PoC User Plane

Candidate Version 2.0 – 26 Feb 2008

Open Mobile Alliance

OMA-TS-PoC_UserPlane-V2_0-20080226-C

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1. Scope

This document describes the User Plane signalling procedures for the Push to talk over Cellular (PoC) service over the POC-3, POC-4, POC-10 and POC-12 reference points as defined in [OMA-PoC-AD] using the Media Burst Control Protocol (MBCP). This specification version is applicable, if the corresponding CP specification version is used as described in [OMA-PoC-CP] "*Backward compatibility*".

The Talk Burst Control Protocol (TBCP) can be used for PoC Speech and is specified in [OMA-PoC-1-UP].

When necessary, the interworking between the Control Plane [OMA-PoC-CP] and the User Plane is described in this document.

2. References

2.1 Normative references

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[RFC2396] IETF RFC 2396: "Uniform Resource Identifiers (URI): Generic Syntax", August 1998,
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[RFC3261] IETF RFC 3261: "SIP: Session Initiation Protocol", June 2002,
URL: http://www.ietf.org/rfc/rfc3261.txt

[RFC3267] IETF RFC 3267: "Real-Time Transport Protocol (RTP) Payload Format and File Storage Format for the Adaptive Multi-Rate (AMR) and Adaptive Multi-Rate Wideband (AMR-WB) Audio Codecs", June 2002,
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[RFC2543] IETF RFC 2543: "SIP: Session Initiation Protocol", March 1999,
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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 specified in [RFC2119].

All subclause, clauses and appendixes, except "Scope" and "Introduction", 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-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.

Active PoC Dispatcher PoC User currently taking the role of PoC Dispatcher for all the Dispatch PoC Sessions of a Dispatch PoC Group. The Active PoC Dispatcher can change along time between PoC Users that are allowed the role of PoC Dispatcher for the Dispatch PoC Group (e.g. through role transfer mechanisms).

Active PoC Session A PoC Session that carries both RTP and MBCP/TBCP based packets to the PoC User. If the PoC User has multiple PoC Sessions, at most only one can be active at any given time.

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.

Anonymous PoC Address A PoC Address identifies a PoC User who has requested privacy. The Anonymous PoC Address is of the form that the hostname of URI is "anonymous.invalid" and 'user' is of the form "anonymous-n". Anonymous PoC Addresses are scoped within a given PoC Session.

Answer Mode A PoC Client mode of operation for the terminating PoC Session invitation handling.

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.

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 Session A PoC Session established to a Chat PoC Group.

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.

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.
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.
Dormant PoC Session	A PoC Session in which the PoC User receives MBCP/TBCP messages and no RTP Media. If the PoC User has multiple PoC Sessions, all except at most one PoC Session are dormant.
Group	A predefined set of Users together with its policies and attributes. A Group is identified by a SIP 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.
Implicit Media Burst Request	A Media Burst request that is inferred from the receipt of a SIP INVITE request or a SIP REFER request as specified in [OMA-PoC-CP] "*Implicit Media Burst request*".
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.
Inviting PoC User	The PoC User who invites other PoC User(s) to a PoC Session.
Local Granted Mode	A permission for a PoC User to start sending Media prior to receiving the MBCP Media Burst Grant message.
LockIn PoC Session	A PoC Session, which the PoC User is locked in when using Simultaneous PoC Sessions.
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 this document.
Media Parameters	Media Parameters are SIP/SDP based information exchanged between the PoC Server and the PoC Client, between the PoC Server and the PoC Box and between PoC Servers that specify the characteristics of the Media for a PoC Session being established or that already exists.
Media Stream	An instance of the transmission of a Media Type, which is used as the basic unit to distinguish each Media flow. Multiple Media Streams can be combined to transmit multimedia.

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)

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.

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.

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.

Participant A Participant is a PoC User in a PoC Session.

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 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.

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 Name Indicates the name of the PoC Group that can be presented to the PoC User.

PoC Group Session A Pre-arranged PoC Group Session, Ad-hoc PoC Group Session or Chat PoC Group Session.

PoC Media Traffic Optimisation A mechanism for reducing PoC Media traffic via the PoC-4 reference point.

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 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 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 Speech	Communication of speech as defined by PoC version 1.0.
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-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.
RTP Media	The Media carried in an RTP payload.
RTP Session	Considered as an association that allows exchange of RTP Media Streams and RTCP messages among a set of PoC functional entities.
Secondary PoC Session	A PoC Session for which the PoC User receives Media when there is no Media present on the Primary PoC Session.
Sender Identification	The procedure by which the identity of the current Media sender is determined and made known to receivers on the PoC Session.
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.
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.
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.
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.

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.

3.3 Abbreviations

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

APP	Application defined RTCP packet
CNAME	Canonical name
GPS	Global Positioning System
ID	Identity
IETF	Internet Engineering Task Force
IP	Internet Protocol
MB_Ack	MBCP Media Burst Acknowledgement message
MB_Deny	MBCP Media Burst Deny message
MB_Granted	MBCP Media Burst Granted message
MB_Idle	MBCP Media Burst Idle message
MB_Queued	MBCP Media Burst Request Queue Status message
MB_Release	MBCP Media Burst Release message
MB_Request	MBCP Media Burst Request message
MB_Revoke	MBCP Media Burst Revoke message
MB_seg_Preload_in 200	Media Buffering Segment Preload in SIP 200 "OK"
MB_Taken	MBCP Media Burst Taken message
MBCP	Media Burst Control Protocol
MSRP	Message Session Relay Protocol

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

NAT	Network Address Translators
NAME	User Name SDES Item
NTP	Network Time Protocol
OMA	Open Mobile Alliance
PoC	Push to talk over Cellular
PT	Payload Type
QoE	Quality of Experience
RFC	Request For Comments (IETF specification)
RR	Receiver Report

RTCP	R TP Control Protocol
RTP	Real-time Transport Protocol
SCR	Static Conformance Requirement
SDES	Source Description RTCP Packet
SDP	Session Description Protocol
SIP	Session Initiation Protocol
SR	Sender Report
SSRC	Synchronization source
UDP	User Datagram Protocol

4. Introduction

4.1 Overview

This document describes the User Plane aspect of the PoC service. This document also gives an overview of the Discrete Media User Plane aspect of PoC service, details of which are defined in [OMA-IM-TS] and as endorsed in [OMA-PoC-IM]. The Control Plane is specified in [OMA-PoC-CP].

The PoC Service supports half-duplex type of communication for both Continuous Media and Discrete Media Types. Alternatively, PoC Clients in a PoC Session could select to send Discrete Media at any time. The PoC Client does not send a continuous stream of Media packets instead the Media is sent in bursts, in this document referred to as a Media Burst. A Talk Burst is the Media Burst, where the sent Media is PoC Speech. A Continuous Media Burst consists of one or more RTP Media packets and the Media Burst starts when the PoC Client sends the first RTP Media packet and it ends when the PoC Client sends the last RTP Media packet. The Discrete Media Burst consists of one or several messages delivered over MSRP as specified in [OMA-PoC-IM].

A PoC Server (referred to as the Controlling PoC Function in the [OMA-PoC-AD]) located between the PoC Clients communicating with each other acts as an arbitrator and controls the sending of Media Burst using a Media Burst Control Protocol (MBCP). In many of the PoC Service scenarios also a PoC Server (referred to as the Participating PoC Function in [OMA-PoC AD]) can be inserted in the Media path.

Before a PoC Client can send a Media Burst the PoC Client has to ask for permission from the PoC Server performing the Controlling PoC Function. Other PoC Clients in a PoC Session receive an indication about the identity of the PoC Client sending the Media Burst, subject to privacy.

For PoC Clients located on mobile devices the quality of the transmission can vary depending on access network and distance to the base station. This implies that the quality of sent Continuous Media Burst needs to be controlled using RTCP and, when needed, Media Parameters are changed for improving the PoC User's experience.

The State machines are used by the PoC Server, the PoC Client and the PoC Box to control each separate Media Floor Control Entity. Media Streams including one or more Media Types are bound to Media-floor Control Entities.

The state machines for the PoC Server are specified in subclause 6.3 "*Procedures at the PoC Server performing the Participating PoC Function*" and 6.4 "*Procedures at the PoC Server performing the Controlling PoC Function*".

The state machines for the PoC Client are specified in subclause 6.2 "*Procedures at the PoC Client*".

The state machines for PoC Box are specified in subclause 6.6 "*Procedures at the UE PoC Box*" and 6.7 "*Procedures at the NW PoC Box*".

4.2 User Plane routing

Figure 1 "*Entities in the User Plane*" shows the entities active in the User Plane in a PoC Session and the relevant User Plane interfaces in between.

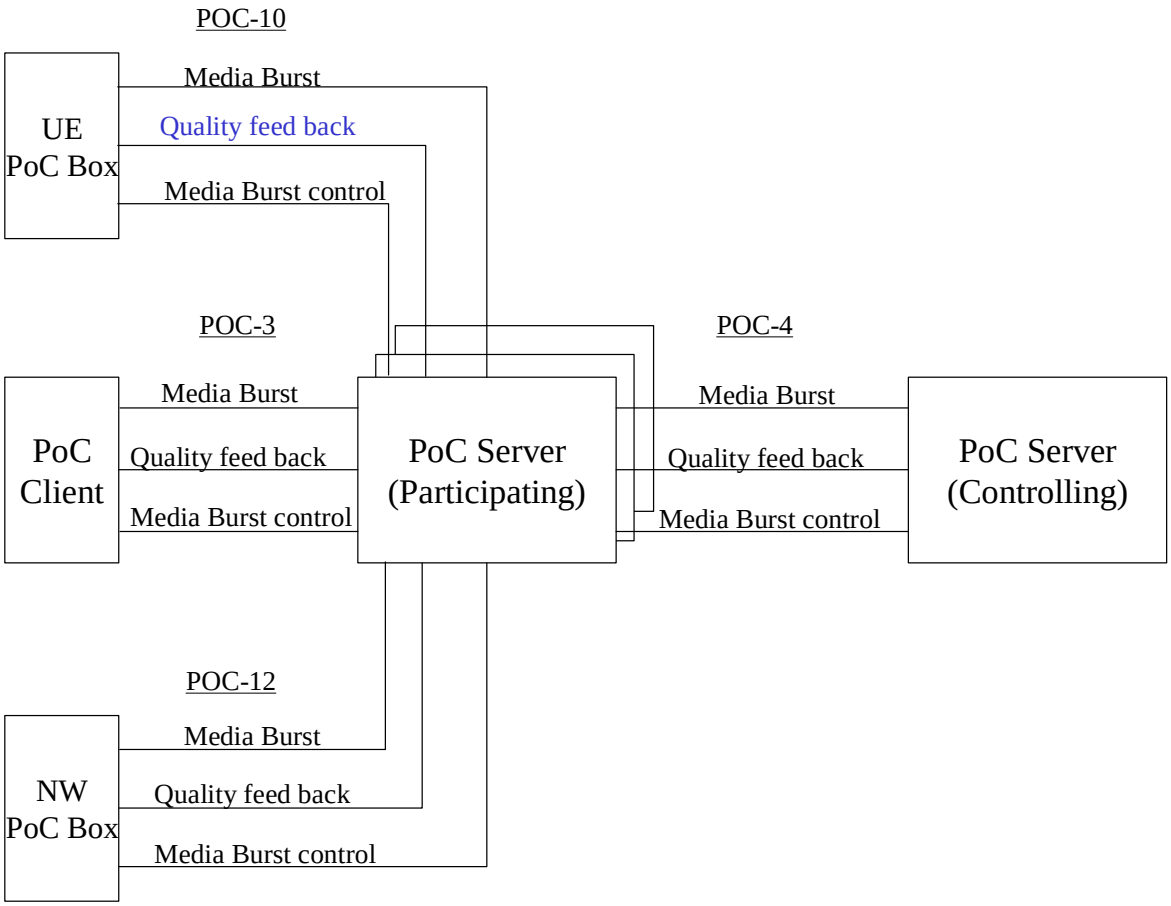


Figure 1: Entities in the User Plane

All RTP Media packets, MSRP messages, RTCP packets and MBCP messages flow through the PoC Server performing the Participating PoC Function (if inserted in the transport path) are terminated in the PoC Server performing the Controlling PoC Function.

Media Burst Control, MSRP message replication and RTP Media packet replication are done in Controlling PoC Functions.

The transport path between the PoC Client and the PoC Server performing the Controlling PoC Function is established on a per PoC Session basis as specified in [OMA-PoC-CP].

The transport path between the PoC Box (the NW PoC Box or the UE PoC Box) and the PoC Server performing the Controlling PoC Function is established on a per PoC Session basis as specified in [OMA-PoC-CP].

When the PoC Session is established, the PoC Server performing the Participating PoC Function normally includes itself into the transport path to relay the MSRP messages, RTP Media packets, RTCP packets and MBCP messages between the PoC Client or the PoC Box and the PoC Server performing the Controlling PoC Function and act as a RTP translator according to [RFC3550] and MSRP relay according to [OMA-PoC-IM].

Figure 2 "*Transport Path Options*" shows the 2 options for the transport path.

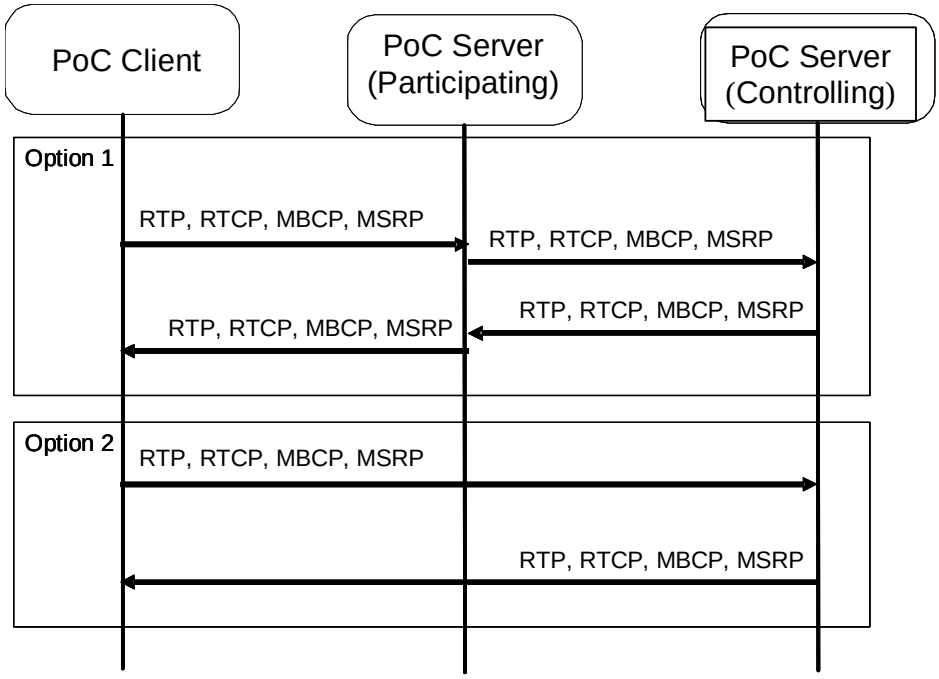


Figure 2: Transport path options

Option 1 is the case where a PoC Server performing the Participating PoC Function has inserted itself in the transport path. When included in the transport path the PoC Server performing the Participating PoC Function forwards MSRP messages, RTP Media packets, RTCP packets and MBCP messages between the PoC Client or the PoC Box and the PoC Server performing the Controlling PoC Function.

Examples of when the PoC Server performing the Participating PoC Function is in the transport path (Option 1) are:

- The PoC Session is over a Pre-established Session;
- The PoC Client and that PoC Server support Simultaneous PoC Sessions;
- The PoC Server needs transport information to support charging;
- The PoC Service Provider has configured the Participating PoC Function to be in the transport path;
- The PoC Server is used for transcoding or other Media translation;
- The PoC Server is used to support lawful intercept; and,
- The PoC Server is in the terminating PoC Network and the use of QoE Profiles is enabled.

In option 2, a PoC Server performing the Participating PoC Function has not inserted itself in the transport path. In this case the PoC Client or the PoC Box and the PoC Server performing the Controlling PoC Function send the MSRP messages, RTP Media packets, RTCP packets and MBCP messages directly between each other.

5. Transport

5.1 Internet Protocol

The IP domain for the PoC User Plane for a PoC Client, a PoC Box or a PoC Server SHALL be the same IP domain as the SIP/IP Core. (e.g., if the SIP/IP Core uses IPv4, the PoC Clients, the UE PoC Boxes, the NW PoC Boxes and PoC Servers in that network use IPv4 for the User Plane.)

NOTE: In case different domains have different IP versions, an IP protocol translator (e.g. NAT-PT) and an application level getaway (e.g. SIP-ALG) is needed, if PoC Servers do not support dual stack operation.

5.2 UDP

The User Datagram Protocol (UDP), as defined in [RFC768], SHALL be used as Continuous Media transport protocol over the POC-3, POC-4, POC-10 and POC-12 reference points.

5.2.1 Port Numbers

The UDP port numbers are used to identify the endpoints of the Continuous Media packets, MBCP messages and RTCP packets and SHALL be exchanged during the SIP Session establishment phase.

If the PoC Server performing the Participating PoC Function will be present in the Media path, the PoC Server performing the Participating PoC Function SHALL provide its port numbers for the Continuous Media and Media Burst Control Protocol part of the User Plane to the PoC Client or to the PoC Box and to the PoC Server performing the Controlling PoC Function during the SIP Session establishment phase.

If the PoC Server performing the Participating PoC Function will not be present in the Media path, the PoC Server performing the Participating PoC Function SHALL forward to the PoC Server performing the Controlling PoC Function the port numbers that it received from the PoC Client or from the PoC Box and return to the PoC Client or to the PoC Box the port numbers that it receives from the PoC Server performing the Controlling PoC Function.

The PoC Server SHALL use the same UDP port number for sending and receiving Continuous Media. The PoC Server SHALL use the same UDP port number for sending and receiving MBCP messages.

The PoC Client SHOULD use the same UDP port number for sending and receiving Continuous Media. The PoC Client SHOULD use the same UDP port number for sending and receiving MBCP messages.

The NW PoC Box SHOULD use the same UDP port number for sending and receiving MBCP messages.

The NW PoC Box SHOULD use the same UDP port number for sending and receiving Continuous Media.

NOTE 1: The UE PoC Box is only receiving Media hence no special requirements for selecting Continuous Media port applies.

NOTE 2: The sending port is not carried in SDP. This can allow a threat of masquerading the sending PoC Client to be imposed by other PoC Client that has the same IPv4 address, though the sending port number can be different. This is possible because the PoC Server cannot associate the SSRC with the Contact address of the PoC Client. Thus the PoC Client is recommended to use the same port for sending and receiving Media Streams. The same applies to the MBCP messages.

In case of Simultaneous PoC Sessions, the PoC Server performing the Participating PoC Function SHALL use a unique UDP port number for Media Streams per PoC Session towards the PoC Client. The PoC Server performing the Participating PoC Function SHALL use a unique UDP port number per Media-floor Control Entity for MBCP messages towards the PoC Client using Simultaneous PoC Sessions.

NOTE 3: Unique port numbers identify a Media-floor Control Entity and the Media-floor Control Entity identifies the PoC Session.

5.3 RTP

The Real-time Transport Protocol (RTP), as defined in [RFC3550], provides means for sending real-time data over UDP. In PoC, Media related to a Continuous Media over reference points POC-3, POC-4, POC-10 and POC-12 SHALL be transported by RTP/UDP/IP.

The Media SHALL be encapsulated in the RTP packets with Media specific RTP payload formats.

A PoC Client MAY send RTP Media packets without payload (referred to as "RTP "dummy" packets) in order to keep the Media path open through Network Address Translators (NAT).

NOTE 1: The PoC Server discards RTP Media packets without payload if received.

NOTE 2: How often the PoC Client needs to send the RTP Media packet without the payload is out of scope of this specification.

NOTE 3: The method how to determine if the PoC Client is behind a NAT or not is out of scope of this specification. However, one method for determine whether a PoC Client is behind a NAT or not is described in the [RFC3489bis]. Another method could be configuration of the PoC Client.

Before sending the first RTP Media packet, RTCP packet or Media Burst Control Protocol message in a PoC Session, the PoC Client, the PoC Server, the NW PoC Box or the UE PoC Box SHALL assign itself a SSRC identifier for the PoC Session. A suitable algorithm to generate the SSRC identifier is described in [RFC3550]. The allocated SSRC identifier SHALL NOT be 1111…1 (all 32 bits 1's), because this SSRC identifier is reserved for a special use.

5.4 RTCP

The PoC Client, the UE PoC Box, the NW PoC Box, the PoC Server performing the Controlling PoC Function and the PoC Server performing the Participating PoC Function SHALL support the RTP Control Protocol (RTCP), according to rules and procedures as specified in [RFC3550], with the clarifications in this subclause.

The MBCP messages SHALL be sent as RTCP APP packets.

When one Continuous Media is bound to a Media Floor Control Entity the MBCP messages SHOULD be sent to the same UDP port as the other RTCP packets.

When more than one Continuous Media is bound to a Media Floor Control Entity the MBCP messages SHOULD be sent to the one of the UDP port as the other RTCP packets for one of the Continuous Media bound to the Media Floor Control Entity.

NOTE 1: When only Discrete Media is bound to a Media-floor Control Entity a port independent on RTCP is selected for MBCP messages.

The PoC Client, the UE PoC Box, the NW PoC Box, the PoC Server performing the Controlling PoC Function and the PoC Server performing the Participating PoC Function:

- SHALL support the creation, modification and processing of the content in MBCP packets.

A PoC Client MAY send RTP Media packets without payload (referred to as "RTP "dummy" packets) to the port used for MBCP if MBCP uses a different UDP port than any of the ports used for RTCP for any of the Continuous Media or when MBCP is not using the RTCP port of any Continuous Media in order to keep the Media path open through Network Address Translators (NAT).

NOTE 2: The PoC Server discards RTP Media packets without payload if received.

NOTE 3: How often the PoC Client needs to send the RTP Media packet without the payload is out of scope of this specification.

NOTE 4: The method how to determine if the PoC Client is behind a NAT or not is out of scope of this specification. However, one method for determine whether a PoC Client is behind a NAT or not is described in the [RFC3489bis]. Another method could be configuration of the PoC Client.

RTCP packets, other than those used for MBCP messages, SHALL be RTCP compound packets according to rules and procedures as specified in [RFC3550]. MBCP messages SHOULD NOT be formatted as RTCP compound packets.

NOTE 5: Since the MBCP messages are not formatted as compound packets in compliance with [RFC3550], the Media Burst Control Protocol can be implemented separately from other standard RTCP message processing. By separating the MBCP messages, it is easier for the PoC Servers to forward these messages to the proper handling function.

The UE PoC Box, the NW PoC Box and the PoC Client,

- SHALL at the minimum support the reception of RTCP packets, in addition to those used for MBCP messages.

NOTE 6: If the PoC Client, the UE PoC Box, the NW PoC Box, supports the minimum level of RTCP, the PoC Client, the UE PoC Box or the NW PoC Box discards received RTCP packets.

- MAY support the creation and processing of the content in RTCP packets, in addition to those used for MBCP messages, to provide means for User Plane adaptation, feedback of the quality of the RTP Media packet transmission and give a persistent transport-level identifier for the RTP source.

The PoC Server performing the Controlling PoC Function and the PoC Server performing the Participating PoC Function:

- SHALL support the reception of RTCP packets, in addition to those used for MBCP messages.
- SHALL support forwarding of RTCP packets, in addition to those used for MBCP messages.
- MAY support creation, modification and processing of the content in RTCP packets, in addition to those used for MBCP messages, to provide means for User Plane adaptation and feedback of the quality of the RTP Media packet transmission.

NOTE 7: To reduce network load, it is beneficial if the RTCP compound packets created, modified or processed by the PoC Client, the PoC Box and the PoC Server only contains the mandatory RTCP packets required for that RTCP compound packet as specified in [RFC3550].

To reduce potential degradation of the quality of the RTP Media packet transmission, the PoC Client, the UE PoC Box, the NW PoC Box and the PoC Server SHOULD NOT schedule transmission of RTCP packets during a Media Burst as specified in 7.1 "*Quality feed back*".

The PoC Client, the UE PoC Box and the NW PoC Box SHOULD NOT send a RTCP BYE packet when leaving the PoC Session. The PoC Server performing the Controlling PoC Function and the PoC Server performing the Participating PoC Function SHOULD NOT send RTCP BYE packets when the PoC Session is released.

NOTE 8: The PoC service do not require control signalling in the RTP Session by RTCP to indicate which Participants that are leaving the PoC Session, and the PoC service entities do need to keep track of the number of Participants to calculate the transmission interval of RTCP. Therefore, the PoC Clients, the PoC Boxes and PoC Servers do not need to send RTCP BYE packets.

5.5 MSRP

The PoC Server performing the Controlling PoC Function SHALL support the Message Session Relay Protocol (MSRP) for the Discrete Media as specified in [OMA-IM-TS] and as endorsed in [OMA-PoC-IM].

The PoC Server performing the Participating PoC Function SHALL support the Message Session Relay Protocol (MSRP) for Discrete Media as specified in [OMA-IM-TS] and as endorsed in [OMA-PoC-IM].

The PoC Client, the UE PoC Box and the NW PoC Box MAY support the Message Session Relay Protocol (MSRP) for Discrete Media, according to rules and procedures as specified in [OMA-IM-TS] and as endorsed in [OMA-PoC-IM].

The MSRP message sending MAY be arbitrated by Media-floor Control Entity as specified in this document.

The PoC Server SHALL send Discrete Media Transfer Progress Report or Discrete Media Transfer Final Report or both if negotiated in [OMA-PoC-CP].

NOTE 1: If neither Discrete Media Transfer Progress Report nor Discrete Media Transfer Final Report is requested, the MSRP REPORT is sent and received according to rules and procedures of [OMA-PoC-IM].

NOTE 2: When the TCP connection is established the initiator of the TCP connection (the PoC Server or the PoC Client) sends an empty MSRP SEND request towards the remote side of the TCP connection as specified in [RFC4975] "*MSRP Connection Mode*" in order to bind the TCP connection to the MSRP session.

NOTE 3: The first received MSRP message is ignored by the receiver.

The PoC functional entities supporting MSRP SHALL establish the TCP connection used for the MSRP towards the IP address included in the SDP c= line and the TCP port included in the SDP m= line of the MSRP SDP media description as specified in the [RFC4566] in the SDP body negotiated in the [OMA-PoC-CP].

6. Media Burst Control

This subclause describes the Media Burst Control Protocol (MBCP).

NOTE 1: Some Media Burst Control Protocol procedures allow usage of Talk Burst Control Protocol messages, if the Talk Burst Control Protocol is negotiated instead of Media Burst Control Protocol.

NOTE 2: Other protocols for handling Media Burst Control can be used but they are not specified by this document.

6.1 General

Media Burst Control SHALL use the ports (in the PoC Client, PoC Box and PoC Servers) negotiated at the SIP Session establishment.

The PoC Client and the PoC Server SHALL support the following basic Media Burst Control Protocol messages:

- MBCP Media Burst Request – is used by the PoC Client to request permission from the PoC Server to send a Media Burst.
- MBCP Media Burst Granted – is used by the PoC Server to notify the PoC Client that it has been granted permission to send a Media Burst. The Controlling PoC Function includes information about the stop talking timer and can include the number of Participants connected to the Media-floor Control Entity at the time that this message is sent.
- MBCP Media Burst Deny – is used by the PoC Server to notify a PoC Client that it has been denied permission to send a Media Burst.
- MBCP Media Burst Release – is used by the PoC Client to notify the PoC Server that it has completed sending the Media Burst or it cancels the permission before sending Media Burst or it requests the PoC Server to cancel the queued Media Burst request when queuing is supported by the PoC Client and PoC Server.
- MBCP Media Burst Idle– is used by the PoC Server to notify all PoC Clients that no one has the permission to send a Media Burst at the moment and that the PoC Server can accept the MBCP Media Burst Request message.
- MBCP Media Burst Taken – is used by the PoC Server to notify all PoC Clients, except the PoC Client that has been given permission to send a Media Burst that another PoC Client has been given permission to send a Media Burst.

NOTE 1: In the case of privacy the real identity of the PoC User, with the permission to send a Media Burst, is replaced with an anonymous identity as specified in [OMA-PoC-CP] "*Anonymous PoC Address*".

- MBCP Media Burst Revoke - is used by the PoC Server to revoke the permission to send Media from a PoC Client and can be used for pre-emption functionality, but is also be used by the system to prevent overly long use of the Media-floor Control Entity.
- MBCP Media Burst Acknowledgement – is used by the PoC Client, when acknowledgement is required in the received MBCP message.

If the PoC Server and the PoC Client support Pre-established Sessions, the PoC Client and the PoC Server SHALL support the following additional MBCP Control message:

- MBCP Connect - is used by the PoC Server to notify the served PoC Client using a Pre-established Session, that a PoC Session is connected.
- MBCP Disconnect – is used by the PoC Server to close the PoC Session using a Pre-established Session while maintaining the Pre-established Session.

A PoC Server performing the Controlling PoC Function and supporting queuing of MBCP Media Burst Request messages, a PoC Client supporting queuing of the MBCP Media Burst Request message and a PoC Server performing the Participating PoC Function inserted in the Media path SHALL support the following additional Media Burst Control Protocol messages:

- MBCP Media Burst Request Queue Status – is used by the PoC Server to notify the PoC Client that the MBCP Media Burst Request has been queued.

NOTE 2: The PoC Server performing the Participating PoC Function normally only has to transparently transport the MBCP message unless the PoC Server supports Pre-established Session or Simultaneous PoC Sessions.

A Participating PoC Server SHALL send the MBCP Media Burst Acknowledgment message when a MBCP message requires an acknowledgment.

The Media Burst Control Protocol reliability SHALL be ensured thru timer-based retransmissions. Timers are defined in subclause 9.1 "*Timers in the PoC Server performing the Controlling PoC Function*", 9.2 "*Timers in the PoC Server performing the Participating PoC Function*", "*Timers in the PoC Client*" and 9.4 "*Timers in the PoC Box*".

6.2 Procedures at the PoC Client

6.2.1 PoC Client procedures at PoC Session initialization

When a PoC Session is established for a PoC Client, a new instance of the 'PoC Session control state machine – basic' is created or 'PoC Session control state machine – queuing' is created for each agreed Media-floor Control Entity.

This applies to all cases of PoC Session establishment, that is:

- PoC Sessions using On-demand Session signalling origination or termination, or,
- PoC Sessions using Pre-established Session where the PoC Client initiates the PoC Session by sending a SIP REFER request; or,
- PoC Sessions using Pre-established Session where the PoC Server performing the Participating PoC Function sends a MBCP Connect message.

