing response from the PoC Client for certain time after the PoC Server sent the invitation to the PoC Client in case of Manual Answer Mode;

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- when the PoC Server does not receive the invitation accept or reject response from the PoC Client for certain time after the PoC Server received the ringing response from the PoC Client in case of Manual Answer Mode;
- when the PoC Server does not receive the invitation accept or reject response from the PoC Client for certain time after the PoC Server sent the invitation to the PoC Client in case of Automatic Answer Mode;
- when the the PoC Client is busy participating in another PoC Session; and,
- when the Incoming PoC Session Barring setting of the Invited PoC User indicates Incoming PoC Session Barring active.

The incoming PoC Session SHALL be routed to a PoC Box when the Invited PoC User has explicitly indicated using the PoC Box Use setting set to indicate unconditional that incoming PoC Sessions are to be routed to the PoC Box.

The XDMC in the UE SHALL allow the PoC User to change its willingness to route the incoming PoC Sessions to NW PoC Box when the PoC Client is not registered with the SIP/IP Core as specified in subclause 4.18.2.3 *"PoC Box criteria access rules"*.

If the Inviting PoC Client is compliant only to the PoC version 1.0 specification, the PoC Server performing the Controlling PoC Function SHALL include in the PoC Session invitation an indication indicating that the Inviting PoC Client is compliant only to the PoC version 1.0 specification.

According to the PoC Box criteria access rule and/or the PoC Service Setting, the terminating PoC Server performing the Participating PoC Function SHALL perform the necessary routing control (e.g., forward the incoming PoC Session invitation to the PoC Box conditionally or unconditionally, not forward to the PoC Box, and etc…).

NOTE 1: A PoC Session can be established with the NW PoC Box or the UE PoC Box (see subclause 4.28.2 *"UE PoC Box handling"* and 4.28.3 *"NW PoC Box handling"*) depending on the PoC Box criteria access rule as described in 4.18.2.3 *"PoC Box criteria access rules"*.

If PoC Session invitation contains an indication indicating that the Inviting PoC Client is compliant only to the PoC version 1.0 specification and the PoC Session invitation is to be routed to a PoC Box based upon the routing control, the terminating PoC Server performing the Participating PoC Function based on the Service Provider Policy:

- SHALL remove the indication indicating that the Inviting PoC Client is compliant only to the PoC version 1.0 specification, if the regional and national regulations allow the connections to a PoC Box without an indication being provided to the Inviting PoC User, before continuing routing of the PoC Session invitation.
- SHALL route the PoC Session to the NW PoC Box, or
- SHALL reject the PoC Session.

NOTE 2: PoC Sessions initiated by Inviting PoC Client compliant only to PoC version 1.0 specification can be routed to NW PoC Box only.

When the PoC Box receives an invitation to a PoC Session, the PoC Box SHALL accept the invitation and return a PoC Box indication in responses to the invitation.

If PoC Box indication and PoC Box type indication are received in responses to an invitation to a PoC Session, a PoC Server SHALL forward the PoC Box indication and the PoC Box type indication towards the Inviting PoC Client.

The Inviting PoC Client:

- SHALL indicate to the PoC User that a PoC Session is established with an Invited PoC User's PoC Box.; and,
- MAY differentiate between a NW PoC Box or a UE PoC Box (see subclause 4.28.2 "*UE PoC Box handling*" and 4.28.3 "*NW PoC Box handling*") if information is available in responses to the PoC Session invitation request.

If the PoC User is not willing to receive an incoming PoC Session invitation, e.g. in case the maximum amount of Simultaneous PoC Sessions is achieved, the PoC Client MAY route the incoming PoC Session invitation to the NW PoC

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Box, if NW PoC Box is supported as described in subclause 4.28.3 "*NW PoC Box handling*" or to the UE PoC Box as described in subclause 4.28.2 "*UE PoC Box handling*", if UE PoC Box is supported.

If the only Participants in a PoC Session are PoC Boxes then the PoC Session SHALL be released.

If the Invited PoC Client supports the redirection of the incoming invitations to the NW PoC Box by the Invited PoC User, the address of the Invited PoC User's NW PoC Box SHALL be provisioned in the PoC Client.

4.28.2 UE PoC Box handling

When the PoC User activates the UE PoC Box functionality the UE SHALL re-register via the POC-9 reference point with the SIP/IP Core the contact for the UE PoC Box as specified in subclause 4.5.1 *"General"*. If the PoC User deactivates the PoC Box functionality the UE SHALL de-register the PoC Box contact with the SIP/IP Core.

When the UE PoC Box receives an invitation to join a PoC Session either directly via the POC-9 reference point or via the PoC Client it SHOULD accept the invitation immediately and SHALL return its contact along with the indication that this is a UE PoC Box in the OK response. The UE PoC Box SHALL indicate in its answer in the OK the Media Parameters it is capable of storing, the Talk Burst Control and Media Burst Control protocols it supports.

When the UE PoC Box receives a Media Burst it SHOULD store that Media Burst along with the PoC Address of the sending PoC User and the date and time that the Media Burst was received.

When the UE PoC Box is participating in a PoC Session it SHALL perform similar procedures for receiving Media as a PoC Client performs when receiving Media.

When a PoC Client receives an invitation to a PoC Session a PoC User MAY direct the UE PoC Box to accept the PoC Session.

NOTE: When the PoC Client is participating in another PoC Session(s) and does not support additional Simultaneous PoC Session, the PoC Client can direct the incoming PoC Session invitation to the collocated UE PoC Box.

4.28.3 NW PoC Box handling

When the NW PoC Box receives an invitation to join a PoC Session via the PoC Server in the Home PoC Network, the PoC Box SHOULD accept the invitation immediately and SHALL return in responses to the invitation a PoC Box indication, the Media Parameters it is capable of storing, the Talk Burst Control and Media Burst Control protocols it supports.

When the NW PoC Box receives a Media Burst it SHOULD store that Media Burst along with the PoC Address of the sending PoC User and the date and time that the Media Burst was received.

The retrieval of PoC Session Control Data and PoC Session Data is not specified in this version of the specification.

The NW PoC Box SHALL be able to send PoC Session Control Data when requested by the served PoC User and manage PoC Session Data according to the corresponding PoC Session Control Data. The NW PoC Box SHALL be able to send Media when the served PoC User requests the NW PoC Box to send recorded Media to the PoC User.

4.28.3.1 NW PoC Box handling PoC Session invitation from PoCv1.0 Client

NOTE: This optional functionality is only provided to ensure that the PoC Clients compliant only to PoC version 1.0 specification are able to leave a message in the NW PoC Box without violating any relevant regional or national regulations

NW PoC Box MAY support PoC Sessions initiated by Inviting PoC Client compliant only to PoC version 1.0 specification. If supported and the PoC Session invitation contains the indication indicating that the Inviting PoC Client is compliant only to the PoC version 1.0 specification and the NW PoC Box accepted the PoC Session invitation, the NW PoC Box SHALL request permission to send Media. After the NW PoC Box is granted the permission to send Media, the NW PoC Box SHALL send the Media indicating the recording (e.g. a beep). The NW PoC Box SHALL discard the received Media until the NW PoC Box finishes sending the Media indicating the recording.

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4.29 Invocation of PoC Client from Browsing

The PoC Client MAY support the browser-based PoC Client invocation functionality.

If the PoC Client supports the browser-based PoC Client invocation functionality, when the User Equipment receives a document as specified in [PoC Invocation Descriptor], through the browser, that has a MIME media type for invocation of PoC Client registered in [OMA WAE];

- the PoC Client SHALL be invoked and the PoC Invocation Descriptor SHALL be passed through to the PoC Client; and
- the PoC Client SHALL initiate a PoC Session that is specified by the PoC Invocation Descriptor.

4.30 Answer Mode

4.30.1 General

The Home PoC Server of the Invited PoC Client determines the Answer Mode that is requested of the PoC Client based on several conditions, e.g. the PoC Client's Answer Mode Indication indicated by the PoC Service Settings, the Access Rules, and any indication indicating the requested Answer Mode contained in the incoming PoC Session invitation, and if the PoC Server already has a PoC Session with the PoC Client, etc.

If the determined Answer Mode is Automatic Answer Mode, the Home PoC Server of the Invited PoC Client SHALL either forward the invitation request to the Invited PoC Client or in the case of a Pre-established Session send a connect message to Invited PoC Client, and response the invitation request at the same time.

If the determined Answer Mode is Manual Answer Mode, the Home PoC Server of the Invited PoC Client SHALL forward invitation request to the PoC Client and wait for the answer from the Invited PoC Client. The Home PoC Server SHALL request the Invited PoC Client to use the determined Answer Mode by including the determined Answer Mode in the forwarded invitation request.

PoC Server SHALL support both Manual Answer Mode and Automatic Answer Mode. PoC Client SHALL support either Manual Answer Mode or Automatic Answer Mode or both. The PoC Server MAY support manual answer override and polite calling. The PoC Client MAY support manual answer override and polite calling.

4.30.2 Answer Mode determination procedures

Answer Mode for PoC Session is based on originating PoC User's selection or terminating PoC User's settings. The cases where originating PoC User has selected the Answer Mode for PoC Session are described in subclauses 4.30.3 "*Manual answer override (MAO)*" and 4.30.4 "*Polite calling*". In those cases, the originating PoC Client has included an indication indicating the requested Answer Mode in its PoC Session invitation.

In cases where no indication indicating the requested Answer Mode is contained in an incoming PoC Session invitation, the determination for used Answer Mode SHALL be performed at terminating Participating PoC Function. The determination SHALL be based on terminating PoC User's access rules settings and the published Answer Mode Indication PoC Service Setting as described in 4.26.1 *"Answer Mode"*.

On determination of the Answer Mode for the PoC Session in the case where incoming PoC Session invitation does not contain an indication indicating the requested Answer Mode, following rules apply:

1) Firstly the access rules configured by Invited PoC User are checked. The access rules to be checked are the default access rules as specified in 4.18.2.1 *"General access rules"* and Media Type specific access rules as specified in 4.18.2.2 *"Media Type specific access* rules*"*. If any of these access rules indicates Manual Answer and no access rule indicates 'block', then Manual Answer Mode SHALL be applied.

2) If the access rules checking allow Automatic Answer, then the PoC Service Setting Answer Mode Indication published by Invited PoC Client SHALL be checked, and if Automatic Answer Mode Indication has been published by the terminating PoC User, then Automatic Answer Mode for the PoC Session SHALL be applied.

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3) if the Invited PoC User already participates in another PoC Session using the Invited PoC User's PoC Address of this PoC Session, then Manual Answer Mode SHOULD be applied.

4) if the Invited PoC User already participates in another PoC Session using any other PoC Address registered by the PoC Client of the Invited PoC User as specified in the subclause 4.47 "*Multiple registered PoC Address determination*", then Manual Answer Mode SHOULD be used otherwise Automatic Answer Mode is applied.

4.30.3 Manual answer override (MAO)

A PoC Client MAY initiate a PoC Session with a request to override the Answer Mode Indication setting of Invited PoC Client(s) if the Answer Mode Indication setting is the Manual Answer Mode.

The PoC Server in the Home PoC Network of the PoC User requesting manual answer override SHALL authorize the MAO request. If authorization is not successful the establishment of the PoC Session SHALL be rejected.

The PoC Server performing the Participating PoC Function serving the Invited PoC User SHALL authorize the MAO request when received in an invitation request. If authorization is not successful the invitation request SHALL be rejected.

4.30.4 Polite calling

A PoC Client MAY initiate a PoC Session with a request to override Answer Mode Indication setting of Invited PoC Client(s) if the Answer Mode Indication setting is the Automatic Answer Mode.

If the PoC Server receives a manual answer request in an invitation request the PoC Server performing the Participating PoC Function serving an Invited PoC User SHALL use the Manual Answer Mode procedure independent on the Answer Mode Indication setting of the PoC User's PoC Clients.

NOTE: If Manual Answer Mode is not supported by the Invited PoC Client the invitation request can be automatically rejected by the Invited PoC Client.

4.31 Advanced Revocation Alert

The PoC Client MAY support the Advanced Revocation Alert which indicates remaining Media transmit time to the PoC User. The PoC Servers SHOULD support Advanced Revocation Alert functionality.

The PoC Client SHOULD indicate an alert to the PoC User before the Media transmit time is almost ending, if it received Media Burst Control message including maximum transmit time and Alert Margin time from PoC Server performing Controlling PoC Function. The PoC Client MAY have the capability to configure the alert (e.g., sound, volume, vibration, time etc).

If Advanced Revocation Alert is supported, the PoC Server performing Controlling PoC Function SHALL include maximum transmit time information and SHOULD include Alert Margin time in the Media Burst Confirm response message based on Service Provider Policy.

If the PoC Client receives the Media Burst Control message which includes maximum transmit time information, the PoC Client knows the maximum transmit time to send Media Bursts.

The PoC Client SHALL run the timer using maximum transmit time information. The PoC Client MAY display the remaining time information to the PoC User or indicate an alert (e.g., beep, lightning, vibration, etc.) to the PoC User that remaining transfer time is almost ending.

4.32 Requests with included media content

4.32.1 General

The PoC Client MAY include an amount of media in invitations to PoC Sessions or in Group Advertisement messages.

The media content MAY be included, subject to PoC Service Provider policies, as:

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- Referenced Media Content;
- Text Content; or,
- Included Media Content.

A PoC Client MAY indicate whether reception of media content included in an incoming PoC request is currently allowed in the PoC Service Setting published to the Home PoC Server of the served PoC User as described in the subclause 4.26.6 *"Support for Media Content included in a* request*"*.

The types of media allowed to be included in the request MAY be limited by Service Provider Policy.

4.32.2 Referenced Media Content

The PoC Client MAY insert a reference to any media stored in the network in invitations to PoC Sessions or in Group Advertisement messages.

The PoC Client and the PoC Server MAY support referenced Media Content in the invitations when initiating a PoC Session or in Group Advertisement messages.

If the PoC Client and the PoC Server support referenced Media Content the PoC Client MAY include a reference to media in invitations to PoC Sessions and in Group Advertisement messages.

NOTE 1: Examples of types of media can be found in [RFC2046].

If the PoC Server performing the Controlling PoC Function supports Referenced Media Content and a request with Referenced Media Content is received, the PoC Server MAY remove the Referenced Media Content according to a local policy in the PoC Server.

If the Home PoC Server serving the PoC User receiving the request supports referenced Media Content include in a request, the Home PoC Server (performing the Participating PoC Function) SHALL keep or remove the Referenced Media Content in PoC Session invitation(s) and in Group Advertisement request(s) according to the PoC Service Settings set by the Served PoC Client and according to local policy in the PoC Server.

If the PoC Client includes a reference to media in the invitation to a PoC Session the PoC Client SHALL also include an indication of the intent of the referenced media and the type of media of the referenced media.

NOTE 2: The intent of the referenced media could be to replace the local ring tone generated by a PoC Client on receipt of the invitation in Manual Answer Mode or to provide media (e.g. an image) in parallel to the local tones generated by the PoC Client.

If the Invited PoC Client supports referenced Media Content included in a request and the reception of referenced Media Content included in a request is allowed according to the PoC User's PoC Service Setting then when the PoC Client receives a PoC Session invitation with referenced Media Content included and the referenced and the Media Type is supported, the PoC Client:

1. SHOULD, if the intent of the referenced media is to replace local generated tones in case of Manual Answer Mode and the PoC Client allows replacement (e.g. configurable by the PoC User) of local generated tones:

   a. fetch the media using the received reference; and,

   b. render the media to the PoC User instead of local generated tones.

   NOTE 3: The PoC Client can stop fetching the media and display/play local generated tones e.g. if the PoC Client determines that the referenced media is too large.

   or,

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2. SHOULD, if the intent of the referenced media is other than to replace local generated tones in case of Manual Answer Mode or if the PoC Client does not allow replacement of local generated tones (e.g. configurable by the PoC User) or in case of Automatic Answer Mode:

    a. Perform the action that the PoC Client normally would do e.g. generate local tones in case of Manual Answer Mode or accept the invitation in case of Automatic Answer Mode;

    b. Fetch the media using the received reference; and,

    c. When media is received render the media to the PoC User.

If the PoC Client supports referenced Media Content included in a request and the reception of referenced Media Content included in a request is allowed according to the PoC User's PoC Service Setting then when the PoC Client receives a Group Advertisement request with referenced media included then if the referenced Media Type is supported the PoC Client SHOULD:

a. Fetch the media using the received reference; and,

b. When media is received render the media to the PoC User.

4.32.3 Text Content

The Inviting PoC Client MAY include text in invitation to PoC Sessions or in Group Advertisement messages. The information can be useful for the Invited PoC User, in the case of an invitation to a PoC Session as basis for the decision whether to accept the invitation or not, or in case of a Group Advertisement whether to join a PoC Group Session or not.

The PoC Client and PoC Server MAY support Text Content included in a PoC Session invitation or in a Group Advertisement request.

If the Home PoC Server supports Text Content included in a request the allowed maximum size of the text allowed SHALL be provisioned in the PoC Client and in the PoC Server. The allowed maximum size of text SHALL be an operator configurable parameter.

NOTE: The configuration of the PoC Server is out of scope of this specification.

If the Home PoC Server serving the PoC User receiving the request supports Text Content included in a request, the Home PoC Server (performing the Participating PoC Function):

- SHALL forward the included Text Content in the request to the PoC Client, if the size of media content is below the allowed maximum size of the Text Content and if the Text Content included in a request is supported in the PoC Service Settings; or,

- SHALL discard the Text Content, if the size of the media content exceeds the allowed maximum size of the Text Content or if the reception of Text Content included in a request is not allowed according to the PoC User's PoC Service Setting.

If the PoC Server performing the Controlling PoC Function supports Text Content included in a request, the PoC Server MAY remove the text content in PoC Session invitation(s) and in Group Advertisement request(s) according to local policy in the PoC Server.

If the Invited PoC Client supports Text Content included in a request, and the reception of Text Content included in a request is allowed, according to the PoC User's PoC Service Setting, and if the PoC Client receives a PoC Session invitation with Text Content included then the PoC Client:

1. SHOULD, in case of Manual Answer Mode, render the text to the PoC User along with normal behaviour (e.g. generating local ring signals).

2. SHOULD, in case of Automatic Answer Mode

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a. accept the invitation; and,

b. render the text to the PoC User.

If the PoC Client supports Text Content included in a request, and the reception of Text Content included in a request is allowed according to the PoC User's PoC Service Setting, then when the PoC Client receives a Group Advertisement request with Text Content included the PoC Client SHOULD render the text to the PoC User.

4.32.4 Included Media Content

The Inviting PoC Client MAY include Media Content in a PoC Session invitation or in a Group Advertisement request

The PoC Client and the PoC Server MAY support Media Content included in a PoC Session invitation or in a Group Advertisement request.

If the Home PoC Server supports Media Content included in a request the allowed maximum total size of all the media content SHALL be provisioned in the PoC Client. The allowed maximum total size of all the media content to be included in requests SHALL be an operator configurable value.

If the PoC Server performing the Controlling PoC Function supports Media Content included in a request and a request is received with media content the PoC Server:

- SHALL forward the media content towards all PoC Users invited to the PoC Session or receiving the Group Advertisement, if authorization is successful and the size of the media content is below the allowed maximum total size of all the media content; or,
- SHALL either discard non-authorized media content or reject the request, based on a Service Provider Policy, if authorization is not successful.
- SHALL either discard all media content or reject the request, based on a Service Provider Policy, if the media content exceeds the allowed maximum total size of all the media content.

NOTE: Media content identification and authorization is according to local policy (e.g. only allow media content in requests for 1-1 PoC Sessions).

If the Home PoC Server serving the PoC User receiving the request supports Media Content included in a request, then if a request with media content is received by the Home PoC Server (performing the Participating PoC Function), the PoC Server:

- SHALL forward the media in the request to the PoC Client, if authorization is successful and the size of media content is below the allowed maximum total size of all the media content and if the reception of Media Content included in a request is allowed according to the PoC User's PoC Service Setting; or,
- SHALL either discard the non-authorized media content or reject the request based on Service Provider Policy, if authorization is not successful or if the media content exceeds the allowed maximum total size of all the media content.
- SHALL discard the media content if the reception of Media Content included in a request is not allowed according to the PoC User's PoC Service Setting.

If the Invited PoC Client supports Media Content included in a request (e.g. configurable by the PoC User) and the Media Type is supported, the PoC Client:

1. SHOULD, in case of Manual Answer Mode, render the media to the PoC User. The Included Media Content MAY replace normal behavior (e.g. generating local ring signals).
2. SHOULD, in case of Automatic Answer Mode

   a. accept the invitation; and,

   b. render the media to the PoC User.

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If the PoC Client supports Media Content included in a request, and the reception of Media Content included in a request is allowed according to the PoC User's PoC Service Setting, then when the PoC Client receives a Group Advertisement request with Media Content included then the PoC Client SHOULD render the media to the PoC User, if the Media Type is supported.

4.33 Invited Parties Identity Information

The PoC Server SHALL support the invited parties identity information functionality based on Service Provider Policy and configuration. A PoC Client MAY support invited parties identity information functionality.

NOTE: It is recommended that the Service Provider Policy enables this functionality except in the case where this functionality is prohibited by local regulations.

The PoC Client MAY set ID Notification Indications for each PoC Address of all the Invited PoC Users in the invitation when it establishes an Ad-hoc PoC Group Session or 1-1 PoC Session.

When a PoC Server performing the Controlling PoC Function receives a request to initiate an Ad-hoc PoC Group Session or 1-1 PoC Session with ID Notification Indications:

- the PoC Server performing the Controlling PoC Function MAY, according to the settings of the Service Provider Policy, modify the ID Notification Indications in the received invitation; and
- the PoC Server performing the Controlling PoC Function SHALL include PoC Addresses of all Invited PoC Users to all terminating PoC Servers performing the Participating PoC Function with the ID Notification Indications of each PoC Address of all the Invited PoC Users.

When a terminating PoC Server performing the Participating PoC Function receives an invitation for an Ad-hoc PoC Group or 1-1 PoC Session Session with the ID Notification Indications of each PoC Address of all the Invited PoC Users:

- the terminating PoC Server performing the Participating PoC Function MAY, according to the settings of the Service Provider Policy, modify the ID Notification Indications in the received invitation, and
- the terminating PoC Server performing the Participating PoC Function SHALL send the invitation to Invited PoC Client(s) with the ID Notification Indications of each PoC Address of all the Invited PoC Users except in the case that the Invited PoC User has configured the PoC Service setting to indicate the Invited Parties Identity Information Mode is not active. In that case the terminating PoC Server performing the Participating PoC Function SHALL NOT include the invited party identity information in the invitation request.

When a PoC Server performing the Controlling PoC Function and/or the Participating PoC Function receives request to initiate an Ad-hoc PoC Group Session or 1-1 PoC Session with no ID Notification Indication, the PoC Server performing the Controlling PoC Function and/or the Participating PoC Function SHALL set the ID Notification Indications based on the settings of the PoC Service Provider, where the default setting SHOULD make the ID Notification Indication of the PoC Address of the Invited PoC User be "HIDDEN".

In case one or more of the Invited PoC Addresses have been indicated as "HIDDEN" in ID Notification Indication(s):

- A PoC Server performing the Controlling PoC Function SHALL inform all terminating PoC Server(s) performing the Participating PoC Function of the all PoC Addresses with ID Notification Indications.
- A terminating PoC Server performing the Participating PoC Function SHALL indicate, in the invitation to the Invited PoC User, the total number of the Invited PoC Users whose PoC Addresses are indicated as "HIDDEN" in the ID Notification Indications and SHALL remove the PoC User Addresses of any PoC User indicated as "HIDDEN" in the ID Notification Indications in the invitation to the Invited PoC Client.

When a terminating PoC Server performing the Participating PoC Function remove identity information from an invitation according to the PoC service provider's settings, the terminating PoC Server performing the Participating PoC Function MAY indicate, in the invitation to the Invited PoC User, the total number of the Invited PoC Users.

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The Invited PoC Client MAY support displaying the list of invited parties identity information and the total number of ID Notification Indications set to "HIDDEN" on the User Equipment.

If the invited party identity information is supported, a PoC Client SHALL be able to publish its Invited Parties Identity Information Mode setting for its Home PoC Server. The Home PoC Server handles the identity information according to the setting, when the Home PoC Server receives the invitation request containing the invited parties identity information.

4.34 Full Duplex Call Follow-on Proceed

4.34.1 General

The PoC Server MAY support Full Duplex Call Follow-on Proceed. The PoC Client MAY support Full Duplex Call Follow-on Proceed. If supported the following applies.

The Full Duplex Call Follow-on Proceed allows a Participant to send an indication to the other Participants to initiate/join another independent full duplex voice call (either a circuit switched voice call or voice-over-IP call, subject to Service Provider Policy and configuration).

NOTE 1: The full duplex voice call initiation is out of the scope of this specification. The full duplex voice call is to be initiated by full duplex voice client (circuit switched client or voice-over-IP client), which is collocated in the UE with PoC Client.

NOTE 2: After the originating PoC Client sends the Full Duplex Call Follow-on Proceed distribution indication, the full duplex voice client collocated with the originating PoC Client initiates the full duplex voice call.

A PoC Client sends to the PoC Server performing the Controlling PoC Function a Full Duplex Call Follow-on Proceed distribution indication containing one or more addresses to be used by the other Participants to initiate the full duplex voice call.

NOTE 3: Multiple addresses can be provided, only if they identify the same full duplex voice call

NOTE 4: Each address can be a TEL URI (E.164) or a SIP URI

The PoC Server performing the Controlling PoC Function upon reception of a Full Duplex Call Follow-on Proceed distribution indication sends to the other Participants a Full Duplex Call Follow-on Proceed distribution indication containing the same information as the received Full Duplex Call Follow-on Proceed distribution indication.

NOTE 5: If the terminating PoC User acknowledges the Full Duplex Call Follow-on Proceed distribution indication, the full duplex voice client collocated with the terminating PoC Client initiates the full duplex voice call to the provided address (if multiple addresses are provided, selection is based on local settings and subject to Service Provider Policy and configuration).

The PoC Client, when the full duplex voice client collocated with the PoC Client successfully establishes the full duplex voice call:

- SHOULD release the PoC Session, or
- SHOULD remove PoC Speech from the PoC Session, if the PoC Session included Media Types additional to the PoC Speech.

NOTE 6: The timing of the PoC Session release and the PoC Session modification is not specified in detail.

NOTE 7: Any type of PoC Session is converted to dial-in full duplex voice conference.

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4.34.2 Full Duplex Call Follow-on Proceed support negotiation

A PoC Client and a PoC Server MAY support the Full Duplex Call Follow-on Proceed. If supported the following applies.

The PoC Client SHALL indicate the Full Duplex Call Follow-on Proceed support at the PoC Session establishment.

The PoC Server performing the Controlling PoC Function SHALL include the PoC Client's Full Duplex Call Follow On support indication into Participant Information.

When Pre-established Session is used, the PoC Server performing the Participating PoC Function SHALL indicate at PoC Session establishment towards the PoC Server performing the Controlling PoC Function the PoC Client's Full Duplex Call Follow On support negotiated at the Pre-established Session establishment.

When On-demand Session is used, the PoC Server performing the Participating PoC Function SHALL relay the PoC Client's Full Duplex Call Follow On support indication towards the PoC Server performing the Controlling PoC Function.

4.35 Retrieving members of Pre-arranged PoC Groups

The PoC Server MAY retrieve members in other Pre-arranged PoC Groups by inviting a Pre-arranged PoC Group to a PoC Session e.g. when the Pre-arranged PoC Group is hosted in other domain.

The Pre-arranged PoC Group(s) hosted by the PoC Server(s) MAY reside on separate Shared Group XDM Servers, each possibly owned by a different PoC Service Provider or otherwise in another administrative domain.

NOTE 1: An External P2T Network considered as another administrative domain can also host a Pre-arranged PoC Group to be retrieved by a PoC Server for the establishment of a PoC Session.

When a PoC Server hosting a Pre-arranged PoC Group receives an invitation from another PoC Server indicating willingness to perform the Controlling PoC Function, the PoC Server hosting the Pre-arranged PoC Group SHALL authorize the request using the PoC Address of the initiator of the invitation. The authorization MAY be based on the policy for Pre-arranged PoC Groups and inter-domain agreements.

If authorization is successful the PoC Server hosting the Pre-arranged PoC Group SHALL return a list of PoC Group members of the Pre-arranged PoC Groups.

Members of the Pre-arranged PoC Group SHALL be returned only if the PoC Server indicating willingness to perform the Controlling PoC Function and the PoC Server hosting a Pre-arranged Group are PoC Version 2.0 (or later) Servers.

NOTE 2: If authorization fails or the PoC Server indicating willingness to perform the Controlling PoC Function is a Version 1.0 PoC Server the PoC Server hosting the Pre-arranged PoC Group will return a reject response with an appropriate reason.

4.36 Ad-hoc PoC Group Sessions with Multiple PoC Groups

The PoC Client MAY include one or more PoC Group Identities identifying Pre-arranged PoC Groups in the list of Invited PoC Users when initiating an Ad-hoc PoC Group Session.

If the PoC Server performing the Controlling PoC Function receives one or more PoC Group Identities in the list of Invited PoC Users in a Ad-hoc PoC Group Session request the PoC Server MAY invite members in the Pre-arranged PoC Group based on the policy for Ad-hoc PoC Groups and inter-domain agreements. The members of the Pre-arranged PoC Group SHALL be retrieved as specified in subclause 4.35 *"Retrieving members of Pre-arranged PoC Groups"*.

NOTE: If the PoC Server performing Controlling PoC Function hosts the Pre-arranged-PoC Group included in the list of the Invited PoC Users, the PoC Server can retrieve the URIs of the PoC Group members and invite them directly.

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If the URI list returned from the PoC Server hosting a Pre-arranged PoC Group includes an URI that identifies another Pre-arranged PoC Group the members in that Pre-arranged PoC Group MAY be retrieved as specified in subclause 4.35 "*Retrieving members of Pre-arranged PoC Groups*" depending on the policy of the PoC Server performing the Controlling PoC Function receiving the initial request for the Ad-hoc PoC Group Session.

When the Ad-hoc PoC Group Session is established the policy for Ad-hoc PoC Group (e.g. release policy, maximum number of Participants, etc.) SHALL apply. The PoC Server performing the Controlling PoC Function SHALL only once invite a PoC User if the same PoC User is a member in more than one Pre-arranged PoC Group or if the PoC User is already in the list of Invited PoC Users.

In case the PoC User that is a member of the Pre-arranged PoC Group tries to initiate a Pre-arranged PoC Group Session, when the Ad-hoc PoC Group Session involving that Pre-arranged PoC Group Identity is already ongoing (e.g., the PoC Client did not receive an invitation by the Ad hoc PoC Group Session due to being out of radio range or not being powered on), the PoC Server hosting the Pre-arranged PoC Group SHALL initiate a new Pre-arranged PoC Group Session separately

4.37 Media Burst Control Schemes

Media Burst Control Scheme is a way of using Media Burst Control according to predefined rules and procedures. The PoC Server performing the Controlling PoC Function MAY support Media Burst Control Schemes.

NOTE 1: One example of a Media Burst Control Schema can be that if queuing is supported, the PoC Server can apply a Media Burst Control Scheme that one queue is assigned for all the associated Media-floor Control Entities.

NOTE 2: PoC Server can use for 1-1 PoC Session and Ad hoc PoC Group Session a Media Burst Control Scheme according to the Service Provider Policy. Media Burst Control Schemes are out of scope of PoC specifications.

The PoC Client MAY support Media Burst Control Schemes. The originating PoC Client MAY initiate a PoC Session by providing an indication of the Media Burst Control Scheme to be used in the PoC Session invitation request.

If the PoC Server performing the Controlling PoC Function supports Media Burst Control Schemes, the followings apply:

- On receiving a Pre-arranged or Chat PoC Group Session set-up request with the indicated Media Burst Control Scheme, the PoC Server performing the Controlling PoC Function SHALL seek the allowed Media Burst Control Schemes in PoC Group information and apply Media Burst Control Scheme defined for the Pre-arranged or Chat PoC Group if included in the PoC Group information. If not included or not indicated in PoC Session set-up request, the PoC Server performing the Controlling PoC Function MAY choose a Media Burst Control Scheme according to the local policy.
- On receiving an Ad-hoc PoC Group Session and 1-1 PoC Session set-up request, the PoC Server performing the Controlling PoC Function SHALL apply the Media Burst Control Scheme indicated in the PoC Session set-up request. If not included, the PoC Server performing the Controlling PoC Function MAY choose any Media Burst Control Scheme according to the local policy.

NOTE 3: Typically the standardised Media Burst Control procedure is used if no special Media Burst Control Scheme is requested.

- The PoC Server performing the Controlling PoC Function MAY indicate to the PoC Client the Media Burst Control Scheme used in the PoC Session in the INVITE request or the OK response.
- The PoC Client MAY indicate to the PoC User which Media Burst Control Scheme is used in the PoC Session when the PoC Session is established.

4.38 PoC Dispatcher

4.38.1 General

The PoC Client and the PoC Server MAY support the PoC Dispatcher functionality.

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4.38.2 Creating a Dispatch PoC Group and Assigning the PoC Dispatcher role

An authorized PoC User MAY create a Dispatch PoC Group and store it in the Shared Group XDMS for use in Dispatch PoC Sessions. A Dispatch PoC Group SHALL be a Pre-arranged PoC Group.

If a Pre-arranged PoC Group is a Dispatch PoC Group, each member of the Pre-arranged PoC Group SHALL be identified as allowed or not allowed to act as PoC Dispatcher. Members not allowed to act as PoC Dispatcher always act as PoC Fleet Members, while members allowed to act as PoC Dispatcher MAY also act as PoC Fleet Members. At least one member SHALL be identified as being PoC Dispatcher capable. Only one single PoC User SHALL be active in the role of PoC Dispatcher at any one time, but more than one PoC User MAY be configured as capable of acting in the role of PoC Dispatcher.

The Dispatch PoC Group owner MAY use authorization rules to control permissions to perform some special actions by the active PoC Dispatcher. As described in subclause 4.18.3 *"PoC Group authorization rules"*, the Dispatch PoC Group authorization rules SHALL consider the following actions:

- Allow/block a PoC User adopting the PoC Dispatcher role.
- Allow/block the active PoC Dispatcher transferring the PoC Dispatcher role.

4.38.3 Dispatch PoC Sessions

A PoC Dispatcher capable PoC Client SHALL support the initiation of a Dispatch PoC Session by sending an invitation to the Dispatch PoC Group that explicitly indicates the PoC Dispatcher role. Upon reception of the invitation, the PoC Server SHALL validate that the inviting PoC User is identified as a PoC Dispatcher capable PoC User for the Dispatch PoC Group. If the validation fails, the invitation SHALL be rejected. If the validation is correct, the establishment procedure SHALL be according to the following:

- Inviting the whole Dispatch PoC Group: if the invitation does not include a list of PoC Users, then all the PoC Fleet Members of the Dispatch PoC Group SHALL be invited to the Dispatch PoC Session by the PoC Server performing the Controlling PoC Function. Other member(s) of the Dispatch PoC Group identified as being PoC Dispatcher capable MAY be invited as PoC Fleet Member(s) to the Dispatch PoC Session.
- Inviting a sub-set of the Dispatch PoC Group: if the invitation includes a list of one or more individual PoC Users, the PoC Server performing the Controlling PoC Function SHALL validate that the included PoC Users are members of the Dispatch PoC Group. If the validation is correct, the PoC Server performing the Controlling PoC Function SHALL only invite, as PoC Fleet Members, the PoC Users explicitly included in the invitation. The policies associated to the Dispatch PoC Groups SHALL be applicable to this Dispatch PoC Session.
- If the invitation for the whole Dispatch PoC Group is sent when there is an already established Dispatch PoC Session with the whole Dispatch PoC Group, the PoC Server performing the Controlling PoC Function SHAL reject the Dispatch PoC Session establishment, indicating the reason for rejection.
- If the invitation for a sub-set of the Dispatch PoC Group is sent when there is an already established Dispatch PoC Session with the whole Dispatch PoC Group or a sub-set of it, then:
    - If the inviting PoC User is the PoC Dispatcher for the other Dispatch PoC Sessions, the PoC Server performing the Controlling PoC Function SHALL establish a separate parallel Dispatch PoC Session, associated with a unique PoC Session Identity, with the sub-group indicated in the invitation.
    - If the inviting PoC User is not the PoC Dispatcher for the other Dispatch PoC Sessions, the PoC Server performing the Controlling PoC Function SHALL reject the establishment.
- When inviting a PoC Client as PoC Dispatcher, the PoC Server performing the Controlling PoC Function SHALL explicitly indicate the PoC Dispatcher role in the (re-)invitation for the Dispatch PoC Session sent to that PoC Client.
- The PoC Server performing the Controlling PoC Function SHALL include a Dispatch PoC Session indication in the (re-)invitation for the Dispatch PoC Session and in the confirmation of the Dispatch PoC Session (re-)establishment.

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NOTE: The Dispatch PoC Session indication can be used to confirm that the contacted PoC Group is actually a Dispatch PoC Group.

A PoC Dispatcher capable PoC Client SHALL support Simultaneous PoC Sessions. A PoC Dispatcher MAY establish simultaneous Dispatch PoC Sessions with different Dispatch PoC Groups.

The PoC Dispatcher SHALL have the capability to use the manual answer override when establishing the Dispatch PoC Session.

The PoC Server performing the Controlling PoC Function MAY resend an invitation to a Dispatch PoC Session to those PoC Fleet Members(s) who did not respond to the original invitation (e.g., due to being out of access network coverage).

If authorized according to the Dispatch PoC Group policy, the PoC Dispatcher SHALL have the capability to expel any PoC Fleet Member from a Dispatch PoC Session (including all PoC Fleet Members at once).

A PoC Fleet Member for a Dispatch PoC Group MAY send an invitation to the identity of the Dispatch PoC Group. In this case:

- If there is no Dispatch PoC Session established for the whole Dispatch PoC Group:
  - The PoC Server hosting the Dispatch PoC Group SHALL select one of the PoC Dispatcher capable PoC Users for the Dispatch PoC Group and SHALL invite only that selected PoC User to a 1-1 PoC Session with the inviting PoC Fleet Member.
  - The PoC Dispatcher selection decision SHALL be based on local policy (e.g. load balancing, etc). Moreover, the selection decision MAY be based on the status of the PoC Dispatcher as reported by the Presence Server.
- If there is a Dispatch PoC Session already established for the whole Dispatch PoC Group, the PoC Fleet Member SHALL join the Dispatch PoC Session already established with the whole Dispatch PoC Group.

A PoC Dispatcher capable PoC Client MAY send an invitation for a Dispatch PoC Group that requests the PoC Fleet Member role. When the PoC Server performing the Controlling PoC Function receives an invitation from a PoC Dispatcher capable PoC User that requests the PoC Fleet Member role, the Controlling PoC Function SHALL follow the same procedures as those followed for PoC Fleet Members.

Following the procedures considered in subclause 4.10 *"Handling of Simultaneous PoC Sessions"*, a PoC Client acting as a PoC Fleet Member MAY automatically set the priority of a new incoming Dispatch PoC Session to be the Primary PoC Session in case Simultaneous PoC Sessions are used.

If the PoC Dispatcher leaves the Dispatch PoC Session without first successfully transferring the PoC Dispatcher role to another Participant, the PoC Server performing the Controlling PoC Function SHALL release the Dispatch PoC Session.

4.38.3.1 Transfer of the PoC Dispatcher role

During an already established Dispatch PoC Session and when requested by the PoC User active in the role of PoC Dispatcher, the PoC Client SHALL request the transfer of the PoC Dispatcher role to another PoC User selected by the PoC User active in the role of PoC Dispatcher. Alternatively, the PoC Client MAY indicate a special SIP URI identifying all the PoC Dispatcher capable PoC Users of the Dispatch PoC Group as possible targets for the transfer request:

- When the Controlling PoC Function receives a request to transfer the PoC Dispatcher role, it SHALL first check if the PoC Dispatcher is allowed to transfer the PoC Dispatcher role according to the Dispatch PoC Group policy. If the validation fails, the Controlling PoC Function SHALL reject the request. Otherwise, the Controlling PoC Function SHALL proceed as follows.
- If the Controlling PoC Function receives a request to transfer the PoC Dispatcher role to another PoC User, it SHALL invite the indicated PoC User to join the PoC Session as PoC Dispatcher if, and only if, the PoC User is identified as being PoC Dispatcher capable for the Dispatch PoC Group associated with the Dispatch PoC Session. Otherwise, the request to transfer the PoC Dispatcher role SHALL be rejected.

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- If the Controlling PoC Function receives a request to transfer the PoC Dispatcher role to a special target URI identifying all the PoC Dispatcher capable PoC Users of the Dispatch PoC Group, the Controlling PoC Function SHALL select one of the PoC Users identified as being PoC Dispatcher capable for the Dispatch PoC Group and SHALL invite this selected PoC User to join the PoC Session as PoC Dispatcher. The target PoC User selection decision SHALL be based on local policy (e.g. load balancing, etc). If no PoC User can be selected by the Controlling PoC Function, the transfer request SHALL be rejected.

- When a PoC Dispatcher capable PoC Client receives an invitation to join an already established Dispatch PoC Session as PoC Dispatcher, it SHALL ask the PoC User for confirmation:
  - If that PoC User accepts, the PoC Client SHALL answer with an indication of this acceptance and the Controlling PoC Function SHALL include that PoC Client as the PoC Dispatcher for the PoC Session. The Controlling PoC Function SHALL indicate the previous PoC Client taking the role of PoC Dispatcher that the PoC Dispatcher role has been transferred to the PoC User who is the new PoC Dispatcher. The previous PoC Client who had the role of PoC Dispatcher remains in the Dispatch PoC Session as PoC Fleet Member.

NOTE: Following appropriate PoC Session control procedures, the previous PoC Client who had the role of PoC Dispatcher is always able to leave the Dispatch PoC Session after successfully transferring the role to another Participant.

  - If that PoC User does not accept, the PoC Client SHALL answer with an indication of the rejection, and the Controlling PoC Function SHALL NOT include that PoC Client in the Dispatch PoC Session as PoC Dispatcher. The previous PoC Client who had the role of PoC Dispatcher SHALL remain as the PoC Dispatcher of the Dispatch PoC Session.

Based on local configuration policy, the PoC Server performing the Controlling PoC Function SHALL notify the transfer of the Dispatcher role to another PoC Dispatcher capable PoC User as part of the Participant information.

A PoC Fleet Member capable PoC Client SHALL have the capability to subscribe to the Participant information in order to receive notifications that convey Participant roles in the Dispatch PoC Session.

4.38.4 Media Burst Control for Dispatch PoC Sessions

If requested during PoC Session (re-)establishment, the PoC Dispatcher SHALL have pre-emptive Media Burst priority over the PoC Fleet Members in an ongoing Dispatch PoC Session.

4.39 PoC Interworking Service

The PoC Server MAY support the PoC Interworking Service. The PoC Client MAY support the PoC Interworking Service.

4.39.1 General

If the PoC Interworking Service is supported, the PoC Server SHALL be able to support P2T Users and Remote PoC Users from one or more external networks simultaneously on the same PoC Session.

NOTE 1: If the PoC Interworking Service is supported with P2T Users or PoC Remote Access Users, the PoC Server has a trusted relationship with the PoC Interworking Function connecting the PoC Network to the External P2T Network or remote access networks, regardless of the network domain. Different domains are assumed to be under the control of different operators.

If the PoC Interworking Service is supported, the PoC Server SHALL support PoC Interworking Service charging. PoC charging principles as described in subclause 8.15 *"Charging"* SHALL apply to the PoC Interworking Service.

NOTE 2: The PoC Interworking Agent and the PoC Interworking Function acts as an IP protocol translator and an application level gateway if the External P2T Network or the remote access network and the PoC Network have different IP address space or different IP version.

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4.39.2 PoC Interworking with External P2T Systems

The PoC Server MAY support the PoC Interworking with External P2T Systems. If the PoC Interworking Service is supported the PoC Server interacts with the PoC Interworking Function as specified by the POC-4 interface.

If the PoC Interworking Service is supported, the PoC Server SHALL support P2T Users from multiple external P2T Networks to simultaneously participate in a given PoC Session.

NOTE 1: The external P2T system is assumed to manage its own subscribers, users, and services, and is outside the scope of OMA PoC Specifications.

If the PoC Interworking Service is supported, the PoC Server SHALL

- recognize the involvement of P2T Users from External P2T Networks and PoC Remote Access Users (e.g. for generation of interworking specific charging events) based on a received interworking indication.

NOTE 2: Within the PoC Network, the P2T Address of the P2T Users points to the PoC Interworking Function which acts as a PoC Interworking Agent on behalf of the P2T User in the External P2T Network

The PoC Server SHALL handle PoC Session invitations, Instant Personal Alerts or Group Advertisements from a P2T User transparently to the other PoC Users involved in the communication.

The following bullet lists identify the intended scope of the PoC Interworking Service specification.

If the PoC Interworking Service is supported, the PoC Server together with the PoC Interworking Function enables a PoC User or a P2T User to:

- invite, join, or be invited to PoC Sessions of the following communication modes: 1-to-1 PoC Sessions, PoC Group Sessions for Ad-hoc PoC Groups, Pre-arranged PoC Groups, Chat PoC Groups, and 1-many-1 PoC Sessions.
- send or receive an Instant Personal Alert.
- send or receive an Group Advertisement.
- receive and forward Participant Information for the PoC Session.

If the PoC Interworking Service is supported, the PoC Server supports the following PoC functions following the same procedures as those involving the PoC Clients:

- negotiation with the PoC Interworking Agent of either the Talk Burst Control Protocol or the Media Burst Control Protocol or both,
- negotiation with the PoC Interworking Agent of codec and Media Parameters for each Media Types used within the PoC Session,
- negotiation with the PoC Interworking Agent of ongoing session modification,
- negotiation with the PoC Interworking Agent of either the Talk Burst Control Protocol options or the Media Burst Control Protocol options or both,,
- negotiation with the PoC Interworking Agent of ongoing session User Plane adaptation.

NOTE 3: The functionalities and communication modes supported by the PoC Interworking Service assume that similar functionalities and communication modes are supported in the External P2T Network; if a given mode or feature is not supported in an External P2T Network, then the PoC Interworking Function, responsible for mapping PoC functionality to equivalent P2T functions, allows for compliant PoC service actions and events from the perspective of PoC Session participants by emulating the unsupported PoC functionality in an appropriate way.

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If the PoC Interworking Service is supported, the PoC Server together with the PoC Interworking Function can support following PoC functions as requested by the P2T Users:

- Manual Answer Override, Polite Calling.

If the PoC Interworking Service is supported, the PoC Server or the PoC Interworking Function can arrange that a single media flow be associated with multiple users in an External P2T Network, i.e., it is not necessary to send multiple copies of a given media flow to an PoC Interworking Function in support of multiple P2T Users in the External P2T Network, and, vice verse for the PoC Interworking Function to the PoC Network as specified in subclause 4.43 *"PoC Media Traffic Optimisation"*.

If PoC Interworking Service is supported, the PoC Server together with the PoC Interworking Function can support the transfer of Participant Information to P2T Users or PoC Users, upon request.

4.39.3 Remote Access to PoC Service

PoC Clients MAY support PoC Remote Access. PoC Servers MAY support PoC Remote Access.

If PoC Remote Access is supported, the PoC Interworking Agent SHALL:

- register as a PoC Client for PoC Service
- publish PoC Service Settings
- negotiate with the PoC Server based on the host User Equipment capabilities during the PoC Session establishment:
  - either Talk Burst Control Protocol or Media Burst Control Protocol or both
  - either Talk Burst Control Protocol options or Media Burst Control Protocol options or both
  - codec and Media Parameters
  - User Plane adaptation
- limit PoC Service requests to those supported by the PoC Interworking Service

NOTE 1: Within the PoC Network, the PoC Address of a PoC User registered for PoC Remote Access will point to the PoC Interworking Agent. or the Remote PoC Client.

NOTE 2: Routing of messages between the PoC Network with SIP/IP Core corresponding to 3GPP/3GPP2 IMS and the Remote PoC Client in network with SIP/IP Core not corresponding to 3GPP/3GPP2 IMS is out of scope of this specification.

The PoC Server SHALL handle a PoC Session invitation, an Instant Personal Alert or a Group Advertisement from a PoC Remote Access User transparently to the other PoC Users involved in the communication (e.g. Sender Identification)

4.40 Operator Specified Warning Message

The operator specified warning message is a string of free texts that is sent from the PoC Server to the PoC Client in order to present miscellaneous information from the PoC Service Provider to the PoC User. If the PoC Service Provider wants to notify arbitrary warning information other than the texts which are statically implemented on the PoC Client and the PoC Server, the PoC Service Provider may utilise this functionality.

Based on the local policy determined by the PoC Service Provider, various languages may be used in the operator specified warning message.

- A PoC Server MAY support the operator specified warning message.

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- A PoC Client SHOULD display the operator specified warning message if it is sent from the PoC Server and if the language of the message is supported.

NOTE: UEs which have limited capability for displaying such a message may not be able to support multiple languages.

- A PoC Server MAY support its own set of languages.
- The PoC Client MAY support its own set of languages.
- A PoC Client MAY request to the PoC Server the language that it can accept in a request message.
- If the operator specified warning message is supported, the PoC Server MAY include miscellaneous information as the operator specified warning message in a response to a request message sent from a PoC Client. The PoC Server SHALL send back a response using the language requested by the PoC Client in the operator specified warning message if the PoC Server supports the language.
- A PoC Client SHOULD display the received operator specified warning message to the PoC User as it is received

4.41 Quality of Experience (QoE)

Quality of Experience (QoE) Profiles enable end-to-end quality of service management capabilities and allow the PoC Service Provider to suit different PoC User's needs in terms of customer experience and quality of service they may require given their different contexts, thus, it enables user differentiation and a rational use of network resources.

4.41.1 General

Quality of Experience (QoE) Profiles apply to individual's PoC User subscription with the PoC Service Provider, to Pre-arranged PoC Groups and, finally, to PoC Sessions.

PoC Servers SHALL support QoE Profiles. PoC Clients SHOULD support QoE Profiles.

Each PoC Service Provider can decide whether to use QoE Profiles or not. If QoE Profiles are used, the following SHALL apply.

A QoE Profile SHALL be defined for each PoC subscriber. If not explicitly defined the lowest profile ('Basic') SHALL be used.

If authorized by the Service Provider Policy, the PoC Group owner MAY define and assign a QoE Profile for a Pre-arranged PoC Group. The assigned QoE Profile SHALL be stored in Shared Group XDMS as an attribute of the PoC Group.

NOTE 1: It is possible that a Pre-arranged PoC Group has no QoE Profile assigned in the PoC Group document.

Those PoC Clients that support the QoE feature and PoC Servers SHALL support the following QoE Profiles:

The possible QoE Profile(s) SHALL be:

- 'Basic' profile: Intended for users who do not have high Quality of Experience expectations, such as via "best effort" communication; or,
- 'Premium' profile: Intended for users who have demanding Quality of Experience expectations, such as via interactive 1 communication and higher priority; or
- 'Professional' profile: Intended for users involved in special applications for professional use and that therefore have demanding Quality of Experience expectations, such as via streaming communication and higher priority.

Those PoC Clients that support the QoE feature and PoC Servers MAY support the following QoE Profile:

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- 'Official Government Use' profile: Intended for those users who require priority access to PoC Service according to one of the 5-levels existing in the WPS namespace, as specified in [RFC4412]. Subject to applicable regulations, when the 'Official Government Use' profile is implemented in a PoC network domain, this profile SHALL take precedence over all other QoE profiles.

NOTE 2: The use of the WPS namespace is subject to be changed in order to be aligned with the namespace used in 3GPP Multimedia Priority Service.

NOTE 3: The above profiles are arranged in increasing order of priority, but only one QoE Profile can be associated to PoC User's subscription.

Each QoE Profile SHALL be associated with a set of well-defined QoS and prioritization parameters that are understandable for the specific underlying network(s) and also applicable to the PoC Server itself to actually obtain the target quality of experience for the end user. The appropriate QoE to QoS mapping(s) SHALL be provisioned to PoC Clients as reflected in subclause 4.41.2 *"QoE provisioning"*.

As described in subclause 4.41.3 *"Setting the QoE Profile for the PoC Session"*, based on the QoE Profile proposed by the Inviting PoC Client and the QoE Profile associated to the involved PoC Group, the PoC Server SHALL assign a QoE Profile for each PoC Session at the PoC Session establishment time. When a QoE Profile has been assigned for the PoC Session and each involved PoC Client knows the Local QoE Profiles that is acceptable for him based on individual constraints, the involved PoC Clients and PoC Servers:

- SHOULD apply/request the corresponding QoS in the underlying network for the transport of PoC Session Media and signalling.
- MAY apply the corresponding prioritization and pre-emption procedures.

4.41.2 QoE provisioning

If QoE Profiles are used, the following SHALL apply.

QoE Profiles are used as a way to define a mapping between different types of quality of service expected by the PoC Users at application level and different profiles of performance criteria to be realized at underlying network level. In order to receive the appropriate mapping(s), PoC Clients SHOULD support provisioning of QoE Profile(s) through OMA DM according to the following rules:

- Depending on the PoC User subscription, one mapping SHALL be received per authorized QoE Profile.
- Each mapping SHALL cover the QoS to be provided for each of the Media Types in the PoC Session. Media Types can be logically grouped according to any desirable criteria (e.g. continuous vs discrete Media Types) so that the same QoS parameters are applicable to every logically grouped Media Type.

NOTE 1: Any mapping mechanism must consider the concrete underlying network capabilities (i.e QoS framework…).

NOTE 2: For different types of access networks, the same QoE Profile may map to different QoS parameters due to the use of different QoS frameworks.

4.41.3 Setting the QoE Profile for the PoC Session

4.41.3.1 General

QoE Profile assignation and application for PoC Sessions SHALL be supported by PoC Servers and SHOULD be supported by PoC Clients. For those PoC Service Providers using this capability, the setting of the QoE Profile for the PoC Session SHALL be according to the following.

Each PoC Session SHALL have a unique QoE Profile assigned by the Controlling PoC Function at PoC Session establishment time.

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Based on PoC User's selection, the originating PoC Client SHOULD indicate in the initial invitation the desired QoE Profile to be applied for outgoing PoC Sessions on a session-by-session basis, according to the following:

- The indicated QoE Profile SHALL be an authorized QoE Profile according to PoC User's subscription, as provisioned by the PoC Service Provider (described in subclause 4.41.2 "*QoE provisioning*").
- For Pre-established Sessions, the PoC Client SHOULD include the desired QoE Profile at the initial establishment or later modification(s) of the Pre-established Session.
- For outgoing PoC Sessions using On-demand Session, the PoC Client SHOULD include the QoE Profile in the initial invitation.

PoC Servers and PoC Clients using QoE Profiles SHALL interpret the absence of an explicit QoE Profile indication as an implicit indication of 'Basic' QoE Profile.

Upon reception of the initial invitation, the Participating PoC Function serving the originating PoC Client SHALL check the QoE Profile indicated by the PoC Client:

- If the requested QoE Profile is not authorized for the served PoC User, the establishment request SHALL be rejected. If the requested QoE Profile is authorized for the served PoC User, the Participating PoC Function SHALL send the invitation to the Controlling PoC Function without modifying the indicated QoE Profile.
- For PoC Sessions using Pre-established Session, the QoE Profile indicated by the PoC Client for the initial establishment of the Pre-established Session SHALL be indicated by the Participating PoC Function in the invitation sent to the Controlling PoC Function.

If QoE Profiles are used by the PoC Service Provider, upon reception of the initial invitation, the Controlling PoC Function SHALL assign a QoE Profile for the PoC Session according to the following:

- For Pre-arranged PoC Group Session:
    - when there is no QoE Profile defined in the PoC Group document, the QoE Profile for the PoC Session SHALL be the QoE Profile requested by the Inviting PoC Client. When different from the 'Basic' QoE Profile, the QoE Profile assigned for the PoC Session SHALL be explicitly indicated in the invitation(s) sent to the Invited PoC Client(s).
    - when there is a QoE Profile defined in the PoC Group document and the requested QoE Profile is not the 'Official Government Use' QoE Profile, the Controlling PoC Function SHALL first check if the QoE Profile requested by the Inviting PoC Client is equal or higher than the QoE Profile defined for the PoC Group. If it is lower, the Controlling PoC Function SHALL reject the invitation. Otherwise, the QoE Profile for the PoC Session SHALL be the QoE Profile defined in the PoC Group document. The Controlling PoC Function SHALL explicitly indicate the QoE Profile assigned for the PoC Session in the invitation(s) sent to the Invited PoC Client(s). The Controlling PoC Function SHALL also indicate in the invitation(s) that the QoE Profile for the PoC Session is mandatory.
    - When the requested QoE Profile is the 'Official Government Use' QoE Profile, the QoE Profile for the PoC Session SHALL always be the 'Official Government Use' QoE Profile. The Controlling PoC Function SHALL explicitly indicate the 'Official Government Use' QoE Profile in the invitation(s) sent to the Invited PoC Client(s).
- For 1-1 and Ad-hoc PoC Group Sessions, the QoE Profile for the PoC Session SHALL be the QoE Profile explicitly or implicitly indicated in the invitation from the originating PoC Client. When different from the 'Basic' QoE Profile, the QoE Profile assigned for the PoC Session SHOULD be explicitly indicated in the invitation(s) sent to the Invited PoC Client(s).
- Redirecting a PoC Session to a PoC Box SHALL NOT impact to the QoE Profile.
- The QoE Profile SHALL NOT be changed during a PoC Session.

Upon reception of the initial invitation, the Participating PoC Function serving an Invited PoC User SHALL check the QoE Profile assigned for the PoC Session against the QoE Profile subscribed by the Invited PoC User. If the QoE Profile for the

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PoC Session is mandatory and it is not allowed based on the PoC User's Subscription, the Participating PoC Function SHALL reject the invitation, indicating the reason for rejection. Otherwise, the Participating PoC Function SHALL forward the invitation to the Invited PoC Client without any change.

In the first response to the initial invitation each terminating PoC Client SHOULD indicate their Local QoE Profile according to the following:

- The Local QoE Profile SHOULD be the QoE Profile proposed in the incoming invitation if the terminating PoC User's subscription allows that proposed QoE Profile.
- The Local QoE Profile SHOULD be the maximum acceptable QoE Profile according to the PoC User's subscription, in case the requested QoE Profile is not authorized for the Invited PoC User.
- In case of automatic answer and Pre-established Session in the terminating side, the terminating Participating PoC Function SHOULD indicate the Local QoE Profile on behalf of the Invited PoC Client, based on the desired QoE Profile communicated by the PoC Client during the Pre-established Session establishment.

In case of On-demand Session, upon reception of the final response from the terminating PoC Client, the Participating PoC Function serving an Invited PoC User SHALL check the Local QoE Profile indicated by the PoC User. If the Local QoE Profile is not authorized for the served PoC User, the PoC Server SHALL reject the PoC Session establishment towards the inviting party and SHALL release the PoC Session towards the served PoC User.

PoC Servers using QoE Profiles SHALL interpret the absence of an explicit indication about the Local QoE Profile from a PoC Client as an implicit indication of 'Basic' Local QoE Profile for that PoC Client.

The Local QoE Profile for the Inviting PoC Client SHALL be:

- Equal to the requested QoE Profile for PoC Sessions using On-demand Session.
- Equal to the QoE Profile communicated by the PoC Client during the Pre-established Session set-up, in case of Pre-established Session in the inviting side.

Each PoC Client SHOULD apply his Local QoE Profile for the PoC Session when performing resource reservation in the underlying network.

Each PoC Client MAY apply his Local QoE Profile for potential prioritization and pre-emption procedures.

The QoE Profile assigned for the PoC Session and the Local QoE Profile for each PoC Client SHALL be included in the charging information.

4.41.3.2 Users joining/leaving an on-going PoC Session

In case a PoC User leaves or joins an on-going PoC Session, the QoE Profile for the PoC Session SHALL not be modified.

A PoC Client joining to an on-going Chat PoC Group Session or re-joining to an on-going PoC Session SHALL follow the behaviour for Inviting PoC Clients described in subclause 4.41.3 *"Setting the QoE Profile for the PoC Session"*. If the joining is successful, the Local QoE Profile for the PoC User SHALL be the QoE Profile requested by the PoC Client.

NOTE: In these scenarios the QoE Profile requested by the PoC Client is not used to assign the QoE Profile for the PoC Session, therefore the Local QoE Profile assigned to the PoC Client can be different from the QoE Profile assigned to the PoC Session.

Upon reception of a request to join an on-going Chat PoC Group Session or to re-join an on-going PoC Session, the PoC Server performing the Controlling PoC Function SHALL:

- Reject the joining or re-joining request, if the requested QoE Profile is lower than the QoE Profile assigned to the on-going PoC Session and if the QoE Profile assigned to the on-going PoC Session is mandatory.
- Otherwise, add the PoC Client to the on-going PoC Session without modifying the QoE Profile assigned to the PoC Session.

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4.41.4 Prioritization and pre-emption

The PoC Server and PoC Client MAY support the prioritization and pre-emption.

The Controlling PoC Function SHOULD determine the PoC Session Precedence from the QoE Profile assigned for the PoC Session, as defined by the PoC Service Provider.

The PoC Server and PoC Client MAY support three levels of PoC Session Precedence, according to Basic, Premium and Professional QoE Profiles.

Additionally, the PoC Server and PoC Client MAY support a higher level of PoC Session Precedence assigned to Official Government Use QoE Profile. Within this level of priority there are 5-levels of priority according to the WPS namespace, as reflected in [RFC4412]. These five levels of priority represent levels of PoC Session Precedence and they are represented by a number from 0 to 4, where 0 is used for the highest priority level and 4 is used for the lowest priority level.

The Participating PoC Function SHOULD directly determine the PoC Session Precedence from the Local QoE Profile applied for the served PoC Client in the PoC Session, as defined by the PoC Service Provider.

If the prioritization and pre-emption capability is supported, then under high load situations at the PoC Server:

- The PoC Server SHALL prioritise the signalling of a PoC Session with higher PoC Session Precedence among the signalling of other PoC Sessions with lower PoC Session Precedence.
- When located on the Media path, the PoC Server SHOULD prioritise the Continuous Media flows of PoC Sessions of higher PoC Session Precedence over Continuous Media flows of PoC Sessions of lower PoC Session Precedence.
- When performing the Controlling PoC Function, the PoC Server MAY revoke the Media Burst sending permissions, or reject the Media Burst requests, of PoC Clients participating in PoC Sessions of lower PoC Session Precedence.
- In case of several PoC Session establishment requests of the same PoC Session Precedence, the PoC Server SHALL service the requests based on the order of the requests.
- According to Service Provider Policy, the PoC Server MAY pre-empt (i.e., release) PoC Sessions of lower PoC Session Precedence due to the requests of PoC Sessions of a higher PoC Session Precedence.

When a PoC Server acting as a Participating PoC Function serving a PoC Client with existing PoC Session(s) established using any PoC Address of the Invited PoC Client as specified in the subclause 4.47 "*Multiple registered PoC Address determination*" receives a PoC Session invitation with an Official Government Use QoE Profile, then subject to Service Provider Policy:

- If the PoC Client does not support Simultaneous PoC Sessions, and if the incoming PoC Session has a higher PoC Session Precedence than the currently existing PoC Session, PoC Server performing the Participating PoC Function SHALL release the PoC Session and send the new incoming invitation to the destined PoC Client.
- If Simultaneous PoC Sessions are supported, and the maximum number of PoC Sessions has not been reached and none are locked, the PoC Server performing the Participating PoC Function SHALL send the new incoming invitation to the destined PoC Client.
- If Simultaneous PoC Sessions are supported and the maximum number of PoC Sessions has been reached, and if the incoming request has a higher PoC Session Precedence than the lowest currently established PoC Session, the PoC Server performing the Participating PoC Function SHALL release the PoC Session of lowest PoC Session Precedence and send the new incoming invitation to the destined PoC Client.
- If Simultaneous PoC Sessions are supported and one of the PoC Sessions is locked, and if the incoming PoC Session has a higher PoC Session Precedence than the locked PoC Session, the PoC Server performing the Participating PoC Function SHALL release the locked PoC Session and send the new incoming invitation to the destined PoC Client.

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4.41.5 QoE mismatch

If the PoC Client fails to reserve the resources the PoC Client requested from the underlying network according to the Local QoE Profile, as provisioned by the PoC Service Provider, the PoC Client SHOULD inform back to the serving Participating PoC Function about the QoE mismatch.

The Participating PoC Function SHOULD send this information to the Controlling PoC Function.

The available information about the QoE mismatch SHALL be included in the charging information.

4.42 Discrete Media transfer

4.42.1 General

In addition to the Continuous Media, the PoC Server SHALL support the transfer of Discrete Media. The PoC Client MAY support Discrete Media.

If the PoC Client supports Discrete Media, the PoC Client MAY initiate the PoC Session establishment procedure with Discrete Media as described in subclause 4.6 *"Session establishment"*. The PoC Client SHALL include MSRP protocol and offered Media Types into PoC Session invitation. If the terminating PoC Client accepts the Discrete Media in the PoC Session invitation, the terminating PoC Client SHALL include MSRP protocol and accepted Media Types into PoC Session invitation response.

If the PoC Client supports Discrete Media, the PoC Client MAY add Discrete Media to already existing PoC Session by initiation of the PoC Session modification procedure as described in subclause *4.6.1.3 "Session modification"*. The PoC Client SHALL add MSRP protocol and offered Media Types into PoC Session modification request. If the terminating PoC Client accepts the Discrete Media in the PoC Session invitation, the terminating PoC Client SHALL include MSRP protocol and accepted Media Types into PoC Session modification response.

NOTE: OMA IM specified IM session mechanism is utilized (chapter 6.1.2 in OMA SIP/SIMPLE IM TS)

4.42.2 MSRP Session establishment

MSRP protocol can deliver any arbitrary MIME content. MSRP protocol provides a session mode messaging scheme and all MSRP-based messaging occurs in the context of a session. The Session Description Protocol (SDP) with its offer/answer model provides for MSRP session management, and the Session Initiation Protocol acts as a carrier for session signaling. A typical case involves more than a few instant messages exchanges over MSRP protocol. The MSRP protocol itself does not limit the size of messages, however the PoC Clients and PoC Server SHALL negotiate maximum supported message size using SDP. A reliable transport layer protocol is a required such as TCP.

The MSRP protocol provides for message chunking that allows multiple sessions to share one TCP connection. A sender can fragment its message, which can be of any MIME or multi MIME type. An MSRP message MAY convey a file name, if the MIME body is a file.

NOTE: OMA IM specified IM Session mechanism is utilized.

4.42.3 File transfer with extended SDP information

If the PoC Client supports Discrete Media, the PoC Client MAY support file transfer with extended SDP information.

If the PoC Client supports Discrete Media and extended SDP information, the PoC Client SHALL include for each file a separate Discrete Media into PoC Session invitation or PoC Session modification request. The PoC Client SHALL include information on offered file (e.g., file name, file size, file type) as media parameters of the Discrete Media. MSRP itself does not need any extensions.

NOTE 1: OMA IM specified file transfer mechanism is utilized.

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NOTE 2: This mechanism defines the SDP attribute extensions and usage conventions needed for meeting the requirements on file transfer services within SIP sessions using MSRP as the transfer protocol within the session.

4.42.4 Discrete Media Sender Identification

When the PoC Server performing the Controlling PoC Function receives a Discrete Media Burst, the PoC Server performing the Controlling PoC Function SHALL include the Discrete Media Burst sender's PoC Address and Nick Name, which were negotiated by the Discrete Media Burst sender during PoC Session initiation or available in the PoC Group data.

NOTE: The PoC Server does not always know the Nick Name, if the privacy is not requested by the sender.

In the case the PoC Address is restricted subclause 4.8 "*Privacy*" applies.

4.42.5 Discrete Media reports

4.42.5.1 General

When transferring Discrete Media, the PoC Server performing the Controlling PoC Function SHALL support Discrete Media Transfer Final Report and Discrete Media Transfer Progress Report.

If PoC Client supports Discrete Media it MAY support requesting transfer of Discrete Media Transfer Progress Reports and Discrete Media Transfer Final Reports and SHALL support providing information essential for the generation of Discrete Media Transfer Final Report and Discrete Media Transfer Progress Report, if requested.

When requesting transfer reports the PoC Client MAY request either Discrete Media Transfer Progress Report, Discrete Media Transfer Final Report or both. The PoC Client MAY request Discrete Media Transfer Final Report for any Discrete Media transfer irrespective of the transfer mode and MAY request Discrete Media Transfer Progress Report only for Discrete Media transfer using MSRP.

4.42.5.2 Requesting Discrete Media reports

The PoC Client sending the Discrete Media MAY request from the PoC Server performing the Controlling PoC Function, the Discrete Media Transfer Progress Report, Discrete Media Transfer Final Report or both at the PoC Session setup or at the PoC Session modification.

4.42.5.3 Discrete Media transfer progress information

If the PoC Client sending the Discrete Media has negotiated the use of Discrete Media Transfer Progress Report, the PoC Server performing the Controlling PoC Function SHALL provide the amount of data received per destination and error information, if reported at any destination to the PoC Client sending the Discrete Media.

In addition the PoC Server performing the Controlling PoC Function MAY provide the time stamp information.

4.42.5.4 Discrete Media transfer status collection and report creation

If Discrete Media Transfer Progress Report or Discrete Media Transfer Final Report or both are requested from the PoC Server performing the Controlling PoC Function by the PoC Client sending the Discrete Media, the PoC Server performing the Controlling PoC Function:

1. SHALL request reports from the PoC Client(s) receiving the Discrete Media;
2. SHALL provide Discrete Media Transfer Final Report or Discrete Media Transfer Progress Report or both per each PoC Client receiving the Discrete Media, as negotiated at PoC Session setup or at PoC Session modification; and,
3. SHALL generate and transfer the reports to the PoC Client, which sent Discrete Media according to local policy.

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4.43 PoC Media Traffic Optimisation

Traffic via the POC-4 reference point can be optimised by setting Media transmissions to unidirectional transmission: The Participating PoC Function MAY request the Controlling PoC Function to set Media transmission via the POC-4 reference point to unidirectional transmission from the Controlling PoC Function to the Participating PoC Function for PoC Clients with Media off hold.

The Controlling PoC Function indicates to the Participating PoC Functions whether it does not support traffic optimisation: If the Controlling PoC Function receives a request from the Participating PoC Function to set the Media transmission via the POC-4 reference point to unidirectional transmission for PoC Clients with Media off hold and if the Controlling PoC Function does not support POC-4 traffic optimisation then the Controlling PoC Function SHALL reject the request.

Traffic optimised Media are transferred from the PoC Server performing the Controlling PoC Function to the terminating PoC Server via the POC-4 reference point and distributed within the terminating PoC Server to the Participating PoC Functions of the terminating PoC Clients. In this case the Media transfer is set to unidirectional transmission for a PoC Client with Media off hold. The PoC Server performing the Participating PoC Function SHALL forward Media received from the Controlling PoC Function for PoC Clients with transmission via the POC-4 reference point set to bidirectional transmission. The forwarded Media SHALL have the same Media Parameters as those negotiated for the PoC Client with unidirectional transmission.

NOTE: Bidirectional transmission is used for the Media transferred by the Controlling PoC Function to the Participating PoC Function and vice-versa, whereas unidirectional transmission refers to Media transferred by the Participating PoC Function to the Controlling PoC Function.

Figure 3 depicts the transfer and distribution of Media.

The PoC Media Traffic Optimisation cannot be used in PoC Session, in which the 1-many-1 communication method is used.

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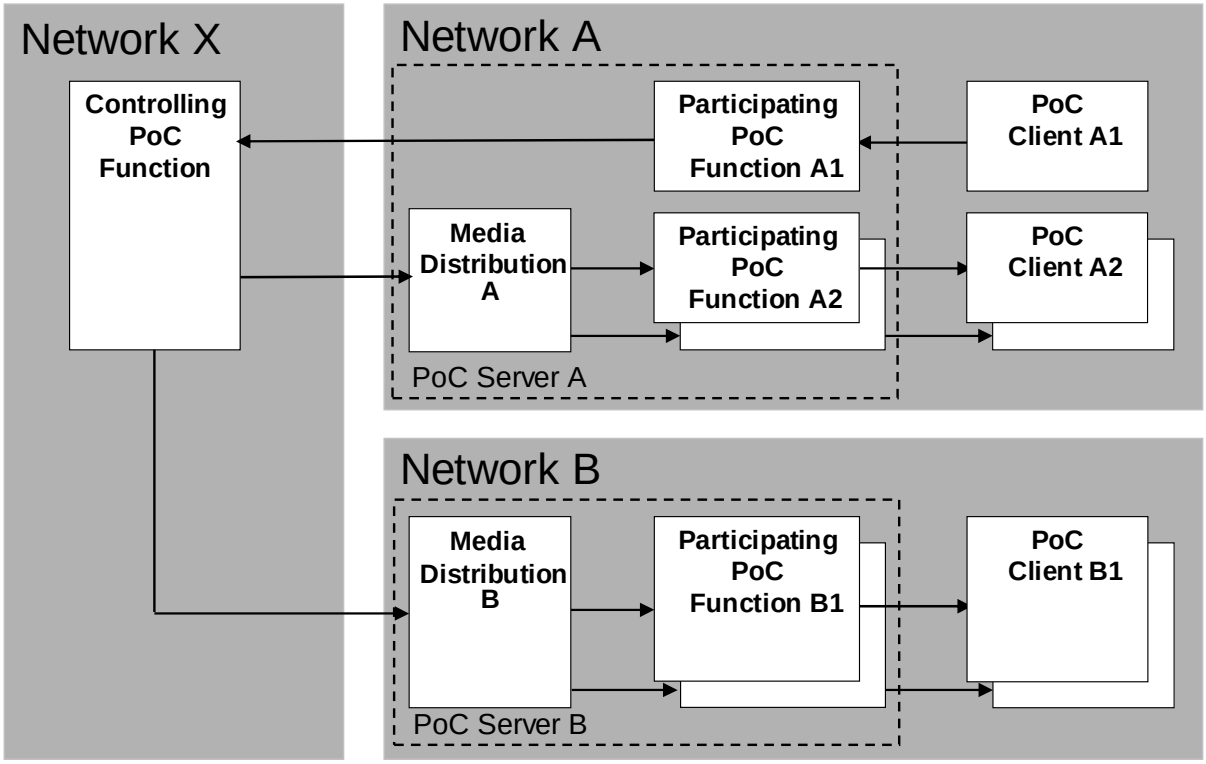

Figure 3: Media transfer and distribution when using PoC Media Traffic Optimisation

PoC Client A1 is sending PoC Media. The Media is forwarded by Participating PoC Function A1 to the Controlling PoC Function. The Controlling PoC Function forwards the Media to all PoC Servers providing Participating PoC Functions for the PoC Clients participating in the PoC Session. The PoC Servers Providing the Participating PoC Functions distribute the Media to all Participating PoC Functions except the Participating PoC Function of the sending PoC Client.

4.44 Lawful Interception (LI)

4.44.1 General

The following subclauses describe the PoC service related events and information elements that can be of interest to a Law Enforcement Agency, subject to regional and national laws.

The PoC service, its underlying network, or both SHOULD be able to provide the information identified herein in this document to a Law Enforcement Agency when required.

It MAY be required that when privacy or anonymity is invoked by an Identified PoC User, the available PoC Address information of all Participants in the PoC Session are provided to a Law Enforcement Agency.

NOTE: A PoC Server performing the Participating PoC Function can obtain the PoC Addresses of Participants in the PoC Session via Participant Information even if Participants have requested privacy.

The combination of a unique identifier and a timestamp is a commonly used mechanism to assist with the proper correlation of the sequence of events during delivery to a Law Enforcement Agency. The assignment and management of the unique identifier is outside the scope of PoC.

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When the SIP/IP Core corresponds with 3GPP IMS, the PoC lawful interception delivery is done as in the [3GPP TS 33.107] and [3GPP TS 33.108].

4.44.2 PoC Session Events and Informational Elements

This subclause describes the PoC events that can be of interest to a Law Enforcement Agency concerning origination and termination attempts, establishment, control, and release of PoC Sessions, including Instant Personal Alerts, for an Identified PoC User.

1. When the Identified PoC User attempts to initiate or receives an invitation to any type of PoC Session, or when the Identified PoC User sends or receives an Instant Personal Alert.
2. When the Identified PoC User answers an invitation to a PoC Session or if another PoC User answers an invitation from the Identified PoC User.
3. When the Identified PoC User's invitation is redirected to another service or PoC User (e.g., PoC Box).
4. When any PoC Session in which the Identified PoC User is involved is completed or when an initiation is abandoned or unsuccessful.
5. When a new PoC User is added to a PoC Session involving the Identified PoC User.
6. When the Identified PoC User joins and/or leaves any Chat PoC Group.
7. When the Media parameters (e.g., codec or Media Format) of any PoC Session in which the Identified PoC User is involved changes and the Identified PoC User's Participating PoC Function is aware of the change.
8. When there is a request for an addition or removal of a Media Stream for any PoC Session involving the Identified PoC User.

Informational elements for these events MAY include, but are not limited to the following:

1. Identities of the Identified PoC User (e.g., PoC Addresses).
2. Location of the Identified PoC User (at the beginning and end of PoC Sessions), if known by the PoC service.
3. Event type (e.g., origination, termination, Instant Personal Alert).
4. Identities of other PoC Users and/or PoC Groups involved in the PoC Session.
5. PoC Session Identities
6. PoC host identity
7. Media Type
8. Timestamp of the event.

4.44.3 Media Burst Control Events and Informational Elements

This subclause describes the Talk and Media Burst Control events of those Media Types used in PoC Sessions involving the Identified PoC User that can be of interest to a Law Enforcement Agency.

1. When the Identified PoC User requests permission to send Media.
2. When the Identified PoC User is granted permission to send Media and/or that permission is revoked.
3. If queuing is supported, when the Identified PoC User is queued, when any pre-emption of the Identified PoC User occurs, and when the Identified PoC User cancels his/her queued request.

Informational elements for these events MAY include, but are not limited to the following:

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1. Identities of the Identified PoC User (e.g., PoC Address)
2. Identity of the Participant with the permission to send Media
3. Event type (e.g., request, revocation, grant, queue query)
4. PoC Session Identities.
5. RTP Timestamp of the event.

4.44.4 PoC Content

This subclause describes the Media Burst (i.e., PoC content) that can be of interest to a Law Enforcement Agency of those Media Types used in PoC Sessions involving the Identified PoC User .

Informational elements for the PoC content MAY include, but are not limited to the following:

1. Identities of the Identified PoC User (e.g., PoC Addresses).
2. Media Type.
3. RTP Timestamp of the Media Burst.
4. Media Burst.

4.45 Media buffering capability

4.45.1 General

The PoC Client MAY support Media buffering capability negotiation. The PoC Server MAY support Media buffering capability negotiation.

The PoC Client MAY support Limited Segment Media Buffer preload capability. The PoC Server MAY support Limited Segment Media Buffer preload capability by the PoC Client.

The PoC Client MAY support Media Time Compression of buffered Media. The PoC Server MAY support Media Time Compression of buffered Media by the Client.

NOTE: Media Time Compression results in more Media details per time. To avoid loss of Media details it is recommended not to employ Media Time Compression if low quality Media codecs are used.

The PoC Server performing the Controlling PoC Function MAY determine when to instruct the PoC Client to transmit Media based on the Transmit Media Buffering capability indicated by the PoC Client (i.e the PoC Server may delay instructing the PoC Client to transmit Media in the Unconfirmed Indication scenario when the PoC Client is able to buffer the Media).

The PoC Server SHOULD support controlling the transmitted Media data rate based on the Receive Media Processing capability indicated by the PoC Client (i.e the PoC Server is able to transmit the Media at a data rate that the PoC Client is able to handle).

4.45.2 PoC Client Transmit Media Buffering capability

The PoC Client MAY indicate information on its Transmit Media Buffering capabilities for each Media Stream to the Home PoC Server when establishing a Pre-established Session, and the PoC Server performing the Controlling PoC Function when establishing an On-demand Session or when modifying the Media capabilities. The PoC Client MAY indicate to the PoC Server the following information:

- Limited Segment Media Buffer preload support
- Media Time Compression support

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- Maximum transmit data rate
- Transmit Media buffer size
- Media Time Compression factor

NOTE: It is not necessary for PoC Clients supporting Media buffering capability negotiation to indicate Media buffering capability for those Media Types not requiring Media buffering.

4.45.3 PoC Client Receive Media Processing Capability

The PoC Client MAY indicate information on its Receive Media Processing Capabilities for each Media Type to the Home PoC Server when establishing a Pre-established Session, establishing an On-demand Session or when modifying the Media capabilities. The PoC Client MAY indicate to the PoC Server the "Maximum receive data rate".

4.45.4 PoC Server Media processing handling

If the PoC Client has informed the PoC Server performing the Controlling PoC Function about its Transmit Media Buffering capabilities, the PoC Server performing the Controlling PoC Function MAY use the information indicated by the PoC Client about its "Transmit Media buffer size", "Media Time Compression factor" and "Maximum transmit data rate" to determine when to instruct the PoC Client to transfer Media to the PoC Sever. If the PoC Client has indicated Limited Segment Media Buffer preload support the PoC Server performing the Controlling PoC Function MAY instruct the PoC Client to transmit a Limited Segment of its Media buffer prior to instructing the PoC Client to transfer the rest of its Media.

In the case of a Pre-established Session where the PoC Client has informed the Home PoC Server about its Transmit Media Buffering Capabilities, the Home PoC Server MAY forward the PoC Client’s Transmit Media Buffering Capabilities to the PoC Server performing the Controlling PoC Function.

If the PoC Client has informed the PoC Server about its Receive Media Processing Capabilities, the PoC Server SHOULD transfer the Media with data rate not higher than "Maximum receive data rate" indicated by the PoC Client.

4.46 Multiple Continuous Media synchronization

The PoC Client sending multiple Continuous Media that are synchronized SHALL send Sender Report according to rules and procedures of [RFC3550].

NOTE: In order to allow the receiving PoC Client to synchronize the Media Bursts, the sending PoC Client needs to send the Sender Report as soon as possible after receiving the Media Burst Confirm.

4.47 Multiple registered PoC Address determination

The PoC Server performing the Participating PoC Function SHALL determine the PoC Addresses used by the same PoC Client.

4.48 Instant Personal Alert

The Instant Personal Alert allows one PoC User to request another PoC User to initiate a 1-1 PoC Session back to the sender of the Instant Personal Alert.

The PoC Server SHALL support Instant Personal Alert.

The PoC Client MAY support sending Instant Personal Alerts and SHALL support receiving Instant Personal Alerts.

The PoC Client SHALL support initiating a 1-1 PoC Session using the PoC Address received in an Instant Personal Alert.

Incoming Session Barring SHALL not apply to Instant Personal Alerts.

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The PoC Client MAY bar reception of Instant Personal Alerts by means of PoC Services Settings for Incoming Instant Personal Alert Barring as specified in the subclause 4.26.3 "*Incoming Instant Personal Alert Barring (IAB)*".

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5. High level procedures (Informative)

The flow charts in the following subclauses describe the logical flow of information between the PoC architectural functional elements but do not necessarily fully conform to all the details of the protocols that will be used. Call flows does not indicate whether information elements are mandatory or optional.

The interworking between the PoC Server and the Shared XDM Servers is not described in the high level procedure but can be assumed to take place depending on implementation either prior to the flow takes place or when the flow takes place.

Information stored in the Shared XDM Servers is needed when:

- Inviting PoC Users to a Pre-arranged PoC Group.
- Adding PoC Users to an ongoing Pre-arranged PoC Group or a Chat PoC Group.
- When a PoC User is joining a Pre-arranged PoC Group or a Chat PoC Group for Access Control.
- When performing Access Control on terminating side before inviting a PoC User to a PoC Session.
- Sending a Group Advertisement to a Pre-arranged PoC Group or a Chat PoC Group.

5.1 Pre-established Session

5.1.1 Introduction

The Pre-established Session provides a mechanism to negotiate Media Parameters such as IP address, ports and codecs, which are used for sending the media, Media Type and Talk Burst Control and/or Media Burst Control messages between the PoC Client and the Home PoC Server. The mechanism allows the PoC Client to invite other PoC Clients or receive PoC Sessions without negotiating again the Media Parameters.

The Pre-established Session can be established after the initial registration. The Figure 4 *"Pre-established Session"* presents the high level description of the Pre-established Session procedure.