The SIP INVITE request or the SIP REFER request sent by the PoC Client

- can be regarded an implicit MBCP Media Burst Request message if a 1-1 PoC Session or an Ad-hoc PoC Group Session or a Pre-Arranged PoC Group Session is initiated when only PoC Speech is bound to the Media-floor Control Entity and if 'imp_mb_req' is not negotiated; or,
- can be regarded as an implicit MBCP Media Burst Request message if the parameter 'imp_mb_req=1' is negotiated and accepted by the PoC Server as specified in [OMA-PoC-CP] "*Media Burst Control Protocol MIME registration*"; or,
- can not be regarded as an implicit MBCP Media Burst Request message if a Chat PoC Group Session is initiated or in case of a rejoin to an already on-going PoC Session and if 'imb_mb_req' is not negotiated.

Based on the negotiations during PoC Session establishment either the basic or the optional queuing state machine is started for each agreed Media-floor Control Entity.

The state machines are defined in subclauses 6.2.5 "*PoC Session control state diagram – basic*" and 6.2.9 "*PoC Session control state diagram – Queuing*".

If Simultaneous PoC Sessions are supported, multiple instances of the PoC Session control state machine can be executing at the same time. For the purposes of this specification, each state machine operates independently and both the basic and the optional queuing state machine can be executing simultaneously. When the second PoC Session is created, within each PoC Session control state machine, basic or queuing, a sub-state machine is created for the 'U: not permitted and MB_Taken' state. This state machine is specified in subclause 6.2.8 "*PoC Session control state diagram – Simultaneous PoC Sessions*".

The PoC Client can negotiate the use of prioritization of MBCP Media Burst Request messages for each agreed Media-floor Control Entity. In that case, the PoC Client can request permission to send Media at a priority level that is either the same as or lower than the highest priority that was permitted to the Participant in the PoC Session initialization for the Media-floor Control Entity. If a PoC Client is authorized for pre-emptive priority in the PoC Session initialization for the Media-floor Control Entity it is good practise to always request permission to send Media at a priority level that is lower than pre-emptive priority unless the Participant explicitly requests to pre-empt the current Media sender.

6.2.2 PoC Client procedures at Pre-established Session initialization

When Pre-established Session is created, the PoC Client creates an instance of the PoC Session control state machine –Pre-established Session, as defined in subclause 6.2.6 "*PoC Session control state diagram –Pre-established Session*". There is one instance of this state machine for each Pre-established Session. This does not cause an instance of a 'PoC Session control state machine – basic' or a 'PoC Session control state machine – queuing 'to be created. The instance of the 'PoC Session control state machine – basic' or the 'PoC Session control state machine – queuing' will be created when a PoC Session is initiated.

6.2.3 PoC Client procedures at PoC Session release

PoC Session release (whether it is initiated by the PoC Client or PoC Server) is a two-stage procedure.

In the first stage, the PoC Client stops sending MBCP messages for each Media-floor Control Entity and sending or playing Media for each Media Type.

In the second stage, when the Control Plane has determined that the PoC Session has been released, the corresponding instance of the PoC Session control state machine for each Media-floor Control Entity is also terminated and the PoC Client releases all the resources needed by the used Media Types.

The User Plane can initiate the first stage, but the Control Plane always initiates the second stage.

If the PoC Session is established over a Pre-established Session, the normal case for PoC Session release is to receive a MBCP Disconnect message from the Participating PoC Function. When the MBCP Disconnect message is received, the PoC Session control state machine initiates the PoC Session release.

If Simultaneous PoC Sessions are supported, each instance of the 'PoC Session control state machine – basic' or the 'PoC Session control state machine – queuing' will be terminated independently based on the state of the associated PoC Session.

6.2.4 PoC Client procedures at Pre-established Session release

The User Plane resources for a Pre-established Session are released after the Control Plane has released the Pre-established Session. This means that any PoC Session over the Pre-established Session has been released before the Pre-established Session is released and so, there are no RTP Media packets or MBCP messages flowing at the time that the Pre-established Session is released. All that the PoC Client needs to do is to release any User Plane resources associated with the Pre-established Session.

6.2.4A PoC Client procedures at PoC Session modification

6.2.4A.1 PoC Client procedures when connecting to a Media Type

When a new Media-floor Control Entity is offered by PoC Client to the PoC Server, a new instance of the 'PoC Session control state machine – basic' or 'PoC Session control state machine – queuing' is created for the Media-floor Control Entity and started based on the negotiation result. The state machines are defined in subclauses 6.2.5 "*PoC Session control state diagram – basic*" and 6.2.9 "*PoC Session control state diagram – Queuing*".

When a Continuous Media is accepted by the PoC Server to the PoC Session, the 'PoC Session control state diagram – Simultaneous per PoC Client' is created and started, if not already started. The state machine is defined in subclauses 6.2.7 "*PoC Session control state diagram – Simultaneous per PoC Client*".

NOTE: When a Continuous Media is connected, the Simultaneous PoC Sessions state machine is created and started in a special case, when the PoC Client has e.g. two PoC Sessions: one having only Discrete Media and another one having PoC Speech and when PoC User adds PoC Speech to the first PoC Session.

When the new Media-floor Control Entity offered by PoC Client to the PoC Server is rejected, the corresponding instance of the PoC Client state machine for basic operation or the PoC Session control state machine for queuing.

If connecting to a Media Type is agreed, the PoC Client starts using the connected Media Type.

6.2.4A.2 PoC Client procedures when disconnecting from a Media Type

If removing a Media-floor Control Entity or changing the Media-floor Control Entity bindings or if disconnecting from an existing Media Type the PoC Client:

1. SHALL release the permission to send Media as specified in subclause 6.2.5.4.2 "*Send MBCP Media Burst Release message (S: MB_Release)*" if the PoC Client has the permission to send Media; and,
2. SHALL stop sending Media Burst Control messages associated with the Media-floor Control Entity.

NOTE 1: Received Media or Media Burst Control messages are handled as specified in 6.2.5 "*PoC Session control state diagram – basic*".

When disconnecting from an existing Media Type is agreed, the PoC Client SHALL release resources used by the disconnected Media Type.

When removing of an existing Media-floor Control Entity is agreed, the corresponding instance of the PoC Client state machine diagram for basic operation or the PoC Session control state machine for queuing SHALL be terminated.

When the Media-floor Control bindings are changed the PoC Client SHALL not send Media and Media Burst Control messages according to the old binding.

NOTE 2: The ports to send Media and MBCP messages to is negotiated in the [OMA-PoC-CP] "*Procedures in the PoC Client*".

6.2.5 PoC Session control state diagram – basic

NOTE 1: When the PoC Client negotiates the Talk Burst Control Protocol as specified in [OMA-PoC-1-UP] instead of the Media Burst Control Protocol, the PoC Client acts as specified in [OMA-PoC-1-UP].

The PoC Client SHALL support the state diagram and the state transitions specified in this subclause for PoC Speech.

The PoC Client SHALL support the state diagram and the state transitions specified in this subclause for other Media Types than PoC Speech if other Media Types are bound to a Media-floor Control Entity.

NOTE 2: In the case the PoC Client supports Discrete Media not bound to a Media-floor Control Entity the state diagram and the state transitions specified in this subclause are not used for Discrete Media.

NOTE 3: The sending or receiving of reports related to Discrete Media are described in subclauses 7.12 "*Discrete Media Transfer Final Report*" and 7.13 "*Discrete Media Transfer Progress Report*".

Figure 3 "*PoC Client state transition diagram for basic operation*" shows the state diagram.

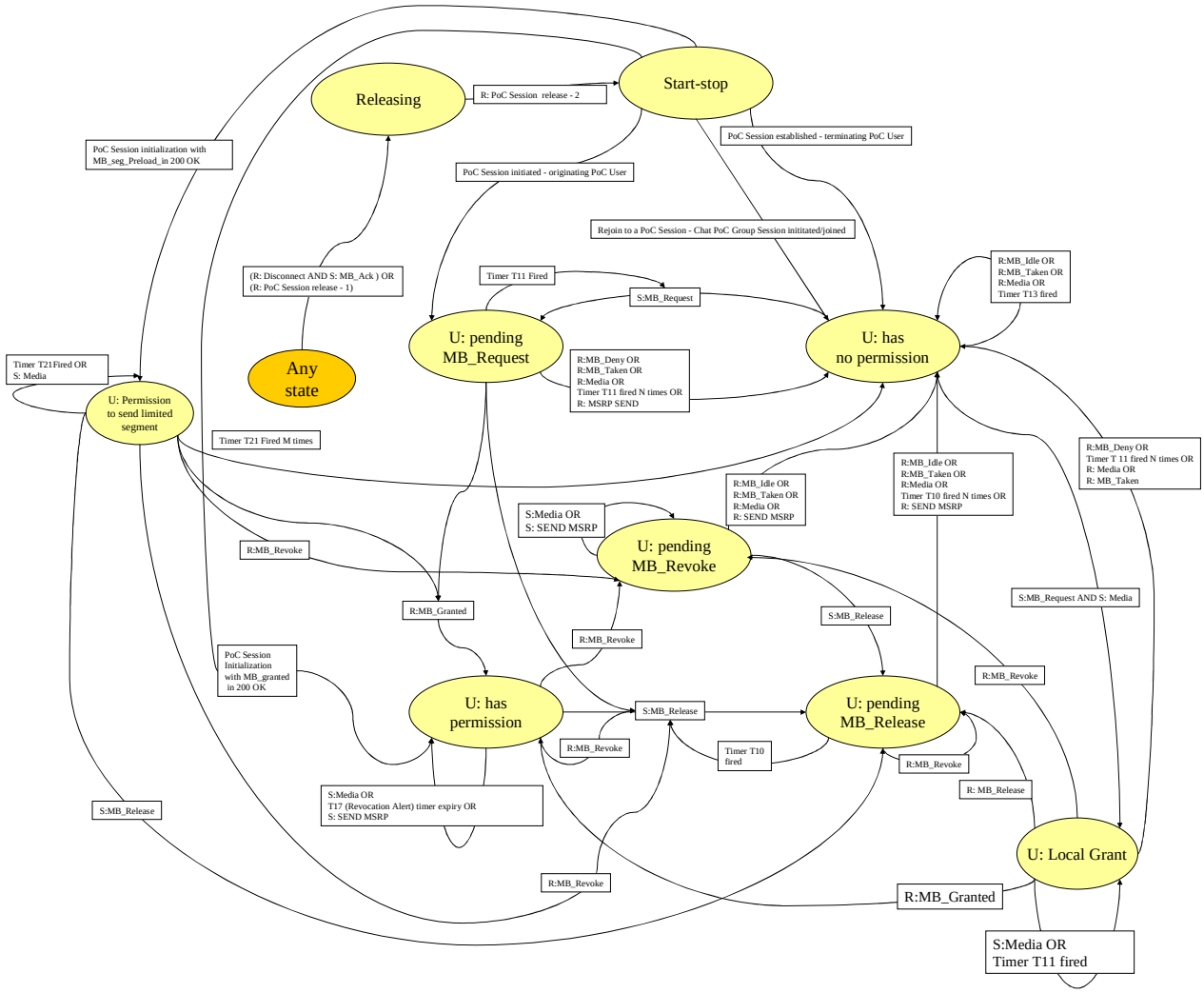


Figure 3: PoC Client state transition diagram for basic operation

State details are explained in the following subclauses.

If a MBCP message a MSRP message, a MSRP response or a RTP Media packet arrives in any state and there is no procedure specified in the subclauses below the PoC Client SHALL discard the MBCP message, the MSRP message, the MSRP response or the RTP Media packet and SHALL remain in the current state.

6.2.5.1 State 'Start-stop'

In this state no Media-floor Control Entity exists.

If the PoC Client supports Media buffering capability the PoC Client could already be buffering Media when the PoC Client enters this state.

6.2.5.1.1 PoC Session initiated – originating PoC User

When a PoC Session is initiated as described in [OMA-PoC-CP] "*Using Pre-established Session*" or in [OMA-PoC-CP] "*Establishment of an On-demand Session*" the originating PoC Client:

1. SHALL create an instance of the 'PoC Client state transition diagram for basic operation' state machine; and,

2. if the originating PoC Client receives a MBCP message before it receives the SIP 200 "OK" response, the PoC Client SHALL store the MBCP message.

NOTE: The originating PoC Client might receive a MBCP message before the SIP 200 "OK" response, because of processing delays of the SIP 200 "OK" in the SIP/IP Core. Regardless the order the PoC Client receives the SIP 200 "OK" response and the MBCP message, the PoC Client must wait for SIP 200 "OK" before moving out from the Start-Stop state.

3. If the value of the Session Type uri parameter received in the Contact header of the SIP 200 "OK" response is "chat" the PoC Client:

   a. SHALL enter the 'U: has no permission state.

4. If the value of the Session Type uri parameter received in the Contact header of SIP 200 "OK" response is different from "chat" the PoC Client,

   a. for an On-demand Session if tb_granted parameter is either not received or received with the value 0 in the SIP 200 "OK" response as specified in [OMA-PoC-CP] "*Controlling PoC Function procedures*"; the PoC Client:

      i. SHALL start timer T11 (Media Burst Request); and,

      ii. in case that the PoC Client has received and stored a MBCP message before the reception of the SIP 200 "OK" response, the PoC Client SHALL act as if the MBCP message was received in the 'U: pending MB_Request' state, and not continue with the steps subsequent to this paragraph.

      iii. SHALL enter the 'U: pending MB_Request' state.

   or,

   b. for an On-demand Session if tb_granted parameter is received and set to 1 in the SIP 200 "OK" response as specified in [OMA-PoC-CP] "*Controlling PoC Function procedures*" the PoC Client:

      i. SHALL enter the 'U: has permission' state.

   or,

   c. for an On-demand Session if tb_seg_preload parameter is received and set to a non zero value in the SIP 200 "OK" response as specified in [OMA-PoC-CP] "*Controlling PoC Function procedures*" the PoC Client:

      i. SHALL perform actions specified in subclause 6.2.5.9.1 "*Enter State U: Permission to send limited segment*".

   or,

   d. for a Pre-established Session, when sending a SIP REFER request, the PoC Client:

      i. SHALL enter the 'U: pending MB_Request' state.

When the PoC Client is rejoining an ongoing PoC Session as described in [OMA-PoC-CP] "*PoC Client rejoining a PoC Session*" the PoC Client:

1. SHALL enter the 'U: has no permission state'.

6.2.5.1.2 PoC Session established – terminating PoC User

When a PoC Session is established the terminating PoC Client:

1. SHALL create an instance of a PoC Client state transition diagram for basic operation state machine; and,

2. SHALL enter the 'U: has no permission' state.

NOTE: From a PoC Client perspective the PoC Session is established when the PoC Client sends the SIP 200 "OK" response or the MBCP Media Burst Acknowledgement message after reception of the MBCP Connect message.

6.2.5.1.3 Connecting to a Media-floor Control Entity during an ongoing PoC Session

When the PoC Client is connected to a Media-floor Control Entity during a PoC Session as specified in [OMA-PoC-CP] "*PoC Session Modification"* the PoC Client:

1. SHALL enter the 'U: has no permission' state.

6.2.5.2 State: 'U: has no permission'

The 'U: has no permission' state is a stable state and the PoC Client uses this state when the PoC Client is not sending Media or is not waiting for a MBCP message response.

In this state the PoC Client can receive RTP Media packets and MBCP Media Burst Control messages.

6.2.5.2.1 Receive MBCP Media Burst Idle message (R: MB_Idle)

Upon receiving MBCP Media Burst Idle message the PoC Client:

1. MAY provide Media Burst idle notification to the PoC User, if it has not done so;
2. SHALL stop the optional timer T13 (end of RTP Media), if it is running; and,
3. SHALL remain in the 'U: has no permission' state.

6.2.5.2.2 Receive MBCP Media Burst Taken message (R: MB_Taken)

Upon receiving of the MBCP Media Burst Taken message the PoC Client:

1. SHALL send a MBCP Media Burst Acknowledgement message if the MBCP Media Burst Taken message expects an acknowledgement reply;
2. SHOULD perform the mapping between the SSRC of the PoC Client granted a permission to send a Media Burst and the PoC Address or Nick Name or both, if they are included in the message;
3. SHALL provide a Media Burst taken notification to the PoC User;
4. MAY display the PoC Address and Nick Name to the PoC User, if they are included in the message;
5. SHOULD start the optional timer T13 (end of RTP Media) for the Active PoC Session if Continuous Media is bound to the Media-floor Control Entity; and,
6. SHALL remain in the 'U: has no permission' state.

6.2.5.2.3 Receive RTP Media packets (R: Media)

Upon receiving RTP Media packets the PoC Client:

1. SHALL render the Media;
2. MAY display the PoC Address or Nick Name or both based on SSRC of the sending PoC Client, if mapping between those exists in PoC Client;
3. SHOULD restart/start the optional timer T13 (end of RTP Media); and,
4. SHALL remain in the 'U: has no permission' state.

6.2.5.2.4 Send MBCP Media Burst Request message (S: MB_Request)

Upon receiving an indication from the PoC User to request permission to send Media and if timer T12 (Retry after) is not running and if removing a Media-floor Control Entity or changing the Media-floor Control Entity bindings or disconnecting from an existing Media Type is not initiated by the PoC Client the PoC Client:

1. SHALL send the MBCP Media Burst Request message toward the PoC Server;
2. SHALL stop the optional timer T13 (end of RTP Media), if it is running; and,
3. SHALL start timer T11 (Media Burst Request).
4. If Local Granted Mode is not used or not supported the PoC Client:
    a. SHALL enter the 'U: pending MB_Request' state.
5. If Local Granted Mode is supported and used and if only PoC Speech is bound to the Media-floor Control Entity the PoC Client:
    a. SHALL provide Media Burst granted notification to the PoC User;
    b. MAY start sending RTP Media packets when receiving Media from the PoC User; and,
    c. SHALL enter the 'U: Local Grant' state.

6.2.5.2.5 T13 (end of RTP Media) timer fired

On firing of T13 (end of RTP Media) timer, the PoC Client:

1. MAY provide Media Burst idle notification to the PoC User; and,
2. SHALL remain in the 'U: has no permission' state.

6.2.5.2.6 Receiving a MSRP SEND request (R: MSRP SEND)

Upon receiving an MSRP SEND request the PoC Client:

1. SHALL generate and send a MSRP 200 "OK" response according to rules and procedures of [OMA-PoC-IM];
2. MAY render the received content of the MSRP SEND request for the PoC User; and,
3. SHALL remain in the 'U: has no permission' state.

6.2.5.3 State: 'U: pending MB_Request'

The 'U: pending MB_Request' state is a transition state, and the PoC Client uses this state when the PoC Client is waiting for response to a MBCP Media Burst Request message.

In this state the PoC Client can receive RTP Media packets, the MSRP SEND messages and MBCP Media Burst Control messages.

Timer T11 (Media Burst Request) is running in this state.

If the PoC Client supports Media buffering capability the PoC Client can be buffering Media in this state.

This state is not used for Media buffering in the case that Limited Segment Media Buffering is used.

6.2.5.3.1 Receive MBCP Media Burst Granted message (R: MB_Granted)

Upon receiving a MBCP Media Burst Granted message from the PoC Server, the PoC Client:

1. SHALL provide Media Burst granted notification to the PoC User if not already done;

NOTE 1: Providing the Media Burst granted notification to the PoC User prior to receiving the MBCP Media Burst Granted message is an implementation option.

2. MAY provide information about the stop talking timer value to the PoC User;
3. MAY provide notification of the number of Participants connected to the Media-floor Control Entity, receiving the Media Burst in the PoC Session, to the PoC User, if included in the message;
4. SHALL stop timer T11 (Media Burst Request);
5. If MBCP Media Burst Granted message contains Alert-Margin parameter the PoC Client
    a. MAY set the initial value of timer T17 (Revocation Alert) by calculating T2-timer minus Alert-Margin and start the timer T17 (Revocation Alert); and,
    b. MAY start to display the T17 (Revocation Alert) timer, when the value of Alert Margin is zero;

NOTE 2: Advanced Revocation Alert is not valid when only Discrete Media is bound to the Media-floor.

6. SHALL enter the 'U: has permission' state.

6.2.5.3.2 Receive MBCP Media Burst Taken message (R: MB_Taken)

Upon receiving a MBCP Media Burst Taken message from the PoC Server, the PoC Client:

1. SHALL send a MBCP Media Burst Acknowledgement message if the MBCP Media Burst Taken message expects an acknowledgement reply;
2. SHOULD perform the mapping between the SSRC of the PoC Client granted a permission to send a Media Burst and the PoC Address or Nick Name or both, if they are included in the message;
3. SHALL provide a Media Burst taken notification to the PoC User;
4. MAY display the PoC Address and Nick Name to the PoC User, if they are included in the message;
5. SHALL stop timer T11 (Media Burst Request);
6. SHOULD start the optional timer T13 (end of RTP Media) if Continuous Media is bound to the Media-floor Control Entity; and,
7. SHALL enter the 'U: has no permission' state.

6.2.5.3.3 Receive MBCP Media Burst Deny message (R: MB_Deny)

Upon receiving a MBCP Media Burst Deny message from the PoC Server, the PoC Client:

1. SHALL provide Media Burst deny notification to the PoC User;
2. MAY display the Media Burst deny reason to the PoC User, if it is included in the message;
3. SHALL stop timer T11 (Media Burst Request); and,
4. SHALL enter the 'U: has no permission' state.

6.2.5.3.4 T11 (Media Burst request) timer fired

On firing of timer T11 (Media Burst Request), the PoC Client:

1. SHALL send a MBCP Media Burst Request message towards the PoC Server;
2. SHALL restart timer T11 (Media Burst Request); and,

3. SHALL remain in the 'U: pending MB_Request' state.

6.2.5.3.5 T11 (Media Burst request) timer fired N times

On the N:th firing of timer T11 (Media Burst Request), the PoC Client:

1. MAY provide a Media Burst request timeout notification to the PoC User; and,
2. SHALL enter the 'U: has no permission' state.

6.2.5.3.6 Receive RTP Media packets (R: Media)

Upon receiving RTP Media packets the PoC Client:

1. SHALL render the Media;
2. MAY display the PoC Address or Nick Name or both based on SSRC of the sending PoC Client, if mapping between those exists in PoC Client;
3. SHALL stop timer T11 (Media Burst Request);
4. SHOULD start the optional timer T13 (end of RTP Media); and,
5. SHALL enter the 'U: has no permission' state.

6.2.5.3.7 Send MBCP Media Burst Release message (S: MB_Release)

Upon receiving an indication from the PoC User to release permission to send Media, the PoC Client:

1. SHALL send a MBCP Media Burst Release message towards the PoC Server.

   The MBCP Media Burst Release message:

   a. SHALL set the sequence number ignore field to 1, because no RTP Media packets were sent.
2. SHALL start timer T10 (Media Burst Release);
3. SHALL stop timer T11 (Media Burst Request); and,
4. SHALL enter the 'U: pending MB_Release' state.

6.2.5.3.8 Receiving a MSRP SEND request (R: MSRP SEND)

Upon receiving MSRP SEND request the PoC Client:

1. SHALL generate and send a MSRP 200 "OK" response according to rules and procedures of [OMA-PoC-IM];
2. MAY render the received content of the MSRP SEND request to the PoC User;
3. SHALL stop timer T11 (Media Burst Request); and,
4. SHALL enter the 'U: has no permission' state.

6.2.5.4 State: 'U: has permission'

The 'U: has permission' state is a stable state and the PoC Client uses this state when the PoC Client is permitted to send Media. In this state the PoC Client is allowed to send RTP Media packets or MSRP SEND requests or both and can receive MBCP Media Burst Control messages.

In this state, the PoC Client can release permission to send a Media Burst anytime, even before sending any Media.

The PoC Client can have already buffered Media when it enters this state.

If the PoC Client entered this state from the 'U: Permission to send limited segment' state the PoC Client can have already transmitted some RTP Media packets for this Media Burst.

6.2.5.4.1 Send RTP Media packets (S: Media)

Upon receiving encoded voice from the PoC User or if encoded voice is already buffered, the PoC Client:

1. SHALL create and send an RTP Media packet toward the PoC Server.

   The RTP Media packet SHALL include:

   a. The SSRC of the PoC Client; and,

   b. Other Media packets and payload attributes as defined in [RFC3550].

2. SHALL remain in the 'U: has permission' state.

6.2.5.4.2 Send MBCP Media Burst Release message (S: MB_Release)

Upon receiving an indication from the PoC User to release permission to send Media, the PoC Client:

1. SHALL send a MBCP Media Burst Release message towards the PoC Server.

   The MBCP Media Burst Release message:

   a. SHOULD include the sequence number of the last RTP Media packet that was sent, if at least 1 RTP Media packet was sent and Continuous Media is bound to the Media-floor Control Entity; and,

NOTE: The PoC Client is expected to provide the sequence number in all cases when the PoC Client knows the sequence number of the RTP Media packets in the case Continuous Media is bound to the Media-floor Control Entity.

   b. SHALL set the sequence number ignore field to 1, if no Media were sent or if the PoC Client is not capable of providing the correct sequence number or if only Continuous Media is bound to the Media-floor Control Entity.

2. SHALL stop timer T17 (Revocation Alert), if timer T17 is running;

3. SHALL start timer T10 (Media Burst Release); and,

4. SHALL enter the 'U: pending MB_Release' state.

6.2.5.4.3 Receive MBCP Media Burst Revoke message (R: MB_Revoke)

Upon receiving a MBCP Media Burst Revoke message from the PoC Server, the PoC Client:

1. SHALL inform the PoC User that the permission to send a Media Burst is being revoked;

2. MAY give information to the PoC User about the reason for revoking the permission to send a Media Burst received in the reason code field;

3. MAY inform the PoC User of the retry after time, if a retry after time is contained in the MBCP Media Burst Revoke message;

4. SHALL stop receiving and encoding PoC User's Media;

NOTE 1: Media can be buffered in transport layer, in which case it's sending can be impossible to stop.

NOTE 2: MSRP chunk can be aborted according to rules and procedures of [RFC4975], if chunk is being sent.

5. SHALL stop timer T17 (Revocation Alert), if timer T17 is running;

6. SHOULD start the optional timer T12 (PoC Client retry-after), if a retry after time is contained in the MBCP Media Burst Revoke message;

NOTE 3: The PoC Client does not take any action when T12 expires, but when T12 is running, the PoC Client does not send a MBCP Media Burst Request message.

7. If the reason code is 'Media Burst too long' or 'Media-floor occupied too long' 'Other reason', or 'Media Burst pre-empted', the PoC Client SHALL enter the 'U: pending MB_Revoke' state; and,

8. If the reason code is 'Only one PoC User', 'No resources available' or 'No permission to send a Media Burst', the PoC Client:

    a. SHOULD discard any remaining buffered RTP Media packets or MSRP SEND requests; and,

    b. SHOULD perform the action in subclause 6.2.5.6.5 "*Send MBCP Media Burst Release message*".

6.2.5.4.4 T17 (Revocation Alert) timer expiry

Upon expiry of the timer T17 (Revocation Alert) in case the value of Alert Margin is non-zero, the PoC Client:

1. MAY alert the PoC User that the maximum-transmit time is almost reached.

NOTE: Upon firing of the T17 (Revocation Alert) timer in case the value of Alert Margin is zero, the PoC Client can send a MBCP Media Burst Release message towards the PoC Server as specified in subclause 6.2.5.4.2 "*Send MBCP Media Burst Release message (S: MB_Release)*".

6.2.5.4.5 Sending a MSRP SEND request (S: MSRP SEND)

When the state is permitted and Discrete Media is available for transfer, the PoC Client:

1. SHALL generate and send a MSRP SEND request according to rules and procedures of [OMA-PoC-IM];

2. SHALL include the encoded Discrete Media as specified in [OMA-PoC-IM];

3. SHALL send the MSRP SEND request according to rules and procedures of [OMA-PoC-IM]; and,

4. SHALL remain in the 'U: has permission' state.

6.2.5.5 State: 'U: pending MB_Release'

The 'U: pending MB_Release' state is a transition state and the PoC Client uses this state when the PoC Client is waiting for response to a MBCP Media Burst Release message.

In this state the PoC Client can receive MBCP Media Burst Control messages, MSRP SEND requests and RTP Media packets.

Timer T10 (Media Burst release) is running and the optional timer T12 (PoC Client retry-after) can be running in this state.

6.2.5.5.1 T10 (Media Burst release) timer fired

On firing of timer T10 (Media Burst Release), the PoC Client:

1. SHALL send a MBCP Media Burst Release message towards the PoC Server.

    The MBCP Media Burst Release message:

    a. SHALL include the SSRC of the PoC Client;

    b. SHALL include the sequence number of the last RTP Media packet that was sent, if at least 1 RTP Media packet was sent; and,

NOTE: The PoC Client is expected to provide the sequence number in all cases when the PoC Client knows the sequence number of the RTP Media packets.

c. SHALL set the sequence number ignore field to 1, if no RTP Media packets were sent or if the PoC Client is not capable of providing the correct sequence number or if only Discrete Media is bound to the Media-floor Control Entity.

2. SHALL restart timer T10 (Media Burst Release); and,

3. SHALL remain in state 'U: pending MB_Release'.

6.2.5.5.2 T10 (Media Burst release) timer fired N times

On the N:th firing of timer T10 (Media Burst Release), the PoC Client:

1. SHALL enter the 'U: has no permission' state.

6.2.5.5.3 Receive MBCP Media Burst Idle (R: MB_Idle)

Upon receiving a MBCP Media Burst Idle message the PoC Client:

1. SHALL provide Media Burst idle notification to the PoC User;

2. SHALL stop the optional timer T12 (PoC Client retry-after) if it is running;

3. SHALL stop timer T10 (Media Burst Release); and,

4. SHALL enter the 'U: has no permission' state.

6.2.5.5.4 Receive MBCP Media Burst Taken message (R: MB_Taken)

Upon receiving a MBCP Media Burst Taken message the PoC Client:

1. SHALL send a MBCP Media Burst Acknowledgement message if the MBCP Media Burst Taken expects an acknowledgement reply;

2. SHOULD perform the mapping between the SSRC of the PoC Client granted a permission to send a Media Burst and the PoC Address or Nick Name or both, if they are included in the message;

3. SHALL provide Media Burst taken notification to the PoC User;

4. MAY display the PoC Address and Nick Name to the PoC User, if they are included in the message, or alternatively if the PoC Client has a mapping between SSRC of the PoC Client granted the permission to send a Media Burst and the PoC Address or the Nick Name or both;

5. SHOULD start the optional timer T13 (end of RTP Media) if Continuous Media is bound to the Media-floor Control Entity;

6. SHALL stop the optional timer T12 (PoC Client retry-after) if it is running;

7. SHALL stop timer T10 (Media Burst Release); and,

8. SHALL enter the 'U: has no permission' state.

6.2.5.5.5 Receive RTP Media packets (R: Media)

Upon receiving RTP Media packets the PoC Client:

1. SHALL render the Media;

2. MAY display the PoC Address or Nick Name or both based on SSRC of the sending PoC Client, if mapping between those exists in PoC Client;

3. SHOULD start the optional timer T13 (end of RTP Media);
4. SHALL stop timer T10 (Media Burst Release); and,
5. SHALL enter the 'U: has no permission' state.

6.2.5.5.6 Receive MBCP Media Burst Revoke message (R: MB_Revoke)

Upon receiving a MBCP Media Burst Revoke message from the PoC Server, the PoC Client:

1. MAY give information to the PoC User that permission to send a Media Burst is being revoked, if a retry after time is contained in the MBCP Media Burst Revoke message;
2. MAY inform the PoC User of the reason contained in the reason code field received in the MBCP Media Burst Revoke message;
3. MAY inform the PoC User of the retry after time, if a retry after time is contained in the MBCP Media Burst Revoke message;
4. SHOULD start the optional timer T12 (PoC Client retry-after), if a retry after time is contained in the MBCP Media Burst Revoke message; and,

NOTE: The PoC Client does not take any action when T12 expires, but when T12 is running, the PoC Client SHALL not send a MBCP Media Burst Request message.

5. SHALL remain in the 'U: pending MB_Release' state.

6.2.5.6 State: 'U: pending MB_Revoke'

The 'U: pending MB_Revoke' state is a transition state and the PoC Client uses this state when the PoC Client has received a MBCP Media Burst Revoke message and is waiting for any remaining buffered RTP Media packets or any remaining chunks of MSRP SEND requests to be sent.

In this state the PoC Client is sending RTP Media packets, MSRP SEND requests and can receive MBCP Media Burst Control messages.

6.2.5.6.1 Send RTP Media (S: Media)

If the PoC Client has PoC User's encoded Media remaining in the buffer, the PoC Client:

1. SHOULD create and send an RTP Media packet toward the PoC Server.

   The RTP Media packet SHALL include:

   a. The SSRC of the PoC Client; and,
   b. Other Media and payload attributes as defined in [RFC3550].

2. If the sent RTP Media packet has not been the last packet from the PoC Client's buffer, the PoC Client SHALL remain in the 'U: pending MB_Revoke' state:
3. If the sent RTP Media packet has been the last packet from the PoC Client's buffer, the PoC Client SHALL perform the action in subclause 6.2.5.6.5 "*Send MBCP Media Burst Release message*".

6.2.5.6.2 Receive MBCP Media Burst Idle message (R: MB_Idle)

Upon receiving a MBCP Media Burst Idle message the PoC Client:

1. SHALL stop sending RTP Media packets or MSRP SEND requests;
2. SHALL provide Media Burst idle notification to the PoC User; and,

3. SHALL enter the 'U: has no permission' state.

6.2.5.6.3 Receive MBCP Media Burst Taken message (R: MB_Taken)

Upon receiving a MBCP Media Burst Taken message the PoC Client:

1. SHALL send a MBCP Media Burst Acknowledgement message if the MBCP Media Burst Taken expects an acknowledgement reply;
2. SHALL stop sending RTP Media packets or MSRP SEND requests;
3. SHOULD perform the mapping between the SSRC of the PoC Client granted a permission to send a Media Burst and the PoC Address or Nick Name or both, if they are included in the message;
4. SHALL provide a Media Burst taken notification to the PoC User;
5. MAY display the PoC Address and Nick Name to the PoC User, if they are included in the message, or alternatively if the PoC Client has a mapping between SSRC of the PoC Client granted a permission to send a Media Burst and the PoC Address and /or Nick Name;
6. SHOULD start the optional timer T13 (end of RTP Media) if Continuous Media is bound to the Media-floor Control Entity; and,
7. SHALL enter the 'U: has no permission' state.

6.2.5.6.4 Receive RTP Media (R: Media)

Upon receiving RTP Media packets the PoC Client:

1. SHALL stop sending RTP Media packets or MSRP SEND requests;
2. SHALL render the Media;
3. MAY display the PoC Address or Nick Name or both based on SSRC of the sending PoC Client, if mapping between those exists in PoC Client;
4. SHOULD start the optional timer T13 (end of RTP Media); and,
5. SHALL enter the 'U: has no permission' state.

6.2.5.6.5 Send MBCP Media Burst Release message (S: MB_Release)

When releasing the permission to send Media the PoC Client:

1. SHALL send a MBCP Media Burst Release message towards the PoC Server.

   The MBCP Media Burst Release message:

   a. SHALL include the SSRC of the PoC Client; and,

   b. SHOULD include the sequence number of the last RTP Media packet that was sent.

   NOTE: The PoC Client is expected to provide the sequence number in all cases where the PoC Client knows the sequence number that is being put into the RTP Media packets.

   c. SHALL set the sequence number validity ignore field to 1, if the PoC Client is not providing the correct sequence number or if only Discrete Media is bound to the Media-floor Control Entity.

2. SHALL start timer T10 (Media Burst Release); and,
3. SHALL enter the 'U: pending MB_Release' state.

6.2.5.6.6 Receiving a MSRP SEND request (R: MSRP SEND)

Upon receiving an MSRP SEND request the PoC Client:

1. SHALL generate and send a MSRP 200 "OK" response according to rules and procedures of [OMA-PoC-IM];
2. MAY render the received content of the MSRP SEND request for the PoC User;
3. MAY display the PoC Address or Nick Name or both retrieved from the message/cpim From header in the MSRP SEND body; and,
4. SHALL enter the 'U: has no permission' state.

6.2.5.7 State: Any state

This subclause describes the actions to be taken in all states defined for the basic state diagram with the exception of the 'Start-stop' state and the 'Releasing' state.

6.2.5.7.1 Receive MBCP Disconnect message (R: Disconnect)

Upon receiving a MBCP Disconnect message from the PoC Server in any state, the PoC Client:

1. SHALL update the status information of the PoC Session to indicate that the PoC Session within the Pre-established Session is released and the User Plane association between the PoC Session and the Pre-established Session is removed in the PoC Server performing the Participating Function;

NOTE: MBCP Media Burst Acknowledge message is sent in the subclause 6.2.6 "*PoC Session control state diagram – Pre-established Session*".

2. SHALL stop sending MBCP messages, MSRP requests and RTP Media packets towards the PoC Server;
3. SHALL interact with the Control Plane according to the reference [OMA-PoC-CP] "*PoC Client Leaving a PoC Session*"; and,
4. SHALL enter the 'Releasing' state.

6.2.5.7.2 Receive PoC Session release – 1 (R: PoC Session release - 1)

Upon receiving a PoC Session release stage 1 request from the Control Plane when the PoC Session is going to be released or when the PoC Client is leaving the PoC Session or when the PoC Client disconnects from the Media-floor Control Entity or when the Media-floor Control Entity is removed from the PoC Session, the PoC Client:

1. SHALL stop sending MBCP messages, MSRP requests and RTP Media packets towards the PoC Server; and,
2. SHALL enter the 'Releasing' state.

6.2.5.8 State: 'Releasing'

The 'Releasing' state is a transition state. The PoC Client uses this state while waiting for Control Plane to finalize the disconnection of a PoC Session.

6.2.5.8.1 Receive PoC Session release – 2 (R: PoC Session release - 2)

Upon receiving a PoC Session release stage 2 request from the Control Plane when the PoC Session is going to be released or when the PoC Client is leaving the PoC Session or when the PoC Client disconnects from the Media-floor Control Entity or when the Media-floor Control Entity is removed from the PoC Session, the PoC Client:

1. SHALL release all resources including any running timers associated with the PoC Session; and,
2. SHALL enter the 'Start-stop' state and terminate the 'PoC Session control state machine – basic' or terminate the 'PoC Session control state machine – queuing' state machine if queuing is used.

NOTE: If this was a PoC Session using a Pre-established Session, the PoC Client maintains the Pre-established Session.

6.2.5.9 State: 'U: Permission to send limited segment'

The 'U: Permission to send limited segment' state is a stable state. This state is optional and only supported if the PoC Client supports Limited Segment Media Buffer preload capability. The PoC Client will have already buffered Media when entering this state.

The PoC Client uses this state when the PoC Client is permitted to send a limited segment of Media contained in the PoC Clients Media buffer. In this state the PoC Client is allowed to send a limited number of RTP Media packets based on the value of the tb_seg_preload parameter received in the SIP 200 “OK” response and can receive MBCP Media Burst Control messages.

Once the PoC Client has completed sending the limited number of RTP Media packets the PoC Client must wait for a MBCP Media Burst Granted message from the PoC Server before sending further RTP Media packets.

NOTE: While the PoC Client is waiting for the MBCP Media Burst Granted message, after the PoC Client has completed sending the limited number of RTP Media packets, the PoC Client buffers any encoded Media from the PoC User for later sending.

6.2.5.9.1 Enter State U: Permission to send limited segment

When entering this state the PoC Client:

1. SHALL start timer T21 (Limited Media Segment) ; and,
2. SHALL enter the 'U: Permission to send limited segment' state.

6.2.5.9.2 Send RTP Media packets (S: Media)

Upon entering this state, provided that the limited Media segment as indicated by the tbseg_preload parameter received in the SIP 200 “OK” has not been exceeded, when receiving encoded Media from the PoC User or when buffered Media is available, the PoC Client:

1. SHALL create and send an RTP Media packet toward the PoC Server.

   The RTP Media packet SHALL include:

   a. The SSRC of the PoC Client; and,

   b. Other Media packets and payload attributes as defined in 7.2 "*Media Parameter negotiation*".

2. SHALL remain in the 'U: Permission to send limited segment' state.

6.2.5.9.3 Receive MBCP Media Burst Revoke message (R: MB_Revoke)

Upon receiving a MBCP Media Burst Revoke message from the PoC Server, the PoC Client:

1. SHALL inform the PoC User that the permission to send a Media Burst is being revoked;
2. MAY give information to the PoC User about the reason for revoking the permission to send a Media Burst received in the reason code field;
3. MAY inform the PoC User of the retry after time, if a retry after time is contained in the MBCP Media Burst Revoke message;
4. SHALL stop receiving and encoding PoC User's Media;
5. SHOULD start the optional timer T12 (PoC Client retry-after), if a retry after time is contained in the MBCP Media Burst Revoke message;

NOTE: The PoC Client does not take any action when T12 expires, but when T12 is running, the PoC Client does not send a MBCP Media Burst Request message.

6. If the reason code is 'Media Burst too long', 'Media-floor occupied too long', 'Other reason' or 'Media Burst pre-empted', the PoC Client SHALL enter the 'U: pending MB_Revoke' state; and,

7. If the reason code is 'Only one PoC User', 'No resources available' or 'No permission to send a Media Burst', the PoC Client:

    a. SHOULD discard any remaining buffered Media; and,

    b. SHOULD perform the action in 6.2.5.6.5 "*Send MBCP Media Burst Release message*".

6.2.5.9.4 Receive MBCP Media Burst Granted message (R: MB_Granted)

Upon receiving a MBCP Media Burst Granted message from the PoC Server, the PoC Client:

1. SHALL provide Media Burst granted notification to the PoC User if it has not already done so;

NOTE: Providing the Media Burst granted notification to the PoC User prior to receiving the MBCP Media Burst Granted message is an implementation option.

2. MAY provide information about the stop talking timer to the PoC User;

3. MAY provide notification of the number of Participants connected to the Media-floor Control Entity, receiving the Media Burst in the PoC Session, to the PoC User, if included in the message;

4. If MBCP Media Burst Granted message contains Alert-Margin parameter the PoC Client:

    a. MAY set the initial value of timer T17 (Revocation Alert) by calculating T2-timer minus Alert-Margin and start the timer T17 (Revocation Alert); and,

    b. MAY start to display the T17 (Revocation Alert) timer, when the value of Alert Margin is zero;

5. SHALL enter the 'U: has permission' state.

6.2.5.9.5 T21 (Limited Media Segment) timer fired

On firing of timer T21 (Limited Media Segment), the PoC Client:

1. SHALL send a MBCP Media Burst Request message towards the PoC Server;

2. SHALL restart timer T21 (Limited Media Segment Burst); and,

3. SHALL remain in the 'U: pending MB_Request' state.

6.2.5.9.6 T21 (Limited Media Segment) timer fired M times

On the M: th firing of timer T21 (Limited Media Segment), the PoC Client:

1. MAY provide a Media Burst request timeout notification to the PoC User; and,

NOTE: The PoC Client can discard buffered Media.

2. SHALL enter the 'U: has no permission' state.

6.2.5.9.7 Send MBCP Media Burst Release message (S: MB_Release)

Upon receiving an indication from the PoC User to release permission to send Media, the PoC Client:

1. SHALL send a MBCP Media Burst Release message towards the PoC Server.

The MBCP Media Burst Release message:

a. SHALL set the sequence number ignore field to 1, (because no MBCP Media Burst Granted message was received.

NOTE: The PoC Client can discard buffered Media.

2. SHALL start timer T10 (Media Burst Release); and,
3. SHALL enter the 'U: pending MB_Release' state.

6.2.5.10 State: 'U: Local Grant'

The 'U: Local Grant' state is a transition state, and the PoC Client uses this state when the PoC Client is waiting for response to a MBCP Media Burst Request message.

In this state the PoC Client can receive RTP Media packets and MBCP Media Burst Control messages.

Timer T11 (Media Burst Request) is running in this state.

6.2.5.10.1 Receive MBCP Media Burst Granted message (R: MB_Granted)

Upon receiving a MBCP Media Burst Granted message from the PoC Server, the PoC Client:

1. MAY provide information about the stop talking timer to the PoC User;
2. MAY provide notification of the number of Participants connected to the Media-floor Control Entity, receiving the Media Burst in the PoC Session, to the PoC User, if included in the message;
3. SHALL stop timer T11 (Media Burst Request);
4. If MBCP Media Burst Granted message contains Alert-Margin parameter the PoC Client
   a. MAY set the initial value of timer T17 (Revocation Alert) by calculating T2-timer minus Alert-Margin and start the timer T17 (Revocation Alert); and,
   b. MAY start to display the T17 (Revocation Alert) timer, when the value of Alert Margin is zero;
5. SHALL enter the 'U: has permission' state.

6.2.5.10.2 Receive MBCP Media Burst Taken message (R: MB_Taken)

Upon receiving a MBCP Media Burst Taken message from the PoC Server, the PoC Client:

1. SHALL send a MBCP Media Burst Acknowledgement message if the MBCP Media Burst Taken message expects an acknowledgement reply;
2. SHALL ignore encoded Media from the PoC User;
3. SHOULD perform the mapping between the SSRC of the PoC Client granted a permission to send a Media Burst and the PoC Address or Nick Name or both, if they are included in the message;
4. SHALL provide a Media Burst taken notification to the PoC User;
5. MAY display the PoC Address and Nick Name to the PoC User, if they are included in the message;
6. SHALL stop timer T11 (Media Burst Request);
7. SHOULD start the optional timer T13 (end of RTP Media); and,
8. SHALL enter the 'U: has no permission' state.

6.2.5.10.3 Receive MBCP Media Burst Deny message (R: MB_Deny)

Upon receiving a MBCP Media Burst Deny message from the PoC Server, the PoC Client:

1. SHALL ignore encoded voice from the PoC User;
2. SHALL provide Media Burst deny notification to the PoC User;
3. MAY display the Media Burst deny reason to the PoC User, if it is included in the message;
4. SHALL stop timer T11 (Media Burst Request); and,
5. SHALL enter the 'U: has no permission' state.

6.2.5.10.4 T11 (Media Burst request) timer fired

On firing of timer T11 (Media Burst Request), the PoC Client:

1. SHALL send a MBCP Media Burst Request message towards the PoC Server;
2. SHALL restart timer T11 (Media Burst Request); and,
3. SHALL remain in the 'U: Local Grant' state.

6.2.5.10.5 T11 (Media Burst request) timer fired N times

On the N:th firing of timer T11 (Media Burst Request), the PoC Client:

1. SHALL ignore encoded Media from the PoC User;
2. MAY provide a Media Burst request timeout notification to the PoC User; and,
3. SHALL enter the 'U: has no permission' state.

6.2.5.10.6 Receive RTP Media packets (R: Media)

Upon receiving RTP Media packets the PoC Client:

1. SHALL ignore encoded voice from the PoC User;
2. SHALL provide Media Burst deny notification to the PoC User;
3. SHALL render the Media;
4. MAY display the PoC Address or Nick Name or both based on SSRC of the sending PoC Client, if mapping between those exists in PoC Client;
5. SHALL stop timer T11 (Media Burst Request);
6. SHOULD start the optional timer T13 (end of RTP Media); and,
7. SHALL enter the 'U: has no permission' state.

6.2.5.10.7 Send MBCP Media Burst Release message (S: MB_Release)

Upon receiving an indication from the PoC User to release permission to send Media, the PoC Client:

1. SHALL send a MBCP Media Burst Release message towards the PoC Server.

   The MBCP Media Burst Release message:

   a. SHOULD include the sequence number of the last RTP Media packet that was sent, if at least 1 RTP Media packet was sent; and,

NOTE: The PoC Client is expected to provide the sequence number in all cases when the PoC Client knows the sequence number of the RTP Media packets.

b. SHALL set the sequence number ignore field to 1, if no RTP Media packets were sent or if the PoC Client is not capable of providing the correct sequence number.

2. SHALL start timer T10 (Media Burst Release); and,

3. SHALL enter the 'U: pending MB_Release' state.

6.2.5.10.8 Send RTP Media packets (S: Media)

Upon receiving encoded voice from the PoC User, the PoC Client:

1. SHALL create and send an RTP Media packet toward the PoC Server.

   The RTP Media packet SHALL include:

   a. The SSRC of the PoC Client; and,

   b. Other Media packets and payload attributes as defined in [RFC3550].

2. SHALL remain in the 'U: Local Grant' state.

6.2.6 PoC Session control state diagram – Pre-established Session

If the PoC Client supports Pre-established Session, the PoC Client SHALL support the state diagram and the state transitions specified in this subclause.

NOTE: The PoC Client can only use Pre-established Sessions if supported by the Home PoC Server.

A Pre-established Session has two states: Pre-established Session_Not_in_use and Pre-established Session_In_use. The states are partly controlled on the Control Plane [OMA-PoC-CP].

A PoC Client MAY have several Pre-established Sessions at a time.

Figure 4 "*PoC Client state transition diagram for Pre-established Session*" shows the Pre-established PoC User states (U states) and the state transitions.

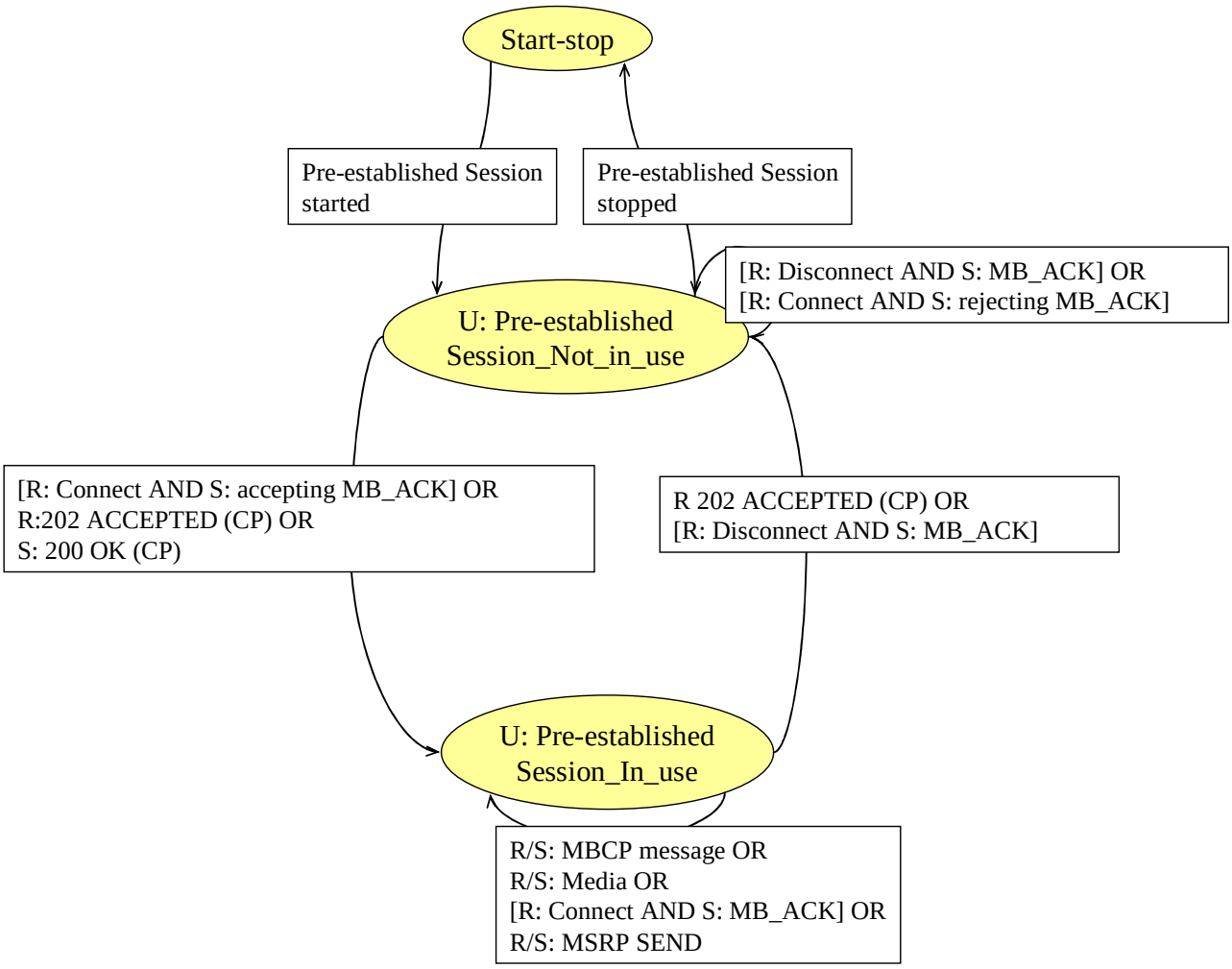


Figure 4: PoC Client state transition diagram for Pre-established Session

The PoC Client SHALL create one instance of the Pre-established Session state machine per Pre-established Session.

State details are explained in the following subclauses.

If a MBCP message, SIP request or RTP Media packet arrives in any state and there is no procedure specified in the subclauses below the PoC Client SHALL discard the MBCP message, SIP request or RTP Media packet and SHALL remain in the current state.

6.2.6.1 State 'Start-stop

In this state, no Pre-established Session exists.

6.2.6.1.1 Pre-established Session started

When a Pre-established Session is created between the PoC Server and a PoC Client, the PoC Client:

1. SHALL initialize any needed User Plane resources for the Pre-established Session; and,
2. SHALL enter the 'G: Pre-established Session_Not_in_use' state.

6.2.6.2 State 'U: Pre-established Session_Not_in_use'

The 'U: Pre-established Session_Not_in_use' state is a stable state. The PoC Client is in this state when Pre-established Session is established, but it is not used for PoC Session.

In this state the PoC Client can receive PoC Session initiation message and MBCP messages.

6.2.6.2.1 Receive MBCP Connect message (R: Connect)

Upon receiving a MBCP Connect message the PoC Client:

1. SHALL create an instance of the PoC Session control state machine as defined in subclause 6.2.5 "*PoC Session control state diagram – basic*" or 6.2.9 "*PoC Session control state diagram – queuing*" if queuing of Media Burst requests are used; and,
2. if the PoC Client accepts the incoming PoC Session the PoC Client:
    a. SHALL send MBCP Media Burst Acknowledgement message with the reason code 'Accepted';
    b. SHALL use only the Media Streams of the Pre-established Session which are indicated as used in the associated PoC Session in the Media-Streams field, if MBCP Connect contains the Media-Streams field; and,
    c. SHALL enter the 'U: Pre-established Session_In_use' state.
3. Otherwise the PoC Client:
    a. SHALL send MBCP Media Burst Acknowledgement message with the reason code 'Busy' or 'Not accepted'; and,
    b. SHALL remain in the 'U: Pre-established Session_Not_in_use' state.

6.2.6.2.2 Void

6.2.6.2.3 Receive SIP 202 "Accepted" response (R: 202 ACCEPTED (CP))

Upon receiving a SIP 202 "Accepted" response for the SIP REFER request sent to initiate a PoC Session as specified in the [OMA-PoC-CP] "*PoC Client initiates and Ad-hoc PoC Group and 1-1 PoC Session*", or "*PoC Client initiates a Pre-arranged Group Session or joining a Chat PoC Group*" or "*PoC Client rejoining a PoC Session*" the PoC Client:

1. SHALL create an instance of the PoC Session control state machine as defined in subclause 6.2.5 "*PoC Session control state diagram – basic*" or 6.2.9 "*PoC Session control state diagram – queuing*" if queuing of Media Burst requests are used; and,
2. SHALL enter the 'U: Pre-established Session_In_use' state.

6.2.6.2.4 Pre-established Session stopped

When the Pre-established Session between the PoC Client and the PoC Server is released, the PoC Client:

1. SHALL release any User Plane resources including any running timers associated with the Pre-established Session; and,
2. SHALL enter the 'Start-stop' state.

6.2.6.2.5 Void

6.2.6.2.6 Receive MBCP Disconnect (R: Disconnect)

Upon receiving a MBCP Disconnect message the PoC Client:

1. SHALL send MBCP Media Burst Acknowledgement message; and,

2. SHALL remain in the 'U: Pre-established Session_Not_in_use' state.

6.2.6.2.7 Send SIP 200 "OK" response to the SIP re-INVITE request (S: 200 OK (CP))

Upon sending the SIP 200 "OK" response to the SIP re-INVITE request of the Pre-established Session initiating a PoC Session as specified in the [OMA-PoC-CP] "*PoC Client invited to a PoC Session*", the PoC Client:

1. SHALL create an instance of the PoC Session control state machine as defined in subclause 6.2.5 "*PoC Session control state diagram – basic*" or 6.2.9 "*PoC Session control state diagram – queuing*" if queuing of Media Burst requests are used; and,

2. SHALL enter the 'U: Pre-established Session_In_use' state.

6.2.6.3 State 'U: Pre-established Session_In_use'

The 'U: Pre-established Session_In_use' state is a stable state. The PoC Client is in this state when Pre-established Session is established and it is used for PoC Session.

In this state the PoC Client can receive RTP Media packets, MSRP requests or responses, MBCP messages and indication of the PoC Session release.

NOTE: Reception and sending of the MSRP response and the MSRP REPORT request is handled according to rules and procedures of [OMA-PoC-IM].

6.2.6.3.1 Receive MBCP Connect message (R: Connect)

Upon receiving a MBCP Connect message the PoC Client:

1. SHALL send MBCP Media Burst Acknowledgement message;

2. SHALL start T11 (Media Burst Request) timer, if the T11 (Media Burst Request) timer is not running yet and if the PoC Session control state machine is in the state "U: pending MB_Request";

3. SHALL use only the Media Streams of the Pre-established Session which are indicated as used in the associated PoC Session in the Media-Streams field, if MBCP Connect contains the Media-Streams field; and,

4. SHALL remain in the 'U: Pre-established Session_In_use' state.

6.2.6.3.2 Receive other MBCP message (R: MBCP message)

Upon receiving a MBCP message the PoC Client:

1. SHALL act as specified in the subclause 6.2.5 "*PoC Session control state diagram – basic*" or in the subclause 6.2.9 "*PoC Session control state diagram – queuing*" if queuing of Media Burst requests are used; and,

2. SHALL remain in the 'Pre-established Session_In_use' state.

6.2.6.3.3 Receive RTP Media packets (R: Media)

Upon receiving RTP Media packets the PoC Client:

1. SHALL act as specified in the subclause 6.2.5 "*PoC* Session *control state diagram – basic*" or 6.2.9 "*PoC Session control state diagram – queuing*" if queuing of Media Burst requests are used; and,

2. SHALL remain in the 'Pre-established Session_In_use' state.

6.2.6.3.4 Receive SIP 202 "Accepted" (R: 202 ACCEPTED (CP))

Upon receiving a SIP 202 "Accepted" response to the sent SIP REFER request as described in [OMA-PoC-CP] "*Leaving a PoC Session – Pre-established Session case*" when the PoC Session is released, but the Pre-established Session is kept alive the PoC Client:

1. SHALL enter the 'U: Pre-established Session_Not_in_use' state; and,

2. SHALL terminate the instance of the PoC Session control state machine as defined in subclause 6.2.5 "*PoC Session control state diagram – basic*" or 6.2.9 "*PoC Session control state diagram – queuing*" if queuing of Media Burst requests are used.

6.2.6.3.5 Send MBCP message (S: MBCP message)

When sending a MBCP message the PoC Client:

1. SHALL act as specified in subclause 6.2.5 "*PoC Session control state diagram – basic*" or 6.2.9 "*PoC Session control state diagram – queuing*" if queuing of Media Burst request are used; and,

2. SHALL remain in the 'Pre-established Session_In_use' state.

6.2.6.3.6 Send RTP Media packets (S: Media)

When sending RTP Media packets the PoC Client:

1. SHALL act as specified in subclause 6.2.5.4.1 "*Send RTP Media packets (S: Media)*"; and,

2. SHALL remain in the 'Pre-established Session_In_use' state.

6.2.6.3.7 Receive MBCP Disconnect (R: Disconnect)

Upon receiving a MBCP Disconnect message the PoC Client:

1. SHALL send MBCP Media Burst Acknowledgement message;

2. SHALL enter the 'U: Pre-established Session_Not_in_use' state; and,

3. SHALL act as specified in subclause 6.2.5 "*PoC Session control state diagram – basic*" or 6.2.9 "*PoC Session control state diagram – queuing*" if queuing of Media Burst requests are used.

6.2.6.3.8 Receive a MSRP SEND request (R: MSRP SEND)

Upon receiving an MSRP SEND request the PoC Client:

1. SHALL act as specified in the subclause 6.2.5 "*PoC* Session *control state diagram – basic*" or 6.2.9 "*PoC Session control state diagram – queuing*" if queuing of Media Burst requests are used; and,

2. SHALL remain in the 'Pre-established Session_In_use' state.

6.2.6.3.9 Send a MSRP SEND request (S: MSRP SEND)

When sending an MSRP SEND request the PoC Client:

1. SHALL act as specified in subclause 6.2.5.4.5 "*Sending a MSRP SEND request (S: MSRP SEND)*"; and,

2. SHALL remain in the 'Pre-established Session_In_use' state.

6.2.7 PoC Session control state diagram – Simultaneous per PoC Client

In the case PoC Client has Simultaneous PoC Sessions with Continuous Media the PoC Client

1. SHALL follow for each PoC Session the PoC Session specific state diagrams and state transitions specified in the subclause 6.2.5 "*PoC Session control state diagram – basic*" or 6.2.9 "*PoC Session control state diagram – queuing*" if queuing of Media Burst requests are used, if MBCP is used; or,

2. SHALL follow for each PoC Session the PoC Session specific state diagrams and state transitions specified in [OMA-PoC-1-UP] "*PoC Session control state diagram – basic*" or [OMA-PoC-1-UP] "*PoC Session control state diagram – queuing*" if queuing of Talk Burst requests are used, if TBCP is used.