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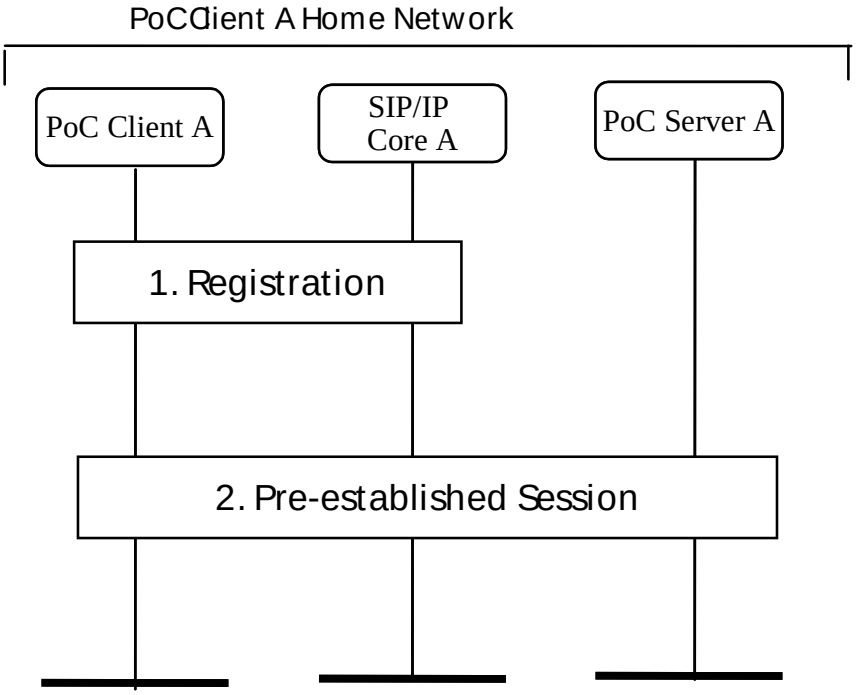

Figure 4: Pre-established Session

0. The PoC Client registers to the SIP/IP Core. The registration is described in the subclause 4.5 *"Registration"*.

1. The Pre-established Session is a session establishment procedure between the PoC Client and the PoC Server to exchange necessary Media Parameters needed for setting up the media bearer. After the Pre-established Session is established the PoC Client is able to activate media bearer whenever needed:
    - immediately after the Pre-established Session procedure or;
    - when the actual SIP signalling for the PoC Session is initiated.

5.1.2 Pre-established Session flow

The Pre-established Session is a session between the PoC Client and the PoC Server in the Home PoC Network. The Figure 5 *"Pre-established Session"* presents the Pre-established Session establishment flow.

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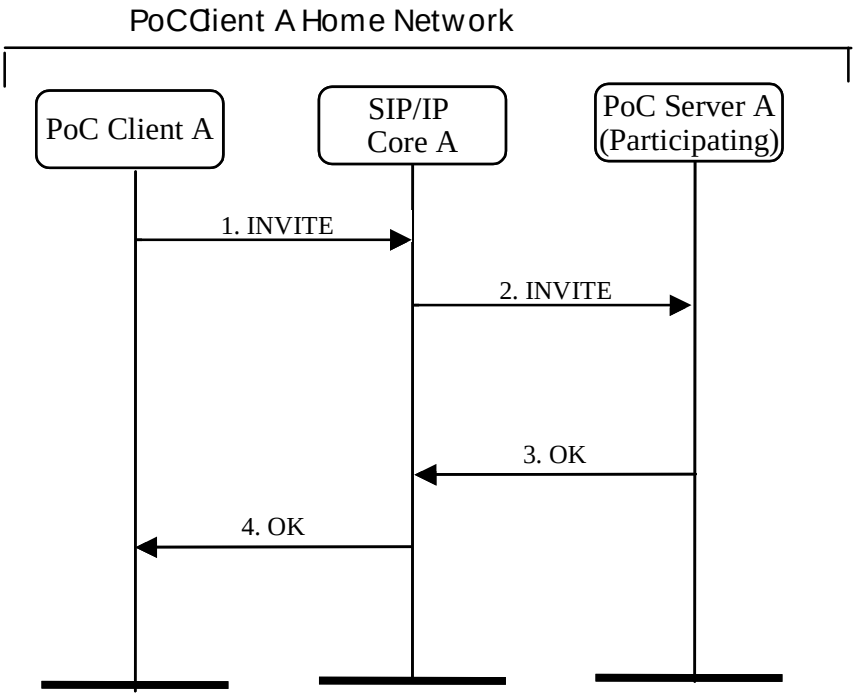

Figure 5: Pre-established Session

1. The PoC Client sends an INVITE request to the SIP/IP Core containing a PoC indication.

   Information elements contained in INVITE request:

   a. Participating function URI

   b. Media Parameters of PoC Client A for inactive media stream(s)

   c. PoC service indication

   d. PoC Address of the PoC User at the PoC Client A

   e. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal.

   f. Media-floor Control Entities proposal.

   g. Desired QoE Profile.

2. The SIP/IP Core forwards the request to the PoC Server based on the PoC service indication and the Participating Function URI in the request.

   Information elements contained in INVITE request:

   a. Participating function URI

   b. Media Parameters of PoC Client A with inactive media stream(s)

   c. PoC Service indication

   d. PoC Address of the PoC User at the PoC Client A

   e. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal.

   f. Media-floor Control Entities proposal.

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g. Desired QoE Profile

3. The PoC Server performs necessary service control and sends OK response to the SIP/IP Core.

   Information elements contained in OK response:

   a. Media Parameters of PoC Server A

   b. A conference URI that identifies the Pre-established Session

   c. Selected Talk Burst Control Protocol and/or Media Burst Control Protocol.

   d. Media-floor Control Entities response.

   e. QoE Profile for the Pre-established session.

4. The SIP/IP Core forwards the OK response the PoC Client.

   Information elements contained in OK response:

   a. Media Parameters of PoC Server A

   b. A conference URI that identifies the Pre-established Session

   c. Selected Talk Burst Control Protocol and/or Media Burst Control Protocol.

   d. Media-floor Control Entities response if a proposal for Media-floor Control Entities was included in the request.

   e. QoE Profile for the Pre-established session.

The procedure for establishing a PoC Session with other users within the Pre-established Session is described in the subclause 5.2 *"Ad-hoc PoC Group Session and 1-1 PoC Session setup"* and in the subclause 5.3 *"Pre-arranged PoC Group Session setup*".

5.2 Ad-hoc PoC Group Session and 1-1 PoC Session setup

In the Ad-hoc PoC Group Session setup one PoC User selects several other PoC Users, or Pre-arranged PoC Groups, or both to be invited to an Ad-hoc PoC Group Session.

1-1 PoC Session setup is similar case with Ad-hoc PoC Group session except only one PoC User is invited by the inviting PoC User.

5.2.1 Ad-hoc PoC Group Session invitation from PoC Client

In the following subclauses different setup scenarios are described from the Inviting PoC Client point of view.

Chapter 5.2.1.1 *"Confirmed indication using On-demand Session"* describes a case where right-to-speak indication is given to the inviting PoC User when one of the Invited PoC Users has accepted the invitation using On-demand Session establishment.

Chapter 5.2.1.2 *"Unconfirmed Indication using On-demand Session"* describes a case where right-to-speak indication is given to the inviting PoC User when the Invited PoC User is registered and uses automatic answer.

Chapter 5.2.1.3 *"Confirmed indication using Pre-established Session"* describes a case where right-to-speak indication is given to the inviting PoC User when one of the Invited PoC Users has accepted the invitation and the Inviting PoC Client has Pre-established Session.

Chapter 5.2.1.4 *"Unconfirmed Indication using Pre-established Session"* describes a case where right-to-speak indication is given to the inviting PoC User when one of the Invited PoC Users is registered and uses automatic answer and the inviting PoC User has a Pre-established Session.

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5.2.1.1 Confirmed Indication using On-demand Session

This subclause describes a case where right-to-speak indication is given to the inviting PoC User when one of the Invited PoC Users has accepted the invitation and the final response is not sent before the first accepted indication from the terminating network is received. Figure 6 *"Confirmed indication using On-demand Session"* shows the signalling flow for this scenario.

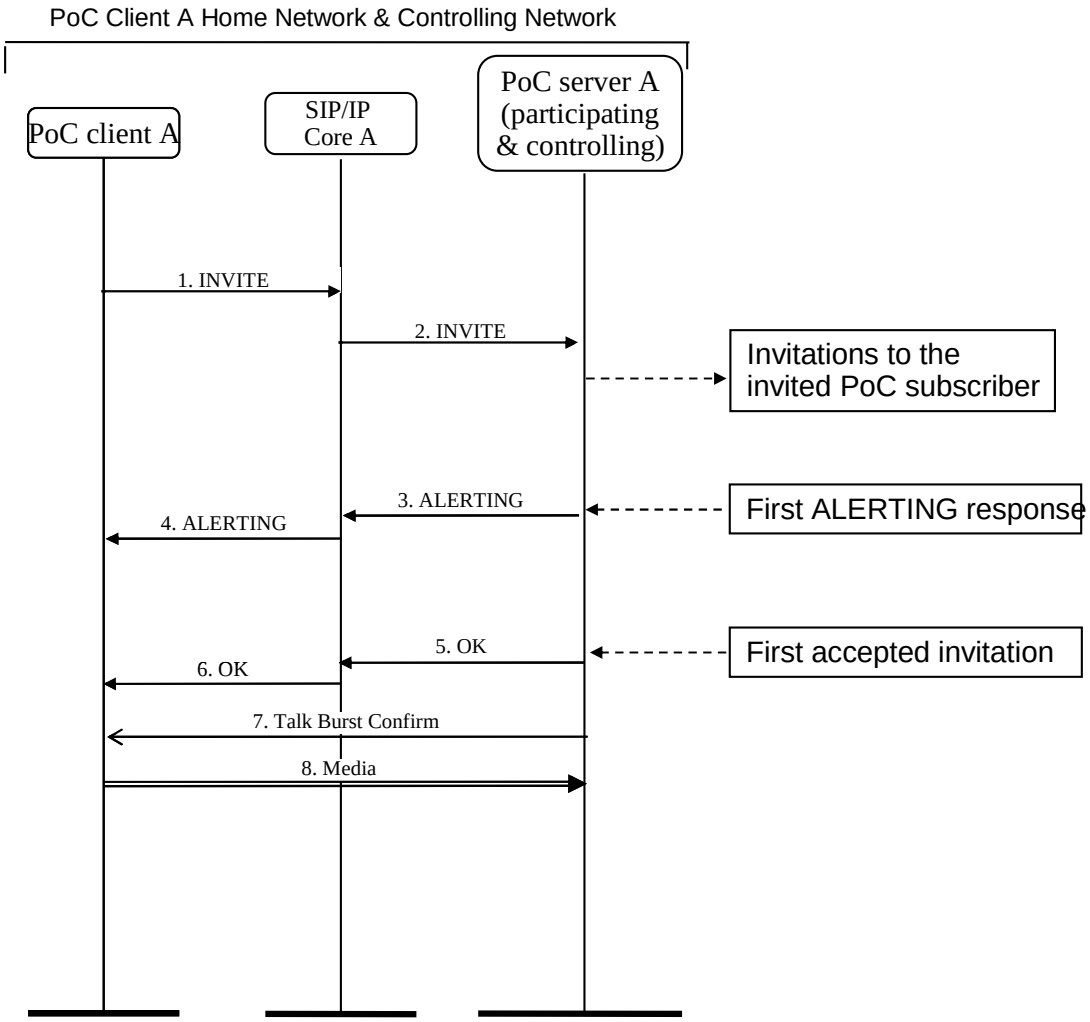

Figure 6: Confirmed Indication using On-demand Session

1. PoC Client A initiates an Ad-hoc PoC Group Session or 1-1 PoC Session by sending an INVITE request to the Home PoC Network.

   Information elements contained in INVITE request:

   a. A list of PoC Addresses of Invited PoC Users;

   b. Media Parameters of PoC Client A

   c. PoC Service indication

   d. PoC Address of the PoC User at the PoC Client A

   e. A manual answer override request

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f. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal.

g. Media-floor Control Entities proposal.

h. Desired QoE Profile.

i. Media included in the request.

2. SIP/IP Core A routes the INVITE request to the PoC Server A (participating & controlling) based on PoC Address of inviting PoC User and PoC service indication.

   Information elements contained in INVITE request:

   a. A list of PoC Addresses of Invited PoC Users;

   b. Media Parameters of PoC Client A

   c. PoC service indication

   d. PoC Address of the PoC User at the PoC Client A

   e. Manual answer override request, if selected by PoC Client A

   f. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal.

   g. Media-floor Control Entities proposal.

   h. Desired QoE Profile.

   i. Media included in the request.

3. Since this is an Ad-hoc PoC Group Session setup or 1-1 PoC Session setup the PoC Server A (participating & controlling) takes the roles of the Controlling PoC Function and Participating PoC Function. The PoC Server A (participating & controlling) sends invitations to the PoC Clients of the Invited PoC Users as described in the subclause 5.2.2 "*Ad-hoc PoC Group session invitation to the PoC Client*". When the first ALERTING response is received the PoC Server A (participating & controlling) sends ALERTING response towards the PoC Client A, when the final response OK is not yet sent.

4. SIP/IP Core A forwards the ALERTING response to the PoC Client A.

5. When the first PoC Client accepts the PoC Session request, the PoC Server A (participating & controlling) sends OK response towards the PoC Client A. The supported Media Types in the OK response can depend on the local policy independent of the supported Media Types contained in the first acceptance response received by the PoC Server A (participating & controlling). The OK response includes the following information:

   Information elements contained in OK response:

   a. Media Parameters of PoC Server A (participating & controlling)

   b. Selected Talk Burst Control and/or Media Burst Control Protocol Protocol.

   c. Media-floor Control Entities response

   d. QoE Profile for the PoC Session

6. SIP/IP Core A forwards the OK response to the PoC Client A.

   Information elements contained in OK response:

   a. Media Parameters of PoC Server A (participating & controlling)

   b. Selected Talk Burst Control Protocol and/or Media Burst Control Protocol.

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c. Media-floor Control Entities response

d. QoE Profile for the PoC Session

7. Since one Participant is connected, the PoC Server A (participating & controlling) sends the Talk Burst confirm response to the PoC Client A.

8. The PoC Client A sends media to the PoC Server A (participating & controlling).

If none of the Invited PoC Users accepts the invitation, the PoC Server A (participating & controlling) rejects the PoC Session.

The negotiated Media Types of Participants in the PoC Session can be obtained as described in the subclause 5.10 *"Subscription to Participant information"*.

5.2.1.2 Unconfirmed Indication using On-demand Session

This subclause describes a case where right-to-speak indication is given to the inviting PoC User when one of the Invited PoC Users is registered and uses automatic answer. In this case the PoC Server sends the final response after receiving the first auto-answer response from the terminating side and adds the Unconfirmed Indication to the final response. In this case the media buffering is supported and the Talk Burst confirm is sent after the first auto answer response is received. If buffering is not supported the Talk Burst confirm is sent after the first response to the invitation is received.

Figure 7 *"Unconfirmed Indication using On-demand Session"* shows the signalling flow for this scenario.

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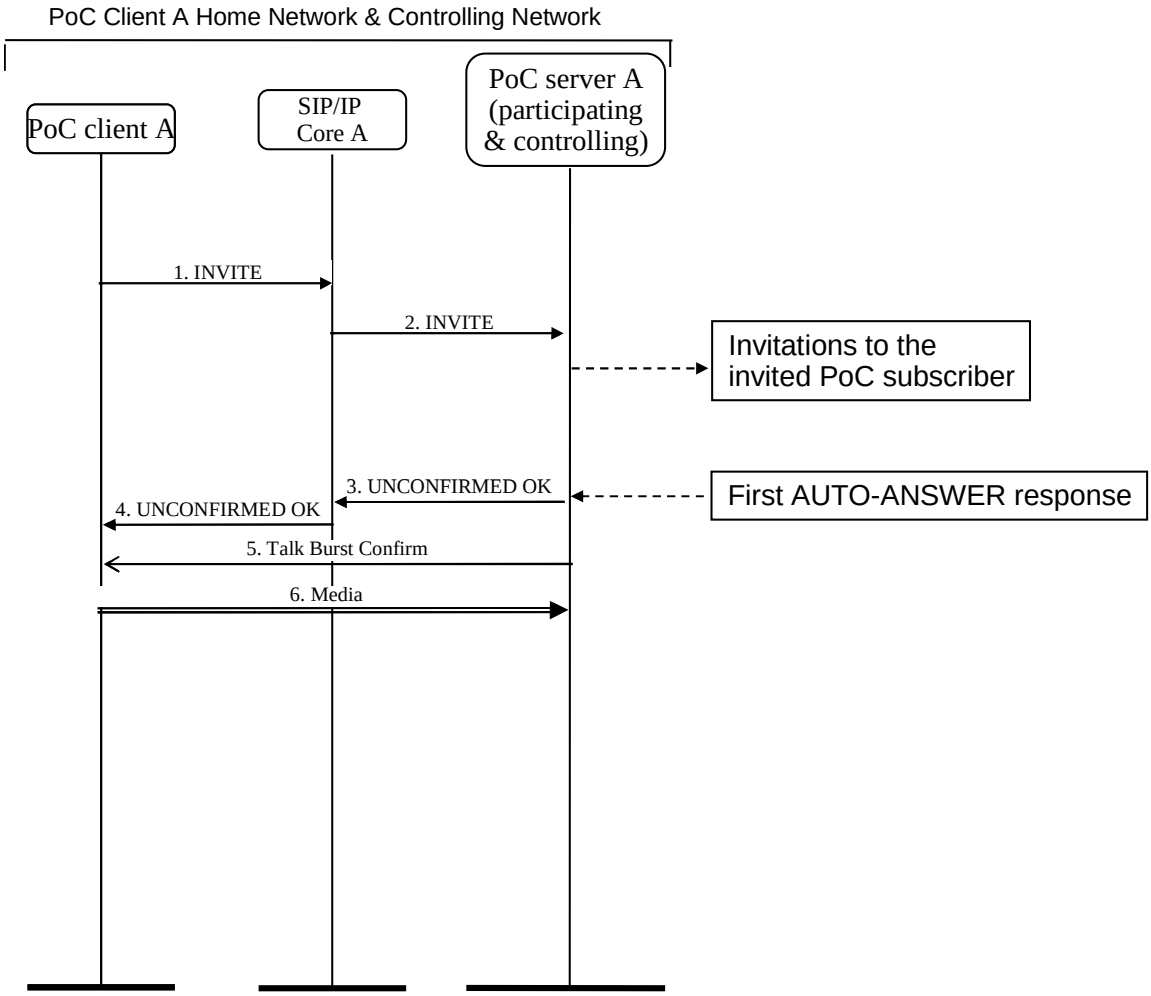

Figure 7: Unconfirmed Indication using On-demand Session

1. PoC Client A initiates an Ad-hoc PoC Group Session or 1-1 PoC Session by sending an INVITE request to the Home PoC Network.

   Information elements contained in INVITE request:

   a. A list of PoC Addresses of Invited PoC Users;

   b. Media Parameters of PoC Client A

   c. PoC service indication

   d. PoC Address of the PoC User at the PoC Client A

   e. A manual answer override request

   f. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal.

   g. Media-floor Control Entities proposal.

   h. Desired QoE Profile.

   i. Media included in the request.

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2. SIP/IP Core A routes the INVITE request to the PoC Server A (participating & controlling) based on PoC Address of inviting PoC User at the PoC Client and PoC Service indication.

   Information elements contained in INVITE request:

   a. A list of PoC Addresses of Invited PoC Users;

   b. Media Parameters of PoC Client A

   c. PoC Service indication

   d. PoC Address of the PoC User at the PoC Client A

   e. Manual answer override request, if selected by PoC Client A

   f. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal.

   g. Media-floor Control Entities proposal.

   h. Desired QoE Profile.

   i. Media included in the request.

3. Since this is an ad-hoc PoC Group Session setup or 1-1 PoC Session setup the PoC Server A (participating & controlling) takes the roles of the Controlling PoC Function and Participating PoC Function. The PoC Server A (participating and controlling) sends invitations to the PoC Clients of the Invited PoC Subscribers as described in the subclause 5.2.2 "*Ad-hoc PoC Group Session invitation to the PoC Client*". When the first Auto-answer response from the terminating side is received the PoC Server A (participating & controlling) sends UNCONFIRMED OK response towards the PoC Client A indicating that none of the Invited PoC Users are yet connected in the PoC Session. The supported Media Types in the UNCONFIRMED OK response can depend on the local policy independent of the supported Media Types contained in the first AUTO-ANSWER response received by the PoC Server A (participating & controlling).

   Information elements contained in UNCONFIRMED OK response:

   a. Media Parameters of PoC Server A (participating & controlling)

   b. Selected Talk Burst Control Protocol and/or Media Burst Control Protocol.

   c. Media-floor Control Entities response.

   d. QoE Profile for the PoC Session

4. SIP/IP Core A forwards the UNCONFIRMED OK response to the PoC Client A.

   Information elements contained in UNCONFIRMED OK response:

   a. Media Parameters of PoC Server A (participating & controlling)

   b. Selected Talk Burst Control Protocol and/or Media Burst Control Protocol.

   c. Media-floor Control Entities response.

   d. QoE Profile for the PoC Session

5. The PoC Server A (participating & controlling) sends the message Talk Burst confirm response to the PoC Client A.

6. The PoC Client A sends media to the PoC Server A (participating & controlling). The PoC Server A (participating & controlling) buffers the media to be sent to the Invited PoC Clients when they are connected.

If none of the Invited PoC Users accepts the invitation, the PoC Server A (participating & controlling) rejects the PoC Session.

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The negotiated Media Types of Participants in the PoC Session can be obtained as described in the subclause 5.10 *"Subscription to Participant information"*.

5.2.1.2A Unconfirmed Indication using On-demand Session and PoC Client buffering

This subclause describes a case where the PoC Client has the ability to perform Media buffering and communicates the buffering capability to the PoC Server. In this case the PoC Client includes an indication of its ability to perform buffering and its buffer size in the INVITE request and the PoC Server sends the final response after receiving the first auto-answer response from the terminating side and adds the Unconfirmed Indication to the final response along with and indication of permission for the PoC Client to buffer the Media. Upon receiving the first Confirmed response the PoC server will send the Talk Burst Confirm and in this case the PoC Server does not perform media buffering.

Figure 8 *"Indication using On-demand Session with PoC Client buffering"* shows the signalling flow for this scenario.

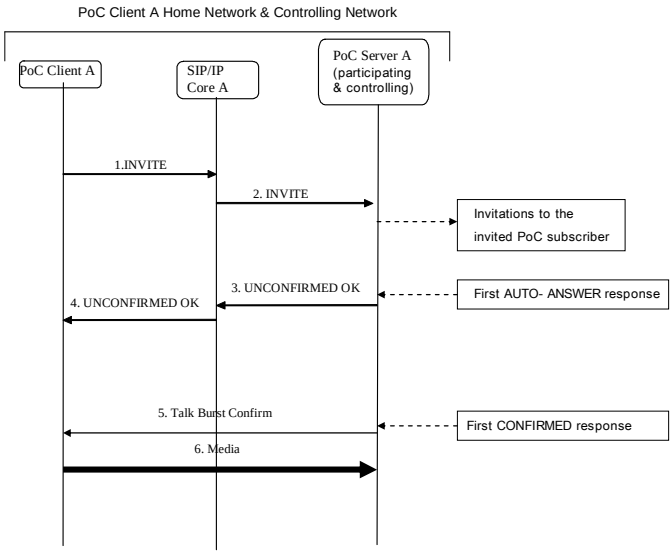

Figure 8: Indication using On-demand Session with PoC Client buffering

1. PoC Client A initiates an Ad-hoc PoC Group Session or 1-1 PoC Session by sending an INVITE request to the Home PoC Network. The PoC Client is buffering Media from the PoC User.

   Information elements contained in INVITE request:

   a. A list of PoC Addresses of Invited PoC Users;

   b. Media Parameters of PoC Client A

   c. PoC service indication

   d. PoC Address of the PoC User at the PoC Client A

   e. A manual answer override request

   f. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal.

   g. Media-floor Control Entities proposal.

   h. Desired QoE Profile.

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i. Client buffer size and indication.

j. Media included in the request.

2. SIP/IP Core A routes the INVITE request to the PoC Server A (participating & controlling) based on PoC Address of inviting PoC User at the PoC Client and PoC Service indication.

   Information elements contained in INVITE request:

   a. A list of PoC Addresses of Invited PoC Users;

   b. Media Parameters of PoC Client A

   c. PoC Service indication

   d. PoC Address of the PoC User at the PoC Client A

   e. Manual answer override request, if selected by PoC Client A

   f. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal.

   g. Media-floor Control Entities proposal.

   h. Desired QoE Profile.

   i. Client buffer size and indication.

   j. Media included in the request.

3. Since this is an ad-hoc PoC Group Session setup or 1-1 PoC Session setup the PoC Server A (participating & controlling) takes the roles of the Controlling PoC Function and Participating PoC Function. The PoC Server A (participating and controlling) sends invitations to the PoC Clients of the Invited PoC Subscribers as described in the subclause 5.2.2 "*Ad-hoc PoC Group Session invitation to the PoC Client*". When the first Auto-answer response from the terminating side is received the PoC Server A (participating & controlling) sends UNCONFIRMED OK response towards the PoC Client A indicating that none of the Invited PoC Users are yet connected in the PoC Session and providing an indication of permission for the PoC Client to continue to perform Media buffering. The supported Media Types in the UNCONFIRMED OK response can depend on the local policy independent of the supported Media Types contained in the first AUTO-ANSWER response received by the PoC Server A (participating & controlling).

   Information elements contained in UNCONFIRMED OK response:

   a. Media Parameters of PoC Server A (participating & controlling)

   b. Selected Talk Burst Control Protocol and/or Media Burst Control Protocol.

   c. Media-floor Control Entities response.

   d. QoE Profile for the PoC Session

   e. Client buffering permission indication

4. SIP/IP Core A forwards the UNCONFIRMED OK response to the PoC Client A.

   Information elements contained in UNCONFIRMED OK response:

   a. Media Parameters of PoC Server A (participating & controlling)

   b. Selected Talk Burst Control Protocol and/or Media Burst Control Protocol.

   c. Media-floor Control Entities response.

   d. QoE Profile for the PoC Session

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e. Client buffering permission indication

5. The PoC Server A (participating & controlling) receives the first confirmed response from the terminating side and sends the message Talk Burst confirm response to the PoC Client A.

6. The PoC Client A sends Media to the PoC Server A (participating & controlling). The PoC Server A (participating & controlling) send the Media to the Invited PoC Clients that are connected.

If none of the Invited PoC Users accepts the invitation, the PoC Server A (participating & controlling) rejects the PoC Session.

The negotiated Media Types of Participants in the PoC Session can be obtained as described in the subclause 5.10 *"Subscription to Participant information"*.

5.2.1.2B Unconfirmed Indication using On-demand Session and PoC Client buffering with Limited Segment preload

This subclause describes a case where the PoC Client supports the Limited Segment preload and has the ability to perform Media buffering and communicates the buffering capability to the PoC Server. In this scenario the PoC Server also supports the ability to buffer Media of a limited size. In this case the PoC Client includes an indication of its ability to perform buffering, its buffer size and an indication of Limited Segment preload support in the INVITE request and the PoC Server sends the final response after receiving the first auto-answer response from the terminating side and adds the Unconfirmed Indication to the final response along with and indication of permission for the PoC Client to buffer the Media and the right to send a Limited Segment of Media of specified size to be buffered at the PoC Server. Upon receiving the first Confirmed response the PoC server will send the Talk Burst Confirm and in this case the media buffering in the PoC Server is limited to the size of the Limited Segment preload.

Figure 9 *"Unconfirmed Indication using On-demand Session with PoC Client buffering and Limited Segment preload"* shows the signalling flow for this scenario.

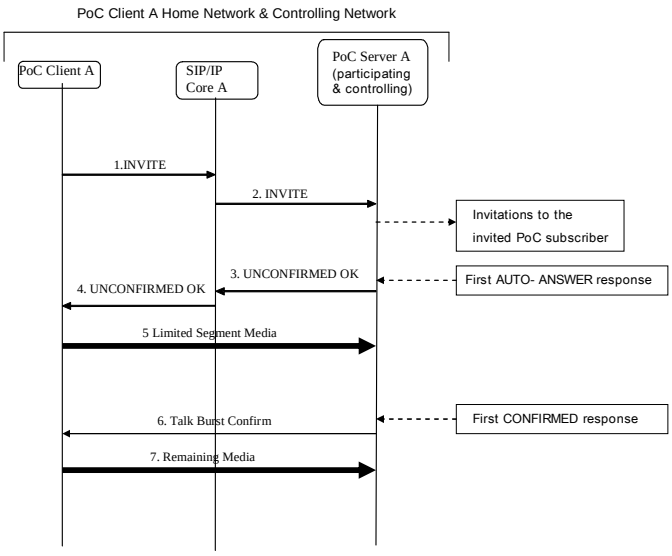

Figure 9: Unconfirmed Indication using On-demand Session with PoC Client buffering and Limited Segment preload

1. PoC Client A initiates an Ad-hoc PoC Group Session or 1-1 PoC Session by sending an INVITE request to the Home PoC Network. The PoC Client is buffering Media from the PoC User.

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Information elements contained in INVITE request:

a. A list of PoC Addresses of Invited PoC Users.

b. Media Parameters of PoC Client A.

c. PoC service indication.

d. PoC Address of the PoC User at the PoC Client A.

e. A manual answer override request.

f. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal.

g. Media-floor Control Entities proposal.

h. Desired QoE Profile.

i. Client buffer size and indication.

j. Limited Segment preload indication.

k. Media included in the request.

2. SIP/IP Core A routes the INVITE request to the PoC Server A (participating & controlling) based on PoC Address of inviting PoC User at the PoC Client and PoC Service indication.

   Information elements contained in INVITE request:

   a. A list of PoC Addresses of Invited PoC Users.

   b. Media Parameters of PoC Client A.

   c. PoC Service indication.

   d. PoC Address of the PoC User at the PoC Client A.

   e. Manual answer override request, if selected by PoC Client A.

   f. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal.

   g. Media-floor Control Entities proposal.

   h. Desired QoE Profile.

   i. Client buffer size and indication.

   j. Limited Segment preload indication.

   k. Media included in the request.

3. Since this is an ad-hoc PoC Group Session setup or 1-1 PoC Session setup the PoC Server A (participating & controlling) takes the roles of the Controlling PoC Function and Participating PoC Function. The PoC Server A (participating and controlling) sends invitations to the PoC Clients of the Invited PoC Subscribers as described in the subclause 5.2.2 "*Ad-hoc PoC Group Session invitation to the PoC Client*". When the first Auto-answer response from the terminating side is received the PoC Server A (participating & controlling) sends UNCONFIRMED OK response towards the PoC Client A indicating that none of the Invited PoC Users are yet connected in the PoC Session and providing an indication of permission for the PoC Client to continue to perform Media buffering and to send a Limited Segment of Media up to a specified size (the size of Limited Segment specified must be sufficiently large to cover the worst case round trip for sending a Talk Burst confirm message and receiving the first Media packet). The supported Media Types in the UNCONFIRMED OK response can depend on the local policy independent of the supported Media Types contained in the first AUTO-ANSWER response received by the PoC Server A (participating & controlling).

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Information elements contained in UNCONFIRMED OK response:

a. Media Parameters of PoC Server A (participating & controlling)

b. Selected Talk Burst Control Protocol and/or Media Burst Control Protocol.

c. Media-floor Control Entities response.

d. QoE Profile for the PoC Session

e. Client buffering permission indication

f. Limited Segment preload permission and buffer size

4. SIP/IP Core A forwards the UNCONFIRMED OK response to the PoC Client A.

   Information elements contained in UNCONFIRMED OK response:

   a. Media Parameters of PoC Server A (participating & controlling)

   b. Selected Talk Burst Control Protocol and/or Media Burst Control Protocol.

   c. Media-floor Control Entities response.

   d. QoE Profile for the PoC Session

   e. Client buffering permission indication

   f. Limited Segment preload permission and buffer size

5. The PoC Client A sends a Limited Segment of buffered Media to the PoC Server A (participating & controlling). The PoC Server A (participating & controlling) buffers the Media to be sent to the Invited PoC Clients when they are connected

6. The PoC Server A (participating & controlling) receives the first confirmed response from the terminating side and sends the message Talk Burst confirm response to the PoC Client A.

7. The PoC Client A sends remaining Media and new Media from the PoC User to the PoC Server A (participating & controlling). The PoC Server A (participating & controlling) sends the Media to the Invited PoC Clients that are connected once the Limited Segment preload Media is exhausted and buffers the Media in the meantime.

If none of the Invited PoC Users accepts the invitation, the PoC Server A (participating & controlling) rejects the PoC Session.

The negotiated Media Types of Participants in the PoC Session can be obtained as described in the subclause 5.10 *"Subscription to Participant information"*.

5.2.1.3 Confirmed Indication using Pre-established Session

This subclause describes a case where right-to-speak indication is given to the inviting PoC User when one of the Invited PoC Users has accepted the invitation and the Inviting PoC Client has Pre-established Session. Figure 10 *"Confirmed indication using Pre-established Session"* shows the signalling flow for this scenario.

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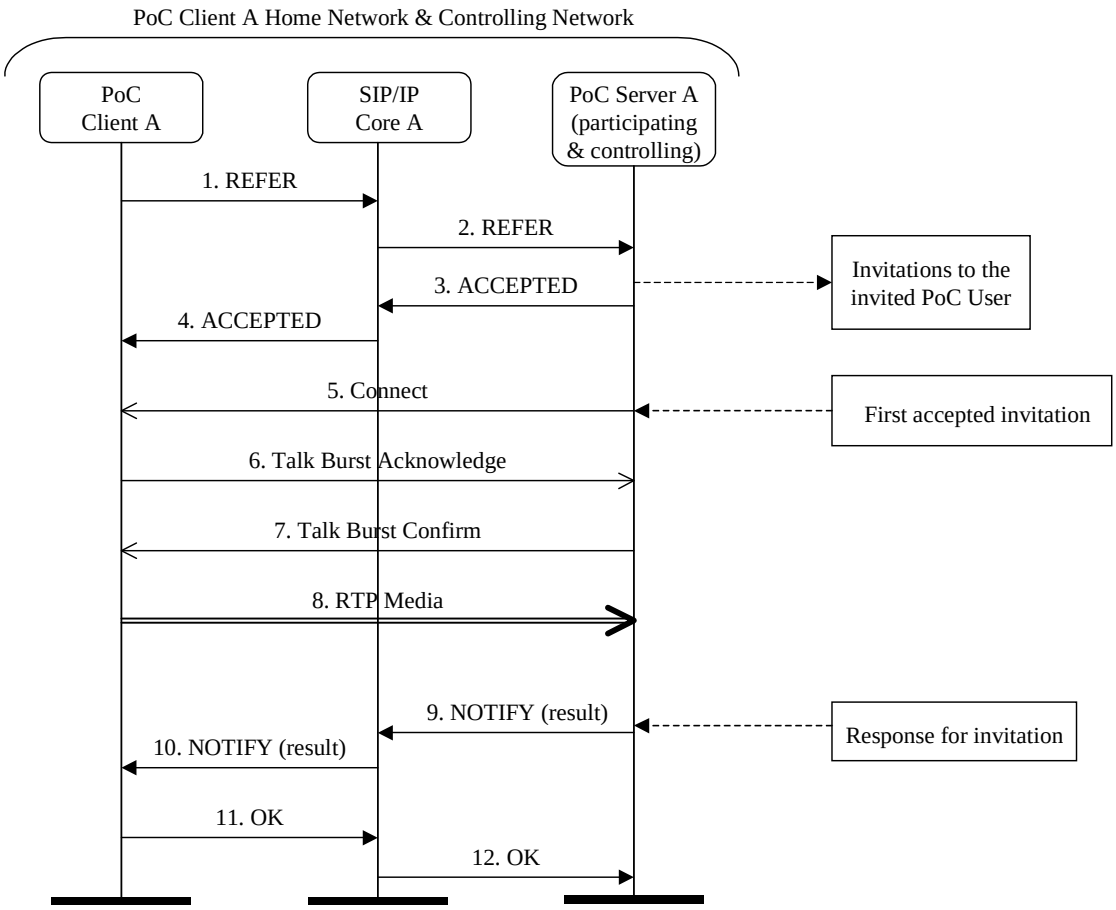

Figure 10: Confirmed Indication using Pre-established Session

1. In this case PoC Client A has a Pre-established Session with the PoC Server A (participating & controlling). PoC Client A initiates an Ad-hoc PoC Group Session or 1-1 PoC Session by sending REFER request to the Home PoC Network.

   Information elements contained in REFER request:

   a. A list of PoC Addresses of PoC Users to be invited.

   b. PoC service indication.

   c. PoC Address of the PoC User at the PoC Client A.

   d. A manual answer override request.

   e. A conference URI that identifies the Pre-established Session to which the REFER applies.

   f. Notification request.

   g. Media included in the request.

2. SIP/IP Core A forwards the REFER request to the PoC Server A (participating & controlling).

   Information elements contained in REFER request:

   a. A list of PoC Addresses of PoC Users to be invited.

   b. PoC service indication.

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c. PoC Address of the PoC User at the PoC Client A.

d. Manual answer override request.

e. A conference URI that identifies the Pre-established Session to which the REFER applies.

f. Notification request.

g. Media included in the request.

3. Since this is an Ad-hoc PoC Group Session setup or 1-1 PoC Session setup the PoC Server A (participating & controlling) takes the roles of the Controlling PoC Function and Participating PoC Function. The PoC Server A (participating & controlling) sends invitations to the PoC Clients of the Invited PoC Users as described in the subclause 5.2.2 "*Ad-hoc PoC Group Session invitation to the PoC Client*". The PoC Server A (participating & controlling) sends ACCEPTED response towards the PoC Client A.

4. SIP/IP Core A forwards the ACCEPTED response to the PoC Client A.

   When ALERTING response is received before final response, the PoC Server A (participating & controlling) can, depending on whether REFER request contains the notification request, send NOTIFY request to the PoC Client A with information about the provisional response.

5. When the first Invited PoC User has accepted the invitation the PoC Server A (participating & controlling) sends the connect message(s) to the PoC Client A. The PoC Server A sends one or multiple independent connect message(s) according to the binding between Media Types and Media-floor Control entities. The supported Media Type by the connect message(s) is independent of the supported Media Type contained in the first acceptance response received by the PoC Server A (participating & controlling) except 1-1 PoC Session setup case.

6. The PoC Client A acknowledges the connect with a Talk Burst acknowledge message to guarantee reliable delivery of the connect message

7. The PoC Server A sends a Talk Burst confirm response to the PoC Client A to indicate that PoC Client A is allowed to send Media Bursts.

8. The PoC Client A sends media to the PoC Server A (participating & controlling).

   The following optional signalling can take place according to the request of the PoC Client A:

9. When final response is received from an Invited PoC User, the PoC Server A (participating & controlling) sends NOTIFY request to the PoC Client A with information about the final result. A final result can be:

   a. The Invited PoC User accepted the invitation;

   b. The Invited PoC User rejected the invitation;

   c. The Invited PoC User is not reachable;

   d. The Invited PoC User is busy or

   e. The Invited PoC User did not answer.

10. The SIP/IP Core A forwards NOTIFY request to the PoC Client A.

11. When the PoC User A accepts the notification, the PoC Client A sends OK response for the NOTIFY request.

12. SIP/IP Core A forwards the OK response to the PoC Server A.

If none of the Invited PoC Users accepts the invitation, the PoC Server A (participating & controlling) rejects the PoC Session.

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5.2.1.4 Unconfirmed indication using Pre-established Session

This subclause describes a case where right-to-speak indication is given to the inviting PoC User when one of the Invited PoC Users is reachable and uses automatic answer and the Inviting PoC Client has a Pre-established Session. Figure 11 *"Unconfirmed Indication using Pre-established Session"* shows the signalling flow for this scenario.

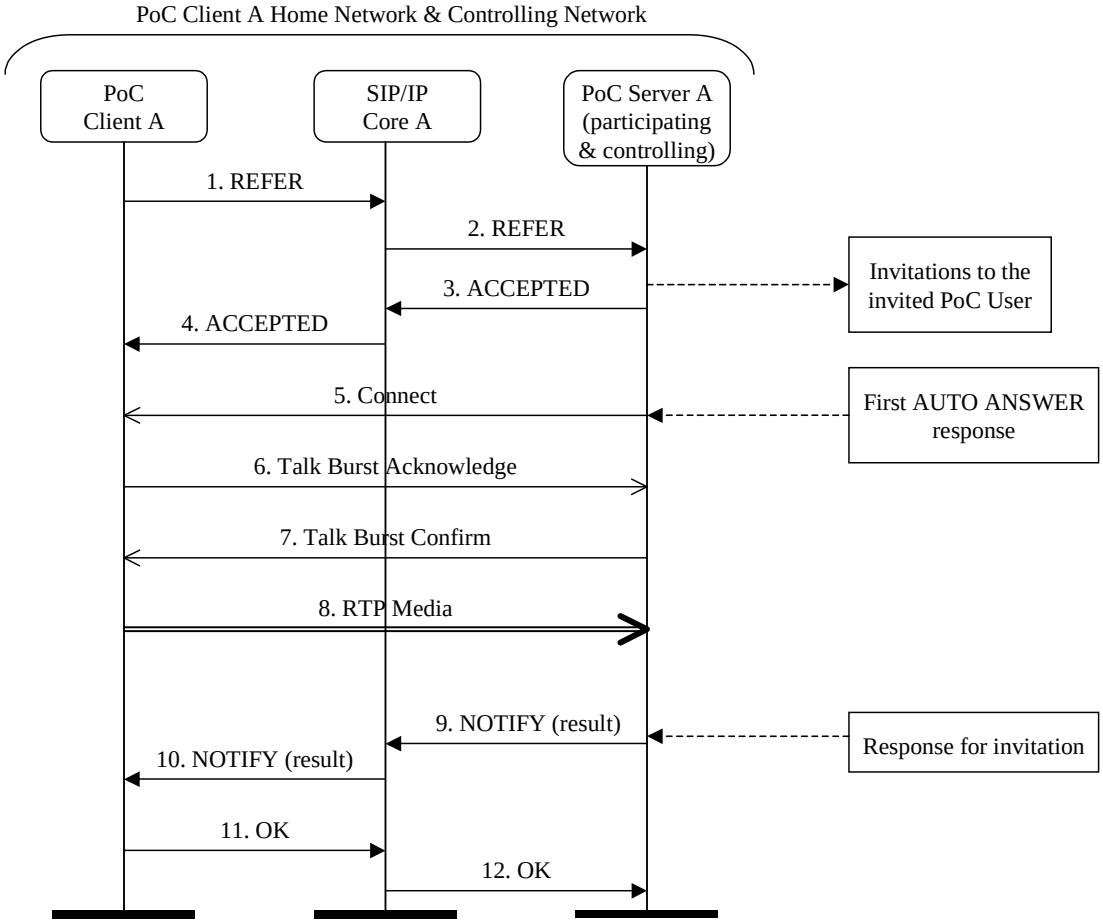

Figure 11: Unconfirmed Indication using Pre-established Session

1. In this case PoC Client A has a Pre-established Session with the PoC Server A (participating & controlling). PoC Client A initiates an Ad-hoc PoC Group Session or 1-1 PoC Session by sending the REFER request to the Home PoC Network.

   Information elements contained in REFER request:

   a. A list of PoC Addresses of PoC Users to be invited

   b. PoC service indication

   c. PoC Address of the PoC User at the PoC Client A

   d. A manual answer override request

   e. A conference URI that identifies the Pre-established Session to which the REFER applies

   f. Notification request.

   g. Media included in the request.

2. SIP/IP Core A forwards the REFER request to the PoC Server A (participating & controlling).

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Information elements contained in REFER request:

a. A list of PoC Addresses of PoC Users to be invited

b. PoC service indication

c. PoC Address of the PoC User at the PoC Client A

d. Manual answer override request, if selected by PoC Client A

e. A conference URI that identifies the Pre-established Session to which the REFER applies

f. Notification request.

g. Media included in the request.

3. Since this is an ad-hoc PoC Group Session setup or 1-1 PoC Session setup the PoC Server A (participating & controlling) takes the roles of the Controlling PoC Function and Participating PoC Function. The PoC Server A (participating & controlling) sends invitations to the PoC Clients of the Invited PoC Users as described in the subclause 5.2.2 "*Ad-hoc PoC Group Session invitation to the PoC Client*". The PoC Server A (controlling & participating) sends ACCEPTED response towards the PoC Client A.

4. SIP/IP Core A forwards the ACCEPTED response to the PoC Client A.

   When ALERTING response is received before final response, the PoC Server A (participating & controlling) can, depending on whether REFER request contains the notification request, send NOTIFY request to the PoC Client A with information about the provisional response.

5. When the first AUTO-ANSWER response has been received the PoC Server A (participating & controlling) sends the connect message(s) to PoC Client A. The PoC Server A sends one or multiple independent connect message(s) according to the binding between Media Types and Media-floor Control entities. The supported Media Type by the connect message(s) is independent of the supported Media Type contained in the first Auto-Answer response received by the PoC Server A (participating & controlling) except 1-1 PoC Session setup case.

6. The PoC Client A acknowledges the connect message with a Talk Burst acknowledge message to guarantee reliable delivery of the connect message.

7. The PoC Server A send a Talk Burst confirm message to the PoC Client A to indicate that PoC Client A is allowed to send media.

8. The PoC Client A sends media to the PoC Server A (participating & controlling) which buffers the media stream for the late delivery upon responses by the Invited PoC Users.

   The following optional signalling can take place according to the request of the PoC Client A:

9. When final response is received from an Invited PoC User, the PoC Server A (controlling and participating) sends NOTIFY request towards the PoC Client A with information about the final result. A final result can be

   a. The Invited PoC User accepted the invitation;

   b. The Invited PoC User rejected the invitation;

   c. The Invited PoC User is not reachable;

   d. The Invited PoC User is busy or

   e. The Invited PoC User did not answer

10. SIP/IP Core A forwards the NOTIFY request to the PoC Client A.

11. When the PoC User A accepts the notification, the PoC Client A sends OK response for the NOTIFY request.

12. SIP/IP Core A forwards the OK response to the PoC Server A.

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If none of the Invited PoC Users accepts the invitation, the PoC Server A (participating & controlling) rejects the PoC Session.

5.2.2 Ad-hoc PoC Group Session invitation to the PoC Client

In the following subclauses different setup cases are described from the Invited PoC Client point of view.

Chapter 5.2.2.1 *"Automatic answer case using On-demand Session"* describes a scenario where the Invited PoC User has defined that the PoC Session request from the inviting PoC User is accepted automatically.

Chapter 5.2.2.2 *"Automatic answer using Pre-established Session"* describes a scenario where the Invited PoC User has a Pre-established Session with the PoC Server and has defined that the PoC Session request from the Inviting PoC Client is accepted automatically.

Chapter 5.2.2.3 *"Manual answer case"* describes a scenario where the Invited PoC User answers manually to the PoC Session request.

Chapter 5.2.2.4 *"Manual answer override case"* describes a scenario using an On-demand Session where the inviting PoC User has requested a manual answer override and the Invited PoC User is configured to answer manually to the PoC Session request.

5.2.2.1 Automatic answer using On-demand Session

This subclause describes a scenario where the Invited PoC User has defined that the PoC Session request from the inviting PoC User is accepted automatically, an On-demand Session establishment is used and invited parties information is delivered. Figure 12 *"Automatic answer using On-demand Session"* shows signalling flow for this scenario.

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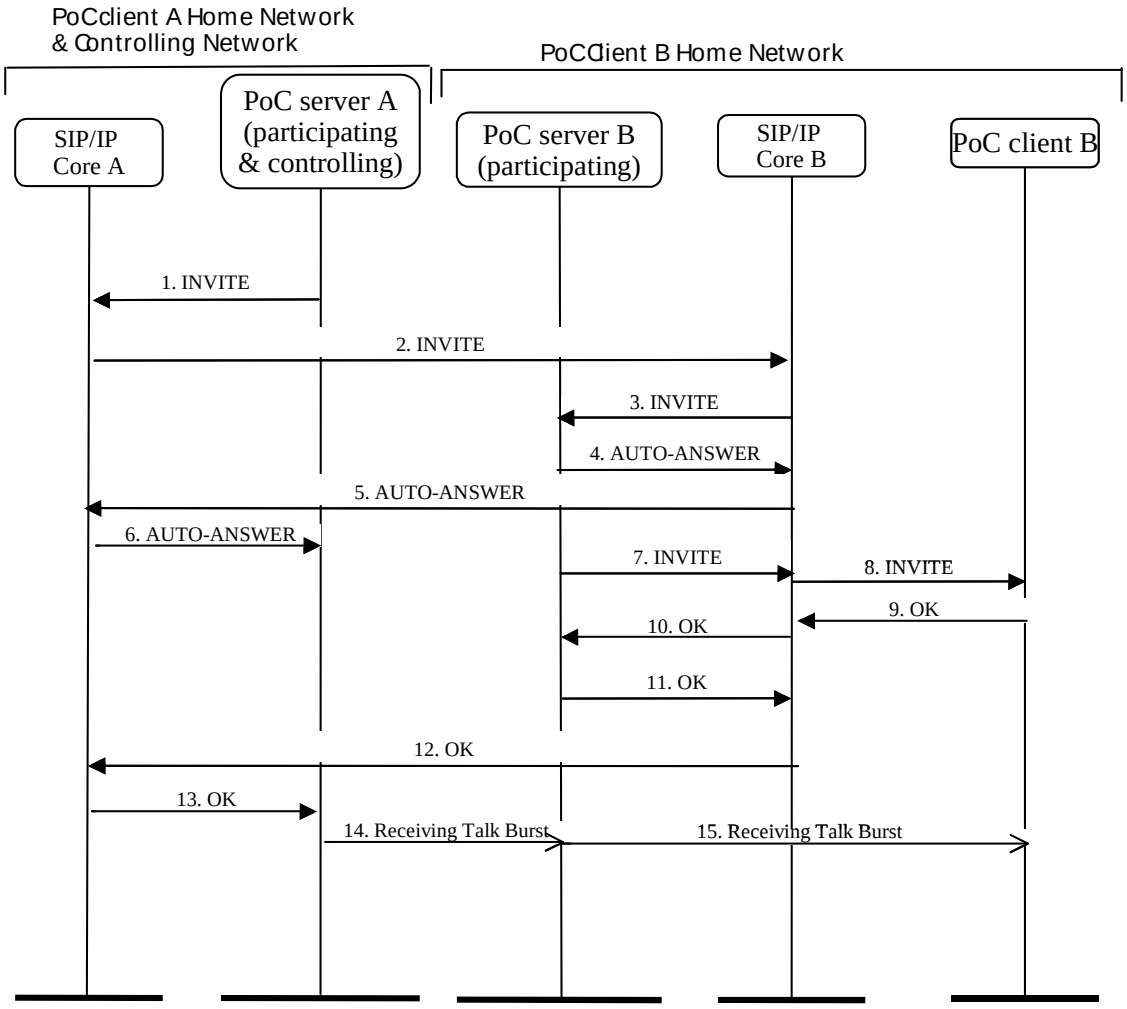

Figure 12: Automatic answer using On-demand Session

1. PoC Server A (participating & controlling) sends INVITE request to the SIP/IP Core A.

   Information elements contained in INVITE request:

   a. PoC Address of PoC User at the PoC Client B

   b. Media Parameters of PoC Server A (participating & controlling)

   c. PoC service indication

   d. PoC Address of the PoC User at the PoC Client A

   e. Controlling PoC Function assigned indication

   f. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal

   g. Manual answer override request, if selected by PoC Client A.

   h. Media-floor Control Entities proposal.

   i. QoE Profile for the PoC Session

   j. A list of PoC Addresses of PoC Users to be invited to the PoC Session

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k. Media included in the request

2. SIP/IP Core A routes the request to the PoC Client B home network.

   Information elements contained in INVITE request:

   a. PoC Address of PoC User at the PoC Client B

   b. Media Parameters of PoC Server A (participating & controlling)

   c. PoC service indication

   d. PoC Address of the PoC User at the PoC Client A

   e. Controlling PoC Function assigned indication

   f. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal

   g. Manual answer override request, if selected by PoC Client A.

   h. Media-floor Control Entities proposal.

   i. QoE Profile for the PoC Session

   j. A list of PoC Addresses of PoC Users to be invited to the PoC Session

   k. Media included in the request

3. SIP/IP Core B routes the request to the PoC Server B (participating) based on the PoC Address of Invited PoC Client and PoC Service indication.

   Information elements contained in INVITE request:

   a. PoC Address of PoC User at the PoC Client B

   b. Media Parameters of PoC Server A (participating & controlling)

   c. PoC service indication

   d. PoC Address of PoC User at the PoC Client A

   e. Controlling PoC Function assigned indication

   f. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal

   g. Manual answer override request, if selected by PoC Client A.

   h. Media-floor Control Entities proposal.

   i. QoE Profile for the PoC Session

   j. A list of PoC Addresses of PoC Users to be invited to the PoC Session

   k. Media included in the request

4. Since in this case the PoC Client B is accepting the PoC Session automatically, the PoC Server B (participating) sends AUTO-ANSWER response back towards the controlling network. The AUTO-ANSWER response indicates that the automatic acceptance is used by the PoC Client B.

5. SIP/IP Core B forwards the AUTO-ANSWER response to the controlling network.

6. SIP/IP Core A forwards the AUTO-ANSWER response to the PoC Server A (participating & controlling)

7. PoC Server B (participating) sends the PoC Session setup request to the SIP/IP Core B.

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Information elements contained in INVITE request:

a. Media Parameters of the PoC Server B (participating), if PoC Server B (participating) stays on the media and Talk Burst Control and/or Media Burst Control message path, otherwise Media Parameters received from the controlling network are included.

b. PoC service indication

c. Automatic acceptance indication

d. PoC Address of PoC User at the PoC Client B

e. PoC Address of PoC User at the PoC Client A

f. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal

g. Media-floor Control Entities proposal.

h. Manual answer override request, if selected by PoC Client A and if PoC Client B has authorised PoC Client A to issue a manual answer override request and PoC Server B (participating) supports manual answer override.

i. QoE Profile for the PoC Session

j. A list of PoC Addresses of PoC Users to be invited to the PoC Session

k. Media included in the request

8. SIP/IP Core B routes the INVITE request to the PoC Client B.

Information elements contained in INVITE request:

a. Media Parameters of the PoC Server B (participating), if PoC Server B (participating) stays on the media and Talk Burst Control and/or Media Burst Control message path, otherwise Media Parameters received from the controlling network are included.

b. PoC service indication

c. Automatic acceptance indication

d. PoC Address of PoC User at the PoC Client B

e. PoC Address of PoC User at the PoC Client A

f. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal

g. Media-floor Control Entities proposal.

h. Manual answer override request, if selected by PoC Client A and included by PoC Server B.

i. QoE Profile for the PoC Session

j. A list of PoC Addresses of PoC Users to be invited to the PoC Session

k. Media included in the request

9. When the PoC Client B receives the INVITE request, the PoC Client B sends an OK response for the INVITE.

Information elements contained in OK response:

a. Media Parameters of the PoC Client B

b. Selected Talk Burst Control Protocol and/or Media Burst Control Protocol.

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c. Media-floor Control Entities response.

d. Local QoE Profile for the PoC Client B

10. SIP/IP Core B forwards the OK response to the PoC Server B (participating)

    Information elements contained in OK response:

    a. Media Parameters of the PoC Client B

    b. Selected Talk Burst Control Protocol and/or Media Burst Control Protocol.

    c. Media-floor Control Entities response.

    d. Local QoE Profile for the PoC Client B

11. When PoC Server B (participating) receives OK response it will forward it to towards controlling network. The OK response includes following information:

    Information elements contained in OK response:

    a. Media Parameters of PoC Server B if PoC Server B (participating) stays on the media and Talk Burst Control message path, otherwise Media Parameters received from the PoC Client B are included

    b. Selected Talk Burst Control Protocol and/or Media Burst Control Protocol.

    c. Media-floor Control Entities response.

    d. Local QoE Profile for the PoC Client B

12. SIP/IP Core B forwards the OK response to the controlling network

    Information elements contained in OK response:

    a. Media Parameters of PoC Server B if PoC Server B (participating) stays on the media and Talk Burst Control message path, otherwise Media Parameters received from the PoC Client B are included

    b. Selected Talk Burst Control Protocol and/or Media Burst Control Protocol.

    c. Media-floor Control Entities response.

    d. Local QoE Profile for the PoC Client B

13. SIP/IP Core A forwards the OK response to the PoC Server A (participating & controlling)

    Information elements contained in OK response:

    a. Media Parameters of PoC Server B if PoC Server B (participating) stays on the media and Talk Burst Control message path, otherwise Media Parameters received from the PoC Client B are included

    b. Selected Talk Burst Control Protocol and/or Media Burst Control Protocol.

    c. Media-floor Control Entities response.

    d. Local QoE Profile for the PoC Client B

14. The PoC Server A sends the receiving Talk Burst indication to the PoC Server B.

    Information elements contained in receiving Talk Burst indication:

    a. PoC Address of the Participant at the PoC Client sending the Talk Burst

    b. Nick Name of the Participant at the PoC Client sending the Talk Burst.

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15. PoC Server B (participating) transfers the receiving Talk Burst message to the PoC Client B.

    Information elements contained in receiving Talk Burst indication:

    a. PoC Address of the Participant at the PoC Client sending the Talk Burst

    b. Nick Name of the Participant at the PoC Client sending the Talk Burst.

NOTE: If the Participating PoC Server B is not on the media and Talk Burst Control and/or Media Burst Control message path, the PoC Server A sends the receiving Talk Burst indication directly to the PoC Client B.

5.2.2.2 Automatic answer using Pre-established Session

This subclause describes the Pre-established Session scenario where the Invited PoC User answers automatically and the invited parties information is delivered.

This scenario is valid in cases:

- Invited PoC User has defined that the PoC Session request from the inviting PoC User is accepted automatically and
- the Invited PoC User has defined that the inviting PoC User is allowed to override the manual answer setting and the inviting PoC User has selected to do so and the PoC Server supports the optional manual answer override capability.

NOTE: If Inviting PoC Client or PoC Server performing Participating PoC Function is not able to use an existing Pre-established Session, then it can either use the On-demand Session or make session modification for the Pre-established Session to get Media Types and Media Parameters to match between the invitation request and the existing Pre-established Session.

Figure 13 *"Answer using Pre-established Session"* shows signalling flow for this scenario.

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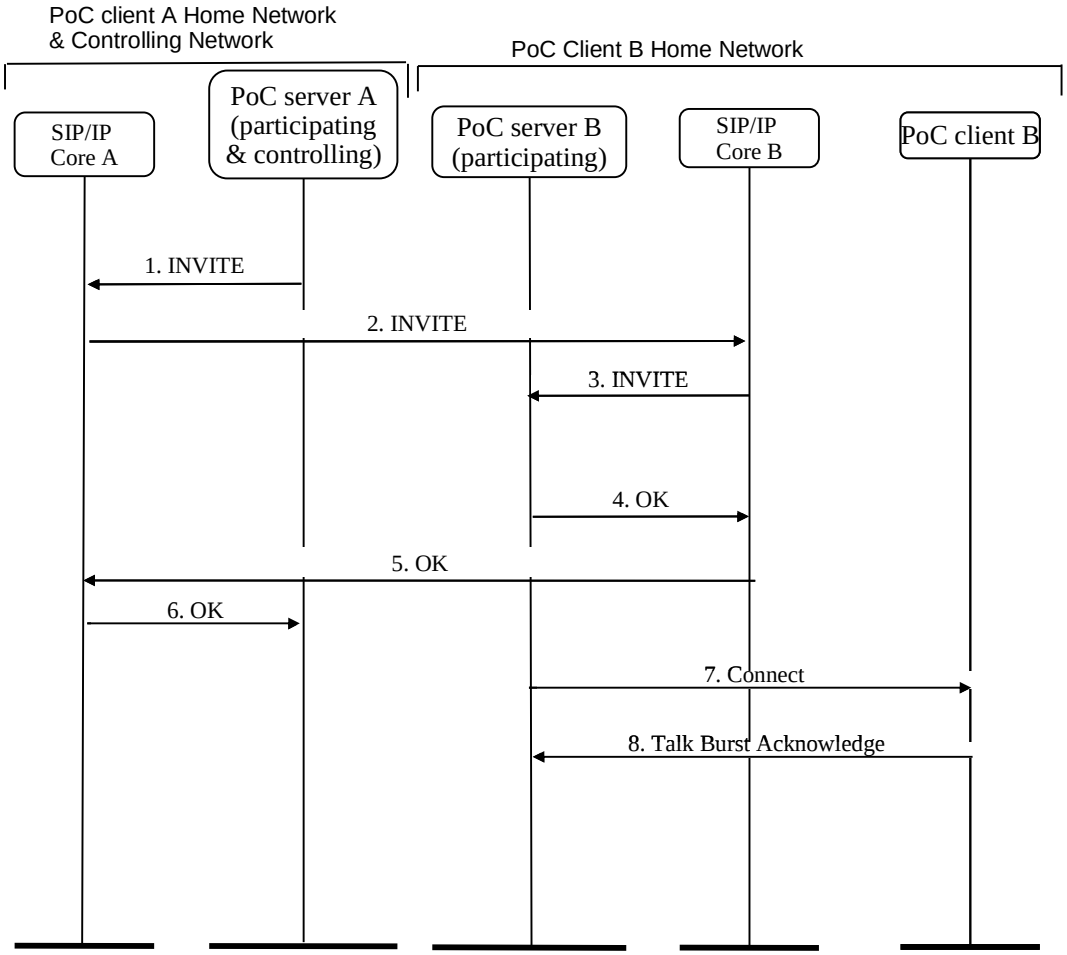

Figure 13: Answer using Pre-established Session

1. PoC Server A (participating & controlling) sends INVITE request to the SIP/IP Core A.

   Information elements contained in INVITE request:

   a. PoC Address of the PoC User at the PoC Client B

   b. Media Parameters of PoC Server A (participating & controlling)

   c. PoC service indication

   d. PoC Address of the PoC User at the PoC Client A

   e. Controlling PoC Function assigned indication

   f. Manual answer override request, if selected by PoC Client A

   g. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal.

   h. Media-floor Control Entities proposal.

   i. QoE Profile for the PoC Session

   j. A list of PoC Addresses of PoC Users to be invited to the PoC Session

   k. Media included in the request.

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2. SIP/IP Core A routes the request to the PoC Client B home network.

   Information elements contained in INVITE request:

   a. PoC Address of the PoC User at the PoC Client B

   b. Media Parameters of PoC Server A (participating & controlling)

   c. PoC service indication

   d. PoC Address of the PoC User at the PoC Client A

   e. Controlling PoC Function assigned indication

   f. Manual answer override request, if selected by PoC Client A

   g. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal.

   h. Media-floor Control Entities proposal.

   i. QoE Profile for the PoC Session.

   j. A list of PoC Addresses of PoC Users to be invited to the PoC Session.

   k. Media included in the request.

3. SIP/IP Core B routes the request to the PoC Server B (participating) based on PoC Address of the Invited PoC User and PoC service indication.

   Information elements contained in INVITE request:

   a. PoC Address of the PoC User at the PoC Client B

   b. Media Parameters of PoC Server A (participating & controlling)

   c. PoC service indication

   d. PoC Address of the PoC User at the PoC Client A

   e. Controlling PoC Function assigned indication

   f. Manual answer override request, if selected by PoC Client

   g. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal.

   h. Media-floor Control Entities proposal.

   i. QoE Profile for the PoC Session.

   j. A list of PoC Addresses of PoC Users to be invited to the PoC Session.

   k. Media included in the request.

4. If the PoC Client B is accepting the PoC Session automatically, or if PoC Client B has authorised PoC Client A to issue a manual answer override request and PoC Server B (participating) supports manual answer override, then the PoC Server B (participating) sends OK response back towards the controlling network.

   Information elements contained in OK response:

   a. Media Parameters of PoC Server B

   b. Selected Talk Burst Control Protocol and/or Media Burst Control Protocol.

   c. Media-floor Control Entities response.

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d. Local QoE Profile for the PoC Client B

5. SIP/IP Core B forwards the OK response to the controlling network.

   Information elements contained in OK response:

   a. Media Parameters of PoC Server B

   b. Selected Talk Burst Control Protocol and/or Media Burst Control Protocol.

   c. Media-floor Control Entities response.

   d. Local QoE Profile for the PoC Client B

6. SIP/IP Core A forwards the OK response to the PoC Server A (participating & controlling)

   Information elements contained in OK response:

   a. Media Parameters of PoC Server B

   b. Selected Talk Burst Control Protocol and/or Media Burst Control Protocol.

   c. Media-floor Control Entities response.

   d. Local QoE Profile for the PoC Client B

7. The PoC Server B (participating) sends the connect message to the PoC Client B.

   Information elements contained in the connect message:

   a. PoC Address of the Participant at the PoC Client initiating the invitation

   b. Nick Name of the Participant at the PoC Client initiating the invitation

   c. Manual answer override request indication, if PoC Client A is authorized and PoC Server B supports manual answer override.

   d. A list of PoC Addresses of PoC Users to be invited to the PoC Session

8. The PoC Client B acknowledges the connect message with a Talk Burst acknowledge message to guarantee reliable delivery of the connect message

5.2.2.3 Manual answer case

This subclause describes a scenario where the Invited PoC User has selected the manual answer indication for responses to the PoC Session request and the invited parties information is delivered. The scenario is valid for On-demand Session case as well as for the Pre-established Session case. Figure 14 *"Manual Answer"* shows signalling flow for this scenario.

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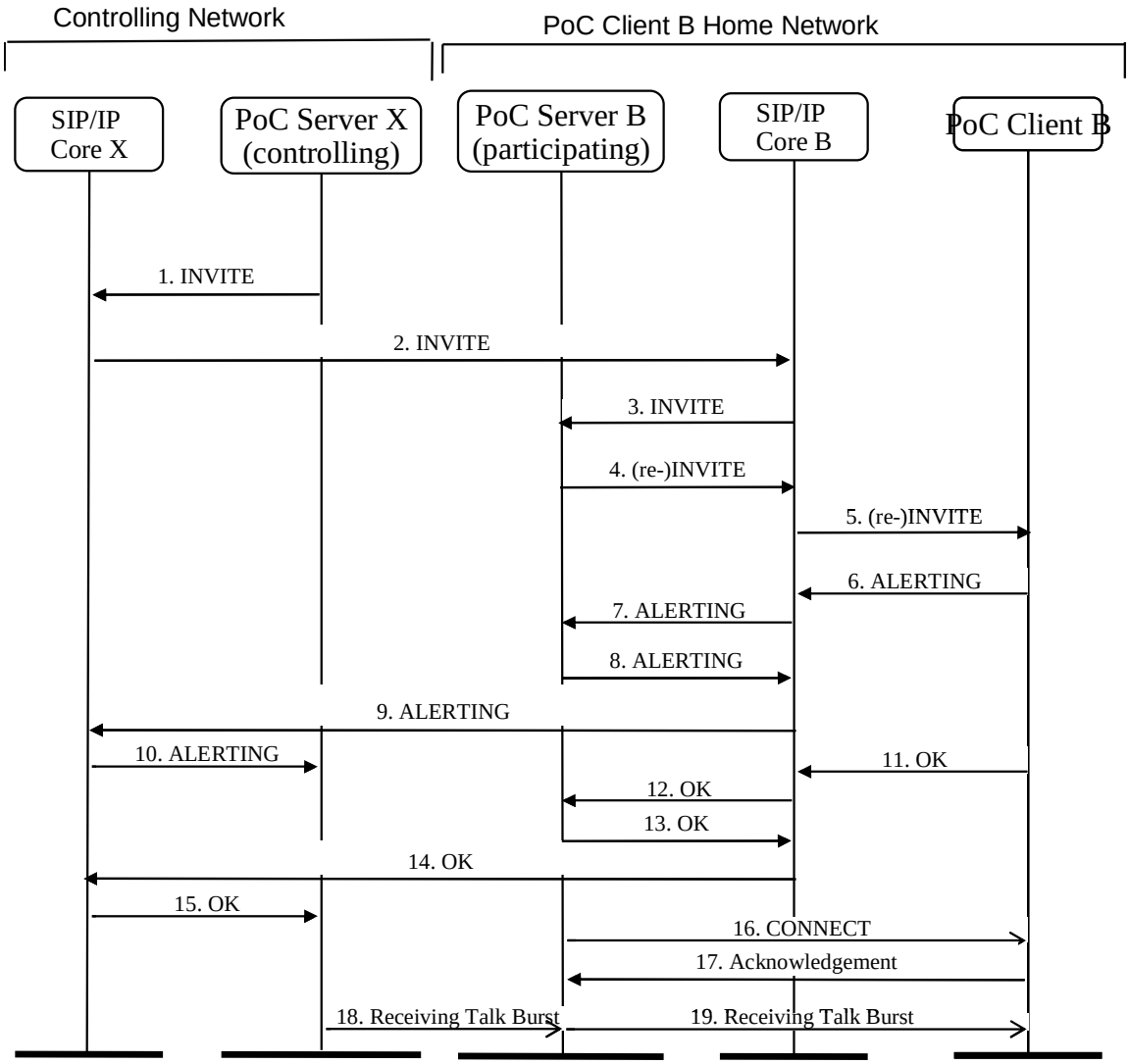

Figure 14: Manual Answer

1. PoC Server A (participating & controlling) sends INVITE request to the SIP/IP Core A.

   Information elements contained in INVITE request:

   a. PoC Address of the PoC User at the PoC Client B

   b. Media Parameters of PoC Server A (participating & controlling)

   c. PoC service indication

   d. PoC Address of the PoC User at the PoC Client A

   e. Controlling PoC Function assigned indication

   f. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal.

   g. Media-floor Control Entities proposal.

   h. QoE Profile for the PoC Session

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i. A list of PoC Addresses of PoC Users to be invited to the PoC Session

j. Media included in the request

2. SIP/IP Core A routes the request to the PoC Client B home network.

   Information elements contained in INVITE request:

   a. PoC Address of the PoC User at the PoC Client B

   b. Media Parameters of PoC Server A (participating & controlling)

   c. PoC service indication

   d. PoC Address of the PoC User at the PoC Client A

   e. Controlling PoC Function assigned indication

   f. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal.

   g. Media-floor Control Entities proposal.

   h. QoE Profile for the PoC Session

   i. A list of PoC Addresses of PoC Users to be invited to the PoC Session

   j. Media included in the request

3. SIP/IP Core B routes the request to the PoC Server B (participating) based on PoC Address of Invited PoC Client and PoC service indication.

   Information elements contained in INVITE request:

   a. PoC Address of the PoC User at the PoC Client B

   b. Media Parameters of PoC Server A (participating & controlling)

   c. PoC service indication

   d. PoC Address of the PoC User at the PoC Client A

   e. Controlling PoC Function assigned indication

   f. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal.

   g. Media-floor Control Entities proposal.

   h. QoE Profile for the PoC Session.

   i. A list of PoC Addresses of PoC Users to be invited to the PoC Session.

   j. Media included in the request.

4. The PoC Server B sends an INVITE request to the SIP/IP Core B. In case Pre-established Session is used, the PoC Server B sends a re-INVITE request within an existing Pre-established Session to the SIP/IP Core B, if supported by the PoC Server B and the PoC Client B.

   Information elements contained in INVITE/re-INVITE request:

   a. PoC Address of the PoC User at the PoC Client B

   b. Media Parameters of PoC Server B (participating) if PoC Server B stays on the media and Talk Burst Control and/or Media Burst Control path, otherwise Media Parameters received from the controlling network are included

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c. Manual answer request

d. PoC service indication

e. PoC Address of the PoC User at the PoC Client A

f. Controlling PoC Function assigned indication

g. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal.

h. Media-floor Control Entities proposal.

i. QoE Profile for the PoC Session

j. A list of PoC Addresses of PoC Users to be invited to the PoC Session

k. Media included in the request

5. SIP/IP Core B routes the INVITE/re-INVITE request to the PoC Client B

   Information elements contained in INVITE/re-INVITE request:

   a. PoC Address of the PoC User at the PoC Client B

   b. Media Parameters of PoC Server B (participating) if PoC Server B stays on the media and Talk Burst Control and/or Media Burst Control path, otherwise Media Parameters received from the controlling network are included

   c. Manual answer request

   d. PoC service indication

   e. PoC Address of the PoC User at the PoC Client A

   f. Controlling PoC Function assigned indication

   g. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal.

   h. Media-floor Control Entities proposal.

   i. QoE Profile for the PoC Session

   j. A list of PoC Addresses of PoC Users to be invited to the PoC Session

   k. Media included in the request

6. When the PoC Client B receives the INVITE/re-INVITE request PoC Client B prompts PoC User B about the PoC Session invitation and sends ALERTING response.

7. SIP/IP Core B forwards the ALERTING response to the PoC Server B (participating).

8. PoC Server B (participating) forwards ALERTING response towards controlling network.

9. SIP/IP Core B forwards the ALERTING response to the controlling network.

10. SIP/IP Core A forwards the ALERTING response to the PoC Server A (participating & controlling).

11. When the PoC User B accepts the invitation, the PoC Client B sends OK response for the INVITE request.

    Information elements contained in OK response:

    a. Media Parameters of the PoC Client B

    b. Selected Talk Burst Control Protocol and/or Media Burst Control Protocol.

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c. Media-floor Control Entities response if supported by the PoC Client B.

d. Local QoE Profile for the PoC Client B.

12. SIP/IP Core B forwards the OK response to the PoC Server B (participating)

    Information elements contained in OK response:

    a. Media Parameters of the PoC Client B

    b. Selected Talk Burst Control Protocol and/or Media Burst Control Protocol.

    c. Media-floor Control Entities response.

    d. Local QoE Profile for the PoC Client B.

13. When PoC Server B (participating) receives OK response it will forward it towards controlling network.

    Information elements contained in OK response:

    a. Media Parameters of PoC Server B if PoC Server B (participating) stays on the media and Talk Burst Control and/or Media Burst Control path, otherwise Media Parameters received from the PoC Client B are included

    b. Selected Talk Burst Control Protocol and/or Media Burst Control Protocol.

    c. Media-floor Control Entities response.

    d. Local QoE Profile for the PoC Client B.

14. SIP/IP Core B forwards the OK response to the controlling network

    Information elements contained in OK response:

    a. Media Parameters of PoC Server B if PoC Server B (participating) stays on the media and Talk Burst Control and/or Media Burst Control path, otherwise Media Parameters received from the PoC Client B are included

    b. Selected Talk Burst Control Protocol and/or Media Burst Control Protocol.

    c. Media-floor Control Entities response.

    d. Local QoE Profile for the PoC Client B.

15. SIP/IP Core A forwards the OK response to the PoC Server A (participating & controlling)

    Information elements contained in OK response:

    a. Media Parameters of PoC Server B if PoC Server B (participating) stays on the media and Talk Burst Control and/or Media Burst Control path, otherwise Media Parameters received from the PoC Client B are included

    b. Selected Talk Burst Control Protocol and/or Media Burst Control Protocol.

    c. Media-floor Control Entities response.

    d. Local QoE Profile for the PoC Client B.

16. The PoC Server B (participating) sends the connect message to the PoC Client B in case Pre-established Session is used.

    Information elements contained in the connect message:

    a. PoC Address of the Participant at the PoC Client initiating the invitation

    b. Nick Name of the Participant at the PoC Client initiating the invitation

    c. PoC Session Identity

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d. A list of PoC Addresses of PoC Users to be invited to the PoC Session

17. The PoC Client B acknowledges the connect message with a Talk Burst acknowledge message to guarantee reliable delivery of the connect message

18. When receiving OK response, the PoC Server A (participating & controlling) sends receiving Talk Burst indication the PoC Client B.

    Information elements contained in receiving Talk Burst indication:

    a. PoC Address of the Participant at the PoC Client sending the Talk Burst

    b. Nick Name of the Participant at the PoC Client sending the Talk Burst.

19. PoC Server B (participating) transfers the receiving Talk Burst indication to the PoC Client B.

    Information elements contained in receiving Talk Burst indication:

    a. PoC Address of the Participant at the PoC Client sending the Talk Burst

    b. Nick Name of the Participant at the PoC Client sending the Talk Burst.

If the Participating PoC Function B is not on the media and Talk Burst Control and/or Media Burst Control message path, the PoC Server A sends the receiving Talk Burst indication directly to the PoC Client B.

5.2.2.4 Manual answer override case – On-demand Session

This subclause describes a scenario where an inviting PoC User is authorized to issue manual answer override request and send INVITE request containing manual answer override and the invited parties information is delivered. Figure 15 *"Manual answer override procedure"* shows signalling flow for this scenario.

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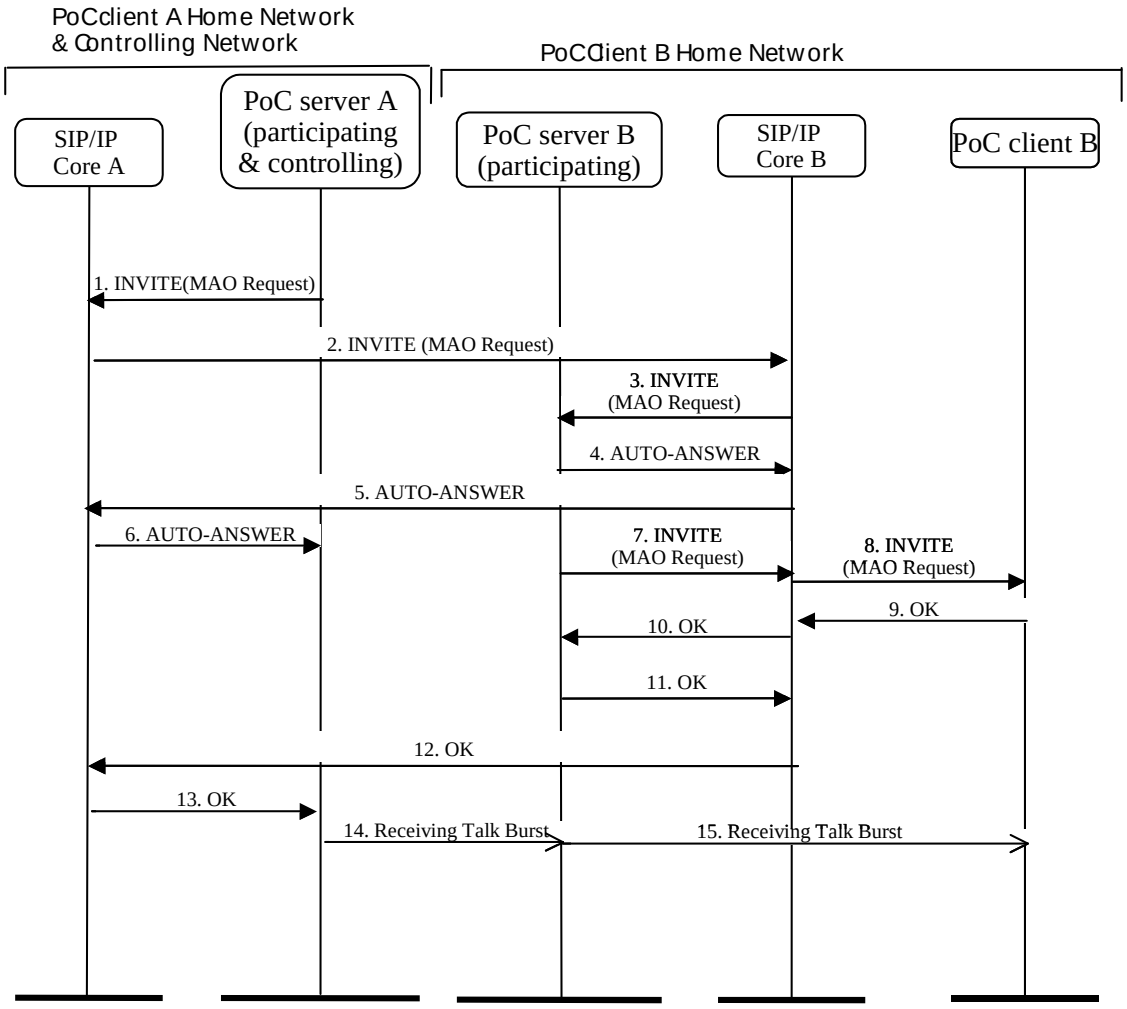

Figure 15: Manual answer override procedure

1. PoC Server A (participating & controlling) sends INVITE request to the SIP/IP Core A.

   Information elements contained in INVITE request:

   a. PoC Address of PoC User at the PoC Client B

   b. Media Parameters of PoC Server A (participating & controlling)

   c. PoC service indication

   d. PoC Address of the PoC User at the PoC Client A

   e. Controlling PoC Function assigned indication

   f. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal

   g. Media-floor Control Entities proposal.

   h. Manual answer override request.

   i. QoE Profile for the PoC Session.

   j. A list of PoC Addresses of PoC Users to be invited to the PoC Session

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k. Media included in the request

2. SIP/IP Core A routes the request to the PoC Client B home network.

   Information elements contained in INVITE request:

   a. PoC Address of PoC User at the PoC Client B

   b. Media Parameters of PoC Server A (participating & controlling)

   c. PoC Service indication

   d. PoC Address of the PoC User at the PoC Client A

   e. Controlling PoC Function assigned indication

   f. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal

   g. Media-floor Control Entities proposal.

   h. Manual answer override request.

   i. QoE Profile for the PoC Session.

   j. A list of PoC Addresses of PoC Users to be invited to the PoC sSession

   k. Media included in the request

3. SIP/IP Core B routes the request to the PoC Server B (participating) based on the PoC Address of Invited PoC Client and PoC service indication.

   Information elements contained in INVITE request:

   a. PoC Address of PoC User at the PoC Client B

   b. Media Parameters of PoC Server A (participating & controlling)

   c. PoC service indication

   d. PoC Address of PoC User at the PoC Client A

   e. Controlling PoC Function assigned indication

   f. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal

   g. Media-floor Control Entities proposal.

   h. Manual answer override request.

   i. QoE Profile for the PoC Session.

   j. A list of PoC Addresses of PoC Users to be invited to the PoC sSession

   k. Media included in the request

4. If the inviting PoC User is authorized to issue manual answer override request, the PoC Server B (participating) sends AUTO-ANSWER response back towards the controlling network whether Answer Mode Indication at PoC Server B (participating) is set to Automatic Answer Mode or Manual Answer Mode. The AUTO-ANSWER response triggers the controlling network to progress session in originating part.

5. SIP/IP Core B forwards the manual answer override response to the controlling network.

6. SIP/IP Core A forwards the manual answer override response to the PoC Server A (participating & controlling)

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7. PoC Server B (participating) sends the PoC Session setup request to the SIP/IP Core B. Information elements contained in INVITE request:
   a. Media Parameters of the PoC Server B (participating), if PoC Server B (participating) stays on the media and Talk Burst Control and/or Media Burst Control message path, otherwise Media Parameters received from the controlling network are included.
   b. PoC service indication
   c. PoC Address of PoC User at the PoC Client B
   d. PoC Address of PoC User at the PoC Client A
   e. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal
   f. Media-floor Control Entities proposal.
   g. Manual answer override request.
   h. QoE Profile for the PoC Session
   i. A list of PoC Addresses of PoC Users to be invited to the PoC Session.
   j. Media included in the request
8. SIP/IP Core B routes the INVITE request to the PoC Client B. Information elements contained in INVITE request:

   NOTE: In case of Pre-established Session it is available that the re-INVITE request is sent.

   a. Media Parameters of the PoC server B (participating), if PoC Server B (participating) stays on the media and Talk Burst Control and/or Media Burst Control message path, otherwise Media Parameters received from the controlling network are included.
   b. PoC service indication
   c. PoC Address of PoC User at the PoC Client B
   d. PoC Address of PoC User at the PoC Client A
   e. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal
   f. Media-floor Control Entities proposal.
   g. Manual answer override request.
   h. QoE Profile for the PoC Session
   i. A list of PoC Addresses of PoC Users to be invited to the PoC Session.
   j. Media included in the request
9. When the PoC Client B receives the INVITE request, the PoC Client B sends an OK response for the INVITE request. Information elements contained in the OK response:
   a. Media Parameters of the PoC Client B
   b. Selected Talk Burst Control Protocol and/or Media Burst Control Protocol.
   c. Media-floor Control Entities response.
   d. Local QoE Profile for the PoC Client B.

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10. SIP/IP Core B forwards the OK response to the PoC Server B (participating). Information elements contained in OK response:
    a. Media Parameters of the PoC Client B
    b. Selected Talk Burst Control Protocol and/or Media Burst Control Protocol.
    c. Media-floor Control Entities response.
    d. Local QoE Profile for the PoC Client B.
11. When PoC Server B (participating) receives OK response it will forward it to towards controlling network. Information elements contained in OK response:
    a. Media Parameters of PoC Server B if PoC Server B (participating) stays on the media and Talk Burst Control and/or Media Burst Control message path, otherwise Media Parameters received from the PoC Client B are included
    b. Selected Talk Burst Control Protocol and/or Media Burst Control Protocol.
    c. Media-floor Control Entities response.
    d. Local QoE Profile for the PoC Client B.
12. SIP/IP Core B forwards the OK response to the controlling network. Information elements contained in OK response:
    a. Media Parameters of PoC Server B if PoC Server B (participating) stays on the media and Talk Burst Control and/or Media Burst Control message path, otherwise Media Parameters received from the PoC Client B are included
    b. Selected Talk Burst Control Protocol and/or Media Burst Control Protocol.
    c. Media-floor Control Entities response.
    d. Local QoE Profile for the PoC Client B.
13. SIP/IP Core A forwards the OK response to the PoC Server A (participating & controlling). Information elements contained in OK response:
    a. Media Parameters of PoC Server B if PoC Server B (participating) stays on the media and Talk Burst Control and/or Media Burst Control message path, otherwise Media Parameters received from the PoC Client B are included
    b. Selected Talk Burst Control Protocol and/or Media Burst Control Protocol.
    c. Media-floor Control Entities response.
    d. Local QoE Profile for the PoC Client B.
14. The PoC Server A sends the Talk Burst Control and/or Media Burst Control message informing the PoC Client B about the status in this case the receiving Talk Burst indication. Information elements contained in receiving Talk Burst indication:
    a. PoC Address of the Participant at the PoC Client sending the Talk Burst
    b. Nick Name of the Participant at the PoC Client sending the Talk burst.
15. The PoC Server B (participating) transfers the receiving Talk Burst message to the PoC Client B. Information elements contained in receiving Talk Burst indication:
    a. PoC Address of the Participant at the PoC Client sending the Talk Burst
    b. Nick Name of the Participant at the PoC Client sending the Talk Burst

If the Participating PoC Function B is not on the Media and Talk Burst Control and/or Media Burst Control message path, the PoC Server A sends the receiving Talk Burst indication directly to the PoC Client B.

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5.3 Pre-arranged PoC Group Session setup

A Pre-arranged PoC Group is a PoC Group having pre-defined PoC Group Identity and member list. A Pre-arranged PoC Group Session is initiated by one of the members. When a Pre-arranged PoC Group Session is initiated, all other PoC Group members are invited. The Pre-arranged PoC Group Session is established by using the PoC Group Identity in the invitation message.

In case the PoC User tries to initiate a Pre-arranged PoC Group Session, when the PoC Session is already ongoing (e.g., the PoC Client did not receive an invitation at the start of the PoC Session due to being out of radio range or not being powered on) the PoC Server adds the PoC User to the existing PoC Session, and notifies the PoC User that the PoC Session was already in progress.

5.3.1 Pre-arranged PoC Session invitation from PoC Client

Chapter 5.3.1.1 *"Confirmed indication using On-demand Session"* describes a case where right-to-speak indication is given to the inviting PoC User when one of the Invited PoC Users has accepted the invitation using On-demand Session establishment.

Chapter 5.3.1.2 *"Unconfirmed Indication using On-demand Session"* describes a case where right-to-speak indication is given to the inviting PoC User using On-demand Session when the Invited PoC Users is registered and uses automatic answer.

Chapter 5.3.1.3 *"Unconfirmed Indication using Pre-established Session"* describes a case where right-to-speak indication is given to the inviting PoC User using Pre-established Session when the Invited PoC Users is registered and uses automatic answer.

Chapter 5.3.1.4 *"Confirmed indication using Pre-established Session"* describes a case where right-to-speak indication is given to the Inviting PoC Client when one of the Invited PoC Clients has accepted the invitation.

5.3.1.1 Confirmed Indication using On-demand Session

In this case, the originator confirms the event that at least one of the PoC Group members has been connected before he starts speaking. In the Figure 16 *"Pre-arranged PoC Group Session setup, originating part"*, the right-to-speak indication in the Talk Burst Control and/or Media Burst Control follows the confirmation from the PoC Server X (controlling).

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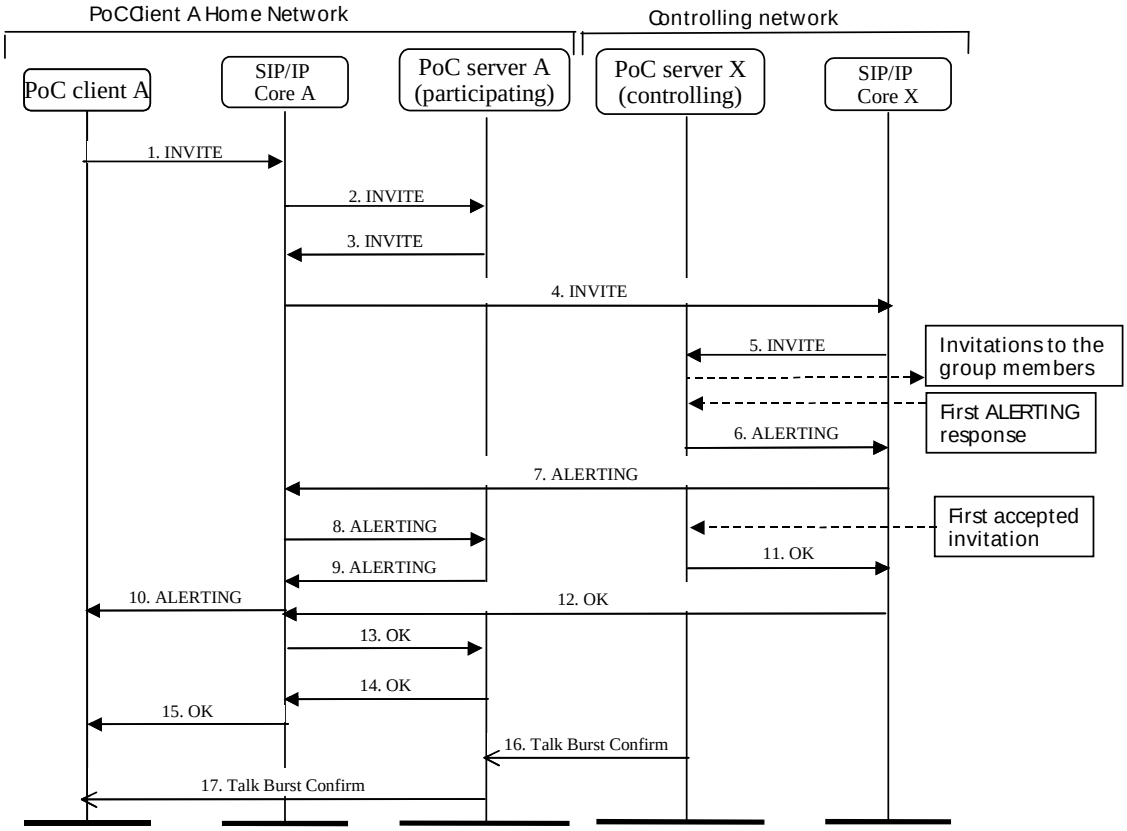

Figure 16: Pre-arranged PoC Group Session setup, originating part

1. The PoC Client A sends an INVITE request to the address of the Pre-arranged PoC Group.

   Information elements contained in the INVITE request:

   a. Pre-arranged PoC Group Identity

   b. PoC Address of the PoC User at the PoC Client A

   c. PoC service indication

   d. Media Parameters of PoC Client A

   e. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal

   f. A manual answer override request

   g. Media-floor Control Entities proposal.

   h. Desired QoE Profile

   i. Media included in the request

2. The SIP/IP Core A routes the INVITE request to the PoC Server A (participating) trigged on the PoC Service indication and the PoC Address.

   Information elements contained in the INVITE request:

   a. Pre-arranged PoC Group Identity

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b. PoC Address of the PoC User at the PoC Client A

c. PoC service indication

d. Media Parameters of PoC Client A

e. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal

f. Media-floor Control Entities proposal.

g. Manual answer override request, if selected by PoC Client A.

h. Desired QoE Profile

i. Media included in the request

3. The PoC Server A (participating) identifies that the Pre-arranged PoC Group is not hosted in this PoC Server therefore it sends the request to the SIP/IP Core A.

   Information elements contained in the INVITE request:

   a. Pre-arranged PoC Group Identity

   b. PoC Address of the PoC User at the PoC Client A

   c. PoC service indication

   d. PoC Server A (participating) selected Media Parameters

   e. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal

   f. Media-floor Control Entities proposal.

   g. Manual answer override request, if selected by PoC Client A.

   h. Desired QoE Profile

   i. Media included in the request

4. The SIP/IP Core A routes the request according to the routing principles to SIP/IP Core X.

   Information elements contained in the INVITE request:

   a. Pre-arranged PoC Group Identity

   b. PoC Address of the PoC User at the PoC Client A

   c. PoC service indication

   d. PoC Server A (participating) selected Media Parameters

   e. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal

   f. Media-floor Control Entities proposal.

   g. Manual answer override request, if selected by PoC Client A.

   h. Desired QoE Profile

   i. Media included in the request

5. The SIP/IP Core X routes the request to the PoC Server X (controlling) based on Pre-arranged PoC Group Identity. If the Pre-arranged PoC Group Identity is used for other services (e.g. messaging) that are hosted on other Application Servers then the SIP/IP Core needs to use PoC service indication to route to the PoC Server.

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The PoC Server X performs the necessary terminating service control (e.g. authorizes the PoC Client A) and if the PoC Address of the PoC User initiating the PoC Session is authorized successfully, the PoC Server X invites the other members to the Pre-arranged PoC Session as described in subclause 5.3.2 *"Pre-arranged PoC Group Session, terminating part"*. In the case the PoC Group Session already is ongoing the PoC Client is added to the PoC Session.

Information elements contained in the INVITE request:

a. Pre-arranged PoC Group Identity

b. PoC Address of the PoC User at the PoC Client A

c. PoC service indication

d. PoC Server A (participating) selected Media Parameters

e. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal

f. Media-floor Control Entities proposal.

g. A manual answer override request

h. Desired QoE Profile

i. Media included in the request

6-10. When the first ALERTING response is received the PoC Server X (controlling) sends ringing response towards the PoC Client A.

11-13. When the first PoC Client accepts the Pre-arranged PoC Session invitation, the PoC Server X sends an OK response to the PoC Server A (participating) along the same signalling path. The supported Media Types in the OK response maycan depend on the local policy independent does not depend on of the supported Media Types contained in the first acceptance OK response received by the PoC Server X from the terminating PoC Client.

Information elements contained in the OK response:

a. PoC Server X (controlling) selected Media Parameters

b. Selected Talk Burst Control Protocol and/or Media Burst Control Protocol.

c. Media-floor Control Entities response.

d. QoE Profile for the PoC Session.

14-15. The PoC Server A sends an OK response to the PoC Client A along the same signalling path.

Information elements contained in the OK response:

a. PoC Server A (participating) selected Media Parameters

b. Selected Talk Burst Control Protocol and/or Media Burst Control Protocol.

c. Media-floor Control Entities response.

d. QoE Profile for the PoC Session.

16. The PoC Server X (controlling) sends the Talk Burst confirm response to the PoC Server A (participating).

17. The PoC Server A (participating) transfers the Talk Burst confirm response to the PoC Client A.

The negotiated Media Types of Participants in the PoC Session can be obtained as described in the subclause 5.10 *"Subscription to Participant information"*.

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NOTE: In case of PoC Client is added to an ongoing PoC Session and the Talk Burst is already given to another Participant the Talk Burst reject is sent instead of Talk Burst confirm.

5.3.1.2 Unconfirmed Indication using On-demand Session

In this case, the originator does not have to confirm that the PoC Group members have been connected before he starts speaking: he can immediately speak after he receives the Unconfirmed Indication from the PoC Server X (controlling). The Figure 17 *"Unconfirmed Indication using On-demand Session"* shows the high level flow of this scenario.

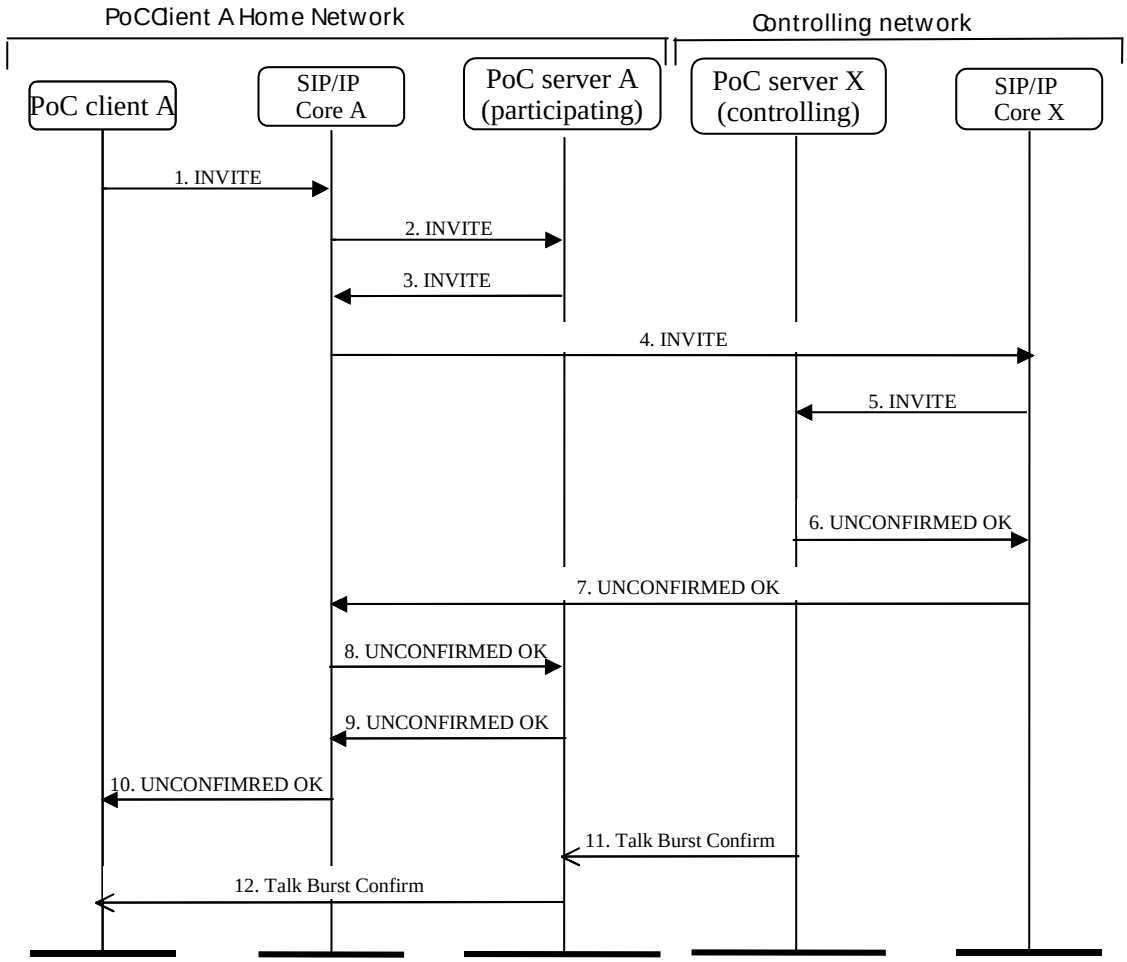

Figure 17: Unconfirmed Indication using On-demand Session.

1. The PoC Client A sends an INVITE request to the address of the Pre-arranged PoC Group. Information elements contained in the INVITE request:

   a. Pre-arranged PoC Group Identity

   b. PoC Address of the PoC User at the PoC Client A

   c. PoC service indication

   d. Media Parameters of the PoC Client A

   e. A manual answer override request

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f. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal.

g. Media-floor Control Entities proposal.

h. Desired QoE Profile

i. Media included in the request

2. The SIP/IP Core A routes the INVITE request to the PoC Server A (participating) trigged on the PoC service indication and PoC Address. Information elements contained in the INVITE request:

a. Pre-arranged PoC Group Identity

b. PoC Address of the PoC User at the PoC Client A

c. PoC service indication

d. Media Parameters of the PoC Client A

e. Manual answer override request, if selected by PoC Client A

f. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal.

g. Media-floor Control Entities proposal.

h. Desired QoE Profile

i. Media included in the request

3. The PoC Server A (participating) identifies that the Pre-arranged PoC Group is not hosted in this PoC Server therefore it sends the request to the SIP/IP Core A. Information elements contained in the INVITE request:

a. Pre-arranged PoC Group Identity

b. PoC Address of the PoC User at the PoC Client A

c. PoC service indication

d. PoC Server A (participating) selected Media Parameters

e. Manual answer override request, if selected by PoC Client A

f. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal.

g. Media-floor Control Entities proposal.

h. Desired QoE Profile

i. Media included in the request

4. The SIP/IP Core A routes the request according to the routing principles to SIP/IP Core X. Information elements contained in the INVITE request:

a. Pre-arranged PoC Group Identity

b. PoC Address of the PoC User at the PoC Client A

c. PoC service indication

d. PoC Server A (participating) selected Media Parameters

e. Manual answer override request, if selected by PoC Client A

f. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal.

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g. Media-floor Control Entities proposal.

h. Desired QoE Profile

i. Media included in the request

5. The SIP/IP Core X routes the request to the PoC Server X (controlling) based on Pre-arranged PoC Group Identity. If the Pre-arranged PoC Group Identity is used for other services (e.g. messaging) that are hosted on other Application Servers then the SIP/IP Core needs to use PoC service indication to route to the PoC Server. The PoC Server X performs the necessary terminating service control (e.g. authorizes the PoC Client A, and verifying authorization to override a manual answer setting, if requested) and if the PoC Address of the PoC User initiating the PoC Session is authorized successfully, the PoC Server X invites the other members to the Pre-arranged PoC Session as described in 5.3.2 *"Pre-arranged PoC Group Session, terminating part"*. In the case the PoC Group Session already is ongoing the PoC Client is added to the PoC Session.

   Information elements contained in the INVITE request:

   a. Pre-arranged PoC Group Identity

   b. PoC Address of the PoC User at the PoC Client A

   c. PoC service indication

   d. PoC Server A (participating) selected Media Parameters

   e. Manual answer override request, if selected by PoC Client A and authorisation has been verified by PoC Server X

   f. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal.

   g. Media-floor Control Entities proposal.

   h. Desired QoE Profile

   i. Media included in the request

6-8. When the PoC Server X receives the first auto-answer indication, it sends the unconfirmed OK response to the PoC Server A through the signalling path. The supported Media Types in the UNCONFIRMED OK response can depend on the local policy independent of the supported Media Types contained in the first AUTO-ANSWER response received by the PoC Server X.

   Information elements contained in the unconfirmed OK response:

   a. PoC Server X (controlling) selected Media Parameters

   b. Selected Talk Burst Control Protocol and/or Media Burst Control Protocol.

   c. Media-floor Control Entities response.

   d. QoE Profile for the PoC Session

9-10. The PoC Server A sends an unconfirmed OK response to the PoC Client A along the same signalling path.

   Information elements contained in the unconfirmed OK response:

   a. PoC Server A (participating) selected Media Parameters

   b. Selected Talk Burst Control Protocol and/or Media Burst Control Protocol.

   c. Media-floor Control Entities response.

   d. QoE Profile for the PoC Session

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11. The PoC Server X (controlling) sends the Talk Burst confirm response to the PoC Server A (participating).

12. The PoC Server A (participating) transfers the Talk Burst confirm response to the PoC Client A. The PoC Client A is now able to start sending and the PoC Server X buffers the media for the late delivery upon the response from the terminating PoC Client indicating the acceptance of the session.

The negotiated Media Types of Participants in the PoC Session can be obtained as described in the subclause 5.10 *"Subscription to Participant information"*.

NOTE: In case of PoC Client is added to an ongoing PoC Session and the Talk Burst is already given to another Participant the Talk Burst reject is sent instead of Talk Burst confirm.

5.3.1.3 Unconfirmed Indication using Pre-Established Session

In this case, the originator does not have to confirm that the PoC Group members have been connected before he starts speaking: he can immediately speak after he receives the Unconfirmed Indication from the PoC Server X (Controlling). The Figure 18 *"Unconfirmed Indication using Pre-established Session"* shows the high level flow of this scenario.

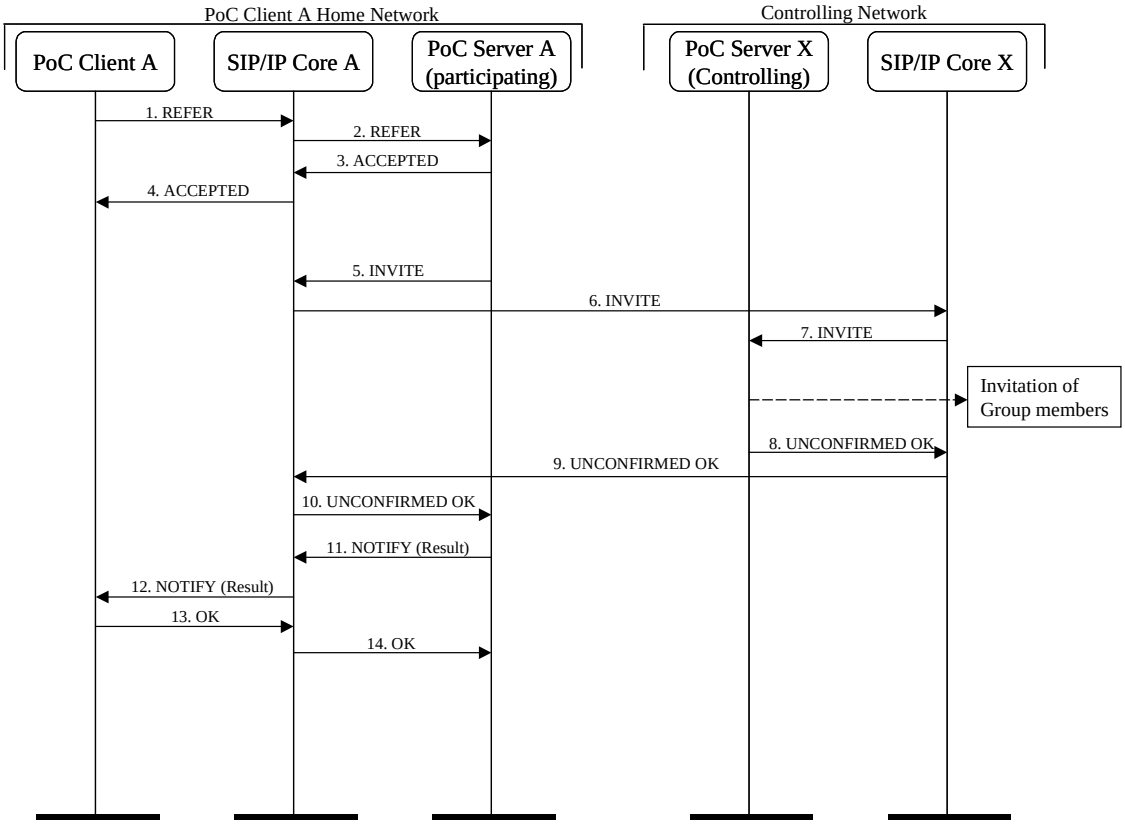

Figure 18: Unconfirmed Indication using Pre-established Session

1. The PoC Client A sends a REFER request to the SIP/IP Core A.

   Information elements contained in the REFER request:

   a. A conference URI that identifies the Pre-established Session to which the REFER applies

   b. Pre-arranged PoC Group Identity with an indication that it is a Pre-arranged PoC Group

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c. PoC Address of the PoC User at the PoC Client A

d. PoC service indication

e. A manual answer override request

f. Media included in the request

2. The SIP/IP Core A routes the REFER request to the PoC Server A (participating) based on the PoC Service indication and a conference URI that identifies the Pre-established Session.

   Information elements contained in the REFER request:

   a. A conference URI that identifies the Pre-established Session to which the REFER applies

   b. Pre-arranged PoC Group Identity with an indication that it is a Pre-arranged PoC Group

   c. PoC Address of the PoC User at the PoC Client A

   d. PoC service indication

   e. Manual answer override request

   f. Media included in the request

3. PoC Server A sends an ACCEPTED response to the SIP/IP Core A

4. The SIP/IP Core A sends the ACCEPTED response to the PoC Client.

5. When the PoC Server A (participating) receives a REFER request containing a URI with an indication that the URI is a Pre-arranged PoC Group not hosted by this PoC Server, the PoC Server A (participating) sends an INVITE request towards the hosting PoC Server. In this scenario, PoC Server X owns the Pre-arranged PoC Group Identity.

   Information elements contained in the INVITE request:

   a. Pre-arranged PoC Group Identity

   b. PoC Address of the PoC User at the PoC Client A

   c. PoC service indication

   d. Media Parameters of the PoC Server A (participating)

   e. Manual answer override request, if selected by PoC Client A

   f. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal.

   g. Media-floor Control Entities proposal.

   h. Desired QoE Profile

   i. Media included in the request

6. The SIP/IP Core A routes the INVITE request to SIP/IP Core X.

   Information elements contained in the INVITE request:

   a. Pre-arranged PoC Group Identity

   b. PoC Address of the PoC User at the PoC Client A

   c. PoC service indication

   d. Media Parameters of the PoC Server A (participating)

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e. Manual answer override request, if selected by PoC Client A

f. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal.

g. Media-floor Control Entities proposal.

h. Desired QoE Profile

i. Media included in the request

7. The SIP/IP Core X routes the request to the PoC Server X (controlling) based on Pre-arranged PoC Group Identity. If the Pre-arranged PoC Group Identity is used for other services (e.g. messaging) that are hosted on other Application Servers then the SIP/IP Core needs to use PoC service indication to route to the PoC Server.

   The PoC Server X performs the necessary terminating service control (e.g. authorizes the PoC Client A, and verifying authorization to override a manual answer setting, if requested) and if the PoC Address of the User initiating the PoC Session is authorized successfully, the PoC Server X invites the other members to the Pre-arranged PoC Session as described in 5.3.2 *"Pre-arranged PoC Group Session, terminating part"*. In the case the PoC Group Session already is ongoing the PoC Client is added to the PoC Session.

   Information elements contained in the INVITE request:

   a. Pre-arranged PoC Group Identity

   b. PoC Address of the PoC User at the PoC Client A

   c. PoC service indication

   d. Media Parameters of the PoC Server A (participating)

   e. Manual answer override request, if selected by PoC Client A

   f. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal.

   g. Media-floor Control Entities proposal.

   h. Desired QoE Profile

   i. Media included in the request

8-10. When the PoC Server X receives the first auto-answer indication, it sends the unconfirmed OK response to the PoC Server A through the signalling path. The supported Media Types in the unconfirmed OK response can depend on the local policy independent of the supported Media Types contained in the first AUTO-ANSWER response received by the PoC Server X.

   Information elements contained in the unconfirmed OK response:

   a. PoC Session Identity of the Pre-arranged PoC Group Session

   b. PoC Server X (controlling) selected Media Parameters

   c. Selected Talk Burst Control Protocol and/or Media Burst Control Protocol.

   d. Media-floor Control Entities response.

   e. QoE Profile for the PoC Session.

   Sending NOTIFY request depends on the PoC Client's request. If it is requested not to send NOTIFY request in response of the REFER request, do not follow the rest of the steps.

11. After receiving the UNCONFIRMED OK response PoC Server A sends a NOTIFY request to the SIP/IP Core A.

   Informational elements contained in the NOTIFY request:

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a. PoC Session Identity of the Pre-arranged PoC Group Session

b. Unconfirmed OK response received indication

c. QoE Profile for the PoC Session.

12. The SIP/IP Core A forwards the NOTIFY request to the PoC Client A. The PoC Client is now able to start sending and the PoC Server X buffers the media for the late delivery upon the response from the terminating PoC Client indicating the acceptance of the session.

    Informational elements contained in the NOTIFY request:

    a. PoC Session Identity of the Pre-arranged PoC Group Session

    b. Unconfirmed OK response received indication.

    c. QoE Profile for the PoC Session.

13. PoC Client A sends an OK response to the SIP/IP Core A.

14. The SIP/IP Core A sends the OK response to the PoC Server A.

5.3.1.4 Confirmed Indication using Pre-established Session

This subclause describes a scenario when the Inviting PoC Client receives the right-to-speak indication in a Talk Burst Control and/or Media Burst Control message from the PoC Server X (controlling) when at least one Invited PoC User accepts the invitation.

Figure 19 *"Confirmed Indication using Pre-established Session"* shows the message flow for the scenario.

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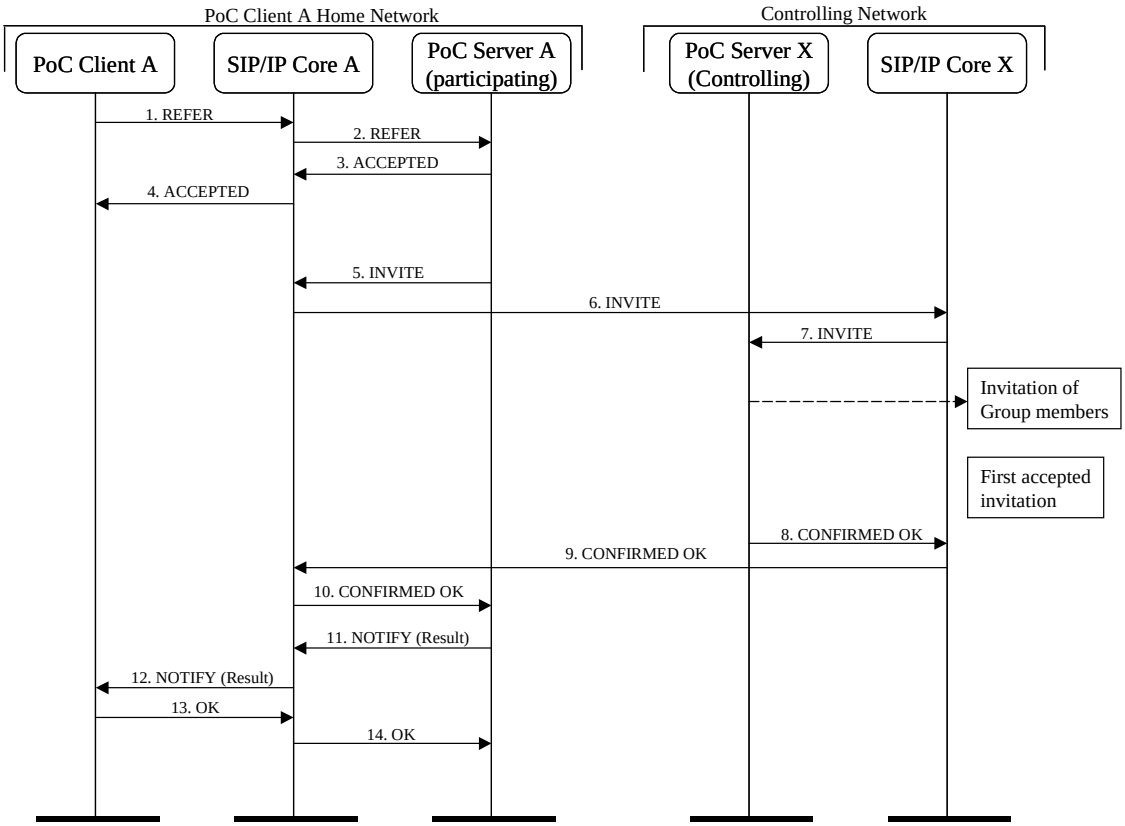

Figure 19: Confirmed Indication using Pre-established Session

1. The PoC Client A sends a REFER request to the SIP/IP Core A.

   Information elements contained in the REFER request:

   a. A conference URI that identifies the Pre-established Session to which the REFER applies

   b. Pre-arranged PoC Group Identity with an indication that it is a Pre-arranged PoC Group

   c. PoC Address of the PoC User at the PoC Client A

   d. PoC service indication

   e. A manual answer override request

   f. Media included in the request

2. The SIP/IP Core A routes the REFER request to the PoC Server A (participating) based on the PoC service indication and a conference URI that identifies the Pre-established Session.

   Information elements contained in the REFER request:

   a. A conference URI that identifies the Pre-established Session to which the REFER applies

   b. Pre-arranged PoC Group Identity with an indication that it is a Pre-arranged PoC Group

   c. PoC Address of the PoC User at the PoC Client A

   d. PoC service indication

   e. Manual answer override request

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f. Media included in the request

3. PoC Server A sends an ACCEPTED response to the SIP/IP Core A

4. The SIP/IP Core A sends the ACCEPTED response to the PoC Client.

5. When the PoC Server A (participating) receives a REFER request containing a URI with an indication that the URI is a Pre-arranged PoC Group not hosted by this PoC Server, the PoC Server A (participating) sends an INVITE request towards the hosting PoC Server. In this scenario, PoC Server X owns the Pre-arranged PoC Group Identity.

   Information elements contained in the INVITE request:

   a. Pre-arranged PoC Group Identity

   b. PoC Address of the PoC User at the PoC Client A

   c. PoC service indication

   d. Media Parameters of the PoC Server A (participating)

   e. Manual answer override request, if selected by PoC Client A

   f. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal.

   g. Media-floor Control Entities proposal.

   h. Desired QoE Profile

   i. Media included in the request

6. The SIP/IP Core A routes the INVITE request to SIP/IP Core X.

   Information elements contained in the INVITE request:

   a. Pre-arranged PoC Group Identity

   b. PoC Address of the PoC User at the PoC Client A

   c. PoC service indication

   d. Media Parameters of the PoC Server A (participating)

   e. Manual answer override request

   f. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal.

   g. Media-floor Control Entities proposal.

   h. Desired QoE Profile

   i. Media included in the request

7. The SIP/IP Core X routes the request to the PoC Server X (controlling) based on Pre-arranged PoC Group Identity. If the Pre-arranged PoC Group Identity is used for other services (e.g. messaging) that are hosted on other Application Servers then the SIP/IP Core X needs to use PoC service indication to route to the PoC Server.

   The PoC Server X performs the necessary terminating service control (e.g. authorizes the PoC Client A, and verifying authorization to override a manual answer setting, if requested) and if the PoC Address of the User initiating the PoC Session is authorized successfully, the PoC Server X invites the other members to the Pre- arranged PoC Session as described in 5.3.2 "*Pre-arranged PoC Group Session, terminating part*".

   Information elements contained in the INVITE request:

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a. Pre-arranged PoC Group Identity

b. PoC Address of the PoC User at the PoC Client A

c. PoC service indication

d. Media Parameters of the PoC Server A (participating)

e. Manual answer override request, if selected by PoC Client A

f. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal.

g. Media-floor Control Entities proposal.

h. Desired QoE Profile

i. Media included in the request

8-10. When the PoC Server X receives the first accept indication, it sends the CONFIRMED OK to the PoC Server A through the signalling path. The supported Media Types in the CONFIRMED OK response can depend on the local policy independent of the supported Media Types contained in the first acceptance response received by the PoC Server X.

Information elements contained in the CONFIRMED OK:

a. PoC Session Identity of the Pre-arranged PoC Group Session

b. PoC Server X (controlling) selected Media Parameters

c. Selected Talk Burst Control Protocol and/or Media Burst Control Protocol.

d. Media-floor Control Entities response.

e. QoE Profile for the PoC Session

Sending NOTIFY request depends on the PoC Client's request. If it is requested not to send NOTIFY request in response of the REFER request, do not follow the rest of the steps.

11. After receiving the CONFIRMED OK PoC Server A sends a NOTIFY request to the SIP/IP Core A.

Informational elements contained in the NOTIFY request:

a. PoC Session Identity of the Pre-arranged PoC Group Session

b. Unconfirmed OK response received indication

c. QoE Profile for the PoC Session.

12. The SIP/IP Core A forwards the NOTIFY request to the PoC Client A. The PoC Client is now able to start sending and the PoC Server X buffers the media for the late delivery upon the response from the terminating PoC Client indicating the acceptance of the session.

Informational elements contained in the NOTIFY request:

a. PoC Session Identity of the Pre-arranged PoC Group Session

b. Unconfirmed OK response received indication

c. QoE Profile for the PoC Session.

13. PoC Client A sends an OK response to the SIP/IP Core A

14. The SIP/IP Core A sends the OK response to the PoC Server A.

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5.3.2 Pre-arranged PoC Group Session, terminating part

In the following subclauses different setup cases are described from the Invited PoC Client point of view.

Subclause 5.3.2.1 *"Auto-answer case"* describes a scenario where the Invited PoC User has defined that the PoC Session request from the inviting PoC User is accepted automatically.

Subclause 5.3.2.2 *"Manual answer case"* describes a scenario where the Invited PoC User has defined that the PoC Session request from the Inviting PoC Client is accepted manually.

5.3.2.1 Auto-answer case

5.3.2.1.1 Auto-answer with Pre-established Session

This subclause describes a scenario where the Invited PoC User has defined that the PoC Session request from the inviting PoC User is accepted automatically or, in systems which support the optional manual answer override capability, that the Invited PoC User has defined that the inviting PoC User is approved to override a manual answer setting and the inviting PoC User has selected to do so and where the Invited PoC Client has a Pre-established Session connection with the Home PoC Server. Figure 20 *"Automatic answer using Pre-established Session"* shows signalling flow for this scenario.

NOTE: If Inviting PoC Client or PoC Server performing Participating PoC Function is not able to use an existing Pre-established Session, then it can either use the On-demand Session or make session modification for the Pre-established Session to get Media Types and Media Parameters to match between the invitation request and the existing Pre-established Session.

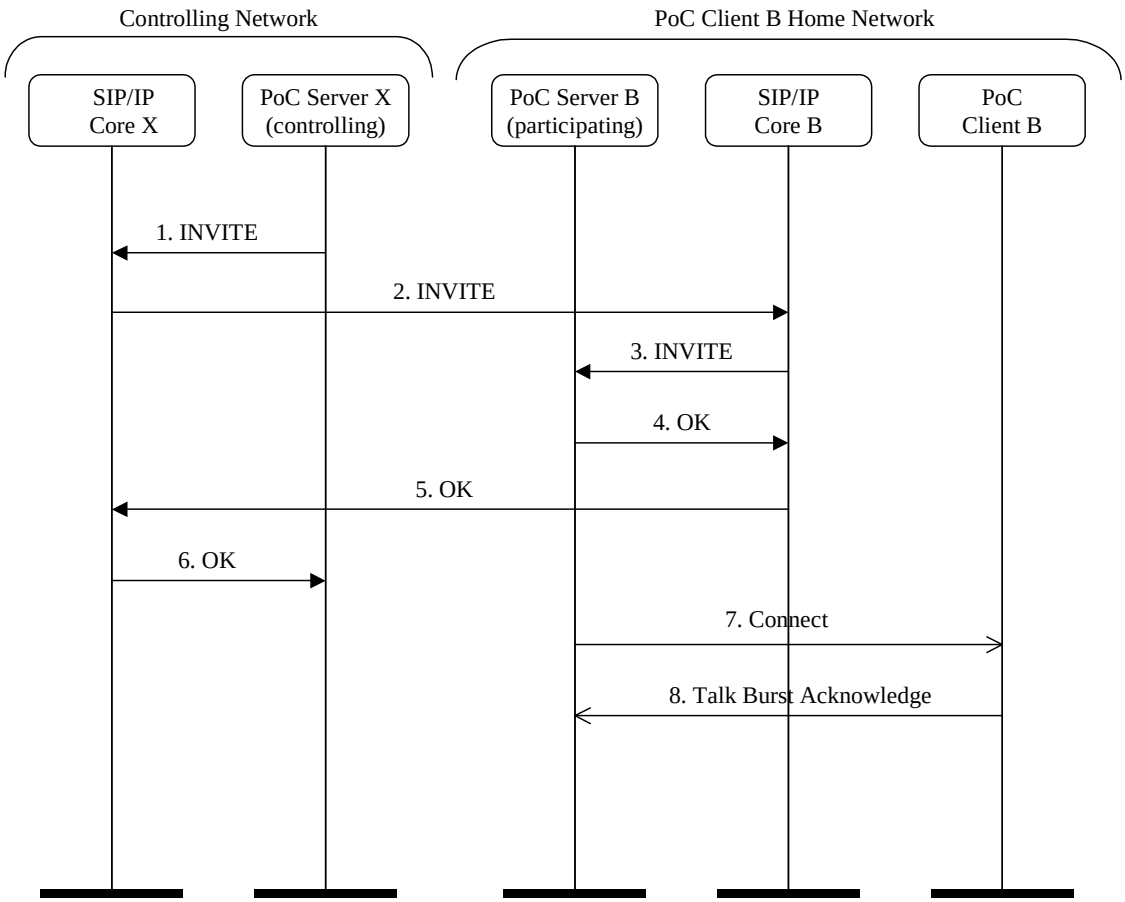

Figure 20: Automatic answer using Pre-established Session

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1. PoC Server X (controlling) sends INVITE request to the SIP/IP Core X.

   Information elements contained in INVITE request:

   a. PoC Address of the PoC User at the PoC Client A
   b. Media Parameters of PoC Server X (controlling)
   c. PoC service indication
   d. PoC Address of the PoC User at the PoC Client B
   e. Controlling PoC Function assigned indication
   f. PoC Session Identityfor the Pre-arranged PoC Group Session
   g. Manual answer override request, if selected by PoC Client A
   h. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal
   i. Media-floor Control Entities proposal.
   j. Pre-arranged PoC Group Identity.
   k. QoE Profile for the PoC Session.
   l. Media included in the request

2. SIP/IP Core X routes the request to the PoC Client B home network.

   Information elements contained in INVITE request:

   a. PoC Address of the PoC User at the PoC Client A
   b. Media Parameters of PoC Server X (controlling)
   c. PoC service indication
   d. PoC Address of the PoC User at the PoC Client B
   e. Controlling PoC Function assigned indication
   f. PoC Session Identity for the Pre-arranged PoC Group Session
   g. Manual answer override request, if selected by PoC Client A
   h. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal
   i. Media-floor Control Entities proposal.
   j. Pre-arranged PoC Group Identity.
   k. QoE Profile for the PoC Session.
   l. Media included in the request

3. SIP/IP Core B routes the request to the PoC Server B (participating) based on PoC Address of PoC Client and PoC Service indication.

   Information elements contained in INVITE request:

   a. PoC Address of the PoC User at the PoC Client A
   b. Media Parameters of PoC Server X (controlling)

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c. PoC service indication

d. PoC Address of the PoC User at the PoC Client B

e. Controlling PoC Function assigned indication

f. PoC Session Identity for the Pre-arranged PoC Group Session

g. Manual answer override request, if selected by PoC Client A

h. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal

i. Media-floor Control Entities proposal.

j. Pre-arranged PoC Group Identity.

k. QoE Profile for the PoC Session.

l. Media included in the request

4. If the PoC Client B is accepting the session automatically and if the offered Media Types in the received invitation request are applicable to the Pre-established Session with the PoC Client B, the PoC Server B sends OK response back towards the controlling network

   Information elements contained in OK response:

   a. Media Parameters of PoC Server B

   b. Selected Talk Burst Control Protocol and/or Media Burst Control Protocol

   c. Media-floor Control Entities response.

   d. Local QoE Profile for the PoC Client B.

5. SIP/IP Core B forwards the OK response to the controlling network.

   Information elements contained in OK response:

   a. Media Parameters of PoC Server B

   b. Selected Talk Burst Control Protocol and/or Media Burst Control Protocol

   c. Media-floor Control Entities response.

   d. Local QoE Profile for the PoC Client B.

6. SIP/IP Core X forwards the OK response to the PoC Server X (controlling)

   Information elements contained in OK response:

   a. Media Parameters of PoC Server B

   b. Selected Talk Burst Control Protocol and/or Media Burst Control Protocol

   c. Media-floor Control Entities response.

   d. Local QoE Profile for the PoC Client B.

7. The PoC Server B (participating) sends the Connect message to the PoC Client B.

   Information elements contained in Connect message:

   a. PoC Address of the Participant at the PoC Client initiating the invitation

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b. Nick Name of the Participant at the PoC Client initiating the invitation

c. PoC Session Identity of the Pre-arranged PoC Group Session

d. Pre-arranged PoC Group Identity

e. Nick Name of the Pre-arranged PoC Group

f. Manual answer override request indication, if PoC Client A is authorized to issue and PoC Server B supports manual answer override.

8. The PoC Client B acknowledges the Connect message with a Talk Burst Acknowledge message to guarantee reliable delivery of the Connect message.

5.3.2.1.2 Auto-answer with On-demand Session

In this case, the terminating PoC Client automatically answers the connection request by the PoC Server and the PoC User is able to hear the voice. The Figure 21 *"Terminating part, autoanswer case"* shows the high level flow of this scenario.

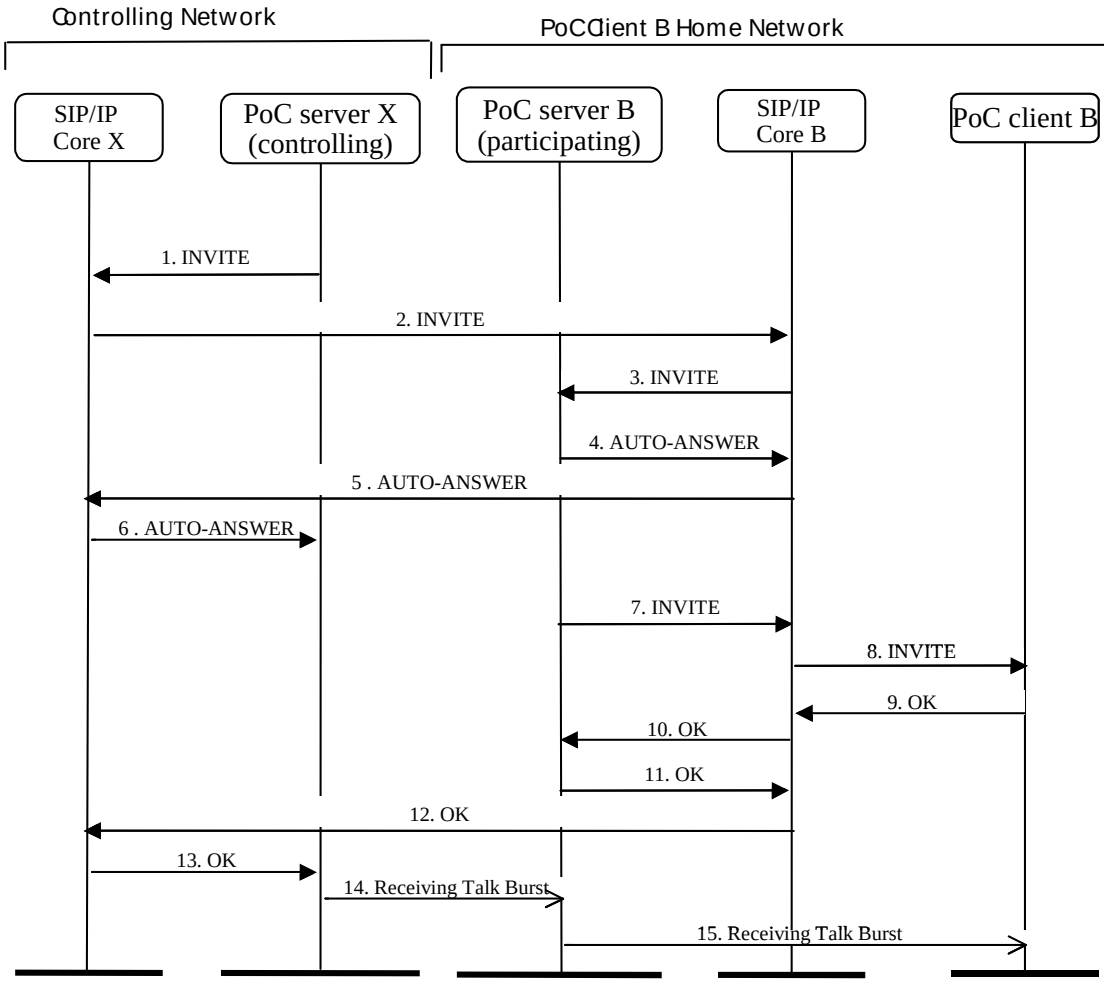

Figure 21: Terminating part, autoanswer case.

1. PoC Server X (controlling) sends an INVITE request to the SIP/IP Core X. Information elements contained in the INVITE request:

   a. PoC Address of the PoC User at the PoC Client A

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b. Media Parameters of PoC Server X (controlling)

c. PoC service indication

d. PoC Address of the PoC User at the PoC Client B

e. Controlling PoC Function assigned indication

f. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal

g. Media-floor Control Entities proposal.

h. Manual answer override request, if selected by PoC Client A

i. Pre-arranged PoC Group Identity

j. PoC Session Identity for the Pre-arranged PoC Group Session.

k. QoE Profile for the PoC Session.

l. Media included in the request

2. SIP/IP Core X routes the request to the PoC Client B home network. Information elements contained in the INVITE request:

a. PoC Address of the PoC User at the PoC Client A

b. Media Parameters of PoC Server X (controlling)

c. PoC service indication

d. PoC Address of the PoC User at the PoC Client B

e. Controlling PoC Function assigned indication

f. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal

g. Media-floor Control Entities proposal.

h. Manual answer override request, if selected by PoC Client A

i. Pre-arranged PoC Group Identity

j. PoC Session Identity for the Pre-arranged PoC Group Session.

k. QoE Profile for the PoC Session.

l. Media included in the request

3. SIP/IP Core B routes the request to the PoC Server B based on the PoC Address of Invited PoC Client and PoC Service indication. Information elements contained in the INVITE request:

a. PoC Address of the PoC User at the PoC Client A

b. Media Parameters of PoC Server X (controlling)

c. PoC service indication

d. PoC Address of the PoC User at the PoC Client B

e. Controlling PoC Function assigned indication

f. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal

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g. Media-floor Control Entities proposal.

h. Manual answer override request, if selected by PoC Client A

i. Pre-arranged PoC Group Identity

j. PoC Session Identity for the Pre-arranged PoC Group Session.

k. QoE Profile for the PoC Session.

l. Media included in the request

4.-6. The PoC Server B sends Automatic Answer Indication to the PoC Server X through the signalling path.

7. The PoC Server B sends an INVITE request to the SIP/IP Core B. Information elements contained in the INVITE request:

   a. PoC service indication

   b. Automatic acceptance indication

   c. PoC Address of the PoC User at the PoC Client B

   d. PoC Address of the PoC User at the PoC Client A

   e. Media Parameters of PoC Server B (participating)

   f. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal

   g. Media-floor Control Entities proposal.

   h. PoC Session Identity for the Pre-arranged PoC Group Sessions

   i. Manual answer override request, if selected by PoC Client A and if PoC Client B has authorised PoC Client A to issue a manual answer override request and PoC Server B (participating) supports manual answer override.

   j. QoE Profile for the PoC Session.

   k. Media included in the request

8. SIP/IP Core B routes the INVITE request to the PoC Client B. Information elements contained in the INVITE request:

   a. PoC Service indication

   b. Automatic acceptance indication

   c. PoC Address of the PoC User at the PoC Client B

   d. PoC Address of the PoC User at the PoC Client A

   e. Media Parameters of PoC Server B (participating)

   f. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal

   g. Media-floor Control Entities proposal.

   h. PoC Session Identity for the Pre-arranged PoC Group Session

   i. Manual answer override request, if selected by PoC Client A and included by PoC Server B.

   j. QoE Profile for the PoC Session

   k. Media included in the request

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9.-13. When the PoC Client B receives the INVITE request, the PoC Client B sends an OK response for the INVITE request. The OK response is sent to the PoC Server X through the signalling connection.

Information elements contained in the OK response:

a. Media Parameters of the PoC Client B

b. Selected Talk Burst Control Protocol and/or Media Burst Control Protocol

c. Media-floor Control Entities response.

d. Local QoE Profile for the PoC Client B.

14. The PoC Server X (controlling) is sending the receiving Talk Burst indication to the PoC Server B (participating).

Information elements contained in receiving Talk Burst:

a. PoC Address of the Participant at the PoC Client sending the Talk Burst

b. Nick Name of the Participant at the PoC Client sending the Talk Burst.

15. The PoC Server B (participating) is sending the receiving Talk Burst indication to the PoC Client B.

Information elements contained in receiving Talk Burst indication:

a. PoC Address of the Participant at the PoC Client sending the Talk Burst

b. Nick Name of the Participant at the PoC Client sending the Talk Burst.

NOTE: If the Participating PoC Function B is not on the media and Talk Burst Control and/or Media Burst Control message path, the PoC Server A sends the receiving Talk Burst indication directly to the PoC Client B.

5.3.2.2 Manual answer case

In the subclause 5.3.2.2.1 "*Manual answer procedure without override*" describes the case, the terminating PoC Client indicates the incoming PoC Session request and the PoC User responds to the request, unless the Inviting PoC Client is authorized to select the optional manual answer override feature and has selected that option. This optional case is described in the subclause 5.3.2.2.2 "*Manual answer override procedure*".

5.3.2.2.1 Manual answer procedure without override

This subclause describes a scenario where the Invited PoC User is using manual answer. The scenario is valid for On-demand Session case as well as for the Pre-established Session case.

The Figure 22 *"Terminating part, manual answer"* shows the high level flow of this scenario.

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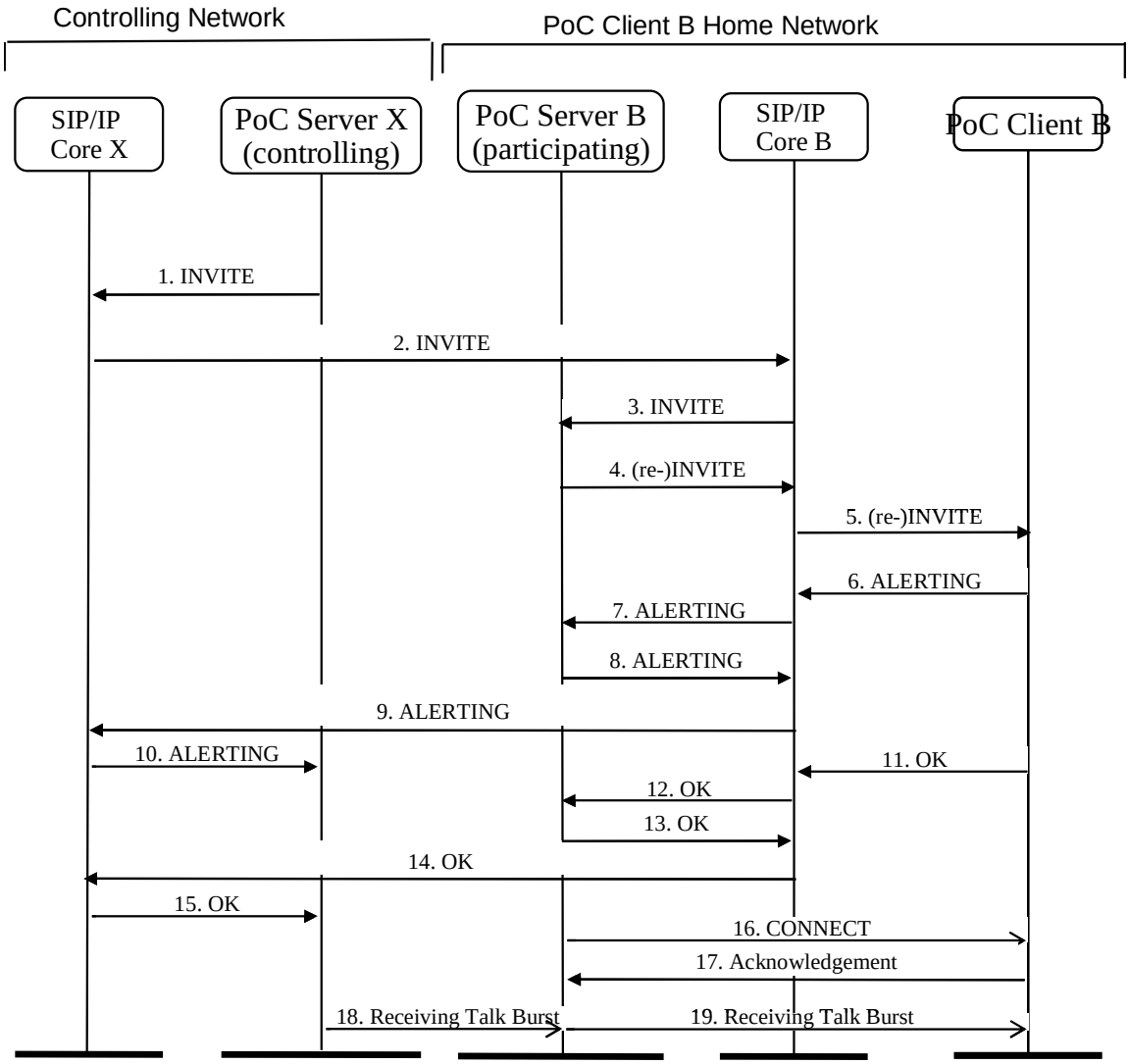

Figure 22: Terminating part, manual answer

1. PoC Server X (controlling) sends an INVITE request to the SIP/IP Core X. Information elements contained in the INVITE request:

   a. PoC Address of the PoC User at the PoC Client A

   b. Media Parameters of PoC Server X (controlling)

   c. PoC service indication

   d. PoC Address of the PoC User at the PoC Client B

   e. Controlling PoC Function assigned indication

   f. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal

   g. Media-floor Control Entities proposal.

   h. Pre-arranged PoC Group Identity

   i. PoC Session Identity for the Pre-arranged PoC Group Session.

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j. QoE Profile for the PoC Session.

k. Media included in the request

2. SIP/IP Core X routes the request to the PoC Client B home network. Information elements contained in the INVITE request:

   a. PoC Address of the PoC User at the PoC Client A

   b. Media Parameters of PoC Server X (controlling)

   c. PoC service indication

   d. PoC Address of the PoC User at the PoC Client B

   e. Controlling PoC Function assigned indication

   f. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal

   g. Media-floor Control Entities proposal.

   h. Pre-arranged PoC Group Identity

   i. PoC Session Identity for the Pre-arranged PoC Group Session.

   j. QoE Profile for the PoC Session.

   k. Media included in the request

3. SIP/IP Core B routes the request to the PoC Server B based on the PoC Address of Invited PoC Client and PoC service indication. Information elements contained in the INVITE request:

   a. PoC Address of the PoC User at the PoC Client A

   b. Media Parameters of PoC Server X (controlling)

   c. PoC service indication

   d. PoC Address of the PoC User at the PoC Client B

   e. Controlling PoC Function assigned indication

   f. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal

   g. Media-floor Control Entities proposal.

   h. Pre-arranged PoC Group Identity

   i. PoC Session Identity for the Pre-arranged PoC Group Session.

   j. QoE Profile for the PoC Session.

   k. Media included in the request

4. The PoC Server B sends an INVITE request to the SIP/IP Core B. In case Pre-established Session is used, the PoC Server B sends a re-INVITE request within the existing Pre-established Session to the SIP/IP Core B, if supported by the PoC Server B and the PoC Client B.

   Information elements contained in the INVITE/re-INVITE request:

   a. PoC service indication

   b. PoC Address of the PoC User at the PoC Client B

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c. PoC Address of the PoC User at the PoC Client A

d. Media Parameters of PoC Server B (participating)

e. Manual answer request

f. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal

g. Media-floor Control Entities proposal.

h. Pre-arranged PoC Group Identity

i. PoC Session Identity for the Pre-arranged PoC Group Session.

j. QoE Profile for the PoC Session.

k. Media included in the request

5. SIP/IP Core B routes the INVITE/re-INVITE request to the PoC Client B. Information elements contained in the INVITE/re-INVITE request:

a. PoC service indication

b. PoC Address of the PoC User at the PoC Client B

c. PoC Address of the PoC User at the PoC Client A

d. Media Parameters of PoC Server B (participating)

e. Manual answer request

f. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal

g. Media-floor Control Entities proposal.

h. Pre-arranged PoC Group Identity

i. PoC Session Identity for the Pre-arranged PoC Group Session.

j. QoE Profile for the PoC Session.

k. Media included in the request

6-10. When the PoC Client B received the INVITE/re-INVITE and the manual answer is selected, the PoC Client sends back the ALERTING indication to the PoC Server X through the signalling path.

11-15. When the PoC Client B receives the indication that the PoC User accepts the PoC Session, the PoC Client B sends OK response for the INVITE/re-INVITE request. The OK response is sent to the PoC Server X through the signalling connection.

Information elements contained in OK response:

a. Media Parameters of the PoC Client B

b. Selected Talk Burst Control Protocol and/or Media Burst Control Protocol.

c. Media-floor Control Entities response.

d. Local QoE Profile for the PoC Client B.

16. The PoC Server B (participating) sends the connect message to the PoC Client B in case Pre-established Session is used.

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Information elements contained in the connect message:

a. PoC Address of the Participant at the PoC Client initiating the invitation

b. Nick Name of the Participant at the PoC Client initiating the invitation

c. PoC Session Identity for the Pre-arranged PoC Group Session

d. A list of PoC Addresses of PoC Users to be invited to the PoC Session

17. The PoC Client B acknowledges the connect message with a Talk Burst acknowledge message to guarantee reliable delivery of the connect message

18. The PoC Server X (controlling) sends the receiving Talk Burst indication to the PoC Server B (participating).

    Information elements contained in OK response:

    a. PoC Address of the Participant at the PoC Client sending the Talk Burst

    b. Nick Name of the Participant at the PoC Client sending the Talk Burst.

19. The PoC Server B (participating) is sending the receiving Talk Burst indication to the PoC Client B.

    Information elements contained in Receiving Talk Burst indication:

    a. PoC Address of the Participant at the PoC Client sending the Talk Burst

    b. Nick Name of the Participant at the PoC Client sending the Talk Burst.

NOTE: If the Participating PoC Function B is not on the media and Talk Burst Control and/or Media Burst Control message path, the PoC Server A sends the receiving Talk Burst indication directly to the PoC Client B.

5.3.2.2.2 Manual answer override procedure

This subclause describes a scenario where an inviting PoC User is authorized to issue manual answer override request and send INVITE request message containing manual answer override, and the Invited PoC User is using manual answer. The scenario is valid for On-demand Session case.

Figure 23 *"Manual answer override procedure"* shows signalling flow for this scenario.

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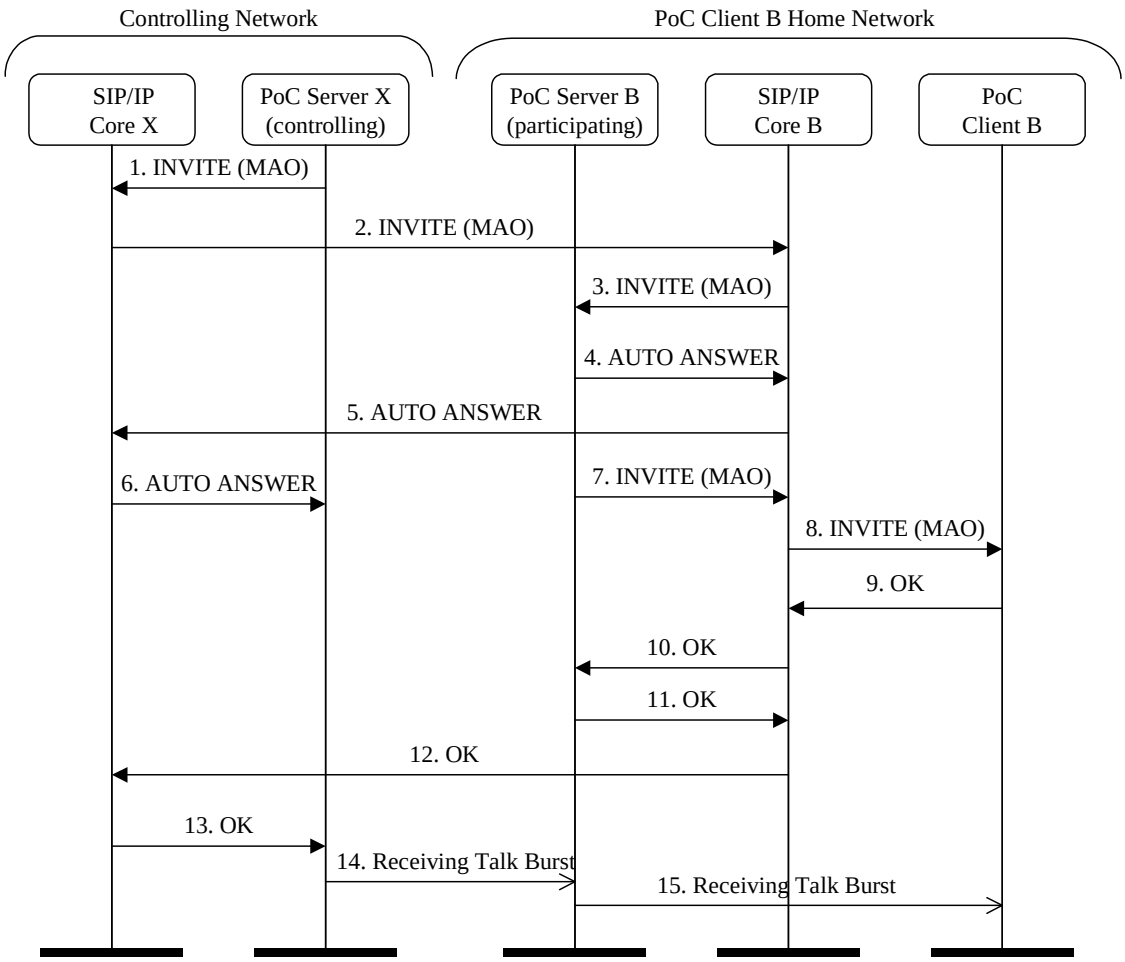

Figure 23: Manual answer override procedure

1. PoC Server X (controlling) sends INVITE request to the SIP/IP Core X.

   Information elements contained in INVITE request:

   a. PoC Address of Invited PoC User

   b. Media Parameters of PoC Server X (controlling)

   c. PoC service indication

   d. PoC Address of the PoC User at the PoC Client A

   e. Controlling PoC Function assigned indication

   f. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal

   g. Media-floor Control Entities proposal.

   h. Manual answer override request

   i. Pre-arranged PoC Group Identity

   j. PoC Session Identity for the Pre-arranged PoC Group Session.

   k. QoE Profile for the PoC Session.

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l. Media included in the request

2. SIP/IP Core X routes the request to the PoC Client B home network.

   Information elements contained in INVITE request:

   a. PoC Address of Invited PoC User

   b. Media Parameters of PoC Server X (controlling)

   c. PoC service indication

   d. PoC Address of the PoC User at the PoC Client A

   e. Controlling PoC Function assigned indication

   f. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal

   g. Media-floor Control Entities proposal.

   h. Manual answer override request

   i. Pre-arranged PoC Group Identity

   j. PoC Session Identity for the Pre-arranged PoC Group Session.

   k. QoE Profile for the PoC Session.

   l. Media included in the request

3. SIP/IP Core B routes the request to the PoC Server B (participating) based on the PoC Address of Invited PoC Client and PoC service indication.

   Information elements contained in INVITE request:

   a. PoC Address of PoC Client B

   b. Media Parameters of PoC Server X (controlling)

   c. PoC service indication

   d. PoC Address of PoC User at the PoC Client A

   e. Controlling PoC Function assigned indication

   f. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal

   g. Media-floor Control Entities proposal.

   h. Manual answer override request

   i. Pre-arranged PoC Group Identity

   j. PoC Session Identity for the Pre-arranged PoC Group Session.

   k. QoE Profile for the PoC Session.

   l. Media included in the request

4. If the inviting PoC User is authorized to issue manual answer override request, the participating PoC Server B sends AUTO-ANSWER response back towards the controlling network whether Answer Mode Indication at participating PoC Server B (participating) is set to auto-answer or manual answer. The AUTO-ANSWER response triggers the controlling network to progress PoC Session in originating part.

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5. SIP/IP Core B forwards the manual answer override response to the controlling network.
6. SIP/IP Core A forwards the manual answer override response to the PoC Server A (participating & controlling)
7. PoC Server B (participating) sends the PoC Session setup request to the SIP/IP Core B. If the PoC Client B is using On-demand Session, the PoC Server B sends an INVITE request to the SIP/IP Core B. Information elements contained in the INVITE request:
    a. Media Parameters of the PoC Server B (participating), if PoC Server B (participating) stays on the media and Talk Burst Control and/or Media Burst Control message path, otherwise Media Parameters received from the controlling network are included.
    b. PoC service indication
    c. PoC Address of PoC User at the PoC Client B
    d. PoC Address of PoC User at the PoC Client A
    e. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal
    f. Media-floor Control Entities proposal.
    g. Manual answer override request
    h. Pre-arranged PoC Group Identity
    i. PoC Session Identity for the Pre-arranged PoC Group Session.
    j. QoE Profile for the PoC Session.
    k. Media included in the request
8. SIP/IP Core B routes the INVITE request to the PoC Client B. Information elements contained in the INVITE request:
    a. Media Parameters of the PoC Server B (participating), if PoC Server B (participating) stays on the media and Talk Burst Control and/or Media Burst Control message path, otherwise Media Parameters received from the controlling network are included.
    b. PoC service indication
    c. PoC Address of PoC User at the PoC Client B
    d. PoC Address of PoC User at the PoC Client A
    e. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal
    f. Media-floor Control Entities proposal.
    g. Manual answer override request
    h. Pre-arranged PoC Group Identity
    i. PoC Session Identity for the Pre-arranged PoC Group Session.
    j. QoE Profile for the PoC Session.
    k. Media included in the request
9. When the PoC Client B receives the INVITE request, the PoC Client B sends an OK response for the INVITE request. Information elements contained in the OK response:
    a. Media Parameters of the PoC Client B

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b. Selected Talk Burst Control Protocol and/or Media Burst Control Protocol.

c. Media-floor Control Entities response if supported by PoC Client B.

d. Local QoE Profile for the PoC Client B.

10. SIP/IP Core B forwards the OK response to the PoC Server B (participating). Information elements contained in OK response:

    a. Media Parameters of the PoC Client B

    b. Selected Talk Burst Control Protocol and/or Media Burst Control Protocol.

    c. Media-floor Control Entities response.

    d. Local QoE Profile for the PoC Client B.

11. When PoC Server B (participating) receives OK response it will forward it to towards controlling network. Information elements contained in OK response:

    a. Media Parameters of PoC Server B if PoC Server B (participating) stays on the media and Talk Burst Control message path, otherwise Media Parameters received from the PoC Client B are included

    b. Selected Talk Burst Control Protocol and/or Media Burst Control Protocol.

    c. Media-floor Control Entities response.

    d. Local QoE Profile for the PoC Client B.

12. SIP/IP Core B forwards the OK response to the controlling network. Information elements contained in OK response:

    a. Media Parameters of PoC Server B if PoC Server B (participating) stays on the media and Talk Burst Control message path, otherwise Media Parameters received from the PoC Client B are included

    b. Selected Talk Burst Control Protocol and/or Media Burst Control Protocol.

    c. Media-floor Control Entities response.

    d. Local QoE Profile for the PoC Client B.

13. SIP/IP Core X forwards the OK response to the PoC Server X (controlling). Information elements contained in OK response:

    a. Media Parameters of PoC Server B if PoC Server B (participating) stays on the media and Talk Burst Control message path, otherwise Media Parameters received from the PoC Client B are included

    b. Selected Talk Burst Control Protocol and/or Media Burst Control Protocol.

    c. Media-floor Control Entities response.

    d. Local QoE Profile for the PoC Client B.

14. The PoC Server X sends the receiving Talk Burst indication to the PoC Client B. Information elements contained in receiving Talk Burst indication:

    a. PoC Address of the Participant at the PoC Client sending the Talk Burst

    b. Nick Name of the Participant at the PoC Client sending the Talk Burst.

15. The PoC Server B (participating) relays the receiving Talk Burst message to the PoC Client B. Information elements contained in receiving Talk Burst indication:

    a. PoC Address of the Participant at the PoC Client sending the Talk Burst

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b. Nick Name of the Participant at the PoC Client sending the Talk Burst

NOTE 1: If the Participating PoC Function B is not on the media and Talk Burst Control and/or Media Burst Control message path, the PoC Server A sends the receiving Talk Burst indication directly to the PoC Client B.

NOTE 2: If PoC Client B is using Pre-established Session the signalling flow for this scenario is as shown in Figure 20 *"Automatic answer using Pre-established Session"* in sub-clause 5.3.2.1.1 "*Auto-answer with Pre-established Session*".

5.4 Chat PoC Group Session Setup

To join a Chat PoC Group Session, a PoC Client sends a request to join the pre-defined Chat PoC Group. The Chat PoC Group is hosted either in PoC User's home PoC network or in a remote PoC network.

The PoC Server hosting the Chat PoC Group accepts any invitation request if the type of the PoC Group is an Unrestricted Group. If the type of PoC Group is a Restricted Group then the invitation request is accepted if the inviting PoC User is a member of the Restricted Group. In both cases the total number of PoC Group Participants does not exceed the group Participant limit.

Figure 24 *"Joining the Chat PoC Group Session"* shows the high-level signalling procedure when a PoC user joins a Chat PoC Group Session existing in another network.

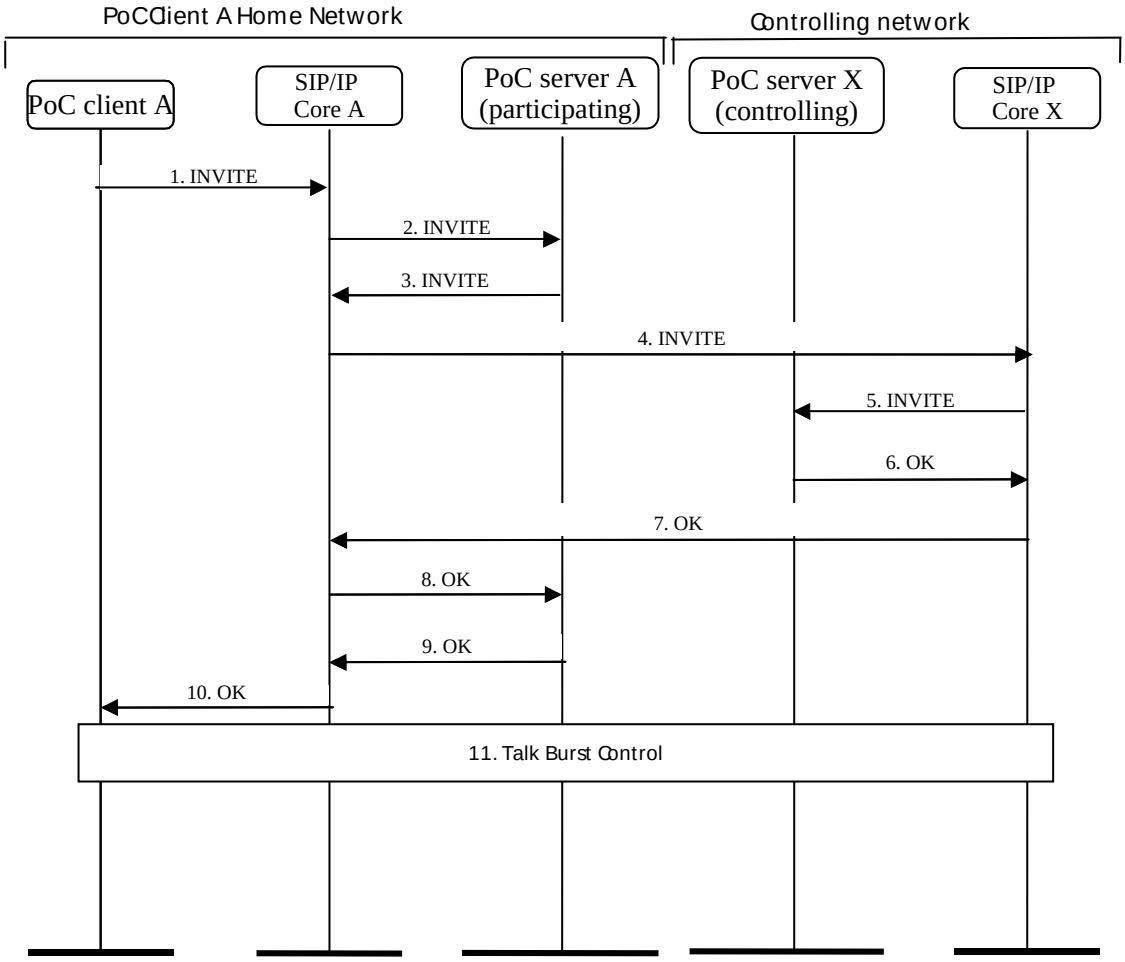

Figure 24: Joining the Chat PoC Group Session

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1. The PoC Client A sends an INVITE request to the address of the Chat PoC Group.

   Information elements contained in INVITE request:

   a. Chat PoC Group Identity

   b. PoC Address of the PoC User at the PoC Client A

   c. PoC service indication

   d. Media Parameters of PoC Client A

   e. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal.

   f. Media-floor Control Entities proposal.

   g. Desired QoE Profile

2. The SIP/IP Core A routes the INVITE request to the PoC Server A (participating) trigged on the PoC Service indication and the PoC Address.

   Information elements contained in INVITE request:

   a. Chat PoC Group Identity

   b. PoC Address of the PoC User at the PoC Client A

   c. PoC service indication

   d. Media Parameters of PoC Client A

   e. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal.

   f. Media-floor Control Entities proposal.

   g. Desired QoE Profile

3. The PoC Server A (participating) identifies that the Chat PoC Group is not hosted in this PoC Server therefore it sends the request to the SIP/IP Core A.

   Information elements contained in INVITE request:

   a. Chat PoC Group Identity

   b. PoC Address of the PoC User at the PoC Client A

   c. PoC service indication

   d. PoC Server A (participating) selected Media Parameters

   e. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal.

   f. Media-floor Control Entities proposal.

   g. Desired QoE Profile

4. The SIP/IP Core A routes the request according to the routing principles to SIP/IP Core X.

   Information elements contained in INVITE request:

   a. Chat PoC Group Identity

   b. PoC Address of the PoC User at the PoC Client A

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c. PoC service indication

d. PoC Server A (participating) selected Media Parameters

e. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal.

f. Media-floor Control Entities proposal.

g. Desired QoE Profile

5. The SIP/IP Core X routes the request to the PoC Server X (controlling) based on Chat PoC Group Identity. If the Chat PoC Group Identity is used for other services (e.g. messaging) that are hosted on other Application Servers then the SIP/IP Core needs to use PoC service indication to route to the PoC Server.

   Information elements contained in INVITE request:

   a. Chat PoC Group Identity

   b. PoC Address of the PoC User at the PoC Client A

   c. PoC service indication

   d. PoC Server A (participating) selected Media Parameters

   e. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal.

   f. Media-floor Control Entities proposal.

   g. Desired QoE Profile

6-8. The PoC Server X performs the necessary terminating service control (e.g. authorizes the PoC Client A) and if the PoC Address of the PoC User initiating the PoC Session is authorized successfully. The Chat PoC Group Session is either established or the PoC User is added to the existing Chat PoC Group Session. The PoC Server X sends an OK response to the PoC Server A (participating) along the same signalling path. Information elements contained in OK response:

   a. PoC Server X (controlling) selected Media Parameters

   b. Selected Talk Burst Control Protocol and/or Media Burst Control Protocol.

   c. Media-floor Control Entities response.

   d. QoE Profile for the PoC Session.

9-10. The PoC Server A sends an OK response to the PoC Client A along the signalling path.

   Information elements contained in OK response:

   a. PoC Server A (participating) selected Media Parameters

   b. Selected Talk Burst Control Protocol and/or Media Burst Control Protocol.

   c. Media-floor Control Entities response.

   d. QoE Profile for the PoC Session.

11. Talk Burst Control and/or Media Burst Control is made and media transmitted as described in the subclause 5.12 "*PoC Media Flows*".

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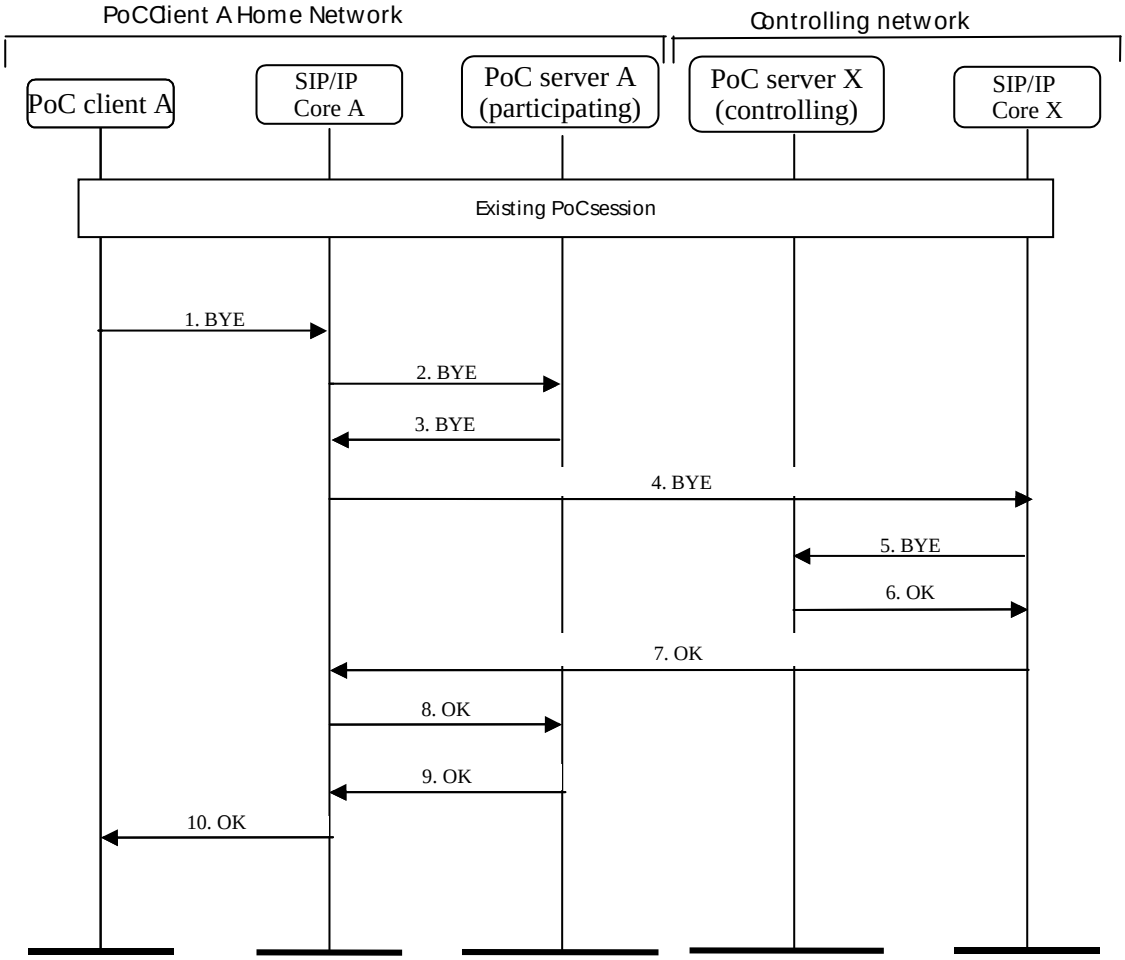
5.5 Leaving PoC Session

5.5.1 Leaving the PoC Session in the case of On-demand Session

Any Participant in a PoC Session (1-1 PoC Session or PoC Group Session) can leave the PoC Session. When the PoC Session initiator leaves the PoC Session, whether the PoC Session is ended or not depends on the release policy.

Figure 25 *"Leaving the PoC Group Session"* shows the high-level signalling procedure for leaving the PoC Group Session. In case the whole PoC Group Session is released the PoC Server releases the whole PoC Session according to the subclause 5.5.3 *"PoC Server releases the PoC Session to a PoC Client having On-demand Session"*.



NOTE: PoC Client A can be any of the PoC Clients participating in the PoC Session.

Figure 25: Leaving the PoC Group Session

1-5. The PoC Client A stops sending Talk Burst Control and/or Media Burst Control messages and stop sending/receiving media and sends a BYE request through the signalling path to the PoC Server X. Information elements contained in the BYE request:

a. PoC Address of the Participant leaving this PoC Session

6-10. Upon receiving the request, the PoC Server X (controlling) performs the necessary procedures to remove the PoC Client A. The PoC Server X (controlling) sends an OK response to the PoC Client A through the signalling path,

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which has routed the request. This event can be informed to other PoC Clients as described in the subclause 5.10 "*Subscription to Participant information*"

5.5.2 Leaving the PoC Session in the case of the Pre-established Session

This subclause provides scenarios as follows for PoC Clients using the Pre-established Session for a PoC Session. A PoC Client using the Pre-established Session initiates release of a Participant from a PoC Session. Other members of the PoC Session either remain on the PoC Session or depending on the release policy they are released according to the subclause 5.5.4 *"PoC Server releases the PoC Session towards a PoC Client having a Pre-established Session*". The PoC Session is released, but the Pre-established Session is maintained.