NOTE: TBCP is defined in [OMA-PoC-1-UP].

The PoC Client MAY have more than one PoC Sessions established at a time.

For the overall handling of Simultaneous PoC Sessions containing Continuous Media the PoC Client SHALL support the state diagram and the state transitions specified in this subclause.

Transitions between different PoC Sessions are dictated by actions of the PoC User and changes in the Simultaneous PoC Session states. The changes of the states are partly controlled on the Control Plane [OMA-PoC-CP].

Figure 5 "*Simultaneous PoC Sessions state diagram – per PoC Client.*" shows the Simultaneous PoC Sessions PoC Client states (C states) per PoC Client and the state transitions.

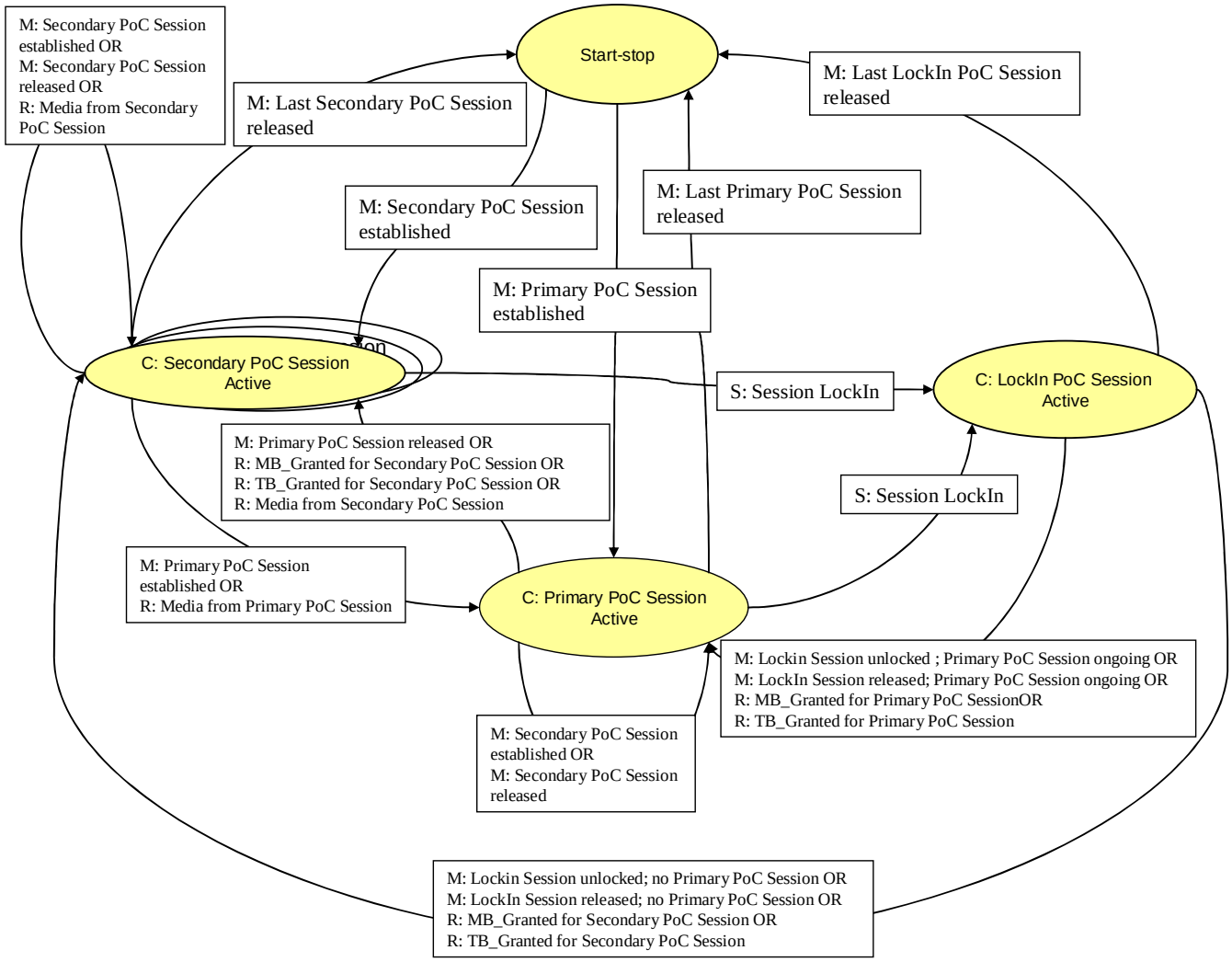


Figure 5: Simultaneous PoC Sessions state diagram – per PoC Client

The state diagram in Figure 5 "*Simultaneous PoC Sessions state diagram – per PoC Client*" applies when the PoC Client for a PoC User supports several PoC Sessions containing Continuous Media simultaneously.

State details are explained in the following subclauses.

If a MBCP message, TBCP message, SIP request or RTP Media packet arrives in any state and there is no procedure specified for it in the subclauses below the PoC Client SHALL discard the MBCP message, TBCP message, SIP request or RTP Media packet and SHALL remain in the current state.

NOTE: MSRP request and MSRP response relaying is not affected by the state machine.

6.2.7.1 State 'Start-stop'

In this state no PoC Session containing Continuous Media exists.

6.2.7.1.1 Monitor Primary PoC Session establishment (M: Primary PoC Session established)

When a Primary PoC Session including Continuous Media is established or when a Continuous Media is connected in the previously Discrete Media only Primary PoC Session as specified in the [OMA-PoC-CP] "*PoC Client setting PoC Session priority*", the PoC Client:

1. SHALL create an instance of the Simultaneous PoC Sessions state machine per PoC Client; and,
2. SHALL enter the 'C: Primary PoC Session Active' state.

6.2.7.1.2 Monitor Secondary PoC Session establishment (M: Secondary PoC Session established)

When a Secondary PoC Session including Continuous Media is established or when a Continuous Media is connected in the previously Discrete Media only Secondary PoC Session as specified in the [OMA-PoC-CP] "*PoC Client setting PoC Session priority*", the PoC Client:

1. SHALL create an instance of the Simultaneous PoC Sessions state machine per PoC Client; and,
2. SHALL enter the 'C: Secondary PoC Session Active' state.

6.2.7.2 State: 'C: Primary PoC Session Active'

In this state a Primary PoC Session exists as an Active PoC Session. The "C: Primary PoC Session Active" is a stable state.

6.2.7.2.A General

In the "C: Primary PoC Session Active" state the PoC Client:

1. SHALL send and receive RTP Media packets , TBCP messages and MBCP messages for the Active PoC Session; and,
2. SHOULD send and receive TBCP messages and MBCP messages for all other established PoC Sessions containing Continuous Media.

6.2.7.2.1 Monitor Primary PoC Session release when no other PoC Sessions are ongoing (M: Last Primary PoC Session released)

When a Primary PoC Session is released or when all Continuous Media are disconnected from the PoC Session and no other PoC Sessions containing Continuous Media for the same PoC Client are established as specified in [OMA-PoC-CP] "*PoC Client setting PoC Session priority*" the PoC Client:

1. SHALL enter the 'Start-stop' state.

6.2.7.2.2 Send SDP with Session LockIn (S: Session LockIn)

When the PoC Client locks this PoC Session containing Continuous Media as specified in [OMA-PoC-CP] "*PoC Client handling of PoC Session locking*" the PoC Client:

1. SHALL enter the 'C: LockIn PoC Session Active' state.

6.2.7.2.3 Monitor Secondary PoC Session release (M: Secondary PoC Session released)

When a Secondary PoC Session containing Continuous Media is released or when all Continuous Media are disconnected from the PoC Session as specified in [OMA-PoC-CP] the PoC Client:

1. SHALL remain in PoC Client state 'C: Primary PoC Session Active'.

6.2.7.2.4 Monitor Secondary PoC Session establishment (M: Secondary PoC Session established)

When a Secondary PoC Session containing Continuous Media is established or when a Continuous Media is connected in the previously Discrete Media only Secondary PoC Session as specified in [OMA-PoC-CP] "*PoC Client setting PoC Session priority*" the PoC Client:

1. SHALL remain in PoC Client state 'C: Primary PoC Session Active'.

6.2.7.2.5 Monitor Primary PoC Session release (M: Primary PoC Session released)

When a Primary PoC Session containing Continuous Media is released or when all Continuous Media are disconnected from the Primary PoC Session as specified in the [OMA-PoC-CP] and other PoC Sessions containing Continuous Media for the same PoC User are established as specified in [OMA-PoC-CP] "*PoC Client setting PoC Session priority*" the PoC Client:

1. SHALL enter the 'C: Secondary PoC Session Active'.

6.2.7.2.6 Receive Media Burst Granted message (R: MB_Granted for Secondary PoC Session)

When the PoC Client receives a MBCP Media Burst Granted message in response to a MBCP Media Burst requests message for a Secondary PoC Session containing Continuous Media, the PoC Client:

1. SHALL enter the 'C: Secondary PoC Session active' state.

6.2.7.2.7 Receive RTP Media packets (R: Media from Secondary PoC Session)

Upon receiving RTP Media packets from a Secondary PoC Session the PoC Client:

1. SHALL enter the 'C: Secondary PoC Session Active' state.

6.2.7.2.8 Receive Talk Burst Granted message (R: TB_Granted for Secondary PoC Session)

When the PoC Client receives a TBCP Talk Burst Granted message in response to a TBCP Talk Burst request message for a Secondary PoC Session containing Continuous Media, the PoC Client:

1. SHALL enter the 'C: Secondary PoC Session active' state.

6.2.7.3 State: 'C: Secondary PoC Session Active'

In this state a Secondary PoC Session containing Continuous Media exists as an Active PoC Session. The 'C: Secondary PoC Session Active' state is a stable state.

6.2.7.3.A General

In the "C: Secondary PoC Session Active" state the PoC Client:

1. SHALL send and receive RTP Media packets, TBCP messages and MBCP messages for the Active PoC Session; and,

2. SHOULD send and receive MBCP messages and TBCP messages for all other established PoC Sessions containing Continuous Media.

6.2.7.3.1 Monitor Secondary PoC Session release when no other PoC Sessions are ongoing (M: Last Secondary PoC Session released)

When the Secondary PoC Session containing Continuous Media is released or when all Continuous Media are disconnected from the PoC Session as specified in [OMA-PoC-CP] and no other PoC Sessions containing Continuous Media for the same PoC Client are established as specified in [OMA-PoC-CP] "*PoC Client setting PoC Session priority*" the PoC Client:

1. SHALL enter the 'Start-stop' state.

6.2.7.3.2 Send SDP with Session LockIn (S: Session LockIn)

When a Secondary PoC Session containing Continuous Media is an Active PoC Session and the PoC Client locks this PoC Session containing Continuous Media as specified in [OMA-PoC-CP] "*PoC Client handling of PoC Session locking*" the PoC Client:

1. SHALL enter the 'C: LockIn PoC Session Active'.

6.2.7.3.3 Monitor Primary PoC Session establishment (M: Primary PoC Session established)

When a Primary PoC Session containing Continuous Media is established or when a Continuous Media is connected in the previously Discrete Media only Primary PoC Session as specified in the [OMA-PoC-CP] "*PoC Client setting PoC Session priority*", and fulfils the criteria defined in the subclause [OMA-PoC-CP] "*Procedures at the PoC Client"* to be activated the PoC Client:

1. SHALL enter the 'C: Primary PoC Session Active'.

6.2.7.3.4 Receive RTP Media packets (R: Media from Primary PoC Session)

Upon receiving RTP Media packets from a Primary PoC Session containing Continuous Media the PoC Client:

1. SHALL enter the 'C: Primary PoC Session Active' state.

6.2.7.3.5 Monitor Secondary PoC Session release (M: Secondary PoC Session released)

When the Secondary PoC Session containing Continuous Media is released or when all Continuous Media are disconnected from the PoC Session as specified in [OMA-PoC-CP] and at least one other PoC Sessions containing Continuous Media for the same PoC Client are established as specified in [OMA-PoC-CP] and fulfils the criteria defined in the subclause 7.5.1 "*Procedures at the PoC Client"* to be activated the PoC Client:

1. SHALL remain in the state 'C: Secondary PoC Session Active'.

6.2.7.3.6 Monitor Secondary PoC Session establishment (M: Secondary PoC Session established)

When a Secondary PoC Session containing Continuous Media is established or when a Continuous Media is connected in the previously Discrete Media only Secondary PoC Session as specified in the [OMA-PoC-CP] "*PoC Client setting PoC Session priority*", the PoC Client:

1. SHALL remain in PoC Client state 'C: Secondary PoC Session Active'.

6.2.7.3.7 Receive RTP Media packets (R: Media from Secondary PoC Session)

Upon receiving RTP Media packets from a Secondary PoC Session containing Continuous Media different than the Active PoC Session, the PoC Client:

1. SHALL enter in the 'C: Secondary PoC Session Active' state for the Secondary PoC Session it received RTP Media packets from.

6.2.7.4 State: 'C: LockIn PoC Session Active'

In this state a LockIn PoC Session containing Continuous Media exists and is an Active PoC Session. The 'C: LockIn PoC Session Active' state is a stable state.

6.2.7.4.A General

In the "C: LockIn PoC Session Active" state the PoC Client:

1. SHALL send and receive RTP Media packets, TBCP messages and MBCP messages for the Active PoC Session;
2. SHOULD receive MBCP messages and TBCP messages from any other PoC Session; and,
3. MAY prevent PoC User to request Media Burst for any other PoC Sessions containing Continuous Media.

6.2.7.4.1 Monitor LockIn PoC Session release and no other PoC Session are ongoing (M: Last LockIn PoC Session released)

When a LockIn PoC Session containing Continuous Media is released or when all Continuous Media are disconnected from the PoC Session as specified in [OMA-PoC-CP] and no other PoC Sessions containing Continuous Media for the same PoC Client are ongoing the PoC Client:

1. SHALL enter the 'Start-stop' state.

6.2.7.4.2 Monitor LockIn PoC Session release and Primary PoC Session ongoing (M: LockIn PoC Session released; Primary PoC Session ongoing)

When a LockIn PoC Session containing Continuous Media is released or when all Continuous Media are disconnected from the PoC Session as specified in [OMA-PoC-CP] and a Primary PoC Sessions containing Continuous Media for the same PoC Client is already established the PoC Client:

1. SHALL enter the 'C: Primary PoC Session active' state.

6.2.7.4.3 Monitor LockIn PoC Session release and no Primary PoC Session ongoing (M: LockIn PoC Session released; no Primary PoC Session)

When a LockIn PoC Session containing Continuous Media is released or when all Continuous Media are disconnected from the PoC Session as specified in [OMA-PoC-CP] and no Primary PoC Session containing Continuous Media for the same PoC Client is established and at least one Secondary PoC Session containing Continuous Media for the same PoC Client is established and fulfils criteria defined in the subclause 7.5.1 "*Procedures at the PoC Client"* to be activated the PoC Client:

1. SHALL enter the 'C: Secondary PoC Session active' state.

6.2.7.4.4 Monitor LockIn PoC Session is unlocked and Primary PoC Session ongoing (M: LockIn PoC Session unlocked; Primary PoC Session ongoing)

When a LockIn PoC Session containing Continuous Media is unlocked as specified in [OMA-PoC-CP] "*PoC Client handling of PoC Session locking*" and a Primary PoC Sessions containing Continuous Media for the same PoC User is already established the PoC Client:

1. SHALL enter the 'C: Primary PoC Session active' state.

6.2.7.4.5 Monitor LockIn PoC Session is unlocked and no Primary PoC Session ongoing (M: LockIn PoC Session unlocked; no Primary PoC Session)

When a LockIn PoC Session containing Continuous Media is unlocked, as specified in [OMA-PoC-CP] "*PoC Client handling of PoC Session locking*", and no Primary PoC Session containing Continuous Media is ongoing and at least one Secondary PoC Session containing Continuous Media for the same PoC Client and fulfils criteria defined in the subclause 7.5.1 "*PoC Client handling of PoC Session locking*", to be activated, the PoC Client:

1. SHALL enter the 'C: Secondary PoC Session active' state.

6.2.7.4.6 Receive MBCP Media Burst Granted message for Primary PoC Session (R: MB_Granted for Primary PoC Session)

When the PoC Client receives a MBCP Media Burst Granted message in response to a MBCP Media Burst requests message for the Primary PoC Session containing Continuous Media to the PoC Server, the PoC Client:

1. SHALL enter the 'C: Primary PoC Session active' state.

6.2.7.4.7 Receive MBCP Media Burst Granted message for Secondary PoC Session (R: MB_Granted for Secondary PoC Session)

When the PoC Client receives a MBCP Media Burst Granted message in response to a MBCP Media Burst Request message for a Secondary PoC Session containing Continuous Media, the PoC Client:

1. SHALL enter the 'C: Secondary PoC Session active' state.

6.2.7.4.8 Receive TBCP Talk Burst Granted message for Primary PoC Session (R: TB_Granted for Primary PoC Session)

When the PoC Client receives a TBCP Talk Burst Granted message in response to a TBCP Talk Burst request message for the Primary PoC Session containing Continuous Media, the PoC Client:

1. SHALL enter the 'C: Primary PoC Session active' state.

6.2.7.4.9 Receive TBCP Talk Burst Granted message for Secondary PoC Session (R: TB_Granted for Secondary PoC Session)

When the PoC Client receives a TBCP Talk Burst Granted message in response to a TBCP Talk Burst Request message for a Secondary PoC Session containing Continuous Media, the PoC Client:

1. SHALL enter the 'C: Secondary PoC Session active' state.

6.2.8 PoC Session control state diagram – Simultaneous PoC Sessions

In the case PoC Client has Simultaneous PoC Sessions the PoC Client:

1. SHALL follow for each PoC Session the PoC Session specific state diagrams and state transitions specified in the subclause 6.2.5 "*PoC Session control state diagram – basic*" or 6.2.9 "*PoC Session control state diagram – queuing*" if queuing of Media Burst requests are used, if MBCP is used;

   or,

2. SHALL follow for each PoC Session the PoC Session specific state diagrams and state transitions specified in [OMA-PoC-1-UP] "*PoC Session control state diagram – basic*" or [OMA-PoC-1-UP] "*PoC Session control state diagram – queuing*" if queuing of Talk Burst requests are used, if TBCP is used.

For the handling of each of the Simultaneous PoC Sessions containing Continuous Media the PoC Client SHALL support the state diagram and the state transitions specified in this subclause.

Transitions between different PoC Sessions are dictated by actions of the PoC User and changes in the Simultaneous PoC Session states. The changes of the states are partly controlled by the Control Plane as specified in [OMA-PoC-CP] "*Simultaneous PoC Session control procedures*".

Figure 6 "*PoC Session control state diagram – Simultaneous PoC Sessions*" shows Simultaneous PoC Sessions states and the state transitions for a PoC User per PoC Session.

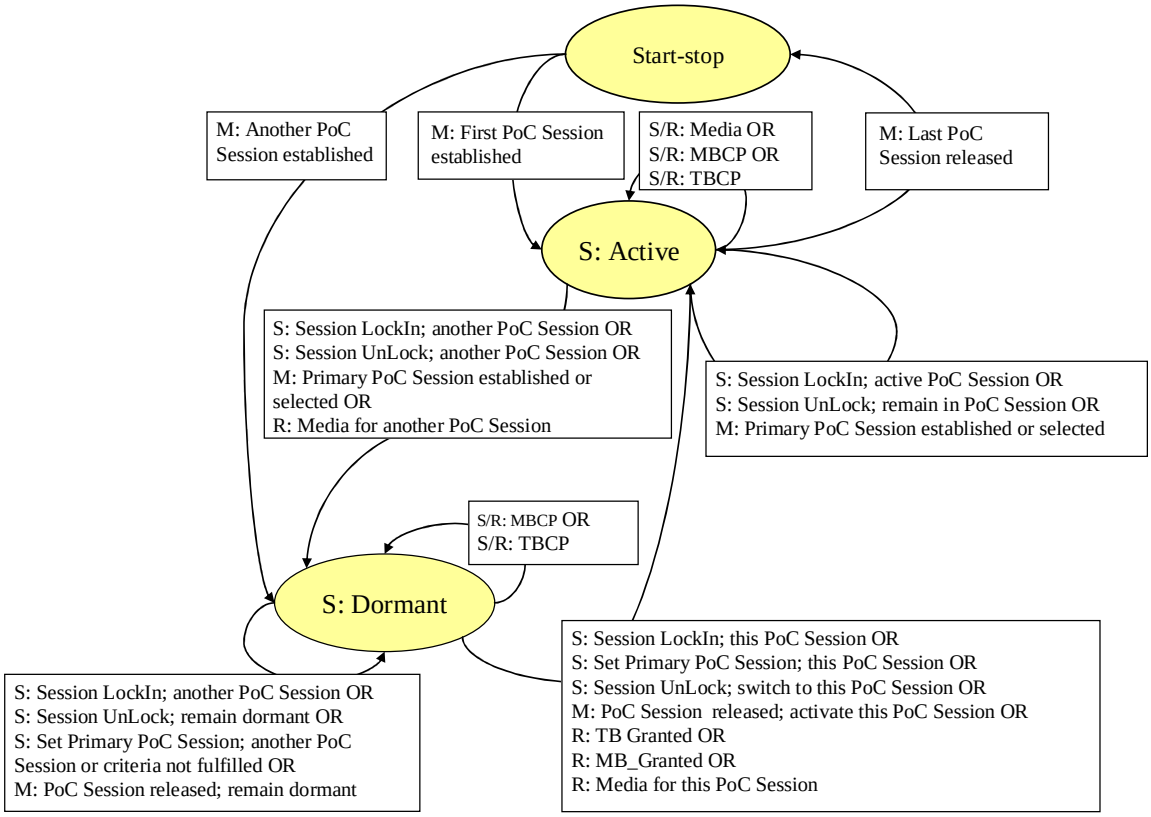


Figure 6: PoC Session control state diagram – Simultaneous PoC Sessions

The State Diagram in Figure 6 "*PoC Session control state diagram - Simultaneous PoC Sessions"* applies to one PoC Session containing Continuous Media out of multiple Simultaneous PoC Sessions supported by the PoC Client.

The PoC Client SHALL create an instance of the state machine for each PoC Session containing Continuous Media.

State details are explained in the following subclauses.

If a MBCP message, TBCP message, SIP request or RTP Media packet arrives in any state and there is no procedure specified for it in the subclauses below the PoC Client SHALL discard the MBCP message, TBCP message, SIP request or RTP Media packet and SHALL remain in the current state.

NOTE: MSRP request and MSRP response relaying is not affected by the state machine.

6.2.8.1 State 'Start-Stop'

In this state no PoC Session containing Continuous Media exists.

6.2.8.1.1 Monitor first PoC Session established (M: First PoC Session established)

When a PoC Session containing Continuous Media exists is established or when a Continuous Media is connected in the previously Discrete Media only PoC Session as specified in [OMA-PoC-CP] "*PoC Client procedures at PoC Session initialization*" and in case there is no Active PoC Session for the same PoC User the PoC Client:

1. SHALL create an instance of the general Media Burst operation state machine as specified in 6.2.5 "*PoC Session control state diagram – basic*" or 6.2.9 "*PoC Session control state diagram – queuing*" if queuing of Media Burst requests are used, if MBCP is used;

2. SHALL create an instance of the general Talk Burst operation state machine as specified in [OMA-PoC-1-UP] "*PoC Session control state diagram – basic*" or [OMA-PoC-1-UP] "*PoC Session control state diagram – queuing*" if queuing of Talk Burst requests are used, if TBCP is used; and,

3. SHALL enter the 'S: Active' state.

6.2.8.1.2 Monitor another PoC Session established (M: Another PoC Session established)

When another PoC Session is established or when a Continuous Media is connected in the previously Discrete Media only PoC Session as specified in the [OMA-PoC-CP] "*PoC Client procedures at PoC Session initialization*" the PoC Client:

1. SHALL create an instance of the general Media Burst operation state machine as specified in 6.2.5 "*PoC Session control state diagram – basic*" or 6.2.9 "*PoC Session control state diagram – queuing*" if queuing of Media Burst requests are used, if MBCP is used;

2. SHALL create an instance of the general Talk Burst operation state machine as specified in [OMA-PoC-1-UP] "*PoC Session control state diagram – basic*" or [OMA-PoC-1-UP] "*PoC Session control state diagram – queuing*" if queuing of Talk Burst requests are used, if TBCP is used; and,

3. SHALL enter the 'S: Dormant' state in case there is an Active PoC Session for the same PoC User.

6.2.8.2 State: 'S: Active'

The 'S: Active' state of a PoC Session containing Continuous Media (one of the Simultaneous PoC Sessions) is a stable state.

In this state the PoC Client is receiving and sending RTP Media packets, TBCP messages and MBCP messages of this PoC Session and monitoring MBCP messages, TBCP messages and SIP requests with associated SDP information of other PoC Sessions containing Continuous Media and is reacting on the events of the PoC Sessions containing Continuous Media, as specified in the following subclauses.

6.2.8.2.1 Send or receive MBCP message (S/R: MBCP)

Upon receiving MBCP Messages the PoC Client:

1. SHALL act as specified in the PoC Session specific state diagrams and state transitions specified in the subclause 6.2.5 "*PoC Session control state diagram – basic*" or 6.2.9 "*PoC Session control state diagram – queuing*" if queuing of Media Burst requests are used; and,

2. SHALL remain in 'S: Active' state.

6.2.8.2.2 Send or receive RTP Media packets (S/R: Media)

When sending or receiving of RTP Media packets for this PoC Session the PoC Client:

1. SHALL act as specified in the PoC Session specific state diagrams and state transitions specified in the subclause 6.2.5 "*PoC Session control state diagram – basic*" or 6.2.9 "*PoC Session control state diagram – queuing*" if queuing of Media Burst requests are used, if MBCP is used;

2. SHALL act as specified in the PoC Session specific state diagrams and state transitions specified in [OMA-PoC-1-UP] "*PoC Session control state diagram – basic*" or in [OMA-PoC-1-UP] "*PoC Session control state diagram – queuing*" if queuing of Talk Burst requests are used, if TBCP is used; and,

3. SHALL remain in 'S: Active' state.

6.2.8.2.3 Monitor PoC Session release when no other PoC Sessions are ongoing (M: Last PoC Session released)

When the PoC Session containing Continuous Media is released or when all Continuous Media are disconnected from the PoC Session and no other PoC Sessions containing Continuous Media for the same PoC Client are ongoing as specified in [OMA-PoC-CP] "*PoC Client setting PoC Session priority*" the PoC Client:

1. SHALL enter the 'Start-stop' state.

6.2.8.2.4 Send SDP with Session LockIn; LockIn indication for the Active PoC Session (S: Session LockIn; Active PoC Session)

Upon receiving an indication from the PoC User that the Active PoC Session is to be locked the PoC Client:

1. SHALL proceed with message handling as specified in [OMA-PoC-CP] "*PoC Client Handling of PoC Session locking*"; and,
2. SHALL remain in 'S: Active' state.

6.2.8.2.5 Send SDP with Session LockIn; LockIn indication for another PoC Session (S: Session LockIn; another PoC Session)

Upon receiving an indication from the PoC User that another PoC Session containing Continuous Media (not the Active PoC Session) is to be locked the PoC Client:

1. SHALL proceed with message handling as specified in [OMA-PoC-CP] "*PoC Client Handling of PoC Session locking*"; and,
2. SHALL enter the 'S: Dormant' state.

6.2.8.2.6 Send SDP with Session UnLock; switch to another PoC Session (S: Session Unlock; another PoC Session)

Upon receiving an indication from the PoC User that this PoC Session is to be unlocked, and if criteria defined in the subclause 7.5.1 "*Procedures at the PoC Client*" for switching to another PoC Session containing Continuous Media are fulfilled then the PoC Client:

1. SHALL proceed with message handling as specified in [OMA-PoC-CP] "*PoC Client Handling of PoC Session locking*"; and,
2. SHALL enter the 'S: Dormant' state.

6.2.8.2.7 Send SDP with Session UnLock; remain active in the current PoC Session (S: Session Unlock; remain in PoC Session)

Upon receiving an indication from the PoC User that this PoC Session is to be unlocked and the PoC Client remains in the current PoC Session (thus the criteria for switching to another PoC Session containing Continuous Media is not fulfilled) then the PoC Client:

1. SHALL proceed with message handling as specified in [OMA-PoC-CP] "*PoC Client Handling of PoC Session locking*"; and,
2. SHALL remain in the 'S: Active' state.

6.2.8.2.8 Monitor SDP with Primary PoC Session established or selected (M: Primary PoC Session established or selected)

Upon receiving of an indication that a Primary PoC Session containing Continuous Media has been established or when a Continuous Media is connected in the previously Discrete Media only Primary PoC Session or should become the Active PoC Session based on new priority settings the PoC Client:

1. SHALL proceed with message handling as specified in [OMA-PoC-CP] "*PoC Client Setting Session priority*" and,
2. if criteria specified in the subclause 7.5.1 "*Procedures at the PoC Client*" for switching to another PoC Session are fulfilled then the PoC Client:
    a. SHALL enter the 'S: Dormant' state.
3. Otherwise the PoC Client:
    a. SHALL remain in the 'S: Active' state.

6.2.8.2.9 Receive RTP Media packets (R: Media for another PoC Session)

Upon receiving RTP Media packets for a different PoC Session the PoC Client:

1. SHALL enter the 'S: Dormant' state.

6.2.8.2.10 Send or receive TBCP message (S/R: TBCP)

Upon receiving TBCP Messages the PoC Client:

1. SHALL act as specified in the PoC Session specific state diagrams and state transitions specified in the subclause [OMA-PoC-1-UP] "*PoC Session control state diagram – basic*" or [OMA-PoC-1-UP] "*PoC Session control state diagram – queuing*" if queuing of Talk Burst requests are used; and,
2. SHALL remain in 'S: Active' state.

6.2.8.3 State: 'S: Dormant'

The 'S: Dormant' state of a PoC Session containing Continuous Media is a stable state.

In this state the PoC Client is monitoring MBCP messages, TBCP messages and SIP messages pertaining to this PoC Session and to all other PoC Sessions containing Continuous Media of the same PoC User and is reacting on activation events of the PoC Sessions containing Continuous Media, as specified in the following subclauses.

6.2.8.3.1 Send or receive MBCP message (S/R: MBCP)

Upon receiving MBCP messages (other than the MBCP Media Burst Granted message) or when sending MBCP messages the PoC Client:

1. SHALL act as specified in the PoC Session specific state diagrams and state transitions specified in the subclause 6.2.5 "*PoC Session control state diagram – basic*" or 6.2.9 "*PoC Session control state diagram – queuing*" if queuing of Media Burst requests are used; and,
2. SHALL remain in 'S: Dormant' state.