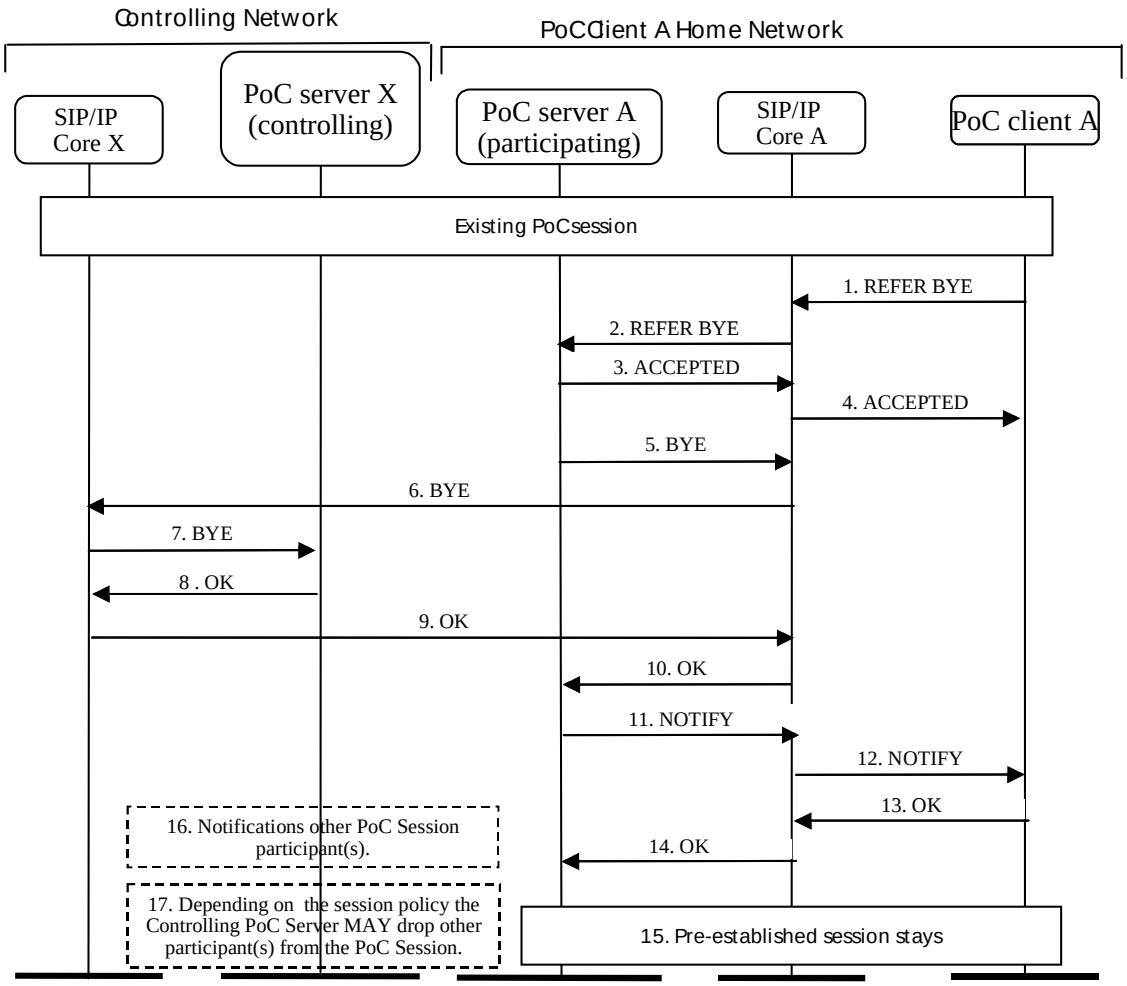

Figure 26: PoC Client releases from PoC Session (Pre-established Session)

1. PoC Client A sends a REFER BYE message to SIP/IP Core A.

   Information elements contained in REFER BYE message:

   a. A conference URI that identifies the Pre-established Session to which the REFER applies

   b. PoC Session Identity of PoC Session to leave.

2. SIP/IP Core sends the REFER BYE message to the PoC Server A (participating).

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3. PoC Server A (participating) acknowledges the request by sending ACCEPTED to the SIP/IP Core.
4. SIP/IP Core A forwards the ACCEPTED to the PoC Client A

5-7. The PoC Server A (participating) sends a BYE message to the PoC Server X (controlling) via SIP/IP Cores.

8-10. The PoC Server X (controlling) sends an acknowledgement to the PoC Server A (participating) via SIP/IP Cores.

11. After receiving the OK response PoC Server A sends a NOTIFY request to the SIP/IP Core A. Informational elements contained in the NOTIFY request:
    a. A conference URI that identifies the Pre-established Session
    b. Unconfirmed OK response received indication
12. The SIP/IP Core forwards the NOTIFY request to the PoC Client A.
13. PoC Client A sends an OK response to the SIP/IP Core A
14. The SIP/IP Core A sends the OK response to the PoC Server A.
15. The Pre-established Session between PoC Client A and the PoC Server A is maintained.
16. The release is notified to other Participants of the PoC Group Session if subscribed.
17. According to the release policy the other Participants of the PoC Session are either released or kept in the PoC Session. If they are released the Participants, who have had a Pre-established Session are released as described in the subclause 5.5.4 "*PoC Server releases the PoC Session towards a PoC Client having a Pre-established Session*". If the Participant has not had the Pre-established Session the PoC Session is released as described in the subclause 5.5.1 "*Leaving the PoC Session in the case of On-demand Session*".

NOTE 1: The procedure to close the Pre-established Session is similar to the procedure described in the subclause 5.5.1 '*Leaving the PoC Session in the case of On-demand Session*'.

NOTE 2: NOTIFYs caused by the implicit subscription of the REFER request may also be suppressed by request of PoC Client A.

5.5.3 PoC Server releases the PoC Session to a PoC Client having On-demand Session

The PoC Session can be released also by the PoC Server e.g. when PoC Session length time-out occurs.

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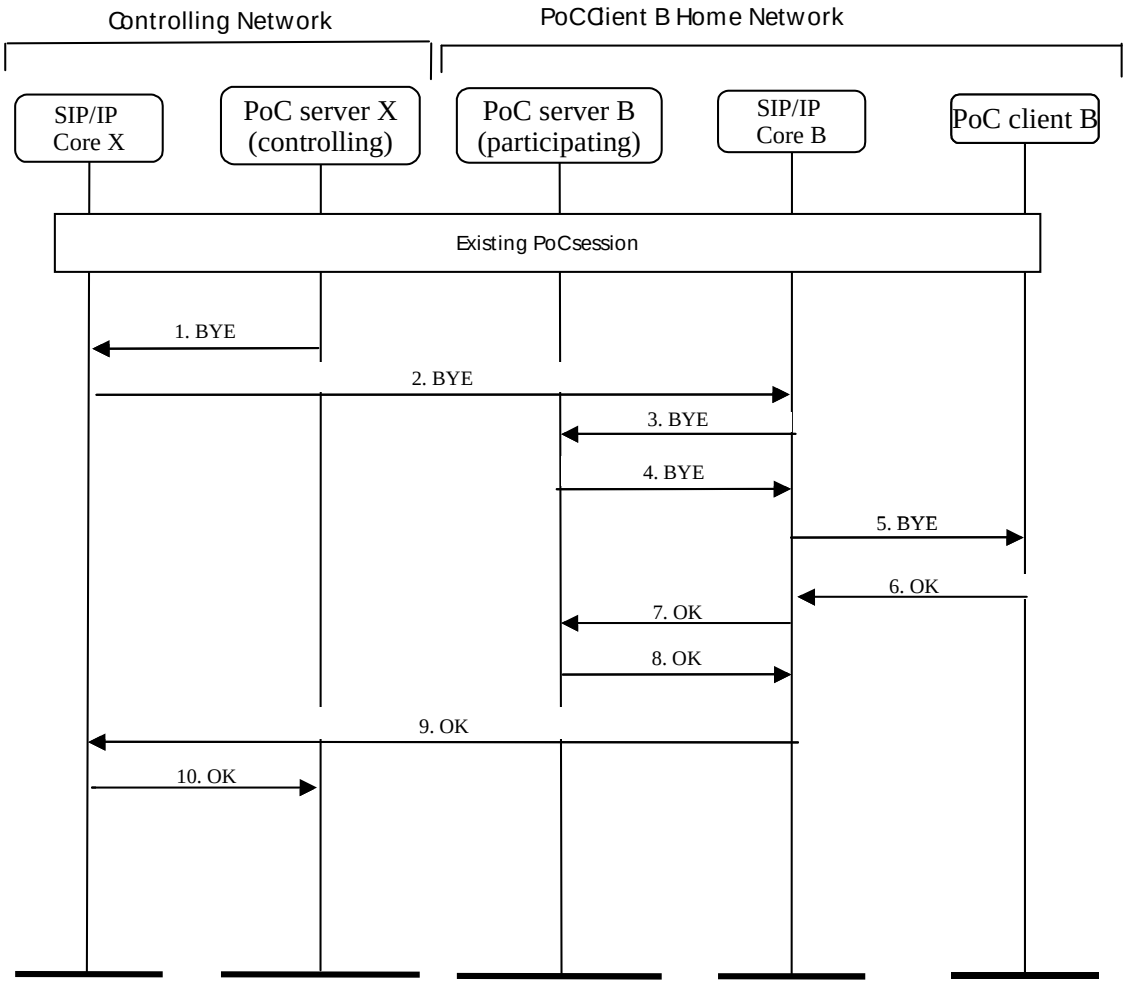

Figure 27: The release of the PoC Session.

1-5. The PoC Server X (controlling) sends a BYE request through the signalling path to the PoC Client B. Information elements contained in the BYE request:

a. PoC Address of the Participant released from the PoC Session

6-10. Upon receiving the request, the PoC Client B can indicate the release to the PoC User and sends an OK response to the PoC Server X (controlling) through the signalling path that has routed the request.

5.5.4 PoC Server releases the PoC Session towards a PoC Client having a Pre-established Session

The PoC Session using the Pre-established Session can be released also by the PoC Server e.g. when PoC Session length time-out occurs.

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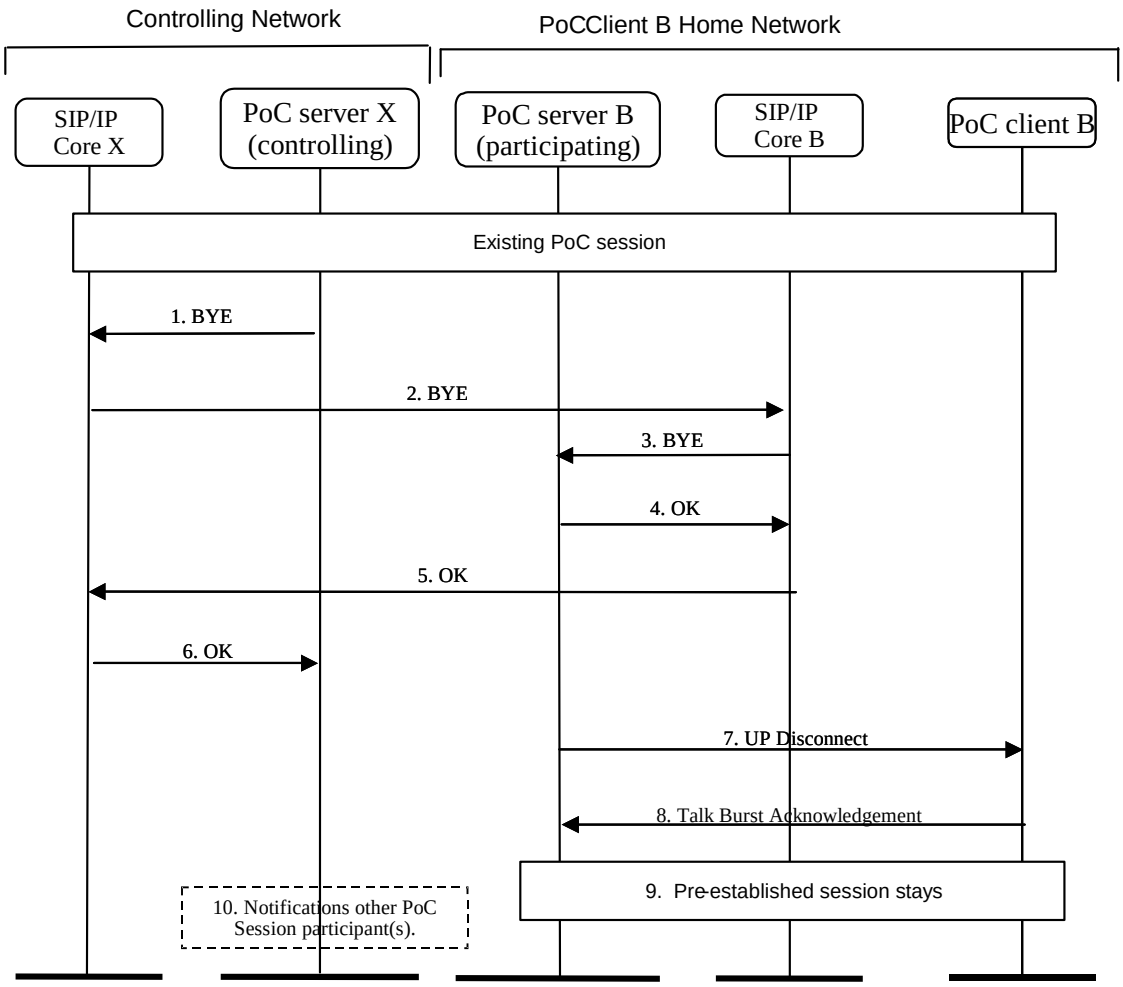

Figure 28: The release of the PoC Session with maintaining the Pre-established Session.

1-3. The PoC Server X (controlling) sends a BYE request through the signalling path to the PoC Server B (participating). Information elements contained in the BYE request:

   a. PoC Address of the Participant released from the PoC Session

4-6. Upon receiving the request, the PoC Server B sends an OK response to the PoC Server X (controlling) through the signalling path, which has routed the request.

7. PoC Server B (participating) sends the UP Disconnect indication to the PoC Client B.

8. PoC Client B sends the Talk Burst Acknowledgement response to the PoC Server B (participating).

9. Pre-established Session stays for further use.

10. The PoC Session release is notified to other Participants of the PoC Group Session if subscribed.

5.5.5 Expelling a Participant(s) from a PoC Session

Authorised Participant can expel other Participant(s) from a PoC Group Session. One or more Participants can be expelled at a time. The terminating part of the release is described in the subclauses 5.5.3 "*PoC Server releases the PoC Session to a*

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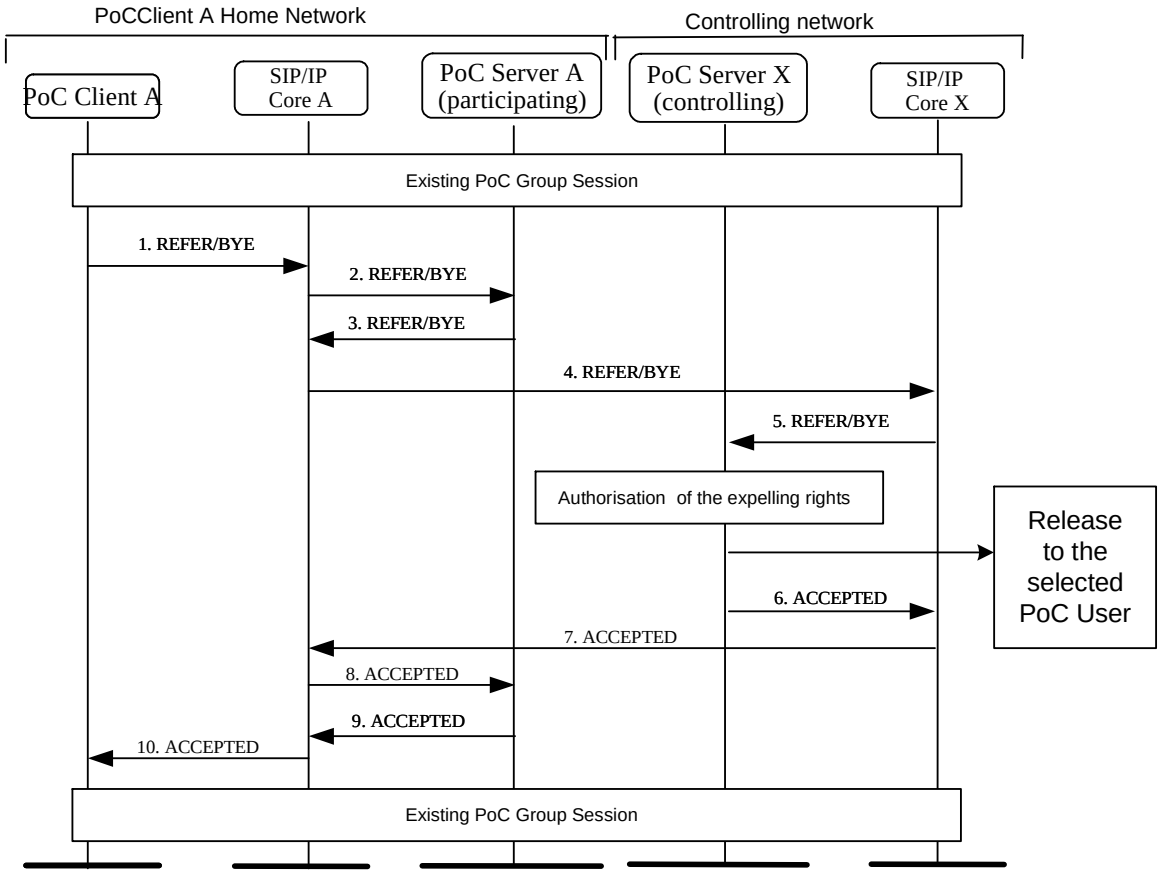
PoC Client having On-demand Session" and 5.5.4 "*PoC Server releases the PoC Session towards a PoC Client having a Pre-established Session*".

Figure 29 *"Expelling Participant(s) from a PoC Group Session"* shows the high-level signalling procedure for expelling a Participant from a PoC Group Session. The procedure is valid for both cases, when PoC Session is originally established by using On-demand Session or Pre-established Session.



NOTE: PoC Client A can be only a Participant authorised to expel Participants in a PoC Session.

Figure 29: Expelling Participant(s) from a PoC Group Session

1-5. The PoC Client A sends a REFER/BYE request through the signalling path to the PoC Server X. Information elements contained in the REFER/BYE request:

a. Address of the initiator of the request.

b. Participant(s) to be expelled from this PoC Session.

6-10. Upon receiving the request, the PoC Server X (controlling) performs the authorisation of expelling rights of the PoC User A and other necessary procedures to remove the addressed PoC Client. The PoC Server X (controlling) sends a release request to the selected PoC User and an ACCEPTED response to the PoC Client A through the signalling path, which has routed the request. This event can be informed to other PoC Clients as described in the subclause 5.10 "*Subscription to Participant information*".

The PoC Session continues and the PoC Client A stays in this PoC Session.

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5.6 Re-joining PoC Group Session

5.6.1 Re-joining PoC Group Session in the case of On-demand Session

When the PoC User wishes to rejoin the PoC Group Session, he issues INVITE request to the PoC Server. The PoC Server adds the PoC User to the PoC Group Session if it is still ongoing, otherwise the request is rejected.

Figure 30 *"Rejoining the PoC Group Session"* shows the high-level signalling procedure of re-joining the PoC Group Session.

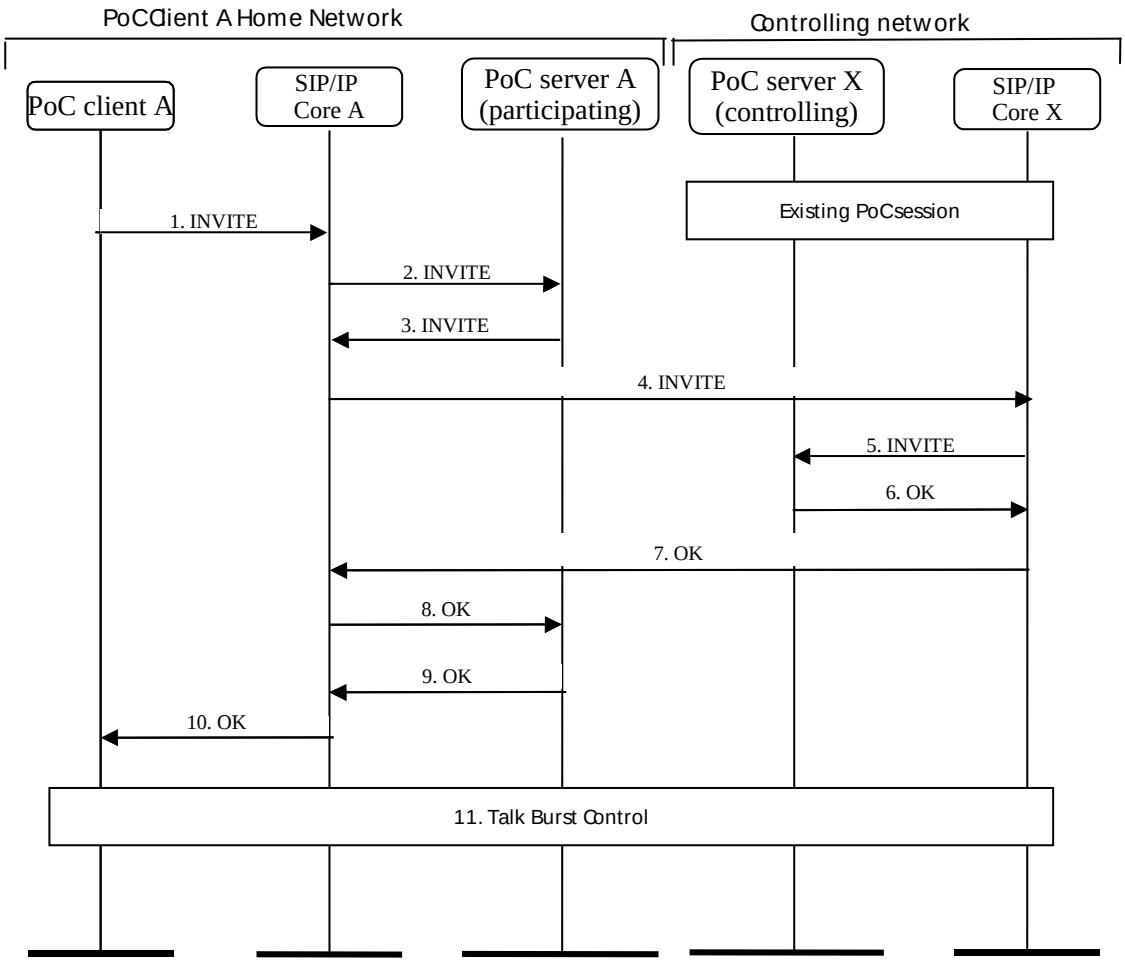

Figure 30: Rejoining the PoC Group Session

1. The PoC Client A sends an INVITE request to the PoC Group Session Identity. Information elements contained in the INVITE request:
   a. PoC Session Identity of the PoC Session to re-join
   b. PoC service indication
   c. PoC Address of the PoC User at the PoC Client A
   d. Media Parameters of PoC Client A
   e. Desired Local QoE Profile for PoC Client A

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2. The SIP/IP Core A routes the INVITE request to the PoC Server A (participating) trigged on the PoC Service indication and the PoC Address. Information elements contained in the INVITE request:
   a. PoC Session Identity of the PoC Session to re-join
   b. PoC service indication
   c. PoC Address of the PoC User at the PoC Client A
   d. Media Parameters of PoC Client A
   e. Desired Local QoE Profile for PoC Client A
3. The PoC Server A (participating) identifies that the PoC Group is not hosted in this PoC Server therefore it sends the request to the SIP/IP Core A. Information elements contained in the INVITE request:
   a. PoC Session Identity of the PoC Session to re-join
   b. PoC service indication
   c. PoC Address of the PoC User at the PoC Client A
   d. Media Parameters of PoC Server A
   e. Local QoE Profile for PoC Client A.
4. The SIP/IP Core A routes the request to SIP/IP Core X according to the routing principles of the SIP/IP Core. Information elements contained in the INVITE request:
   a. PoC Session Identity of the PoC Session to re-join
   b. PoC service indication
   c. PoC Address of the PoC User at the PoC Client A
   d. Media Parameters of PoC Server A
   e. Local QoE Profile for PoC Client A.
5. The SIP/IP Core X routes the request to the PoC Server X (controlling) based on the PoC Group Session Identity. If the Pre-arranged PoC Group Identity is used for other services (e.g. messaging) that are hosted on other Application Servers then the SIP/IP Core needs to use PoC Service indication to route to the PoC Server. Information elements contained in the INVITE request:
   a. PoC Session Identity of the PoC Session to re-join
   b. PoC service indication
   c. PoC Address of the PoC User at the PoC Client A
   d. Media Parameters of PoC Server A
   e. Local QoE Profile for PoC Client A.

6.-10. Upon receiving the request, the PoC Server X (controlling) performs the necessary procedures to add the PoC Client A to the PoC Session. The PoC Server X (controlling) sends an OK response to the PoC Client A through the signalling path, which has routed the request. The PoC Client A stores the contact address of the PoC Server X (controlling). Information elements contained in the OK response:

   a. QoE Profile for the PoC Session.

5.6.2 Re-joining PoC Group Session in the case of Pre-established Session

When the PoC User desires to rejoin the PoC Group Session in the case of Pre-established Session, he issues a REFER request to the PoC Server performing Participating PoC Function in his Home PoC Network. The PoC Server in the controlling network adds the PoC User to the requested PoC Group Session if it is still on-going, otherwise the PoC Server rejects the request.

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Figure 31 *"Rejoining a PoC Session in the case of Pre-established Session"* shows the high-level signalling procedure of re-joining the PoC Group Session in the case of Pre-established Session when the PoC Session is still on-going.

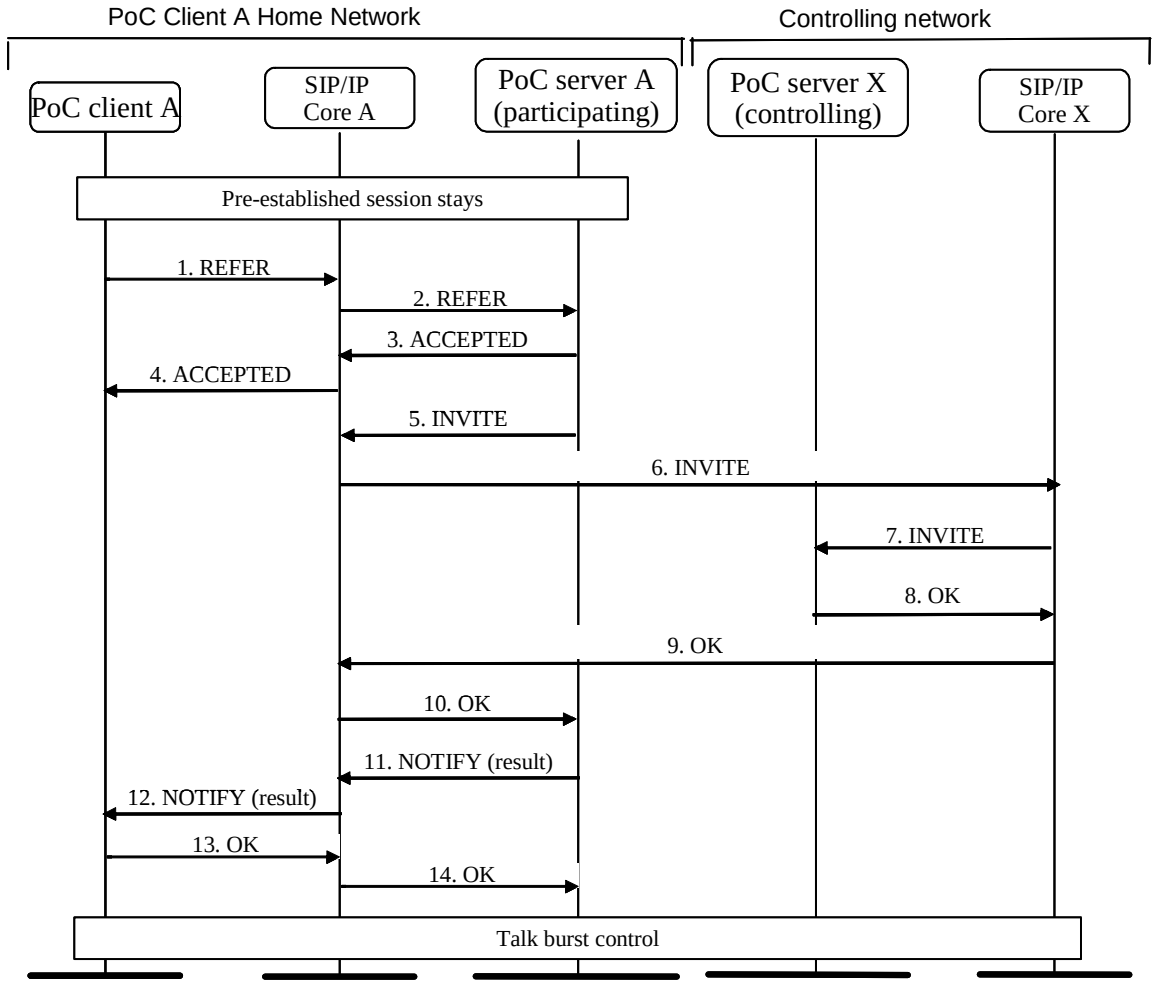

Figure 31: Rejoining a PoC Session in the case of Pre-established Session.

1. The PoC Client A sends a REFER request to SIP/IP Core A. Information elements contained in the REFER request:
   a. PoC Session Identity of the PoC Session to re-join
   b. PoC Address of the PoC User at the PoC Client A
   c. PoC service indication
   d. A conference URI that identifies the Pre-established Session to which the REFER applies.
2. The SIP/IP Core A routes the REFER request to the PoC Server A (participating) trigged on the PoC service indication and the PoC Address. Information elements contained in the REFER request:
   a. PoC Session Identity of the PoC Session to re-join
   b. PoC Address of the PoC User at the PoC Client A
   c. PoC service indication
   d. A conference URI that identifies the Pre-established Session to which the REFER applies.
3. PoC Server A sends an ACCEPTED response to the SIP/IP Core A.
4. The SIP/IP Core A routes the ACCEPTED response back to the PoC Client A.

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5. When the PoC Server A (participating) receives a REFER request containing a URI with an indication that the URI identifies a PoC Session not hosted by this PoC Server, the PoC Server A (participating) sends an INVITE request towards the SIP/IP Core A. Information elements contained in the INVITE request:
   a. PoC Session Identity of the PoC Session to re-join
   b. PoC Address of the PoC User at the PoC Client A
   c. PoC service indication
   d. Media Parameters of the PoC Server A (participating)
   e. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal.
   f. Media-floor Control Entities proposal.
   g. Local QoE Profile for PoC Client A
6. The SIP/IP Core A routes the request to SIP/IP Core X according to the routing principles of the SIP/IP Core. Information elements contained in the INVITE request:
   a. PoC Session Identity of the PoC Session to re-join
   b. PoC Address of the PoC User at the PoC Client A
   c. PoC service indication
   d. Media Parameters of the PoC Server A (participating)
   e. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal.
   f. Media-floor Control Entities proposal.
   g. Local QoE Profile for PoC Client A
7. The SIP/IP Core X routes the request to the PoC Server X (controlling) based on the PoC Session Identity. Information elements contained in the INVITE request:
   a. PoC Session Identity of the PoC Session to re-join
   b. PoC Address of the PoC User at the PoC Client A
   c. PoC service indication
   d. Media Parameters of the PoC Server A (participating)
   e. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal.
   f. Media-floor Control Entities proposal.
   g. Local QoE Profile for PoC Client A

8.-10. Upon receiving the request, the PoC Server X (controlling) performs the necessary procedures to add the PoC Client A to the PoC Session. The PoC Server X (controlling) sends an OK response to the PoC Server A (participating) through the signalling path, which has routed the INVITE request. Information elements contained in the OK response:
   a. PoC Session Identity of the PoC Session that the PoC Client A rejoined
   b. PoC Server X selected Media Parameters
   c. Selected Talk Burst Control Protocol and/or Media Burst Control Protocol.
   d. Media-floor Control Entities response.
   e. QoE Profile for the PoC Session

11.-12. After receiving the OK response, then the PoC Server A (participating) sends a NOTIFY request to the PoC Client A through the signalling path. Information elements contained in the NOTIFY request:
   a. PoC Session Identity of the PoC Session that the PoC Client A rejoined.

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b. QoE Profile for the PoC Session

13.-14. Upon receiving the NOTIFY request, the PoC Client A sends an OK response to the PoC Server A through the signalling path.

5.7 Adding PoC User(s) to a PoC Session

Any Participant can add any other PoC User to ongoing PoC Session, as long as the maximum number of Participants is not exceeded and if allowed by the PoC Group policy.

5.7.1 Procedure at inviting PoC User

Figure 32 *"Adding PoC User(s) (procedure at inviting PoC User)"* shows the high-level signalling procedure of adding PoC User(s) to the PoC Group Session from the inviting PoC User's point of view. The scenario is valid for On-demand Session case as well as for the Pre-established Session case.

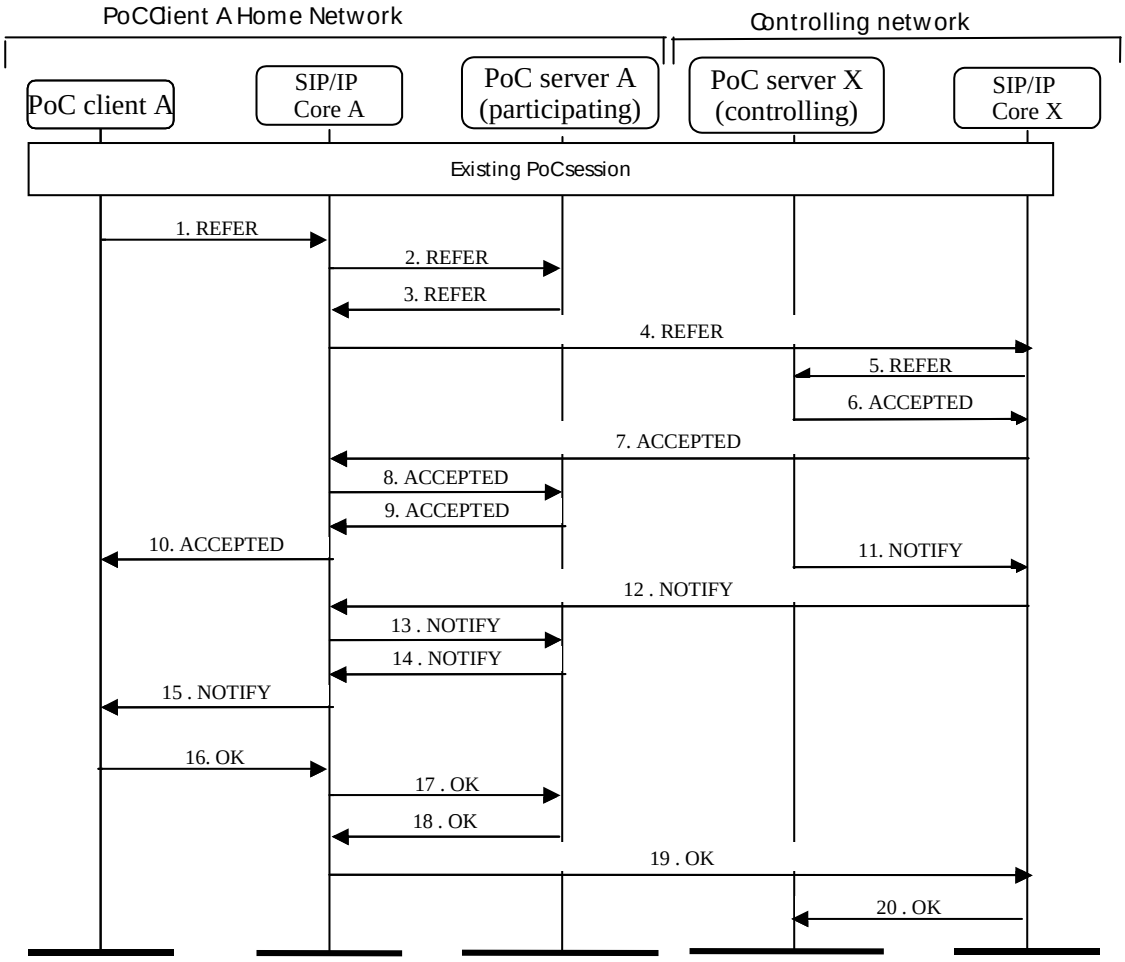

Figure 32: Adding PoC User(s) (procedure at inviting PoC User)

When the PoC User (referred to as the "inviting PoC User") wishes to add user(s) to the PoC Group Session, the PoC Client issues a REFER request to the PoC Server X (controlling). The REFER method is handled to add the PoC User(s) (referred to as the "Invited PoC User(s)") to the PoC Group Session by the PoC Server X (controlling).

The PoC Server can apply PoC Group policies to the adding Users to an ongoing PoC Group Session.

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The PoC Server X (controlling) issues a NOTIFY method according to the rules and procedures of [RFC3515] to the inviting PoC User upon receiving the accepted-response from the Invited PoC User.

1.-5. The PoC Client A sends a REFER request with the intended Invited PoC User's address (PoC Client B) through the signalling path to the PoC Server X (controlling). Information elements contained in the REFER request:

a. PoC Address or a list of the Invited PoC User(s) or Pre-arranged PoC Group identity

b. PoC Session Identity of the PoC Session to add

c. Manual answer override request if the inviting PoC User has been authorized to issue this request and selected to do so.

6.-10. Upon receiving the REFER request, the PoC Server X (controlling) initiates the inviting procedure to the PoC Client B side and sends an ACCEPTED response to the PoC Client A through the signalling path which has routed the original request.

If more than one PoC User is invited in the PoC Group Session, the following steps are skipped.

11.-15. When the PoC Server X (controlling) receives the indication from the PoC Client B that it has accepted the invitation, the PoC Server X (controlling) sends a NOTIFY request to the PoC Client A.

16.-20. Upon receiving the NOTIFY request, the PoC Client A sends an OK response to the PoC Server X (controlling).

5.7.2 Procedure at Invited PoC User

When an Invited PoC User is indicated with incoming INVITE method by the PoC Server, depending on the answering mode on the PoC Client, the Invited PoC User manually answers or automatically accepts which issues the final response back to the PoC Server.

5.7.2.1 Invited PoC User is in Manual Answer Mode

In this case, the terminating PoC Client indicates the incoming invitation request and the PoC User responds the request. The scenario is valid for On-demand Session case as well as for the Pre-established Session case.

This subclause describes the scenario where the inviting PoC User did not issue manual answer override request. For the procedure of the manual answer override if the inviting PoC User has been authorized to issue this request and selected to do so, refer to the subclauses 5.7.2.2 "*Invited PoC User is in Automatic Answer Mode using On-demand Session*" and 5.7.2.3 *"Invited PoC User is in Automatic Answer Mode using Pre-established Session"*.

The Figure 33 *"Adding PoC User(s) (procedure at Invited PoC User)"* shows the high level flow of this scenario.

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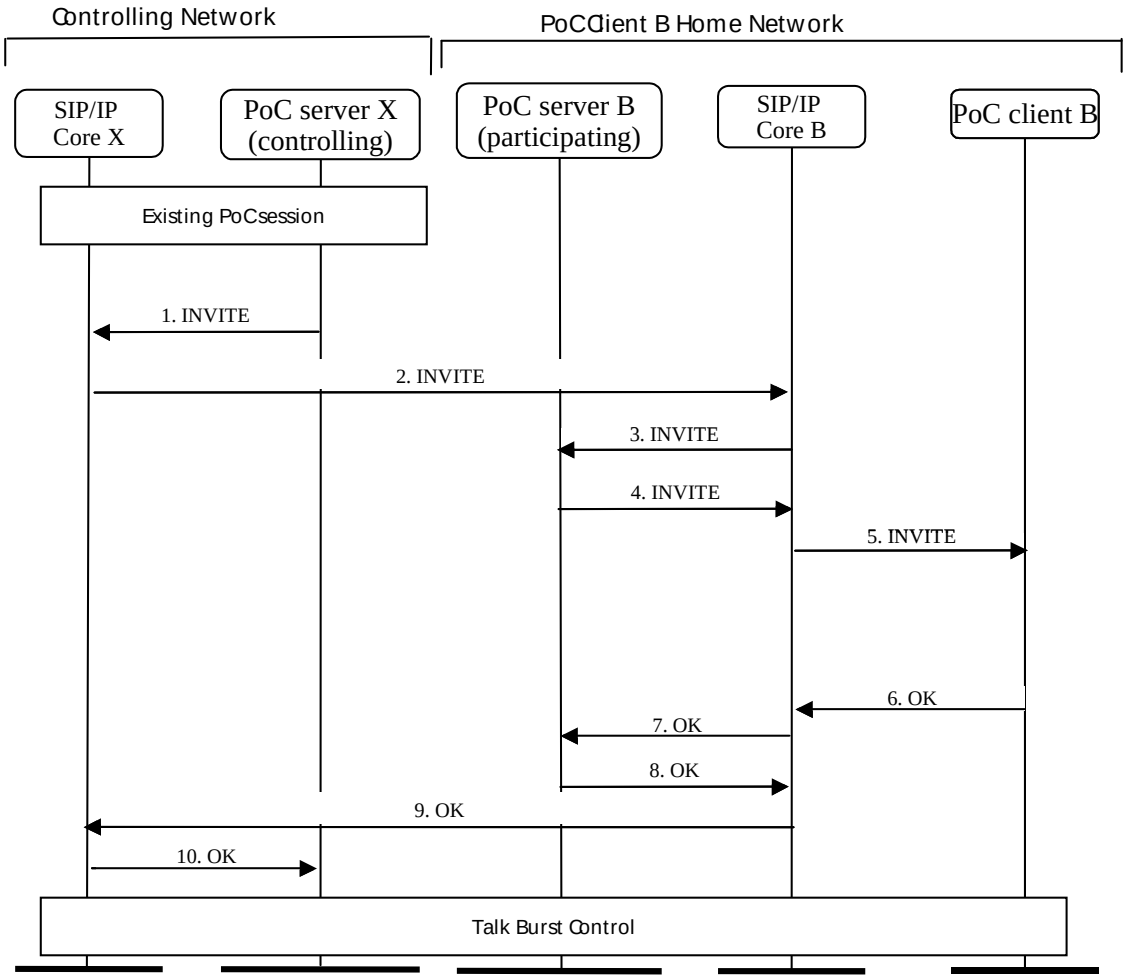

Figure 33: Adding PoC User(s) (procedure at Invited PoC User)

1. Upon receiving the request to invite a PoC Client B, the PoC Server X (controlling) sends an INVITE request to the PoC Client B. To reach the PoC Client B, the PoC Server X (controlling) sends INVITE request to the SIP/IP Core X. Information elements contained in the INVITE request:
   a. PoC Group Identity, if Pre-arranged or Chat PoC Group
   b. PoC Address of the PoC User at the PoC Client B,
   c. PoC service indication,
   d. PoC Address of the PoC User at the PoC Client A,
   e. Controlling PoC Function assigned indication,
   f. Media Parameters of the PoC Server X (controlling),
   g. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal,
   h. Media-floor Control Entities proposal.
   i. PoC Session Identity of the PoC Group Session.
   j. QoE Profile for the PoC Session.
   k. A list of PoC Addresses of PoC Users to be invited and have already been invited to the PoC Session, in case of Ad-hoc PoC Group Session.

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   l. Media included in the request.

2. SIP/IP Core routes the request to the PoC Client B's home network. Information elements contained in the INVITE request:
   a. PoC Group Identity, if Pre-arranged or Chat PoC Group
   b. PoC Address of the PoC User at the PoC Client B,
   c. PoC service indication,
   d. PoC Address of the PoC User at the PoC Client A,
   e. Controlling PoC Function assigned indication,
   f. Media Parameters of the PoC Server X (controlling),
   g. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal,
   h. Media-floor Control Entities proposal.
   i. PoC Session Identity of the PoC Group Session.
   j. QoE Profile for the PoC Session.
   k. A list of PoC Addresses of PoC Users to be invited and have already been invited to the PoC Session, in case of Ad-hoc PoC Group Session.
   l. Media included in the request.
3. SIP/IP Core B routes the request to the PoC Server B based on the PoC Address of the Invited PoC User and PoC service indication. Information elements contained in the INVITE request:
   a. PoC Group Identity, if Pre-arranged or Chat PoC Group,
   b. PoC Address of the PoC User at the PoC Client B,
   c. PoC service indication,
   d. PoC Address of the PoC User at the PoC Client A,
   e. Controlling PoC Function assigned indication,
   f. Media Parameters of the PoC Server X (controlling),
   g. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal
   h. Media-floor Control Entities proposal.
   i. PoC Session Identity of the PoC Group Session.
   j. QoE Profile for the PoC Session.
   k. A list of PoC Addresses of PoC Users to be invited and have already been invited to the PoC Session, in case of Ad-hoc PoC Group Session.
   l. Media included in the request.
4. The PoC Server B (participating) sends an INVITE request to the SIP/IP Core B. If the PoC Client B is using Pre-established Session, the PoC Server B sends a re-INVITE request within the existing Pre-established Session to the SIP/IP Core B, if supported by the PoC Server B and the PoC Client B.

   Information elements contained in the INVITE/re-INVITE request:
   a. PoC Group Identity, if Pre-arranged or Chat PoC Group,
   b. PoC Address of the PoC User at the PoC Client B,
   c. PoC service indication,
   d. PoC Address of the PoC User at the PoC Client A,
   e. Media Parameters of the PoC Server B (participating)

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f. Manual answer request

g. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal,

h. Media-floor Control Entities proposal.

i. PoC Session Identity of the PoC Group Session.

j. QoE Profile for the PoC Session.

k. A list of PoC Addresses of PoC Users to be invited and have already been invited to the PoC Session, in case of Ad-hoc PoC Group Session.

l. Media included in the request.

5. The SIP/IP Core forwards the INVITE/re-INVITE request to the PoC Client B. Information elements contained in the INVITE/re-INVITE request:

   a. PoC Group Identity, if Pre-arranged or Chat PoC Group,

   b. PoC Address of the PoC User at the PoC Client B,

   c. PoC service indication,

   d. PoC Address of the PoC User at the PoC Client A,

   e. Media Parameters of the PoC Server B (participating),

   f. Manual answer request,

   g. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal,

   h. Media-floor Control Entities proposal.

   i. PoC Session Identity of the PoC Group Session.

   j. QoE Profile for the PoC Session.

   k. A list of PoC Addresses of PoC Users to be invited and have already been invited to the PoC Session, in case of Ad-hoc PoC Group Session.

   l. Media included in the request.

6.-10. The PoC Client B indicates the invitation and waits for the accept indication by the PoC User. Upon receiving the invitation accept indication by the PoC User, the PoC Client B responds with an OK response to the PoC Server X (controlling) through the signalling path which has routed the request. The PoC Server X (controlling) notifies the inviting PoC User that the Invited PoC User has accepted the invitation.

   Information elements contained in OK response:

   a. Media Parameters of the PoC Client B

   b. Selected Talk Burst Control Protocol and/or Media Burst Control Protocol.

   c. Media-floor Control Entities proposal.

   d. Local QoE Profile for the PoC Client B.

5.7.2.2 Invited PoC User is in Automatic Answer Mode using On-demand Session

This subclause describes the scenario when the terminating PoC Client automatically answers the invitation using an On-demand Session and invited parties identification is delivered. The Figure 34 *"Adding PoC User(s) (procedure at Invited PoC User)"* shows the high level flow of this scenario.

NOTE 1: The following procedure assumes that the access policy of the PoC Client B about invited identity information allows to answer the invitation request automatically. When the access policy of the PoC Client B about invited identity information does not allow to answer the invitation request automatically, the answer mode shall be changed to manual answer for the invitation request (see 5.7.2.1 *"Invited PoC User is in Manual Answer Mode"*).

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NOTE 2: The following procedure assumes that the Invited Identity Information Mode for Invited PoC Client (PoC Client B) is not set as 'without'. When the Invited Identity Information Mode for Invited PoC Client (PoC Client B) is set as 'without', an information element k. *"A list of PoC Addresses of PoC Users to be invited and have already been invited to the PoC Session"* is not included in the INVITE request sent from the PoC Server B performing the Participating PoC Function to the PoC Client B via the SIP/IP Core B.

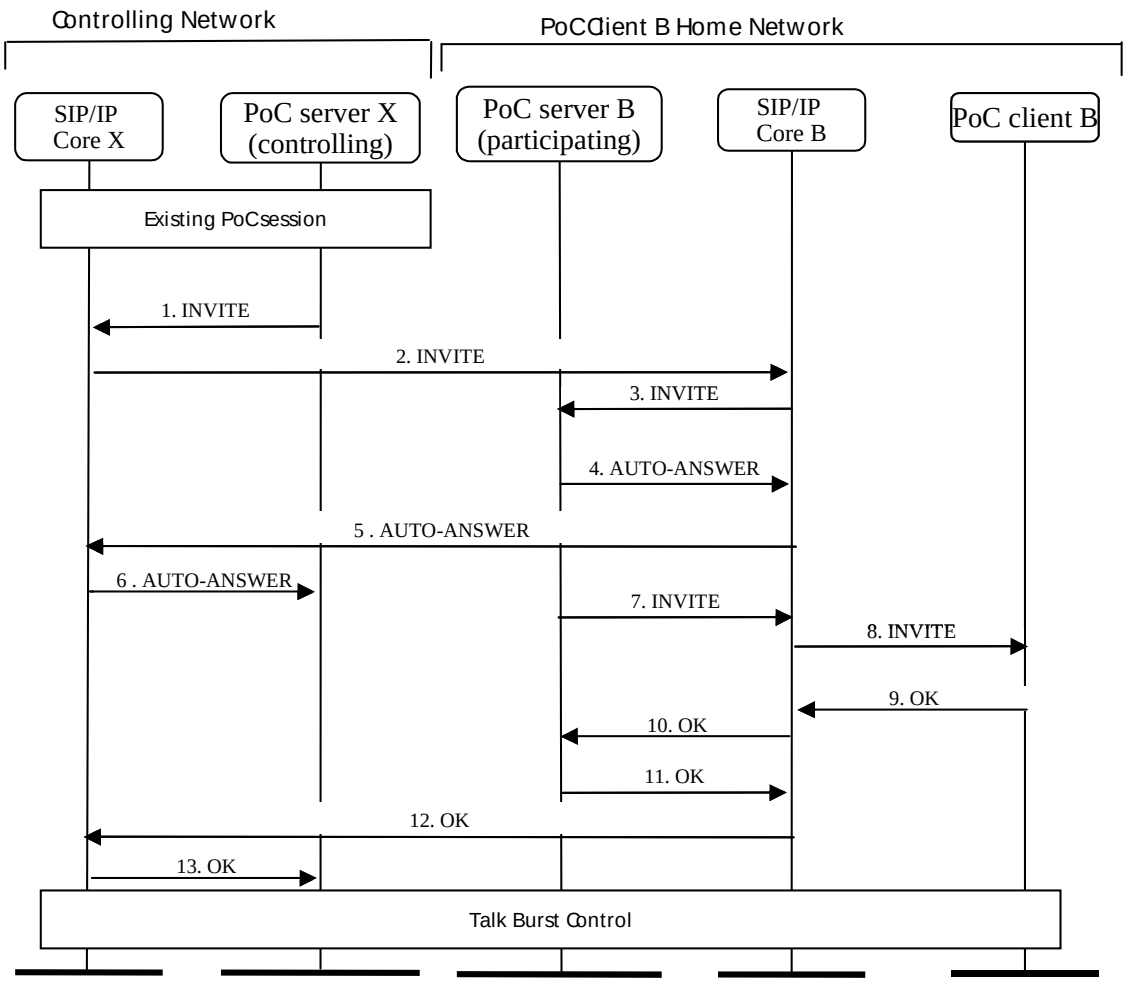

Figure 34: Adding PoC User(s) (procedure at Invited PoC User)

1. Upon receiving the request to invite a PoC Client B, the PoC Server X sends INVITE request to the PoC Client B. To reach the PoC Client B, the PoC Server X sends INVITE request to the SIP/IP Core X. Information elements contained in the INVITE request:
   a. PoC Group Identity, if Pre-arranged or Chat PoC Group,
   b. PoC Address of the PoC User at the PoC Client B,
   c. PoC service indication,
   d. PoC Address of the PoC User at the PoC Client A,
   e. Controlling PoC Function assigned indication,
   f. Media Parameters of the PoC Server X (controlling),
   g. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal,

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h. Media-floor Control Entities proposal.

i. Manual answer override request if the inviting PoC User has been authorized to issue this request and selected to do so,

j. PoC Session Identity of the PoC Group Session.

k. QoE Profile for the PoC Session.

l. A list of PoC Addresses of PoC Users to be invited and have already been invited to the PoC Session, in case of Ad-hoc PoC Group Session.

m. Media included in the request.

2. SIP/IP Core routes the request to the PoC Client B's home network. Information elements contained in the INVITE request:

   a. PoC Group Identity, if Pre-arranged or Chat PoC Group,

   b. PoC Address of the PoC User at the PoC Client B,

   c. PoC service indication,

   d. PoC Address of the PoC User at the PoC Client A,

   e. Controlling PoC Function assigned indication,

   f. Media Parameters of the PoC Server X (controlling),

   g. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal,

   h. Media-floor Control Entities proposal,

   i. Manual answer override request if the inviting PoC User has been authorized to issue this request and selected to do so,

   j. PoC Session Identity of the PoC Group Session.

   k. QoE Profile for the PoC Session.

   l. A list of PoC Addresses of PoC Users to be invited and have already been invited to the PoC Session, in case of Ad-hoc PoC Group Session.

   m. Media included in the request.

3. SIP/IP Core B routes the request to the PoC Server B based on the PoC Address of the Invited PoC Client and PoC service indication. Information elements contained in the INVITE request:

   a. PoC Group Identity, if Pre-arranged or Chat PoC Group,

   b. PoC Address of the PoC User at the PoC Client B,

   c. PoC service indication,

   d. PoC Address of the PoC User at the PoC Client A,

   e. Controlling PoC Function assigned indication,

   f. Media Parameters of the PoC Server X (controlling),

   g. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal,

   h. Media-floor Control Entities proposal,

   i. Manual answer override request if the inviting PoC User has been authorized to issue this request and selected to do so,

   j. PoC Session Identity of the PoC Group Session.

   k. QoE Profile for the PoC Session.

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l. A list of PoC Addresses of PoC Users to be invited and have already been invited to the PoC Session, in case of Ad-hoc PoC Group Session.

m. Media included in the request.

4-6. If the PoC Client B is accepting the PoC Session automatically, or if PoC Client B has authorised PoC Client A to issue a manual answer override request and PoC Server B (participating) supports manual answer override, and if the PoC Client B also uses On-demand Session, then the PoC Server B (participating) sends automatic answer request to the PoC Server X (controlling) through the signalling path.

7. The PoC Server B (participating) sends the PoC Session setup request to the SIP/IP Core B. Information elements contained in the INVITE request:

a. PoC Group Identity, if Pre-arranged or Chat PoC Group,

b. PoC Address of the PoC User at the PoC Client B,

c. PoC service indication,

d. PoC Address of the PoC User at the PoC Client A,

e. Automatic answer request,

f. Media Parameters of the PoC Server B (participating),

g. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal,

h. Media-floor Control Entities proposal.

i. PoC Session Identity of the PoC Group Session.

j. QoE Profile for the PoC Session.

k. A list of PoC Addresses of PoC Users to be invited and have already been invited to the PoC Session, in case of Ad-hoc PoC Group Session.

l. Media included in the request.

8. The SIP/IP Core B forwards the INVITE request to the PoC Client B. Information elements contained in the INVITE request:

a. PoC Group Identity, if Pre-arranged or Chat PoC Group,

b. PoC Address of the PoC User at the PoC Client B,

c. PoC service indication,

d. PoC Address of the PoC User at the PoC Client A,

e. Automatic answer request,

f. Media Parameters of the PoC Server B (participating),

g. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal,

h. Media-floor Control Entities proposal.

i. PoC Session Identity of the PoC Group Session.

j. QoE Profile for the PoC Session.

k. A list of PoC Addresses of PoC Users to be invited and have already been invited to the PoC Session, in case of Ad-hoc PoC Group Session.

l. Media included in the request.

9-13. The PoC Client B responds with an OK response to the PoC Server X (controlling) through the signalling path, which has routed the request. The PoC Server X (controlling) notifies the inviting PoC User that the Invited PoC User has accepted the invitation.

Information elements contained in OK response:

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a. Media Parameters of the PoC Client B

b. Selected Talk Burst Control Protocol and/or Media Burst Control Protocol.

c. Media-floor Control Entities response.

d. Local QoE Profile for the PoC Client B.

5.7.2.3 Invited PoC User is in Automatic Answer Mode using Pre-established Session

This subclause describes the scenario when the terminating PoC Client automatically answers the invitation using a Pre-established Session and invited parties identification is delivered. The Figure 34 *"Adding PoC User(s) (procedure at Invited PoC User)"* shows the high level flow of this scenario.

NOTE 1: The following procedure assumes that the access policy of the PoC Client B about invited identity information allows to answer the invitation request automatically. When the access policy of the PoC Client B about invited identity information does not allow to answer the invitation request automatically, the answer mode shall be changed to manual answer for the invitation request (see *5.7.2.1 "Invited PoC User is in Manual Answer Mode"*).

NOTE 2: The following procedure assumes that the Invited Identity Information Mode for Invited PoC Client (PoC Client B) is not set as 'without'. When the Invited Identity Information Mode for Invited PoC Client (PoC Client B) is set as 'without', an information element *g."A list of PoC Addresses of PoC Users to be invited and have already been invited to the PoC Session"* is not included in the connect message sent from the PoC Server B performing the Participating PoC Function to the PoC Client B.

NOTE 3: If Inviting PoC Client or PoC Server performing Participating PoC Function is not able to use an existing Pre-established Session, then it can either use the On-demand Session or make session modification for the Pre-established Session to get Media Types and Media Parameters to match between the invitation request and the existing Pre-established Session.

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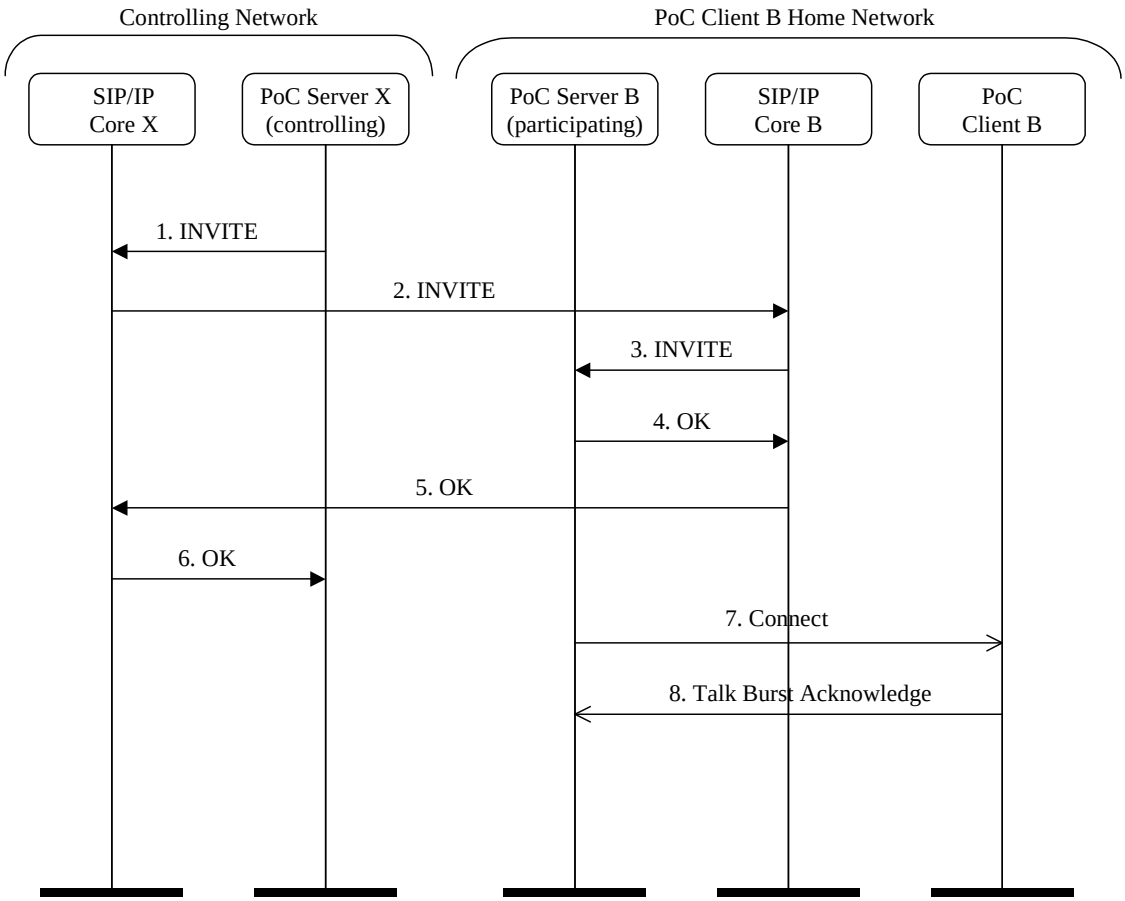

Figure 35: Adding PoC User(s) (procedure at Invited PoC User)

1. Upon receiving the request to invite a PoC Client B, the PoC Server X sends INVITE request to the PoC Client B. To reach the PoC Client B, the PoC Server X (controlling) sends INVITE request to the SIP/IP Core X (controlling). Information elements contained in the INVITE request:
   a. PoC Group Identity, if Pre-arranged or Chat PoC Group,
   b. PoC Address of the PoC User at the PoC Client B,
   c. PoC service indication,
   d. PoC Address of the PoC User at the PoC Client A,
   e. Controlling PoC Function assigned indication,
   f. Media Parameters of the PoC Server X (controlling),
   g. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal,
   h. Media-floor Control Entities proposal,
   i. Manual answer override request if the inviting PoC User has been authorized to issue this request and selected to do so,
   j. PoC Session Identity of the PoC Group Session.
   k. QoE Profile for the PoC Session
   l. A list of PoC Addresses of PoC Users to be invited and have already been invited to the PoC Session, in case of Ad-hoc PoC Group Session.

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m. Media included in the request.

2. SIP/IP Core routes the request to the PoC Client B's home network. Information elements contained in the INVITE request:

   a. PoC Group Identity, if Pre-arranged or Chat PoC Group,

   b. PoC Address of the PoC User at the PoC Client B,

   c. PoC service indication,

   d. PoC Address of the PoC User at the PoC Client A,

   e. Controlling PoC Function assigned indication,

   f. Media Parameters of the PoC Server X (controlling),

   g. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal,

   h. Media-floor Control Entities proposal,

   i. Manual answer override request if the inviting PoC User has been authorized to issue this request and selected to do so,

   j. PoC Session Identity of the PoC Group Session.

   k. QoE Profile for the PoC Session

   l. A list of PoC Addresses of PoC Users to be invited and have already been invited to the PoC Session, in case of Ad-hoc PoC Group Session.

   m. Media included in the request.

3. SIP/IP Core B routes the request to the PoC Server B based on the PoC Address of the Invited PoC Client and PoC service indication. Information elements contained in the INVITE request:

   a. PoC Group Identity , if Pre-arranged or Chat PoC Group,

   b. PoC Address of the PoC User at the PoC Client B,

   c. PoC service indication,

   d. PoC Address of the PoC User at the PoC Client A,

   e. Controlling PoC Function assigned indication,

   f. Media Parameters of the PoC Server X (controlling),

   g. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal,

   h. Media-floor Control Entities proposal,

   i. Manual answer override request if the inviting PoC User has been authorized to issue this request and selected to do so,

   j. PoC Session Identity of the PoC Group Session.

   k. QoE Profile for the PoC Session

   l. A list of PoC Addresses of PoC Users to be invited and have already been invited to the PoC Session, in case of Ad-hoc PoC Group Session.

   m. Media included in the request.

4-6. If the PoC Client B is accepting the PoC Session automatically, or if PoC Client B has authorised PoC Client A to issue a manual answer override request and PoC Server B (participating) supports manual answer override, and if the PoC client B also has Pre-established Session with PoC Server B (participating), and if the offered Media in the received invitation request are applicable to the Pre-established Session with the PoC Client B, then the PoC Server B (participating) sends an OK response back towards the controlling network. Information elements contained in OK response:

   a. Media Parameters of PoC Server B

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b. Selected Talk Burst Control Protocol and/or Media Burst Control Protocol.

c. Media-floor Control Entities response

d. Local QoE Profile for the PoC Client B.

7. The PoC Server B (participating) sends the Connect message to the PoC Client B. Information elements contained in the Connect message:

   a. PoC Address of the Participant at the PoC Client initiating the invitation

   b. Nick Name of the Participant at the PoC Client initiating the invitation

   c. PoC Session Identity of the PoC Group Session

   d. PoC Group Identity

   e. Nick Name of the PoC Group

   f. Manual answer override request indication, if PoC Client A is authorized and PoC Server B supports manual answer override.

   g. A list of PoC Addresses of PoC Users to be invited and have already been invited to the PoC Session, in case of Ad-hoc PoC Group Session.

8. The PoC Client B acknowledges the Connect message with a Talk Burst Acknowledge message to guarantee reliable delivery of the connect message.

5.8 Handling of Simultaneous PoC Sessions

5.8.1 Simultaneous PoC Session setup and control

This subclause describes the case when the PoC Client, which is capable of handling Simultaneous PoC Sessions, selects the PoC Session priority of two priority levels (primary and secondary).

The setting is made on the session setup as described in the Figure 36 *"Simultaneous session setup"* or on the session update as described in the Figure 37 *"Setting the session priority and/or locking during the session"*, where Pre-arranged or Chat PoC Group Session priority and/or locking is changed. The priority and locking request information element can be added to the 1-to-1 and Ad-hoc PoC Group Session setup and update, too. The priority information is received and processed by the Home PoC Server (performing the Participating PoC Function). The lock/unlock information is sent by the PoC Client to the PoC Server performing the Participating PoC Function similar way. When PoC Client is locked to one PoC Session, then the PoC Server performing the Participating PoC Function does not send Talk Bursts of any other PoC Session to the PoC Client until unlocked or when PoC Session is ended.

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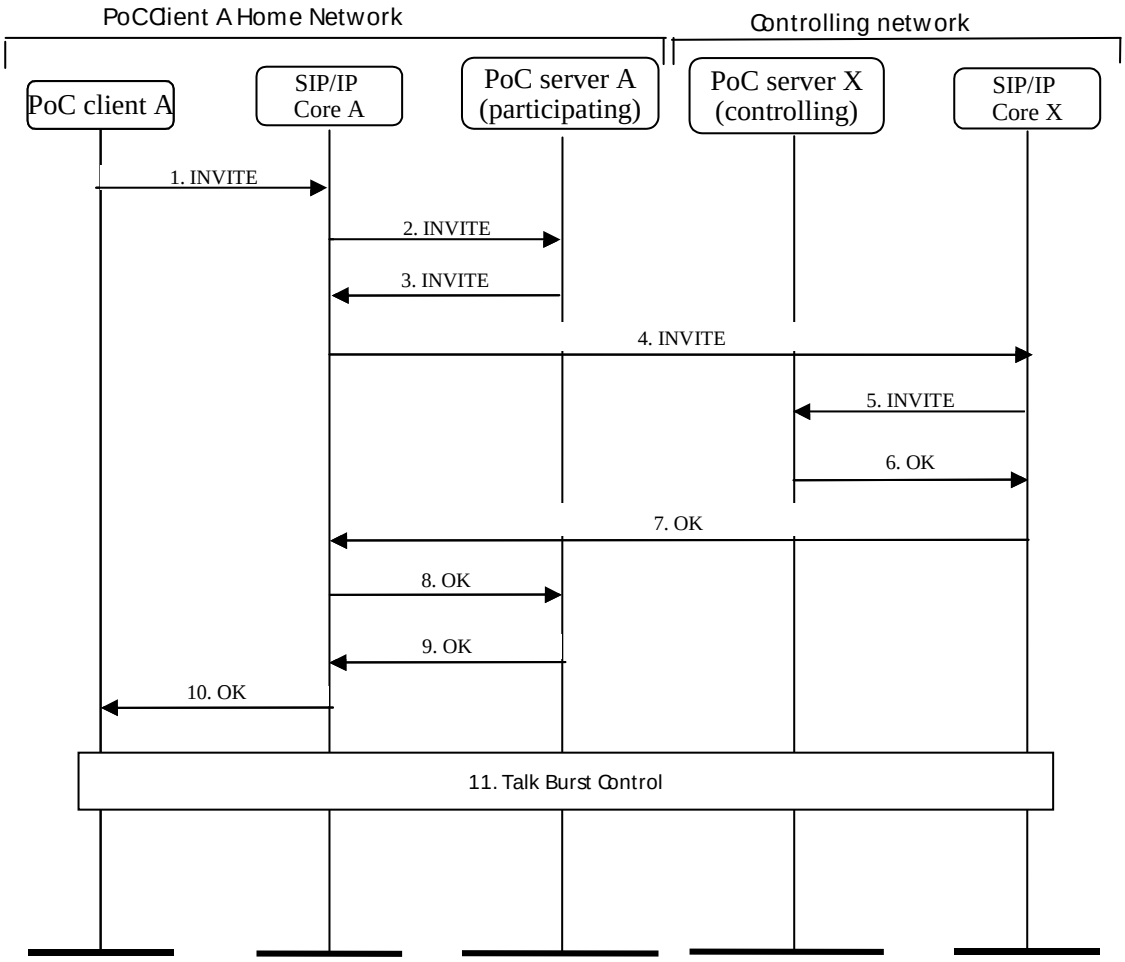

Figure 36: Simultaneous session setup.

1. In order to establish a Simultaneous PoC Session the PoC Client A sends an initial INVITE request.

   Information elements contained in INVITE request:

   a. PoC Group Identity
   b. PoC Address of the PoC User at the PoC Client A
   c. PoC service indication
   d. Media Parameters of the PoC Client A
   e. The session priority and/or locking request
   f. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal,
   g. A manual answer override request.
   h. Media-floor Control Entities proposal.
   i. Desired QoE Profile
   j. Media included in the request.

2. The SIP/IP Core A routes the INVITE request to the PoC Server A (participating) trigged on the PoC service indication and PoC Address.

   Information elements contained in INVITE request:

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a. PoC Group Identity
b. PoC Address of the PoC User at the PoC Client A
c. PoC service indication
d. Media Parameters of the PoC Client A
e. The session priority and/or locking request
f. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal,
g. Media-floor Control Entities proposal,
h. A manual answer override request.
i. Desired QoE Profile.
j. Media included in the request.

3. The PoC Server A (participating) identifies that the Simultaneous PoC Sessions capability is requested and the session priority and/or locking is requested. The PoC Server A updates the session priority according to the request. If locking is requested the PoC Server A locks the RTP Media filtering the way that this session is by-passed to the PoC Client A until the session ends or it is unlocked. The PoC Server A performing the Participating PoC Function sends the INVITE request to the PoC Server X (controlling), but without Simultaneous PoC Session specific information elements.

   Information elements contained in INVITE request:

   a. PoC Group Identity
   b. PoC Address of the PoC User at the PoC Client A
   c. PoC service indication
   d. PoC Server A (participating) selected Media Parameters
   e. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal,
   f. Media-floor Control Entities proposal,
   g. A manual answer override request.
   h. Desired QoE Profile.
   i. Media included in the request.

4. The SIP/IP Core A routes the request to SIP/IP Core X.

   Information elements contained in INVITE request:

   a. PoC Group Identity
   b. PoC Address of the PoC User at the PoC Client A
   c. PoC service indication
   d. PoC Server A (participating) selected Media Parameters
   e. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal,
   f. Media-floor Control Entities proposal,
   g. A manual answer override request.
   h. Desired QoE Profile.
   i. Media included in the request.

5. The SIP/IP Core X routes the request to the PoC Server X (controlling) based on PoC Group Identity.

   Information elements contained in INVITE request:

   a. PoC Group Identity

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b. PoC Address of the PoC User at the PoC Client A

c. PoC service indication

d. PoC Server A (participating) selected Media Parameters

e. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal,

f. Media-floor Control Entities proposal,

g. A manual answer override request.

h. Desired QoE Profile.

i. Media included in the request.

6-8. The PoC Server X (controlling) performs the necessary terminating service control. The PoC Server X sends an OK response to the PoC Server A (participating) along the same signalling path. Information elements contained in OK response:

a. PoC Server X (controlling) selected Media Parameters

b. Selected Talk Burst Control Protocol and/or Media Burst Control Protocol.

c. Media-floor Control Entities response.

d. QoE Profile for the PoC Session.

9-10. The PoC Server A sends an OK response to the PoC Client A along the same signalling path.

Information elements contained in OK response:

a. PoC Server A (participating) selected Media Parameters

b. Selected Talk Burst Control Protocol and/or Media Burst Control Protocol.

c. Media-floor Control Entities response.

d. The session priority and/or locking response.

e. QoE Profile for the PoC Session.

The session priority may be set also during the Pre-established Session setup. Locking to the Pre-established Session, when there is no PoC Session, is not relevant.

5.8.2 Setting session priority/lock-in during a session

This subclause describes the case when the session priority is changed during a PoC Session. In this case the UPDATE is sent to the PoC Server A (participating) without forwarding it to the PoC Server X (controlling) as described in the Figure 37 *"Setting the session priority and/or locking during the session"*, where Pre-arranged or Chat PoC Group Session priority and/or locking is changed. The priority and locking request information element can be added to the 1-to-1 and Ad-hoc PoC Group Session update, too.

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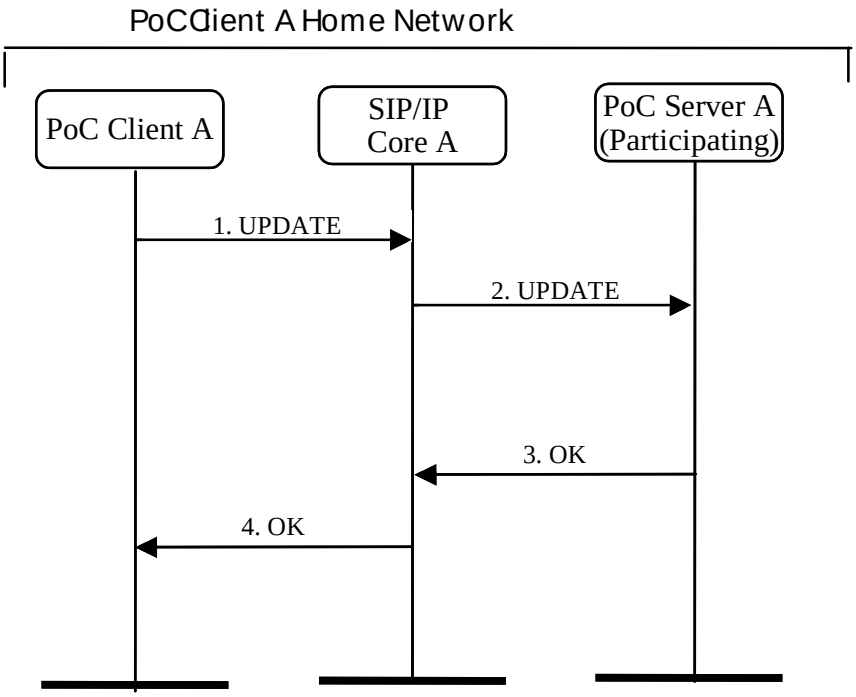

Figure 37: Setting the session priority and/or locking during the session

1. The PoC Client A sends an UPDATE request to the address of the PoC Group.

   Information elements contained in UPDATE request:

   a. PoC Group Identity
   b. PoC Address of the Participant initiating the session priority and/or locking setting
   c. PoC service indication
   d. The session priority and/or locking request.

2. The SIP/IP Core A routes the UPDATE request to the PoC Server A (participating) trigged on the PoC service indication and PoC Address.

   Information elements contained in UPDATE request:

   a. PoC Group Identity
   b. PoC Address of the Participant initiating the session priority and/or locking setting
   c. PoC service indication
   d. The session priority and/or locking request.

3. The PoC Server A (participating) changes the session priority and/or locking, configured if the local policy allows it and sends OK response to the SIP/IP Core A with the response to the request.

   Information elements contained in OK response:

   a. The session priority and/or locking response.

4. The SIP/IP Core A forwards the response to the PoC Client A with the response to the request.

   Information elements contained in OK response:

   a. The session priority and/or locking response.

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NOTE 1: The UPDATE in this subclause is realized in the protocol specification either as SIP UPDATE or SIP re-INVITE request.

NOTE 2: If the Invited PoC Client wants to change the session priority and/or locking, it shall execute the procedure described in this subclause.

5.9 Instant Personal Alert

The Instant Personal Alert provides the capability for one PoC User to alert another PoC User, i.e. request the other PoC User to establish a 1-1 PoC Session when convenient for the alerted PoC User.

5.9.1 Originating side

This subclause describes the procedures in the home network of the PoC User sending the Instant Personal Alert. Figure 38 *"Sending an Instant Personal Alert, originating side"* shows the high-level signalling flow for this scenario.

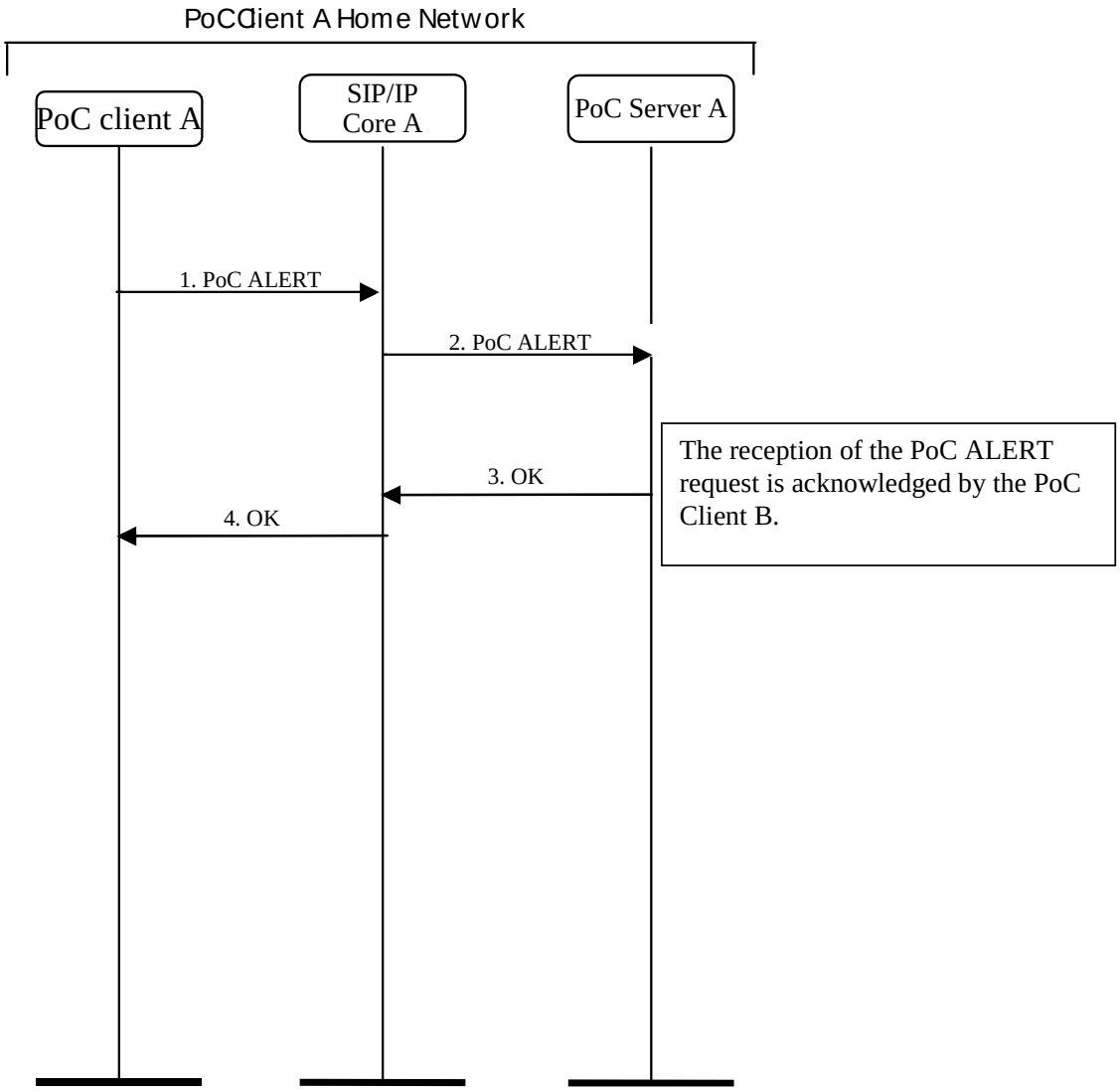

Figure 38: Sending an Instant Personal Alert, originating side.

1. The PoC Client A sends a PoC ALERT to the SIP/IP Core A. Information elements contained in PoC ALERT request:

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a. The PoC Address of the PoC User at the PoC Client A;

b. The PoC Address of the PoC User at the PoC Client B;

c. PoC service indication;

d. PoC alert indication.

2. The SIP/IP Core sends the PoC ALERT request to the PoC Server A based on the PoC Address of PoC User A and PoC service indication.

   Information elements contained in PoC ALERT request:

   a. The PoC Address of the PoC User at the PoC Client A;

   b. The PoC Address of the PoC User at the PoC Client B;

   c. PoC service indication;

   d. PoC alert indication.

   The signalling flow on the terminating side is described in the subclause 5.9.2 *"Terminating side"*.

3-4. When the PoC Client B acknowledges the reception of the PoC ALERT request an OK response is received in the PoC Server A. The PoC Server A forwards the OK response via SIP/IP Core A to the PoC Client A.

5.9.2 Terminating side

This subclause describes the procedures when the PoC User in another network receives the Instant Personal Alert. Figure 39 *"Sending an Instant Personal Alert, terminating side"* shows the high level signalling for the scenario.

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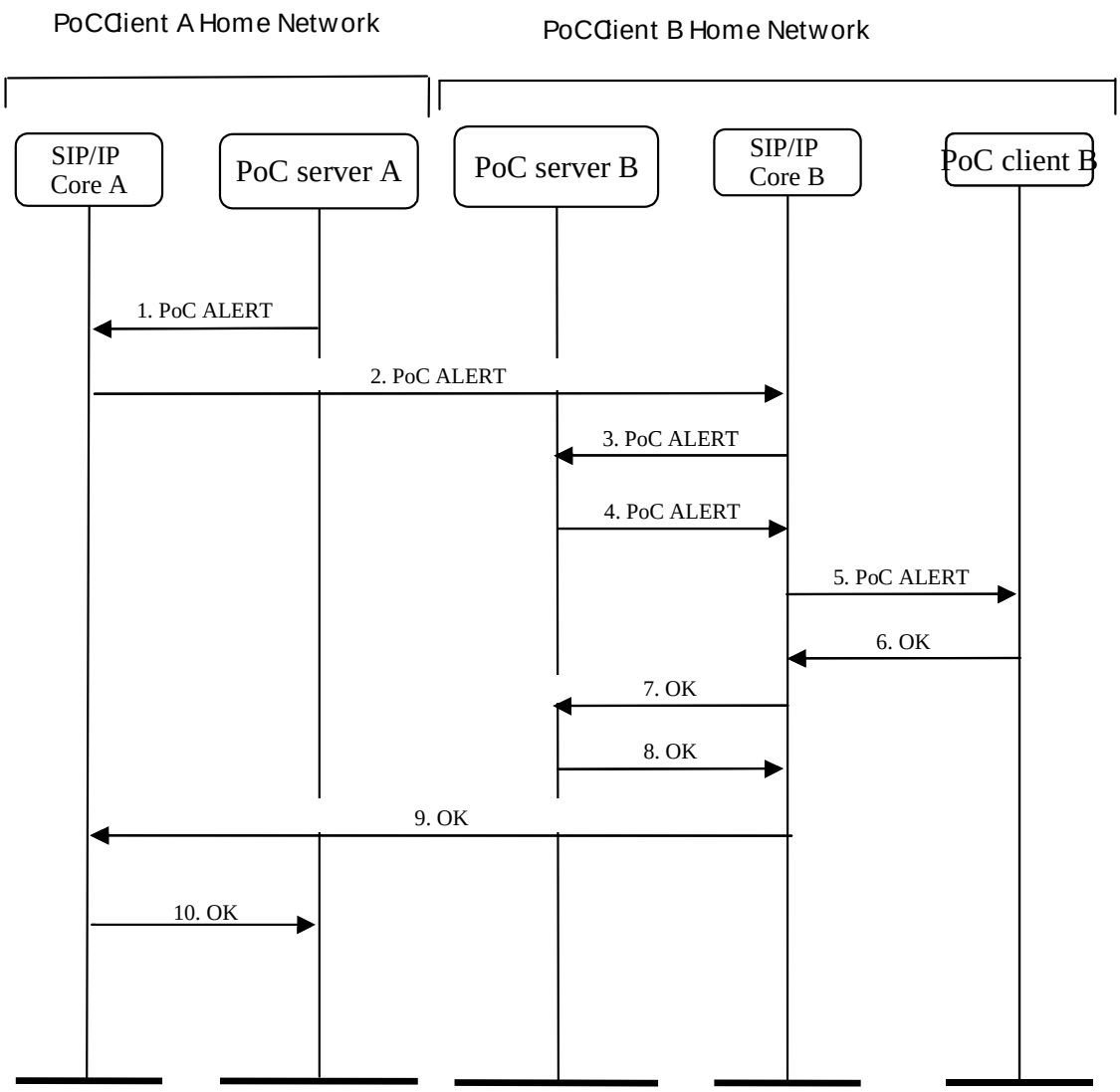

Figure 39: Sending an Instant Personal Alert, terminating side.

1. The PoC Server A sends the PoC ALERT to the SIP/IP Core A.

   Information elements contained in PoC ALERT request:

   a. The PoC Address of the PoC User at the PoC Client A;

   b. The PoC Address of the PoC User at the PoC Client B;

   c. PoC service indication;

   d. PoC alert indication.

2. The SIP/IP Core A routes the PoC ALERT request to the SIP/IP Core B based on the PoC Address of the target PoC User B.

   Information elements contained in PoC ALERT request:

   a. The PoC Address of the PoC User at the PoC Client A;

   b. The PoC Address of the PoC User at the PoC Client B;

   c. PoC service indication;

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d. PoC alert indication.

3. The SIP/IP Core B sends the PoC ALERT request to the PoC Server B based on the PoC Address of the target PoC User, the PoC service indication and the PoC alert indication.

   Information elements contained in PoC ALERT request:

   a. The PoC Address of the PoC User at the PoC Client A;

   b. The PoC Address of the PoC User at the PoC Client B;

   c. PoC service indication; and,

   d. PoC alert indication.