6.2.8.3.2 Send SDP with Session LockIn for this PoC Session (S: Session LockIn; this PoC Session)

When sending an indication that this PoC Session is to be locked, the PoC Client:

1. SHALL proceed with message handling as specified in [OMA-PoC-CP] "*PoC Client handling PoC Session locking"*; and,
2. SHALL enter the 'S: Active' state.

6.2.8.3.3 Send SDP with Session LockIn for another PoC Session (S: Session LockIn; another PoC Session)

When sending an indication that another PoC Session containing Continuous Media is to be locked, the PoC Client:

1. SHALL proceed with message handling as specified in [OMA-PoC-CP] "*PoC Client handling PoC Session locking"*; and,

2. SHALL remain in the 'S: Dormant' state.

6.2.8.3.4 Send SDP with Primary PoC Session selected; this PoC Session selected (S: Set Primary PoC Session; this PoC Session)

When sending an indication that a PoC Session containing Continuous Media is to be selected as Primary PoC Session and if the Primary PoC Session setting is for this PoC Session and if criteria defined in the subclause 7.5.1 "*Procedures at the PoC Client*" for switching to another PoC Session containing Continuous Media are fulfilled the PoC Client:

1. SHALL proceed with message handling as specified in [OMA-PoC-CP] "*PoC Client setting PoC Session priority*"; and,

2. SHALL enter the 'S: Active' state.

6.2.8.3.5 Send SDP with Primary PoC Session selected; another PoC Session selected or criteria not fulfilled (S: Set Primary PoC Session; another PoC Session or criteria not fulfilled)

When sending an indication that a PoC Session containing Continuous Media is to be selected as Primary PoC Session and if the Primary PoC Session setting is for another PoC Session containing Continuous Media or if criteria defined in the subclause 7.5.1 "*Procedures at the PoC Client*" for switching to another PoC Session containing Continuous Media are not fulfilled the PoC Client:

1. SHALL proceed with message handling as specified in [OMA-PoC-CP] "*PoC Client setting PoC Session priority*"; and,

2. SHALL remain in the 'S: Dormant' state.

6.2.8.3.6 Send SDP with PoC Session UnLock and remain active in another PoC Session (S: Session UnLock; remain dormant)

When sending an indication that another PoC Session containing Continuous Media is to be unlocked and if criteria defined in the subclause 7.5.1 "*Procedures at the PoC Client*" for switching to this PoC Session are not fulfilled, the PoC Client:

1. SHALL proceed with message handling as specified in [OMA-PoC-CP] "*PoC Client handling PoC Session locking*"; and,

2. SHALL remain in the 'S: Dormant' state.

6.2.8.3.7 Send SDP with PoC Session UnLock and switch to this PoC Session (S: Session UnLock; switch to this PoC Session)

When sending an indication that another PoC Session containing Continuous Media is to be unlocked and if criteria defined in the subclause 7.5.1 "*Procedures at the PoC Client*" for switching to this PoC Session are fulfilled, the PoC Client:

1. SHALL proceed with message handling as specified in [OMA-PoC-CP] "*PoC Client handling PoC Session locking*"; and,

2. SHALL enter the 'S: Active' state.

6.2.8.3.8 Monitor PoC Session release and activate this PoC Session (M: PoC Session released; activate this PoC Session)

Upon receiving an indication that another PoC Session containing Continuous Media has been released or when all Continuous Media are disconnected from that PoC Session, and if criteria for activation of this PoC Session defined in the subclause 7.5.1 "*Procedures at the PoC Client"* activation for this PoC Session are fulfilled, then the PoC Client:

1. SHALL enter the 'S: Active' state.

6.2.8.3.9 Monitor PoC Session release and remain active in another PoC Session (M: PoC Session released; remain dormant)

Upon receiving an indication that another PoC Session containing Continuous Media has been released or when all Continuous Media are disconnected from that PoC Session, and if criteria for activation of this PoC Session defined in the subclause 7.5.1 "*Procedures at the PoC Client"* activation for this PoC Session the PoC Client:

1. SHALL remain in the 'S: Dormant' state.

6.2.8.3.10 Receive MBCP Media Burst Granted message (R: MB_Granted)

When receiving a MBCP Media Burst Granted message in a response to a MBCP Media Burst Request the PoC Client:

1. SHALL enter the 'S: Active' state.

6.2.8.3.11 Receive RTP Media packets (R: Media for this PoC Session)

Upon receiving RTP Media packets for this PoC Session the PoC Client:

1. SHALL enter the 'S: Active' state.

6.2.8.3.12 Send or receive TBCP message (S/R: TBCP)

Upon receiving TBCP messages (other than the TBCP Talk Burst Granted message) or when sending TBCP messages the PoC Client:

1. SHALL act as specified in the PoC Session specific state diagrams and state transitions specified in the subclause [OMA-PoC-1-UP] "*PoC Session control state diagram – basic*" or [OMA-PoC-1-UP] "*PoC Session control state diagram – queuing*" if queuing of Talk Burst requests are used; and,
2. SHALL remain in 'S: Dormant' state.

6.2.8.3.13 Receive TBCP Talk Burst Granted message (R: TB_Granted)

When receiving a TBCP Talk Burst Granted message in a response to a TBCP Talk Burst Request the PoC Client:

1. SHALL enter the 'S: Active' state.

6.2.9 PoC Session control state diagram – queuing

NOTE: When the PoC Client negotiates the Talk Burst Control Protocol as specified in [OMA-PoC-1-UP] instead of the Media Burst Control Protocol, the PoC Client acts as specified in [OMA-PoC-1-UP].

If the PoC Client and PoC Server negotiate support of queuing for a PoC Session Media-floor Control Entity, the PoC Client SHALL support the state diagram and the state transitions specified in this subclause.

Figure 7 "*PoC Session control state diagram – queuing*" shows the state diagram for queued operation.

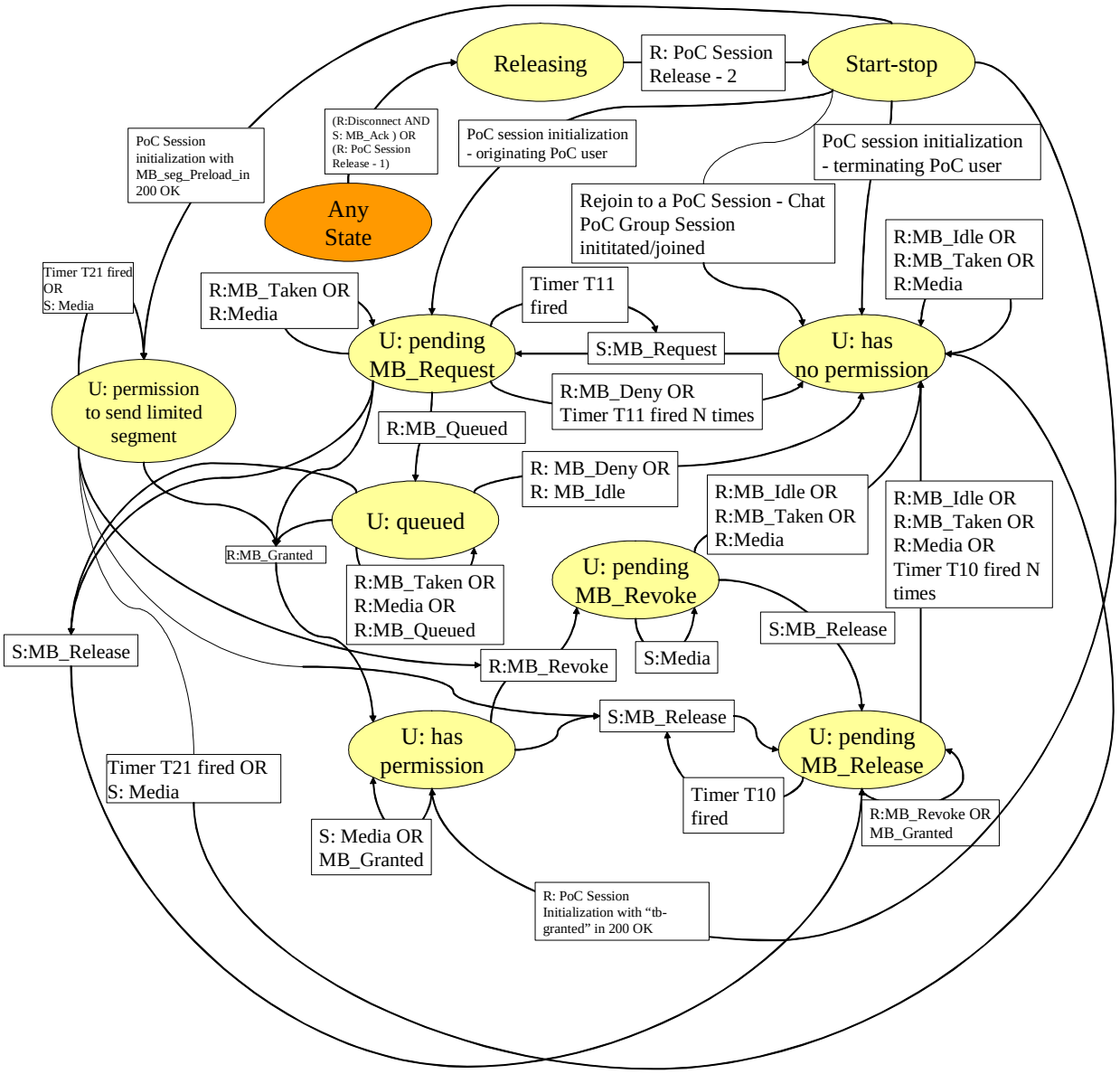


Figure 7: PoC Session control state diagram – queuing

State details are explained in the following subclauses.

If a MBCP message, MSRP request, MSRP response or RTP Media packet arrives in any state and there is no procedure specified for it in the subclauses below the PoC Client SHALL discard the MBCP message, MSRP request, MSRP response or RTP Media packet and SHALL remain in the current state.

6.2.9.1 State: 'Start-stop'

In this state Media-floor Control Entity for queuing does not exist.

Do the actions specified in the subclause 6.2.5.1 *"State: 'Start-stop'"*.

6.2.9.1.1 State: 'U: has no permission'

Do the actions specified in the subclause 6.2.5.2 "*State: 'U: has no permission'*", but instead of subclause 6.2.5.2.4 "*Send MBCP Media Burst Request message (S: MB_Request)*" do 6.2.9.2.1 "*Send MBCP Media Burst Request message (S: MB_Request)*".

6.2.9.1.2 Send MBCP Media Burst Request message (S: MB_Request)

Upon receiving an indication from the PoC User to request permission to send Media the PoC Client:

1. if the PoC Client has a maxpriority = '00 - receive only' the PoC Client:
    a. SHALL provide an indication to the User that the PoC Client is in receive only mode; and,
    b. SHALL remain in the 'U: has no permission' state.
2. Otherwise the PoC Client:
    a. SHALL send the MBCP Media Burst Request message toward the PoC Server;

       The MBCP Media Burst Request message:

        i. MAY include the Media Burst request priority level; and,
        ii. MAY include the Media Burst request timestamp.

    b. SHALL start T11 (Media Burst Request) timer; and,
    c. SHALL enter the 'U: pending MB_Request' state.

6.2.9.2 State: 'U: pending MB_request'

The 'U: pending MB_Request' state is a transition state, and the PoC Client uses this state when the PoC Client is waiting for response to a MBCP Media Burst Request message.

In this state the PoC Client can receive RTP Media packets, MSRP SEND requests and MBCP Media Burst Control messages.

Timer T11 (Media Burst Request) is running in this state.

6.2.9.2.1 Receive MBCP Media Burst Granted message (R: MB_Granted)

Do the actions specified in the subclause 6.2.5.3.1 "*Receive MBCP Media Burst Granted message (R: MB_Granted)*".

6.2.9.2.2 Receive MBCP Media Burst Taken message (R: MB_Taken)

Upon receiving a MBCP Media Burst Taken message from the PoC Server, the PoC Client:

1. SHALL send a MBCP Media Burst Acknowledgement message if the MBCP Media Burst Taken message expects an acknowledgement reply;
2. SHALL provide Media Burst taken notification to the PoC User;
3. SHOULD perform the mapping between the SSRC of the PoC Client granted a permission to send a Media Burst and the PoC Address or Nick Name or both, if they are included in the message;
4. MAY display the PoC Address or Nick Name or both based on SSRC of the sending PoC Client, if mapping between those exists in PoC Client; and,
5. SHALL remain in the 'U: pending MB_Request' state.

6.2.9.2.3 Receive MBCP Media Burst Deny message (R: MB_Deny)

Do the actions specified in the subclause 6.2.5.3.3 "*Receive MBCP Media Burst Deny message (R: MB_Deny)*".

6.2.9.2.4 T11 (Media Burst request) timer fired

On firing of timer T11 (Media Burst Request), the PoC Client:

1. SHALL send a MBCP Media Burst Request message towards the PoC Server.

   The MBCP Media Burst Request message:

   a. MAY include the Media Burst request priority level; and,

   b. MAY include the Media Burst Request Timestamp of the original Media Burst Request.

2. SHALL remain in the U: pending MB_Request' state.

6.2.9.2.5 T11 timer fired N times

Do the actions specified in the subclause 6.2.5.3.5 "*T11 timer fired N times*".

6.2.9.2.6 Receive RTP Media packets (R: Media)

Upon receiving RTP Media packets the PoC Client:

1. SHALL render the Media;
2. MAY display the PoC Address or Nick Name or both based on SSRC of the sending PoC Client, if mapping between those exists in PoC Client; and,
3. SHALL remain in the 'U: pending MB_Request' state.

6.2.9.2.7 Receive MBCP Media Burst Request Queue Status message (R: MB_Queued)

Upon receiving a MBCP Media Burst Request Queue Status message from the PoC Server,

1. if the message indicates that the request has been queued, the PoC Client:

   a. SHALL provide Media Burst request queued status response notification to the PoC User;

   b. MAY provide the queue position and priority (if available) to the PoC User;

   c. SHALL stop T11 (Media Burst Request) timer; and,

   d. SHALL enter the 'U: queued' state.

2. if the message indicates that the request has not been queued the PoC Client:

   a. SHALL remain in the 'U: pending MB_Request' state.

6.2.9.2.8 Receiving a MSRP SEND request (R: MSRP SEND)

Upon receiving an MSRP SEND request the PoC Client:

1. SHALL generate and send a MSRP 200 "OK" response according to rules and procedures of [OMA-PoC-IM];
2. MAY render the received content of the MSRP SEND request for the PoC User;
3. MAY display the PoC Address or Nick Name or both retrieved from the message/cpim From header in the MSRP SEND body; and,
4. SHALL enter the 'U: pending MB_Request' state.

6.2.9.3 State: 'U: has permission'

Do the actions specified in this subclause and the actions specified in the subclause 6.2.5.4 "*State: 'U: has permission'*".

NOTE: If the PoC Client was queued, the PoC Client can request a confirmation from the PoC User before starting sending the Media. If confirmed, the Media sending starts otherwise the permission to send Media is released.

6.2.9.3.1 Receive MBCP Media Burst Granted message (R: MB_Granted)

Upon receiving a MBCP Media Burst Granted message from the PoC Server, the PoC Client:

1. SHALL remain in the 'U: has permission' state.

6.2.9.4 State: 'U: pending MB_Release'

Do the actions specified in this subclause and the actions specified in the subclause 6.2.5.5 "*State: 'U: pending MB_Release'*".

6.2.9.4.1 Receive MBCP Media Burst Granted message (R: MB_Granted)

Upon receiving a MBCP Media Burst Granted message from the PoC Server, the PoC Client:

1. SHALL remain in the 'U: pending MB_Release' state.

6.2.9.5 State: 'U: pending MB_Revoke'

Do the actions specified in the subclause 6.2.5.6 "*State: 'U: pending MB_Revoke'*".

6.2.9.6 State: 'U: Queued'

The 'U: queued' state is a stable state and the PoC Client uses this state when the PoC Client has received indication from the PoC Server that a request to send a Media Burst has been queued by the PoC Server, and is awaiting indication that a Media Burst has been granted. In this state the PoC Client can receive RTP Media packets and can send and receive MBCP Media Burst Control messages.

6.2.9.6.1 Receive RTP Media packets (R: Media)

Upon receiving RTP Media packets the PoC Client:

1. SHALL render the Media;
2. MAY display the PoC Address or Nick Name or both based on SSRC of the sending PoC Client, if mapping between those exists in PoC Client;
3. SHOULD restart the T13 (end of RTP Media) timer; and,
4. SHALL remain in the 'U: Queued' state.

6.2.9.6.2 Receive MBCP Media Burst Taken message (R: MB_Taken)

Upon receiving a MBCP Media Burst Taken message from the PoC Server, the PoC Client:

1. SHOULD perform the mapping between the SSRC of the PoC Client granted a permission to send a Media Burst and the PoC Address or Nick Name or both, if they are included in the message;
2. MAY display the PoC Address and Nick Name to the PoC User, if they are included in the message, or alternatively if the PoC Client has a mapping between SSRC of the PoC Client granted a permission to send a Media Burst and the PoC Address and /or Nick Name;
3. SHALL provide Media Burst taken notification to the PoC User; and,
4. SHALL remain in the 'U: Queued' state.

6.2.9.6.3 Receive MBCP Media Burst Granted message (R: MB_Granted)

Upon receiving a MBCP Media Burst Granted message from the PoC Server, the PoC Client:

2. SHALL provide Media Burst granted notification to the PoC User;
3. MAY provide information about the stop talking timer value to the PoC User;
4. MAY provide notification of the number of Participants, receiving the Media Burst, to the PoC User, if included in the message; and,
5. SHALL enter the 'U: has permission' state.

6.2.9.6.4 Receive MBCP Media Burst Deny message (R: MB_Deny)

Upon receiving a MBCP Media Burst Deny message from the PoC Server, the PoC Client:

1. SHALL provide Media Burst deny notification to the PoC User;
2. MAY display the Media Burst Deny reason, if it is included in the message; and,
3. SHALL enter the 'U: has no permission' state.

6.2.9.6.5 Send MBCP Media Burst Release message (S: MB_Release)

Upon receiving an indication to release the queued Media Burst request from the PoC User, the PoC Client:

1. SHALL send a MBCP Media Burst Release message towards the PoC Server.

   The MBCP Media Burst Release message:

   a. SHALL include the sequence number ignore field set to 1.
2. SHALL start timer T10 (Media Burst Release); and,
3. SHALL enter the 'U: pending MB_Release state.

6.2.9.6.6 Receive MBCP Media Burst Request Queue Status message (R: MB_Queued)

Upon receiving a MBCP Media Burst Request Queue Status message from the PoC Server, the PoC Client:

1. if the message indicates that the request has been queued, the PoC Client:

   a. MAY provide the queue position and priority (if available) to the PoC User;
2. SHALL remain in the 'U: queued' state.

6.2.9.6.7 Receive MBCP Media Burst Idle message (R: MB_Idle)

Upon receiving a MBCP Media Burst Idle message from the PoC Server, the PoC Client:

1. SHALL enter the 'U: has no permission' state.

6.2.9.7 State: Any state

This subclause describes the actions to be taken in all states defined for the queuing state diagram with the exception of the 'Start-stop' state.

6.2.9.7.1 Receive MBCP Disconnect message (R: Disconnect)

Do the actions specified in the subclause 6.2.5.7.1 "*Receive MBCP Disconnect message (R: Disconnect)*".

6.2.9.7.2 Receive PoC Session release - 1 (R: PoC Session release - 1)

Do the actions specified in the subclause 6.2.5.7.2 "*Receive PoC Session release - 1*".

6.2.9.8 State: Releasing

Do the actions specified in the subclause 6.2.5.8 "*State: Releasing*".

6.2.9.9 State: 'U: Permission to send limited segment'

Do the actions specified in the subclause 6.2.5.9 "*State: U: Permission to send limited segment*".

6.2.10 PoC Client procedures for Media Stream not bound to Media-floor Control Entity

NOTE: The Discrete Media can also be received as specified in [OMA-PoC-CP] "*PoC Client receiving Discrete Media as a SIP MESSAGE*" and sent as specified in [OMA-PoC-CP] "*PoC Client sending a Discrete Media as a SIP MESSAGE*".

6.2.10.1 Receiving a MSRP SEND request

Upon receiving an MSRP SEND request the PoC Client:

1. SHALL generate and send a MSRP 200 "OK" response according to rules and procedures of [OMA-PoC-IM];
2. MAY store the received content of the MSRP SEND request; and,
3. MAY notify the PoC User that Discrete Media is received.

6.2.10.2 Sending a MSRP SEND request

When Discrete Media is available for transfer, the PoC Client:

1. SHALL generate a MSRP SEND request according to rules and procedures of [OMA-PoC-IM];
2. SHALL include the encoded Discrete Media as specified in [OMA-PoC-IM]; and,
3. SHALL send the MSRP SEND request according to rules and procedures of [OMA-PoC-IM].

6.3 Procedures at the PoC Server performing the Participating PoC Function

6.3.1 General

The PoC Server SHALL support the basic procedures specified in the subclause 6.3.5 "*PoC Session Procedures – Basic*" if the PoC Server stays in the Media path.

The PoC Server MAY support the Pre-established Session procedure as specified in subclause 6.3.6 "*Pre-established Session state diagrams – basic".*

The PoC Server MAY support the Simultaneous PoC Session procedure as specified in the subclause 6.3.7 "*Simultaneous PoC Sessions state diagram - per PoC Client"* and 6.3.8 "*Simultaneous PoC Sessions state diagram - per PoC Session".*

If the PoC Server supports Simultaneous PoC Sessions also procedures described in [OMA-PoC-1-UP] SHALL be used when the PoC Session is a PoC 1 session.

6.3.2 Participating PoC Function procedures at PoC Session initialization

There are two types of PoC Sessions where the PoC Server needs to initiate procedures in the User Plane:

1. The PoC Session is an On-demand Session and the PoC Server remains in the transport path; or,
2. The PoC Session is using a Pre-established Session.

If the PoC Server and PoC Client support Simultaneous PoC Sessions, the PoC Session can be one of many Simultaneous PoC Sessions that the PoC Server is managing for a given PoC Client. When the first PoC Session with Continuous Media is established, the procedures specified in subclause 6.2.7 "*Simultaneous PoC Sessions state diagram – per PoC Client*" are performed.

If the PoC Session is either an On-demand Session or a PoC Session using a Pre-established Session, if the PoC Server does not support Simultaneous PoC Sessions, the procedures in subclause 6.3.5 "*PoC Session Procedure –basic*" is performed.

If the PoC Session in case of manual answer using Pre-established Session is established, the PoC Server performing the Participating PoC Function sends the MBCP Connect message to the Invited PoC Client as specified in subclause 6.3.6.2.4 *"Receive SIP 200 "OK" response to the SIP re-INVITE request (R: 200 OK)"*.

Before the PoC Server sends the first Media Burst Control Protocol message in the PoC Session, the PoC Server has to assign itself a SSRC identifier to be included in the Media Burst Control Protocol messages. A suitable algorithm to generate the SSRC identifier is described in [RFC3550].

6.3.3 Participating PoC Function procedures at PoC Session release

When a PoC Session is released (whether it is initiated by the PoC Client or PoC Server) and the PoC Server remained on the transport path, a two-stage procedure is followed:

1. In the first stage, the PoC Server stops forwarding all MBCP messages, RTP Media packets and RTCP packets and relaying MSRP requests and responses between the PoC Client and the PoC Server performing the Controlling PoC Function.
2. In the second stage, the PoC Server terminates any processes or state machines on the User Plane associated with this PoC Session.

There are no cases where a User Plane state machine will cause the PoC Session to be released.

If Simultaneous PoC Sessions are supported and the released PoC Session included Continuous Media:

1. The 'Simultaneous PoC Sessions state machine – per PoC Client' associated with the PoC Session being released is terminated; and,
2. if the last PoC Session with Continuous Media is being released, the 'Simultaneous PoC Sessions state machine – per PoC Session is terminated.

If the PoC Session uses a Pre-established Session, the Pre-established Session state machine returns to a state specified in subclause 6.3.6 "*Pre-established Session state diagrams – basic*".

If a Pre-established Session is released, the Pre-established Session state machine is terminated.

6.3.3A Participating PoC Function procedures at PoC Session modification

6.3.3A.1 Participating PoC Function procedures when connecting to a Media Type

If connecting to Continuous Media is agreed, the PoC Server includes the Media Type in the filtering process and creates the 'Simultaneous PoC Sessions state diagram - per PoC Client' as specified in the subclause 6.3.7 "*Simultaneous PoC Sessions state diagram - per PoC Client*", if not already started and if more than one PoC Session per PoC Client includes the Continuous Media.

NOTE: When a Continuous Media is connected, the Simultaneous PoC Sessions state machine is created and started in a special case, when the PoC Client has e.g. two PoC Sessions: one having only Discrete Media and another one having PoC Speech and when PoC User adds PoC Speech to the first PoC Session.

When a new Media-floor Control Entity is agreed, the PoC Server starts handling the Media-floor Control Entity messages.

6.3.3A.2 Participating PoC Function procedures when disconnecting from a Media Type

If disconnecting from a Media Type is agreed, the PoC Server stops handling the Media Type and remove the 'Simultaneous PoC Sessions state diagram - per PoC Client' as specified in the subclause 6.3.7 "*Simultaneous PoC Sessions state diagram - per PoC Client*", if not more than one PoC Session per PoC Client includes anymore the Continuous Media.

When removing of an existing Media-floor Control Entity is agreed, the PoC Server stops handling the Media-floor Control Entity messages.

6.3.4 Participating PoC Function procedures at Pre-established Session release

The User Plane resources for a Pre-established Session are released after the Control Plane has released the Pre-established Session. This means that any PoC Session over the Pre-established Session has been released before the Pre-established Session is released and so, there are no RTP Media packets MBCP messages, MSRP requests or responses flowing at the time that the Pre-established Session is released. All that the PoC Server needs to do is to release any User Plane resources associated with the Pre-established Session.

6.3.5 PoC Session Procedures – basic

NOTE 1: When the PoC Server negotiates with the PoC Client the Talk Burst Control Protocol as specified in [OMA-PoC-1-UP] instead of the Media Burst Control Protocol, the PoC Server acts as specified in [OMA-PoC-1-UP].

When a PoC Session is initiated and the PoC Server remains on the transport path, a process SHALL be created that

1. SHALL forward all MBCP messages from the PoC Client to the PoC Server performing the Controlling PoC Function at the address and port as specified during PoC Session setup. See [OMA-PoC-CP] *"Participating PoC Function procedures"*;
2. SHALL forward all MBCP messages from the PoC Server performing the Controlling PoC Function to the PoC Client at the address and port as specified during PoC Session setup. See [OMA-PoC-CP] *"Participating PoC Function procedures"*;
3. SHALL forward all RTP Media packets with payload of each used Continuous Media from the PoC Client to the PoC Server performing the Controlling PoC Function at the address and port as specified during PoC Session setup. See [OMA-PoC-CP] *"Participating PoC Function procedures"*;
4. SHALL, if PoC Media Traffic Optimisation has not been negotiated, forward all RTP Media packets of each used Continuous Media from the PoC Server performing the Controlling PoC Function to the PoC Client at the address and port as specified during PoC Session setup. See [OMA-PoC-CP] *"Participating PoC Function procedures"*;
5. SHALL, if PoC Media Traffic Optimisation has been negotiated, forward RTP Media packets of each used Continuous Media from the PoC Server performing the Controlling PoC Function to PoC Clients satisfying the following conditions:
    a. The PoC Clients Media are set off hold;
    b. The RTP Media packets are not originating from the PoC Client itself; and,
    c. The PoC Client's Media Parameters are the same as the received RTP Media packets' parameters.

NOTE 2: PoC Media Traffic Optimisation does not cover Discrete Media and cannot be negotiated for PoC Session, in which the 1-many-1 communication method is used.

NOTE 3: The handling of RTCP packets is explained in the subclause 5.4 "*RTCP*".

6. SHALL relay MSRP requests and responses of each used Discrete Media from the PoC Client to the PoC Server performing the Controlling PoC Function as specified in [OMA-IM-TS] and as endorsed in [OMA-PoC-IM]; and,

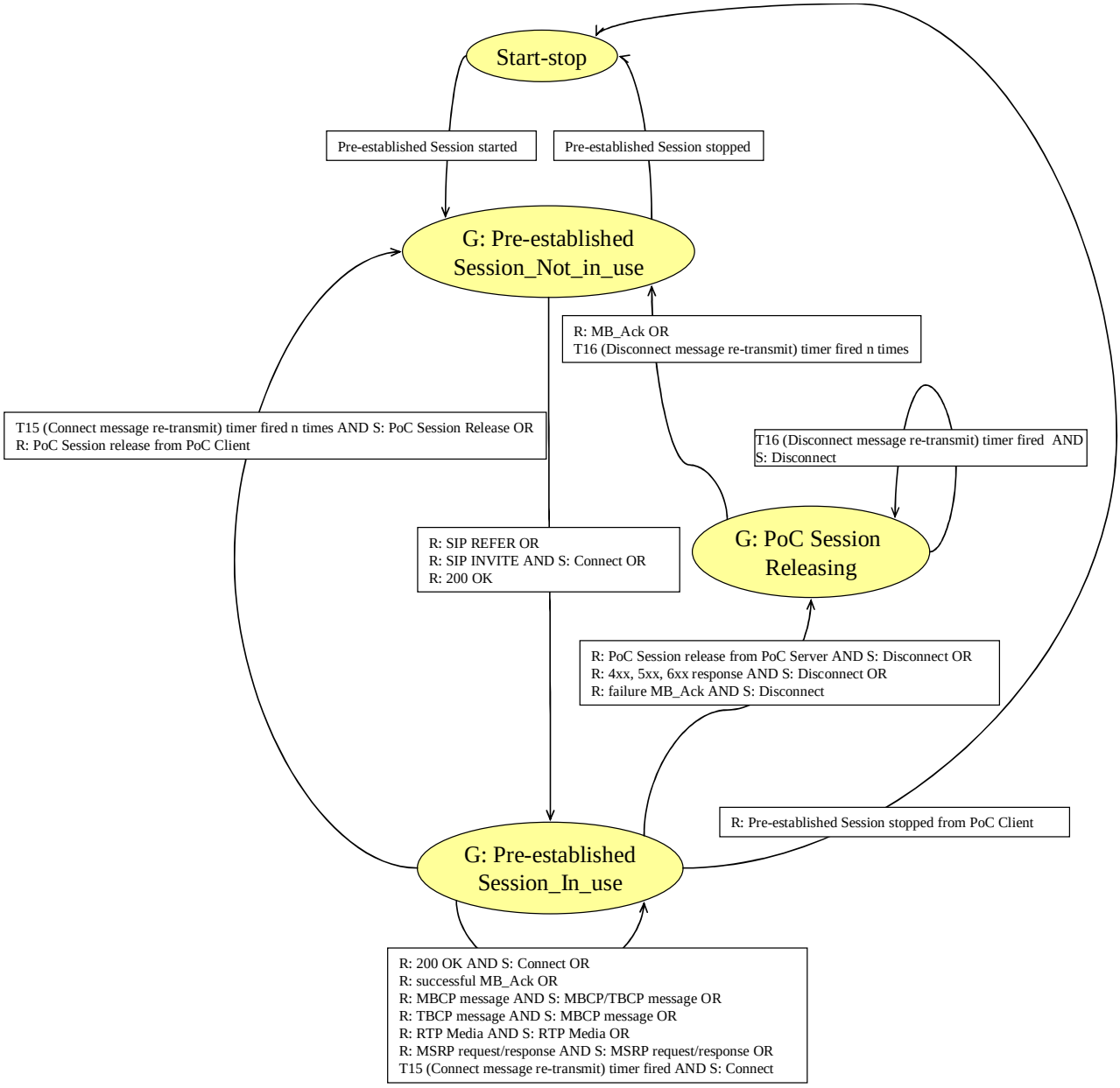
7. SHALL relay MSRP requests and responses of each used Discrete Media from the PoC Server performing the Controlling PoC Function to the PoC Client at the address and port as specified during PoC Session setup as specified in [OMA-IM-TS] and as endorsed in [OMA-PoC-IM].

6.3.6 Pre-established Session state diagrams – basic

If the PoC Server supports Pre-established Session the PoC Server SHALL support the state diagram and the state transitions specified in this subclause.

Pre-established Session has three states: 'Pre-established Session_Not_In_Use' state, Pre-established Session_In_use' state and 'PoC Session Releasing' state. The states are partly controlled by the Control Plane as specified in [OMA-PoC-CP].

Figure 8 "*Pre-established Session state diagrams – basic*" shows the general Pre-established Session states (G states) and the state transitions.



NOTE: T15 is the 'Connect message re-transmit' timer and T 16 is the 'Disconnect message re-transmit' timer.

Figure 8: Pre-established Session state diagrams – basic

The PoC Server SHALL create one instance of the Pre-established Session state machine per Pre-established Session initiated by PoC Client.

State details are explained in the following subclauses.

If a MBCP message, TBCP message, SIP request, SIP response, RTP Media packet, MSRP request or response arrives in any state and there is no procedure specified for it in the subclauses below the PoC Server SHALL discard the MBCP message, TBCP message, SIP request, SIP response RTP Media packet, MSRP request or response and SHALL remain in the current state.

6.3.6.1 State 'Start-stop

In this state, no Pre-established Session exists.

6.3.6.1.1 Pre-established Session started

When a Pre-established Session is created between the PoC Server and a PoC Client, the PoC Server:

1. SHALL initialize any needed User Plane resources for the Pre-established Session; and,
2. SHALL enter the 'G: Pre-established Session_Not_in_use' state.

6.3.6.2 State 'G: Pre-established Session_Not_in_use'

The 'G: Pre-established Session_Not_in_use' state is a stable state. The PoC Server Function is in this state when the Pre-established Session is established, but it is not used for a PoC Session.

In this state the PoC Server can receive PoC Session initiation.

6.3.6.2.1 Receive SIP REFER request (R: SIP REFER)

Upon receiving a SIP REFER request from the PoC Client the PoC Server:

1. SHALL reserve the User Plane resources for the PoC Session, if not yet reserved; and,
2. SHALL enter the 'G: Pre-established Session_In_use' state.

6.3.6.2.2 Receive SIP INVITE request (R: SIP INVITE)

Upon receiving a SIP INVITE request from the PoC Server performing the Controlling PoC Function the PoC Server:

1. if Automatic Answer Mode is used the PoC Server:
    a. SHALL send the MBCP Connect message to the Invited PoC Client using the UDP port of one of the Media-floor Control Entities used in the PoC Session.

        The MBCP Connect message:

        i. SHALL include the CNAME to identify the PoC Session Identity;
        ii. SHALL include the CNAME to identify the PoC Client initiating the PoC Session, if privacy was not requested;
        iii. MAY include the NAME to identify the Nick Name of the PoC Client initiating the PoC Session;
        iv. SHALL include the CNAME of the PoC Group Identity, if this is a Pre-arranged or Chat PoC Group Session;
        v. MAY include the NAME to identify the PoC Group Name, if this is a Pre-arranged or Chat PoC Group Session
        vi. MAY include the NAME and CNAME to identify the Nick Name and the PoC Address of each non-anonymous Invited PoC User;
        vii. If this is a Dispatch PoC Session the MBCP Connect message:
            a) SHALL include dispatcher (b-bit) set to 1;
            b) SHALL include in the role (c-bit) set to 1 if the PoC User is invited as PoC Dispatcher otherwise set to 0;
            c) SHALL include the type (d-bit) of Dispatch PoC Session;

viii. SHALL include the MBCP-restrict field with the MBCP-restrict-value set to 1, if the Media-floor Control Entity of the PoC Session associated with the Pre-established Session does not use the Media-floor Control Protocol multimedia extensions as specified in [OMA-PoC-CP] "*Media Burst Control Protocol MIME registration*";

ix. SHALL include the Media-Streams field indicating the usage of the Media Streams of the Pre-established Session in the associated PoC Session, if a Media Stream of the Pre-established Session does not have a matching Media Stream in the PoC Session; and,

x. SHALL include the Discrete-Media-feature-tag-indication with the value set to 1 if the '+g.poc.discretemedia' feature tag was included in the SIP INVITE request.

b. SHALL start the T15 (Connect message re-transmit) timer;

c. SHALL reserve the User Plane resources for the PoC Session, if not yet reserved;

2. SHALL enter the 'G: Pre-established Session_In_use' state.

NOTE: In case manual answer is used the procedure is described in [OMA-PoC-CP] *"Manual-Answer"*.

6.3.6.2.3 Pre-established Session stopped

When the Pre-established Session between the PoC Client and the PoC Server is released, the PoC Server:

1. SHALL release any User Plane resources including any running timers associated with the Pre-established Session; and,

2. SHALL enter the 'Start-stop' state.

6.3.6.2.4 Receive SIP 200 "OK" response to the SIP re-INVITE request (R: 200 OK)

Upon receiving the SIP 200 "OK" response to the SIP re-INVITE request of the Pre-established Session initiating a PoC Session as specified in the [OMA-PoC-CP] "*Manual-answer using Pre-established Session*", the PoC Server:

1. SHALL send the MBCP Connect message to the Invited PoC Client using the UDP port of one of the Media-floor Control Entities used in the PoC Session.

   The MBCP Connect message:

   a. SHALL include the CNAME to identify the PoC Session Identity;

   b. SHALL include the CNAME to identify the PoC Client initiating the PoC Session, if privacy was not requested;

   c. MAY include the NAME to identify the Nick Name of the PoC Client initiating the PoC Session;

   d. SHALL include the CNAME of the PoC Group Identity, if this is a Pre-arranged or Chat PoC Group Session;

   e. MAY include the NAME to identify the PoC Group Name, if this is a Pre-arranged or Chat PoC Group Session;

   f. MAY include the NAME and CNAME to identify the Nick Name and the PoC Address of each non-anonymous Invited PoC User;

   g. If this is a Dispatch PoC Session the MBCP Connect message:

      i. SHALL include dispatcher (b-bit) set to 1;

      ii. SHALL include in the role (c-bit) set to 1 if the PoC User is invited as PoC Dispatcher otherwise set to 0;

iii. SHALL include the type (d-bit) of Dispatch PoC Session;

h. SHALL include the MBCP-restrict field with the MBCP-restrict-value set to 1, if the Media-floor Control Entity of the PoC Session associated with the Pre-established Session does not use the Media-floor Control Protocol multimedia extensions as specified in [OMA-PoC-CP] "*Media Burst Control Protocol MIME registration*"; and,

i. SHALL include the Media-Streams field indicating the usage of the Media Streams of the Pre-established Session in the associated PoC Session, if a Media Stream of the Pre-established Session does not have a matching Media Stream in the PoC Session.

2. SHALL start the T15 (Connect message re-transmit) timer;

3. SHALL reserve the User Plane resources for the PoC Session, if not yet reserved and,

4. SHALL enter the 'G: Pre-established Session_In_use' state.

6.3.6.3 State 'G: Pre-established Session_In_use'

The 'G: Pre-established Session_In_use' state is a stable state. The PoC Server is in this state when a Pre-established Session is established and it is used for a PoC Session.

In this state the PoC Server can receive RTP Media packets, TBCP message, MBCP messages and MSRP request or response.

6.3.6.3.1 Receive MBCP message (R: MBCP message)

Upon receiving a MBCP message the PoC Server:

1. SHALL forward the MBCP message between the PoC Client and the PoC Server performing the Controlling PoC Function, if the Media-floor Control Entity of the PoC Session associated with the Pre-established Session uses the Media-floor Control Protocol multimedia extensions as specified in [OMA-PoC-CP] "*Media Burst Control Protocol MIME registration*";

2. SHALL create a TBCP message of the same subtype as the MBCP message and include into the TBCP message the allowed received MBCP message specific fields and send the TBCP message to the PoC Server performing the Controlling PoC Function, if the MBCP message is received from the PoC Client and if the Media-floor Control Entity of the PoC Session associated with the Pre-established Session does not use the Media-floor Control Protocol multimedia extensions as specified in [OMA-PoC-CP] "*Media Burst Control Protocol MIME registration*"; and,

3. SHALL remain in the 'Pre-established Session_In_use' state.

6.3.6.3.2 Receive RTP Media packets (R: RTP Media)

Upon receiving RTP Media packets the PoC Server:

1. SHALL forward the RTP Media packets of a used Media Type between the PoC Client and the PoC Server performing the Controlling PoC Function; and,

2. SHALL remain in the 'Pre-established Session_In_use' state.

6.3.6.3.3 Receive PoC Session release indication from PoC Client (R: PoC Session release from PoC Client)

Upon receiving an indication that the PoC Session is released, but the Pre-established Session is kept alive the PoC Server:

1. SHALL send PoC Session release to the Controlling PoC Function as specified in [OMA-PoC-CP] "*PoC Session release from User Plane*";

2. MAY release any User Plane resources associated with the PoC Session not needed for the Pre-established Session;

3. SHALL stop the T15 (Connect message re-transmit) timer, if running; and,
4. SHALL enter the 'G: Pre-established Session_Not_in_use' state.

6.3.6.3.4 Receive PoC Session release indication from Controlling PoC Function (R: PoC Session release from PoC Server)

Upon receiving an indication from the PoC Server performing the Controlling PoC Function that the PoC Session is released, the PoC Server:

1. SHALL stop the T15 (Connect message re-transmit) timer, if running;
2. SHALL send a MBCP Disconnect message to the PoC Client;
3. SHALL start the T16 (Disconnect message re-transmit) timer; and,
4. SHALL enter the 'G: PoC Session Releasing' state.

6.3.6.3.5 Receive Pre-established Session stopped indication from PoC Client (R: Pre-established Session stopped from PoC Client)

Upon receiving the Pre-established Session release from the PoC Client , the PoC Server:

1. SHALL stop sending RTP Media packets, TBCP messages and MBCP messages and relaying of MSRP requests and responses between the PoC Client and the PoC Server performing the Controlling PoC Function;
2. SHALL release any User Plane resources including any running timers associated with the PoC Session and the Pre-established Sessions; and,
3. SHALL enter the 'Start-stop' state.

6.3.6.3.6 Receive MBCP Media Burst Acknowledgement message ((R: successful MB_Ack) and (R: failure MB_Ack))

Upon receiving a MBCP Media Burst Acknowledgement message from the PoC Client, the PoC Server:

1. SHALL stop the T15 (Connect message re-transmit) timer; and,
2. if the reason code is not 'Accepted' the PoC Server:
    a. SHALL send MBCP Disconnect message to the PoC Client;
    b. SHALL start the T16 (Disconnect message re-transmit) timer;
    c. SHALL send a PoC Session release to the Controlling PoC Function as specified in [OMA-PoC-CP] *"PoC Session release from User Plane"*; and,
    d. SHALL enter the 'G: Releasing" state.
3. Otherwise the PoC Server:
    a. SHALL remain in the 'G: Pre-established Session_In_use' state.

6.3.6.3.7 T15 (Connect message re-transmit) timer fired

On expiry of T15 (Connect message re-transmit) timer, the PoC Server:

1. SHALL send a MBCP Connect message to the PoC Client using the UDP port of one of the Media-floor Control Entities used in the PoC Session.

    The MBCP Connect message:

a. SHALL include the CNAME to identify the PoC Session Identity;

b. SHALL include the CNAME to identify the PoC Client initiating the PoC Session, if privacy was not requested;

c. MAY include the NAME to identify the Nick Name of the PoC Client initiating the PoC Session;

d. SHALL include the CNAME of the PoC Group Identity, if this is a Pre-arranged or Chat PoC Group Session;

e. MAY include the NAME to identify the PoC Group Name, if this is a Pre-arranged or Chat PoC Group Session;

f. SHALL include the MBCP-restrict field with the MBCP-restrict-value set to 1, if the Media-floor Control Entity of the PoC Session associated with the Pre-established Session does not use the Media-floor Control Protocol multimedia extensions as specified in [OMA-PoC-CP] "*Media Burst Control Protocol MIME registration*";

g. SHALL include the Media-Streams field indicating the usage of the Media Streams of the Pre-established Session in the associated PoC Session, if a Media Stream of the Pre-established Session does not have a matching Media Stream in the PoC Session; and,

h. SHALL include the Discrete-Media-feature-tag-indication with the value set to 1 if the '+g.poc.discretemedia' feature tag was included in the SIP INVITE request received from the PoC Server performing the Controlling PoC Function.

2. SHALL restart the T15 (Connect message re-transmit) timer; and,

3. SHALL remain in the 'G: Pre-established Session_In_use' state.

6.3.6.3.8 T15 (Connect message re-transmit) timer fired N times

On the N:th firing of timer T15 (Connect message re-transmit), the PoC Server:

1. SHALL send a PoC Session release to the Controlling PoC Function as specified in [OMA-PoC-CP] *"PoC Session release from User Plane"*;

2. MAY release any User Plane resources associated with the PoC Session not needed for the Pre-established Session; and,

3. SHALL enter the 'G: Pre-established Session_Not_in_use' state.

6.3.6.3.9 Receive SIP 200 "OK" response (R: SIP 200 OK)

Upon receiving a SIP 200 "OK" response from the PoC Server performing the Controlling PoC Function the PoC Server:

1. SHALL send the MBCP Connect message to the PoC Client, which initiated a PoC Session using the UDP port of one of the Media-floor Control Entities used in the PoC Session.

   The MBCP Connect message:

   a. SHALL include the CNAME to identify the PoC Session Identity;

   b. SHALL include the CNAME to identify the PoC Client initiating the PoC Session, if privacy was not requested;

   c. MAY include the NAME to identify the Nick Name of the PoC Client initiating the PoC Session;

   d. SHALL include the CNAME of the PoC Group Identity, if this is a Pre-arranged or Chat PoC Group Session;

   e. MAY include the NAME to identify the PoC Group Name, if this is a Pre-arranged or Chat PoC Group Session;

f. SHALL include the MBCP-restrict field with the MBCP-restrict-value set to 1, if the Media-floor Control Entity of the PoC Session associated with the Pre-established Session does not use the Media-floor Control Protocol multimedia extensions as specified in [OMA-PoC-CP] "*Media Burst Control Protocol MIME registration*"; and,

g. SHALL include the Media-Streams field indicating the usage of the Media Streams of the Pre-established Session in the associated PoC Session, if a Media Stream of the Pre-established Session does not have a matching Media Stream in the PoC Session.

2. SHALL start the T15 (Connect message re-transmit) timer; and,

3. SHALL remain in the 'G: Pre-established Session_In_use' state.

6.3.6.3.10 Receives a failed SIP response from the Controlling PoC Function (R: PoC Session release from PoC Server)

Upon receiving a failed PoC Session establishment indication from the PoC Server performing the Controlling PoC Function, the PoC Server:

1. SHALL send a MBCP Disconnect message to the PoC Client;

2. SHALL start the T16 (Disconnect message re-transmit) timer;

3. SHALL terminate the PoC Session; and,

4. SHALL enter the 'G: PoC Session Releasing' state.

6.3.6.3.11 Receive MSRP request or response (R: MSRP request/response)

Upon receiving MSRP request or response the PoC Server:

1. SHALL forward the MSRP request or response between the PoC Client and the PoC Server performing the Controlling PoC Function; and,

2. SHALL remain in the 'Pre-established Session_In_use' state.

6.3.6.3.12 Receive TBCP message (R: TBCP message)

Upon receiving a TBCP message the PoC Server:

1. SHALL create a MBCP message of the same subtype as the TBCP message and include into the MBCP message the allowed received TBCP message specific fields and send the MBCP message to the PoC Client, if the MBCP message is received from the PoC Server performing the Controlling PoC Function and if the Media-floor Control Entity of the PoC Session associated with the Pre-established Session does not use the Media-floor Control Protocol multimedia extensions as specified in [OMA-PoC-CP] "*Media Burst Control Protocol MIME registration*"; and,

2. SHALL remain in the 'Pre-established Session_In_use' state.

6.3.6.4 State 'G: PoC Session Releasing'

The 'G: PoC Session Releasing' state is a transition state. The PoC Server is in this state when a PoC Server originated PoC Session is releasing.

The T16 (Disconnect message re-transmit) timer is running in this state.

6.3.6.4.1 Receive MBCP Media Burst Acknowledgement message (R: MB_Ack)

Upon receiving a MBCP Media Burst Acknowledgement message from the PoC Client, the PoC Server:

1. SHALL stop the T16 (Disconnect message re-transmit) timer;

2. SHALL stop T15 (Connect message re-transmit), if running;

3. MAY release any User Plane resources associated with the PoC Session not needed for the Pre-established Session; and,
4. SHALL enter the 'G: Pre-established Session_Not_in_use' state.

6.3.6.4.2 T16 (Disconnect message re-transmit) timer fired

On expiry of T16 (Disconnect message re-transmit) timer, the PoC Server:

1. SHALL send a MBCP Disconnect message to the PoC Client;
2. SHALL restart the T16 (Disconnect message re-transmit) timer; and,
3. SHALL remain in the 'G: PoC Session Releasing' state.

6.3.6.4.3 T16 timer fired N times

On the N:th firing of timer T16 (Disconnect message re-transmit), the PoC Server:

1. SHALL stop the T16 (Disconnect message re-transmit) timer;
2. MAY release any User Plane resources associated with the PoC Session not needed for the Pre-established Session; and,
3. SHALL enter the 'G: Pre-established Session_Not_in_use' state.

6.3.7 Simultaneous PoC Sessions state diagram - per PoC Client

If the PoC Server supports Simultaneous PoC Sessions the PoC Server SHALL support the state diagram and the state transitions specified in this subclause, when PoC Client has more than one PoC Session including the Continuous Media.

The state diagram SHALL be used for PoC Sessions established as specified in [OMA-PoC-1-UP].

Figure 9 "*Simultaneous PoC Sessions state diagram - per PoC Client*" shows the state diagram for Simultaneous PoC Session per PoC Client.

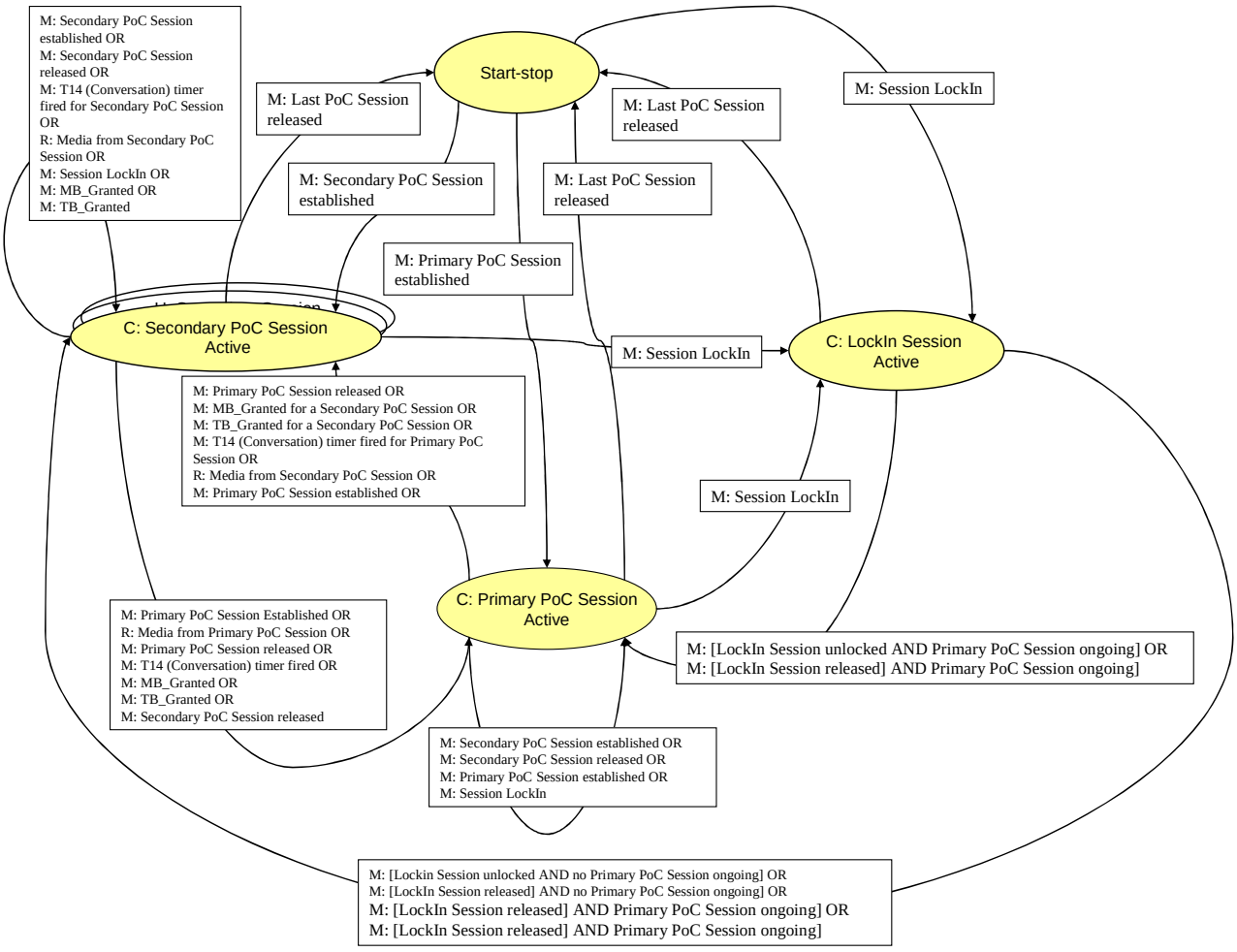


Figure 9: Simultaneous PoC Sessions state diagram - per PoC Client

State details are explained in the following subclauses.

If a TBCP message, MBCP message, SIP request or RTP Media packet arrives in any state and there is no procedure specified for it in the subclauses below the PoC Server SHALL discard the TBCP message, MBCP message, SIP request or RTP Media packet and SHALL remain in the current state.

NOTE 1: TBCP messages are defined in [OMA-PoC-1-UP].

NOTE 2: MSRP request and MSRP response relaying is not affected by the state machine.

6.3.7.1 State 'Start-stop'

The state 'Start-stop' is a stable state. In this state no PoC Session exists containing Continuous Media.

6.3.7.1.1 Monitor Primary PoC Session establishment (M: Primary PoC Session established)

When a Primary PoC Session including Continuous Media is established as specified in [OMA-PoC-CP] *"PoC Session priority request"* the PoC Server:

1. SHALL create an instance of the Simultaneous PoC Sessions state machine - per PoC Client; and,
2. SHALL enter the 'C: Primary PoC Session Active' state.

6.3.7.1.2 Monitor Secondary PoC Session establishment (M: Secondary PoC Session established)

When a Secondary PoC Session including Continuous Media is established as specified in the [OMA-PoC-CP] *"PoC Session priority request"* the PoC Server:

1. SHALL create an instance of the Simultaneous PoC Sessions state machine - per PoC Client; and,
2. SHALL enter the 'S: Secondary PoC Session Active' state.

6.3.7.1.3 Monitor SDP LockIn PoC Session establishment (M: Session LockIn)

When a PoC Session is established as specified in the [OMA-PoC-CP] *"PoC Session Locking request"* the PoC Server:

1. SHALL create an instance of the Simultaneous PoC Sessions state machine - per PoC Client; and,
2. SHALL enter the 'C: LockIn PoC Session Active' state.

6.3.7.2 State 'C: Primary PoC Session Active'

The "C: Primary PoC Session Active state" is a stable state. In this state a Primary PoC Session exists as an Active PoC Session. In the 'C: Primary PoC Session Active' state the PoC Server:

1. SHALL start the T14 (Conversation) timer upon receipt of the MBCP Media Burst Release message from the PoC Client or MBCP Media Bust Idle message from the PoC Server performing the Controlling PoC Function for this PoC Session;
2. SHALL start the T14 (Conversation) timer upon receipt of the TBCP Talk Burst Release message from the PoC Client or TBCP Talk Bust Idle message from the PoC Server performing the Controlling PoC Function for this PoC Session;
3. SHALL stop the T14 (Conversation) timer upon receipt of a Media Burst for this PoC Session;
4. SHALL relay RTP Media packets between the PoC Server performing the Controlling PoC Function and the PoC Client for this PoC Session; and,
5. SHALL NOT relay RTP Media packets between the PoC Server performing the Controlling PoC Function and the PoC Client for any other PoC Session(s).

6.3.7.2.1 Monitor Primary PoC Session release when no other PoC Sessions are established (M: Last PoC Session released)

When a Primary PoC Session is released or when all Continuous Media is disconnected from the PoC Session and no other PoC Sessions with Continuous Media for the same PoC Client are established as specified in [OMA-PoC-CP] the PoC Server:

1. SHALL enter the PoC Client state to 'Start-Stop' state.

6.3.7.2.2 Monitor SDP with PoC Session LockIn (M: Session LockIn)

When a Primary PoC Session is an Active PoC Session and the PoC Server receives the indication to lock this PoC Session with Continuous Media as specified in [OMA-PoC-CP] *"PoC Session locking request"* the PoC Server:

1. SHALL enter the 'C: LockIn PoC Session Active' state.

When the PoC Server receives SDP LockIn information for another PoC Session for this PoC Client as specified in [OMA-PoC-CP] *"PoC Session locking request"* the PoC Server either

1. SHALL enter the ‘C: LockIn PoC Session Active’ state if the PoC Client does not have the permission to send a Media Burst; for this Primary PoC Session;

   or,

2. SHALL

   a. remain in the 'C: Primary PoC Session Active' state if the PoC Client has permission to send a Media Burst for this Primary PoC Session; and,

   b. reject the LockIn request as specified in [OMA-PoC-CP] "*PoC Session locking request*".

NOTE: The LockIn request can be received when initializing a PoC Session or during the PoC Session.

6.3.7.2.3 Monitor Secondary PoC Session release (M: Secondary PoC Session released)

When a Secondary PoC Session is released as specified in [OMA-PoC-CP] the PoC Server:

1. SHALL remain in PoC Client state 'C: Primary PoC Session Active'.

6.3.7.2.4 Monitor Secondary PoC Session establishment (M: Secondary PoC Session established)

When a Secondary PoC Session is established as specified in [OMA-PoC-CP] "*PoC Client setting PoC Session priority*" the PoC Server:

1. SHALL remain in PoC Client state 'C: Primary PoC Session Active'.

6.3.7.2.5 Monitor Primary PoC Session release (M: Primary PoC Session released)

When a Primary PoC Session is released or when all Continuous Media for the Primary PoC Session is disconnected and other PoC Sessions with Continuous Media for the same PoC Client are ongoing the PoC Server:

1. SHALL enter to 'C: Secondary PoC Session Active' state.

6.3.7.2.6 Monitor Media Burst message (M: MB_Granted for a Secondary PoC Session)

When the PoC Server receives a MBCP Media Burst Granted message or a TBCP Talk Burst Granted message in response to a MBCP Media Burst Request message or a TBCP Media Burst Request message of the PoC Client for a Secondary PoC Session, the PoC Server:

1. SHALL enter the 'C: Secondary PoC Session active'.

6.3.7.2.7 T14 (Conversation) timer fired for Primary PoC Session

When T14 (Conversation) timer fires for the Primary PoC Session and at least one other Secondary PoC Session with Continuous Media for the same PoC Client is established as specified in the [OMA-PoC-CP] and fulfils conditions as defined in the subclause 7.5.2 "*Procedures at the PoC Server performing the Participating PoC Function*" to be activated, the PoC Server:

1. MAY either

   a. send MBCP Media Burst Taken message to the PoC Client, if the Media Burst is on-going and if the PoC Session is established using procedures specified in this document;

   or,

   b. send TBCP Talk Burst Taken message to the PoC Client, if the Media Burst is on-going and if the PoC Session is established using procedures specified in [OMA-PoC-1-UP].

NOTE: The MBCP Media Burst Taken message and the TBCP Talk Burst Taken message is the same as the one received from the PoC Server performing the Controlling PoC Function in the beginning of the Media Burst.

2. SHALL enter the 'C: Secondary PoC Session active' state for the identified Secondary PoC Session.

6.3.7.2.8 Monitor Primary PoC Session establishment (M: Primary PoC Session established)

When a Primary PoC Session with Continuous Media is established or when a Secondary PoC Session becomes a Primary PoC Session as specified in [OMA-PoC-CP] *"PoC Session priority request"* the PoC Server:

1. SHALL remain in the state 'C: Primary PoC Session Active' state if the new PoC Session fulfils conditions as defined in the subclause 7.5.2 "*Procedures at the PoC Server performing the Participating PoC Function*" to be activated;

   or,

2. SHALL enter the 'C: Secondary PoC Session active' state if the existing Primary PoC Session fulfils conditions as defined in the subclause 7.5.2 "*Procedures at the PoC Server performing the Participating PoC Function*" to be activated.

6.3.7.2.9 Monitor Talk Burst message (M: TB_Granted for a PoC Secondary PoC Session)

Perform the actions specified in subclause 6.3.7.2.6 "*Monitor Media Burst message (M: MB_Granted for a PoC Secondary PoC Session)*".

6.3.7.2.10 Monitor Secondary PoC Session receiving RTP Media packets (R: Media from Secondary PoC Session)

When receiving RTP Media packets in one of the Secondary PoC Sessions and that Secondary PoC Session fulfils conditions as defined in the subclause 7.5.2 "*Procedures at the PoC Server performing the participating PoC Function*" to be activated and the T14 (Conversation) timer has expired, the PoC Server:

1. MAY either

   a. send MBCP Media Burst Taken message to the PoC Client, if the Media Burst is on-going and if the PoC Session is established using procedures specified in this document;

      or,

   b. send TBCP Talk Burst Taken message to the PoC Client, if the Media Burst is on-going and if the PoC Session is established using procedures specified in [OMA-PoC-1-UP].

NOTE: The MBCP Media Burst Taken message and the TBCP Taken message is the same as the one received from the PoC Server performing the Controlling PoC Function in the beginning of the Media Burst.