4. The PoC Server B checks if the PoC User sending the PoC ALERT request is authorized to send an Instant Personal Alert to the target PoC User using the target PoC User's accept and reject rules and if authorized the PoC Server B sends the PoC ALERT to the SIP/IP Core B.

   Information elements contained in PoC ALERT request:

   a. The PoC Address of the PoC User at the PoC Client A;

   b. The PoC Address of the PoC User at the PoC Client B;

   c. PoC service indication; and,

   d. PoC alert indication.

5. The SIP/IP Core B routes the PoC ALERT request to the PoC Client B based on registration information.

   Information elements contained in PoC ALERT request:

   a. The PoC Address of the PoC User at the PoC Client A;

   b. The PoC Address of the PoC User at the PoC Client B;

   c. PoC service indication; and,

   d. PoC alert indication.

6-10. The PoC Client B sends the OK response in order to acknowledge the reception of the PoC ALERT request. The OK response is sent along the signalling path created by the PoC ALERT request. The sending of the OK response does not imply that the PoC User has seen the alert.

5.10 Subscription to Participant information

5.10.1 Subscription initiated by PoC Client

A PoC User is able to request notification about the Participants in a PoC Session. The PoC Client subscribes to the Participant information either when participating in the PoC Session or when not participating in a PoC Session. When subscribing to the PoC Session the subscription is performed using SIP URI associated to a PoC Group or using the PoC Session Identity.

The PoC Server can decline the request based on PoC Group policy information disallowing the requesting PoC User to subscribe the Participant information.

The subscription to the Participant information is done according to [RFC3265].

When subscribing to the PoC Session, the PoC Client MAY either subscribe to the full conference information or subscribe to the partial conference information by including content limiting filter in the subscription request.

The PoC Client MAY choose to subscribe to the current status (one-off mode) of the PoC Group or for a period of time (continuous mode) of Participant information.

The signalling flow is described in the Figure 40 *"Subscribing to Participant information by the PoC Client"*.

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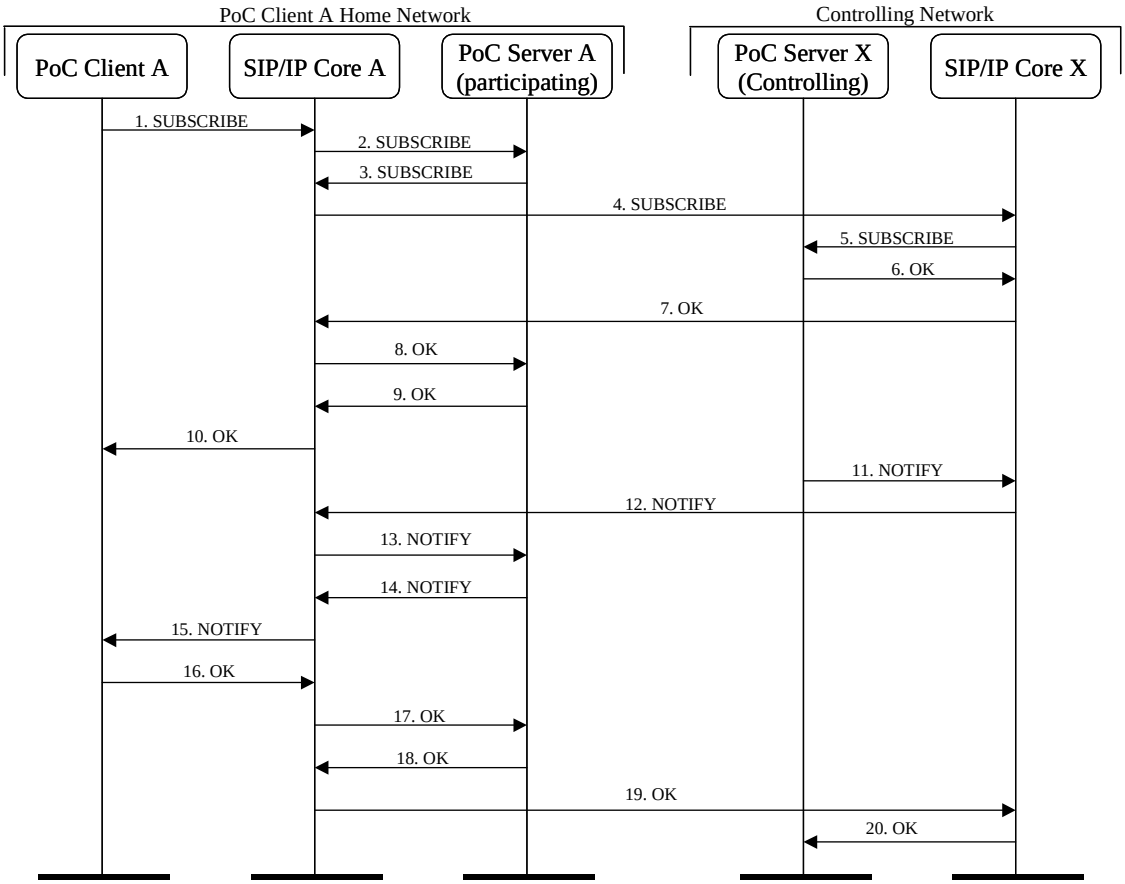

Figure 40: Subscribing to Participant information by the PoC Client

1. PoC Client A initiates the Participant information subscription by creating a SUBSCRIBE request and sends the SUBSCRIBE request to the SIP/IP Core A. Information elements contained in the SUBSCRIBE request includes:
   a. PoC Address of the PoC User at the PoC Client A;
   b. PoC service indication;
   c. PoC Session Identity;
   d. Content filter information; and,
   e. The length of time the subscription lasts (is zero if the one-off mode is used and higher than zero if continuous mode is used).
2. The SIP/IP Core A forwards the SUBSCRIBE request to the PoC Server A (participating) based on the PoC service indication and the PoC Address. Information elements contained in the SUBSCRIBE request:
   a. PoC Address of the PoC User at the PoC Client A;
   b. PoC service indication;
   c. PoC Session Identity;
   d. Content filter information; and,
   e. The length of time the subscription lasts (is zero if the one-off mode is used and higher than zero if continuous mode is used).

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3. PoC Server A (participating) identifies that the SUBSCRIBE request is destined to a further PoC Server. The PoC Server A (participating) forwards the message to the SIP/IP Core. The information elements contained in the SUBSCRIBE request:
   a. PoC Address of the PoC User at the PoC Client A;
   b. PoC service indication;
   c. PoC Group Session Identity;
   d. Content filter information; and,
   e. The length of time the subscription lasts (is zero if the one-off mode is used and higher than zero if continuous mode is used).

4. SIP/IP Core forwards the SUBSCRIBE request to the hosting network of the PoC Session. Information elements contained in the SUBSCRIBE request:
   a. PoC Address of the PoC User at the PoC Client A;
   b. PoC service indication;
   c. PoC Session Identity;
   d. Content filter information; and,
   e. The length of time the subscription lasts (is zero if the one-off mode is used and higher than zero if continuous mode is used).

5. The SIP/IP Core X forwards the SUBSCRIBE request to the PoC Server X (controlling) based on the PoC Session Identity. The PoC Server X (controlling) receives the SUBSCRIBE request and checks whether the PoC Group Session exists and whether the originator is allowed subscribing to it. Information elements contained in the SUBSCRIBE request:
   a. PoC Address of the PoC User at the PoC Client A;
   b. PoC service indication;
   c. PoC Session Identity;
   d. Content filter information; and,
   e. The length of time the subscription lasts (is zero if the one-off mode is used and higher than zero if continuous mode is used).

6-10. If a PoC Session exists and the originator is allowed to subscribe to it, the PoC Server X (controlling) sends an OK response to the PoC Client A along the signalling path.

11-15. The PoC Server X (controlling) generates and sends a NOTIFY request including information of all the Participants of the PoC Session. The NOTIFY request is sent to the SIP/IP Core X and it follows the signalling path to the PoC Client A. Information elements contained in the NOTIFY request:
   a. Subscribed information including the negotiated Media Types of the Participants; and,
   b. If the one-off mode is used an indication that the subscription is terminated.

16-20. The PoC Client A answers the NOTIFY request with an OK response. The OK response is sent following the signalling path to the PoC Server X (Controlling) hosting the subscribed PoC Group.

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The PoC Client can choose to subscribe to the current status of the PoC Session or for a period of time. In the first case, the procedure of above is run once. In the second case, the steps 11-20 are additionally run when the status of the PoC Session changes. The rate can be limited to assure the PoC Client A is not overwhelmed by the NOTIFY requests.

The PoC Client can refresh the subscription to extend the subscription time. In addition, the PoC Client can choose to end the subscription before the ending of that time. Both refreshing the subscription or deletion of a subscription is done by running the same procedure as the original subscribing (steps 1-20) indicating the desire.

5.10.2 Subscription initiated by the Participating PoC Function

A PoC Server performing the Participating PoC Function can subscribe to Participant information stored in the PoC Server performing the Controlling PoC Function e.g. for charging purposes.

The signalling flow is described in the Figure 41 *"Subscribing to Participant information by the Participating PoC Function"*.

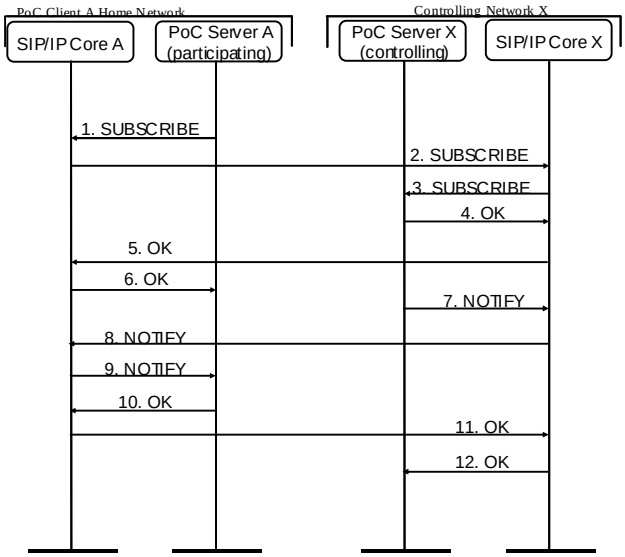

Figure 41: Subscribing to Participant information by the Participating PoC Function

1. The PoC Server A (participating) sends a SUBSCRIBE request to the SIP/IP Core. The information elements contained in the SUBSCRIBE request:
   a. PoC Address of the PoC Server (participating);
   b. PoC service indication;
   c. PoC Session Identity;
   d. Content filter information;
   e. Authentication information; and,
   f. The length of time the subscription lasts (is zero if the one-off mode is used and higher than zero if continuous mode is used).
2. SIP/IP Core forwards the SUBSCRIBE request to the hosting network of the on going PoC Session. Information elements contained in the SUBSCRIBE request:

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a. PoC Address of the PoC Server (participating);

b. PoC service indication;

c. PoC Session Identity;

d. Content filter information;

e. Authentication information; and,

f. The length of time the subscription lasts (is zero if the one-off mode is used and higher than zero if continuous mode is used).

3. The SIP/IP Core X forwards the SUBSCRIBE request to the PoC Server X (controlling) based on the PoC Session Identity. The PoC Server X (Controlling) receives the SUBSCRIBE request and checks whether the PoC Session exists and whether the originator is allowed to subscribe to it. Information elements contained in the SUBSCRIBE request:

a. PoC Address of the PoC Server (participating)

b. PoC service indication

c. PoC Session Identity

d. Content filter information;

e. Authentication information

f. The length of time the subscription lasts (is zero if the one-off mode is used and higher than zero if continuous mode is used).

4-6. If the PoC Session exists and the authentication information is valid, the PoC Server X (controlling) sends an OK response towards the PoC Server A along the signalling path.

7-9. The PoC Server X (controlling) generates and sends a NOTIFY request including information of all the Participants of the PoC Session. The NOTIFY request is sent to the SIP/IP Core X and it follows the signalling path to the PoC Server A. Information elements contained in the NOTIFY request:

a. Subscribed information including:

i. the identities of the Participants even if privacy is requested; and,

ii. the negotiated Media Types of the Participants.

b. If the one-off mode is used an indication that the subscription is terminated.

10-12. The PoC Server A answers the NOTIFY request with an OK response. The OK response is sent following the signalling path to the PoC Server X (controlling) hosting the subscribed PoC Group.

The PoC Server A (participating) can choose to subscribe to the current status of the PoC Session or for a period of time. In the first case, the procedure of above is run once. In the second case, the steps 7-12 are additionally run when the status of the group changes.

The rate can be limited to assure the PoC Server A is not overwhelmed by the NOTIFY requests.

The PoC Server A (participating) can refresh the subscription to extend the subscription the length of time chosen in step 1. In addition, the PoC Server A (participating) can choose to end the subscription before the ending of that time. Both refreshing the subscription or deletion of one is done by running the same procedure as the original subscription (steps 1-12) indicating the desire.

5.11 Group Advertisement

Group Advertisement is used to inform PoC Users about the existence and the membership of the PoC Group. Group Advertisement is a feature, which extends the basic PoC service functionality with an additional communication mode for providing operational PoC Group-related information. When supported, Group Advertisement reuses PoC addressing.

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PoC Clients and PoC Servers supporting Group Advertisement indicate this operational capability as an additional communication mode when required, to indicate that the request is different from the basic PoC capability.

A PoC Client can be able to send Group Advertisement information to a single PoC User, a list of PoC Users or to all members of the PoC Group using the PoC Group Identity.

PoC Server performing the Controlling PoC Function can support delivery of Group Advertisement messages to all PoC Group members and applies authorization rules for who are allowed to send Group Advertisement information to all PoC Group members. The possible authorization rules are:

- only the PoC Group owner is allowed to send Group Advertisement information to all Group members
- all the PoC Group members are allowed to send Group Advertisement information to all Group members.

PoC Server performing the Participating PoC Function provides Access Control for the Group Advertisement information sent to a PoC User.

The subclause 5.11.1 *"Individual Group Advertisement"* specifies a case where PoC Client sends Group Advertisement information to a single PoC User

The subclause 5.11.2 *"Advertising information to PoC Group members"* specifies a case where PoC Client sends Group Advertisement information to all members.

5.11.1 Individual Group Advertisement

This subclause describes a case where PoC Client advertises the PoC Group information by sending a Group Advertisement message to a PoC Client.

The subclause 5.11.1.1 "*Originating side"* describes the originating signalling flows in the case that the terminating party is in another network.

The subclause 5.11.1.2 "*Terminating side"* described the terminating part of the signalling flow.

5.11.1.1 Originating side

The Figure 42 *"Group Advertisement; originating part"* describes the originating signalling flows in the case that the terminating party is in another network.

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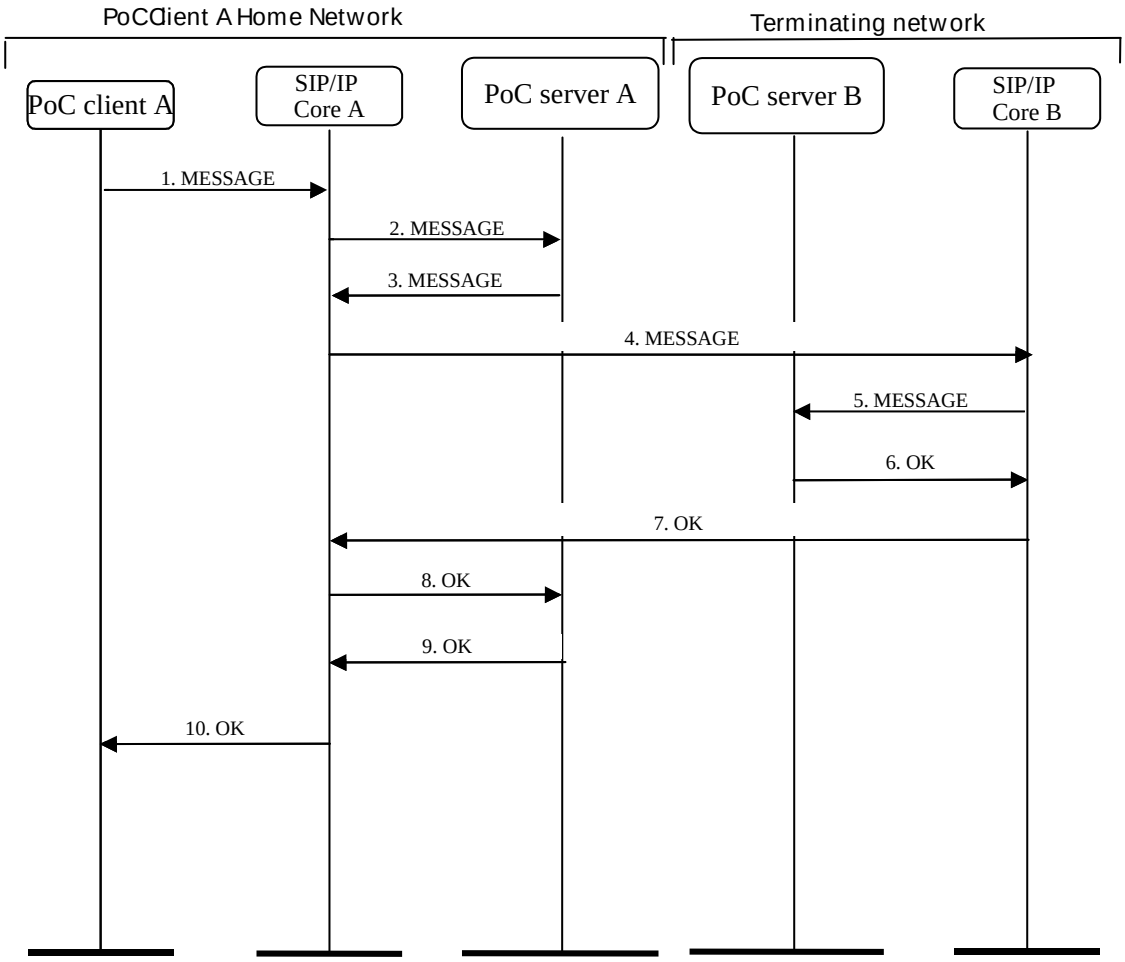

Figure 42: Group Advertisement; originating part

1. PoC Client sends the MESSAGE request to SIP/IP Core A. Information elements contained in the MESSAGE request:
   a. PoC Address of the PoC User sending the Group Advertisement
   b. PoC Address of the PoC User receiving the Group Advertisement
   c. PoC service indication
   d. PoC Group characteristics: PoC Group Identity, Nick Name, description
   e. Media included in the request
2. SIP/IP Core A forwards the received MESSAGE request and reroute (according to PoC service indication and originating party PoC Address) to the PoC Server A. Information elements in the MESSAGE request:
   a. PoC Address of the PoC User sending the Group Advertisement
   b. PoC Address of the PoC User receiving the Group Advertisement
   c. PoC service indication
   d. PoC Group characteristics: PoC Group Identity, Nick Name, description
   e. Media included in the request
3. PoC Server A sends the MESSAGE request to the SIP/IP Core A.
4. SIP/IP Core A routes the MESSAGE request to the terminating network B.

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5. SIP/IP Core B sends the MESSAGE request to the PoC Server B. PoC Server B sends the MESSAGE to the terminating party as seen in the subclause 5.11.1.2 "*Terminating side*".

6-10. PoC Server B sends the OK response back to the originating PoC Client along the same signalling path.

5.11.1.2 Terminating side

The Figure 43 "*Group Advertisement, terminating part*" describes the terminating part of the signalling flow.

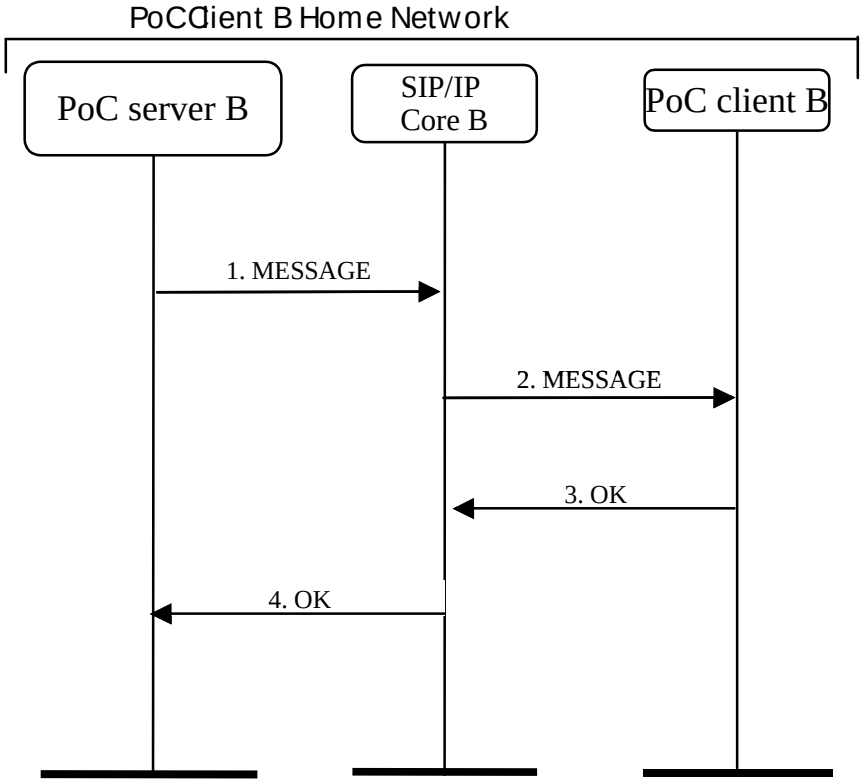

Figure 43: Group Advertisement, terminating part

1. When PoC Server B has received the MESSAGE request as described in the subclause 5.11.1.1 *"Originating side"* the PoC Server B sends the MESSAGE request to SIP/IP Core B if allowed by the Access Control policies of PoC User B as described in the subclause 4.18 *"Access Control"*. Information elements contained in the MESSAGE request:

   a. PoC Address of the PoC User sending the Group Advertisement

   b. PoC Address of the PoC User receiving the Group Advertisement

   c. PoC service indication

   d. PoC Group characteristics: PoC Group Identity, Nick Name, description

   e. Media included in the request

2. SIP/IP Core B sends the MESSAGE request to the PoC Client B. Information elements contained in the MESSAGE request:

   a. PoC Address of the PoC User sending the Group Advertisement

   b. PoC Address of the PoC User receiving the Group Advertisement

   c. PoC service indication

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d. PoC Group characteristics: PoC Group Identity, Nick Name, description

e. Media included in the request

3.-4. PoC Client B sends the OK response to the PoC Server B along the same signalling path.

5.11.2 Group Advertisement to PoC Group Members

This subclause describes sending of the Group Advertisement to all PoC Group members. The sending of the Group Advertisement can be initiated by the PoC Client or by the PoC Server.

The subclause 5.11.2.1 "*Originating side"* shows the originating part of the flow when PoC Client initiates the sending of Group Advertisement. The terminating flow is described in the subclause 5.11.2.2 "*Terminating side"*. The flow described in subclause 5.11.2.2 "*Terminating side"* is also used when PoC Server initiates the sending of the Group Advertisement to group members.

5.11.2.1 Originating side

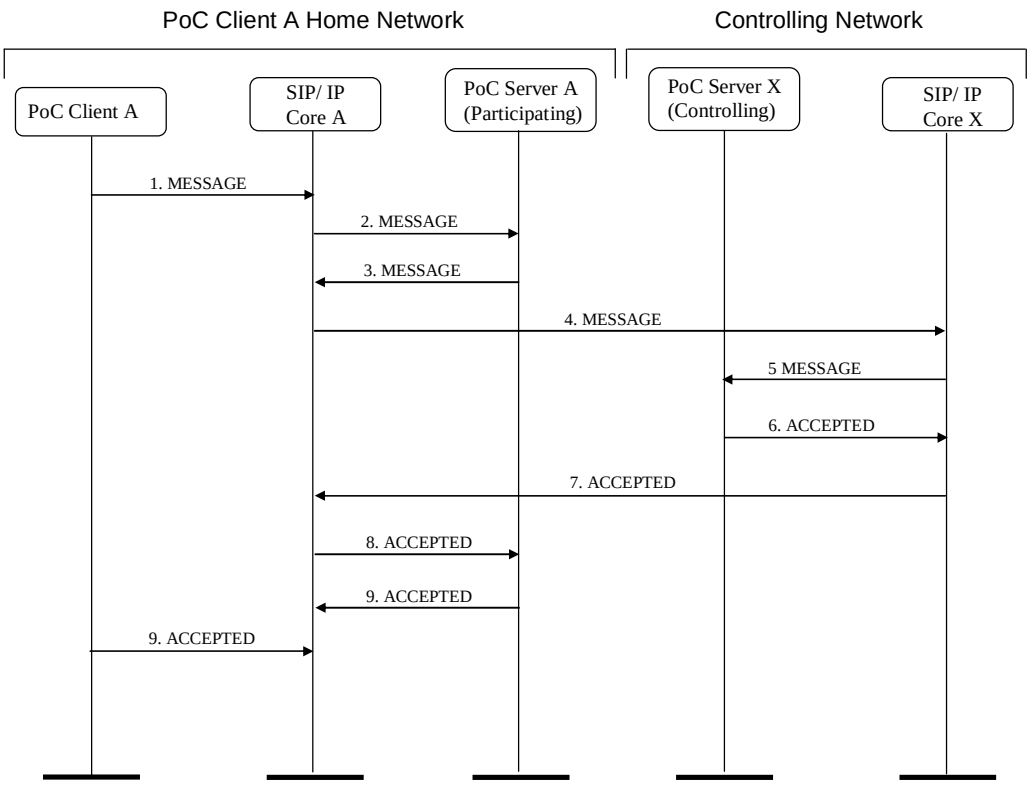

Figure 44: Group Advertisement; originating part.

1. PoC Client A sends the MESSAGE request to SIP/IP Core A. Information elements contained in the MESSAGE request:

   a. PoC Address of the PoC User sending the Group Advertisement

   b. PoC Address(es) of the PoC Group members receiving the Group Advertisement

   c. PoC service indication

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d. PoC Group characteristics: PoC Group Identity, Nick Name, description

e. Media included in the request

2. SIP/IP Core A forwards the received MESSAGE request and reroute (according to PoC service indication and the PoC Address of the originating PoC User) to the PoC Server A. Information elements contained in the MESSAGE request:

   a. PoC Address of the PoC User sending the Group Advertisement

   b. PoC Address(es) of the PoC Group members receiving the Group Advertisement

   c. PoC service indication

   d. PoC Group characteristics: PoC Group Identity, Nick Name, description

   e. Media included in the request

3. PoC Server A sends the MESSAGE request to the SIP/IP Core A. The information elements contained in the MESSAGE request:

   a. PoC Address of the PoC User sending the Group Advertisement

   b. PoC Address(es) of the PoC Group members receiving the Group Advertisement

   c. PoC service indication

   d. PoC Group characteristics: PoC Group Identity, Nick Name, description

   e. Media included in the request

4. SIP/IP Core A routes the MESSAGE request to the terminating network X. Information elements contained in the MESSAGE request:

   a. PoC Address of the PoC User sending the Group Advertisement

   b. PoC Address(es) of the PoC Group members receiving the Group Advertisement

   c. PoC service indication

   d. PoC Group characteristics: PoC Group Identity, Nick Name, description

   e. Media included in the request

5. SIP/IP Core X sends the MESSAGE request to the PoC Server X. The PoC Server X authorises the advertising client (PoC Client A) if the authorisation is provisioned. PoC Server X sends the MESSAGE to the terminating party as seen in the subclause 5.11.2.2 "*Terminating side"*. Information elements contained in the MESSAGE request:

   a. PoC Address of the PoC User sending the Group Advertisement

   b. PoC Address(es) of the PoC Group members receiving the Group Advertisement

   c. PoC service indication

   d. PoC Group characteristics: PoC Group Identity, Nick Name, description

   e. Media included in the request

6.-10. PoC Server X sends the ACCEPTED response back to the originating PoC Client along the same signalling path.

5.11.2.2 Terminating side

The terminating flow of the sending Group Advertisement to the PoC Group is described in the Figure 45 "*The PoC Server (controlling) sends Group Advertisement to one of the Group members.".* The flow is also used when PoC Server initiates the

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sending of the Group Advertisement to PoC Group members. The procedures for a service provider to send Group Advertisements are out of scope of this specification.

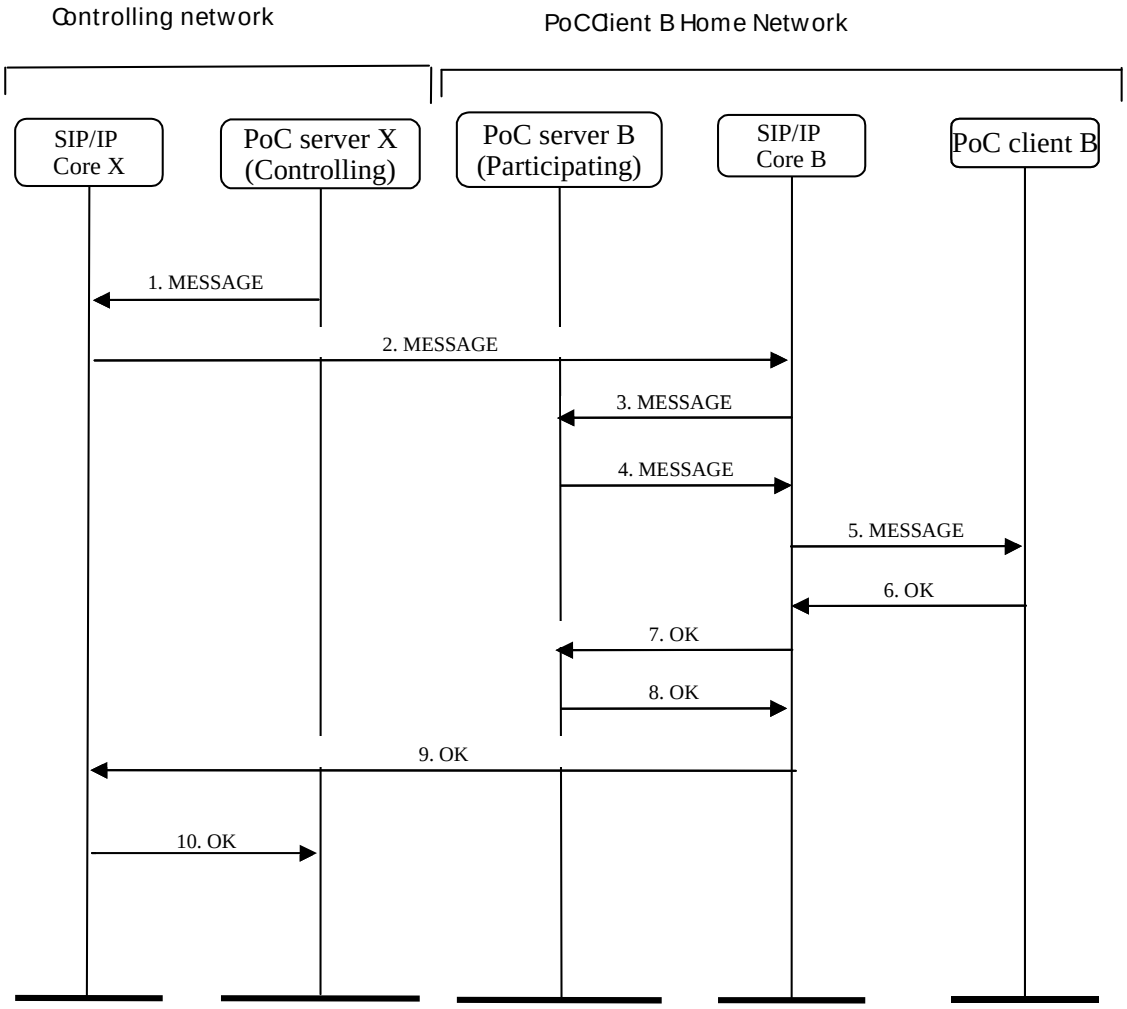

Figure 45: The PoC Server (controlling) sends Group Advertisement to one of the Group members.

The flow described in the Figure 45 "*The PoC Server (controlling) sends Group Advertisement to one of the Group members.*" is initiated either by the PoC Client or the service provider. If it is initiated by the PoC Client the PoC Server X first checks if the PoC User A is authorized to send Group Advertisement information to the PoC Group members.

1. PoC Server X sends the MESSAGE request to the SIP/IP Core X. Information elements contained in the MESSAGE request:
   a. PoC Address of the PoC User sending the Group Advertisement
   b. PoC Address of the PoC User receiving the Group Advertisement
   c. PoC service indication
   d. PoC Group characteristics: PoC Group Identity, Nick Name, description
   e. Media included in the request
2. SIP/IP Core X routes the MESSAGE request to the terminating network B. Information elements contained in the MESSAGE request:

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a. PoC Address of the PoC User sending the Group Advertisement

b. PoC Address of the PoC User receiving the Group Advertisement

c. PoC service indication

d. PoC Group characteristics: PoC Group Identity, Nick Name, description

e. Media included in the request

3. SIP/IP Core B sends the MESSAGE request to the PoC Server B. Information elements contained in the MESSAGE request:

a. PoC Address of the PoC User sending the Group Advertisement

b. PoC Address of the PoC User receiving the Group Advertisement

c. PoC service indication

d. PoC Group characteristics: PoC Group Identity, Nick Name, description

e. Media included in the request

4. PoC Server B sends the MESSAGE to the terminating PoC Client B if allowed by the Access Control policies of PoC User B as described in subclause 4.18 *"Access Control"*. Information elements contained in the MESSAGE request:

a. PoC Address of the PoC User sending the Group Advertisement

b. PoC Address of the PoC User receiving the Group Advertisement

c. PoC service indication

d. PoC Group characteristics: PoC Group Identity, Nick Name, description

e. Media included in the request

5. SIP/IP Core sends the MESSAGE to the terminating PoC Client B. Information elements contained in the MESSAGE request:

a. PoC Address of the PoC User sending the Group Advertisement

b. PoC Address of the PoC User receiving the Groups Advertisement

c. PoC service indication

d. PoC Group characteristics: PoC Group Identity, Nick Name, description

e. Media included in the request

6.-10. PoC Client B sends the OK back to the PoC Server X (controlling) along the same signalling path.

5.12 PoC media flows

5.12.1 General

RTP Media, Talk Burst Control and/or Media Burst Control signalling and quality feedback reports are passed across the POC-3 and POC-4 interfaces.

In all types of PoC Sessions (i.e. 1-1, 1-many, 1-many-1 PoC Group Sessions), the RTP Media transfer is half-duplex. Hence, only one Participant is permitted to originate RTP Media at a time in the PoC Session.

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All RTP Media to and from all PoC Clients in a PoC Session is sent through (and maybe replicated by) the Controlling PoC Function. If the Participating PoC Function is inserted in the transport path between the Controlling PoC Function and a PoC Client, all RTP Media to and from the PoC Client flows through the Participating PoC Function. Talk Burst Control and/or Media Burst Control and RTP Media replication are Controlling PoC Function functions. The transport path between the PoC Client and the Controlling PoC Function is established on a per PoC Session basis. When the PoC Session is established the Participating PoC Function normally includes itself into the transport path to relay the RTP Media packets between the PoC Client and the Controlling PoC Function.

5.12.2 One-to-one media flow

The one-to-one media flow is used in any type of PoC Session.

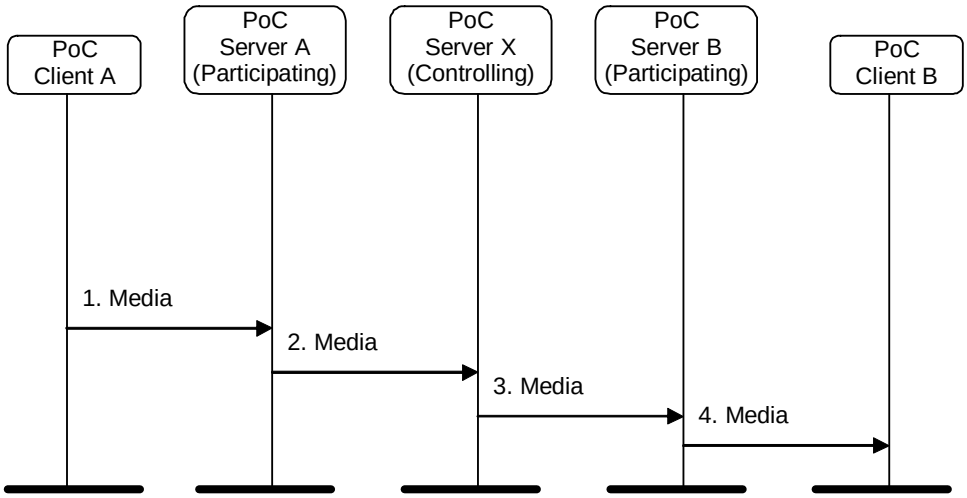

Figure 46: One-to-one media flow

1. PoC Client A, having been granted permission to send Talk Bursts, sends media to PoC Server A, which performs the Participating PoC Function for PoC Client A.
2. PoC Server A sends the media to PoC Server X, which performs the Controlling PoC Function for the PoC Session.
3. PoC Server X sends the media to PoC Server B, which performs the Participating PoC Function for PoC Client B.
4. PoC Server B sends the media to PoC Client B.

5.12.3 One-to-many media flow

The one-to-many media flow is used in PoC Sessions with Pre-arranged, Ad-hoc or Chat PoC Groups.

The media flow is illustrated with respect to a PoC Session with three Participants and two PoC Servers performing the Participating PoC Function

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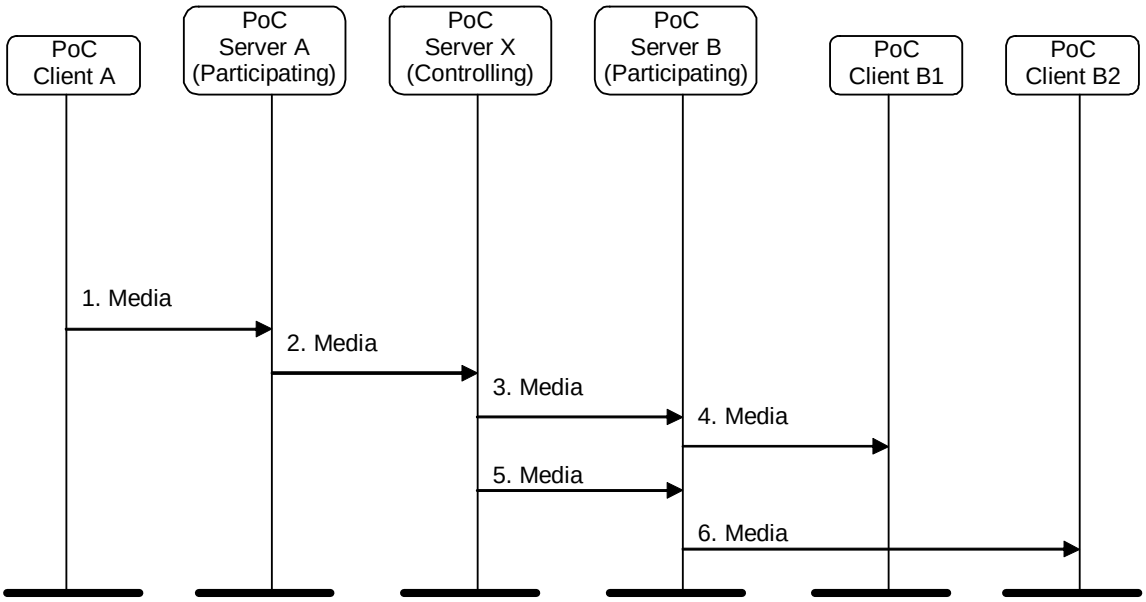

Figure 47: One-to-many media flow

1. PoC Client A, having been granted permission to send Talk Bursts, sends media to PoC Server A, which performs the Participating PoC Function for PoC Client A.
2. PoC Server A sends the media to PoC Server X, which performs the Controlling PoC Function for the PoC Session.
3. PoC Server X sends the media to PoC Server B, which performs the Participating PoC Function for PoC Client B1.
4. PoC Server B sends the media to PoC Client B1.
5. Concurrently with step 3, PoC Server X sends a second copy of the media to PoC Server B, which performs the Participating PoC Function for PoC Client B2.
6. PoC Server B sends the second copy of the media to PoC Client B2.

5.12.4 One-to-many-to-one media flow

The one-to-many-to-one media flow is used in PoC Sessions with Pre-arranged PoC Groups, which have been configured to support it. See subclause 4.22.3 *"One-to-many-to-one topology"* for further information on configuring Pre-arranged PoC Groups to support one-to-many-to-one media flows.

If the PoC Session is configured for one-to-many-to-one media flows, one Participant is the Distinguished Participant and all other Participants are Ordinary Participants.

The media flow for Talk Bursts transmitted by the Distinguished Participant is the same as the one-to-many media flow, shown in the subclause 5.12.3 "*One-to-many media*".

The media flow Talk Bursts transmitted by an Ordinary Participant is illustrated with respect to a PoC Session with three Participants and two PoC Servers performing the Participating PoC Function is described in the Figure 48 *"One-to-many-to-one media flow: Ordinary Participant"*.

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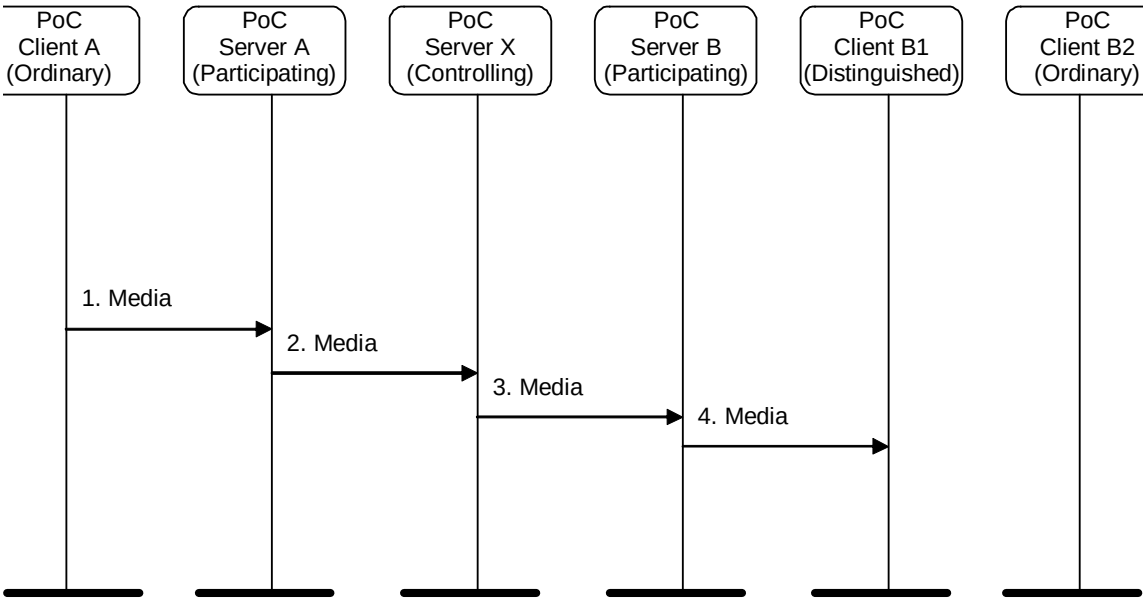

Figure 48: One-to-many-to-one media flow: Ordinary Participant

1. PoC Client A, having been granted permission to send Talk Bursts, sends media to PoC Server A, which performs the Participating PoC Function for PoC Client A.
2. PoC Server A sends the media to PoC Server X, which performs the Controlling PoC Function for the PoC Session.
3. PoC Server X sends the media to PoC Server B, which performs the Participating PoC Function for PoC Client B1, the Distinguished Participant.
4. PoC Server B sends the media to PoC Client B1, the Distinguished Participant.

PoC Server X does not distribute media to any Ordinary Participant. However, Talk Burst Control and/or Media Burst Control signalling is distributed to all Participants.

5.12.5 Simultaneous PoC Sessions media flow

The media flow in the case of Simultaneous PoC Sessions is illustrated with respect to three PoC Sessions with three Servers performing the Controlling PoC Function.

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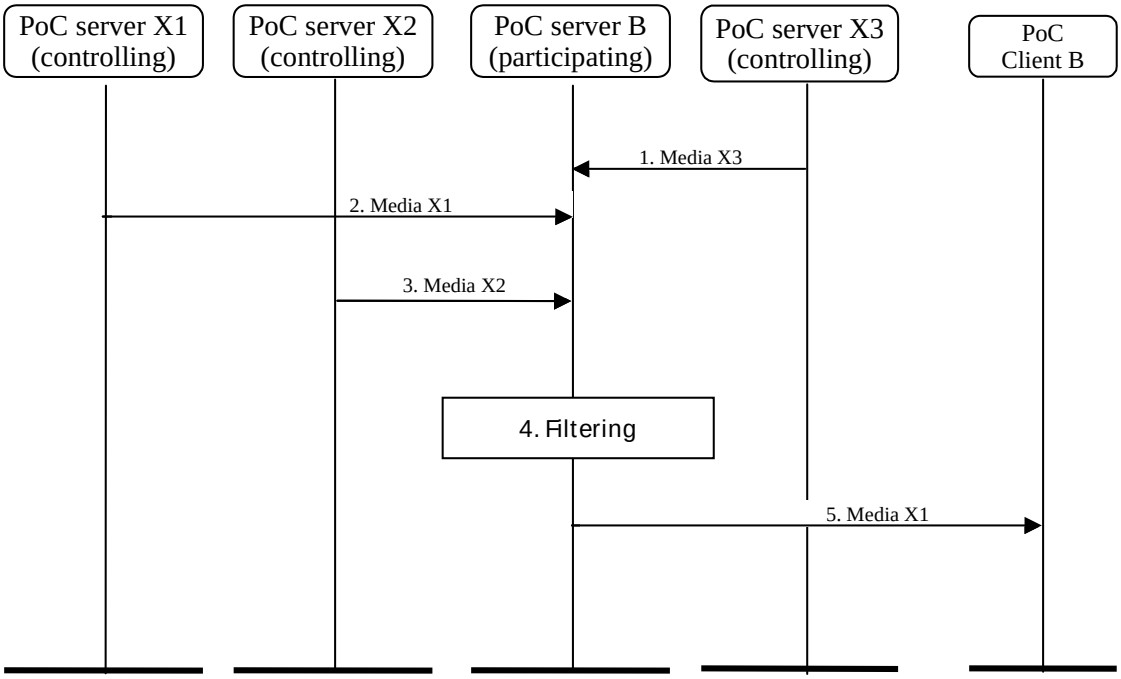

Figure 49: Media flow in the case of simultaneous sessions

1. The PoC Server X3 (controlling) sends the media stream X3 to the PoC Server B (participating).
2. The PoC Server X1 (controlling) sends the media stream X1 to the PoC Server B (participating).
3. The PoC Server X2 (controlling) sends the media stream X2 to the PoC Server B (participating).
4. The PoC Server B (participating) filters the media stream as described in the Chapter 4.10.4 *"RTP Media filtering of the Simultaneous PoC Sessions"* selecting the media stream X1.
5. The PoC Server B sends (participating) the media stream X1 to the PoC Client B.

5.13 Talk Burst Control procedures

The Talk Burst Control Procedures are described in *5.13A Media Burst Control Procedures*".

5.13A Media Burst Control Procedures

This subclause describes the high-level Talk Burst Control Procedures. The Talk Burst Control Procedures are also applicable for Media Burst Control Procedure with the difference that Media Burst Control messages and proper description about Media Bursts instead of Talk Burst are used.

Talk Burst Control provides a mechanism to arbitrate the Participant requests to speak. The PoC Server and PoC Client supports arbitration of Talk Burst requests without queuing. The mechanism for Talk Burst requests without queuing allows PoC Server and PoC Client to support Talk Burst request, Talk Burst confirm response, Talk Burst reject, Talk Burst complete, no Talk Burst, receiving Talk Burst, stop Talk Burst and Talk Burst acknowledgement messages. This is described in subclause 5.13.1 *"Talk Burst Control procedures without queuing"*.

PoC Server and PoC Client can additionally support queuing of Talk Burst requests. If so, then the PoC Server and PoC Client additionally support the Talk Burst queue position request and Talk Burst queue position status messages. The additional procedures for Talk Burst control with queuing are described in subclause 5.13.2 *"Talk Burst request procedure at PoC Session initialisation"*.

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Talk Burst Control is negotiated at SIP Session establishment along with the other Media Parameters.

5.13.1 Talk Burst Control procedures without queuing

In PoC service there are four main Talk Burst Control procedures described in the following sub clauses:

- Talk Burst request procedure at PoC Session initialisation
- Talk Burst request procedure (both confirmed and rejected)
- Talk Burst complete procedure
- Talk Burst stop procedure

5.13.1.1 Talk Burst request procedure at PoC Session initialisation

This subclause describes the Talk Burst Control procedure when a PoC Client is connected to a PoC Session and permission to send one Talk Burst is granted to the PoC Client. The Figure 50 *"Talk Burst request procedure at PoC Session initialisation"* shows the Talk Burst Control flow for this scenario.

The PoC Session establishment request message from the originating PoC Client to PoC Server performing the Controlling PoC Function through the initiation of an On-demand Session or through the setup of a PoC Session over a Pre-established Session is an implicit Talk Burst request. When the Controlling PoC Server has accepted the PoC Session establishment, it acts as if it has received a Talk Burst request. Note that initiating or joining a Chat PoC Group Session does not imply a Talk Burst request.

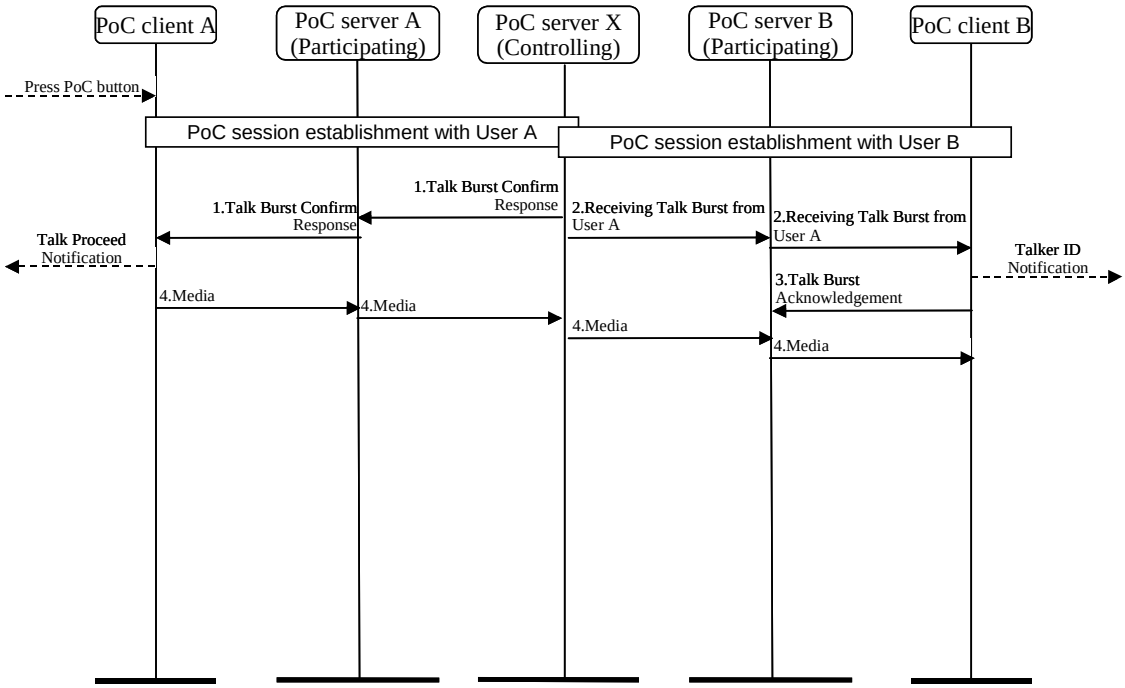

Figure 50: Talk Burst request procedure at PoC Session initialisation

1. PoC Client A has initiated a PoC Session with PoC Server X (controlling). This creates an implicit Talk Burst request and Controlling PoC Server X sends Talk Burst confirm response message to PoC Client A. While this scenario shows the Talk Burst confirm response message being sent after the PoC Session is established with PoC User B, it can be transmitted also before or during the PoC Session establishment with PoC User B depending on whether the PoC Session indication is confirmed or unconfirmed.

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2. At the same time, PoC Server X (controlling) sends a receiving Talk Burst message to all other PoC Clients in the PoC Session (only PoC Client B is shown in Figure 50 *"Talk Burst request procedure at PoC Session initialisation"*). The receiving Talk Burst message contains PoC User A's identity and the PoC Client B can display this identity for PoC User B.

3. In the case of acknowledgement is required by the receiving Talk Burst message PoC Client acknowledges the receiving Talk Burst message. The Talk Burst acknowledgement is received by the PoC Server B (participating) and is not sent to the PoC Server X (controlling).

4. When PoC Client A receives the Talk Burst confirm response message, it provides a talk proceed notification to PoC User A. PoC Client A then begins to send media to PoC Server X (controlling). PoC Server X (controlling) forwards this media to the other PoC Clients.

5.13.1.2 Talk Burst request confirmed procedure during a PoC Session

This subclause describes the Talk Burst Control procedure when a PoC Client, connected to a PoC Session, successfully requests permission to send a Talk Burst when no other PoC Client has permission to send. Figure 51 *"Talk Burst request confirmed procedure during a PoC Session"* shows the Talk Burst Control flow for this scenario.

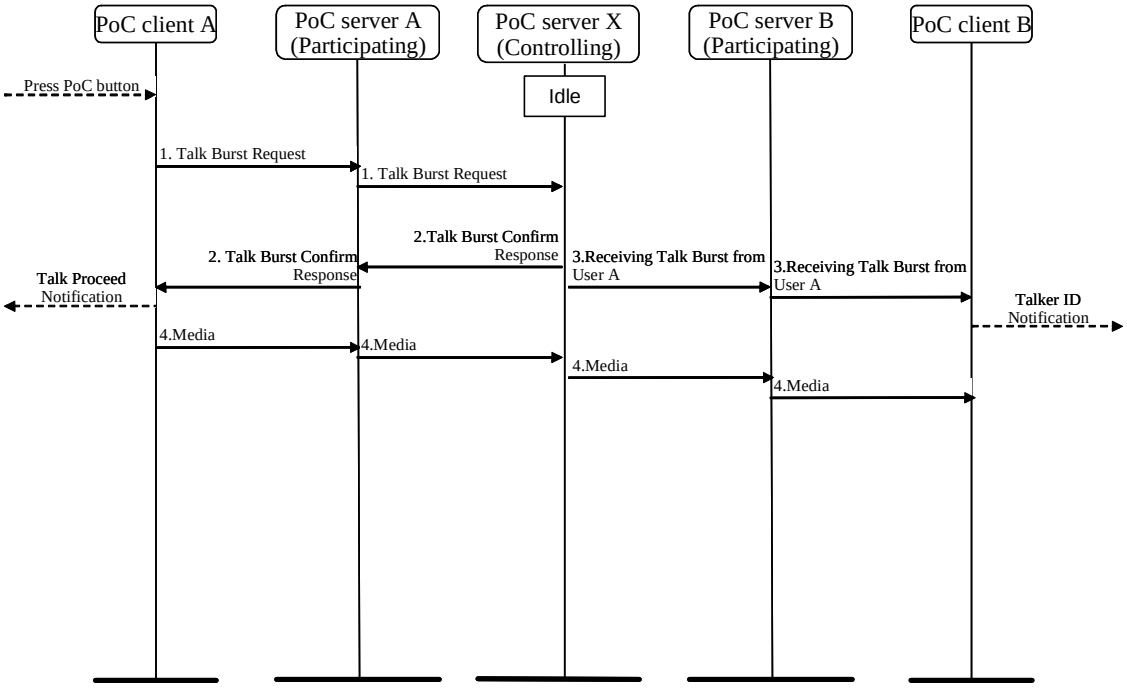

Figure 51: Talk Burst request confirmed procedure during a PoC Session

1. PoC User A has pressed the PoC button when no other PoC User is known to have permission to send a Talk Burst. PoC Client A sends a Talk Burst request message to PoC Server X (controlling).

2. PoC Server X (controlling) decides to grant the Talk Burst to PoC Client A and sends a Talk Burst confirm response message to PoC Client A.

3. At the same time PoC Server X (controlling) sends a receiving Talk Burst message to the other PoC Clients on the PoC Session (only PoC Client B is shown in Figure 51 *"Talk Burst request confirmed procedure during a PoC Session")* with PoC User A's identity.

4. When PoC Client A receives the Talk Burst confirm response message, it provides a talk proceed notification to PoC User A. PoC Client A then begins to send media to PoC Server X (controlling). PoC Server X (controlling) forwards this media to the other PoC Clients.

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5.13.1.3 Talk Burst request rejected procedure during a PoC Session

This subclause describes the Talk Burst Control procedure when a PoC Client, connected to a PoC Session, unsuccessfully requests permission to send a Talk Burst. Figure 52 *"Talk Burst request rejected procedure during a PoC Session"* shows the Talk Burst Control flow for this scenario.

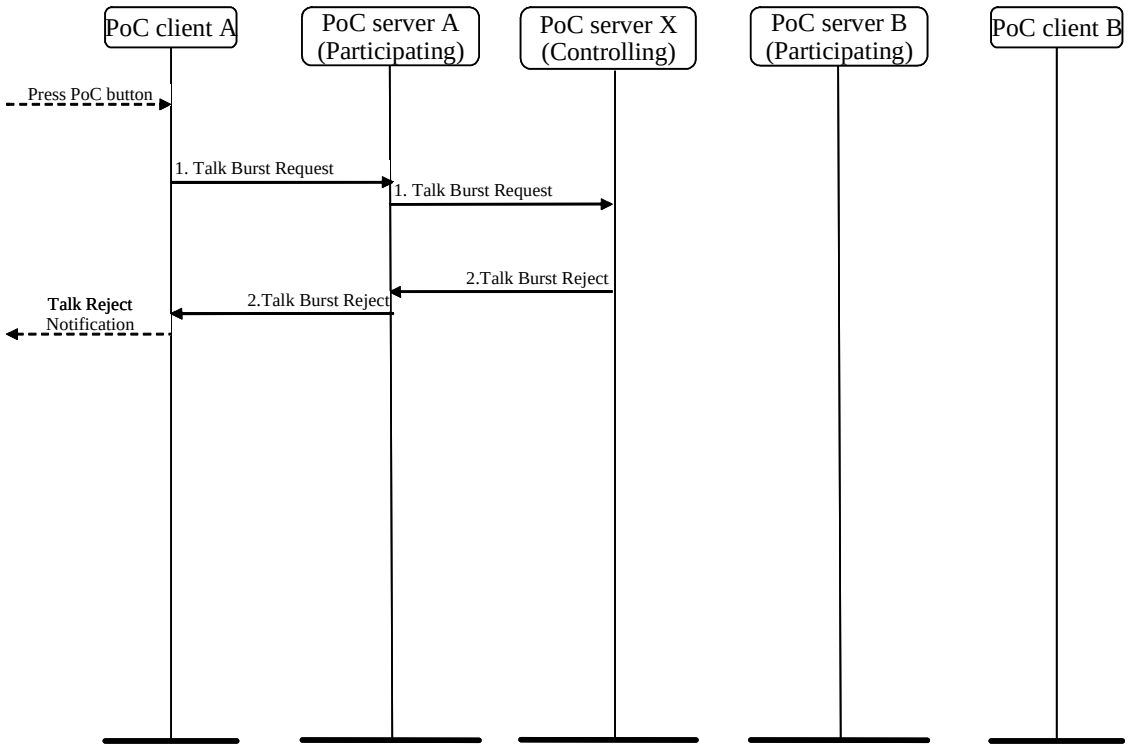

Figure 52: Talk Burst request rejected procedure during a PoC Session

1. PoC User A has pressed the PoC button. PoC Client A sends a Talk Burst request message to PoC Server X (controlling).

2. PoC Server X (controlling) decides to reject the Talk Burst request made by PoC Client A (either because another PoC Client has permission to send a Talk Burst or because PoC Server X (controlling) has some policy that determines that PoC Client A can not be given permission to send a Talk Burst at this time) and sends a Talk Burst reject message to PoC Client A. When PoC Client A receives the Talk Burst reject message, it sends a talk reject notification to PoC User A.

5.13.1.4 Talk Burst complete procedure

This subclause describes the Talk Burst Control procedure when a PoC Client with permission to send a Talk Burst finishes speaking and the PoC User releases the PoC button. Figure 53 *"Talk Burst complete procedure"* shows the Talk Burst Control flow for this scenario.

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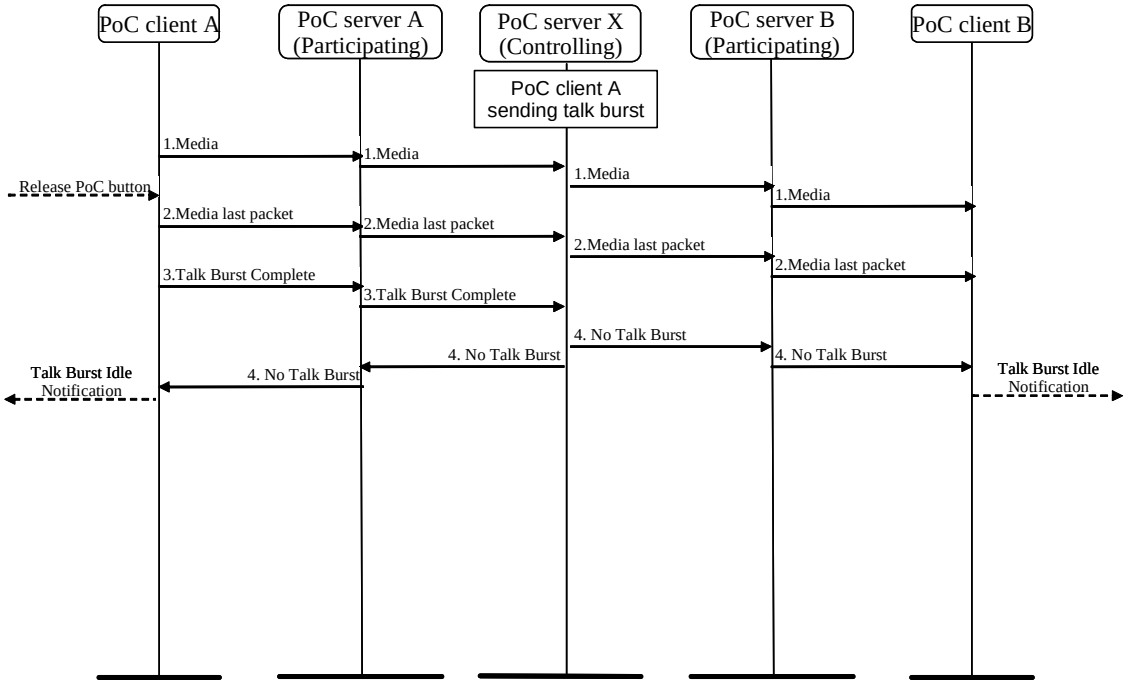

Figure 53: Talk Burst complete procedure

1. PoC Client A has permission to send a Talk Burst. Media has been streaming from PoC Client A to PoC Server X (controlling) and PoC Server X (controlling) has been forwarding this media stream to the other PoC Clients in the PoC Session (only PoC Client B is shown in Figure 53 *"Talk Burst complete procedure"*).

2. PoC User A releases the PoC button and PoC Client A sends the last media packet to PoC Server X (controlling), who forwards it to the other PoC Clients.

3. PoC Client A then sends the Talk Burst complete message to PoC Server X (controlling).

4. After PoC Server X (controlling) has forwarded the last media packet, it then sends a No Talk Burst message to all Participants of the PoC Session, including PoC Client A. Each of the PoC Clients sends a Talk Burst idle notification to its PoC User.

5.13.1.5 Talk Burst stop procedure

This subclause describes the Talk Burst Control procedure when the Controlling PoC Server decides to revoke permission to send a Talk Burst from a PoC User. Figure 54 *"Talk Burst stop procedure"* shows the Talk Burst Control flow for this scenario.

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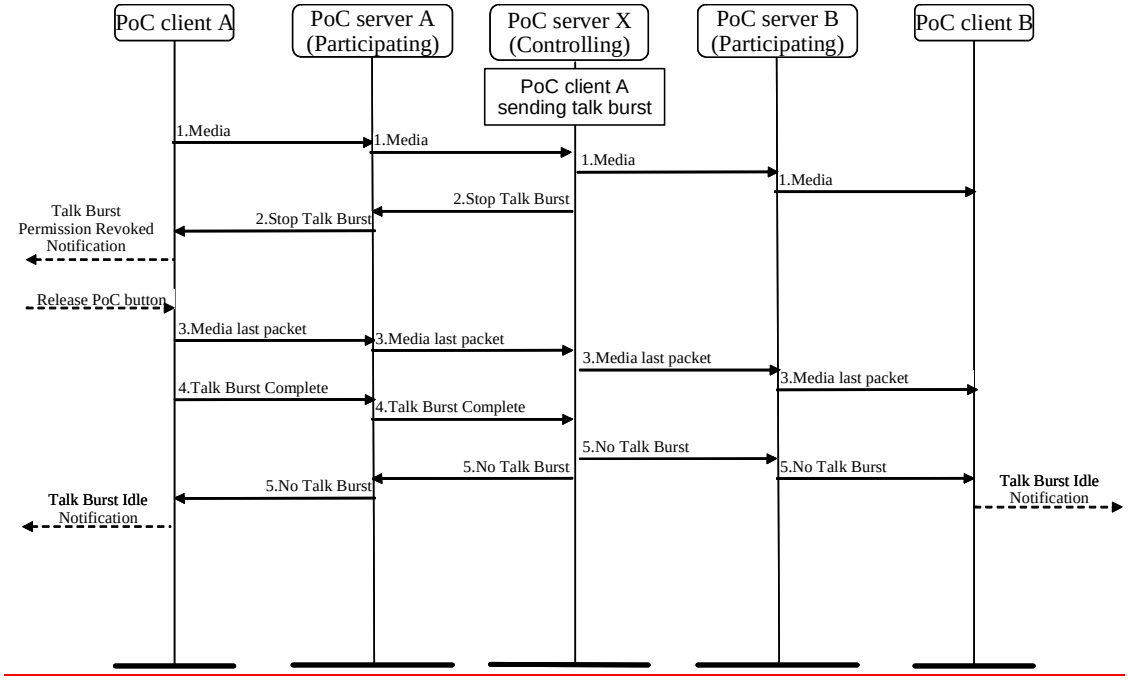

Figure 54: Talk Burst stop procedure

1. PoC Client A has permission to send a Talk Burst. Media has been streaming from PoC Client A to PoC Server X (controlling) and PoC Server X (controlling) has been forwarding this media stream to the other PoC Clients in the PoC Session (only PoC Client B is shown in Figure 54 *"Talk Burst stop procedure"*).

2. Based on some policy (e.g. the PoC User has exceeded an allowed time limit), PoC Server X (controlling) decides to revoke permission to send a Talk Burst from PoC Client A and sends a Stop Talk Burst message to PoC Client A. In this scenario, it is possible, that PoC Server X (controlling) grants the PoC Client A a grace period before revoking the Talk Burst. If the Talk Burst complete has not been received before the grace timer expires, the PoC Server X (controlling) will stop forwarding media from PoC User A and will send out the No Talk Burst message to all Participants of the PoC Session.

3. PoC Client A sends a Talk Burst permission revoked notification to PoC User A. PoC User A finishes speaking and releases the PoC button. PoC Client A sends the last media packet to PoC Server X (controlling), who is still forwarding the media to all other Participants of the PoC Session.

4. PoC Client A then sends the Talk Burst complete message to PoC Server X (controlling).

5. When the Talk Burst complete message arrives at the PoC Server X (controlling), it sends a no Talk Burst message to all Participants of the PoC Session, including PoC Client A. Each of the PoC Clients sends a Talk Burst idle notification to its PoC User.

5.13.2 Talk Burst Control procedures with queuing

If the PoC Client and the PoC Server (controlling) in a PoC Session support Talk Burst Control with queuing, the following procedures apply in addition to those defined in subclause 5.13.1 *"Talk Burst Control procedures without queuing"*:

- Talk Burst request with queued response
- Talk Burst request cancellation
- Talk Burst complete with transfer to queued request
- Talk Burst stop with transfer to queued request

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- Talk Burst request with pre-emptive priority
- Talk Burst queue position request

The PoC Server (controlling) provides the same level of support for queuing Talk Burst requests from a given PoC Client for all Talk Burst requests received in a given PoC Session from that PoC Client. The PoC Server (controlling) does not change the highest level of priority, which can be granted to a PoC Client, if requested by that PoC Client during the course of a PoC Session, unless the PoC Server performing the Controlling PoC Function is externally commanded to do so.

The PoC Server (controlling) supports Talk Burst Control with queuing by means of a Talk Burst request queue. When the PoC Client repeats the Talk Burst request message until the PoC Client receives Talk Burst queue position status message, the Talk Burst request message can include a timestamp value to indicate when the original Talk Burst request message was sent. If the PoC Server performing the Controlling PoC Function supports the timestamp based queuing then the PoC Client that has the earliest request time can be placed in the queue according to the timestamp and priority. The PoC Client at the head of the queue SHALL have permission to send the Talk Burst. The Talk Burst grant is indicated by the Talk Burst granted message.

NOTE: If the timestamp value of the Talk Burst request message is significantly earlier than the current time at the PoC Server the PoC Server may discard the Talk Burst request message.

When queuing a PoC request, the PoC Server (controlling) notifies the requesting PoC Client that the request is queued. In addition, the PoC Server (controlling) can support a policy of notifying a PoC Client when it is next in line for permission to send a Talk Burst, e.g. in order to allow the PoC Client the opportunity to acquire radio resources in advance of being granted permission to send a Talk Burst.

5.13.2.1 Talk Burst request with queued response

This subclause describes the Talk Burst Control procedure when a PoC Client supporting Talk Burst Control with queuing, connected to a PoC Session controlled by a PoC Server supporting Talk Burst Control with queuing, requests permission to send a Talk Burst when another PoC Client has permission to send. Figure 55 *"Procedure for Talk Burst request with queued response"* shows the Talk Burst Control flow for this scenario.

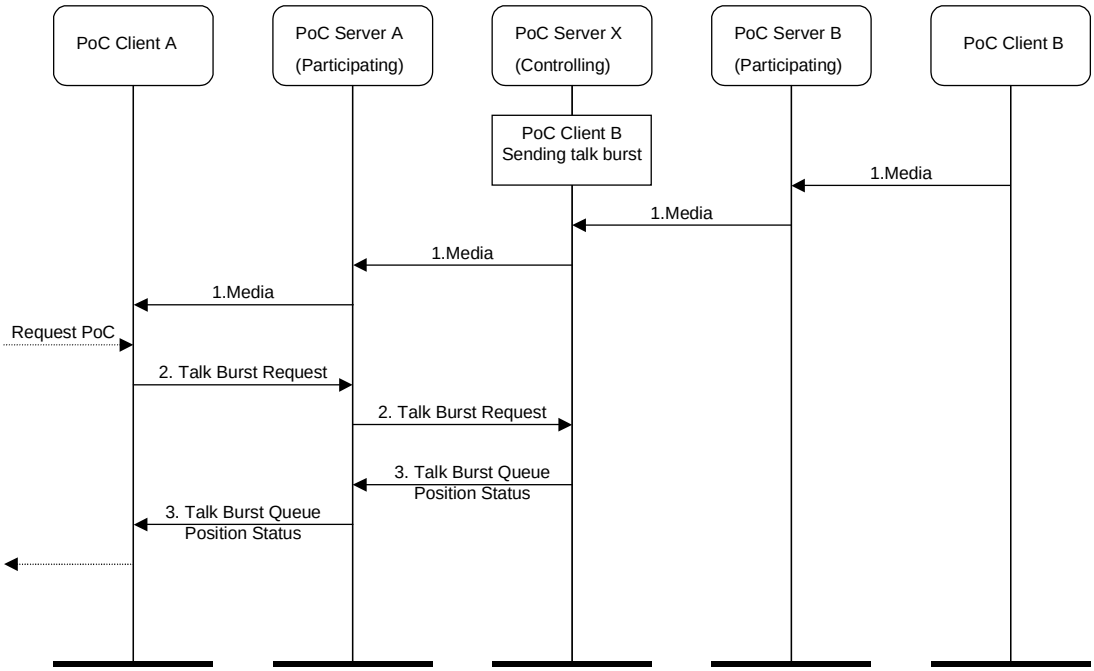

Figure 55: Procedure for Talk Burst request with queued response

1. PoC User A requests permission to send a Talk Burst, e.g. by pressing a PoC button, when another PoC User (PoC User B) has permission to send a Talk Burst.

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2. PoC Client A sends a Talk Burst request message to PoC Server X (controlling). The Talk Burst request message identifies PoC Client A. If PoC User A is permitted to request priority levels other than normal priority the Talk Burst request message can include a priority level that PoC User A is permitted to access.

3. PoC Server X performing the Controlling PoC Function determines that PoC User B has permission to send a Talk Burst at this time, that PoC User A does not currently have a request for permission to send a Talk Burst in the Talk Burst request queue, and either that PoC User A has not requested to pre-empt PoC User B or that PoC User B has pre-emptive priority. PoC Server X performing the Controlling PoC Function queues the request of PoC User A in the Talk Burst request queue and send a Talk Burst queue position status message to PoC Client A. If PoC User A already has a request for permission to send a Talk Burst in the Talk Burst request queue, PoC Server X performing the Controlling PoC Function removes the previous request and queues the second request of PoC User A in the Talk Burst request queue before sending a Talk Burst queue position status message to the PoC Client A. PoC Client A notifies PoC User A that the Talk Burst request is queued. Information elements contained in the Talk Burst queue position status message

   a. The position that PoC Client A currently holds in the Talk Burst request queue

   b. The priority granted to PoC Client A's request

(Not shown in Figure 55 *"Procedure for Talk Burst request with queued response"*) If the request of PoC Client A has been granted a higher priority than the request(s) of one or more PoC Client(s) which were previously next in line for permission to talk (PoC Client C, PoC Client D, etc…), then the PoC Server X (controlling) can send a Talk Burst queue position status message to those PoC Clients whose queue positions had been changed and give them the updated status of their queued requests. The Talk Burst queue position status message(s) is(are) interleaved with the media originating from PoC User B.

5.13.2.2 Talk Burst request cancellation

This subclause describes the Talk Burst Control procedure when a PoC Client supporting Talk Burst Control with queuing, connected to a PoC Session controlled by a PoC Server supporting Talk Burst Control with queuing, cancels a queued request for permission to send a Talk Burst before it is known that the request has been granted. Figure 56 *"Procedure for Talk Burst request cancellation"* shows the Talk Burst Control flow for this scenario.

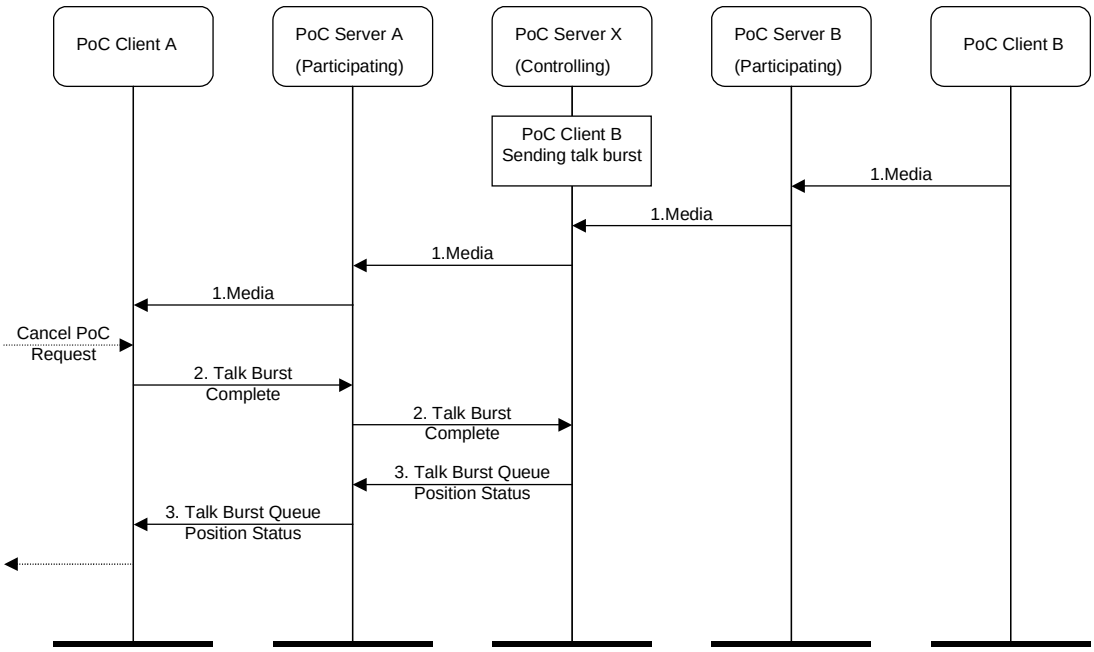

Figure 56: Procedure for Talk Burst request cancellation

1. PoC Client A has queued a request for permission to send a Talk Burst in the Talk Burst request queue. While PoC User B has permission to send a Talk Burst, PoC User A cancels the request, e.g. by releasing the PoC button.

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2. PoC Client A sends a Talk Burst complete message to PoC Server X performing the Controlling PoC Function.

3. PoC Server X performing the Controlling PoC Function removes the request of PoC User A from the Talk Burst request queue and sends a Talk Burst queue position status message to PoC Client A. The Talk Burst queue position status message indicates that PoC Client A is not in the Talk Burst request queue. PoC Client A notifies PoC User A that the Talk Burst request is cancelled.

   (Not shown in Figure 56). If the effect of cancelling the request from PoC Client A is to change one or more PoC Client(s) which are next in line to be granted permission to talk (PoC Client C, PoC Client D, etc…), then the PoC Server X (controlling) can send a Talk Burst queue position status message to those PoC Clients whose queue positions had been changed and give them the updated status of their queued requests.

5.13.2.3 Talk Burst complete with transfer to queued request

This subclause describes the Talk Burst Control procedure when a PoC User with permission to send a Talk Burst indicates that he has finished speaking, e.g. by releasing the PoC button, in a PoC Session controlled by a PoC Server supporting Talk Burst Control with queuing, and the Talk Burst request queue contains queued requests for permission to send Talk Bursts from other users. Figure 57 *"Procedure for Talk Burst complete with transfer to queued request"* shows the Talk Burst Control flow for this scenario.

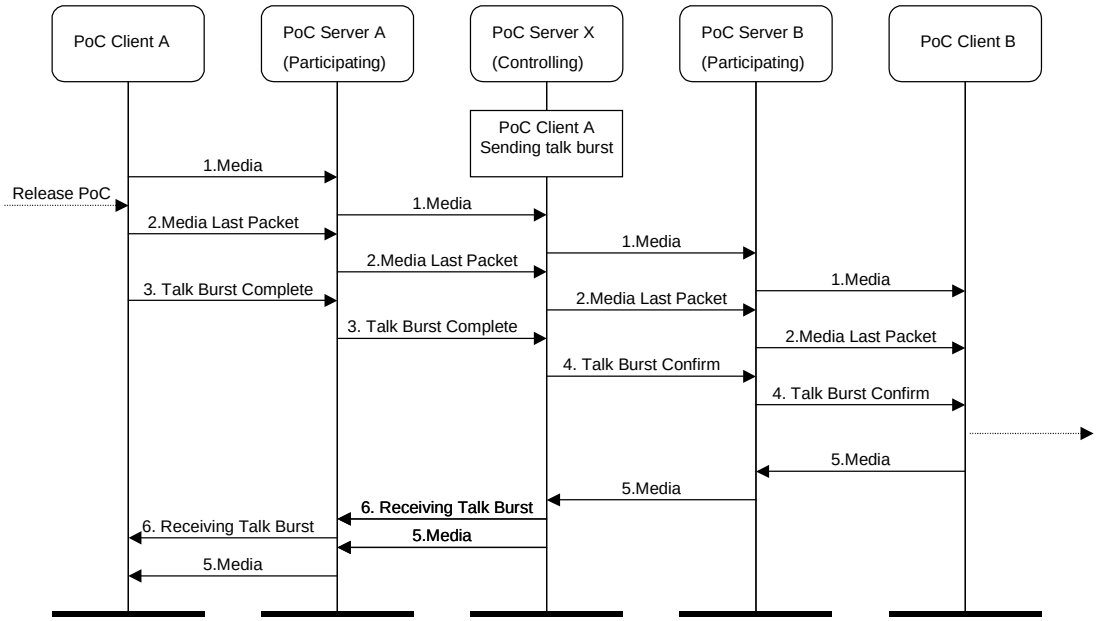

Figure 57: Procedure for Talk Burst complete with transfer to queued request

1. PoC Client A has permission to send a Talk Burst. Media has been streaming from PoC Client A to PoC Server X (controlling) and PoC Server X (controlling) has been forwarding this media stream to the other PoC Clients in the talk session (only PoC Client B is shown in Figure 57 *"Procedure for Talk Burst complete with transfer to queued request"*).

2. PoC User A indicates that he has finished speaking, e.g. by releasing the PoC button, and PoC Client A sends the last media packet to PoC Server X (controlling), who forwards it to the other PoC Clients.

3. PoC Client A then sends the Talk Burst complete message to PoC Server X (controlling). PoC Server X (controlling) removes PoC Client A from the Talk Burst request queue.

4. PoC Server X (controlling) examines the Talk Burst request queue and determines that PoC Client B has queued a request to send a Talk Burst that is at the head of the queue, after also taking into account the priority levels (if any)

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associated with all queued requests. After PoC Server X (controlling) has forwarded the last media packet from PoC Client A, it sends a Talk Burst confirm response message to PoC Client B.

5. When PoC Client B receives the Talk Burst confirm response message, it provides a talk proceed notification to PoC User B. PoC Client B then begins to send media to PoC Server X (controlling). PoC Server X (controlling) forwards this media to the other PoC Clients.

6. The first media packets forwarded to the other PoC Clients are preceded by a receiving Talk Burst message.

   (Not shown in Figure 57). If the effect of granting PoC Client B permission to send Talk Bursts is to change one or more PoC Client(s) which are next in line to be granted permission to talk (PoC Client C, PoC Client D, etc…), then the PoC Server X (controlling) can send a Talk Burst queue position status message to those PoC Clients whose queue positions had been changed and give them the updated status of their queued requests.

5.13.2.4 Talk Burst stop with transfer to queued request

This subclause describes the Talk Burst Control procedure in a PoC Session when the PoC Server X (controlling) supporting Talk Burst Control with queuing decides to revoke permission to send a Talk Burst from a PoC User, and the Talk Burst request queue contains queued requests for permission to send Talk Bursts from other PoC Users. Figure 58 *"Procedure for Talk Burst stop with transfer to queued request"* shows the Talk Burst Control flow for this scenario.

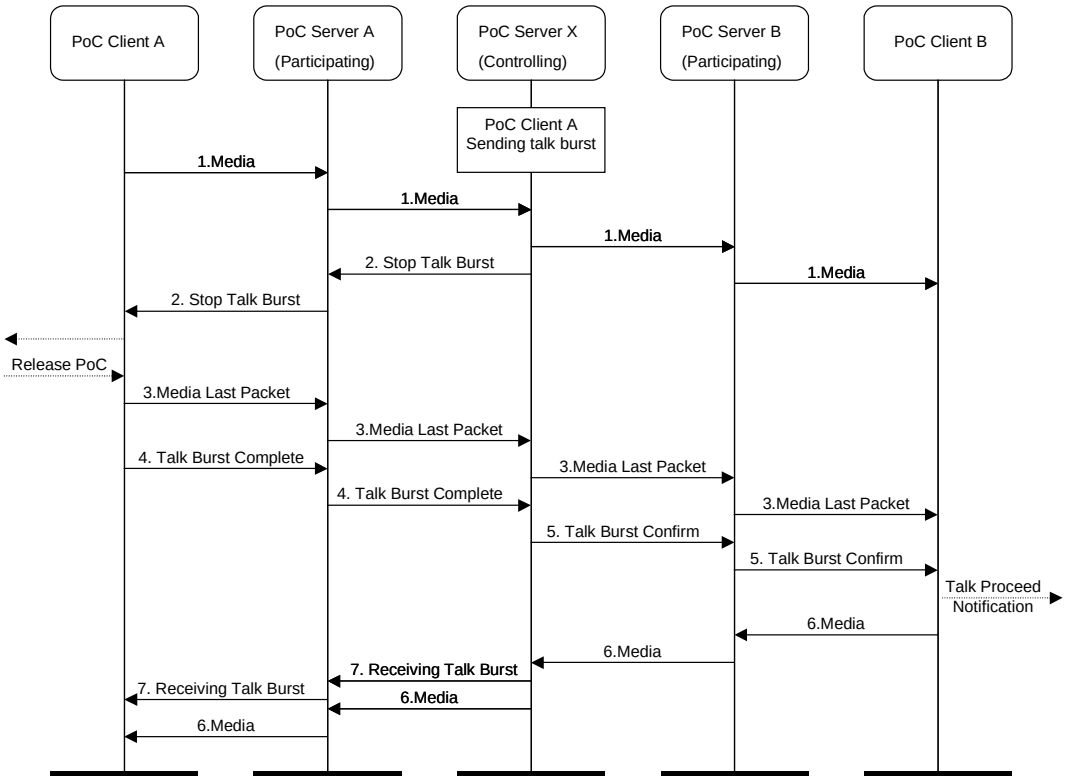

Figure 58: Procedure for Talk Burst stop with transfer to queued request

1. PoC Client A has permission to send a Talk Burst. Media has been streaming from PoC Client A to PoC Server X (controlling) and PoC Server X (controlling) has been forwarding this media stream to the other PoC Clients in the PoC session (only PoC Client B is shown in Figure 58 *"Procedure for Talk Burst stop with transfer to queued request"*).

2. Based on some policy (e.g. the PoC User has exceeded an allowed time limit), PoC Server X (controlling) decides to revoke permission to send a Talk Burst from PoC Client A and sends a stop Talk Burst message to PoC Client A. In this

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scenario, PoC Server X (controlling) can grant PoC Client A a grace period before revoking permission to send a Talk Burst.

3. PoC Client A sends a Talk Burst permission revoked notification to PoC User A. PoC User A indicates that he has finished speaking, e.g. by releasing the PoC button. PoC Client A sends the last media packet to PoC Server X (controlling), who is still forwarding the media to all other members of the PoC session.

4. PoC Client A then sends the Talk Burst complete message to PoC Server X (controlling).

5. PoC Server X (controlling) examines the Talk Burst request queue and determines that PoC Client B has queued a request to send a Talk Burst that is at the head of the queue, after also taking into account the priority levels (if any) associated with all queued requests. After PoC Server X (controlling) has forwarded the last media packet from PoC Client A, it sends a Talk Burst confirm response message to PoC Client B.

6. When PoC Client B receives the Talk Burst confirm response message, it provides a talk proceed notification to PoC User B. PoC Client B then begins to send media to PoC Server X (controlling). PoC Server X (controlling) forwards this media to the other PoC Clients.

7. The first media packets forwarded to the other PoC Clients are preceded by a receiving Talk Burst message.

   (Not shown in Figure 58). If the effect of granting PoC Client B permission to send Talk Bursts is to change one or more PoC Client(s) which are next in line to be granted permission to talk (PoC Client C, PoC Client D, etc…), then the PoC Server X (controlling) can send a Talk Burst queue position status message to those PoC Clients whose queue positions had been changed and giving them updated status of their queued requests.

5.13.2.5 Talk Burst request with pre-emptive priority

This subclause describes the Talk Burst Control procedure when a PoC Client supporting Talk Burst Control with queuing, connected to a PoC Session controlled by a PoC Server supporting Talk Burst Control with queuing, requests permission to send a Talk Burst with pre-emptive priority when another PoC Client which does not have pre-emptive priority has permission to send. Figure 59 *"Procedure for Talk Burst request with pre-emptive priority"* shows the Talk Burst Control flow for this scenario.

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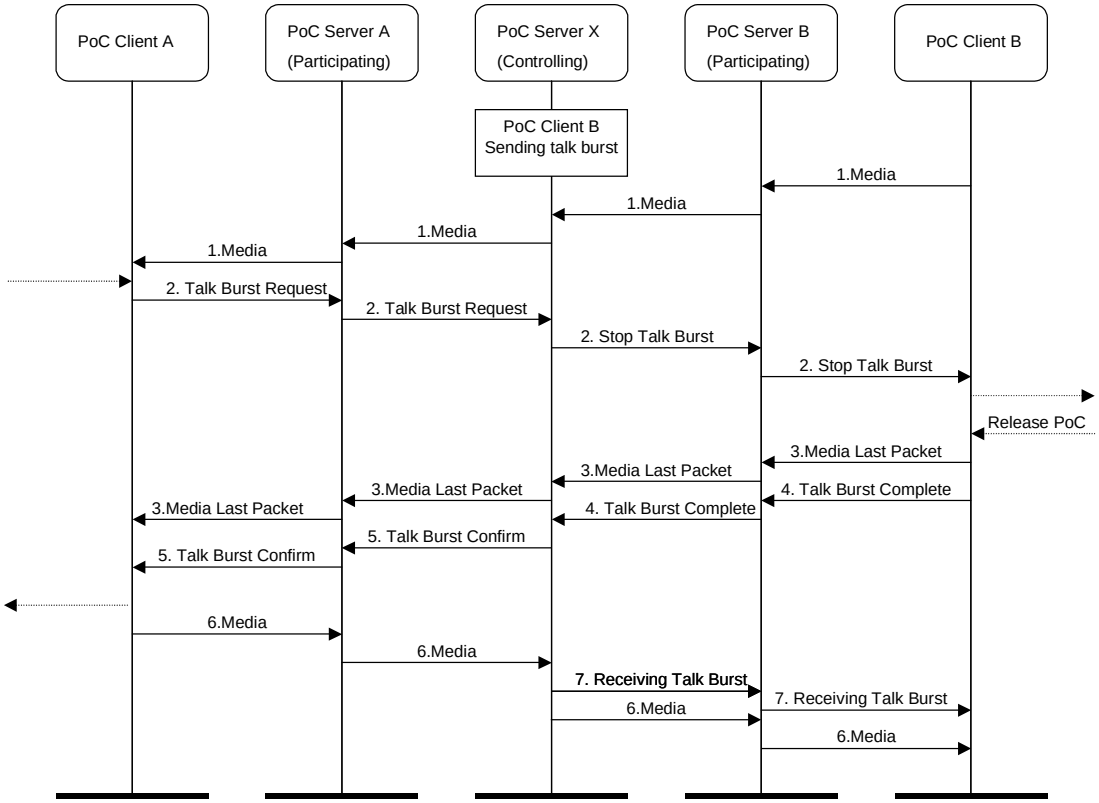

Figure 59: Procedure for Talk Burst request with pre-emptive priority

1. PoC User A, who is authorized to request permission to send a Talk Burst with pre-emptive priority, does so, e.g. by pressing a PoC button, when another PoC User (PoC User B) who does not have pre-emptive priority has permission to send a Talk Burst. PoC Client A sends a Talk Burst Request message to PoC Server X (controlling). The Talk Burst request message identifies the PoC Client A. The Talk Burst request message indicates that PoC User A is requesting access with pre-emptive priority.

2. PoC Server X (controlling) determines that PoC User B does not have pre-emptive priority and that the pre-emption request from PoC User A is authorized and does not violate policies supported by PoC Server X (controlling), such as limits on the number of times or the amount of time that a PoC User is permitted to pre-empt other PoC Users. PoC Server X (controlling) revokes permission to send a Talk Burst from PoC Client B by sending a stop Talk Burst message to PoC Client B. The stop Talk Burst message can indicate that PoC Client B has been pre-empted by another PoC Client. In this scenario, PoC Server X (controlling) can grant the PoC Client B a grace period before revoking permission to send a Talk Burst.

3. PoC Client B sends a Talk Burst permission revoked notification to PoC User B. PoC User B indicates that he has finished speaking, e.g. by releasing the PoC button. PoC Client B sends the last media packet to PoC Server X (controlling), who is still forwarding the media to all other Participants of the PoC Session.

4. PoC Client B then sends the Talk Burst complete message to PoC Server X (controlling).

5. After PoC Server X (controlling) has forwarded the last media packet from PoC Client B, it sends a Talk Burst confirm response message to PoC Client A.

6. When PoC Client A receives the Talk Burst confirm response message, it provides a talk proceed notification to PoC User A. PoC Client A then begins to send media to PoC Server X (controlling). PoC Server X (controlling) forwards this media to the other PoC Clients.

7. The first media packets forwarded to the other PoC Clients are preceded by a receiving Talk Burst message.

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(Not shown in Figure 59). If the effect of granting PoC Client B permission to send Talk Bursts is to change one or more PoC Clients which are next in line to be granted permission to talk (PoC Client C, PoC Client D, etc…), then the PoC Server X (controlling) can send a Talk Burst queue position status message to those PoC Clients whose queue positions had been changed and give themthe updated status of their queued requests.

5.13.2.6 Talk Burst queue position request

This subclause describes the Talk Burst Control procedure when a PoC Client supporting Talk Burst Control with queuing, connected to a PoC Session controlled by a PoC Server supporting Talk Burst Control with queuing, requests the PoC Server to notify the PoC Client of its position in the Talk Burst request queue. Figure 60 *"Procedure for Talk Burst queue position request"* shows the Talk Burst Control flow for this scenario.

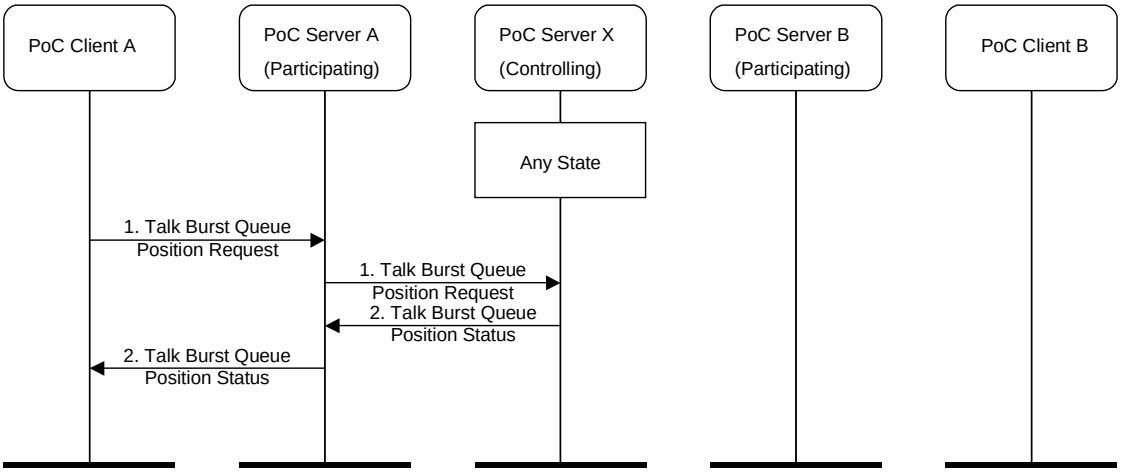

Figure 60: Procedure for Talk Burst queue position request

1. PoC Client A, which supports Talk Burst Control with queuing, and is connected to a PoC Session controlled by a PoC Server supporting Talk Burst Control with queuing, determine that it is necessary to obtain information on the PoC Client's position in the Talk Burst request queue, e.g. in response to a request by PoC User A. PoC Client A requests the PoC Server to notify the PoC Client of its position in the Talk Burst request queue by sending a Talk Burst queue position request to the PoC Server. The Talk Burst queue position request can be sent at any time in the PoC Session, when Talk Burst is requested, but not yet granted.

2. The PoC Server responds by sending a Talk Burst queue position status message to PoC Client A.

5.14 Changing PoC Service Settings

This subclause describes successful modification of a PoC User's PoC Service Settings as specified in subclause 4.26 "*PoC Service Settings*". Figure 61 *"Changing PoC Service Settings"* shows the message flow for the scenario.

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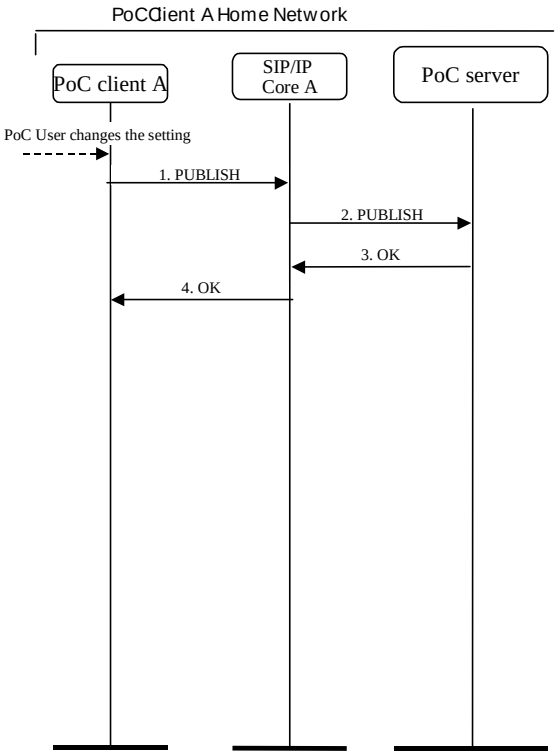

Figure 61: Changing PoC Service Settings

1. The PoC Client sends the PUBLISH request to the SIP/IP Core. Information elements contained in the PUBLISH request:
   a. PoC service indication.
   b. PoC Address of the PoC User at PoC Client A.
   c. Answer Mode Indication setting (Automatic Answer Mode or Manual Answer Mode).
   d. Incoming PoC Session Barring setting (ISB active or ISB not active).
   e. Incoming Instant Personal Alert Barring setting (IAB active or IAB not active).
   f. Simultaneous PoC Sessions Support setting (SSS active or SSS not active).
   g. PoC Box Use setting (PoC Box Use unwilling, conditional, or unconditional)
   h. Invited Parties Identity Information Mode setting (IPIIM active or IPIIM not active with or without invited parties' identity information).
   i. Support for contents settings (support or no support for each content setting).
   j. Privacy setting (anonymous or non-anonymous).
2. The SIP/IP Core sends the PUBLISH request to the PoC Server based on the PoC Address of the PoC User and the PoC service indication. Information elements contained in the PUBLISH request:
   a. PoC service indication.

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b. PoC Address of the PoC User at PoC Client A.

c. Answer Mode Indication setting (Automatic Answer Mode or Manual Answer Mode).

d. Incoming PoC Session Barring setting (ISB active or ISB not active).

e. Incoming Instant Personal Alert Barring setting (IAB active or IAB not active).

f. Simultaneous PoC Sessions Support setting (SSS active or SSS not active).

g. PoC Box Use setting (PoC Box Use unwilling, conditional, or unconditional).

h. Invited Parties Identity Information Mode setting (IPIIM active or IPIIM not active with or without invited parties' identity information).

i. Support for content settings (support or no support for each content setting).

j. Privacy setting (anonymous or non-anonymous).

3. The PoC Server authorizes the PoC Address of the PoC User and if successful stores the new values and sends the OK response to the SIP/IP Core.

4. The SIP/IP Core forwards the OK response to the PoC Client.

5.15 PoC Sessions with Multiple PoC Groups

This subclause describes a scenario where a request for initializing an Ad-hoc PoC Group Session contains a PoC Group Identity identifying a Pre-arranged PoC Group. The scenario is also valid if a Pre-arranged PoC Group Session is initialized and one of the URIs in the list of members defined for the Pre-arranged PoC Group contains an URI identifying another Pre-arranged PoC Group.

Figure 62 shows the signalling flow for the scenario.

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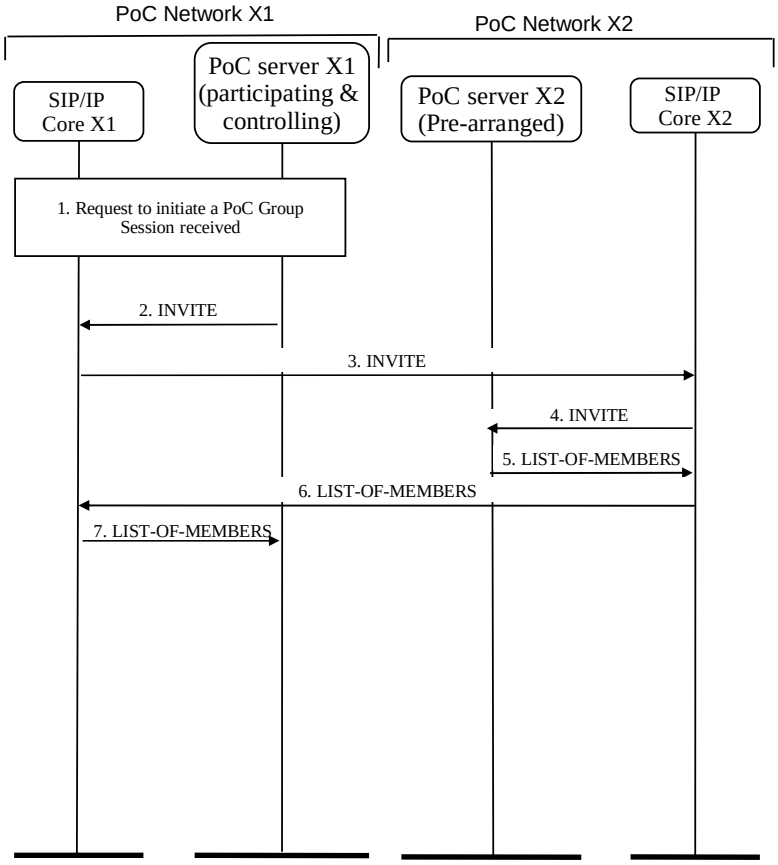

NOTE 1: The flow assumes that all involved entities are PoC Version 2.0 compliant.

NOTE 2: The PoC Server X2 (Pre-arranged) is hosting the Pre-arranged PoC Group.

Figure 62: PoC Session with Multiple PoC Groups.

The steps of the flow are as follows.

NOTE 3: The steps of the flow only contain the elements relevant to PoC Sessions with Multiple PoC Groups containing the Pre-arranged PoC Group hosted by other domain. Other steps of the PoC Group Session establishment are described in subclause 5.2 "*Ad-hoc PoC Group Session and 1-1 PoC Session setup*" or 5.3 "*Pre-arranged PoC Group Session setup*" with the clarification given in the following procedure.

1. The PoC Server X1 receives a request to initiate a PoC Group Session as described in subclause 5.2 "*Ad-hoc PoC Group Session and 1-1 PoC Session setup*" or 5.3 "*Pre-arranged PoC Group Session setup*".

2. The PoC Server X1 starts the procedure to invite PoC User's to the PoC Session by sending an INVITE request to SIP/IP Core X1 for each address in the list received from the initiating PoC Client as described in subclause 5.2.2 "*Ad-hoc PoC Group Session invitation to the PoC Client*" in case of an Ad-hoc PoC Group Session or in the list of members received from Shared Group XDMS as described in subclause 5.3.2 "*Pre-arranged PoC Group Session, terminating part*" in case of a Pre-arranged PoC Group Session. When the included Pre-arranged PoC Group is hosted by other domain, the PoC Server X1 sends the invitation request to the SIP/IP Core X1.

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Information elements contained in INVITE request:

a. Controlling PoC Function assigned indication;

b. PoC Address of the Invited PoC User, i.e. in this example a PoC Group Identity identifying a Pre-arranged PoC Group;

c. PoC Address of the PoC User at the PoC Client A; i.e., the PoC Address of the PoC User initializing the Ad-hoc PoC Session;

d. An PoC Version 2.0 indication; and,

e. Other elements.

1. SIP/IP Core X1 routes the request to the SIP/IP Core X2.

   Information elements contained in INVITE request:

   a. Controlling PoC Function assigned indication;

   b. PoC Group Identity identifying a Pre-arranged PoC Group;

   c. PoC Address of the PoC User at the PoC Client A, i.e. the PoC Address of the PoC User initializing the Ad-hoc PoC Session;

   d. An PoC Version 2.0 indication; and,

   e. Other elements

2. SIP/IP Core X2 routes the request to the PoC Server X2.

   Information elements contained in INVITE request:

   a. Controlling PoC Function assigned indication;

   b. PoC Group Identity identifying a Pre-arranged PoC Group;

   c. PoC Address of the PoC User at the PoC Client A, i.e. the PoC Address of the PoC User initializing the Ad-hoc PoC Session;

   d. An PoC Version 2.0 indication; and,

   e. Other elements.

3. The PoC Server X2 who is responsible for the Pre-arranged PoC Group receives the invitation and detects that the Controlling PoC Function is assigned to another PoC Server compliant to Version 2. The PoC Server X2 authorizes the invitation by checking if the Inviting PoC Client is a member in Pre-arranged PoC Group hosted by PoC Server X2.

   NOTE 4: The PoC Server X2 can also base the authorization on a local policy based on inter-operator agreements.

   PoC Server X2 sends the LIST-OF-MEMBERS response to the SIP/IP Core, if authorization is successful..

   Information elements contained in the LIST-OF MEMBERS response:

   a. List of members in the Pre-arranged PoC Group that the PoC Server X2 is authorized to return to the PoC Server X1.

4. The SIP/IP Core X2 sends the LIST-OF-MEMBERS response to the SIP/IP Core X1.

5. The SIP/IP Core X1 sends the LIST-OF-MEMBERS response to the PoC Server X1.The PoC Server X1 checks its policy for using members in other PoC Groups and if allowed to do so the PoC Server continues to invite each member

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to the PoC Group Session. If one of the members of the Pre-arrange PoC Group is another Pre-arranged PoC Group the signaling flow in this subclause is repeated until a local policy in PoC Server X1 stops it.

In the case PoC Server X1 or X2 is a Version 1 PoC Server or if the PoC User A at PoC Client A is not authorized by the PoC Server X2 the procedure according to PoC Version 1 is used.

5.16 Multiple Media Burst Requests Control Procedure

5.16.1 Media-floor Control Entity negotiation

5.16.1.1 Binding multiple and dependent Media Streams with one Media-floor Control Entity

In this scenario, a PoC Client successfully negotiates the binding of two Media Types A and B with one Media-floor Control Entity. This scenario is valid for Pre-arranged PoC Group, Ad-hoc PoC Group, Chat PoC Group, and Dispatch PoC Group.

The Figure 63 "*Binding multiple and dependent Media Streams with one Media-floor Control Entity*" presents the negotiation flow.

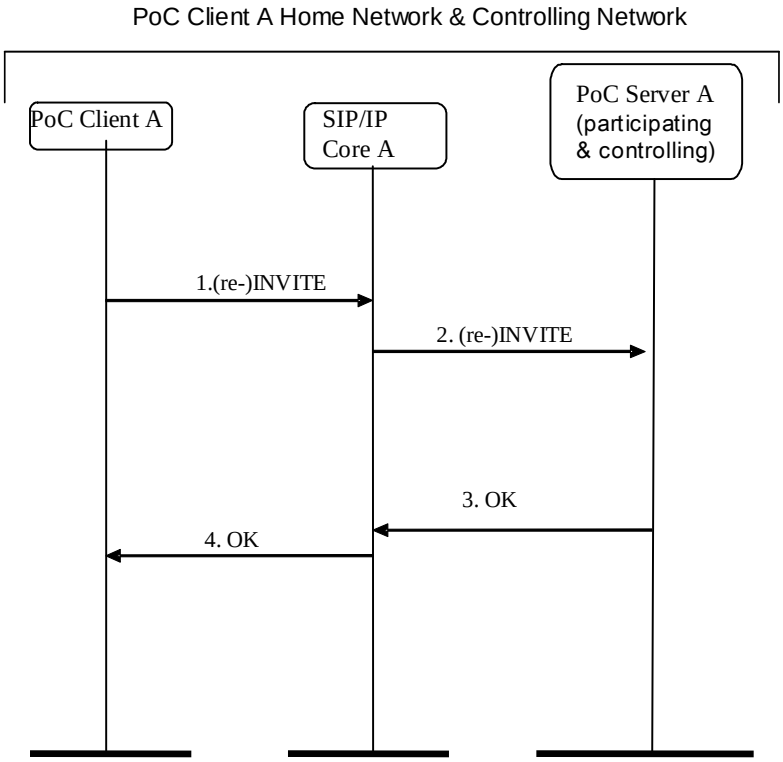

Figure 63: Binding multiple and dependent Media Streams with one Media-floor Control Entity

NOTE: The information elements contained in each step are not complete and show only the relevant elements to this subclause.

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1. The PoC Client sends an (re-)INVITE request to the SIP/IP Core containing a PoC indication.

   Information elements contained in (re-)INVITE request:

   a. Media Parameters of PoC Client A for Media Stream A and Media Stream B

   b. PoC service indication

   c. PoC Address of the PoC User at the PoC Client A

   d. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal.

   e. Media-floor Control Entity proposal bound to both Media Stream A and Media Stream B.

   f. Other elements (e.g. Media included in the request).

2. The SIP/IP Core forwards the request to the PoC Server based on the PoC service indication and the Participating Function URI in the request.

   Information elements contained in (re-)INVITE request:

   a. Media Parameters of PoC Client A for Media Stream A and Media Stream B

   b. PoC Service indication

   c. PoC Address of the PoC User at the PoC Client A

   d. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal.

   e. Media-floor Control Entity proposal bound to both Media Stream A and Media Stream B.

   f. Other elements (e.g. Media included in the request).

3. The PoC Server performs necessary service control and sends OK response to the SIP/IP Core.

   Information elements contained in OK response:

   a. Media Parameters of PoC Server A

   b. Selected Talk Burst Control Protocol and/or Media Burst Control Protocol.

   c. Media-floor Control Entity response bound .to both Media Stream A and Media Stream B.

4. The SIP/IP Core forwards the OK response the PoC Client.

   Information elements contained in OK response:

   a. Media Parameters of PoC Server A

   b. Selected Talk Burst Control Protocol and/or Media Burst Control Protocol.

   c. Media-floor Control Entity response bound .to both Media Stream A and Media Stream B.

5.16.1.2 Binding multiple and independent Media Streams with separate Media-floor Control Entities

In this scenario, a PoC Client successfully negotiates the separate bindings of Media Type A with one Media-floor Control Entity and of Media Type B with the other Media-floor Control Entity. This scenario is valid for Pre-arranged PoC Group, Ad-hoc PoC Group, Chat PoC Group, and Dispatch PoC Group.

The Figure 64 "*Binding multiple and independent Media Streams with separate Media-floor Control Entities*" presents the negotiation flow.

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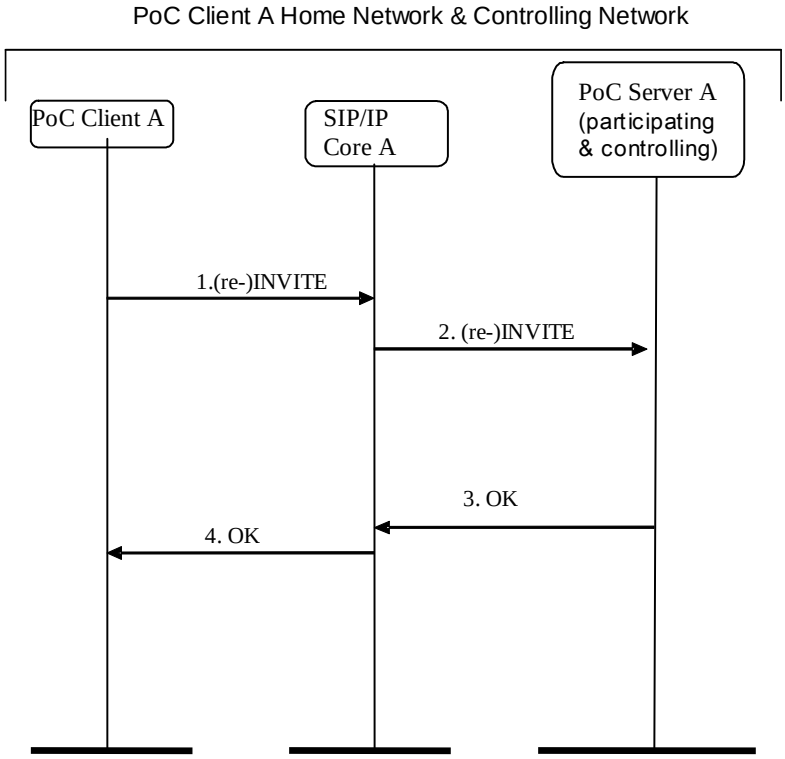

Figure 64: Binding multiple and independent Media Streams with separate Media-floor Control Entities

NOTE: The information elements contained in each step are not complete and show only the relevant elements to this subclause.

1. The PoC Client sends an (re-)INVITE request to the SIP/IP Core containing a PoC indication.

   Information elements contained in (re-)INVITE request:

   a. Media Parameters of PoC Client A for Media Stream A and Media Stream B

   b. PoC service indication

   c. PoC Address of the PoC User at the PoC Client A

   d. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal.

   e. Media-floor Control Entity proposal bound to Media Stream A.

   f. Media-floor Control Entity proposal bound to Media Stream B.

   g. Other elements (e.g. Media included in the request).

2. The SIP/IP Core forwards the request to the PoC Server based on the PoC service indication and the Participating Function URI in the request.

   Information elements contained in (re-)INVITE request:

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a. Media Parameters of PoC Client A for Media Stream A and Media Stream B

b. PoC Service indication

c. PoC Address of the PoC User at the PoC Client A

d. Talk Burst Control Protocol and/or Media Burst Control Protocol proposal.

e. Media-floor Control Entity proposal bound to Media Stream A.

f. Media-floor Control Entity proposal bound to Media Stream B.

g. Other elements (e.g. Media included in the request)

3. The PoC Server performs necessary service control and sends OK response to the SIP/IP Core.

   Information elements contained in OK response:

   a. Media Parameters of PoC Server A

   b. Selected Talk Burst Control Protocol and/or Media Burst Control Protocol

   c. Media-floor Control Entity response bound .to Media Stream A

   d. Media-floor Control Entity response bound .to Media Stream B.

4. The SIP/IP Core forwards the OK response the PoC Client.

   Information elements contained in OK response:

   a. Media Parameters of PoC Server A

   b. Selected Talk Burst Control Protocol and/or Media Burst Control Protocol

   c. Media-floor Control Entity response bound .to Media Stream A

   d. Media-floor Control Entity response bound .to Media Stream B.

5.16.2 Media Burst request for sending multiple and dependent Media Streams

In this scenario, a PoC Client successfully requests the permission to send multiple Media Streams. The Media Burst request from the PoC Client implicitly includes the type of Media, e.g. Media Type A and Media Type B, through the binding of Media Type A and Media Type B to the same Media-floor negotiated prior to the Media Burst request.

Figure 65 *"PoC Client requests for sending multiple* Media Streams successfully" shows the message flow for the scenario.

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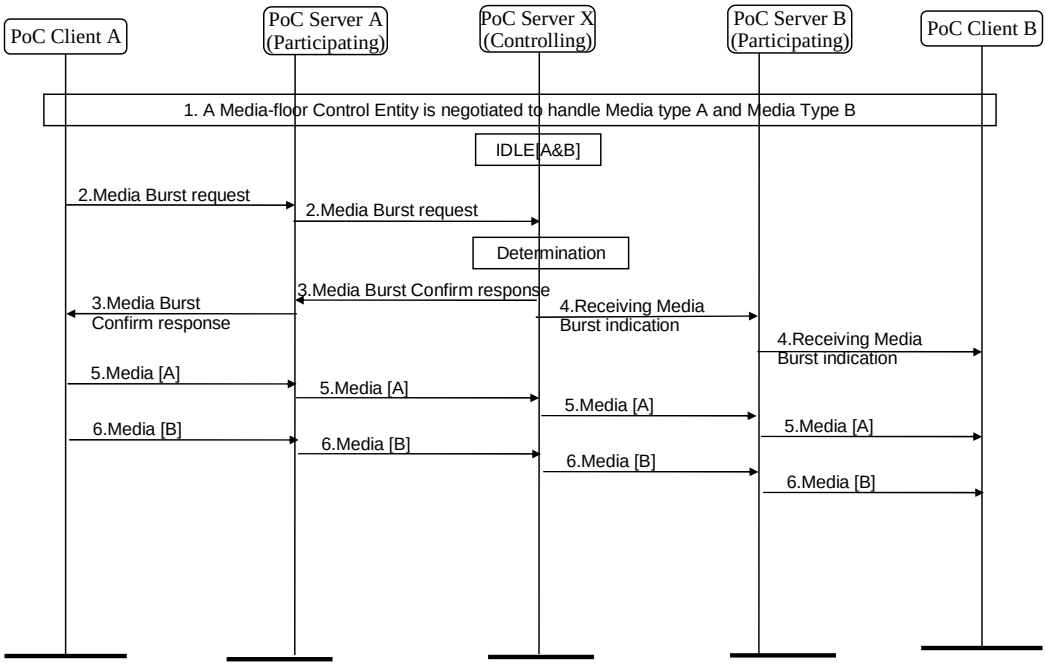

Figure 65: PoC Client requests for sending multiple Media Streams successfully

PoC User A with PoC Client A wants to send Media Streams and presses a PoC button.

The steps of the flow are:

1. A new Media-floor entity is negotiated as described in subclause 5.16.1.1 "*Binding multiple and dependent Media Streams with one Media-floor Control Entity*". The negotiation can occur e.g. at PoC Session establishment or later during the PoC Session.
2. The PoC Client A sends a Media Burst request to PoC Server X to request permission for sending Media Streams A and B by sending the Media Burst request to the Media-floor Control Entity handling Media Type A and Media Type B.
3. PoC Server X decides to grant the permissions of sending streams of Media Type A and B and sends a Media Burst Confirm response message to PoC Client A. When PoC Client A receives the Media Burst Confirm response message, it can provide a media-sending proceed notification to PoC User A.
4. At the same time PoC Server X sends a Receiving Media Burst Indication message to the other PoC Clients in the PoC Session (only PoC Client B is shown in Figure 65 "*PoC Client requests for sending multiple Media Streams successfully*") with PoC User A's identity.
5. PoC Client A sends a Media Burst of Media Type A to PoC Server X. The PoC Server X forwards the Media Burst to the other PoC Clients.
6. PoC Client A sends a Media Burst of Media Type B to PoC Server X. The PoC Server X forwards the Media Burst to the other PoC Clients.

The sending of Media Stream A and Media Stream B can occur at the same time.

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5.16.3 Media Burst / Talk Burst request for sending independent Media Streams

This subclause describes the procedure of PoC Client who has the permission to send Media Stream of Media Type A requests another permission to send Media Stream of Media Type B.

This scenario implies the use of Media Burst Control for requesting permission to send lived-stream video and either Media Burst Control or Talk Burst Control when requesting permission to speak.

Figure 66 "*PoC Client requests for sending multiple and independent* Media Streams successfully" shows the message flow for the scenario.

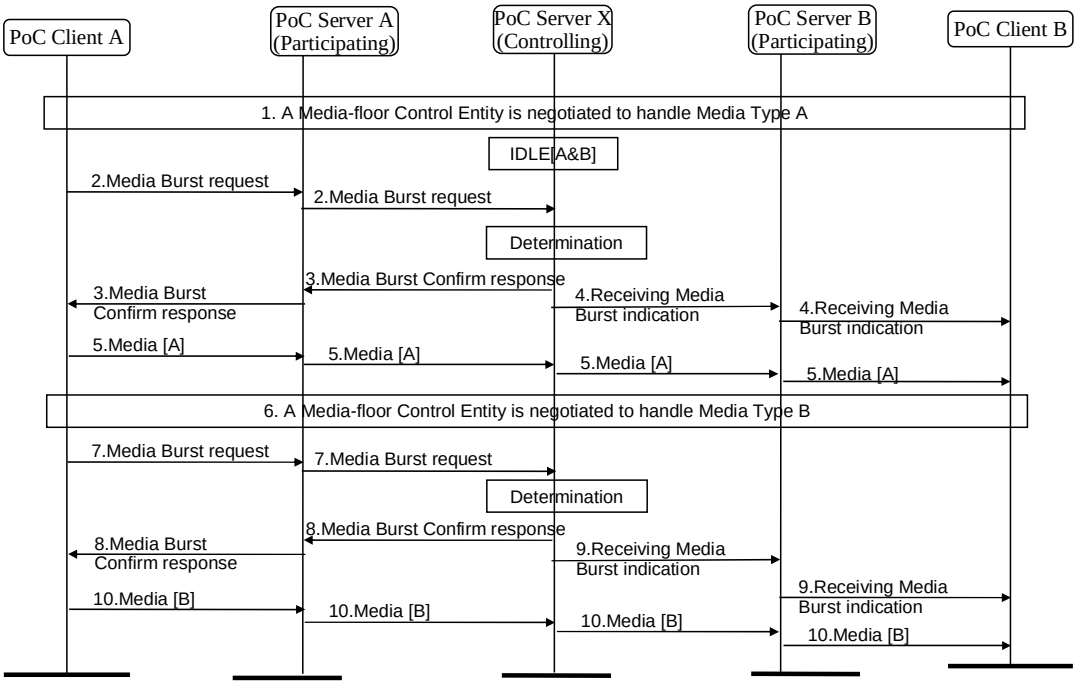

Figure 66: PoC Client requests for sending multiple and independent Media Streams successfully

The steps are:

1. A new Media-floor Control Entity are negotiated as described in subclause 5.16.1.2 "*Binding multiple and independent Media Streams with separate Media-floor Control Entities*". The negotiations can occur e.g. at PoC Session establishment or later during the PoC Session.

2-5. PoC User A successfully requests the permission to send Media Stream A and, when permission is received, sends the Media Stream A, e.g. sends a live-streamed video to the Participants in PoC Session.

6. PoC User A wants to speak while transmitting the live-streamed video, so he does some operations on the PoC Client, e.g. selects Media Type B and presses a PoC button. Another new Media-floor Control Entity can be negotiated as described in subclause 5.16.1 "*Media-floor Control Entity negotiation*" during the existing PoC Session if needed.

7. The PoC Client A sends a Media Burst request / Talk Burst request message to PoC Server X to request the permission to send Media Stream B by sending the Media Burst request to the Media-floor Control Entity handling Media Type B.

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8. PoC Server X decides to grant the permission of sending streams of Media Type B to PoC Client A and sends a Media Burst Confirm / Talk Burst Confirm response message to PoC Client A. When PoC Client A receives the Media Burst Confirm / Talk Burst Confirm response message, it can provide a media-sending proceed notification to PoC User A.

9. At the same time PoC Server X sends a Receiving Media Burst indication / Receiving Talk Burst indication message to the other PoC Clients in the PoC Session (only PoC Client B is shown in Figure 66 *"PoC Client requests for sending multiple and independent* Media Streams successfully") with PoC User A's identity.

10. PoC Client A sends a Media Burst of Media Type B to PoC Server X. PoC Server X forwards the Media Burst to the other PoC Clients in the session.

The sending of Media Stream A and Media Stream B can occur at the same time.

5.17 Handling of PoC Box

A PoC User can request PoC Box service when initiating PoC Session, receiving incoming PoC Session invitation, or during participating PoC Session, as long as the PoC Box is allowed to join the PoC Session by the PoC policy.

5.17.1 UE PoC Box Registration and Service Request

This subclause describes the case when the UE PoC Box registers to the SIP/IP Core and PoC Client requests a PoC Box service to the Home PoC Network.

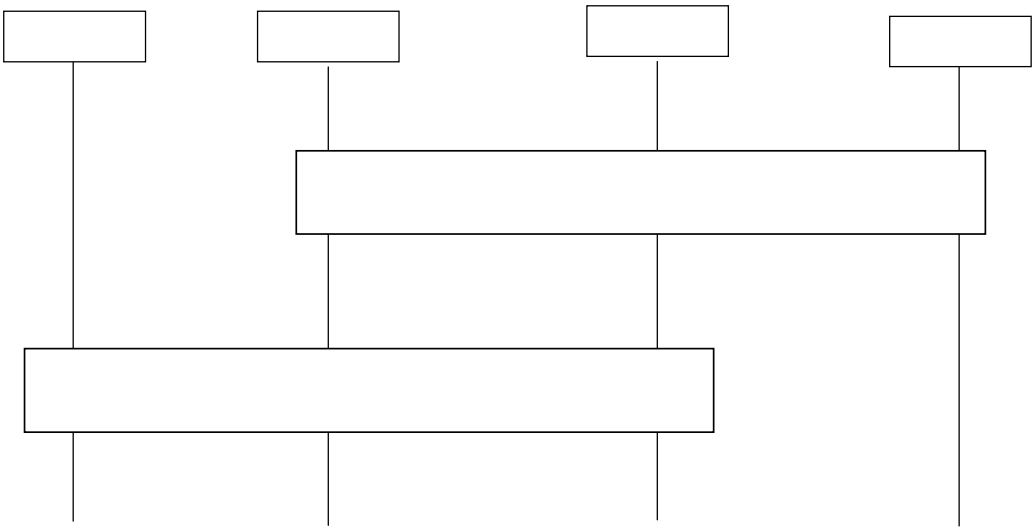

Figure 67: PoC Box Session Setup; Originating side

1. The UE PoC Box registers to the SIP/IP Core of the Home PoC Network.

2. PoC Client requests PoC Box Service to the Home PoC Server using the PoC Box Use PoC Service Setting.

NOTE: The PoC Client publishes PoC Service Settings when the UE PoC Box is registered even when the PoC Client is not registered for the PoC Service.

5.17.2 PoC Box Requested by the Inviting PoC User

This subclause describes the case when the Inviting PoC Client, which is capable of handling PoC Box functionality, sends an invitation request to invoke PoC Box functionality of the Invited PoC User explicitly.

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5.17.2.1 Procedure at the Originating PoC User

This subclause describes the case when the PoC User initiates a 1-1 PoC Session invitation request to the PoC Box of the Invited PoC User. In this scenario, the Inviting PoC Client explicitly request to use PoC Box functionality of the Invited PoC User.

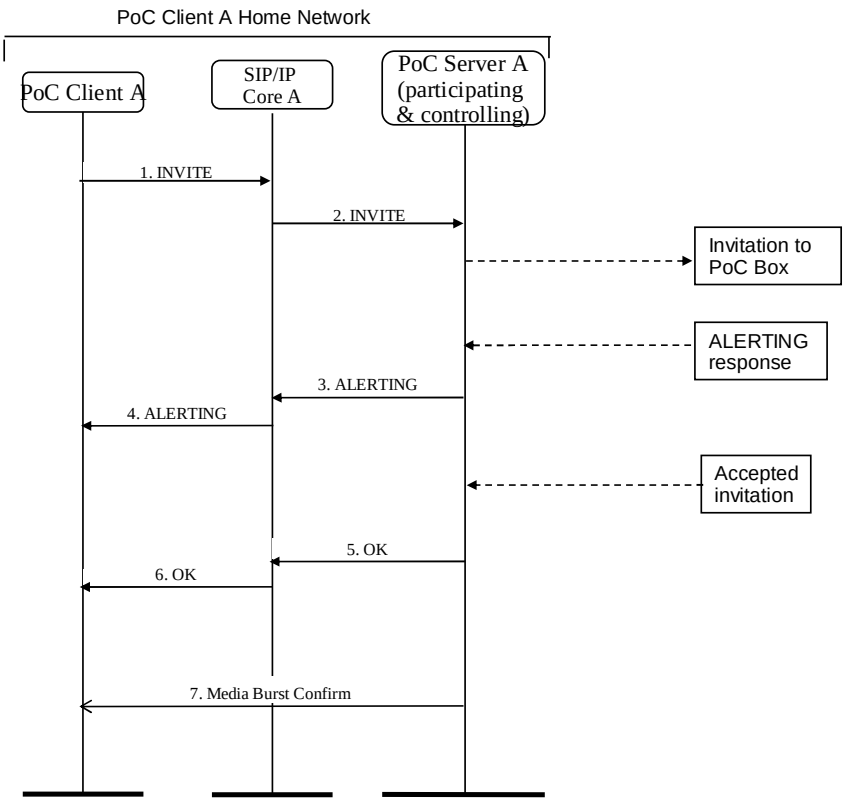

Figure 68: PoC Box Session Setup; Originating side

1. PoC Client A initiates PoC Session to request PoC Box capability provided by the Invited PoC User by sending an INVITE request to the SIP/IP Core of the Home PoC Network.

   Information elements contained in INVITE request:

   a. PoC Address of Invited PoC User

   b. Media Parameters of PoC Client A

   c. PoC service indication

   d. PoC Box request indication

   e. PoC Address of the PoC User at the PoC Client A

   f. Talk Burst Control Protocol proposal or Media Burst Control Protocol proposal or both.

   g. Media-floor Control Entities proposal.

   h. Other elements (e.g. Media included in the request).

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2. SIP/IP Core A routes the request to the PoC Server A (participating and controlling).

   Information elements contained in INVITE request:

   a. PoC Address of Invited PoC User

   b. Media Parameters of PoC Client A

   c. PoC service indication

   d. PoC Box request indication

   e. PoC Address of the PoC User at the PoC Client A

   f. Talk Burst Control Protocol proposal or Media Burst Control Protocol proposal or both.

   g. Media-floor Control Entities proposal.

   h. Other elements (e.g. Media included in the request).

3. Upon receiving invitation request, the PoC Server A (participating & controlling) sends invitation request towards the Home PoC Network of the Invited PoC User. When the ALERTING response is received the PoC Server A (participating & controlling) sends ALERTING response towards the PoC Client A, when the final response OK is not yet sent.

4. SIP/IP Core A forwards the ALERTING response to the PoC Client A.

5. When the Invited PoC Box accepts the PoC Session request, the PoC Server A (participating & controlling) sends OK response towards the PoC Client A. The OK response includes the following information:

   Information elements contained in OK response:

   a. Media Parameters of PoC Server A (participating & controlling)

   b. Selected Talk Burst Control Protocol or the selected Media Burst Control Protocol or both.

   c. PoC Box indication

   d. PoC Box type indication

   e. Media-floor Control Entities response.

6. SIP/IP Core A forwards the OK response to the PoC Client A.

   Information elements contained in OK response:

   a. Media Parameters of PoC Server A (participating & controlling)

   b. Selected Talk Burst Control Protocol or the selected Media Burst Control Protocol or both.

   c. PoC Box indication

   d. PoC Box type indication

   e. Media-floor Control Entities response

7. The PoC Server A (participating & controlling) sends the message Media Burst Confirm response to the PoC Client A.

   Information elements contained in Media Burst Confirm:

   a. Maximum duration time to send Media Burst before the permission is revoked

   b. Alert margin

   c. Number of Participants receiving Media

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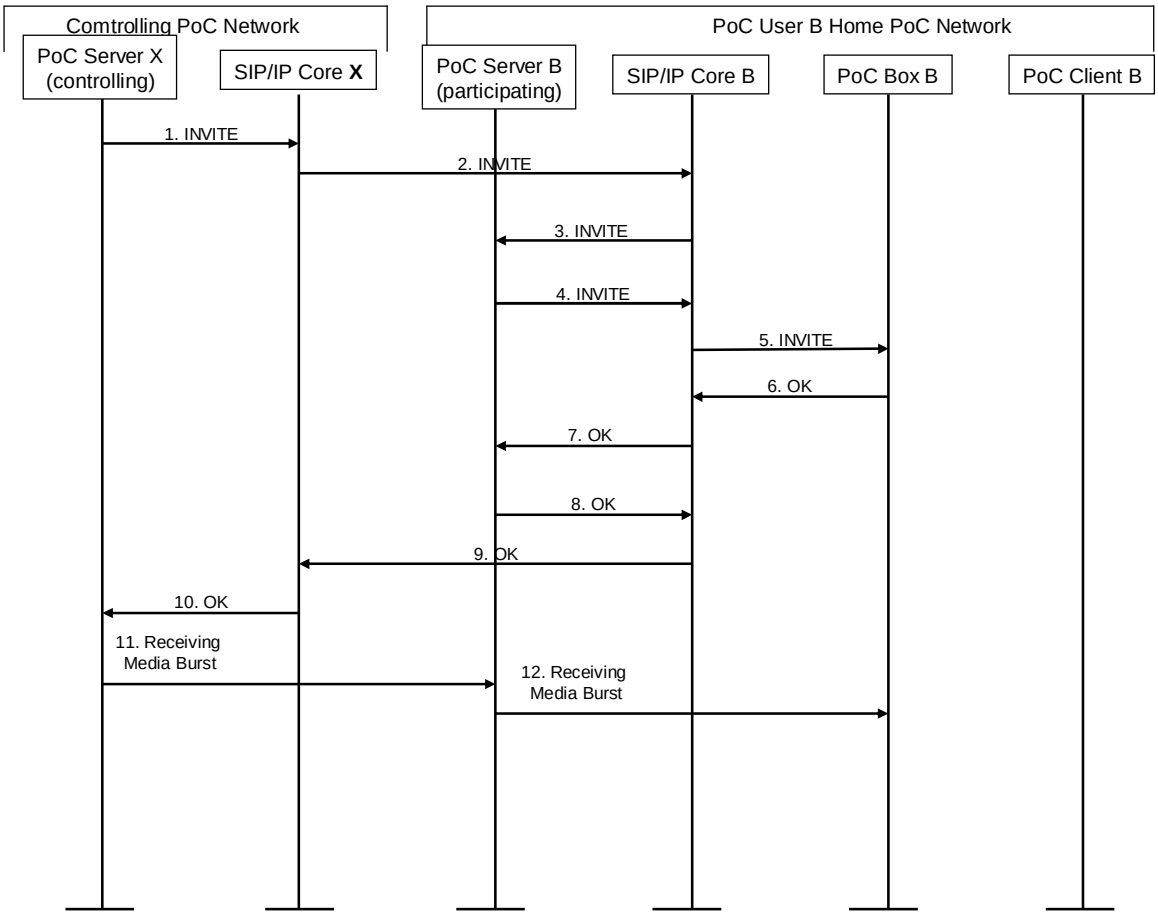
If the PoC Box responds successfully, the Inviting PoC Client is notified of the PoC Box's participation information.

5.17.2.2 PoC Session invitation routed to the PoC Box

This subclause describes how an invitation to a PoC Session is routed to the PoC Box based on a request received from the Inviting PoC User.

The scenario is valid for the case when the PoC Box is located in the network and in the UE.

Figure 69 shows the signaling flow for the scenario.



NOTE: The PoC Box B can be either the NW PoC Box or the UE PoC Box.

Figure 69: PoC Session invitation routed to the PoC Box

The steps of the flow are as follows:

1. The PoC Server X sends the INVITE request to the SIP/IP Core X.

   Information elements contained in the INVITE request are:

   a. The PoC Address of the PoC User B.

   b. PoC Address of the PoC User A.

   c. Media Parameters of PoC Server X.

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d. PoC service indication.

e. PoC Box request indication.

f. Controlling PoC Function assigned indication.

g. Talk Burst Control Protocol proposal or Media Burst Control proposal or both.

h. Media-floor Control Entities proposal.

i. PoC Session Identity for the PoC Session.

j. Other elements (e.g. Media included in the request).

2. The SIP/IP Core X routes the INVITE request to the SIP/IP Core B based on the PoC Address of PoC User B.

   Information elements contained in the INVITE request are:

   a. The PoC Address of the PoC User B.

   b. PoC Address of the PoC User A.

   c. Media Parameters of PoC Server X.

   d. PoC service indication.

   e. PoC Box request indication.

   f. Controlling PoC Function assigned indication.

   g. Talk Burst Control Protocol proposal or Media Burst Control proposal or both.

   h. Media-floor Control Entities proposal.

   i. PoC Session Identity for the PoC Session.

   j. Other elements (e.g. Media included in the request).

3. The SIP/IP Core B routes the INVITE request to the PoC Server B based on the PoC Address of PoC User B and the PoC service indication.

   Information elements contained in the INVITE request are:

   a. The PoC Address of the PoC User B.

   b. PoC Address of the PoC User A.

   c. Media Parameters of PoC Server X.

   d. PoC service indication.

   e. PoC Box request indication.

   f. Controlling PoC Function assigned indication.

   g. Talk Burst Control Protocol proposal or Media Burst Control proposal or both.

   h. Media-floor Control Entities proposal.

   i. PoC Session Identity for the PoC Session.

   j. Other elements (e.g. Media included in the request).

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4. The PoC Server B detects the PoC Box request indication and based on PoC User B configuration or a local policy decides to route the invitation to the PoC Box B. The PoC Server B sends the INVITE request to the SIP/IP Core B.

   Information elements contained in the INVITE request are:

   a. The original PoC Address of the PoC User B.

   b. PoC Address of the PoC User A.

   c. Media Parameters of PoC Server X.

   d. PoC service indication.

   e. PoC Box request indication.

   f. Controlling PoC Function assigned indication.

   g. Talk Burst Control Protocol proposal or Media Burst Control proposal or both.

   h. Media-floor Control Entities proposal.

   i. PoC Session Identity for the PoC Session.

   j. The address of the PoC Box B.

   k. Other elements (e.g. Media included in the request).

5. The SIP/IP Core B routes the INVITE request to the PoC Box based on the address of the PoC Box.

   Information elements contained in the INVITE request are:

   a. The original PoC Address of the PoC User B.

   b. PoC Address of the PoC User A.

   c. Media Parameters of PoC Server X.

   d. PoC service indication.

   e. PoC Box request indication.

   f. Controlling PoC Function assigned indication.

   g. Talk Burst Control Protocol proposal or Media Burst Control proposal or both.

   h. Media-floor Control Entities proposal.

   i. PoC Session Identity for the PoC Session.

   j. The address of the PoC Box B.

   k. Other elements (e.g. Media included in the request).

6. The PoC Box B authorizes the PoC User B as a user of the PoC Box feature based on the original PoC Address of the PoC User B and sends an OK response to the SIP/IP Core B.

   The information elements of the OK response are:

   a. The PoC Address of PoC User B.

   b. The address of the PoC Box.

   c. A PoC Box indication.

   d. PoC Box type indication

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e. Media Parameters of PoC Box B.

f. Selected Talk Burst Control Protocol or Media Burst Protocol or both.

g. Media-floor Control Entities response.

7. The SIP/IP Core B sends the OK response to the PoC Server B.

   The information elements of the OK response are:

   a. The PoC Address of PoC User B.

   b. The address of the PoC Box.

   c. A PoC Box indication.

   d. PoC Box type indication

   e. Media Parameters of PoC Box B.

   f. Selected Talk Burst Control Protocol or Media Burst Protocol or both.

   g. Media-floor Control Entities response.

8. The PoC Server B sends the OK response to the SIP/IP Core B.

   The information elements of the OK response are:

   a. The PoC Address of PoC User B.

   b. The address of the PoC Box.

   c. A PoC Box indication.

   d. PoC Box type indication

   e. Media Parameters of PoC Box B.

   f. Selected Talk Burst Control Protocol or Media Burst Protocol or both.

   g. Media-floor Control Entities response.

9. The SIP/IP Core B sends the OK response to the SIP/IP Core X.

   The information elements of the OK response are:

   a. The PoC Address of PoC User B.

   b. The address of the PoC Box.

   c. A PoC Box indication.

   d. PoC Box type indication

   e. Media Parameters of PoC Box B.

   f. Selected Talk Burst Control Protocol or Media Burst Protocol or both.

   g. Media-floor Control Entities response.

10. The SIP/IP Core X sends the OK response to the PoC Server X.

    The information elements of the OK response are:

    a. The PoC Address of PoC User B.

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b. The address of the PoC Box.

c. A PoC Box indication.

d. PoC Box type indication

e. Media Parameters of PoC Box B.

f. Selected Talk Burst Control Protocol or Media Burst Protocol or both.

g. Media-floor Control Entities response.

11.-12.The PoC Server X (controlling) sends the Receiving Media Burst indication to the PoC Box of the PoC Client B through PoC Server B (participating).

The information elements of the OK response are:

a. PoC Address of the Participant at the PoC Client sending the Media Burst.

b. Nick Name of the Participant at the PoC Client sending the Media Burst.

c. Number of Participants receiving Media.

5.17.3 PoC Box Permitted by the Inviting PoC User

This subclause describes the case when the Inviting PoC Client, which is capable of handling PoC Box functionality, sends an invitation request to initiate 1-1 or PoC Group Session that allows the invitation request to be routed to the PoC Box of the Invited PoC User.

5.17.3.1 Procedure at Originating PoC User

This subclause describes the case where the response from the terminating part is as described in the subclause 5.17.4.2.3 "*Invited PoC User redirects the invitation to a PoC Session to the NW PoC Box*".

Figure 70 *"PoC Box Session Setup; Originating side"* shows the signaling flow for the scenario.

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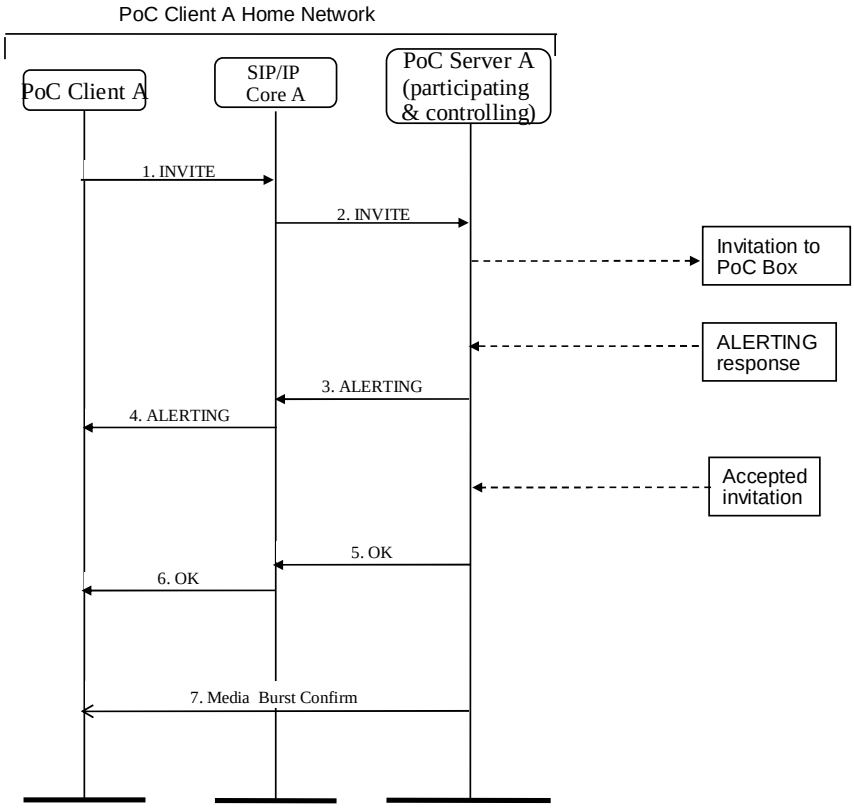

Figure 70: PoC Box Session Setup; Originating side

1. PoC Client A initiates PoC Session to request PoC Box capability provided by the Invited PoC User by sending an INVITE request to the SIP/IP Core of the Home PoC Network.

   Information elements contained in INVITE request:

   a. PoC Address of Invited PoC User

   b. Media Parameters of PoC Client A

   c. PoC service indication

   d. Willingness to use PoC Box indication

   e. PoC Address of the PoC User at the PoC Client A

   f. Talk Burst Control Protocol or Media Burst Control Protocol proposal or both.

   g. Media-floor Control Entities proposal.

   h. Other elements (e.g. Media included in the request).

2. SIP/IP Core A routes the request to the PoC Server A (participating and controlling).

   Information elements contained in INVITE request:

   a. PoC Address of Invited PoC User

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b. Media Parameters of PoC Client A

c. PoC service indication

d. Willingness to use PoC Box indication

e. PoC Address of the PoC User at the PoC Client A

f. Talk Burst Control Protocol or Media Burst Control Protocol proposal or both.

g. Media-floor Control Entities proposal.

h. Other elements (e.g. Media included in the request).

3. Upon receiving invitation request, the PoC Server A (participating & controlling) sends invitation request towards the Home PoC Network of the Invited PoC User. When the ALERTING response is received the PoC Server A (participating & controlling) sends ALERTING response towards the PoC Client A, when the final response OK is not yet sent.

4. SIP/IP Core A forwards the ALERTING response to the PoC Client A.

5. When the PoC Box accepts the PoC Session request, the PoC Server A (participating & controlling) sends OK response towards the PoC Client A. The OK response includes the following information:

   Information elements contained in OK response:

   a. Media Parameters of PoC Server A (participating & controlling)

   b. Selected Talk Burst Control Protocol or Media Burst Control Protocol or both.

   c. PoC Box indication

   d. PoC Box type indication

   e. Media-floor Control Entities response.

6. SIP/IP Core A forwards the OK response to the PoC Client A.

   Information elements contained in OK response:

   a. Media Parameters of PoC Server A (participating & controlling)

   b. Selected Talk Burst Control Protocol and/or Media Burst Control Protocol.

   c. PoC Box indication

   d. PoC Box type indication

   e. Media-floor Control Entities response.

7. The PoC Server A (participating & controlling) sends the message Media Burst Confirm response to the PoC Client A.

   Information elements contained in OK response:

   a. Maximum duration time to send Media Burst before the permission is revoked

   b. Alert margin

   c. Number of Participants receiving Media

If the PoC Box responds successfully, the Inviting PoC Client is notified of the PoC Box's participation information.

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5.17.3.2 Procedure at Terminating PoC User

This subclause describes the case when the Inviting PoC Client, which is capable of handling PoC Box functionality, sends an invitation request to initiate PoC Session that allows the invitation request to be routed to the PoC Box of the Invited PoC User.

5.17.3.2.1 PoC Box Requested by the Invited PoC User

The procedure is the same as described in the subclause 5.17.4.2.3 "*Invited PoC User redirects the invitation to a PoC Session to the NW PoC Box*", without information elements of PoC Box request indication.

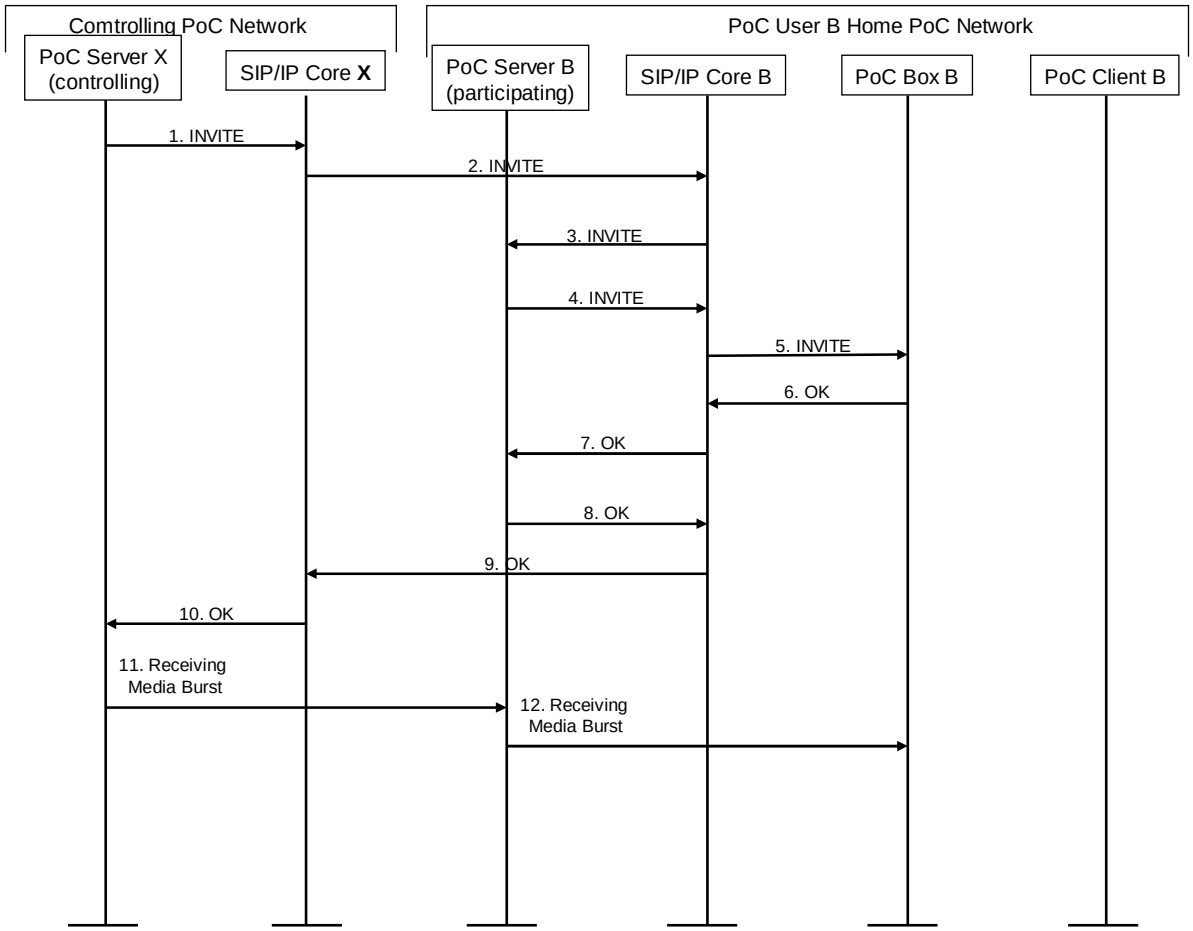
5.17.3.2.2 PoC Box not Requested by the Invited PoC User

The procedure is the same as a general PoC Session invitation procedure as described in the subclause, e.g. 5.2.2 *"Ad-hoc PoC Group Session invitation to the PoC Client"*.

5.17.3.3 PoC Session invitation routed to the PoC Box

This subclause describes the case when a invitation to a PoC Session is routed to a PoC Box based on the Invited PoC User's configuration or local policy. The Inviting PoC Client has indicated its implicit or explicit willingness to be connected to a PoC Box. The scenario is valid for the case when the PoC Box is located in the network and in the UE.

Figure 71 "*PoC Session invitation routed to the PoC Box"* shows the signaling flow for the scenario.



NOTE: The PoC Box B can be either the NW PoC Box or the UE PoC Box.

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Figure 71: PoC Session invitation routed to the PoC Box

The steps of the flow are as follows:

1. The PoC Server X sends the INVITE request to the SIP/IP Core X.

   Information elements contained in the INVITE request are:

   a. The PoC Address of the PoC User B.

   b. PoC Address of the PoC User A.

   c. Media Parameters of PoC Server X.

   d. PoC service indication.

   e. Willingness to use PoC Box indication

   f. Controlling PoC Function assigned indication.

   g. Talk Burst Control Protocol proposal or Media Burst Control proposal or both.

   h. Media-floor Control Entities proposal.

   i. PoC Session Identity for the PoC Session.

   j. Other elements (e.g. Media included in the request).

2. The SIP/IP Core X routes the INVITE request to the SIP/IP Core B based on the PoC Address of PoC User B.

   Information elements contained in the INVITE request are:

   a. The PoC Address of the PoC User B.

   b. PoC Address of the PoC User A.

   c. Media Parameters of PoC Server X.

   d. PoC service indication.

   e. PoC Box request indication.

   f. Willingness to use PoC Box indication, if included in the originating INVITE request.

   g. Controlling PoC Function assigned indication.

   h. Talk Burst Control Protocol proposal or Media Burst Control proposal or both.

   i. Media-floor Control Entities proposal.

   j. PoC Session Identity for the PoC Session.

   k. Other elements (e.g. Media included in the request).

3. The SIP/IP Core B routes the INVITE request to the PoC Server B based on the PoC Address of PoC User B and the PoC service indication.

   Information elements contained in the INVITE request are:

   a. The PoC Address of the PoC User B.

   b. PoC Address of the PoC User A.

   c. Media Parameters of PoC Server X.

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d. PoC service indication.

e. PoC Box request indication, if included in the originating INVITE request.

f. Willingness to use PoC Box indicationt.

g. Controlling PoC Function assigned indication.

h. Talk Burst Control Protocol proposal or Media Burst Control proposal or both.

i. Media-floor Control Entities proposal.

j. PoC Session Identity for the PoC Session.

k. Other elements (e.g. Media included in the request).

4. The PoC User B criteria for routing the invitation to a PoC Box are fulfilled and the PoC Server B decides to route the invitation to the PoC Box. The PoC Server B sends the INVITE request to the SIP/IP Core B.

   Information elements contained in the INVITE request are:

   a. The original PoC Address of the PoC User B.

   b. PoC Address of the PoC User A.

   c. Media Parameters of PoC Server X.

   d. PoC service indication.

   e. PoC Box request indication, if included in the originating INVITE request.

   f. Willingness to use PoC Box indication.

   g. Controlling PoC Function assigned indication.

   h. Talk Burst Control Protocol proposal or Media Burst Control proposal or both.

   i. Media-floor Control Entities proposal.

   j. PoC Session Identity for the PoC Session.

   k. The address of the PoC Box B.

   l. Other elements (e.g. Media included in the request).

5. The SIP/IP Core B routes the INVITE request to the PoC Box based on the address of the PoC Box.

   Information elements contained in the INVITE request are:

   a. The original PoC Address of the PoC User B.

   b. PoC Address of the PoC User A.

   c. Media Parameters of PoC Server X.

   d. PoC service indication.

   e. PoC Box request indication, if included in the originating INVITE request.

   f. Willingness to use PoC Box indication.

   g. Controlling PoC Function assigned indication.

   h. Talk Burst Control Protocol proposal or Media Burst Control proposal or both.

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i. Media-floor Control Entities proposal.

j. PoC Session Identity for the PoC Session.

k. The address of the PoC Box B.

l. Other elements (e.g. Media included in the request).

6. The PoC Box B authorizes the PoC User B as a user of the PoC Box feature based on the original PoC Address of the PoC User B and sends an OK response to the SIP/IP Core B.

   The information elements of the OK response are:

   a. The PoC Address of PoC User B.

   b. The address of the PoC Box B.

   c. A PoC Box indication.

   d. PoC Box type indication

   e. Media Parameters of PoC Box B.

   f. Selected Talk Burst Control Protocol or Media Burst Protocol or both.

   g. Media-floor Control Entities response.

7. The SIP/IP Core B sends the OK response to the PoC Server B.

   The information elements of the OK response are:

   a. The PoC Address of PoC User B.

   b. The address of the PoC Box B.

   c. A PoC Box indication.

   d. PoC Box type indication.

   e. Media Parameters of PoC Box B.

   f. Selected Talk Burst Control Protocol or Media Burst Protocol or both.

   g. Media-floor Control Entities response.

8. The PoC Server B sends the OK response to the SIP/IP Core B.

   The information elements of the OK response are:

   a. The PoC Address of PoC User B.

   b. The address of the PoC Box B.

   c. A PoC Box indication.

   d. PoC Box type indication

   e. Media Parameters of PoC Box B.

   f. Selected Talk Burst Control Protocol or Media Burst Protocol or both.

   g. Media-floor Control Entities response.

9. The SIP/IP Core B sends the OK response to the SIP/IP Core X.

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The information elements of the OK response are:

a. The PoC Address of PoC User B.

b. The address of the PoC Box B.

c. A PoC Box indication.

d. PoC Box type indication

e. Media Parameters of PoC Box B.

f. Selected Talk Burst Control Protocol or Media Burst Protocol or both.

g. Media-floor Control Entities response.

10. The SIP/IP Core X sends the OK response to the PoC Server X.

The information elements of the OK response are:

a. The PoC Address of PoC User B.

b. The address of the PoC Box B.

c. A PoC Box indication.

d. PoC Box type indication

e. Media Parameters of PoC Box B.

f. Selected Talk Burst Control Protocol or Media Burst Protocol or both.

g. Media-floor Control Entities response.

11-12. The PoC Server X (controlling) sends the Receiving Media Burst indication to the PoC Box of the PoC Client B through PoC Server B(participating).

Information elements contained in Receiving Media Burst;

a. PoC Address of the Participant at the PoC Client sending the Media Burst

b. Nick Name of the Participant at the PoC Client sending the Media Burst

c. Number of Participants receiving Media

5.17.4 PoC Box Requested by the Invited PoC User

This subclause describes the case when the Invited PoC Client, which is capable of handling PoC Box functionality, already requested a PoC Box service to the PoC Server in the Home PoC Network.

5.17.4.1 Procedure at Originating PoC User

The procedure is the same as a general PoC Session invitation request, e.g. 5.2.1.1 "*Confirmed Indication using On-demand Session"*, if PoC Box capability is not requested nor permitted by the Originating PoC User.

The procedure is the same as 5.17.2.1 *"Procedure at the Originating PoC User"*, if PoC Box capability is requested by the Originating PoC User.

The procedure is the same as 5.17.3.1 *"Procedure at Originating PoC User"*, if PoC Box capability is permitted by the Originating PoC User.

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5.17.4.2 Procedure at Terminating PoC User

5.17.4.2.1 PoC Box accepts an invitation to a PoC Session on behalf of the Invited PoC User

This subclause describes the scenario when an invitation to a PoC Session is accepted by the PoC Box on behalf of the Invited PoC User.

This scenario is valid for the following cases:

- The Inviting PoC Client, which is capable of handling PoC Box functionality, explicitly requests PoC Box capability (this scenario does not require that the Invited PoC User has enabled the PoC Box or that any of the PoC Box conditions are fulfilled); or,
- The Inviting PoC Client, which is capable of handling PoC Box functionality, explicitly specifies willingness to use PoC Box capability and the Invited PoC User has enabled the use of the PoC Box and conditions for routing the invitation to the PoC Box are fulfilled (e.g. the Invited PoC User participates in another PoC Session and the Invited PoC User's PoC Client does not support Simultaneous PoC Session); or,
- The Inviting PoC Client, does not explicitly request PoC Box capability nor explicitly specify any willingness to use a PoC Box capability and the Invited PoC User has enabled the use of the PoC Box and conditions for routing the invitation to the PoC Box are fulfilled (e.g. the Invited PoC User participates in another PoC Session and the Invited PoC User's PoC Client does not support Simultaneous PoC Session).

Figure 72 *"PoC Box Session Setup; Terminating side"* shows the signalling flow for the scenario.

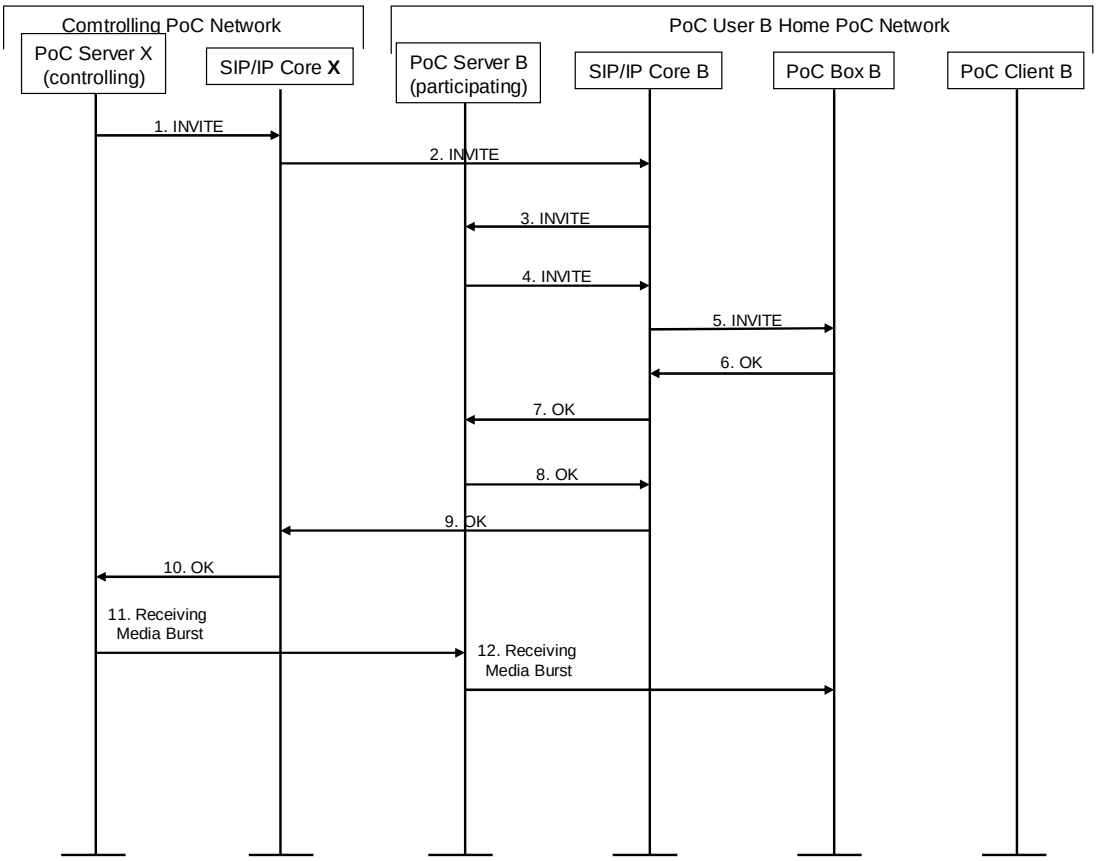

Figure 72: PoC Box Session Setup; Terminating side

1. PoC Server X (controlling) sends an INVITE request to the SIP/IP Core X.

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Information elements contained in the INVITE request:

a. PoC Address of the PoC User A

b. Media Parameters of PoC Server X (controlling)

c. PoC service indication

d. PoC Box request indication, if included in the originating INVITE request

e. Willingness to use PoC Box indication, if included in the originating INVITE request

f. PoC Address of the PoC User B

g. Controlling PoC Function assigned indication

h. Talk Burst Control Protocol proposal or Media Burst Control Protocol Proposal or both.

i. Media-floor Control Entities proposal.

j. PoC Session Identity for the PoC Session.

k. Other elements (e.g. Media included in the request).

2. SIP/IP Core X routes the request to the PoC User B Home PoC Network.

   Information elements contained in the INVITE request:

   a. PoC Address of the PoC User A

   b. Media Parameters of PoC Server X (controlling)

   c. PoC service indication

   d. PoC Box request indication, if included in the originating INVITE request

   e. Willingness to use PoC Box indication, if included in the originating INVITE request

   f. PoC Address of the PoC User B

   g. Controlling PoC Function assigned indication

   h. Talk Burst Control Protocol proposal or Media Burst Control Protocol Proposal or both.

   i. Media-floor Control Entities proposal.

   j. PoC Session Identity for the PoC Session.

   k. Other elements (e.g. Media included in the request).

3. SIP/IP Core B routes the request to the PoC Server B based on the PoC Address of Invited PoC Client and PoC Service indication.

   Information elements contained in the INVITE request:

   a. PoC Address of the PoC User A

   b. Media Parameters of PoC Server X (controlling)

   c. PoC service indication

   d. PoC Box request indication, if included in the originating INVITE request

   e. Willingness to use PoC Box indication, if included in the originating INVITE request

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f. PoC Address of the PoC User B

g. Controlling PoC Function assigned indication

h. Talk Burst Control Protocol proposal or Media Burst Control Protocol Proposal or both

i. Media-floor Control Entities proposal

j. PoC Session Identity for the PoC Session.

k. Other elements (e.g. Media included in the request).

4. The PoC Server B sends an INVITE request to the SIP/IP Core B.

   Information elements contained in the INVITE request:

   a. PoC Address of the PoC User A

   b. Media Parameters of PoC Server X (controlling)

   c. PoC service indication

   d. PoC Box request indication

   e. PoC Address of the PoC User B

   f. Controlling PoC Function assigned indication

   g. Talk Burst Control Protocol proposal or Media Burst Control Protocol Proposal or both

   h. Media-floor Control Entities proposal

   i. PoC Session Identity for the PoC Session.

   j. Other elements (e.g. Media included in the request).

5. SIP/IP Core B routes the INVITE request to the PoC Box based on the PoC Address of Invited PoC User B, PoC Service indication, and PoC Box Service indication.

   Information elements contained in the INVITE request:

   a. PoC Address of the PoC User A

   b. Media Parameters of PoC Server X (controlling)

   c. PoC service indication

   d. PoC Box request indication

   e. PoC Address of the PoC User B

   f. Controlling PoC Function assigned indication

   g. Talk Burst Control Protocol proposal or Media Burst Control Protocol Proposal or both

   h. Media-floor Control Entities proposal

   i. PoC Session Identity for the PoC Session

   j. Other elements (e.g. Media included in the request)

6.-10. SIP/IP Core B routes the OK response towards the PoC Server X (Controlling).

   Information elements contained in the OK response:

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a. Media Parameters of the PoC Box

b. Selected Talk Burst Control Protocol or Media Burst Control Protocol or both

c. Media-floor Control Entities response

d. PoC Box indication

e. PoC Box type indication

11.-12. The PoC Server X (controlling) sends the Receiving Media Burst indication to the PoC Box of the PoC Client B through PoC Server B (participating).

Information elements contained in Receiving Media Burst;

a. PoC Address of the Participant at the PoC Client sending the Media Burst

b. Nick Name of the Participant at the PoC Client sending the Media Burst

c. Number of Participants receiving Media

5.17.4.2.2 Unwilling to Use PoC Box by the Inviting PoC User

This subclause describes the case when the Inviting PoC Client, which is capable of handling PoC Box functionality, has shown unwillingness to use PoC Box capability of the Invited PoC User.

The normal PoC Session establish procedure is used when the Inviting PoC Client has indicated unwillingness to use PoC Box capability of the Invited PoC User.

5.17.4.2.3 Invited PoC User redirects the invitation to a PoC Session to the NW PoC Box

This subclause describes the how an Invited PoC User redirects an invitation to a PoC Session to the NW PoC Box.

Figure 73 *"Invited PoC User redirects invitation to a PoC Session to the NW PoC Box"* shows the signaling flow for the scenario.

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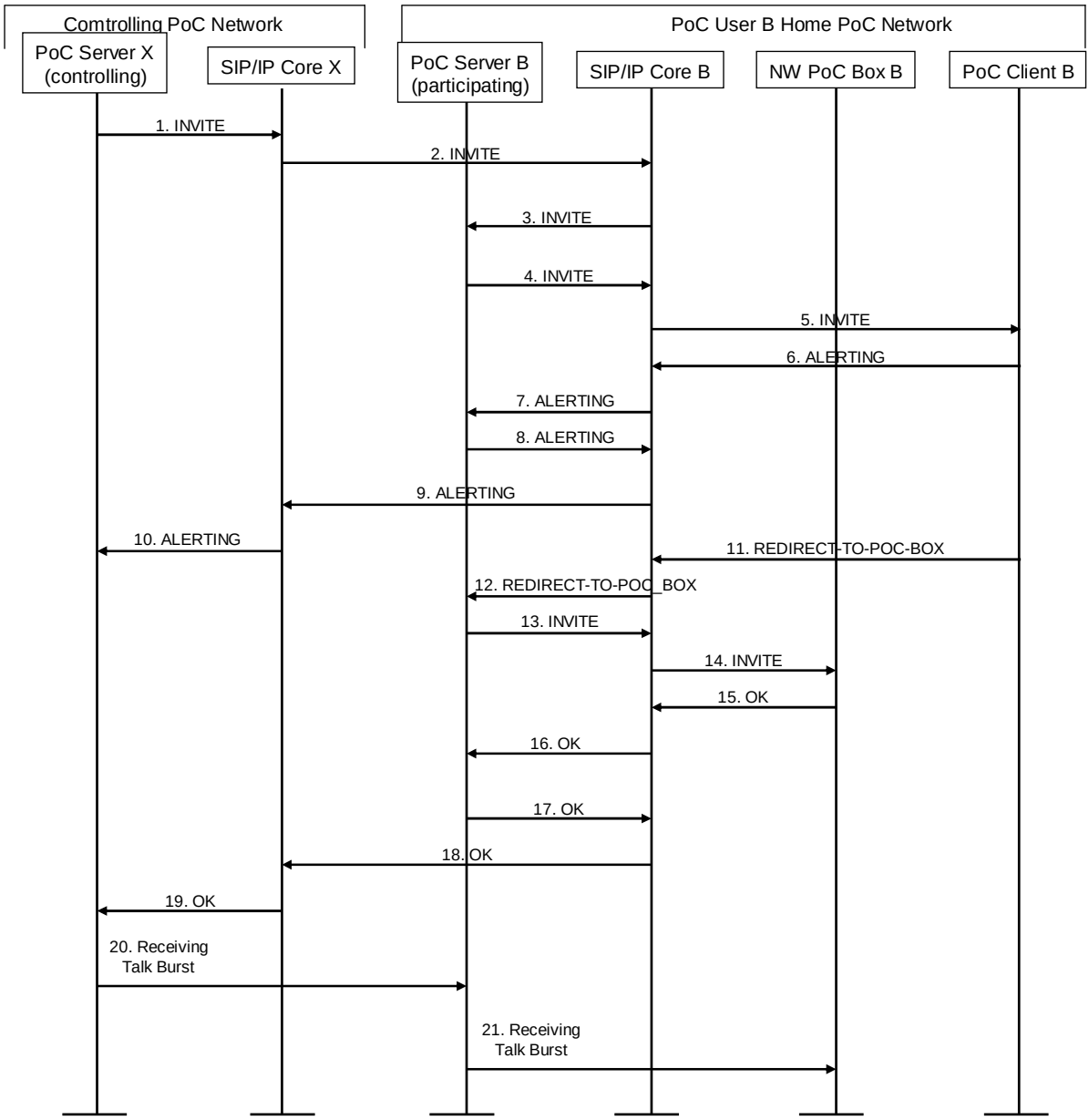

Figure 73: Invited PoC User redirects invitation to a PoC Session to the NW PoC Box

The steps of the flow are as follows:

1. The PoC Server X sends the INVITE request to the SIP/IP Core X.

   Information elements contained in the INVITE request are:

   a. The PoC Address of the PoC User B at PoC Client B.

   b. PoC Address of the PoC User A.

   c. Media Parameters of PoC Server X.

   d. PoC service indication.

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e. Willingness to use PoC Box indication, if included in the originating INVITE request.

f. Controlling PoC Function assigned indication.

g. Talk Burst Control Protocol proposal or Media Burst Control proposal or both.

h. Media-floor Control Entities proposal.

i. PoC Session Identity for the PoC Session.

j. Other elements (e.g. Media included in the request).

2. The SIP/IP Core X routes the INVITE request to the SIP/IP Core B based on the PoC Address of PoC User B.

   Information elements contained in the INVITE request are:

   a. The PoC Address of the PoC User B at PoC Client B.

   b. PoC Address of the PoC User A.

   c. Media Parameters of PoC Server X.

   d. PoC service indication.

   e. Willingness to use PoC Box indication, if included in the originating INVITE request.

   f. Controlling PoC Function assigned indication.

   g. Talk Burst Control Protocol proposal or Media Burst Control proposal or both.

   h. Media-floor Control Entities proposal.

   i. PoC Session Identity for the PoC Session.

   j. Other elements (e.g. Media included in the request).