2. SHALL enter the 'C: Secondary PoC Session active' state for the identified Secondary PoC Session.

6.3.7.3 State: 'C: Secondary PoC Session Active'

The 'C: Secondary PoC Session active' state is a stable state. In this state a PoC Secondary PoC Session with Continuous Media exists as an Active PoC Session. In the 'C: Secondary PoC Session Active' state the PoC Server:

1. SHALL start the T14 (Conversation) timer upon receipt of the MBCP Media Burst Release message from the PoC Client or MBCP Media Bust Idle message from the PoC Server performing the Controlling PoC Function for this PoC Session;

2. SHALL start the T14 (Conversation) timer upon receipt of the TBCP Talk Burst Release message from the PoC Client or TBCP Talk Bust Idle message from the PoC Server performing the Controlling PoC Function for this PoC Session;

3. SHALL stop the T14 (Conversation) timer upon receipt of a Media Burst for this PoC Session;

4. SHALL relay RTP Media packets between the PoC Server performing the Controlling PoC Function and the PoC Client for this PoC Session; and,

5. SHALL NOT relay RTP Media packets between the PoC Server performing the Controlling PoC Function and the PoC Client for any other PoC Session(s).

6.3.7.3.1 Monitor Secondary PoC Session release when no other PoC Sessions are established (M: Last PoC Session released)

When the Secondary PoC Session is released or when all Continuous Media is disconnected from the Secondary PoC Session and no other PoC Sessions with Continuous Media for the same PoC Client are established as specified in [OMA-PoC-CP] *"PoC Session priority request"* the PoC Server:

1. SHALL enter the 'Start-stop' state.

6.3.7.3.2 Monitor SDP with PoC Session LockIn (M: Session LockIn)

When a Secondary PoC Session is an Active PoC Session and the Participating PoC Server receives the indication to lock the Active PoC Session with Continuous Media for this PoC Client as specified in [OMA-PoC-CP] "*PoC Session Locking request*" the PoC Server:

1. SHALL enter the 'C: LockIn PoC Session Active' state.

When the PoC Server receives SDP: LockIn information for another PoC Session for this PoC Client as specified in 7.5.2 *"PoC Session locking request"* the PoC Server either

1. SHALL enter the 'C: LockIn PoC Session Active' state if the PoC Client does not have the permission to send a Media Burst for this Secondary PoC Session;

   or,

2. SHALL perform the following actions:

   a. remain in the 'C: Secondary PoC Session Active' state if the PoC Client has permission to send a Media Burst for this Secondary PoC Session; and,

   b. reject the LockIn request as specified in [OMA-PoC-CP] "*PoC Session locking request*".

NOTE: The LockIn request can be received when initializing a PoC Session or during the PoC Session.

6.3.7.3.3 Monitor Primary PoC Session establishment (M: Primary PoC Session established)

When a Primary PoC Session with Continuous Media is established or when a Secondary PoC Session becomes a Primary PoC Session as specified in [OMA-PoC-CP] *"PoC Session priority request"* and that Primary PoC Session fulfils the criteria defined in the subclause *7.5.2 "Procedures at the PoC Server performing the Participating PoC Function"* to be activated the PoC Server:

1. SHALL enter the state 'C: Primary PoC Session Active' if the changed PoC Session fulfils the conditions defined in the subclause 7.5.2 "*Procedures at the PoC Server performing the participating PoC Function*" to be activated;

   or,

2. SHALL remain in the 'C: Secondary PoC Session active' state if a Secondary PoC Session fulfils the conditions defined in the subclause 7.5.2 "*Procedures at the PoC Server performing the participating PoC Function*" to be activated.

6.3.7.3.4 Receive RTP Media packets (R: Media from Primary PoC Session)

Upon receiving RTP Media packets from a Primary PoC Session and that Primary PoC Session fulfills the criteria defined in the subclause *7.5.2 "Procedures at the PoC Server performing the Participating PoC Function"* to be activated the PoC Server:

1. SHALL enter the 'C: Primary PoC Session Active' state.

NOTE: If the Primary PoC Session does not fulfill the criteria defined in the subclause *7.5.2 "Procedures at the PoC Server performing the Participating PoC Function"* the PoC Server remains in the 'C: Secondary PoC Session Active' state.

6.3.7.3.5 Monitor Secondary PoC Session release (M: Secondary PoC Session released)

When the Secondary PoC Session is released or when all Continuous Media is disconnected from the Secondary PoC Session as specified in [OMA-PoC-CP] and at least one other PoC Session with Continuous Media for the same PoC Client is established and that other PoC Session fulfils the criteria defined in the subclause 7.5.2 "*Procedures at the PoC Server performing the Participating PoC Function*" the PoC Server to be activated the PoC Server:

1. SHALL remain in the state 'C: Secondary PoC Session Active' if the identified PoC Session is a Secondary PoC Session; or,
2. SHALL enter the 'C: Primary PoC Session Active' state if the identified PoC Session is a Primary PoC Session.

6.3.7.3.6 Monitor Secondary PoC Session establishment (M: Secondary PoC Session established)

When a Secondary PoC Session with Continuous Media is established as specified in the [OMA-PoC-CP] *"PoC Session priority request"*, the PoC Server:

1. SHALL remain in the 'C: Secondary PoC Session Active'.

6.3.7.3.7 Monitor T14 (Conversation) timer fired for Secondary PoC Session (M: T14 (Conversation) timer fired)

When T14 (Conversation) timer fires for the Secondary PoC Session and at least one other PoC Session with Continuous Media for the same PoC Client is established as specified in the [OMA-PoC-CP] and fulfils conditions to be activated, the PoC Server:

1. MAY either
    a. send a MBCP Media Burst Taken message to the PoC Client, if the Media Burst is on-going and if the PoC Session is a PoC Session established using procedures specified in this document;

    or,

    b. send a MBCP Media Burst Taken message to the PoC Client, if the Media Burst is on-going and if the PoC Session is a PoC Session established using procedures specified in [OMA-PoC-1-UP].
2. SHALL remain in the 'C: Secondary PoC Session active' state if the identified PoC Session is a Secondary PoC Session.

6.3.7.3.8 Receive RTP Media packets (R: Media from Secondary PoC Session)

Upon receiving RTP Media packets from a Secondary PoC Session different than the active PoC Session and that other PoC Session fulfills the criteria defined in the subclause 7.5.2 "*Procedures at the PoC Server performing the participating PoC Function*", the PoC Server:

1. SHALL remain in 'C: Secondary PoC Session Active' state for the Secondary PoC Session it received RTP Media packets from.

6.3.7.3.9 Monitor MBCP Media Burst Granted message (M: MB_Granted)

Upon receiving a MBCP Media Burst Granted message on another PoC Session the PoC Server:

1. SHALL enter the 'C: Primary PoC Session Active' state if that other PoC Session is a Primary PoC Session and fulfils the conditions defined in the subclause 7.5.2 "*Procedures at the PoC Server performing the participating PoC Function*" to be activated;

   or,

2. SHALL remain in the 'C: Secondary PoC Session Active' state if that other PoC Session is a Secondary PoC Session and fulfils the conditions defined in the subclause 7.5.2 "*Procedures at the PoC Server performing the participating PoC Function*" to be activated.

6.3.7.3.10 Monitor TBCP Talk Burst Granted message (M: TB_Granted)

Upon receiving a Talk Burst Granted message on another PoC Session the PoC Server performs the actions specified in the 6.3.7.3.9 "*Receive MBCP Media Burst Granted message (R: MB_Granted primary)*".

6.3.7.4 State: 'C: LockIn PoC Session Active'

The 'U: LockIn PoC Session active' state is a stable state. In this state a LockIn PoC Session exists and is an Active PoC Session.

In the 'C: LockIn PoC Session Active' state the PoC Server:

1. SHALL relay RTP Media packets between the PoC Server performing the Controlling PoC Function and the PoC Client for this PoC Session; and,

2. SHALL NOT relay RTP Media packets between the PoC Server performing the Controlling PoC Function and the PoC Client for any other PoC Session(s).

6.3.7.4.1 Monitor LockIn PoC Session release and no other PoC Session ongoing (M: Last PoC Session released)

When a LockIn PoC Session is released and no other PoC Session with Continuous Media for the same PoC Client are ongoing the PoC Server:

1. SHALL enter the 'Start-stop' state.

6.3.7.4.2 Monitor LockIn PoC Session release and Primary PoC Session ongoing (M: [LockIn PoC Session released AND Primary PoC Session ongoing])

When a LockIn PoC Session is released or when all Continuous Media in the LockIn PoC Session is disconnected from the PoC Session and a Primary PoC Session with Continuous Media for the same PoC Client is ongoing and a PoC Session fulfills the criteria defined in the subclause 7.5.2 "*Procedures at the PoC Server performing the participating PoC Function*" as specified in [OMA-PoC-CP] *"PoC Session priority request"* the PoC Server:

1. SHALL enter the 'S: Primary PoC Session active' state if the identified PoC Session is a Primary PoC Session;

   or,

2. SHALL enter the 'C: Secondary PoC Session Active' state if the identified PoC Session is a Secondary PoC Session.

6.3.7.4.3 Monitor LockIn PoC Session release and no Primary PoC Session ongoing (M: [LockIn PoC Session released AND no Primary PoC Session ongoing])

When a LockIn PoC Session is released and at least one Secondary PoC Session with Continuous Media for the same PoC Client is already established as specified in [OMA-PoC-CP] *"PoC Session priority request"* and fulfils criteria defined in subclause 7.5.2 "*Procedures at the PoC Server performing the Participating PoC Function*" to be activated the PoC Server:

1. SHALL enter the 'S: Secondary PoC Session active' state.

6.3.7.4.4 Monitor LockIn PoC Session is unlocked and Primary PoC Session ongoing (M: [LockIn PoC Session unlocked AND Primary PoC Session ongoing])

When a LockIn PoC Session is unlocked as specified in [OMA-PoC-CP] "*PoC Session Locking request*" and a Primary PoC Session with Continuous Media for the same PoC Client is already established and a PoC Session fulfills the criteria defined in the subclause 7.5.2 "*Procedures at the PoC Server performing the participating PoC Function*" as specified in the [OMA-PoC-CP] *"PoC Session priority request"* the PoC Server:

1. SHALL enter the 'C: Primary PoC Session active' state if the identified PoC Session is a Primary PoC Session;

   or,

2. SHALL enter the 'C: Secondary PoC Session Active' state if the identified PoC Session is a Secondary PoC Session.

6.3.7.4.5 Monitor LockIn PoC Session is unlocked and no Primary PoC Session ongoing (M: [LockIn PoC Session unlocked AND no Primary PoC Session ongoing])

When a LockIn PoC Session is unlocked, as specified in [OMA-PoC-CP] "*PoC Session Locking request*" and no Primary PoC Session is ongoing and at least one Secondary PoC Session with Continuous Media for the same PoC Client is ongoing as specified in the [OMA-PoC-CP] and fulfils criteria defined in the subclause 7.5.2 "*Procedures at the PoC Server performing the Participating PoC Function"* to be activated, the PoC Server:

1. SHALL enter the 'C: Secondary PoC Session active'.

6.3.7.4.6 Monitor Media Burst Granted message (M: Granted Primary PoC Session)

Upon receiving the MBCP Media Burst Granted message or a TBCP Talk Burst Granted message on another Primary PoC Session the PoC Server:

1. SHALL enter the 'C: Primary PoC Session active' state if the other PoC Session is an Primary PoC Session; and,

2. SHALL unlock the LockIn PoC Session.

NOTE 1: The PoC Server unlocks the locked PoC Session without informing the PoC Client.

NOTE 2: If the MBCP Media Burst Granted message or the TBCP Talk Burst Granted message is received on the LockIn PoC Session no state change is needed.

6.3.7.4.7 Monitor Talk Burst Granted message (M: Granted Secondary PoC Session)

Upon receiving the MBCP Media Burst Granted message or a TBCP Talk Burst Granted message on another Secondary PoC Session the PoC Server:

1. SHALL enter the 'C: Secondary PoC Session active' state if the other PoC Session is an Secondary PoC Session; and,

2. SHALL unlock the LockIn PoC Session.

NOTE 1: The PoC Server unlocks the locked PoC Session without informing the PoC Client.

NOTE 2: If the MBCP Media Burst Granted message or the TBCP Talk Burst Granted message is received on the LockIn PoC Session no state change is needed.

6.3.7.4.8 Monitor SDP with PoC Session LockIn (M: Session LockIn)

When the PoC Server receives SDP: LockIn information for another PoC Session for this PoC Client as specified in 7.5.2 *"PoC Session locking request"* the PoC Server either

1. SHALL remain in the 'C: LockIn PoC Session Active' state; and,
2. SHALL reject the LockIn request as specified in [OMA-PoC-CP] "*PoC Session locking request*" if the PoC Client have the permission to send Media for the already LockIn PoC Session.

6.3.8 Simultaneous PoC Sessions state diagram - per PoC Session

If the PoC Server supports Simultaneous PoC Sessions the PoC Server SHALL support the state diagram and the state transitions specified in this subclause for each PoC Session with Continuous Media.

A PoC Session established using the PoC 1 procedures SHALL use the procedures in [OMA-PoC-1-UP].

NOTE: There can be several 'Simultaneous PoC Sessions state diagram - per PoC Session' state machines running. The procedures to decide when a PoC Session is Active or Dormant are described in 6.3.7 "*Simultaneous PoC Sessions state diagram - per PoC Client*".

Figure 10 "*Simultaneous PoC Sessions state diagram - per PoC Session"* shows the state diagram for Simultaneous PoC Session per PoC Session.

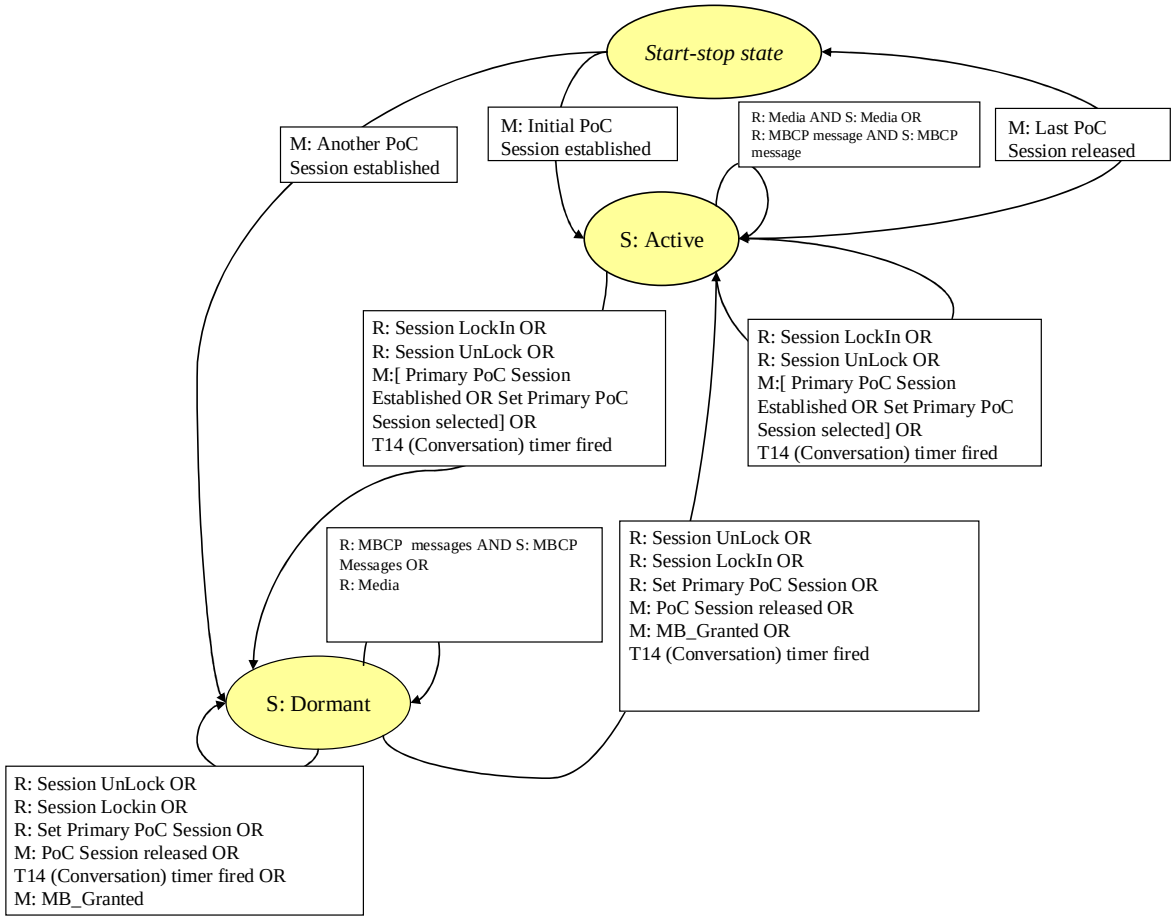


Figure 10: Simultaneous PoC Sessions state diagram - per PoC Session

The State Diagram in Figure 10 "Simultaneous *PoC Sessions state diagram - per PoC Session"* applies to one PoC Session out of multiple Simultaneous PoC Sessions supported the PoC Server for a PoC User.

The PoC Server SHALL create an instance of the state machine for each PoC Session.

State details are explained in the following subclauses.

If a MBCP message, SIP request or RTP Media packet arrives in any state and there is no procedure specified for it in the subclauses below the PoC Server SHALL discard the MBCP message, SIP request or RTP Media packet and SHALL remain in the current state.

NOTE: MSRP request and MSRP response relaying is not affected by the state machine.

6.3.8.1 State 'Start-Stop'

In this state no PoC Session state machine exists.

6.3.8.1.1 Initial PoC Session establishment (M: Initial PoC Session established)

When a PoC Session with Continuous Media is established as specified in [OMA-PoC-CP] "*PoC Session priority request*" and in case there is no active PoC Session for the same PoC User the PoC Server:

1. either

    a. MAY create an instance of the Simultaneous PoC Sessions state machine per PoC Session; and,

    b. SHALL enter the 'S: Active' state;

    or,

    c. SHALL remain in the 'Start-Stop' state.

6.3.8.1.2 Another PoC Session establishment (M: Another PoC Session established)

When a PoC Session with Continuous Media is established as specified in the [OMA-PoC-CP] "*PoC Session priority request*" the PoC Server:

1. SHALL create an instance of the Simultaneous PoC Sessions state machine per PoC Session; and,
2. SHALL enter the 'S: Dormant' state in case there is an Active PoC Session for the same PoC User.

6.3.8.2 State 'S: Active'

The 'S: Active' state of a PoC Session (one of the Simultaneous PoC Sessions) is a stable state.

In this state the PoC Server is receiving and sending RTP Media packets and MBCP messages of this PoC Session and monitoring MBCP messages and SIP requests with associated SDP information of other PoC Sessions and is reacting on PoC Session Events, as specified in the following subclauses.

6.3.8.2.1 Receive MBCP messages (R: MBCP Messages)

Upon receiving MBCP Messages from the PoC Client or Controlling PoC Function, the PoC Server:

1. SHALL relay the MBCP messages between the PoC Client or PoC Controlling PoC Function;
2. SHALL monitor MBCP and SIP messages for PoC Session; and,
3. SHALL remain in 'S: Active' state.

6.3.8.2.2 Receive RTP Media packets (R: Media)

Upon receiving RTP Media packets from the PoC Client or the PoC Server performing the Controlling PoC Function, the PoC Server:

1. SHALL relay the RTP Media packets between the PoC Client or PoC Server performing the Controlling PoC Function; and,
2. SHALL remain in 'S: Active' state.

6.3.8.2.3 Monitor PoC Session release when no other PoC Sessions are ongoing (M: Last PoC Session released)

When the PoC Session is released or all Continues Media is disconnected from the PoC Session and no other PoC Sessions with Continuous Media for the same PoC Client are ongoing as specified in [OMA-PoC-CP] "*PoC Session priority request*" the PoC Server:

1. SHALL return to the 'Start-stop state'.

6.3.8.2.4 Receive SDP with Session LockIn (R: Session LockIn)

Upon receiving an indication from the PoC Client that a PoC Session is to be locked the PoC Server:

1. SHALL proceed with message handling as specified in [OMA-PoC-CP] "*PoC Session locking request*"; and,

2. if the locked indication is for the active PoC Session, the PoC Server:
    a. SHALL remain in 'S: Active' state.
3. Otherwise the PoC Server:
    a. SHALL enter the 'S: Dormant' state.

6.3.8.2.5 Monitor SDP with Session UnLock (M: Session UnLock)

Upon receiving an indication from the PoC Client that this PoC Session is to be unlocked, the PoC Server:

1. SHALL proceed with message handling as specified in [OMA-PoC-CP] "*PoC Session locking request*"; and,
2. if criteria defined in the subclause 7.5.2 "*Procedures at the PoC Server performing the Participating PoC Function*" for switching to another PoC Session are fulfilled the PoC Server:
    a. SHALL enter the 'S: Dormant' state.
3. Otherwise the PoC Server:
    a. SHALL remain in the 'S: Active' state.

6.3.8.2.6 T14 (Conversation) timer fired

On expiry of the T14 (Conversation) timer for the PoC Session and,

1. if criteria specified in the subclause 7.5.2 "*Procedures at the PoC Server performing the Participating PoC Function*" for switching to another PoC Session are fulfilled the PoC Server:
    a. SHALL enter the 'S: Dormant' state.
2. Otherwise the PoC Server:
    a. SHALL remain in the 'S: Active' state.

6.3.8.2.7 Monitor SDP with Primary PoC Session established or selected (M: [Primary PoC Session established OR Primary PoC Session selected])

Upon receiving an indication from the PoC Client that a Primary PoC Session with Continuous Media has been established or should become the Active PoC Session, based on new priority settings and,

1. if criteria defined in the subclause 7.5.2 "*Procedures at the PoC Server performing the Participating PoC Function*" for switching to another PoC Session are fulfilled the PoC Server:
    a. SHALL enter the 'S: Dormant' state.
2. Otherwise the PoC Server:
    a. SHALL remain in the 'S: Active' state.

6.3.8.3 State: 'S: Dormant'

The 'S: Dormant' state of a PoC Session (out of Simultaneous PoC Sessions) is a stable state.

In this state the PoC Participating Function is monitoring MBCP and SIP messages pertaining to this PoC Session and to all other PoC Sessions of the same PoC User and is reacting on PoC Session Activation events as specified in the following subclauses.

6.3.8.3.1 Receive MBCP message (R: MBCP messages)

Upon receiving MBCP Messages from the PoC Client or PoC Controlling Function, the PoC Server:

1. MAY relay the MBCP messages between the PoC Client and Controlling PoC Function according to rules as specified in subclause 5.4 "*RTCP*";
2. SHALL continue to monitor MBCP and SIP messages; and,
3. SHALL remain in 'S: Dormant' state.

6.3.8.3.2 Receive RTP Media packets (R: Media)

Upon receiving RTP Media packets from the PoC Controlling PoC Function, the PoC Server:

1. SHALL discard the RTP Media packet; and,
2. SHALL remain in 'S: Dormant' state.

6.3.8.3.3 Receive SDP with SIP Session LockIn (R: Session LockIn)

Upon receiving an indication from the PoC Client that the PoC Session is to be locked, the PoC Server:

1. SHALL proceed with message handling as specified in [OMA-PoC-CP] "*PoC Session locking request*; and,
2. if the locked indication is for another PoC Session, the PoC Server:
    a. SHALL remain in 'S: Dormant' state.
3. Otherwise the PoC Server:
    a. SHALL enter the 'S: Active' state.

6.3.8.3.4 Receive SDP with Primary PoC Session selected (R: Set Primary PoC Session)

Upon receiving an indication from the PoC Client that the PoC Session is to be selected as the Primary PoC Session and,

1. if the Primary PoC Session setting is for this PoC Session and if criteria defined in the 7.5.2 "*Procedures at the PoC Server performing the Participating PoC Function*" for switching to another PoC Session are fulfilled the PoC Server:
    a. SHALL enter the 'S: Active' state if no other PoC Sessions is in the state "LockIn".
2. Otherwise the PoC Server:
    a. SHALL enter the 'S: Dormant' state if any other PoC Session is in the state "LockIn".

6.3.8.3.5 Receive SDP with SIP Session UnLock (R: Session UnLock)

Upon receiving an indication from the PoC Client that this PoC Session is to be unlocked the PoC Server:

1. SHALL proceed with message handling as specified in [OMA-PoC-CP] "*PoC Session locking request*", and,
2. if criteria defined in the subclause 7.5.2 "*Procedures at the PoC Server performing the Participating PoC Function*" for switching to another PoC Session are fulfilled the PoC Server:
    a. SHALL enter the 'S: Active' state, and;
    b. MAY send the latest MBCP Media Burst Taken message for the activated PoC Session to the PoC Client.
3. Otherwise the PoC Server:
    a. SHALL remain in the 'S: Dormant state.

6.3.8.3.6 Monitor PoC Session release (M: PoC Session released)

Upon receiving an indication from the PoC Client or the PoC Server performing the Controlling PoC Function that another PoC Session has been released or all Continuous Media in that other PoC Session is disconnected and,

1. if criteria defined in the subclause 7.5.2 "*Procedures at the PoC Server performing the Participating PoC Function*" for switching to another PoC Session are fulfilled the PoC Server:
    a. SHALL enter the 'S: Active' state; and,
    b. MAY send the latest MBCP Media Burst Taken message for the activated PoC Session to the PoC Client.
2. Otherwise the PoC Server:
    a. SHALL remain in the 'S: Dormant' state.

6.3.8.3.7 Monitor Media Burst Granted message (M: MB_Granted)

Upon receiving a MBCP Media Burst Granted message as the response to a MBCP Media Burst Request message from the PoC Client and,

1. if criteria defined in the subclause 7.5.2 "*Procedures at the PoC Server performing the Participating PoC Function*" for switching to this PoC Session are fulfilled the PoC Server:
    a. SHALL enter the 'S: Active' state.
2. Otherwise the PoC Server:
    a. SHALL remain in the 'S: Dormant' state.

6.3.8.3.8 T14 (Conversation) timer fired

On expiry of the T14 (Conversation) timer for another PoC Session, and,

1. if criteria defined in the subclause 7.5.2 "*Procedures at the PoC Server performing the Participating PoC Function*" for switching to this PoC Session are fulfilled the PoC Server:
    a. SHALL enter the 'S: Active' state; and,
    b. MAY send the latest MBCP Media Burst Taken message for the activated PoC Session to the PoC Client.
2. Otherwise the PoC Server:
    a. SHALL remain in the 'S: Dormant' state.

6.4 Procedures at the PoC Server performing the Controlling PoC Function

6.4.1 General

The PoC Server SHALL support the procedures specified in subclause 6.4.4 "*PoC Server state transition diagram for general Media Burst operation*".

The PoC Server SHALL support the procedures specified in subclause 6.4.5 "*PoC Server state transition diagram for basic Media Burst operation to the PoC Client*".

The PoC Server MAY support the procedures specified in subclause 6.4.6 "*State transition diagram for general MSRP request distribution*".

6.4.2 Controlling PoC Function procedures at PoC Session initialization

When a PoC Session is established a new instance of the PoC Server state machine for 'general Media Burst operation' is created for each agreed Media-floor Control Entity.

As each Participant and each agreed Media-floor Control Entity, is added to the PoC Session, new instances of the PoC Server state machine for 'basic Media Burst operation' to the PoC Client is created for each PoC Client and used Media-floor Control Entity.

The original initial SIP INVITE / SIP REFER request to establish a 1-1 PoC Session, an Ad-hoc PoC Group Session or a Pre-arranged PoC Group Session (regardless if the PoC Session is ongoing or not) is treated as an implicit Media Burst request for the Media-floor Control Entity, to which only PoC Speech is bound, and the PoC Server state machine for basic Media Burst operation to the PoC Client for that PoC Client behaves as if a MBCP Media Burst Request message has been received.

If the optional "queuing" feature is supported and has been negotiated for the Media-floor Control Entity, the PoC Server could queue the implicit Media Burst request for the Media-floor Control Entity.

The original initial SIP INVITE / REFER request to establish a Chat PoC Group Session or to rejoin an ongoing PoC Session (regardless of type of PoC Session) is not handled as an implicit Media Burst request message by the PoC Server.

The permission to send a Media Burst to the Inviting PoC Client due to implicit Media Burst request is applicable to both Confirmed Indication and Unconfirmed Indication for all kinds of Media Type. The implicit Media Burst request is applicable by default whenever PoC Speech is bound. The implicit Media Burst request for other Media Types can only be negotiated on the PoC Session set-up.

If tb_granted value set to 1 is included in the SIP 200 "OK" response as specified in [OMA-PoC-CP] "*Media Burst Control Protocol MIME registration*" and if the PoC Server performing the Participating PoC Function does not stay on the Media path, the PoC Server does not send MBCP Media Burst Granted message corresponding to the implicit Media Burst request.

If the PoC Client has indicated support for Media buffering and the PoC Server has indicated to the PoC Client to buffer Media the PoC Server optionally can delay granting the permission to send a Media Burst up until a Confirmed Indication is received from the Participating PoC Function.

When the first Unconfirmed Indication is received from the Participating PoC Function the PoC Server optionally can give an early indication to send RTP Media packets for each used Media-floor Control Entity, to which PoC Speech is bound, to the Inviting PoC Client, see [OMA-PoC-CP] "*Controlling PoC Function procedures*". If an early indication to send RTP Media packets is given to the Inviting PoC Client, the PoC Client is granted the permission to send a Media Burst for each used Media-floor Control Entity, to which PoC Speech is bound and the PoC Server buffers RTP Media packets received from the PoC Client at least until the first Invited PoC User accepts the invitation or until the RTP Media packet buffer exceeds it maximum limit to store RTP Media packets. If Limited Segment Media Buffer Preload is used a two phase process is initiated; the first phase, called the preload phase, takes place before the Inviting PoC Client receives a MBCP Media Burst Grant message (which would typically be sent by the Controlling PoC Function when at least one Confirmed Indication has been received from a Participating PoC Function). During the preload phase the PoC Client sends an amount of RTP Media packets limited by the value of the SDP parameter tb_seg_preload, see [OMA-PoC-CP] "*Controlling PoC Function procedures*" and once the PoC Client has sent this limited amount of RTP Media packets, the PoC Client stops sending further RTP Media packets and instead buffers Media until the preload phase finishes. After the preload phase finishes the PoC Client will resume sending RTP Media packets.

NOTE 1: The amount of RTP Media packets the PoC Server buffers is an implementation option.

If the PoC Server does not support or does not allow PoC Client Media buffering then when an early indication to send RTP Media packets is not given to the Inviting PoC Client the PoC Client is granted the permission to send a Media Burst for each used Media-floor Control Entity when the first Invited PoC Client accepts the Media.