3. The SIP/IP Core B routes the INVITE request to the PoC Server B based on the PoC Address of PoC User B and the PoC service indication.

   Information elements contained in the INVITE request are:

   a. The PoC Address of the PoC User B at PoC Client B.

   b. PoC Address of the PoC User A.

   c. Media Parameters of PoC Server X.

   d. PoC service indication.

   e. Willingness to use PoC Box indication, if included in the originating INVITE request.

   f. Controlling PoC Function assigned indication.

   g. Talk Burst Control Protocol proposal or Media Burst Control proposal or both.

   h. Media-floor Control Entities proposal.

   i. PoC Session Identity for the PoC Session.

   j. Other elements (e.g. Media included in the request).

4. The PoC Server B sends the INVITE request to the SIP/IP Core B.

   Information elements contained in the INVITE request are:

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a. The PoC Address of the PoC User B at PoC Client B.

b. PoC Address of the PoC User A.

c. Media Parameters of PoC Server B.

d. PoC service indication.

e. Willingness to use PoC Box indication, if included in the originating INVITE request.

f. Controlling PoC Function assigned indication.

g. Talk Burst Control Protocol proposal or Media Burst Control proposal or both.

h. PoC Session Identity for the PoC Session.

i. A indication indicating the requested Manual Answer Mode as determined by the PoC Server B.

j. Other elements (e.g. Media included in the request).

5. The SIP/IP Core B sends the INVITE request to the PoC Client B based on the registered address of PoC Client B.

   Information elements contained in the INVITE request are:

   a. The PoC Address of the PoC User B at PoC Client B.

   b. PoC Address of the PoC User A.

   c. Media Parameters of PoC Server B.

   d. PoC service indication.

   e. Willingness to use PoC Box indication, if included in the originating INVITE request.

   f. Controlling PoC Function assigned indication.

   g. Talk Burst Control Protocol proposal or Media Burst Control proposal or both.

   h. Media-floor Control Entities proposal.

   i. PoC Session Identity for the PoC Session.

   j. A indication indicating the requested Manual Answer Mode as determined by the PoC Server B.

   k. The address of PoC Client B.

   l. Other elements (e.g. Media included in the request).

6. The PoC Client B sends an ALERTING response to the SIP/IP Core B.

7. The SIP/IP Core B sends an ALERTING response to the PoC Server B.

8. The PoC Server B sends the ALERTING response to the SIP/IP Core B.

9. The SIP/IP Core B sends the ALERTING response to the SIP/IP Core X.

10. The SIP/IP Core X sends the ALERTING response to the PoC Server X.

11. The PoC User B at PoC Client B decides to redirect the invitation to a PoC Box e.g. because the PoC User do not have time at the moment to be involved in a PoC Session and the PoC Client B sends a REDIRECT-TO-POC-BOX response to the SIP/IP Core B.

    Information elements contained in the REDIRECT-TO-POC-BOX response are:

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a. The address of the NW PoC Box B.

b. The PoC Address of the PoC User B.

12. The SIP/IP Core B sends the REDIRECT-TO-POC-BOX response to the PoC Server B.

    Information elements contained in the REDIRECT-TO-POC-BOX response are:

    a. The address of the NW PoC Box B

    b. The PoC Address of the PoC User B.

13. The PoC Server B sends an INVITE request to the SIP/IP Core B.

    Information elements contained in the INVITE request are:

    a. PoC Address of the PoC User A.

    b. Media Parameters of PoC Server B.

    c. PoC service indication.

    d. Willingness to use PoC Box indication, if included in the originating INVITE request.

    e. Controlling PoC Function assigned indication.

    f. Talk Burst Control Protocol proposal or Media Burst Control proposal or both.

    g. Media-floor Control Entities proposal.

    h. The address of the NW PoC Box B.

    i. The original PoC Address of the PoC User B.

    j. Other elements (e.g. Media included in the request).

14. The SIP/IP Core B routes the INVITE request to the NW PoC Box based on the address of the NW PoC Box.

    Information elements contained in the INVITE request are:

    a. PoC Address of the PoC User A.

    b. Media Parameters of PoC Server B.

    c. PoC service indication.

    d. Willingness to use PoC Box indication, if included in the originating INVITE request.

    e. Controlling PoC Function assigned indication.

    f. Talk Burst Control Protocol proposal or Media Burst Control proposal or both.

    g. Media-floor Control Entities proposal.

    h. The address of the NW PoC Box B.

    i. The original PoC Address of the PoC User B.

    j. Other elements (e.g. Media included in the request).

15. The NW PoC Box B authorizes the PoC User B as a user of the PoC Box feature based on the original PoC Address of the PoC User B and sends an OK response to the SIP/IP Core B.

    The information elements of the OK response are:

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a. The PoC Address of PoC User B.

b. The address of the NW PoC Box.

c. A PoC Box indication.

d. NW PoC Box type indication

e. Media Parameters of NW PoC Box B.

f. Selected Talk Burst Control Protocol or Media Burst Protocol or both.

g. Media-floor Control Entities response.

16. The SIP/IP Core B sends the OK response to the PoC Server B.

    The information elements of the OK response are:

    a. The PoC Address of PoC User B.

    b. The address of the NW PoC Box.

    c. A PoC Box indication.

    d. NW PoC Box type indication

    e. Media Parameters of NW PoC Box B.

    f. Selected Talk Burst Control Protocol or Media Burst Protocol or both.

    g. Media-floor Control Entities response.

17. The PoC Server B sends the OK response to the SIP/IP Core B.

    The information elements of the OK response are:

    a. The PoC Address of PoC User B.

    b. The address of the NW PoC Box.

    c. A PoC Box indication.

    d. NW PoC Box type indication

    e. Media Parameters of PoC Server B.

    f. Selected Talk Burst Control Protocol or Media Burst Protocol or both.

    g. Media-floor Control Entities response.

18. The SIP/IP Core B sends the OK response to the SIP/IP Core X.

    The information elements of the OK response are:

    a. The PoC Address of PoC User B.

    b. The address of the NW PoC Box.

    c. A PoC Box indication.

    d. NW PoC Box type indication

    e. Media Parameters of PoC Server B.

    f. Selected Talk Burst Control Protocol or Media Burst Protocol or both.

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g. Media-floor Control Entities response.

19. The SIP/IP Core X sends the OK response to the PoC Server X.

    The information elements of the OK response are:

    a. The PoC Address of PoC User B.

    b. The address of the NW PoC Box.

    c. A PoC Box indication.

    d. NW PoC Box type indication

    e. Media Parameters of PoC Server B.

    f. Selected Talk Burst Control Protocol or Media Burst Protocol or both.

    g. Media-floor Control Entities response.

20.-21. The PoC Server X (controlling) sends the Receiving Media Burst indication to the PoC Box of the PoC Client B through PoC Server B (participating).

    Information elements contained in Receiving Media Burst;

    a. PoC Address of the Participant at the PoC Client sending the Media Burst

    b. Nick Name of the Participant at the PoC Client sending the Media Burst

    c. Number of Participants receiving Media

5.17.4.2.4 Invited PoC User accepts the invitation to a PoC Session with the UE PoC Box

This subclause describes the how an Invited PoC User accepts an invitation to a PoC Session with the UE PoC Box.

Figure 74 *"Invited PoC User accepts the invitation to a PoC Session with the UE PoC Box."* shows the signaling flow for the scenario.

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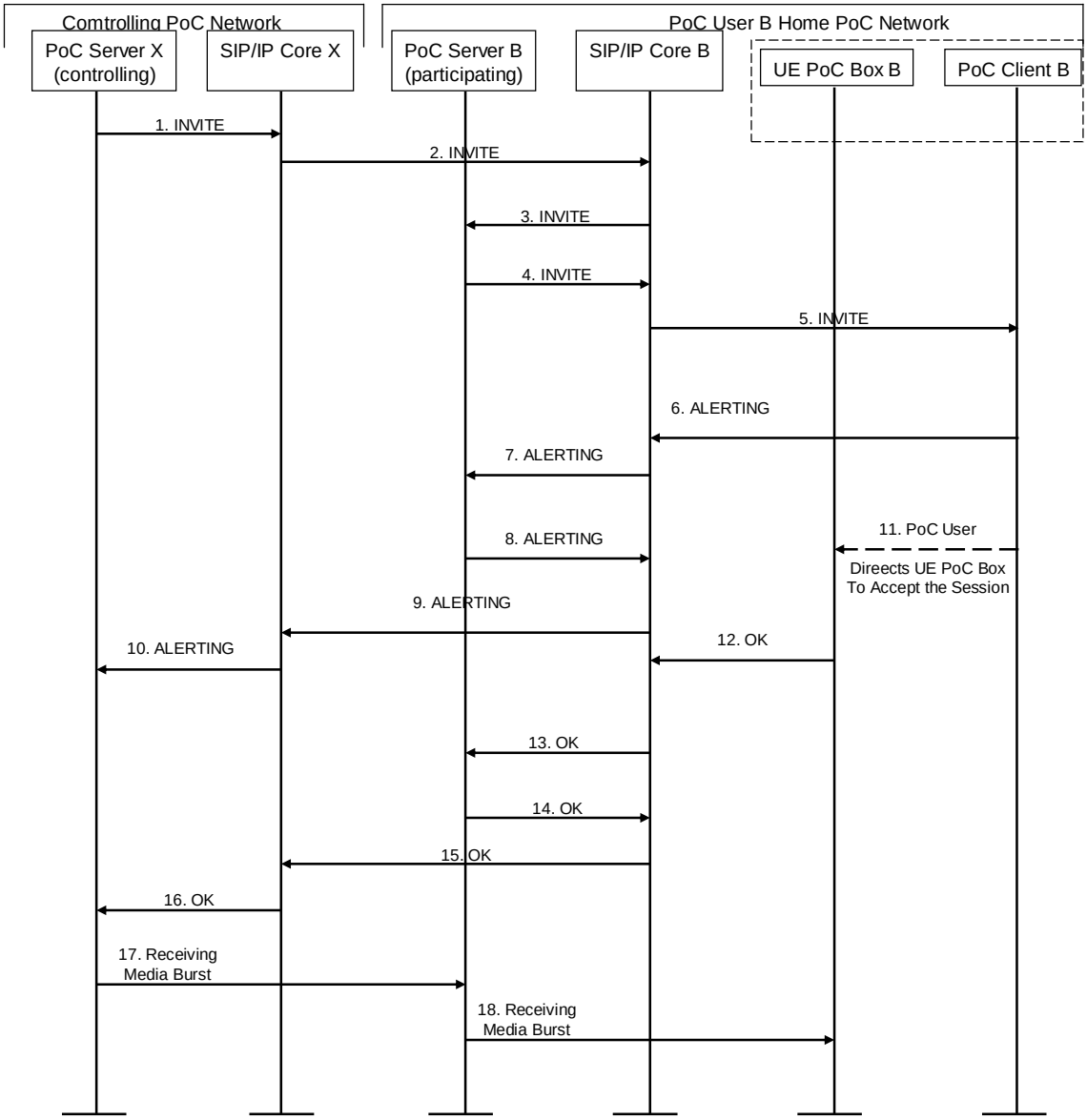

Figure 74: Invited PoC User accepts the invitation to a PoC Session with the UE PoC Box.

The steps of the flow are as follows:

1. The PoC Server X sends the INVITE request to the SIP/IP Core X.

   Information elements contained in the INVITE request are:

   a. The PoC Address of the PoC User B at PoC Client B.

   b. PoC Address of the PoC User A.

   c. Media Parameters of PoC Server X.

   d. PoC service indication.

   e. Willingness to use PoC Box indication, if included in the originating INVITE request.

   f. Controlling PoC Function assigned indication.

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g. Talk Burst Control Protocol proposal or Media Burst Control proposal or both.

h. Media-floor Control Entities proposal.

i. PoC Session Identity for the PoC Session.

j. Other elements (e.g. Media included in the request).

2. The SIP/IP Core X routes the INVITE request to the SIP/IP Core B based on the PoC Address of PoC User B.

   Information elements contained in the INVITE request are:

   a. The PoC Address of the PoC User B at PoC Client B.

   b. PoC Address of the PoC User A.

   c. Media Parameters of PoC Server X.

   d. PoC service indication.

   e. Willingness to use PoC Box indication, if included in the originating INVITE request.

   f. Controlling PoC Function assigned indication.

   g. Talk Burst Control Protocol proposal or Media Burst Control proposal or both.

   h. Media-floor Control Entities proposal.

   i. PoC Session Identity for the PoC Session.

   j. Other elements (e.g. Media included in the request).

3. The SIP/IP Core B routes the INVITE request to the PoC Server B based on the PoC Address of PoC User B and the PoC service indication.

   Information elements contained in the INVITE request are:

   a. The PoC Address of the PoC User B at PoC Client B.

   b. PoC Address of the PoC User A.

   c. Media Parameters of PoC Server X.

   d. PoC service indication.

   e. Willingness to use PoC Box indication, if included in the originating INVITE request.

   f. Controlling PoC Function assigned indication.

   g. Talk Burst Control Protocol proposal or Media Burst Control proposal or both.

   h. Media-floor Control Entities proposal.

   i. PoC Session Identity for the PoC Session.

   j. Other elements (e.g. Media included in the request).

4. The PoC Server B sends the INVITE request to the SIP/IP Core B.

   Information elements contained in the INVITE request are:

   a. The PoC Address of the PoC User B at PoC Client B.

   b. PoC Address of the PoC User A at the PoC Client A.

   c. Media Parameters of PoC Server B.

   d. PoC service indication.

   e. Willingness to use PoC Box indication, if included in the originating INVITE request.

   f. Controlling PoC Function assigned indication.

   g. Talk Burst Control Protocol proposal or Media Burst Control proposal or both.

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h. PoC Session Identity for the PoC Session.

i. A indication indicating the requested Manual Answer Mode as determined by the PoC Server B.

j. Other elements (e.g. Media included in the request).

5. The SIP/IP Core B sends the INVITE request to the PoC Client B based on the registered address of PoC Client B.

   Information elements contained in the INVITE request are:

   a. The PoC Address of the PoC User B at PoC Client B.

   b. PoC Address of the PoC User A at the PoC Client A.

   c. Media Parameters of PoC Server B.

   d. PoC service indication.

   e. Willingness to use PoC Box indication, if included in the originating INVITE request.

   f. Controlling PoC Function assigned indication.

   g. Talk Burst Control Protocol proposal or Media Burst Control proposal or both.

   h. Media-floor Control Entities proposal.

   i. PoC Session Identity for the PoC Session.

   j. A indication indicating the requested Manual Answer Mode as determined by the PoC Server B.

   k. The address of PoC Client B.

   l. Other elements (e.g. Media included in the request).

6. The UE PoC Box B sends an ALERTING response to the SIP/IP Core B.

7. The SIP/IP Core B sends an ALERTING response to the PoC Server B.

8. The PoC Server B sends the ALERTING response to the SIP/IP Core B.

9. The SIP/IP Core B sends the ALERTING response to the SIP/IP Core X.

10. The SIP/IP Core X sends the ALERTING response to the PoC Server X.

11. The PoC User B directs the UE PoC Box to accept the PoC Session using an internal mechanism.

12. The UE PoC Box B sends an OK response to the SIP/IP Core B.

    The information elements of the OK response are:

    a. The PoC Address of PoC User B.

    b. The address of the UE PoC Box.

    c. A PoC Box indication

    d. A UE PoC Box type indication.

    e. Media Parameters of UE PoC Box B.

    f. Selected Talk Burst Control Protocol or Media Burst Protocol or both.

    g. Media-floor Control Entities response.

13. The SIP/IP Core B sends the OK response to the PoC Server B.

    The information elements of the OK response are:

    a. The PoC Address of PoC User B.

    b. The address of the UE PoC Box.

    c. A PoC Box indication

    d. A UE PoC Box type indication.

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e. Media Parameters of UE PoC Box B.

f. Selected Talk Burst Control Protocol or Media Burst Protocol or both.

g. Media-floor Control Entities response.

14. The PoC Server B sends the OK response to the SIP/IP Core B.

The information elements of the OK response are:

a. The PoC Address of PoC User B.

b. The address of the UE PoC Box.

c. A PoC Box indication

d. A UE PoC Box type indication.

e. Media Parameters of PoC Server B.

f. Selected Talk Burst Control Protocol or Media Burst Protocol or both.

g. Media-floor Control Entities response.

15. The SIP/IP Core B sends the OK response to the SIP/IP Core X.

The information elements of the OK response are:

a. The PoC Address of PoC User B.

b. The address of the UE PoC Box.

c. A PoC Box indication

d. A UE PoC Box type indication.

e. Media Parameters of PoC Server B.

f. Selected Talk Burst Control Protocol or Media Burst Protocol or both.

g. Media-floor Control Entities response.

16. The SIP/IP Core X sends the OK response to the PoC Server X.

The information elements of the OK response are:

a. The PoC Address of PoC User B.

b. The address of the UE PoC Box.

c. A PoC Box indication

d. A UE PoC Box type indication.

e. Media Parameters of PoC Server B.

f. Selected Talk Burst Control Protocol or Media Burst Protocol or both.

g. Media-floor Control Entities response.

17.-18. The PoC Server X (controlling) sends the Receiving Media Burst indication to the PoC Box of the PoC Client B through PoC Server B (participating).

Information elements contained in Receiving Media Burst;

a. PoC Address of the Participant at the PoC Client sending the Media Burst

b. Nick Name of the Participant at the PoC Client sending the Media Burst

c. Number of Participants receiving Media

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5.18 Full Duplex Call Follow On

This subclause describes Full Duplex Call Follow On procedures.

The subclause 5.18.1 "*Originating side*" shows the originating part of the flow when PoC Client initiates the sending of Full Duplex Call Follow On distribution indication. The terminating flow is described in the subclause 5.18.2 "*Terminating side*".

5.18.1 Originating side

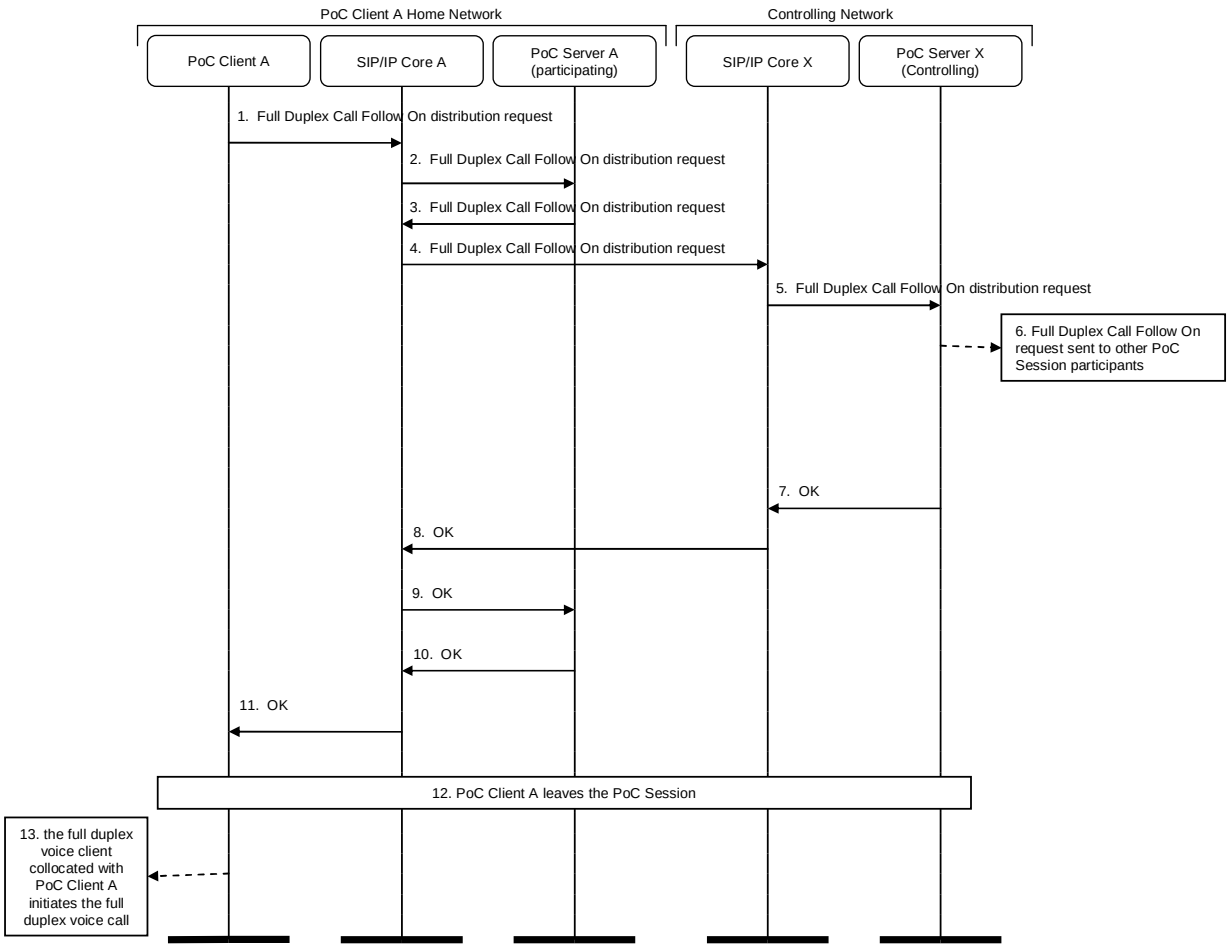

Figure 75: Full Duplex Call Follow On originating side

1.-5. The PoC Client A sends a Full Duplex Call Follow On distribution indication through the signalling path to the PoC Server X (controlling). Information elements contained in the Full Duplex Call Follow On distribution indication:

a. The PoC Address of the PoC User at the PoC Client A;

b. One or more addresses to be used by the other PoC Session Participants to set up the full duplex voice call;

NOTE: PoC Client A can be any of the PoC Clients participating in the PoC Session.

6. Upon receiving the indication, the PoC Server X (controlling) sends the Full Duplex Call Follow On indication to each PoC Participant apart from the PoC Client A.

7.-11. PoC Server X (controlling) sends the OK response back to the PoC Client A along the same signalling path.

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12. The PoC Client A leaves the PoC Session (according to 5.5 "*Leaving PoC Session*").

13. The full duplex voice client collocated with PoC Client A initiates the full duplex voice call.

5.18.2 Terminating side

Figure 76 *"Full Duplex Call Follow On terminating side"* shows the high-level signalling procedure for signalling the Full Duplex Call Follow On.

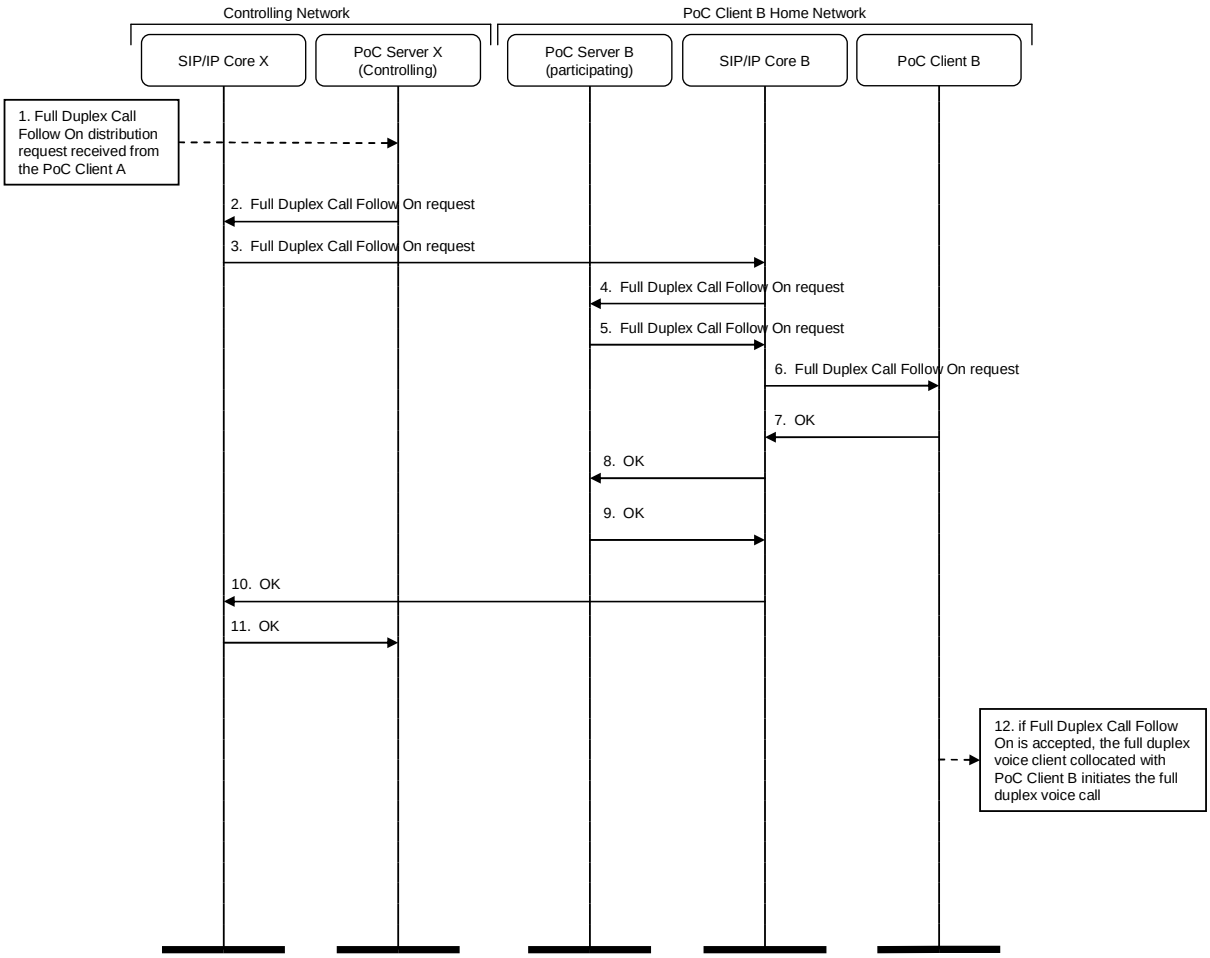

Figure 76: Full Duplex Call Follow On terminating side

1. The PoC Server X (controlling) received the Full Duplex Call Follow On distribution indication from the originating PoC Client

2.-6. The PoC Server X (controlling) sends a Full Duplex Call Follow On indication through the signalling path to the PoC Client B. Information elements contained in the Full Duplex Call Follow On indication:

   a. The PoC Address of the PoC User at the PoC Client A;

   b. One or more addresses to be used by the other PoC Session Participants to set up the full duplex voice call;

7.-11. The PoC Client B sends the OK response back to the PoC Server X (controlling) along the same signalling path.

12. The PoC Client B presents the information to the PoC User B for acceptance. If the Full Duplex Call Follow On indication is accepted, the full duplex voice client collocated with PoC Client B initiates the full duplex voice call

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5.19 Binding between Media Types and Media-floor Control Entities

This subclause explains on how the binding between Media Types and Media-floor Control Entities are assigned. The flow in Figure 77 shows an exemplary case of the originating network, where PoC Client establishes a PoC Session with the PoC Server. The terminating network case is not presented as it is assumed to follow the same principles with the binding between the Media Types and the Media-floor Control Entities.

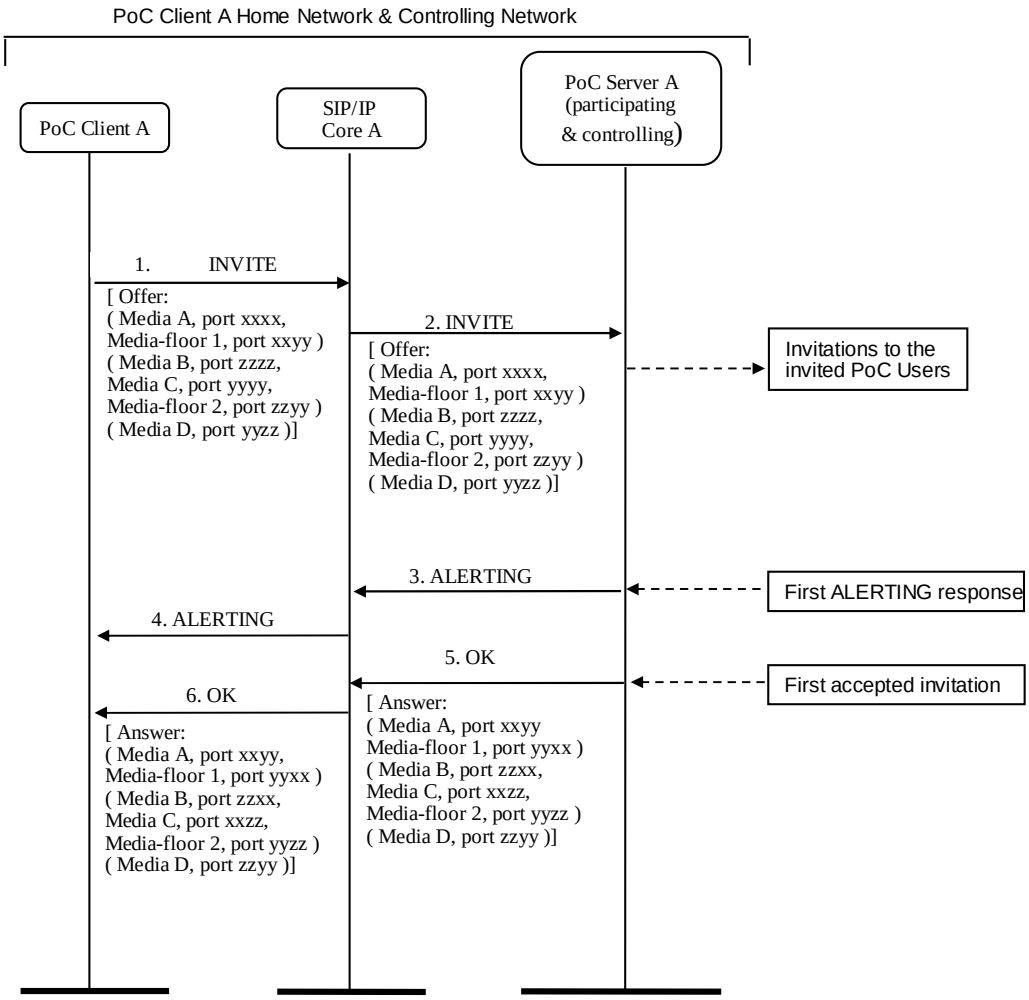

Figure 77: PoC Client negotiates Media Types and Media-floor Control Entities with PoC Server

1. PoC Client A sends an INVITE request towards the SIP/IP Core A of its Home Network. The INVITE request contains an offer characterizing the Media Types that is being offered for the PoC Session. The offer includes definitions of Media Types A,B,C and D and the Media-floor Control Entities 1 and 2. In this example, Media Type A is bind to Media-floor Control Entity 1, where Media-floor Control Entity 1 uses port number yyxx. Media Type B and Media Type C are bind to the Media-floor Control Entity 2, which uses port number zzyy. Media Type D has no Media-floor Control Entity bind i.e. it does not use Media-floor Control.

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2. SIP/IP Core A forwards the INVITE request to PoC Server A. PoC Server A performing the Participating PoC Function receiving the INVITE request, checks and authorizes the PoC Session invitation and takes the role of the Controlling PoC Function. PoC Server A then generates and sends PoC Session invitations to Invited PoC Clients.

3. When PoC Server A receives first ALERTING response from the terminating PoC Network, the PoC Server A sends an ALERTING response towards the SIP/IP Core A.

4. SIP/IP Core A sends the ALERTING response to PoC Client A.

5. When PoC Server A receives the first ACCEPTED invitation from the terminating network, it generates and sends OK response to SIP/IP Core A towards the PoC Client A. The OK response contains an answer to the offer sent by the PoC Client A in its initial INVITE request. The answer characterizes the Media Types that has been accepted for this PoC Session. In this example, the answer contain Media Types A,B,C and D and Media-floor Control Entities 1 and 2. Media Type A uses port number xxyy and it has been bind to Media-floor 1 using the port number yyxx. Media Type B and Media Type C are bind to the Media-floor Control Entity 2, which uses port number yyzz. Media Type D has no Media-floor Control Entity bind i.e. it does not use Media-floor Control.

6. SIP/IP Core A sends the OK response to the PoC Client A. The OK response contains the answer, that characterizes the Media that the PoC Server A has accepted for this PoC Session.

In the flows of the Figure 77, the binding between the Media Types and Media-floor Control Entities are explained. When Media Types are bind to Media-floor Control Entity, the port number of Media-floor Control Entity is used as an identifier of the Media Types that any sent or received Media-floor Control message applies to. In the example of above flow, in step 5 there is indicated that PoC Server has assigned the port number yyzz for Media-floor Control Entity 2. Any Media-floor Control message sent to or received from that port number applies to Media Types B and C.

5.20 QoE mismatch

This subclause describes the procedures followed when a PoC Client fails to reserve the resources he requests to the underlying network according to his Local QoE Profile for the PoC Session, as provisioned by the PoC Service Provider.

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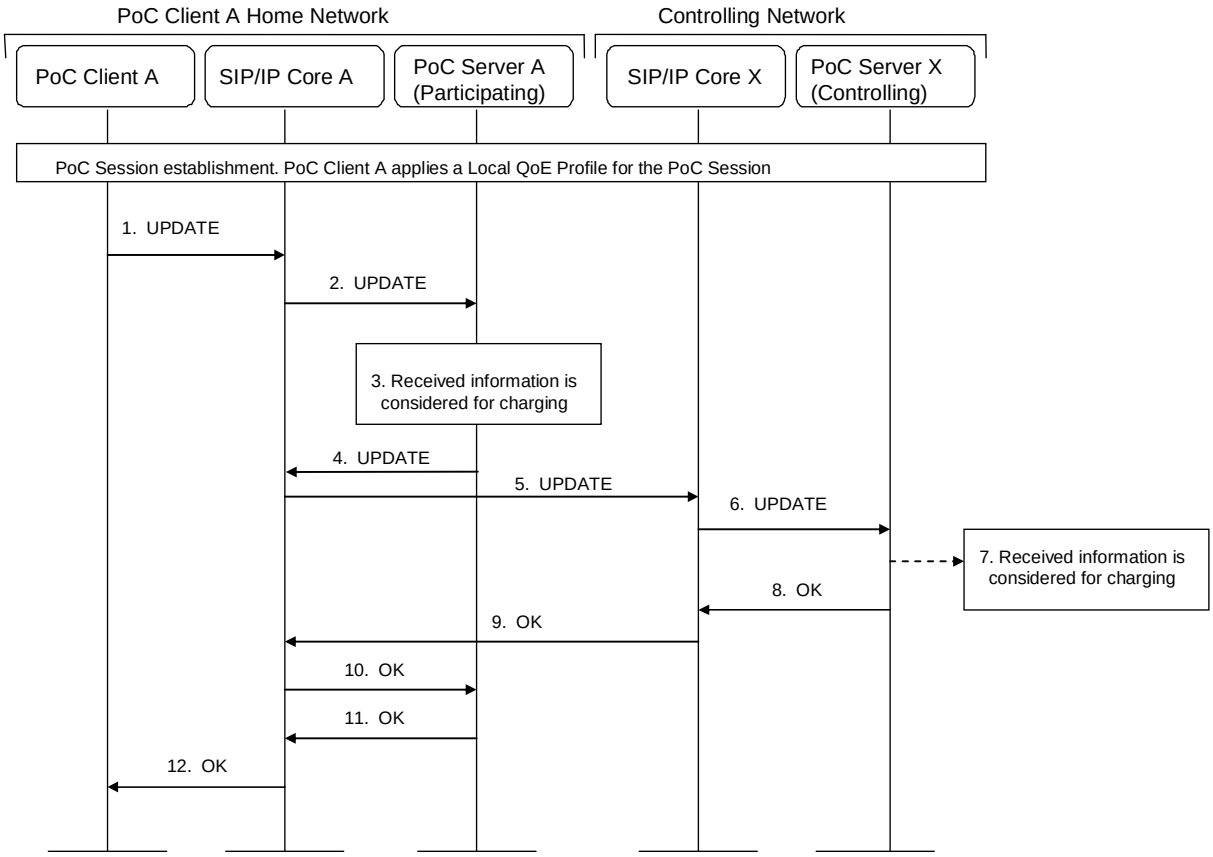

Figure 78: QoE mismatch information procedure

1.-2. The PoC Client A sends and UPDATE message to inform his Home PoC Network about the fact that he could not get resources in the underlying according to the Local QoE Profile for the PoC Session.

Information elements contained in the UPDATE message are:

a. PoC Session Identity

b. Actual Local QoE Profile

c. PoC Address of the PoC User at the PoC Client A

3. Upon receiving the QoE mismatch indication, the PoC Server A (participating) considers the information for charging.

4.-6. PoC Server A (participating) forwards the UPDATE message to the PoC Server X (controlling).

Information elements contained in the UPDATE message are:

a. PoC Session Identity

b. Actual Local QoE Profile

c. PoC Address of the PoC User at the PoC Client A

7. PoC Server X (controlling) considers the information for charging purposes.

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8-12. PoC Server X (controlling) sends the OK response back to the PoC Client A along the same signalling path.

5.21 Dispatch PoC Sessions

Dispatch PoC Sessions are a special case of Pre-arranged PoC Group Sessions. In this type of PoC Sessions, one of the participating PoC Clients plays the special role of the PoC Dispatcher, whereas the rest of the Participants play the role of PoC Fleet Members. The PoC Dispatcher has special capabilities for the establishment and control of the PoC Session and, therefore, he can perform some actions that are not considered for regular Pre-arranged PoC Group Sessions.

The following subclauses show the differences between a regular Pre-arranged PoC Group Session and a Dispatch PoC Session establishment. Additionally, the procedure to transfer the role of the PoC Dispatcher from one PoC Client to another is described as well.

5.21.1 Dispatch PoC Session invitation from the PoC Client

This subclause describes different cases of Dispatch PoC Session establishment from a PoC Dispatcher.

Subclause 5.21.1.1 *"Inviting the whole Dispatch PoC Group"* describes a simple case of Dispatch PoC Session establishment to the whole Dispatch PoC Group.

Subclause 5.21.1.2 *"Inviting a Sub-set of the Dispatch PoC Group"* describes two different cases of Dispatch PoC Session establishment to a sub-group of the Dispatch PoC Group.

5.21.1.1 Inviting the whole Dispatch PoC Group

The establishment of a Dispatch PoC Session to the whole Dispatch PoC Group is very similar to the establishment of a Pre-arranged PoC Group Session. For that reason, only the simple case of confirmed indication using On-demand Session is shown here. For other cases, refer to the Pre-arranged PoC Group Session establishment with the modification outlined here.

In the Figure 79 *"Dispatch PoC Session setup, originating part"*, the right-to-speak indication in the Talk Burst Control and/or Media Burst Control follows the confirmation from the PoC Server X (controlling). Additionally, this case considers the use of manual answer in the terminating side. However, the PoC Dispatcher can always request Manual Answer Override when establishing the Dispatch PoC Session, if desired.

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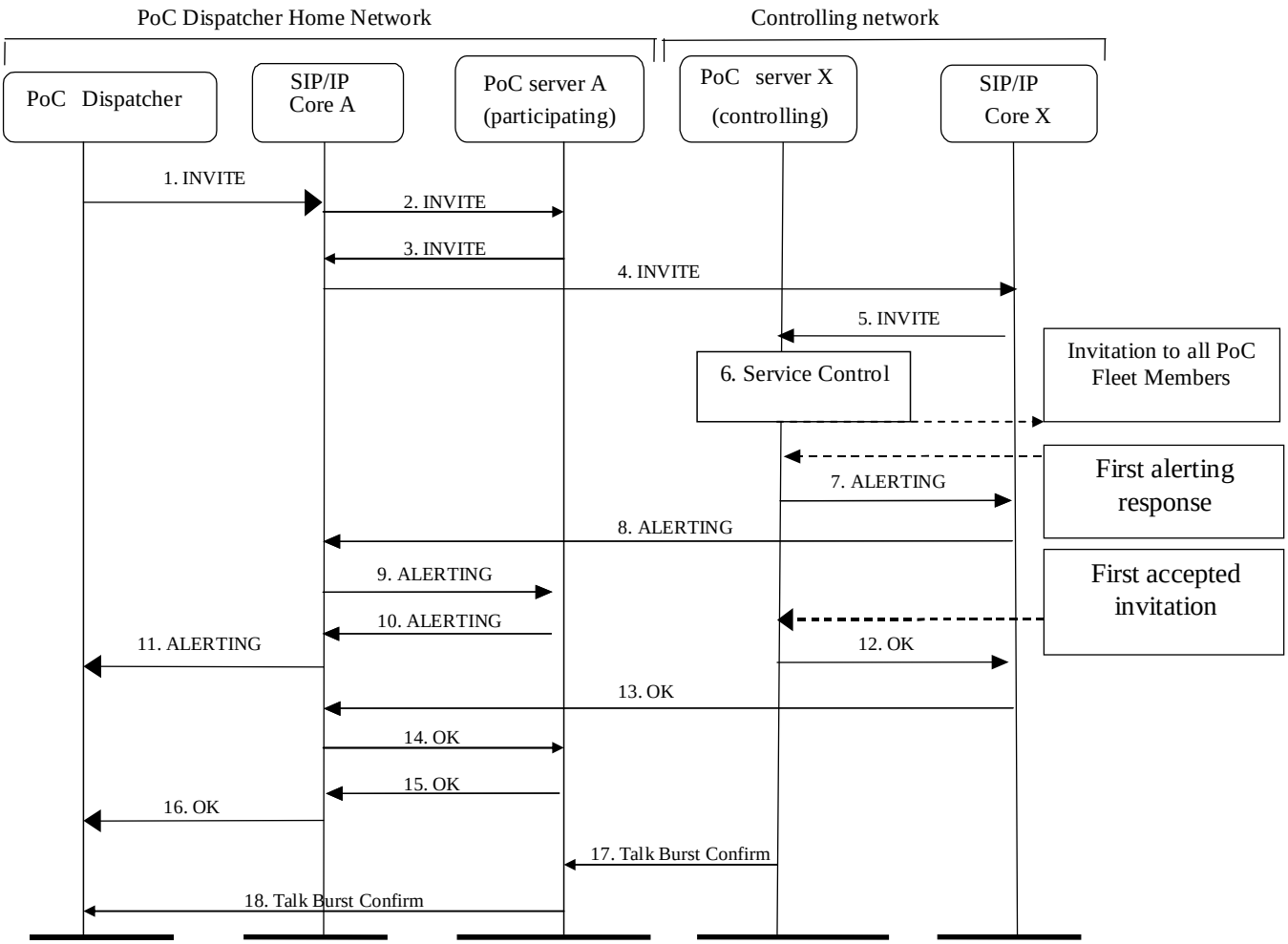

Figure 79: Dispatch PoC Session setup, originating part

1. The PoC Dispatcher sends an INVITE request to the address of the Dispatch PoC Group.

   Information elements contained in the INVITE request:

   a. Dispatch PoC Group Identity.

   b. PoC Dispatcher role indication

   c. Dispatch PoC Session indication

   d. PoC Address of the PoC Dispatcher

   e. PoC service indication

   f. Other elements (Media Parameters, MBCP and/or TBCP proposal, request of pre-emptive Media Burst and/or Talk Burst priority, etc)

2. The SIP/IP Core A routes the INVITE request to the PoC Server A (participating) trigged on the PoC Service indication and the PoC Address.

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Information elements contained in the INVITE request:

a. Dispatch PoC Group Identity

b. PoC Dispatcher role indication

c. Dispatch PoC Session indication

d. PoC Address of the PoC Dispatcher

e. PoC service indication

f. Other elements (Media Parameters, TBCP and/or MBCP proposal, request of pre-emptive Media Burst and/or Talk Burst priority, etc)

3. The PoC Server A (participating) identifies that the Dispatch PoC Group is not hosted in this PoC Server therefore it sends the request to the SIP/IP Core A.

   Information elements contained in the INVITE request:

   a. Dispatch PoC Group Identity

   b. PoC Dispatcher role indication

   c. Dispatch PoC Session indication

   d. PoC Address of the PoC Dispatcher

   e. PoC service indication

   f. Other elements (Media Parameters, TBCP and/or MBCP proposal, request of pre-emptive Media Burst and/or Talk Burst priority, etc)

4. The SIP/IP Core A routes the request according to the routing principles to SIP/IP Core X.

   Information elements contained in the INVITE request:

   a. Dispatch PoC Group Identity

   b. PoC Dispatcher role indication

   c. Dispatch PoC Session indication

   d. PoC Address of the PoC Dispatcher

   e. PoC service indication

   f. Other elements (Media Parameters, TBCP and/or MBCP proposal, request of pre-emptive Media Burst and/or Talk Burst priority , etc)

5. The SIP/IP Core X routes the request to the PoC Server X (controlling) based on Dispatch PoC Group Identity. If the Dispatch PoC Group Identity is used for other services (e.g. messaging) that are hosted on other Application Servers then the SIP/IP Core needs to use PoC service indication to route to the PoC Server.

   Information elements contained in the INVITE request:

   a. Dispatch PoC Group Identity

   b. PoC Dispatcher role indication

   c. Dispatch PoC Session indication

   d. PoC Address of the PoC Dispatcher

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e. PoC service indication

f. Other elements (Media Parameters, TBCP and/or MBCP proposal, request of pre-emptive Media Burst and/or Talk Burst priority, etc)

6. The PoC Server X performs the necessary terminating service control (e.g. checks the PoC Dispatcher is PoC Dispatcher capable, verifies there is no other active PoC Dispatcher for this Dispatch PoC Group, etc) and if the outcome is successful, the PoC Server X invites all the PoC Fleet Members to the Dispatch PoC Session (the other PoC Dispatcher capable PoC Clients can also be invited) as described in subclause 5.21.2 "*Dispatch PoC Session invitation to the PoC Client*". In case there is already another ongoing Dispatch PoC Session with the whole Dispatch PoC Group, the Dispatch PoC Session establishment is rejected.

7-11. When the first ALERTING response is received the PoC Server X (controlling) sends ringing response towards the PoC Dispatcher.

12-14. When the first PoC Fleet Member accepts the Dispatch PoC Session invitation, the PoC Server X sends an OK response to the PoC Server A (participating) along the same signalling path.

Information elements contained in the OK response:

a. PoC Session Identity of the Dispatch PoC Session

b. Dispatch PoC Session indication

c. Other elements (Media Parameters, TBCP and/or MBCP proposal, confirmation of pre-emptive Media Burst and/or Talk Burst priority, etc).

15-16. The PoC Server A sends an OK response to the PoC Dispatcher along the same signalling path.

Information elements contained in the OK response:

a. PoC Session Identity of the Dispatch PoC Session

b. Dispatch PoC Session indication.

c. Other elements (Media Parameters, TBCP and/or MBCP proposal, confirmation of pre-emptive Media Burst and/or Talk Burst priority, etc).

17. The PoC Server X (controlling) sends the Talk Burst confirm response to the PoC Server A (participating).

18. The PoC Server A (participating) transfers the Talk Burst confirm response to the PoC Dispatcher.

5.21.1.2 Inviting a Sub-set of the Dispatch PoC Group

The PoC Dispatcher can also establish a Dispatch PoC Session to a sub-group or sub-set of the Dispatch PoC Group. Moreover, the PoC Dispatcher is able to have several parallel Dispatch PoC Session of this type with the same Dispatch PoC Group. These are the main differences with the establishment of a Pre-arranged PoC Group Session.

NOTE: Dispatch PoC Group members can simultaneously participate in several parallel Dispatch PoC Sessions established with sub-sets of the Dispatch PoC Group.

The following subclauses describe the establishment procedure for Unconfirmed Indication using both, On-demand and Pre-established Sessions. For other cases, refer to the Pre-arranged PoC Group Session establishment with the modification outlined here.

5.21.1.2.1 Unconfirmed Indication using On-demand Session

In this case, due to the manual answer override request, the originating PoC Dispatcher does not have to confirm that the Dispatch PoC Group members have been connected before he starts speaking: he can immediately speak after he receives the Unconfirmed Indication from the PoC Server X (controlling). The Figure 80 *"Unconfirmed Indication using On-demand Session"* shows the high level flow of this scenario.

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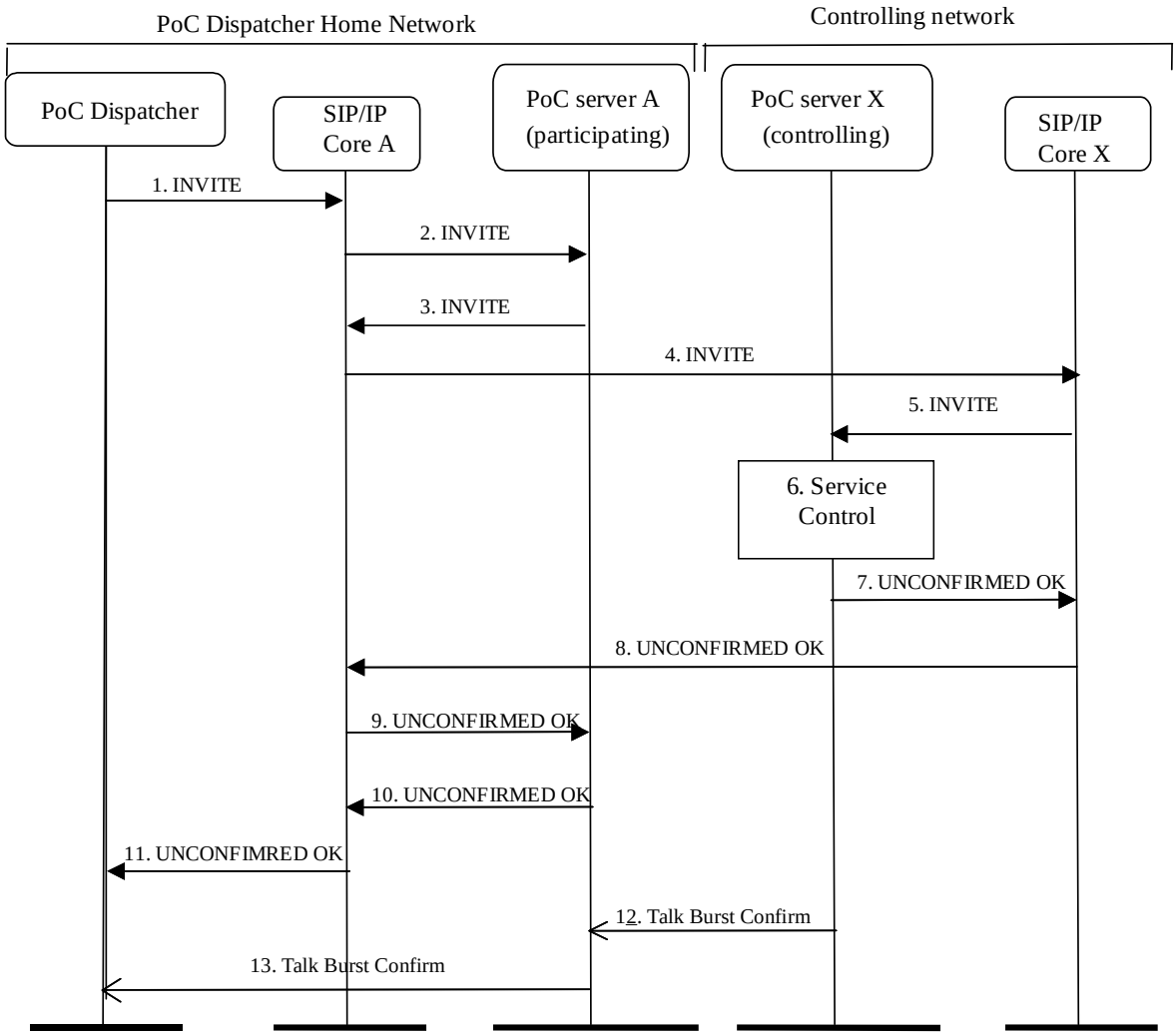

Figure 80: Unconfirmed Indication using On-demand Session

1. The PoC Dispatcher sends an INVITE request to the address of the Dispatch PoC Group. Information elements contained in the INVITE request:

   a. Dispatch PoC Group Identity

   b. PoC Dispatcher role indication

   c. Dispatch PoC Session indication

   d. List of PoC addresses of invited PoC Fleet Members of the Dispatch PoC Group.

   e. PoC Address of the PoC Dispatcher

   f. PoC service indication

   g. Manual answer override request

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h. Other elements (Media Parameters, TBCP and/or MBCP proposal, request of pre-emptive Media Burst and/or Talk Burst priority, etc).

2. The SIP/IP Core A routes the INVITE request to the PoC Server A (participating) trigged on the PoC service indication and PoC Address. Information elements contained in the INVITE request:

   a. Dispatch PoC Group Identity

   b. PoC Dispatcher role indication

   c. Dispatch PoC Session indication

   d. List of PoC addresses of invited PoC Fleet Members of the Dispatch PoC Group.

   e. PoC Address of the PoC Dispatcher

   f. PoC service indication

   g. Manual answer override request

   h. Other elements (Media Parameters, TBCP and/or MBCP proposal, request of pre-emptive Media Burst and/or Talk Burst priority, etc).

3. The PoC Server A (participating) identifies that the Dispatch PoC Group is not hosted in this PoC Server, therefore it sends the request to the SIP/IP Core A. Information elements contained in the INVITE request:

   a. Dispatch PoC Group Identity

   b. PoC Dispatcher role indication

   c. Dispatch PoC Session indication

   d. List of PoC addresses of invited PoC Fleet Members of the Dispatch PoC Group.

   e. PoC Address of the PoC Dispatcher

   f. PoC service indication

   g. Manual answer override request

   h. Other elements (Media Parameters, TBCP and/or MBCP proposal, request of pre-emptive Media Burst and/or Talk Burst priority, etc).

4. The SIP/IP Core A routes the request according to the routing principles to SIP/IP Core X. Information elements contained in the INVITE request:

   a. Dispatch PoC Group Identity

   b. PoC Dispatcher role indication

   c. Dispatch PoC Session indication

   d. List of PoC addresses of invited PoC Fleet Members of the Dispatch PoC Group.

   e. PoC Address of the PoC Dispatcher

   f. PoC service indication

   g. Manual answer override request

   h. Other elements (Media Parameters, TBCP and/or MBCP proposal, request of pre-emptive Media Burst and/or Talk Burst priority, etc).

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5. The SIP/IP Core X routes the request to the PoC Server X (controlling) based on Dispatch PoC Group Identity. If the Dispatch PoC Group Identity is used for other services (e.g. messaging) that are hosted on other Application Servers then the SIP/IP Core needs to use PoC service indication to route to the PoC Server.

   Information elements contained in the INVITE request:

   a. Dispatch PoC Group Identity

   b. PoC Dispatcher role indication

   c. Dispatch PoC Session indication

   d. List of PoC addresses of invited PoC Fleet Members of the Dispatch PoC Group.

   e. PoC Address of the PoC Dispatcher

   f. PoC service indication

   g. Manual answer override request

   h. Other elements (Media Parameters, TBCP and/or MBCP proposal, request of pre-emptive Media Burst and/or Talk Burst priority, etc).

6. The PoC Server X performs the necessary terminating service control (e.g. checks the PoC Dispatcher is PoC Dispatcher capable, verifies that members included in the list really belong to the Dispatch PoC Group, verifies there is no other active PoC Dispatcher for this Dispatch PoC Group, etc) and if the outcome is successful, the PoC Server X invites the correct members listed in the invitation to the Dispatch PoC Session, as described in 5.21.2 "*Dispatch PoC Session invitation to the PoC Client*". In the case there is another active PoC Dispatcher for the same Dispatch PoC Group or the PoC Dispatcher is not identified as PoC Dispatcher capable, the Dispatch PoC Session establishment is rejected.

7-9. When the PoC Server X receives the first auto-answer indication, it sends the unconfirmed OK response to the PoC Server A through the signalling path.

   Information elements contained in the unconfirmed OK response:

   a. PoC Session Identity of the Dispatch PoC Session

   b. Dispatch PoC Session indication

   c. Other elements (Media Parameters, TBCP and/or MBCP proposal, confirmation of pre-emptive Media Burst and/or Talk Burst priority, etc).

10-11. The PoC Server A sends an unconfirmed OK response to the PoC Dispatcher along the same signalling path.

   Information elements contained in the unconfirmed OK response:

   a. PoC Session Identity of the Dispatch PoC Session

   b. Dispatch PoC Session indication

   c. Other elements (Media Parameters, TBCP and/or MBCP proposal, confirmation of pre-emptive Media Burst and/or Talk Burst priority,).

12. The PoC Server X (controlling) sends the Talk Burst confirm response to the PoC Server A (participating).

13. The PoC Server A (participating) transfers the Talk Burst confirm response to the PoC Dispatcher.

5.21.1.2.2 Unconfirmed Indication using Pre-established Session

In this case, due to the manual answer override request, the originating PoC Dispatcher does not have to confirm that the PoC Group members have been connected before he starts speaking: he can immediately speak after he receives the Unconfirmed

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Indication from the PoC Server X (Controlling). The Figure 81 *"Unconfirmed Indication using Pre-established Session"* shows the high level flow of this scenario.

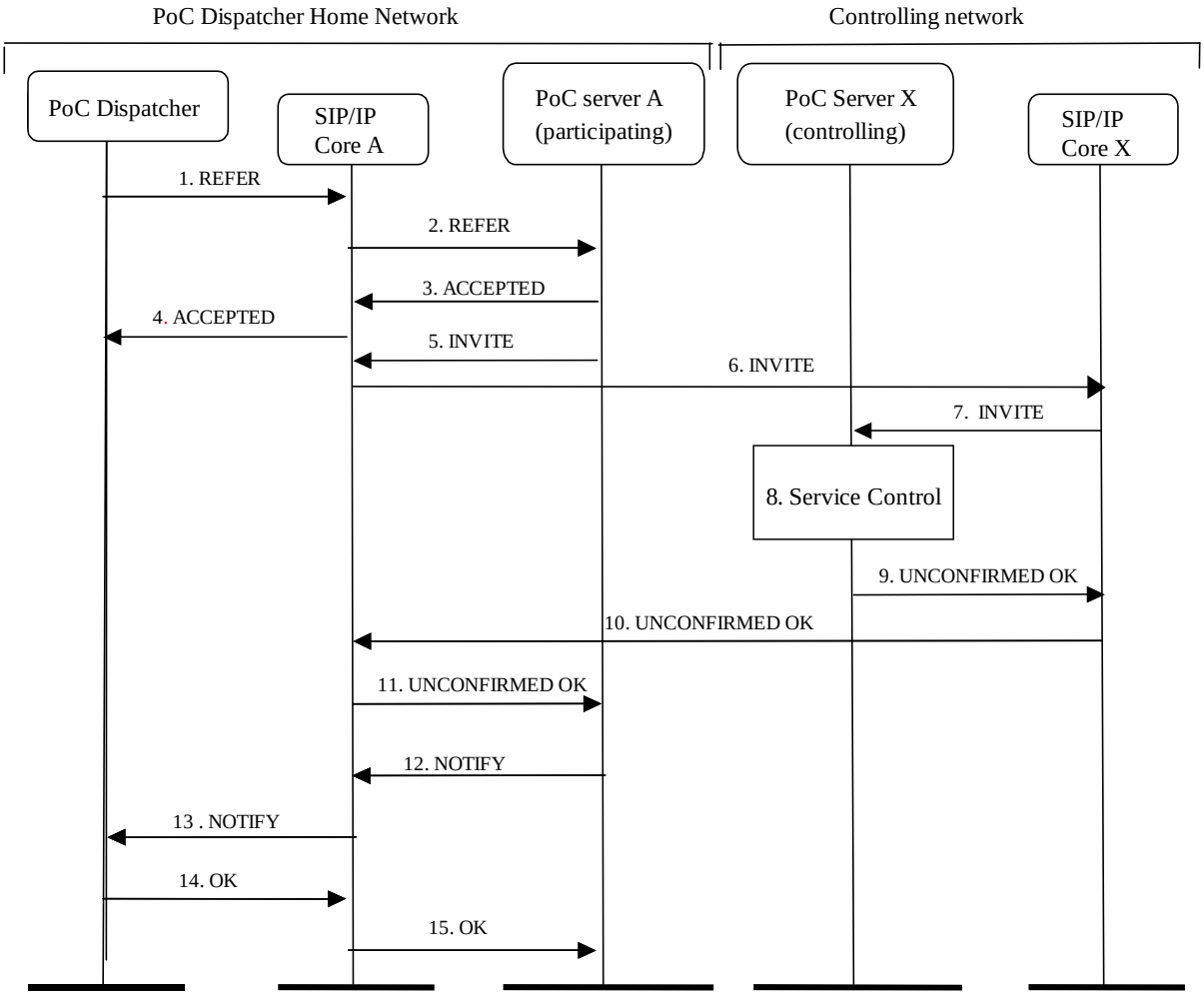

Figure 81: Unconfirmed Indication using Pre-established Session

1. The PoC Dispatcher sends a REFER request to the SIP/IP Core A.

   Information elements contained in the REFER request:

   a. A conference URI that identifies the Pre-established Session to which the REFER applies

   b. Dispatch PoC Group Identity

   c. PoC Dispatcher role indication

   d. Dispatch PoC Session indication

   e. List of PoC addresses of invited PoC Fleet Members of the Dispatch PoC Group.

   f. PoC Address of the PoC Dispatcher

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g. PoC service indication

h. Manual answer override request

i. Other elements (e.g. Media included in the request)

2. The SIP/IP Core A routes the REFER request to the PoC Server A (participating) based on the PoC Service indication and a conference URI that identifies the Pre-established Session.

   Information elements contained in the REFER request:

   a. A conference URI that identifies the Pre-established Session to which the REFER applies

   b. Dispatch PoC Group Identity

   c. PoC Dispatcher role indication

   d. Dispatch PoC Session indication

   e. List of PoC addresses of invited PoC Fleet Members of the Dispatch PoC Group.

   f. PoC Address of the PoC Dispatcher

   g. PoC service indication

   h. Manual answer override request

   i. Other elements (e.g. Media included in the request)

3. PoC Server A sends an ACCEPTED response to the SIP/IP Core A

4. The SIP/IP Core A sends the ACCEPTED response to the PoC Client.

5. When the PoC Server A (participating) receives a REFER request containing a URI with an indication that the URI is a Dispatch PoC Group not hosted by this PoC Server, the PoC Server A (participating) sends an INVITE request towards the hosting PoC Server. In this scenario, PoC Server X owns the Dispatch PoC Group Identity.

   Information elements contained in the INVITE request:

   a. Dispatch PoC Group Identity

   b. PoC Dispatcher role indication

   c. Dispatch PoC Session indication

   d. List of PoC addresses of invited PoC Fleet Members of the Dispatch PoC Group.

   e. PoC Address of the PoC Dispatcher

   f. PoC service indication

   g. Manual answer override request

   h. Other elements (Media Parameters, TBCP and/or MBCP proposal, request of pre-emptive Media Burst and/or Talk Burst priority, etc).

6. The SIP/IP Core A routes the INVITE request to SIP/IP Core X.

   Information elements contained in the INVITE request:

   a. Dispatch PoC Group Identity

   b. PoC Dispatcher role indication

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c. Dispatch PoC Session indication

d. List of PoC addresses of invited PoC Fleet Members of the Dispatch PoC Group.

e. PoC Address of the PoC Dispatcher

f. PoC service indication

g. Manual answer override request

h. Other elements (Media Parameters, TBCP and/or MBCP proposal, request of pre-emptive Media Burst and/or Talk Burst priority, etc).

7. The SIP/IP Core X routes the request to the PoC Server X (controlling) based on Dispatch PoC Group Identity. If the Dispatch PoC Group Identity is used for other services (e.g. messaging) that are hosted on other Application Servers then the SIP/IP Core needs to use PoC service indication to route to the PoC Server.

   Information elements contained in the INVITE request:

   a. Dispatch PoC Group Identity

   b. PoC Dispatcher role indication

   c. Dispatch PoC Session indication

   d. List of PoC addresses of invited PoC Fleet Members of the Dispatch PoC Group.

   e. PoC Address of the PoC Dispatcher

   f. PoC service indication

   g. Manual answer override request

   h. Other elements (Media Parameters, TBCP and/or MBCP proposal, request of pre-emptive Media Burst and/or Talk Burst priority, etc).

8. The PoC Server X performs the necessary terminating service control (e.g. checks the PoC Dispatcher is PoC Dispatcher capable, verifies that members included in the list really belong to the Dispatch PoC Group, verifies there is no other active PoC Dispatcher for this Dispatch PoC Group, etc) and if the outcome is successful, the PoC Server X invites the correct members listed in the invitation to the Dispatch PoC Session, 5.21.2 "*Dispatch PoC Session invitation to the PoC Client*". In the case there is another active PoC Dispatcher for the same Dispatch PoC Group or the PoC Dispatcher is not identified as PoC Dispatcher capable, the Dispatch PoC Session establishment is rejected.

9-11. When the PoC Server X receives the first auto-answer indication, it sends the unconfirmed OK response to the PoC Server A through the signalling path.

   Information elements contained in the unconfirmed OK response:

   a. PoC Session Identity of the Dispatch PoC Session

   b. Dispatch PoC Session indication

   c. Other elements (Media Parameters, TBCP and/or MBCP proposal, confirmation of pre-emptive Media Burst and/or Talk Burst priority, etc).

   Sending NOTIFY request depends on the PoC Client's request. If it is requested not to send NOTIFY request in response of the REFER request, do not follow the rest of the steps.

12. After receiving the UNCONFIRMED OK response PoC Server A sends a NOTIFY request to the SIP/IP Core A.

   Informational elements contained in the NOTIFY request:

   a. PoC Session Identity of the Dispatch PoC Session

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b. Dispatch PoC Session indication

c. Unconfirmed OK response received indication

13. The SIP/IP Core A forwards the NOTIFY request to the PoC Dispatcher. The PoC Dispatcher is now able to start sending and the PoC Server X buffers the media for the late delivery upon the response from the terminating PoC Client indicating the acceptance of the session.

    Informational elements contained in the NOTIFY request:

    a. PoC Session Identity of the Dispatch PoC Session

    b. Dispatch PoC Session indication

    c. Unconfirmed OK response received indication.

14. PoC Dispatcher sends an OK response to the SIP/IP Core A.
15. The SIP/IP Core A sends the OK response to the PoC Server A.

5.21.2 Dispatch PoC Session invitation to the PoC Client

The following subclauses describe different establishment cases from the Invited PoC Client point of view. Due to the fact that the Invited PoC Client does not differentiate the cases of Dispatch PoC Session establishment to the whole or a sub-set of the Dispatch PoC Group, such differentiation is not made here either.

Subcaluse 5.21.2.1 describes a scenario for Pre-established Session in the terminating part

Subclause 5.21.2.2 describes a scenario for On-demand Session in the terminating part.

Any PoC Client invited to a Dispatch PoC Session is included as a PoC Fleet Member for that Dispatch PoC Session, unless the PoC Dispatcher role is requested in the invitation. However, he may be transferred the role of PoC Dispatcher later on.

For other possible cases in the terminating side or to complete the information elements, refer to the terminating side procedures for Pre-arranged PoC Group Sessions, considering the differences outlined here.

5.21.2.1 Auto-answer with Pre-established Session

This subclause describes a scenario where the Invited PoC User has defined that the PoC Session request from the inviting PoC User is accepted automatically and where the Invited PoC Client has a Pre-established Session connection with the Home PoC Server. Figure 82 *"Automatic answer using Pre-established Session"* shows signalling flow for this scenario.

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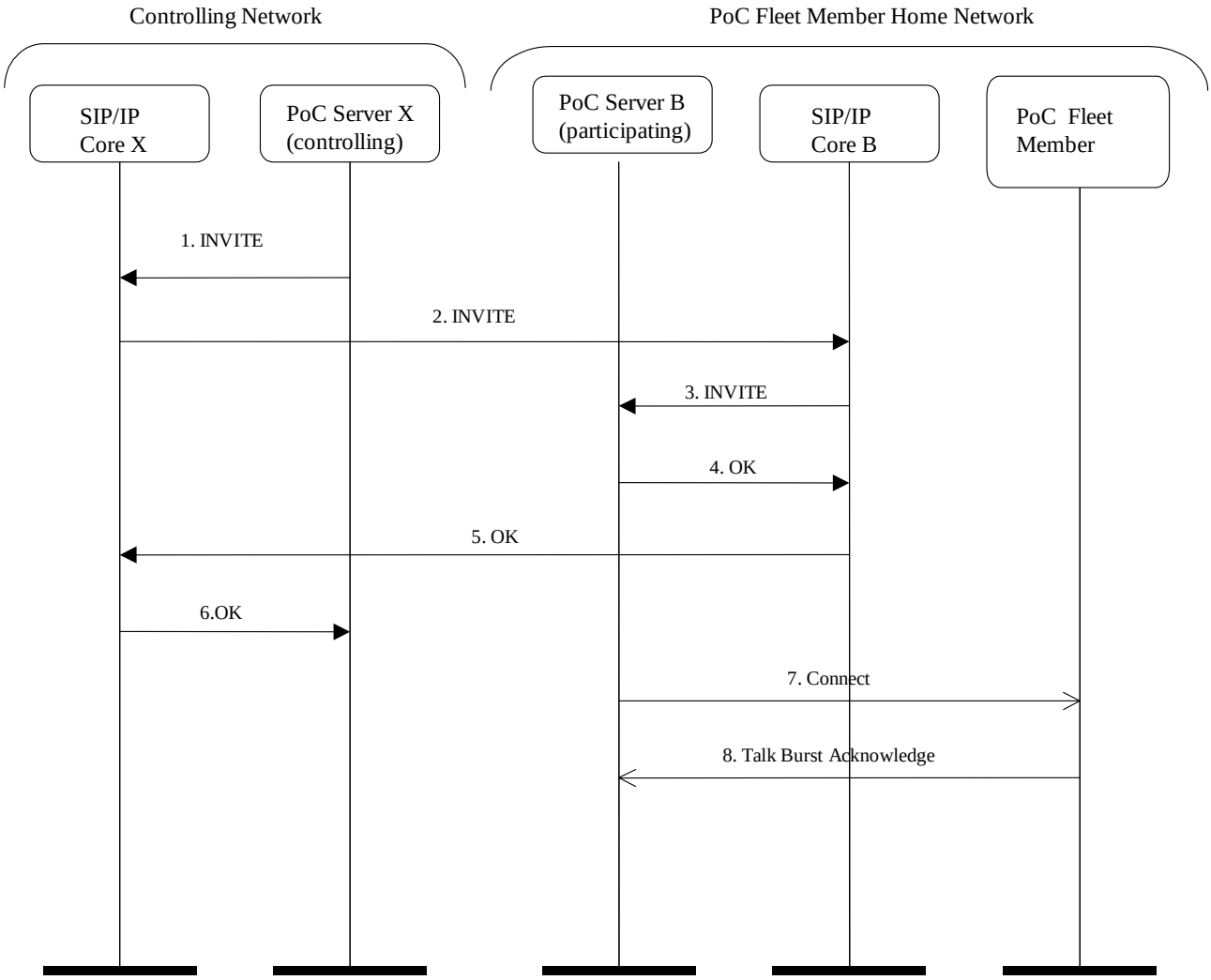

Figure 82: Automatic answer using Pre-established Session

1. PoC Server X (controlling) sends INVITE request to the SIP/IP Core X.

   Information elements contained in INVITE request:

   a. PoC Session Identity for the Dispatch PoC Session

   b. Dispatch PoC Group Identity.

   c. Dispatch PoC Session indication

   d. PoC Address of the PoC Dispatcher

   e. PoC service indication

   f. PoC Address of the PoC Fleet Member

   g. Controlling PoC Function assigned indication

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h. Other elements (Media Parameters, TBCP and/or MBCP proposal, etc).

2. SIP/IP Core X routes the request to the PoC Fleet Member home network.

   Information elements contained in INVITE request:

   a. PoC Session Identity for the Dispatch PoC Session

   b. Dispatch PoC Group Identity.

   c. Dispatch PoC Session indication

   d. PoC Address of the PoC Dispatcher

   e. PoC service indication

   f. PoC Address of the PoC Fleet Member

   g. Controlling PoC Function assigned indication

   h. Other elements (Media Parameters, TBCP and/or MBCP proposal, etc).

3. SIP/IP Core B routes the request to the PoC Server B (participating) based on PoC Address of the PoC Fleet Member and the PoC service indication.

   Information elements contained in INVITE request:

   a. PoC Session Identity for the Dispatch PoC Session

   b. Dispatch PoC Group Identity.

   c. Dispatch PoC Session indication

   d. PoC Address of the PoC Dispatcher

   e. PoC service indication

   f. PoC Address of the PoC Fleet Member

   g. Controlling PoC Function assigned indication

   h. Other elements (Media Parameters, TBCP and/or MBCP proposal, etc).

4. The PoC Server B sends an OK response back to the controlling network, because the Client B communicated to automatically accept PoC Sessions.

5. SIP/IP Core B forwards the OK response to the controlling network.

6. SIP/IP Core X forwards the OK response to the PoC Server X (controlling)

7. The PoC Server B (participating) sends the Connect message to the PoC Fleet Member.

   Information elements contained in Connect message:

   a. PoC Address of the Participant at the PoC Dispatcher

   b. Nick Name of the Participant at the PoC Dispatcher

   c. PoC Session Identity of the Dispatch PoC Session

   d. Dispatch PoC Group Identity

   e. Dispatch PoC Session indication

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f. Nick Name of the Dispatch PoC Group

8. The PoC Fleet Member acknowledges the Connect message with a Talk Burst Acknowledge message to guarantee reliable delivery of the Connect message.

5.21.2.2 Manual answer override procedure

This subclause describes a scenario where the inviting PoC Dispatcher, who is authorized to issue manual answer override request, sends an INVITE request message containing manual answer override, and the Invited PoC User is using manual answer. The scenario is valid for On-demand Session case.

Figure 83 *"Manual answer override procedure"* shows signalling flow for this scenario.

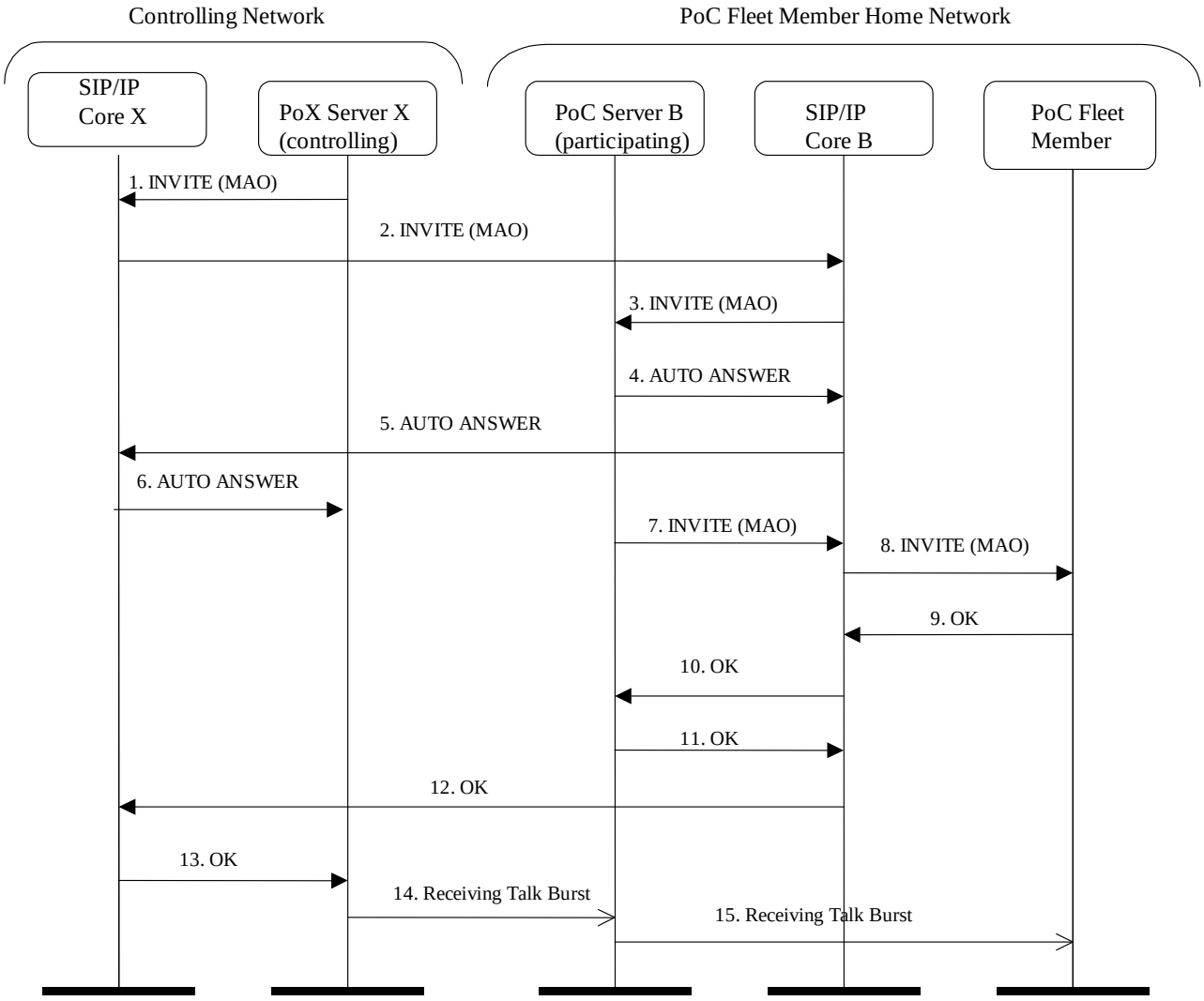

Figure 83: Manual answer override procedure

1. PoC Server X (controlling) sends INVITE request to the SIP/IP Core X.

   Information elements contained in INVITE request:

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a. Dispatch PoC Group Identity

b. PoC Session Identity for the Dispatch PoC Session

c. Dispatch PoC Session indication

d. PoC Address of the PoC Fleet Member

e. PoC service indication

f. PoC Address of the PoC Dispatcher

g. Controlling PoC Function assigned indication

h. Manual answer override request

i. Other elements (Media Parameters, TBCP and/or MBCP proposal, etc).

2. SIP/IP Core X routes the request to the PoC Fleet Member home network.

   Information elements contained in INVITE request:

   a. Dispatch PoC Group Identity

   b. PoC Session Identity for the Dispatch PoC Session

   c. Dispatch PoC Session indication

   d. PoC Address of the PoC Fleet Member

   e. PoC service indication

   f. PoC Address of the PoC Dispatcher

   g. Controlling PoC Function assigned indication

   h. Manual answer override request

   i. Other elements (Media Parameters, TBCP and/or MBCP proposal, etc).

3. SIP/IP Core B routes the request to the PoC Server B (participating) based on the PoC Address of invited PoC Fleet Member and the PoC service indication.

   Information elements contained in INVITE request:

   a. Dispatch PoC Group Identity

   b. PoC Session Identity for the Dispatch PoC Session

   c. Dispatch PoC Session indication

   d. PoC Address of PoC Fleet Member

   e. PoC service indication

   f. PoC Address of PoC User at the PoC Dispatcher

   g. Controlling PoC Function assigned indication

   h. Manual answer override request

   i. Other elements (Media Parameters, TBCP and/or MBCP proposal, etc).

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4. Since the PoC Dispatcher is authorized to issue manual answer override requests, the participating PoC Server B sends AUTO-ANSWER response back to the controlling network. The AUTO-ANSWER response triggers the controlling network to progress PoC Session in originating part.

5. SIP/IP Core B forwards the AUTO-ANSWER response to the controlling network.

6. SIP/IP Core A forwards the AUTO-ANSWER response to the PoC Server A (participating & controlling)

7. PoC Server B (participating) sends the PoC Session setup request to the SIP/IP Core B. If the PoC Fleet Member is using On-demand Session, the PoC Server B sends an INVITE request to the SIP/IP Core B. Information elements contained in the INVITE request:

    a. Dispatch PoC Group Identity

    b. PoC Session Identity for the Dispatch PoC Session

    c. Dispatch PoC Session indication

    d. PoC service indication

    e. PoC Address of PoC User at the PoC Fleet Member

    f. PoC Address of PoC User at the PoC Dispatcher

    g. Manual answer override request

    h. Other elements (Media Parameters, TBCP and/or MBCP proposal, etc).

8. SIP/IP Core B routes the INVITE request to the PoC Fleet Member. Information elements contained in the INVITE request:

    a. Dispatch PoC Group Identity

    b. PoC Session Identity for the Dispatch PoC Session

    c. Dispatch PoC Session indication

    d. PoC service indication

    e. PoC Address of PoC User at the PoC Fleet Member

    f. PoC Address of PoC User at the PoC Dispatcher

    g. Manual answer override request

    h. Other elements (Media Parameters, TBCP and/or MBCP proposal, etc).

9. When the PoC Fleet Member receives the INVITE request, the PoC Fleet Member sends an OK response for the INVITE request.

10. SIP/IP Core B forwards the OK response to the PoC Server B (participating).

11. When PoC Server B (participating) receives OK response it will forward it to towards controlling network.

12. SIP/IP Core B forwards the OK response to the controlling network.

13. SIP/IP Core X forwards the OK response to the PoC Server X (controlling).

14. The PoC Server X sends the receiving Talk Burst indication to the PoC Fleet Member.

15. The PoC Server B (participating) relays the receiving Talk Burst message to the PoC Fleet Member.

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NOTE 1: If the Participating PoC Function B is not on the media and Talk Burst Control and/or Media Burst Control message path, the PoC Server A sends the receiving Talk Burst indication directly to the PoC Fleet Member.

NOTE 2: If PoC Fleet Member is using Pre-established Session the signalling flow for this scenario is as shown in Figure 20 *"Automatic answer using Pre-established Session"* in sub-clause 5.3.2.1.1 "*Auto-answer with Pre-established Session*".

5.21.3 Transferring the PoC Dispatcher role

While in a Dispatch PoC Session, the active PoC Dispatcher can request transferring the role of PoC Dispatcher to another PoC Client.

The following subclauses describe the high-level signalling procedure for transferring the PoC Dispatcher role.

5.21.3.1 Originating side

This subclause, based on Figure 84 *"PoC Dispatcher role transfer – originating side"*, describes the procedures to be followed when transferring the PoC Dispatcher role from the originating PoC Client's point of view. The scenario is valid for On-demand Session case as well as for the Pre-established Session case. Additionally, the current PoC Dispatcher must requests the use of polite calling (i.e manual answer on the terminating side) when transferring the role, since an explicit confirmation from the target PoC User is needed.

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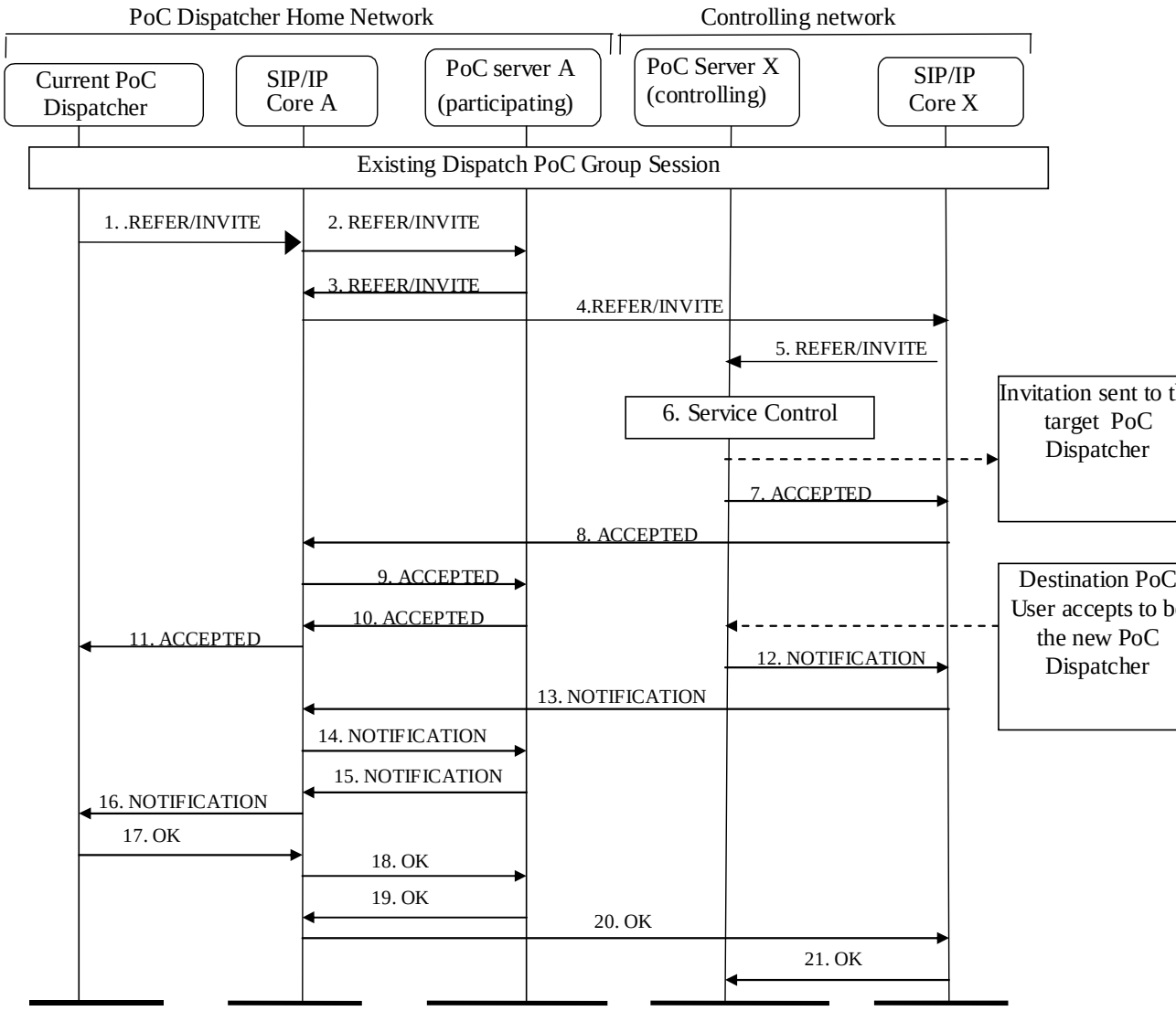

Figure 84: PoC Dispatcher role transfer – originating side

1-5. The current PoC Dispatcher sends a REFER/INVITE request through the signalling path to the PoC Server X (controlling). Information elements contained in the REFER/INVITE request:

a. PoC Session Identity of the Dispatch PoC Session.

b. PoC Address of the target PoC User

c. PoC Dispatcher role indication

d. Polite calling request

6. Upon reception of the request, the PoC Server X (controlling) validates that the PoC User sending the request is the active PoC Dispatcher for the Dispatch PoC Session and that it has the appropriate rights, according to the Dispatch PoC Group policy. If the validation is not correct, the request is rejected. Otherwise, the PoC Server X (controlling) validates that the target PoC User is identified as being PoC Dispatcher capable for the Dispatch PoC Group. If the validation is not correct, the request is rejected. In case the target SIP URI identifies all the PoC Dispatcher capable

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PoC Users for the Dispatch PoC Group, the PoC Server X selects one among them as the target for the transfer, based on local policy.

7-11. PoC Server X (controlling) initiates the necessary procedures to invite the target PoC User as PoC Dispatcher and sends an ACCEPTED response to the current PoC Dispatcher through the signalling path which has routed the original request.

12-16. When the PoC Server X (controlling) receives the indication from the target PoC User (i.e the new PoC Dispatcher for the Dispatch PoC Session) that it has accepted the invitation (role transfer), the PoC Server X sends a request to the previous PoC Dispatcher that notifies/confirms the role change. Information elements contained in the NOTIFICATION request:

a. PoC Session Identity of the Dispatch PoC Session.

b. Acceptance indication

c. PoC Address of the new PoC Dispatcher.

When the CF receives the acceptance message from the target PoC Dispatcher, the PoC Dispatcher that requested the role transfer does not play the PoC Dispatcher role anymore. For that reason, it is referred as previous PoC Dispatcher, instead of current PoC Dispatcher, from that point onwards.

NOTE: If the target PoC User rejects the invitation to join as PoC Dispatcher, the Dispatch PoC Session continues unchanged (i.e. with the same PoC Dispatcher).

17-21. The previous PoC Dispatcher sends an OK response to the PoC Server X (controlling) following the same signalling path. The PoC Client remains in the Dispatch PoC Session acting as a PoC Fleet Member
Regular PoC Session control procedures are to be followed here if the previous PoC Dispatcher wants to leave the Dispatch PoC Session after successfully transferring the role.

5.21.3.2 Terminating side

This subclause, based on Figure 85 *"PoC Dispatcher role transfer – terminating side"*, describes the procedures to be followed when transferring the PoC Dispatcher role from the terminating PoC Client's point of view. The scenario is only valid for Manual answer case. The scenario also assumes that the target PoC Client was not participating as PoC Fleet Member in the Dispatch PoC Session before.

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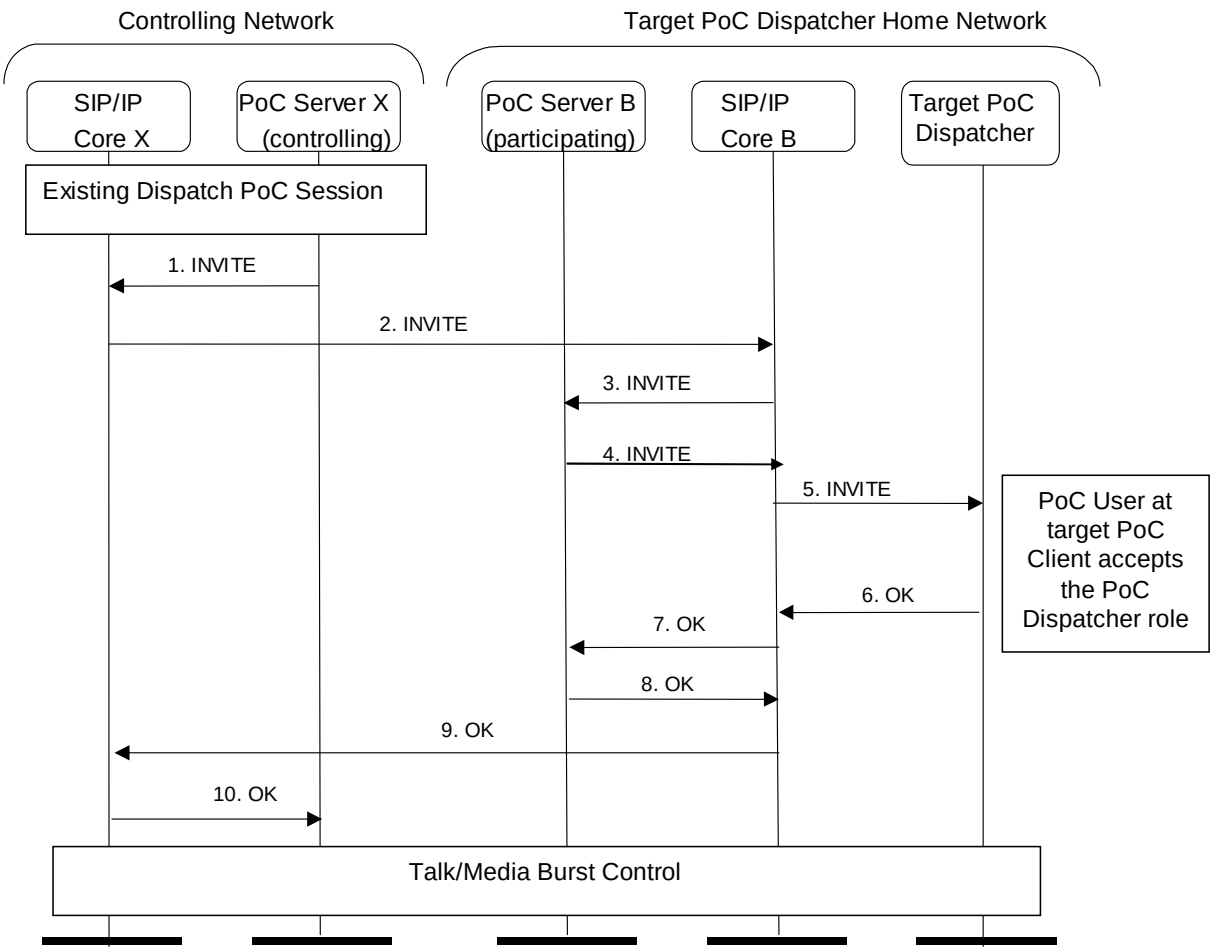

Figure 85: PoC Dispatcher role transfer – terminating side

1. PoC Server X (controlling) sends INVITE request to the SIP/IP Core X.

   Information elements contained in INVITE request:

   a. PoC Session Identity for the Dispatch PoC Session

   b. Dispatch PoC Group Identity.

   c. Dispatch PoC Session indication.

   d. PoC Dispatcher role indication.

   e. PoC Address of the target PoC User

   f. PoC Address of the current PoC Dispatcher

   g. Polite calling request

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When transferring the role, polite calling has to be requested in the INVITE sent to the target PoC Client since explicit confirmation from the target PoC User is needed.

h. Other elements (Media Parameters, TBCP and/or MBCP proposal, etc).

2. SIP/IP Core X routes the request to the target PoC Dispatcher home network.

   Information elements contained in INVITE request:

   a. PoC Session Identity for the Dispatch PoC Session

   b. Dispatch PoC Group Identity.

   c. Dispatch PoC Session indication.

   d. PoC Dispatcher role indication.

   e. PoC Address of the target PoC User

   f. PoC Address of the current PoC Dispatcher

   g. Polite calling request

   h. Other elements (Media Parameters, TBCP and/or MBCP proposal, etc).

3. SIP/IP Core B routes the request to the PoC Server B (participating) based on PoC Address of the target PoC Dispatcher and the PoC Service indication.

   Information elements contained in INVITE request:

   a. PoC Session Identity for the Dispatch PoC Session

   b. Dispatch PoC Group Identity.

   c. Dispatch PoC Session indication.

   d. PoC Dispatcher role indication.

   e. PoC Address of the target PoC User

   f. PoC Address of the current PoC Dispatcher

   g. Polite calling request

   h. Other elements (Media Parameters, TBCP and/or MBCP proposal, etc).

4. PoC Server B sends the request to the SIP/IP Core B.

   Information elements contained in INVITE request:

   a. PoC Session Identity for the Dispatch PoC Session

   b. Dispatch PoC Group Identity.

   c. Dispatch PoC Session indication.

   d. PoC Dispatcher role indication.

   e. PoC Address of the target PoC User

   f. PoC Address of the current PoC Dispatcher

   g. Polite calling request

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h. Other elements (Media Parameters, TBCP and/or MBCP proposal, etc).

5. SIP/IP Core B routes the INVITE request to the target PoC Dispatcher.

   Information elements contained in INVITE request:

   a. PoC Session Identity for the Dispatch PoC Session

   b. Dispatch PoC Group Identity.

   c. Dispatch PoC Session indication.

   d. PoC Dispatcher role indication.

   e. PoC Address of the target PoC User

   f. PoC Address of the current PoC Dispatcher

   g. Polite calling request

   h. Other elements (Media Parameters, TBCP and/or MBCP proposal, etc).

6-10. After the PoC User at the target PoC Dispatcher accepts to take the role of PoC Dispatcher for the Dispatch PoC Session, the PoC Clients sends an OK response following the same signalling path as the invitation request. When the PoC Server X receives the request, the target PoC Dispatcher is actually considered as the PoC Dispatcher for the Dispatch PoC Session. The previous PoC Dispatcher will be notified to change and behave as PoC Fleet Member.

   In case the PoC User does not accept, a negative response is sent instead of the OK response and the Dispatch PoC Session proceeds unchanged.

5.22 Discrete Media

The following subclauses describe different scenarios for transferring Discrete Media within a PoC Session. The Discrete Media can be transferred with or without Media Burst Control, based on negotiation in PoC Session establishment or PoC Session modification during the PoC Session.

For a "Discrete Media without Media Burst Control" Media flow, any PoC Client in a PoC Session is allowed to transfer Discrete Media without requesting permission to send Discrete Media from PoC Server.

When sending Discrete Media without Media Burst Control the PoC Client can decide to send the Discrete Media as a Pager mode message or as a Session mode message as specified as specified in [OMA-IM-AD].

For a "Discrete Media with Media Burst Control" Media flow, all PoC Clients need to request permission from PoC Server in order to send Discrete Media.

When sending Discrete Media with Media Burst Control the PoC Client can only send the Discrete Media as a Session mode message as specified as specified in [OMA-IM-AD].

For both cases, "Discrete Media with Media Burst Control" and "Discrete Media without Media Burst Control", the originating PoC Client can request either progress report or final report functionality, or both.

5.22.1 Sending Discrete Media

This subclause describes the following scenarios:

The subclause 5.22.1.1 *"Sending Discrete Media without Media Burst Control"* shows the message flow when the Discrete Media is sent without Media Burst Control.

The subclause 5.22.1.2 *"Sending Discrete Media with Media Burst Control"* shows the message flow when the Discrete Media is sent with Media Burst Control.

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5.22.1.1 Sending Discrete Media without Media Burst Control

This subclause describes a case when a PoC Client sends Discrete Media without requesting permission to send Media from the PoC Server using the Session mode as specified in [OMA-IM-AD].

Figure 86 *"Sending Discrete Media without Media Burst Control"* shows the signaling flow for the scenario.

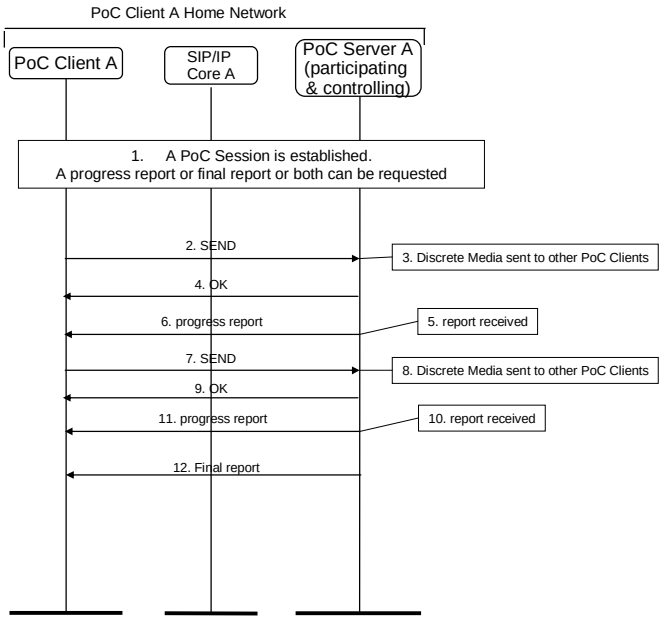

Figure 86: Sending Discrete Media without Media Burst Control

The steps of the flow are as follows:

1. A PoC Session is established as described in 5.2 *"Ad-hoc PoC Group Session and 1-1 PoC Session setup"*, 5.3 *"Pre-arranged PoC Group Session setup"*, 5.4 "*Chat PoC Group Session Setup*" and 5.6 "*Re-joining PoC Group Session*". The necessary capabilities (e.g. supported content types) required for transfer of Discrete Media are negotiated. The PoC Session establishment can contain a request for the final report or progress report functionality of both.
2. The PoC Client A sends a SEND request to the PoC Server

   Information elements contained in SEND request:

   a. The type of content to be transferred;

   b. The content e.g. a Video clip, an image or text;

   c. The size of the content;

   d. An instruction to the receiver how to handle the content (e.g. render or store); and,

   e. A request to receive a Discrete Media Transfer Progress Report on the result or a Discrete Media Transfer Final Report on the result or both.
3. The PoC Server A distributes the content to other Participants in the PoC Session with the capability to receive the type of content to be transferred. The PoC Server can request report from terminating PoC Client(s) on the reception.
4. The PoC Server A sends an OK response to the PoC Client A when the transfer is completed to the PoC Server.
5. If progress report is requested, the PoC Server A receives a report from the PoC Client(s) receiving the Discrete Media

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6. If progress report is requested, the PoC Server A aggregates the received report from the PoC Clients and sends the aggregated or composed progress report to PoC Client A

   The progress report contains one of the following information elements:

   a. Receiving PoC Clients URI and number of bytes transferred, if transfer is in progress; or
   b. Receiving PoC Clients URI and transfer status code, if transfer is either completed or failed; or
   c. Receiving PoC Clients URI, transfer status code and max-size value, if max-size was negotiated by the receiving PoC Client and message-size exceeded the max-size.

7. The PoC Client A sends a SEND request to the PoC Server
8. The PoC Server A distributes the content to other Participants in the PoC Session.
9. PoC Server A sends an OK response to PoC Client A when the transfer is completed to the PoC Server.
10. If progress report is requested, the PoC Server A receives a report from the PoC Client(s) receiving the Discrete Media
11. If progress report is requested, the PoC Server A aggregates the received report from the PoC Clients and sends the aggregated or composed progress report to the PoC Client A

    The progress report contains one of the following information elements:

    a. Receiving PoC Clients URI and number of bytes transferred, if transfer is in progress;
    b. Receiving PoC Clients URI and transfer status code, if transfer is either completed or failed;
    c. Receiving PoC Clients URI, transfer status code and max-size value, if max-size was negotiated by the receiving PoC Client and message-size exceeded the max-size.

12. If final report is requested, the PoC Server A aggregates the received report from the PoC Clients and sends the aggregated or composed final report to the PoC Client A

    The final report contains one of the following information elements:

    a. Receiving PoC Clients URI and transfer status code, if transfer is either completed or failed; or
    b. Receiving PoC Clients URI, transfer status code and max-size value, if max-size was negotiated by the receiving PoC Client and message-size exceeded the max-size.

The PoC Client can render the result of the transfer to the PoC User at the PoC Client A.

5.22.1.2 Sending Discrete Media with Media Burst Control

This subclause describes a case when a PoC Client sends Discrete Media with requesting permission to send Media from the PoC Server using the Session mode as specified in [OMA-IM-AD].

Figure 87 *"Sending Discrete Media with Media Burst Control"* shows the signaling flow for the scenario.

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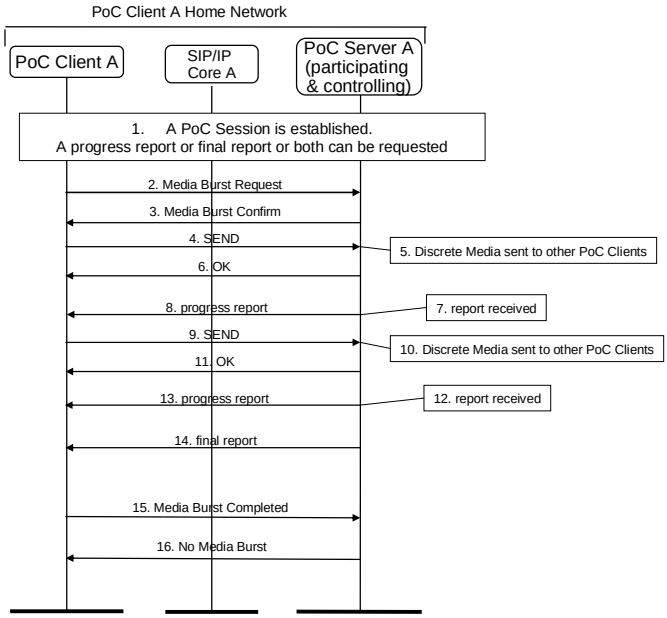

Figure 87: Sending Discrete Media with Media Burst Control

The steps of the flow are as follows:

1. A PoC Session is established as described in 5.2 "*Ad-hoc PoC Group Session and 1-1 PoC Session setup*", 5.3 "*Pre-arranged PoC Group Session setup*" 5.4 "*Chat PoC Group Session Setup*" and 5.6 "*Re-joining PoC Group Session*". The necessary capabilities (e.g. supported content types) required for transfer of Discrete Media and an associated Media-floor Control Entity are negotiated. The PoC Session establishment can contain a request for the progress report or the final report functionality or both.
2. The PoC Client sends a Media Burst request to the PoC Server A.

   Information elements contained in Media Burst request:

   a. Size of the Discrete Content that the PoC Client want to transfer.
3. The PoC Server A determines based on local policy the time the PoC Client can be granted the permission to send the Discrete Media and sends a Media Burst Confirm response. The Discrete Media will be rendered and displayed by the PoC Client receiving the Discrete Media as long as the PoC Client is granted the permission to send Media or until the PoC Client sends the Media Burst Complete indication.

   Information elements contained in Media Burst Confirm response:

   a. Time before the permission to send Discrete Media will be revoked; and,
   b. Number of Participants that will receive the Media.
4. The PoC Client A sends a SEND request to the PoC Server

   Information elements contained in SEND request:

   a. The type of content to be transferred;
   b. The content e.g. a Video clip, an image or text;
   c. The size of the content;
   d. An instruction to the receiver to render the content; and,

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   e. A request to receive a Discrete Media Transfer Progress Report on the result or a Discrete Media Transfer Final Report on the result or both.

5. The PoC Server A distributes the content to other Participants in the PoC Session with the capability to receive the type of content to be transferred.
6. The PoC Server A sends an OK response to the PoC Client A when the transfer is completed to the PoC Server.
7. If progress report is requested, the PoC Server A receives a progress report from the PoC Client(s) receiving the Discrete Media.
8. If progress report is requested, the PoC Server A aggregates the received report from the PoC Clients and sends the aggregated or composed progress report to the PoC Client A.

   The progress report contains one of the following information elements:

   a. Receiving PoC Clients URI and number of bytes transferred, if transfer is in progress; or
   b. Receiving PoC Clients URI and transfer status code, if transfer is either completed or failed; or
   c. Receiving PoC Clients URI, transfer status code and max-size value, if max-size was negotiated by the receiving PoC Client and message-size exceeded the max-size.

9. The PoC Client A sends a SEND request to the PoC Server.
10. The PoC Server A distributes the content to other Participants in the PoC Session with the capability to receive the type of content to be transferred.
11. The PoC Server A sends an OK response to the PoC Client A when the transfer is completed to the PoC Server
12. If progress report is requested, the PoC Server A receives a report from the PoC Client(s) receiving the Discrete Media
13. If progress report is requested, the PoC Server A aggregates the received report from the PoC Client(s) and sends the aggregated or composed progress report to the PoC Client A
14. The progress report contains one of the following information elements:

   a. Receiving PoC Clients URI and number of bytes transferred, if transfer is in progress; or
   b. Receiving PoC Clients URI and transfer status code, if transfer is either completed or failed; or
   c. Receiving PoC Clients URI, transfer status code and max-size value, if max-size was negotiated by the receiving PoC Client and message-size exceeded the max-size.

15. If final report is requested, the PoC Server A aggregates the received report from the PoC Client(s) and sends the aggregated or composed final report to the PoC Client A.

   The final report contains one of the following information elements:

   a. Receiving PoC Clients URI and transfer status code, if transfer is either completed or failed; or
   b. Receiving PoC Clients URI, transfer status code and max-size value, if max-size was negotiated by the receiving PoC Client and message-size exceeded the max-size.

16. The PoC Client A receives an indication from the PoC user to release the Media-floor and PoC Client A sends the Media Burst Completed message to PoC Server A.
17. The PoC Server A sends No Media Burst message to PoC Client A.

5.22.1.3 Using a MESSAGE to send Discrete Media

This subclause describes a case when a PoC Client sends Discrete Media without requesting permission to send Media from the PoC Server using the Pager mode as specified in [OMA-IM-AD].

Figure 88 *"Sending a MESSAGE"* shows the message flow for this scenario.

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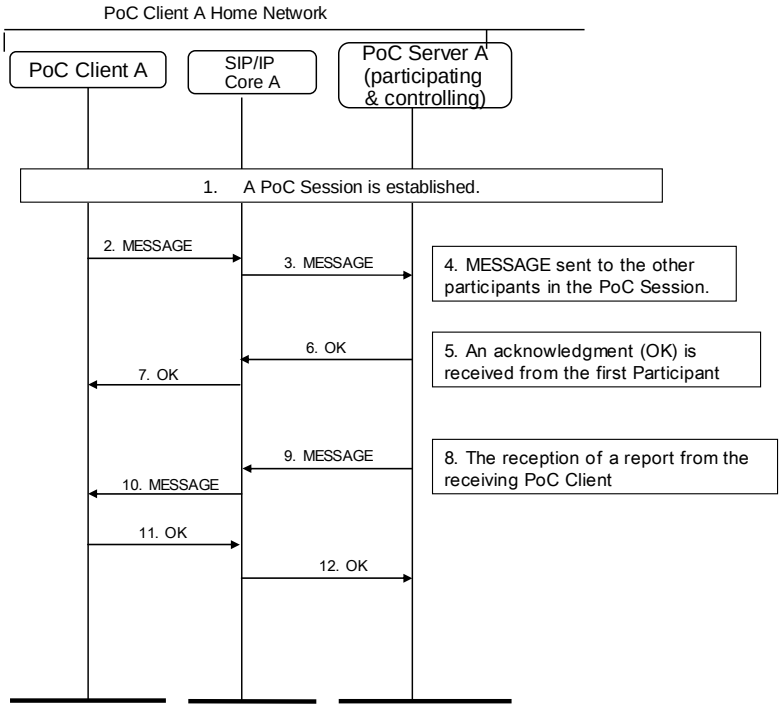

Figure 88: Sending a MESSAGE

The steps of the flow are as follows:

1. A PoC Session is established as described in 5.2 *"Ad-hoc PoC Group Session and 1-1 PoC Session setup"*, 5.3 *"Pre-arranged PoC Group Session setup"*, 5.4 "*Chat PoC Group Session Setup*" and 5.6 "*Re-joining PoC Group Session*".
2. The PoC Client sends a MESSAGE request to the SIP/IP Core A.

   Information contained in the MESSAGE request:

   a. The PoC Session Identity;

      The type of content to be transferred;

      i. The content e.g. a Video clip, an image or text;

      ii. The size of the content; and,

      iii. A request to receive a report on the result.
3. SIP/IP Core sends the MESSAGE request to the PoC Server A.

   Information contained in the MESSAGE request:
4. The PoC Session Identity;

   a. The type of content to be transferred;

   b. The content e.g. a Video clip, an image or text;

   c. The size of the content; and,

   d. A request to receive a report on the result.

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5. The PoC Server A distributes the content to other Participants in the PoC Session with the capability to receive the type of content to be transferred.
6. The PoC Server A receives the first acknowledgment (OK) from the first Participant.
7. The PoC Server A sends the OK to the SIP/IP Core A.
8. The SIP/IP Core A sends the OK to the PoC Client A.
9. The PoC Server A receives a report from the receiving PoC Client.
10. The PoC Server A sends a MESSAGE request to the SIP/IP Core A.

    Information contained in the MESSAGE request:

    a. The PoC Session Identity; and,
    b. The result (success or failure).
11. The SIP/IP Core A sends a MESSAGE request to the PoC Client A.

    Information contained in the MESSAGE request:

    a. The PoC Session Identity; and,
    b. The result (success or failure).
12. The PoC Client A sends an OK response as acknowledgment that the SIP MESSAGE was received towards the PoC Server A via SIP/IP Core B and the PoC Server A.

5.22.2 Receiving Discrete Media

This subclause describes the following scenarios:

The subclause 5.22.2.1 *"Receiving Discrete Media without Media Burst Control"* shows the message flow when the Discrete Media is received without Media Burst Control.

The subclause 5.22.2.2 *"Receiving Discrete Media with Media Burst Control"* shows the message flow when the Discrete Media is received with Media Burst Control.

5.22.2.1 Receiving Discrete Media without Media Burst Control

This subclause describes a case when a PoC Client receives Discrete Media using the Session mode specified in [OMA-IM-AD] and when the sending PoC Client has not requested permission to send Media from the PoC Server.

Figure 89 *"Receiving Discrete Media without Media Burst Control"* shows the signaling flow for the scenario.

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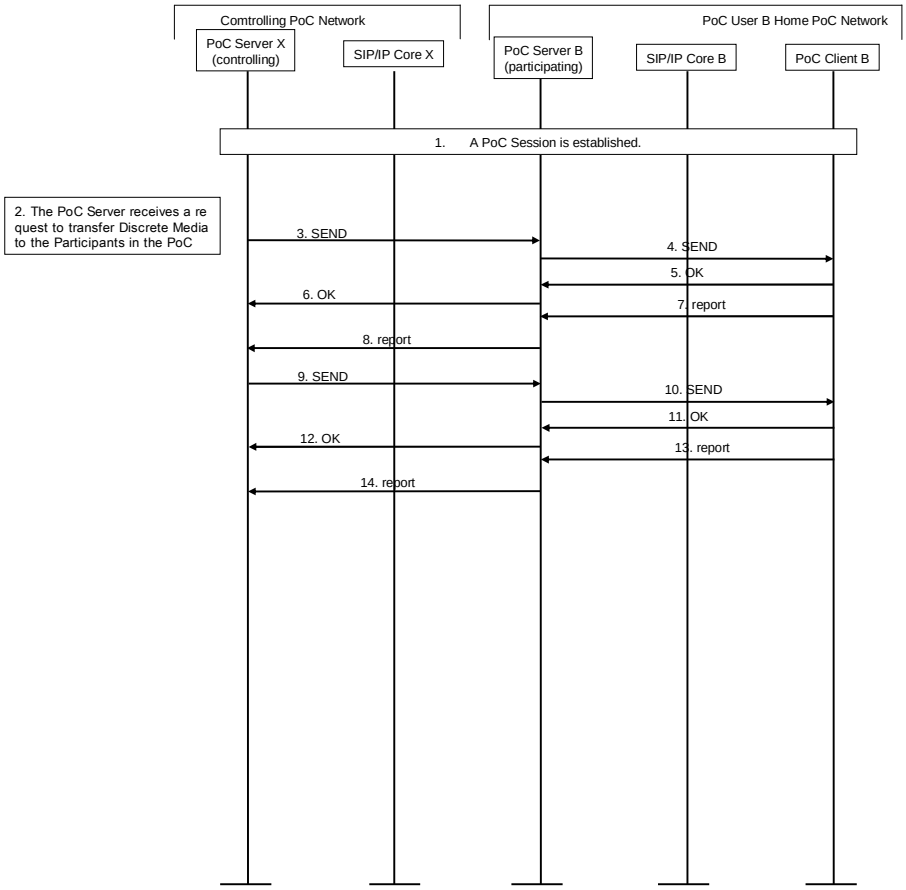

Figure 89: Receiving Discrete Media without Media Burst Control

The steps of the flow are as follows:

1. A PoC Session is established as described in 5.2 "*Ad-hoc PoC Group Session and 1-1 PoC Session setup*", 5.3 "*Pre-arranged PoC Group Session setup*" 5.4 "*Chat PoC Group Session Setup*" and 5.6 "*Re-joining PoC Group Session*". The necessary capabilities (e.g. supported content types) required for transfer of Discrete Media are negotiated.
2. The PoC Server X receives a request to transfer Discrete Media to the PoC Clients in the PoC Session. The following steps are repeated for each Participant that can handle the type and size of the Media to transfer.
3. The PoC Server X sends a SEND request to the PoC Server B.

   Information elements contained in SEND request:

   a. The type of content to be transferred;

   b. The content e.g. a Video clip, an image or text;

   c. The size of the content;

   d. An instruction to the receiver how to handle the content (e.g. render or store); and,

   e. A request to receive a report on the result.
4. The PoC Server B sends a SEND request to the PoC Client B.

   Information elements contained in SEND request:

   a. The type of content to be transferred;

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b. The content e.g. a Video clip, an image or text;

c. The size of the content;

d. An instruction to the receiver how to handle the content (e.g. render or store); and,

e. A request to receive a report on the result.

5. The PoC Client B sends an OK response to the PoC Server B when the content is completely received.
6. The PoC Server B sends an OK response to the PoC Server X.
7. The PoC Client B sends a report to the PoC Server B.
8. The PoC Server B sends a report to the PoC Server X.
9. The PoC Server X sends a SEND request to the PoC Server B.
10. The PoC Server B sends a SEND request to the PoC Client B.
11. The PoC Client B sends OK response to the PoC Server B when the content is completely received.
12. The PoC Server B sends OK response to the PoC Server X.
13. The PoC Client B sends a report to the PoC Server B.
14. The PoC Server B sends the report to the PoC Server X.

The PoC Server X can store the contents of the reports to be used to aggregate the progress reports to be sent to the sender of the Discrete Media or to compose a final report to be sent to the the sender of the Discrete Media.

5.22.2.2 Receiving Discrete Media with Media Burst Control

This subclause describes a case when a PoC Client receives Discrete Media using the Session mode specified in [OMA-IM-AD] and when the sending PoC Client has requested permission to send Media from the PoC Server.

Figure 90 *"Receiving Discrete Media with Media Burst Control"* shows the signaling flow for the scenario.

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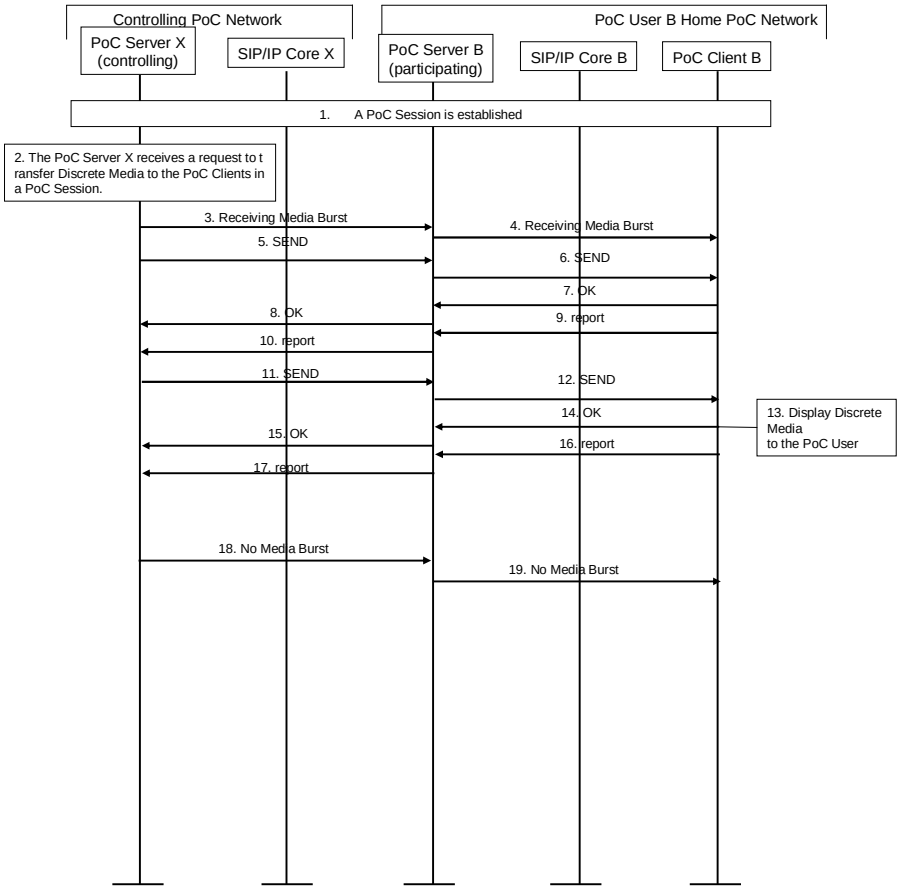

Figure 90: Receiving Discrete Media with Media Burst Control

The steps of the flow are as follows:

1. A PoC Session is established as described in 5.2 "*Ad-hoc PoC Group Session and 1-1 PoC Session setup*", 5.3 "*Pre-arranged PoC Group Session setup*" 5.4 "*Chat PoC Group Session Setup*" and 5.6 "*Re-joining PoC Group Session*". The necessary capabilities (e.g. supported content types) required for transfer of Discrete Media and an associated Media-floor Control Entity are negotiated.
2. The PoC Server X receives a request to transfer Discrete Media to the PoC Clients in the PoC Session. The following steps are repeated for each Participant that can handle the type and size of the Media to transfer.
3. The PoC Server sends a Receiving Media Burst indication to the PoC Server B.

   Information elements contained in SEND request:

   a. The Sender Identity; and,
4. The PoC Server B sends the Receiving Media indication to the PoC Client A.

   Information elements contained in SEND request:

   a. The Sender Identity; and,
5. The PoC Server X sends a SEND request to the PoC Server B.

   Information elements contained in SEND request:

   a. The type of content to be transferred;

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   b. The content e.g. a Video clip, an image or text;
   c. The size of the content;
   d. An instruction to the PoC Client B to render the content; and,
   e. A request to receive a report on the result.

6. The PoC Server B sends a SEND request to the PoC Client B.

   Information elements contained in SEND request:

   a. The type of content to be transferred;
   b. The content e.g. a Video clip, an image or text;
   c. The size of the content;
   d. An instruction to the PoC Client B to render the content; and,
   e. A request to receive a report on the result.

7. The PoC Client B sends an OK response to the PoC Server B when the content is completely received.
8. The PoC Server B sends an OK response to the PoC Server X.
9. The PoC Client B sends a report to the PoC Server B.
10. The PoC Server B sends the report to the PoC Server X.
11. The PoC Server X sends a SEND request to the PoC Server B
12. The PoC Server B sends a SEND request to the PoC Client B
13. The PoC Client B renders the Discrete Media and displays it to the PoC User
14. The PoC Client B sends an OK response to the PoC Server B when the content is completely received
15. The PoC Server B sends the OK response to the PoC Server X
16. The PoC Client B sends a report to the PoC Server B
17. The PoC Server B sends the report to the PoC Server X
18. The PoC Server X sends a No Media Burst indication to PoC Server B
19. The PoC Server B sends the No Media Burst indication to the PoC Client B

The PoC Server stores the content of the reports to be used when aggregating the progress reports to be sent to the sender of the Discrete Media or to be used to compose a final report to the sender.

5.22.2.3 Receiving Discrete Media in a MESSAGE

This subclause describes a case when a PoC Client receives Discrete Media using the Pager mode specified in [OMA-IM-AD] and when the sending PoC Client has not requested permission to send Media from the PoC Server.

Figure 91 *"Receiving a MESSAGE"* shows the message flow for this scenario.

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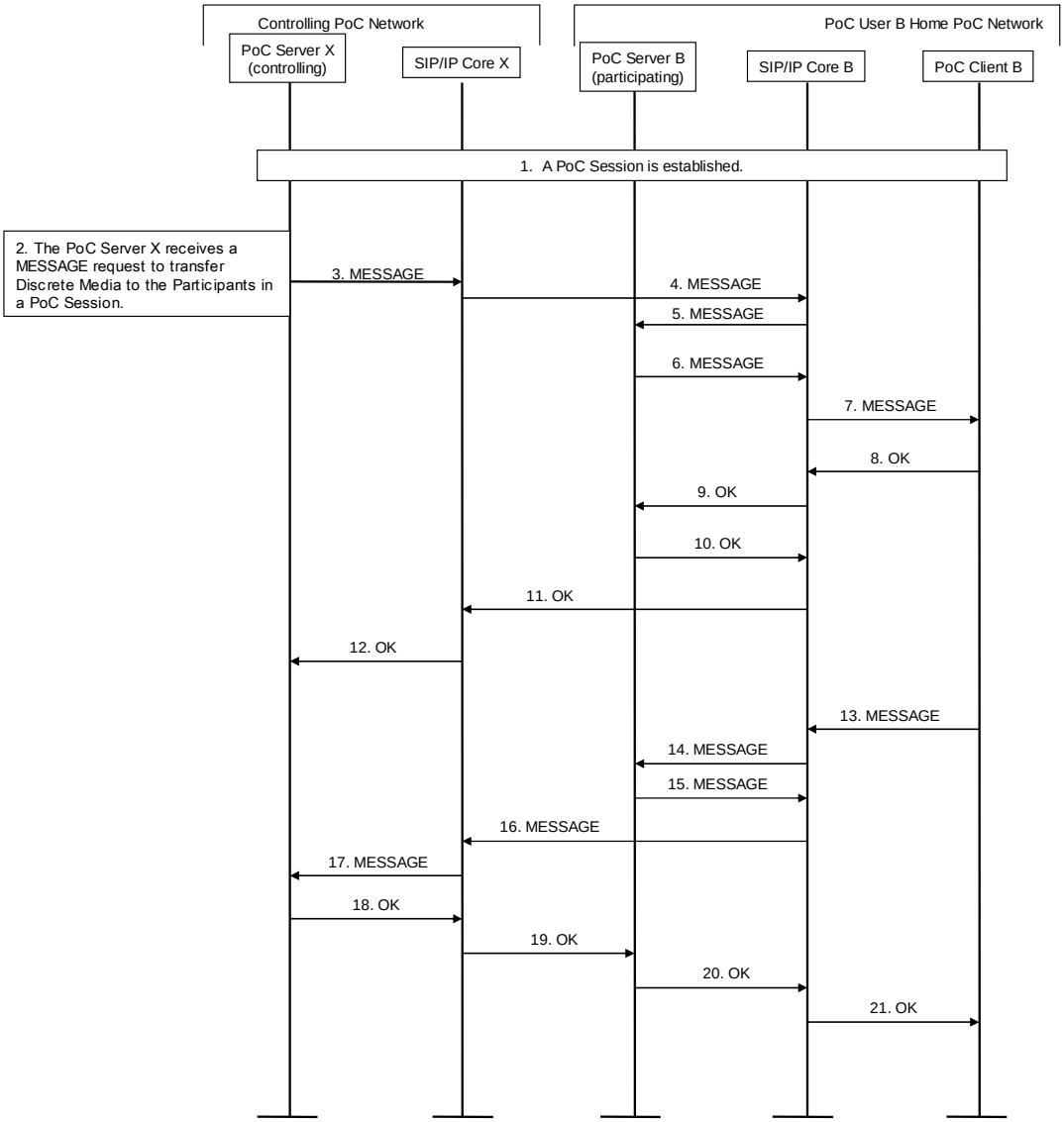

NOTE: Only one receiver of the MESSAGE is shown for simplicity. If there is more than one receiver in the PoC Session the same flow will occur fore each Participant.

Figure 91: Receiving a MESSAGE

The steps of the flow are as follows:

1. A PoC Session is established as described in 5.2 *"Ad-hoc PoC Group Session and 1-1 PoC Session setup"*, 5.3 *"Pre-arranged PoC Group Session setup"*, 5.4 "*Chat PoC Group Session Setup*" and 5.6 "*Re-joining PoC Group Session*".
2. The PoC Server X receives a MESSAGE request to transfer Discrete Media to the Participants in a PoC Session.
3. The PoC Server X sends the MESSAGE request towards SIP/IP Core X.

   The Information contained in the MESSAGE request:

   a. The PoC Session Identity;

   b. The PoC Address of the PoC User B;

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c. The type of content to be transferred;
d. The content e.g. a Video clip, an image or text;
e. The size of the content; and,
f. A request to receive a report on the result.

4. The SIP/IP Core X sends the MESSAGE request to the SIP/IP Core B.

   The Information contained in the MESSAGE request:

   a. The PoC Session Identity;
   b. The PoC Address of the PoC User B;
   c. The type of content to be transferred;
   d. The content e.g. a Video clip, an image or text;
   e. The size of the content; and,
   f. A request to receive a report on the result.

5. The SIP/IP Core B sends the MESSAGE request to the PoC Server B.

   The Information contained in the MESSAGE request:

   a. The PoC Session Identity;
   b. The PoC Address of the PoC User B;
   c. The type of content to be transferred;
   d. The content e.g. a Video clip, an image or text;
   e. The size of the content; and,
   f. A request to receive a report on the result.

6. The PoC Server B sends the MESSAGE request to the SIP/IP Core B.

   The Information contained in the MESSAGE request:

   a. The PoC Session Identity;
   b. The PoC Address of the PoC User B;
   c. The type of content to be transferred;
   d. The content e.g. a Video clip, an image or text;
   e. The size of the content; and,
   f. A request to receive a report on the result.

7. The SIP/IP Core B sends the MESSAGE request to the PoC Client B.

   The Information contained in the MESSAGE request:

   a. The PoC Session Identity;
   b. The PoC Address of the PoC User B;
   c. Contact address of the PoC Client B;
   d. The type of content to be transferred;
   e. The content e.g. a Video clip, an image or text;
   f. The size of the content; and,
   g. A request to receive a report on the result.

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8-12. The PoC Client B sends an OK response as acknowledgment that the SIP MESSAGE was received towards the PoC Server X via SIP/IP Core B, PoC Server B and SIP/IP Core X.

13. If the sender of the Discrete Media requested a report the PoC Client B sends a MESSAGE request to the SIP/IP Core B.

    The Information contained in the MESSAGE request:

    a. The PoC Session Identity;
    b. The PoC Address of the PoC Client sending the Discrete Media; and,
    c. The result (success or failure).

14. The SIP/IP Core B sends the MESSAGE request to the PoC Server B.

    The Information contained in the MESSAGE request:

    a. The PoC Session Identity;
    b. The PoC Address of the PoC Client sending the Discrete Media;and,
    c. The result (success or failure).

15. The PoC Server B sends the MESSAGE request to the SIP/IP Core B.

    The Information contained in the MESSAGE request:

    a. The PoC Session Identity;
    b. The PoC Address of the PoC Client sending the Discrete Media; and,
    c. The result (success or failure).

16. The SIP/IP Core B sends the MESSAGE request to the SIP/IP Core X.

    The Information contained in the MESSAGE request:

    a. The PoC Session Identity;
    b. The PoC Address of the PoC Client sending the Discrete Media; and,
    c. The result (success or failure).

17. The SIP/IP Core X sends the MESSAGE request to the PoC Server X.

    The Information contained in the MESSAGE request:

    a. The PoC Session Identity;
    b. The PoC Address of the PoC Client sending the Discrete Media; and,
    c. The result (success or failure).

18-21. The PoC Server X sends an OK as an acknowledgment towards the PoC Client B via the SIP/IP Core X, the SIP/IP Core B, the PoC Server B and the PoC Client B.

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Appendix A. Change History (Informative)

A.1 Approved Version History

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

A.2 Draft/Candidate Version 2.0 History

Document Identifier	Date	Sections	Description
Draft Versions: OMA-TS-PoC_System_Description-V2_0	14 Mar 2006	all	New TS PoC System Description is created based on OMA PoC AD V2.0 document according to PoC WG decision at Seoul (6-9 Mar 2006). Updated with agreed CRs: OMA-POC-POCv2-2006-0068R03 OMA-POC-POCv2-2006-0074R05 OMA-POC-POCv2-2006-0075R04 OMA-POC-POCv2-2006-0089R04 OMA-POC-POCv2-2006-0090R03 OMA-POC-POCv2-2006-0116R03 OMA-POC-POCv2-2006-0147 OMA-POC-POCv2-2006-0215R01
	22 Mar 2006	4, 5	Updated with agreed CRs: OMA-POC-POCv2-2006-0113R01 OMA-POC-POCv2-2006-0114R01
	14 Apr 2006	all	Updated with agreed CRs: OMA-POC-POCv2-2006-0069R04 OMA-POC-POCv2-2006-0130R03 OMA-POC-POCv2-2006-0138R01 OMA-POC-POCv2-2006-0139R01 OMA-POC-POCv2-2006-0143R01 OMA-POC-POCv2-2006-0179R02 OMA-PoC-PoC2-2006-0189 OMA-POC-POCv2-2006-0201R02 OMA-POC-POCv2-2006-0203R01 OMA-POC-POCv2-2006-0206R01 OMA-POC-POCv2-2006-0214R01 OMA-POC-POCv2-2006-0216R01 OMA-POC-POCv2-2006-0218 OMA-POC-POCv2-2006-0228R01 OMA-POC-POCv2-2006-0248 OMA-POC-POCv2-2006-0071R07 OMA-POC-POCv2-2006-0140R03 OMA-POC-POCv2-2006-0141R01 OMA-POC-POCv2-2006-0145R03 OMA-POC-PoCv2-2006-0165R02 OMA-POC-POCv2-2006-0166R03 OMA-POC-POCv2-2006-0202R03 OMA-POC-POCv2-2006-0212R01 OMA-POC-POCv2-2006-0223R02 OMA-POC-POCv2-2006-0268 OMA-POC-POCv2-2006-0269R02 OMA-POC-POCv2-2006-0270R01 OMA-POC-POCv2-2006-0277R02 OMA-POC-POCv2-2006-0283R01 OMA-POC-POCv2-2006-0286R01 OMA-POC-POCv2-2006-0292R02 OMA-POC-POCv2-2006-0297

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			OMA-POC-POCv2-2006-0308R03 OMA-POC-POCv2-2006-0312R01 OMA-POC-POCv2-2006-0314R01 OMA-POC-POCv2-2006-0319 OMA-POC-POCv2-2006-0321R01 OMA-POC-POCv2-2006-0326R01
	25 Apr 2006	2, 3, 4, 5	Updated with agreed CRs: OMA-POC-POCv2-2006-0220R01 OMA-POC-POCv2-2006-0221R02 OMA-POC-POCv2-2006-0222R01 OMA-POC-POCv2-2006-0247R02 OMA-POC-POCv2-2006-0281R01 OMA-PoC-PoCv2-2006-0307R02 OMA-POC-POCv2-2006-0311R01
	24 May 2006	all	Updated with agreed CRs: OMA-POC-POCv2-2006-0191R04 OMA-POC-POCv2-2006-0217R04 OMA-POC-POCv2-2006-0237R02 OMA-POC-POCv2-2006-0285R02 OMA-POC-POCv2-2006-0288R03 OMA-POC-POCv2-2006-0294 OMA-POC-POCv2-2006-0298 OMA-POC-POCv2-2006-0342R02 OMA-POC-POCv2-2006-0354R01 OMA-POC-POCv2-2006-0356-SD OMA-POC-POCv2-2006-0357-SD OMA-POC-POCv2-2006-0366R02 OMA-POC-POCv2-2006-0369 OMA-POC-POCv2-2006-0370R01 OMA-POC-POCv2-2006-0373R02 OMA-POC-POCv2-2006-0389 OMA-POC-POCv2-SD-0398 OMA-POC-POCv2-2006-0409 OMA-POC-POCv2-2006-0430 Editing correction of previous incorporated documents OMA-POC-POCv2-2006-0319
	21 Jun 2006	all	Updated with agreed CRs: OMA-POC-POCv2-2006-0443R01 OMA-POC-POCv2-2006-0392R01 OMA-POC-POCv2-2006-0272R04 OMA-POC-POCv2-2006-0401R05 OMA-POC-POCv2-2006-0411R02 OMA-POC-POCv2-2006-0412R01 OMA-POC-POCv2-2006-0432R01 OMA-POC-POCv2-2006-0437R01 OMA-POC-POCv2-2006-0456R02 OMA-POC-POCv2-2006-0464R01 OMA-POC-POCv2-2006-0482 OMA-POC-POCv2-2006-0491R03 OMA-POC-POCv2-2006-0492R01 OMA-POC-POCv2-2006-0493 OMA-POC-POCv2-2006-0495 OMA-POC-POCv2-2006-0498 OMA-POC-POCv2-2006-0505R02 OMA-POC-POCv2-2006-0506 OMA-POC-POCv2-2006-0514R02 OMA-POC-POCv2-2006-0518

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			OMA-POC-POCv2-2006-0525R01 OMA-POC-POCv2-2006-0529R01 OMA-POC-POCv2-2006-0530 OMA-POC-POCv2-2006-0540R01 OMA-POC-POCv2-2006-0542 OMA-POC-POCv2-2006-0543R01 OMA-POC-POCv2-2006-0544R01
	26 Jul 2006	all	Editing correction of previous incorporated CR: OMA-POC-POCv2-2006-0544R01 Updated with agreed CRs OMA-POC-POCv2-2006-0477R02 OMA-POC-POCv2-2006-0422R03 OMA-POC-POCv2-2006-0488R01 OMA-POC-POCv2-2006-0449R02 OMA-POC-POCv2-2006-0516R02 OMA-POC-POCv2-2006-0293R06 OMA-POC-POCv2-2006-0323R05 OMA-POC-POCv2-2006-0414R04 OMA-POC-POCv2-2006-0418R02 OMA-POC-POCv2-2006-0419R02 OMA-POC-POCv2-2006-0450R04 OMA-POC-POCv2-2006-0451R03 OMA-POC-POCv2-2006-0526R02 OMA-POC-POCv2-2006-0560R03 OMA-POC-POCV2-2006-0564 OMA-POC-POCv2-2006-0583R01 OMA-POC-POCv2-2006-0584R03 OMA-POC-POCv2-2006-0595R02 OMA-POC-POCv2-2006-0597R02 OMA-POC-POCv2-2006-0598R01 OMA-POC-POCv2-2006-0609R01 OMA-POC-POCv2-2006-0611R01 OMA-POC-POCv2-2006-0612-SD OMA-POC-POCv2-2006-0614R02 OMA-POC-POCv2-2006-0623R02 OMA-POC-POCv2-2006-0625R02 OMA-POC-POCv2-2006-0631R01
	1 Aug 2006	4, 5	Updated with agreed CRs: OMA-POC-POCv2-2006-0579R01 OMA-POC-POCv2-2006-0643R01
	30 Aug 2006	all	Editing correction of previous incorporated CRs OMA-POC-POCv2-2006-0612 Updated with agreed CRs: OMA-POC-POCv2-2006-0517R02 OMA-POC-POCv2-2006-0513R01 OMA-POC-POCv2-2006-0536R024 OMA-POC-POCv2-2006-0596R02 OMA-POC-POCv2-2006-0678R01 OMA-POC-POCv2-2006-0716R02 OMA-POC-POCv2-2006-0721 OMA-POC-POCv2-2006-0750R01 OMA-POC-POCv2-2006-0751R01
	10 Sep 2006	all	Updated with agreed CRs: OMA-POC-POCv2-2006-0640R02 OMA-POC-POCv2-2006-0679R01 OMA-POC-POCv2-2006-0680R01 OMA-POC-POCv2-2006-0681R01

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			OMA-POC-POCv2-2006-0698R01
	28 Sep 2006	all	Updated with agreed CRs: OMA-POC-POCv2-2006-0677R01 OMA-POC-POCv2-2006-0692R01 OMA-POC-POCv2-2006-0694R01 OMA-POC-POCv2-2006-0674R01 OMA-POC-POCv2-2006-0696R02 OMA-POC-POCv2-2006-0697R03 OMA-POC-POCv2-2006-0707R04 OMA-POC-POCv2-2006-0735R04 OMA-POC-POCv2-2006-0746R02 OMA-POC-POCv2-2006-0771R01 OMA-POC-POCv2-2006-0777R01 OMA-POC-POCv2-2006-0795R01 OMA-POC-POCv2-2006-0801 OMA-POC-POCv2-2006-0807 OMA-POC-POCv2-2006-0833R02 OMA-POC-POCv2-2006-0835R01 OMA-POC-POCv2-2006-0848R01 OMA-POC-POCv2-2006-0856 OMA-POC-POCv2-2006-0867R02 OMA-POC-POCv2-2006-0882R01
	05 Oct 2006	4	Updated with agreed CRs: OMA-POC-POCv2-2006-0759R02 OMA-POC-POCv2-2006-0889 OMA-POC-POCv2-2006-0890
	23 Oct 2006	all	Updated with agreed CRs: OMA-POC-POCv2-2006-0380R05 OMA-POC-POCv2-2006-0685R03 OMA-POC-POCv2-2006-0719R03 OMA-POC-POCv2-2006-0767R02 OMA-POC-POCv2-2006-0800R01 OMA-POC-POCv2-2006-0901R01 OMA-POC-POCv2-2006-0902R01 OMA-POC-POCv2-2006-0904R01 OMA-POC-POCv2-2006-0905 OMA-POC-POCv2-2006-0906 OMA-POC-POCv2-2006-0907 OMA-POC-POCv2-2006-0909 OMA-POC-POCv2-2006-0959R01 OMA-POC-POCv2-2006-0985R01 OMA-POC-POCv2-2006-0986 OMA-POC-POCv2-2006-0990 OMA-POC-POCv2-2006-0992R02 OMA-POC-POCv2-2006-0993 OMA-POC-POCv2-2006-0999 OMA-POC-POCv2-2006-1000 OMA-POC-POCv2-2006-1001R01 OMA-POC-POCv2-2006-1002 OMA-POC-POCv2-2006-1045R01 OMA-POC-POCv2-2006-1046R01 OMA-POC-POCv2-2006-1051 OMA-POC-POCv2-2006-1054 OMA-POC-POCv2-2006-1057 OMA-POC-POCv2-2006-1073R01
	24 Oct 2006	4, 5	Updated with agreed CRs: OMA-POC-POCv2-2006-1049R01

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			Error correction on figure 26 according to the agreed contribution OMA-POC-POCv2-2006-0985R01
	23 Nov 2006	all	Updated with agreed CRs: OMA-POC-POCv2-2006-0999 OMA-POC-POCv2-2006-0908R01 OMA-POC-POCv2-2006-1080 OMA-POC-POCv2-2006-1013R03 OMA-PoC-PoCv2-2006-1059R01 OMA-POC-POCv2-2006-1087 OMA-POC-POCv2-2006-1107 OMA-POC-POCv2-2006-1115R01 OMA-POC-POCv2-2006-1125R01 OMA-POC-POCv2-2006-1154R01 OMA-POC-POCv2-2006-1155R01 OMA-POC-POCv2-2006-1178R01 OMA-POC-POCv2-2006-1201
	07 Dec 2006	5	History box reformatted Updated with agreed CRs: OMA-POC-POCv2-2006-1171R01 OMA-POC-POCv2-2006-1186R01
	21 Dec 2006	all	Updated with agreed CRs: OMA-POC-POCv2-2006-0899R04 OMA-POC-POCv2-2006-0900R03 OMA-POC-POCv2-2006-1202R02 OMA-POC-POCv2-2006-1288- OMA-POC-POCv2-2006-1314 OMA-POC-POCv2-2006-1315 OMA-POC-POCv2-2006-1352R01 OMA-POC-POCv2-2006-1422 OMA-POC-POCv2-2006-1424R01 OMA-POC-POCv2-2006-1425 OMA-POC-POCv2-2006-1427R01 OMA-POC-POCv2-2006-1429R01 OMA-POC-POCv2-2006-1464 OMA-POC-POCv2-2006-1474R02
	19 Feb 2007	all	Updated with agreed CRs OMA-POC-POCv2-2006-1487R01 OMA-POC-POCv2-2006-1501R01 OMA-POC-POCv2-2007-0002 OMA-POC-POCv2-2007-0009R01 OMA-POC-POCv2-2007-0023R01 OMA-POC-POCv2-2007-0028 OMA-POC-POCv2-2007-0032R01 OMA-POC-POCv2-2007-0033 OMA-POC-POCv2-2007-0054R01 OMA-POC-POCv2-2007-0056 OMA-POC-POCv2-2007-0057 OMA-POC-POCv2-2007-0059R01 OMA-POC-POCv2-2007-0070R01 OMA-POC-POCv2-2007-0071 OMA-POC-POCv2-2007-0077R01 OMA-POC-POCv2-2007-0091 OMA-POC-POCv2-2007-0092 OMA-POC-POCv2-2007-0093R01 OMA-POC-POCv2-2007-0094 OMA-POC-POCv2-2007-0096R01 OMA-POC-POCv2-2007-0108R01

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			OMA-POC-POCv2-2007-0110 OMA-POC-POCv2-2007-0111R01 OMA-POC-POCv2-2007-0113R03 OMA-POC-POCv2-2007-0119 OMA-POC-POCv2-2007-0121R01 OMA-POC-POCv2-2007-0122 OMA-POC-POCv2-2007-0123 OMA-POC-POCv2-2007-0157R02 OMA-POC-POCv2-2007-0160R01 OMA-POC-POCv2-2007-0178R01 OMA-POC-POCv2-2007-0198R02 OMA-POC-POCv2-2007-0199 OMA-POC-POCv2-2007-0201 OMA-POC-POCv2-2007-0202R01 OMA-POC-POCv2-2007-0203 OMA-POC-POCv2-2007-0242R01 OMA-POC-POCv2-2007-0243R01 OMA-POC-POCv2-2007-0254R01 OMA-POC-POCv2-2007-0248 OMA-POC-POCv2-2007-0249R01 OMA-POC-POCv2-2007-0253R01
	26 Mar 2007	all	Updated with agreed CRs OMA-POC-POCv2-2007-0040R01 OMA-POC-POCv2-2007-0072R04 OMA-POC-POCv2-2007-0074R03 OMA-POC-POCv2-2007-0075R02 OMA-POC-POCv2-2007-0076R03 OMA-POC-POCv2-2007-0200R05 OMA-POC-POCv2-2007-0205R03 OMA-POC-POCv2-2007-0252R02 OMA-POC-POCv2-2007-0255R01 OMA-POC-POCv2-2007-0259R01 OMA-POC-POCv2-2007-0271R02 OMA-POC-POCv2-2007-0274R03 OMA-POC-POCv2-2007-0289 OMA-POC-POCv2-2007-0291R01 OMA-POC-POCv2-2007-0304R02 OMA-POC-POCv2-2007-0315R01 OMA-POC-POCv2-2007-0316R01 OMA-POC-POCv2-2007-0334 OMA-POC-POCv2-2007-0335R01 OMA-POC-POCv2-2007-0338 OMA-POC-POCv2-2007-0357 OMA-POC-POCv2-2007-0358 OMA-POC-POCv2-2007-0359R01 OMA-POC-POCv2-2007-0360 OMA-POC-POCv2-2007-0361 OMA-POC-POCv2-2007-0362R01 OMA-POC-POCv2-2007-0364R01 OMA-POC-POCv2-2007-0365R01 OMA-POC-POCv2-2007-0372 OMA-POC-POCv2-2007-0385R01 OMA-POC-POCv2-2007-0402 OMA-POC-POCv2-2007-0427R01 OMA-POC-POCv2-2007-0428R01 OMA-POC-POCv2-2007-0432R01 OMA-POC-POCv2-2007-0434R01

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	28 Mar 2007	4, 5	Updated with agreed CRs OMA-POC-POCv2-2007-0266R02 OMA-POC-POCv2-2007-0267R01 OMA-POC-POCv2-2007-0373R01
	23 Apr 2007	all	Updated with agreed CRs OMA-POC-POCv2-2007-0158 OMA-POC-POCv2-2007-0256R03 OMA-POC-POCv2-2007-0260R04 OMA-POC-POCv2-2007-0281R02 OMA-POC-POCv2-2007-0393R04 OMA-POC-POCv2-2007-0425R04 OMA-POC-POCv2-2007-0426R01 OMA-POC-POCv2-2007-0442 OMA-POC-POCv2-2007-0443 OMA-POC-POCv2-2007-0444 OMA-POC-POCv2-2007-0446 OMA-POC-POCv2-2007-0523 OMA-POC-POCv2-2007-0524 OMA-POC-POCv2-2007-0526 OMA-POC-POCv2-2007-0594R02 OMA-POC-POCv2-2007-0612 OMA-POC-POCv2-2007-0670R01
	03 May 2007	3, 4, 5	Updated with agreed CRs OMA-POC-POCv2-2007-0191R03 OMA-POC-POCv2-2007-0483R03 OMA-POC-POCv2-2007-0522R01 OMA-POC-POCv2-2007-0532R01 OMA-POC-POCv2-2007-0534R01 OMA-POC-POCv2-2007-0569R03 OMA-POC-POCv2-2007-0607R01 OMA-POC-POCv2-2007-0690R02
	22 May 2007	all	Updated with agreed CRs OMA-POC-POCv2-2007-0520R02 OMA-POC-POCv2-2007-0537R02 OMA-POC-POCv2-2007-0617R02 OMA-POC-POCv2-2007-0631R03 OMA-POC-POCv2-2007-0632R01 OMA-POC-POCv2-2007-0653R02 OMA-POC-POCv2-2007-0658R03 OMA-POC-POCv2-2007-0659R02 OMA-POC-POCv2-2007-0693 OMA-POC-POCv2-2007-0699R01 OMA-POC-POCv2-2007-0703R01 OMA-POC-POCv2-2007-0713R01 OMA-POC-POCv2-2007-0723R01 OMA-POC-POCv2-2007-0724 OMA-POC-POCv2-2007-0725R01 OMA-POC-POCv2-2007-0726 OMA-POC-POCv2-2007-0727R01 OMA-POC-POCv2-2007-0730R01 OMA-POC-POCv2-2007-0763R01 OMA-POC-POCv2-2007-0768R02 OMA-POC-POCv2-2007-0778R01 OMA-POC-POCv2-2007-0794R02

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			OMA-POC-POCv2-2007-0805R01 OMA-POC-POCv2-2007-0806R01 OMA-POC-POCv2-2007-0807
	31 May 2007	4	Updated with agreed CRs OMA-POC-POCv2-2007-0706R01 OMA-POC-POCv2-2007-0719R01 OMA-POC-POCv2-2007-0779R02 OMA-POC-POCv2-2007-0804R02 OMA-POC-POCv2-2007-0820R01
	19 Jun 2007	all	Updated with agreed CRs OMA-POC-POCv2-2007-0519R02 OMA-POC-POCv2-2007-0525R02 OMA-POC-POCv2-2007-0691R03 OMA-POC-POCv2-2007-0707R01 OMA-POC-POCv2-2007-0708R03 OMA-POC-POCv2-2007-0717R03 OMA-POC-POCv2-2007-0731R04 OMA-POC-POCv2-2007-0770R01 OMA-POC-POCv2-2007-0849 OMA-POC-POCv2-2007-0854R01 OMA-POC-POCv2-2007-0857 OMA-POC-POCv2-2007-0862 OMA-POC-POCv2-2007-0886R01 OMA-POC-POCv2-2007-0888R02 OMA-POC-POCv2-2007-0924 OMA-POC-POCv2-2007-0935 OMA-POC-POCv2-2007-0948R01 OMA-POC-POCv2-2007-0980R01
	8 Aug 2007	3, 4, 5	Updated with agreed CRs OMA-POC-POCv2-2007-0988 OMA-POC-POCv2-2007-0999R02 OMA-PoC-PoCv2-2007-1006 OMA-POC-POCv2-2007-1028R01 OMA-POC-POCv2-2007-1030R01
	21 Aug 2007	4	Updated with agreed CRs OMA-POC-POCv2-2007-1082R03 OMA-POC-POCv2-2007-1091
Candidate version: OMA-TS-PoC_System_Description-V2_0	02 Oct 2007	All	Status changed to Candidate by TP TP ref # OMA-TP-2007-0343R01-INP_POC_V2_0_ERP_for_Candidate_Approval General editorial clean-up of styles for publication.
Draft versions: OMA-TS-PoC_System_Description-V2_0	22 Oct 2007	5.2.2.2, 5.2.2.3, 5.7.2.1, 5.7.2.2, 5.7.2.3, 5.8.1, 5.16.1.1, 5.16.1.2, 5.17.2.1, 5.17.2.2, 5.17.3.1, 5.17.3.3, 5.17.4.2.1, 5.17.4.2.3, 5.17.4.2.4, 5.21.1.2.2	Inclusion of CR: OMA-POC-POCv2-2007-1118
	12 Nov 2007	5.17.3.2.1	Inclusion of CR: OMA-POC-POCv2-2007-1141
Candidate version: OMA-TS-PoC_System_Description-V2_0	11 Dec 2007	n/a	Status changed to Candidate by TP TP ref # OMA-TP-2007-0468-INP_PoC_V2_0_ERP_for_Notification
Draft version: OMA-TS-PoC_System_Description-V2_0	20 Dec 2007	2.1, 3.3, 5, 5.11.2.1,	Inclusion of CRs: OMA-POC-POCv2-2007-1160 OMA-POC-POCv2-2007-1172

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			OMA-POC-POCv2-2007-1173
Candidate version: OMA-TS-PoC_System_Description-V2_0	26 Feb 2008	n/a	Status changed to Candidate by TP TP ref # OMA-TP-2008-0098-INP_Push_to_talk_over_Cellular_V2_0_ERP_for_Notification
Draft version: OMA-TS-PoC_System_Description-V2_0	06 Mar 2008	All	Inclusion of CR: OMA-POC-POCv2-2008-0006
Candidate version: OMA-TS-PoC_System_Description-V2_0	21 Apr 2008	n/a	Status changed to Candidate by TP TP ref # OMA-TP-2008-0169-INP_Push_to_talk_over_Cellular_V2_0_ERP_for_Notification

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Appendix B. Guidelines for preparing flow charts (Informative)

The protocol issues are not yet agreed in the OMA PoC work on stage 2. And although it is clear that the Session Initiation Protocol (SIP) and Session Description Protocol (SDP) are used for call set up etc. purposes, it may stay open at this moment what are the exact SIP methods and headers used in the signalling flows.

Therefore it is recommended to use a high level description in the architecture document describing only e.g. INVITE and OK for a successful session setup and leaving open what is the exact message sequence in each session setup case. In some cases when the precise protocol method still needs to be determined it may be appropriate to use an abstract signalling naming, e.g. PoC Session request and acknowledgement.

Additionally it is defined the network elements shown on the figure. It is recommended to show all network elements participating the signalling message transfer. Typically they are PoC Client A and B, PoC Server A, B and X and SIP/IP Core A, B and X. Where A is the originating party, B is the terminating party and X is the session controlling party. Additionally the network element naming shall clarify the PoC Server role: participating, controlling or both.

The originating flow (from originating PoC Client to the PoC Server X (controlling)) and terminating flow (from the PoC Server X (controlling) to the terminating PoC Client) is described separately. The flows are numbered and textually described under the figure. The textual description includes the Information elements that are necessary to be conveyed in each flow.

The flow charts are drawn in AD by using Power Point tool. The template for drawing the flow charts by Power Point is available as a permanent document.

For an example see subclause 5.4 "*Chat PoC Group Session Setup*".

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Appendix C. OMA SEC Group security threats analyses (Informative)

Void.

The appendix **C OMA SEC Group security threats analyses** are described in [PoC AD V2.0].

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Appendix D. PoC Interworking Service (Informative)

Push-to-talk (P2T) service, a two-way communication service that works like a "walkie-talkie" in that the conversations are half-duplex and, typically, the user holds down a button to talk and releases the button to listen, has been known for a long time. The popularity of P2T service is due in part to the fact that it allows a user to quickly communicate with groups of individuals. Currently, P2T services are typically provided over a proprietary network. Since the use of a proprietary network hampers the widespread adoption of P2T services, push-to-talk over cellular (PoC) systems based on the OMA standard have been developed. PoC utilizes the existing cellular phone system with the addition of a PoC server and a PoC Client in the terminal device to provide the PoC service. As PoC systems are being deployed, the need for interworking with already existing P2T systems becomes more and more evident.

OMA PoC Standard is defining an open interface that provides the means to extend PoC service value beyond the direct reach of PoC compliant networks to encompass legacy and proprietary: networks, service elements and users. Examples include:

1. Expand the population of users who may connect to a PoC Session
2. Expand the geographic reach the user may access PoC services.
3. Reuse of legacy service applications for the PoC environment.

allowing P2T systems and PoC Remote Access Users to participate in PoC Communication.

To extend PoC experience beyond the limit of direct reach of the PoC service including the seamless transport of PoC media and signalling (IMS/SIP)) of PoC networks or network elements. For PoC 2.0 this extension is defined only for systems providing a reasonable facsimile of PoC (External P2T Networks, Voice enabled IM systems) POC and for authorized POC Users invoking PoC Remote Access.

The interworking service, should for the most part, reflect the PoC capabilities and not add functionality which is not available to PoC network elements, PoC Clients, and PoC Users invoking PoC Remote Access.

This expansion of the PoC experience is not limited to the PoC User, but also provides the P2T User an expanded experience as well at least to be able to reach the PoC User. External P2T Network elements is of course outside the scope of PoC 2.

D.1 PoC Interworking Function

The PoC Interworking Function is performing following functions at the interface between the PoC system and the External P2T Network:

1. Reception and recognition of signalling and bearer data from either the PoC or the External P2T Network
2. Involvement in authentication and authorization of PoC and P2T Users in a PoC Session (optional)
3. Negotiation of protocols and their options preceding an establishment of a PoC Session involving P2T Users
4. Conversion between the PoC and P2T signalling and bearer protocols during a PoC Session with P2T Users, including floor control protocols.
5. Sending of converted signalling and bearer payloads received from the PoC and/or P2T Network, during a PoC Session involving P2T Users, based on available addressing information to participating PoC Users and P2T Users
6. Mapping between PoC and P2T related signalling data (e.g. presence)

D.2 PoC Interworking Topologies

Figure 92, Figure 93, and Figure 94 show PoC Interworking network configurations for originator (caller) or terminator (callee) PoC Users in an External P2T Network with a compliant PoC User in a PoC Network. Figure 95 depicts the situation when PoC Users A participate in a PoC Session with P2T Users from the External P2T Networks B and C, the session being controlled by the External P2T Network B. The interfaces between the PoC Interworking Function and External P2T Clients are outside the scope of OMA specifications. Figure 96 illustrates the PoC Interworking Function supporting interactions

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with multiple External P2T Networks and technologies. In some cases a PoC Session with interworking may not have any PoC User as Participants.

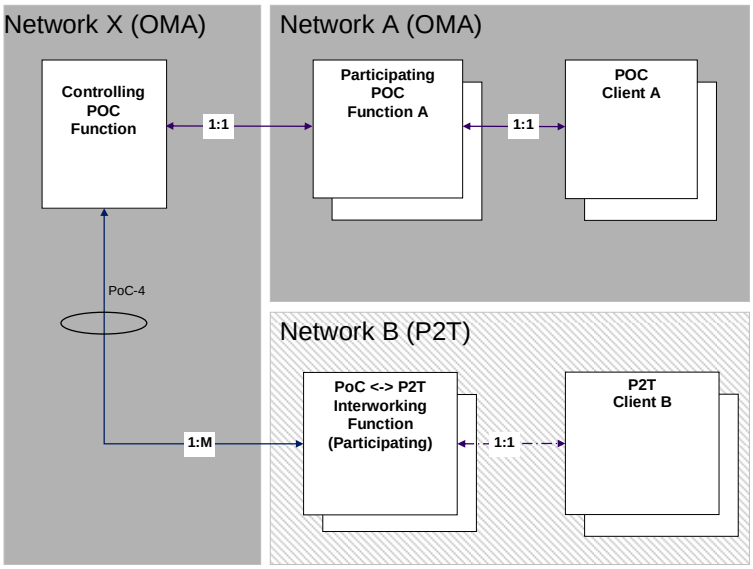

Figure 92: P2T User B is the recipient of a PoC Session

In Figure 92 P2T User 'B' is the recipient (callee) of a PoC Session establishment request for an Ad-hoc PoC Group or Pre-arranged PoC Group session, and the PoC Interworking Function performs the Participating PoC Function (PF) for the PoC Session.

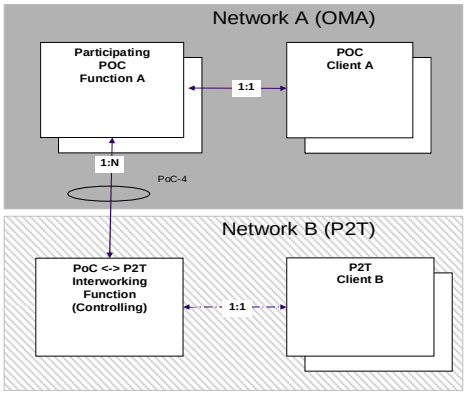

Figure 93: P2T User B is the Originator of an Ad-hoc PoC Session

In Figure 93 the P2T User 'B' is the originator (caller) of an Ad-hoc PoC Group Session, and the PoC Interworking Function performs the Controlling PoC Function for the PoC Session. In an extension of Figure 93 it is possible for there to be more than one External P2T Network, and it is possible that there are no compliant PoC Clients on the PoC Network.

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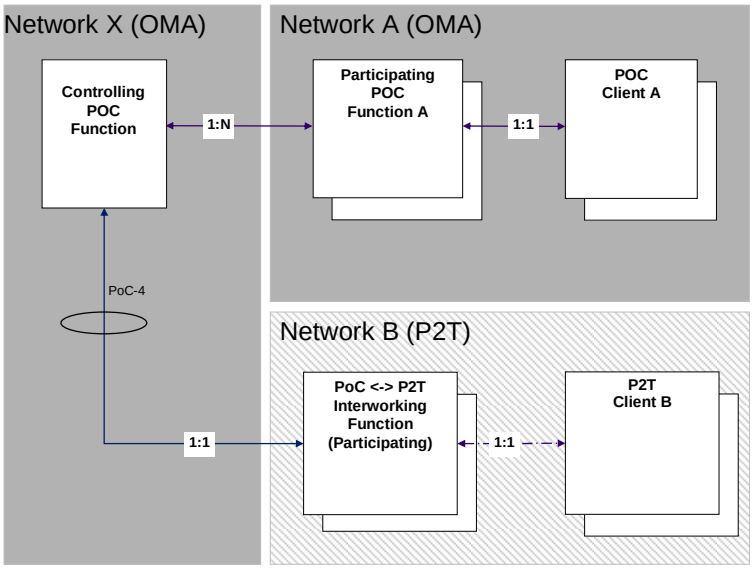

Figure 94: P2T User is the Originator of a Pre-arranged PoC Group Session

In Figure 94 the P2T User is the originator (caller) of a Pre-arranged PoC Group Session, and the PoC Interworking Function performs the Participting PoC Function of a PoC Server for the PoC Session.

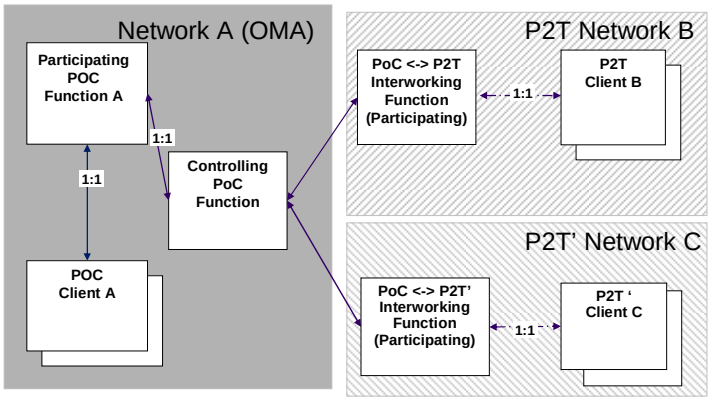

Figure 95: Interworking Involving PoC User (A) and P2T Users (B & C)

In Figure 95 the PoC Interworking Function of the P2T Users 'B' and Users 'C' perform the role of the Participating PoC Function towards the PoC Network A. The other interfaces of the PoC Interworking Function are proprietary interfaces outside the scope of OMA.

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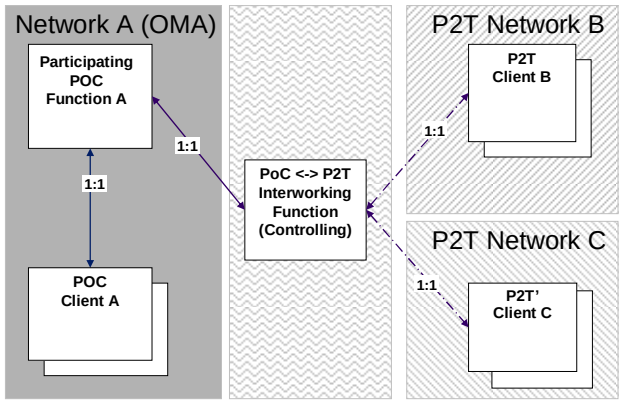

Figure 96: PoC Interworking Function supporting PoC Users (A) and P2T Users (B & C)

In Figure 96 the PoC Interworking Function is shown to perform the Controlling PoC Function on behalf of a P2T User originating a Pre-arranged PoC Group session. Note that the PoC Interworking Function performing the Controlling PoC Function can apply to all the External P2T Networks as one entity, or contain a virtual Controlling PoC Function and Participating PoC Function simultaneously where each External P2T Network is treated individually.

D.3 PoC Remote Access

The PoC Interworking Agent supporting PoC Remote Access is performing following functions at the interface between the PoC system and the external network used for access:

1. Involvement in the registration of PoC Users using PoC Remote Access
2. Authentication and authorization of the PoC User using PoC Remote Access
3. Reception and recognition of signalling and bearer data from/to either the PoC Network or the external network used for PoC Remote Access
4. Negotiation of protocols and their options preceding an establishment of a PoC Session involving PoC Users using PoC Remote Access
5. Conversion between the PoC and external network signalling and bearer protocols during a PoC Session involving PoC User using PoC Remote Access, including floor control protocols.
6. Sending of converted signalling and bearer payloads received from the PoC and/or external network, during a PoC Session involving PoC User using PoC Remote Access, based on available addressing information to participating PoC Users.

D.4 PoC Remote Access Topologies

A simplified diagram showing the architecture of the PoC infrastructure supporting Remote Access to PoC for a user not directly connected to a PoC Network, is shown in Figure 97 "*Access of a Remote PoC Client B to PoC service*".

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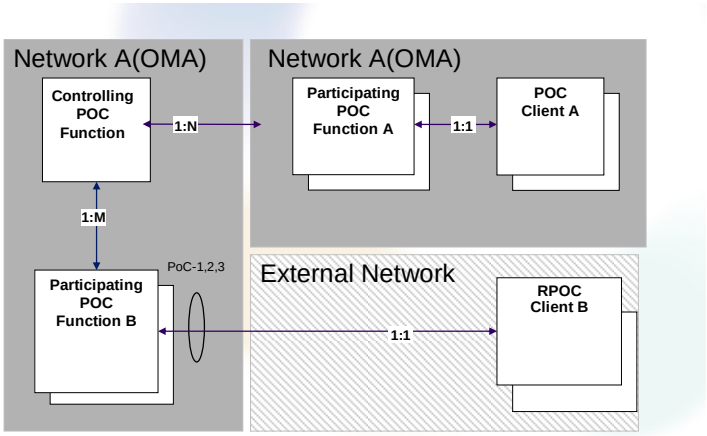

Figure 97: Access of Remote PoC Client B to PoC service

For example, a PoC Interworking Agent is needed when the Remote PoC Client uses an external network which does not have an IMS capable SIP/IP core (e.g. connecting an OMA compliant Remote PoC Client B via a 2G Network).

NOTE: The PoC Interworking Agent needed to connect the underlying networks is outside the scope of OMA.

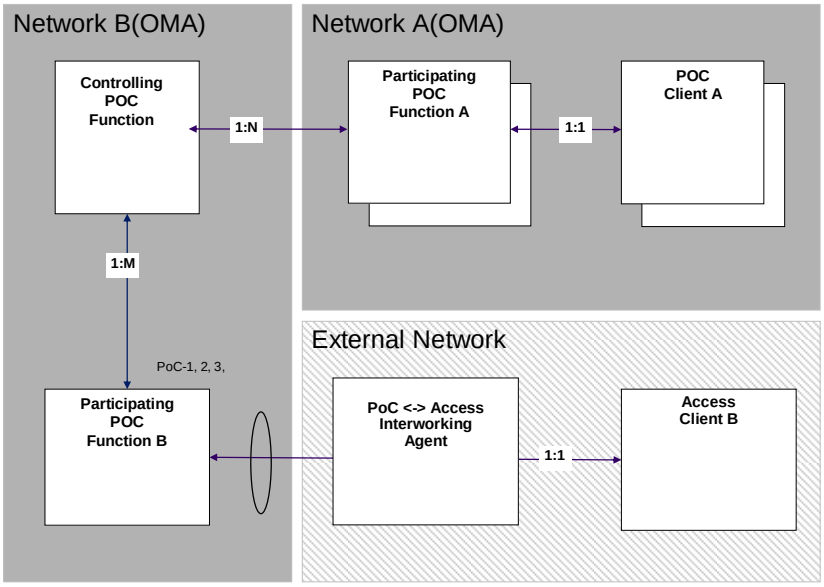

Figure 98: Access of a PoC User to PoC service using an access dependent PoC Interworking Agent

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A simplified diagram showing the architecture of the PoC infrastructure supporting access to PoC service for a user not directly connected to a PoC Network, is shown in Figure 98 "*Access of a PoC User to PoC service using an access dependent PoC Interworking Agent*". The PoC Interworking Agent is playing the role of a PoC Client B towards the PoC Network B and complies to the interface provided by the external network (e.g. a plain old telephone service network, a.k.a. POTS network) and the specific procedures defined for facilitating the PoC Remote Access from the external network (e.g. using Dual Tone Multi-Frequency signals a.k.a. DTMF signals).

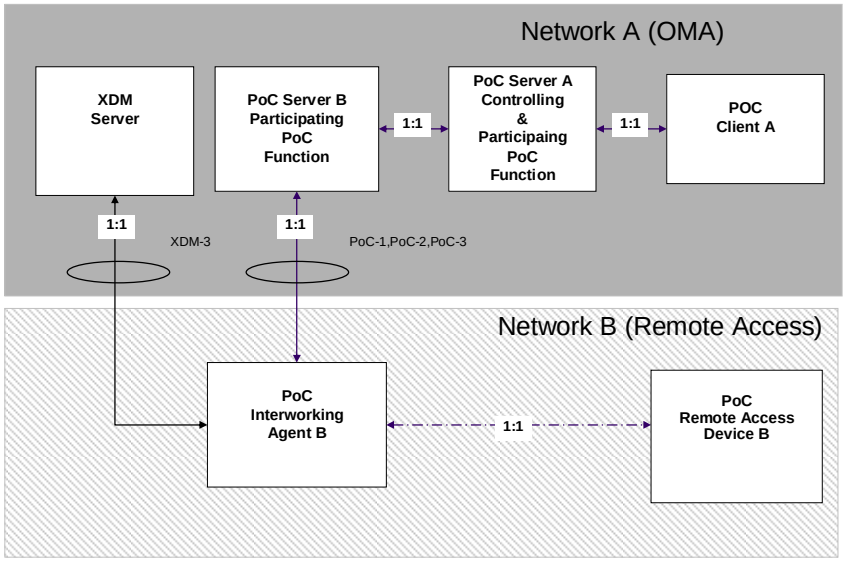

Figure 99: Access of a PoC User to the XDMS using an access dependent PoC Interworking Agent

A simplified diagram showing the architecture of the PoC infrastructure supporting access to PoC service and the XDMS for a PoC User not directly connected to a PoC Network is shown in Figure 94. The PoC Interworking Agent B is playing the role of a PoC Client B and the XDM Client B towards the PoC Network A. Network A is the Home PoC Network for the PoC Interworking Agent B as operated by the User's B PoC Service Provider.

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