Before the PoC Server sends the first Media Burst Control Protocol message in the PoC Session, the PoC Server has to assign itself a SSRC identifier to be included in the Media Burst Control Protocol messages and quality feedback messages if the PoC Server is supporting that option. A suitable algorithm to generate the SSRC identifier is described in [RFC3550].

The PoC Client and the PoC Server can negotiate the maximum priority level that the PoC Client is permitted to request in "tb_priority" as specified in [OMA-PoC-CP] "*Media Burst Control Protocol MIME registration*". The PoC Server queues the Media Burst Request and can pre-empt the current sender based on the negotiated maximum priority level that the PoC Client is permitted to request and the priority level included in the MBCP Media Burst Request.

NOTE 2: The PoC Server policy determining the highest priority level, which can be offered and answered to a PoC User, is out of scope for this specification.

Based on negotiation during a PoC Session establishment or during the PoC Session as specified in [OMA-PoC-CP] "*Media Burst Control Protocol MIME registration*" the Local Granted Mode can be used by the PoC Client for the Media-floor Control Entity to which PoC Speech is bound.

6.4.3 Controlling PoC Function procedures at PoC Session release

When a PoC Client leaves a PoC Session, but the PoC Session remains ongoing with the other PoC Clients, the PoC Server follows a two-stage procedure.

1. In the first stage, the PoC Server stops sending MSRP messages, MBCP messages and RTP Media packets to the PoC Client leaving the PoC Session and .the PoC Server discards MSRP messages, MBCP messages and RTP Media packets received from the PoC Client leaving the PoC Session.

2. In the second stage, when the Control Plane has determined that the PoC Session with this PoC Client has been released, the corresponding instance of the PoC Server state machine for 'basic Media Burst operation' to the PoC Client is released.

There are no cases where the PoC Server state machine for basic Media Burst operation to the PoC Client will cause the PoC Client to be dropped from a PoC Session.

When a PoC Session is released, the PoC Server follows a two-stage procedure.

1. In the first stage, the PoC Server stops sending MSRP messages, MBCP messages and RTP Media packets to all PoC Clients in the PoC Session.

2. In the second stage, when the Control Plane has determined that the PoC Session has been released, the corresponding instance of the PoC Server state machine for 'general Media Burst operation' or 'general MSRP request distribution' or both are also terminated, along with any PoC Server state machines for basic Media Burst operation to the PoC Clients in the PoC Session.

The PoC Server state machine for general Media Burst operation initiates the PoC Session release depending on the release policy specified in [OMA-PoC-CP] "*PoC Session release policy"*.

The state machines describing the procedures on the PoC Session release are described in subclauses 6.4.4 "*PoC Server state transition diagram for general Media Burst operation*", 6.4.5 "*PoC Server state transition diagram for basic Media Burst operation to the PoC Client*", 6.4.6 "*State transition diagram for general MSRP request distribution*" and 6.4.7 "*Discrete Media procedures – basic*".

6.4.3A PoC Server procedures at PoC Session modification

6.4.3A.1 Controlling PoC Function procedures when adding a Media Type to a PoC Session

When a new Media-floor Control Entity, which has not been used by any PoC Client yet, is agreed for a PoC Client,

1. a new instance of the PoC Server state machine for 'general Media Burst operation' for the PoC Session is created by PoC Server,
2. a new instance of the PoC Server state machine for basic Media Burst operation to the PoC Client for the PoC Client and the Media-floor Control Entity is created by PoC Server.

When a new Media-floor Control Entity, which is already used by other PoC Clients, is offered and accepted by a PoC Client, the PoC Server:

1. creates a new instance of the PoC Server state machine for 'basic Media Burst operation to the PoC Client' for the PoC Client and the Media-floor Control Entity.

If a new Media Type is agreed, the PoC Server starts handling the Media Type.

6.4.3A.2 Controlling PoC Function procedures when disconnecting from a Media Type

If disconnecting from a Media Type is initiated by the PoC Server towards a PoC Client the PoC Server SHALL stop sending the Media Type towards the PoC Client.

If disconnecting from an existing Media Type is agreed for a PoC Client, the PoC Server releases the resources used by that Media Type towards the PoC Client.

When removing of the binding to a Media-floor Control Entity by a PoC Client is agreed, the PoC Server SHALL terminate the 'basic Media Burst operation to the PoC Clients' as specified in 6.4.5 "*PoC Server state transition diagram for basic Media Burst operation to the PoC Client*".

NOTE 1: The removal of a binding to a Media-floor Control Entity is always initiated by the PoC Client and the procedure can be done in one step.

When the removal of an existing Media-floor Control Entity from the PoC Session is initiated by the PoC Server, the PoC Server:

NOTE 2: The removal of a Media-floor Control Entity from the PoC Session is always initiated by one of the Participants in the PoC Session and results in that the PoC Server initiates the modification of the PoC Session as specified in [OMA-PoC-CP] "*Request initiated by the Controlling PoC Function*" towards the other Participants in the PoC Server.

1. SHALL stop distributing Media on that Media-floor Control Entity; and,
2. SHALL stop sending Media Burst Control messages associated with the Media-floor Control Entity.

When removing an existing Media-floor Control Entity from the PoC Session is agreed for a PoC Client, the PoC Server:

1. SHALL terminate the PoC Server state machines for 'basic Media Burst operation to the PoC Clients' as specified in 6.4.5 "*PoC Server state transition diagram for basic Media Burst operation to the PoC Client*"; and,
2. SHALL terminate the PoC Server state machine for 'general Media Burst operation'.

6.4.3A.3 Controlling PoC Function procedures when connecting to a Media Type

If the Media-floor Control Entity was not previously used by the PoC Client, a new instance of the PoC Server state machine for basic Media Burst operation for the PoC Client and the Media-floor Control Entity is created by PoC Server.

If connecting to an existing Media Type is agreed for a PoC Client, the PoC Server can send and receive this Media Type to and from the PoC Client.

6.4.4 PoC Server state transition diagram for general Media Burst operation

The PoC Server SHALL support the state diagram and the state transitions specified in this subclause when Continuous Media or Discrete Media or both are bound to a Media-floor Control Entity.

NOTE 1: The sending or receiving of reports related to Discrete Media are described in subclauses 7.12 "*Discrete Media Transfer Final Report*" and 7.13 "*Discrete Media Transfer Progress Report*".

NOTE 2: The optional MBCP features "queuing" and "tb_priority" are specified in [OMA-PoC-CP] "*Media Burst Control Protocol MIME registration*".

Figure 11 "*PoC Server state transition diagram for general Media Burst operation*" shows the general Media Burst operation states (G states) and the state transition diagram.

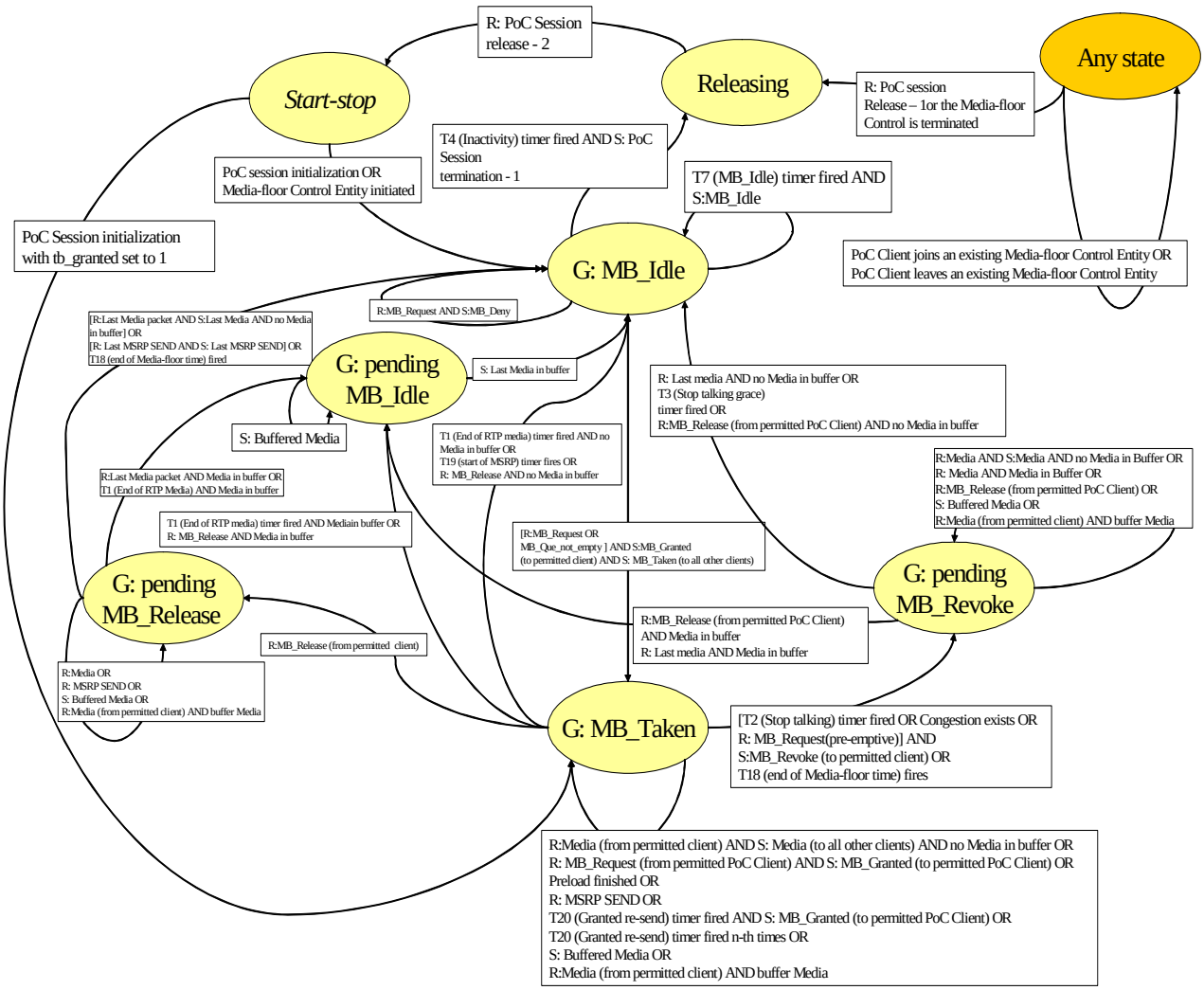


Figure 11: PoC Server state transition diagram for general Media Burst operation

The PoC Server SHALL keep one instance of the general Media Burst operation state machine per PoC Session.

State details are explained in the following subclauses.

If a MBCP message, a MSRP message or a RTP Media packet arrives in any state and there is no procedure specified for it in the subclauses below the PoC Server SHALL discard the MBCP message, the MSRP message or the RTP Media packet and SHALL remain in the current state.

When the PoC Server negotiates with the PoC Client the Talk Burst Control Protocol as specified in [OMA-PoC-1-UP] instead of the Media Burst Control Protocol, the PoC Server:

1. SHALL handle the TBCP message received from the PoC Client as the MBCP message of the same subtype; and,
2. SHALL generate and send towards the PoC Client in the subclauses below the TBCP message instead of the MBCP message as follows:
    a. the TBCP message of the same subtype is generated; and,
    b. the TBCP message fields with the same content are included into the TBCP message.

6.4.4.1 State 'Start-stop

In this state, the Media-floor Control Entity does not exist.

6.4.4.1.1 PoC Session initialization

When a PoC Session is initiated as specified in [OMA-PoC-CP] and in case of Confirmed Indication and at least one Invited PoC Client has accepted the invitation, the PoC Server:

NOTE: In case of Unconfirmed Indication the PoC Server does not wait for an acceptance from an Invited PoC Client.

1. SHALL create an instance of the general Media Burst operation state machine;
2. SHALL wait for the PoC Server state machine transition diagram for normal Media Burst operation to the PoC Client to be initialized before continuing the following steps.
3. SHALL when the PoC Server state machine transition diagram for normal Media Burst operation to the PoC Client is initialized:
    a. perform the actions specified in subclause 6.4.4.2.2 "*Receive MBCP Media Burst Request message (R: MB_Request)*" if SDP parameter tb_granted set to 0 as specified in [OMA-PoC-CP] "*Media Burst Control Protocol MIME registration*" or is not included and if the PoC Server is granting an Implicit Media Burst Request at PoC Session establishment;

    or,

    b. perform the actions specified in the subclause 6.4.4.3.1 "*Enter the state 'G: MB_Taken'*", if SDP parameter tb_granted set to 1 is negotiated as specified in [OMA-PoC-CP] "*Media Burst Control Protocol MIME registration*";

    or otherwise,

    c. perform the actions specified in the subclause 6.4.4.2.1 "*Enter state 'G: MB_Idle'*".

6.4.4.1.2 Media-floor Control Entity initiated

When the Control Plane [OMA-PoC-CP] has negotiated a Media-floor Control Entity during an on-going PoC Session the PoC Server:

1. SHALL create one instance of the ' PoC Server state transition diagram for general Media Burst operation 'state machine; and,
2. SHALL wait for the PoC Server state machine transition diagram for normal Media Burst operation to the PoC Client to be initialized before continuing the following steps.

When the PoC Server state machine transition diagram for normal Media Burst operation to the PoC Client is initiated the PoC Server:

1. SHALL perform the actions in subclause 6.4.4.2.1 "*Enter state 'G: MB_Idle'*".

6.4.4.2 State 'G: MB_Idle'

The 'G: MB_Idle' state is a stable state. The PoC Server is in this state when no PoC User currently has permission to send a Media.

The timer T4 (Inactivity) and the timer T7 (MB_Idle) can be running when the PoC Server is in this state.

NOTE: During the initialization of the PoC Session Control Plane timers supervise the general state machine.

6.4.4.2.1 Enter state 'G: MB_Idle'

When entering this state from any state except the 'Null state' and if no Participant negotiated "queuing" or "tb_priority", the PoC Server:

1. SHALL send the MBCP Media Burst Idle message to all PoC Clients unless otherwise specified in the User specific state machine 6.4.5 '*PoC Server state transition diagram for basic Media Burst operation to the PoC Client*';
2. SHALL start T7 (MB_Idle) timer;
3. SHALL start the T4 (Inactivity timer); and,
4. SHALL set the general state to 'G: MB_Idle' state.

When entering this state from any state except the 'Null state' and if a Participant negotiated "queuing" or "tb_priority" the PoC Server checks the Media Burst request queue.

1. If the Media Burst request queue is empty the PoC Server
    a. SHALL send the MBCP Media Burst Idle message to all PoC Clients unless otherwise specified in the User specific state machine 6.4.5 '*PoC Server state transition diagram for basic Media Burst operation to the PoC Client*';
    b. SHALL start T7 (MB_Idle) timer;
    c. SHALL start the T4 (Inactivity timer); and,
    d. SHALL set the general state to 'G: MB_Idle' state.
2. If the Media Burst request queue is not empty the PoC Server
    a. SHALL perform actions in subclause 6.4.4.2.5 "*Media Burst request queue not empty*".

6.4.4.2.2 Receive MBCP Media Burst Request message (R: MB_Request)

Upon receiving a MBCP Media Burst Request message (from a PoC Client that is permitted to make a request) and

1. if there is only one Participant in the PoC Session or if the negotiated maximum priority level that the PoC Client is permitted to request is receive only or if only one Participant is connected to this Media-floor Control Entity and the PoC Server chooses to send a MBCP Media Burst Deny message the PoC Server:
    a. SHALL reject the request.
2. if there is only one Participant in the PoC Session or if only one Participant is connected to this Media-floor Control Entity and the PoC Server did not choose to send a MBCP Media Burst Deny message to the PoC Client or there is more than one Participant in the PoC Session, the PoC Server:
    a. SHALL grant the request.
3. if the Media Burst is rejected the PoC Server:
    a. SHALL send MBCP Media Burst Deny message.

The MBCP Media Burst Deny message

i. SHALL include in the reason code field:

1. 2, if PoC Server is not able to grant the Media Burst due to an internal error;
2. 3, if the requesting PoC User is the only Participant in the PoC Session or the only one connected to this Media-floor Control Entity;
3. 4, if the retry-after timer is still running; or,
4. 5, if the requesting PoC User has only receive only privilege; or
5. 6, if the PoC Server is denying the Media Burst due to congestion, as defined in subclause 7.7 *"Media Transfer";* or
6. 255, if another reason.

ii. MAY include in the Reason phrase field:

1. "Internal PoC Server error", if PoC Server is not able to grant the Media Burst due to an internal error; or,
2. "Only one Participant", if the requesting PoC User is the only Participant in the PoC Session or the only one connected to this Media-floor Control Entity; or,
3. "Retry-after timer has not expired", if the retry-after timer is still running; or,
4. "Listen only", if the requesting PoC User has only listen only privilege and only PoC Speech is bound to Media-floor Control Entity or "Receive only", if the requesting PoC User has only receive only privilege and other Media Types than PoC Speech is bound to Media-floor Control Entity; or,
5. "No resources available", if PoC Server is denying the Media Burst due to congestion, as defined in subclause 7.7 *"Media Transfer"; or,*
6. "Other reason" ", if the PoC Server denies the request for another reason.

b. SHALL remain in the 'G: MB_Idle' state.

4. if the Media Burst is granted the PoC Server:

a. SHALL stop the T4 (Inactivity) timer;

b. SHALL stop the T7 (MB_Idle) timer;

c. SHALL store the SSRC of PoC Client requesting a permission to send a Media Burst until the end of the Media Burst associated to that Media Burst Request; and,

d. SHALL perform the actions specified in the subclause 6.4.4.3.1 "*Enter the state 'G: MB_Taken'*".

NOTE: An initial SIP INVITE request in an On-demand Session or a SIP REFER request in a Pre-established Session is interpreted as a Media Burst request.

6.4.4.2.3 T7 (MB_Idle) timer fired

On expiry of the T7 (Media Burst Idle) timer the PoC Server:

1. SHALL restart the T7 (Media Burst Idle) timer. The MBCP Media Burst Idle message SHALL be sent only n times (not forever), so the timer SHALL only be restarted, if not yet restarted n times;

2. SHALL send a MBCP Media Burst Idle message to all PoC Clients in the PoC Session; and,

3. SHALL remain in the 'G: MB_Idle' state.

6.4.4.2.4 T4 (Inactivity) timer fired

On expiry of T4 (Inactivity) timer and

1. if the criteria for releasing the PoC Session as specified in [OMA-PoC-CP] "*PoC Session release policy*" is fulfilled the PoC Server

    a. SHALL release the PoC Session as specified in [OMA-PoC-CP] "*Removal of Participants from a PoC Session*"; and,

    b. SHALL enter the 'Releasing' state.

2. Otherwise the PoC Server based on a configurable Service Provider Policy either

    a. SHALL

        i. disconnect all PoC Clients from this Media-floor Control Entity as specified in [OMA-PoC-CP] "*PoC Session Modification*; and,

        ii. enter the 'Releasing' state.

    or,

    b. SHALL remain in the 'G: MB_Idle' state.

NOTE: The disconnection of the Participants from this Media-floor Control Entity, MSRP session release and PoC Session release is specified in subclause 6.4.4.6 "*Any state*".

6.4.4.2.5 Media Burst request queue not empty

If a Participant negotiated "queuing" or "tb_priority" and if the Media Burst request queue is not empty, the PoC Server:

1. SHALL select the queued PoC Client from the head of the Media Burst request queue;

2. SHALL remove that PoC Client from the Media Burst request queue;

3. SHALL perform the actions described in the subclause 6.4.4.3.1 "*Enter the state 'G: MB_Taken'*" with respect to that PoC Client; and,

4. SHOULD send a MBCP Media Burst Request Queue Status message with the updated status to the PoC Clients in the Media Burst request queue which negotiated "queuing", which have requested the queue status and whose queue position has been changed since the previous MBCP Media Burst Request Queue Status message.

    The MBCP Media Burst Request Queue Status message:

    a. SHOULD indicate the position of the PoC Client in the Media Burst request queue; and,

    b. MAY indicate the priority level of the PoC Client in the Media Burst request queue

NOTE: In congested situation the PoC Server can determine to not send the MBCP Media Burst Request Queue Status message based on local policy.

6.4.4.3 State 'G: MB_Taken'

The 'G: MB_Taken' state is a stable state and the PoC Server uses this state when it has permitted one of the PoC Clients in the PoC Session to send a Media Burst.

In this state the PoC Client can send one or more MSRP SEND requests.

The timer T1 (End of RTP) can be running when the PoC Server is in this state and when Continuous Media is bound to the Media-floor Control Entity.

The timer T2 (Stop talking) can be running when the PoC Server is in this state and when only Continuous Media is bound to the Media-floor Control Entity.

The T18 (end of Media-floor time) timer is running to supervise the total time the PoC Client can occupy the Media-floor when Discrete Media is bound to the Media-floor Control Entity.

The T19 (start of MSRP) timer is running to supervise the reception of the first MSRP SEND request after the MBCP Media Burst Granted message has been sent to the PoC Client when only Discrete Media is bound to the Media-floor Control Entity.

The T20 (Granted re-send) timer is running to guarantee reliable delivery of the MBCP Media Burst Granted message, if the granted PoC Client was queued and if the PoC Client supports "queuing".

During this state PoC Server can buffer RTP Media packets towards PoC Clients, e.g. when

- an Early indication to send RTP Media packets is used and the Media path has not yet been established towards a Invited PoC Client; and,
- if Limited Segment Media Buffer Preload is used, and the buffer preload started.

6.4.4.3.1 Enter the state 'G: MB_Taken'

When entering this state the PoC Server:

1. SHALL send a MBCP Media Burst Granted message to the requesting PoC Client, unless any of the following conditions are fulfilled:
    a. Limited Segment Media Buffer Preload is used; or,
    b. Local Granted Mode is used; or,
    c. for the first Media Burst grant when SDP parameter tb_granted set to 1 is negotiated and when the PoC Server performing the Participating PoC Function of PoC Enabler Release 2.0 or later has not indicated as specified in [OMA-PoC-CP] "*Back to back UA uri-parameter*" to act as a back to back UA and to stay on the Media path,

NOTE: A PoC Server performing the Participating PoC Function of PoC Enabler Release 1.0 is not able to indicate, if it acts as a back to back UA and stays on the Media path and therefore the TBCP Talk Burst Granted message is sent.

The MBCP Media Burst Granted message:

i. MAY include notification of the number of Participants connected to the Media-floor Control Entity;

ii. SHOULD include Alert Margin for Advanced Revocation Alert in case Continuous Media is bound to the Media-floor Control Entity; and,

iii. SHALL include information in the stop talking time field;

1. the value of T2 (Stop Talking) timer if only Continuous Media is bound to the Media-floor Control Entity; or,
2. the value of T18 (end of Media-floor time) if Discrete Media is bound to the Media-floor Control Entity.

2. SHALL start the T20 (Granted re-send) if the PoC Client was queued and if the PoC Client negotiated "queuing";

3. SHALL send MBCP Media Burst Taken message to all other PoC Clients;

   MBCP Media Burst Taken message:

   a. SHALL include the identity of the PoC User that has been given permission to send a Media Burst as specified in subclause 8.2 "*Sender Identification*";

   b. SHALL include the SSRC of the PoC Client granted a permission to send a Media Burst, if known by the PoC Server, or alternatively;

   c. SHALL have the SSRC of the PoC Client granted a permission to send a Media Burst field all 32 bits set to '1';

   d. SHALL include Privacy as specified in the subclause 6.5.2.1 "*MBCP specific fields*", if privacy is requested;

   e. MAY include notification of the number of Participants connected to the Media-floor Control Entity; and,

   f. MAY include Anonymous identity as specified in subclause 6.5.2.1 "*MBCP specific fields*", if privacy is requested.

4. SHALL start the timer T1 (end of RTP Media timer) in the case Continuous Media is bound to the Media-floor Control Entity;

5. SHALL start the T19 (start of MSRP) in the case only Discrete Media is bound to the Media-floor Control Entity;

6. SHALL start the T18 (end of Media-floor time) in the case Discrete Media is bound to the Media-floor Control Entity; and,

7. SHALL set the general state to 'G: MB_Taken' state.

6.4.4.3.2 T1 (End of RTP Media) timer fired

On expiry of the T1 (End of RTP Media) timer, the PoC Server

1. unless using Limited Segment Media Buffer Preload and in the preload phase,

   a. SHALL stop the T2 (Stop talking) timer or the T18 (end of Media-floor time); if the timer is running;

   b. SHALL stop the T20 (Granted re-send) timer, if running; and,

   c. If the PoC Server does not have Media packets in the buffer the PoC Server

      i. SHALL perform the actions specified in the subclause 6.4.4.2.1 "*Enter the 'G: MB_Idle state'*".

   d. Otherwise the PoC Server:

      i. SHALL perform the actions specified in the subclause 6.4.4.8.1 "*Enter the 'G: pending MB_Idle state'*".

2. Otherwise the PoC Server SHALL remain in the G: MB_Taken state.

6.4.4.3.3 T2 (Stop talking) timer fired

On expiry of the T2 (Stop talking) timer the PoC Server:

1. SHALL stop the T1 (End of RTP Media) timer;

2. SHALL set the reason code field in the MBCP Media Burst Revoke message to 'Media Burst too long' and,

3. SHALL perform the actions specified in the subclause 6.4.4.5.1 "E*nter the 'G: pending MB_Revoke' state*".

6.4.4.3.4 Receive RTP Media packets (R: Media from permitted client)

Upon receiving RTP Media packets with payload from the permitted PoC Client the PoC Server:

1. SHALL start the T2 (Stop talking) timer if not already running in case only Continuous Media is bound to the Media-floor Control Entity;
2. SHALL either
    a. forward the received RTP Media packets towards either

NOTE 1: This also applies when already buffered RTP Media packets are to be sent.

i. all other PoC Clients that are not on hold, if the PoC Session is neither a 1-many-1 PoC Group Session nor a Dispatch PoC Session and PoC Media Traffic Optimisation has not been negotiated and if the PoC Server does not have Media packets in the Media buffer;

or,

ii. all PoC Clients that are not on hold whose SIP Sessions are selected for Media transmission from the PoC Server performing the Controlling PoC Function to the PoC Server performing the Participating PoC Function, if the PoC Session is neither a 1-many-1 PoC Group Session nor a Dispatch PoC Session and PoC Media Traffic Optimisation has been negotiated and if the PoC Server does not have Media packets in the Media buffer;

iii. all Ordinary Participants or PoC Fleet Members that are not on hold, if the PoC Session is a 1-many-1 PoC Group Session or a Dispatch PoC Session, respectively, and the RTP Media packets are from the Distinguished Participant or the Active PoC Dispatcher sending Media and if the PoC Server does not have Media packets in the Media buffer;

or,

iv. the Distinguished Participant or the Active PoC Dispatcher, if the PoC Session is a 1-many-1 PoC Group Session or a Dispatch PoC Session, respectively, and the RTP Media packets are from an Ordinary Participant or a PoC Fleet Member sending Media, and the Distinguished Participant or Active PoC Dispatcher is not on hold and if the PoC Server does not have Media packets in the Media buffer.

NOTE 2: Notice that both 1-many-1 PoC Group Sessions and Dispatch PoC Sessions use the 1-many-1 communication method, so for User Plane sending and receiving Media procedures, the Active PoC Dispatcher is equivalent to the Distinguished Participant and the PoC Fleet Members are equivalent to the Ordinary Participants.

or,

b. buffer the received RTP Media packets in case of unconfirmed indication and if RTP Media packet buffering is ongoing or if Limited Segment Media Buffer Preload is ongoing and if the PoC Server is in the preload phase.

3. SHALL restart the T1 (End of RTP Media) timer;
4. SHALL stop the T20 (Granted re-send) timer, if running; and,
5. SHALL remain in the 'G: MB_Taken' state.

6.4.4.3.5 Receive MBCP Media Burst Release message (R: MB_Release)

Upon receiving a MBCP Media Burst Release message and,

1. if Continuous Media is bound to the Media-floor Control Entity and the sequence number is not marked as invalid and last RTP Media packet is not received, then the PoC Server:

a. SHALL store the sequence number of the last RTP Media packet indicated in the message;

b. SHALL stop the T20 (Granted re-send) timer, if running; and,

c. SHALL perform the actions specified in subclause 6.4.4.4.1 "*Enter the state 'G: pending MB_Release'*".

2. If Continuous Media is bound to the Media-floor Control Entity and the sequence number is not marked as invalid and last RTP Media packet is already received, then the PoC Server:

   a. SHALL stop the T2 (Stop talking) timer, if the timer is running;

   b. SHALL stop the T20 (Granted re-send) timer, if running; and,

   c. SHALL either

      i. perform the actions specified in subclause 6.4.4.8.1 "*Enter the state 'G: pending MB_Idle'*" if RTP Media packet buffering is ongoing;

         or,

      ii. perform the actions specified in the subclause 6.4.4.2.1 "Enter the 'G: MB_Idle state'" if RTP Media packet buffering is not ongoing.

3. If Continuous Media is bound to the Media-floor Control Entity and the sequence number is marked as invalid, then the PoC Server:

   a. SHALL stop the T2 (Stop talking) timer; if the timer is running;

   b. SHALL stop the T20 (Granted re-send) timer, if running; and,

   c. SHALL

      i. perform the actions specified in subclause 6.4.4.8.1 "*Enter the state 'G: pending MB_Idle'*" if RTP Media packet buffering is ongoing;

         or,

      ii. perform the actions specified in the subclause 6.4.4.2.1 "*Enter the 'G: MB_Idle state'*" if RTP Media packet buffering is not ongoing.

4. If only Discrete Media is bound to the Media-floor Control Entity and

   a. if the last chunk of an MSRP SEND request is not received, then the PoC Server:

      i. SHALL stop the T20 (Granted re-send) timer, if running; and,

      ii. SHALL perform the actions specified in subclause 6.4.4.4.1 "*Enter the state 'G: pending MB_Release'*";

   or,

   b. if there no outstanding chunks of an MSRP SEND request then the PoC Server:

      i. SHALL stop the T18 (end of Media-floor time), if the timer is running;

      ii. SHALL stop the T20 (Granted re-send) timer, if running; and,

      iii. SHALL perform the actions specified in the subclause 6.4.6.2.1 "*Enter the 'G: MB_Idle state*'.

6.4.4.3.6 Receive MBCP Media Burst Request message with pre-emptive priority (R: MB_Request (pre-emptive))

NOTE 1: This procedure is invoked from the subclause 6.4.5.2.3 *"Receive MBCP Media Burst Request message (R: MB_Request)"*.

If the PoC Client negotiated "tb_priority", on receipt of a MBCP Media Burst Request message with the request priority level equal to pre-emptive priority, and if the priority level of the PoC Client with permission to send a Media Burst is not the pre-emptive priority, the PoC Server:

1. SHALL stop the T1 (End of RTP Media) timer or stop the T19 (start of MSRP) timer if any of the timers are running;
2. SHALL stop the T20 (Granted re-send) timer, if running; and,
3. SHALL set the reason code field in the MBCP Media Burst Revoke message to 'Media Burst pre-empted';
4. SHALL perform the actions described in the subclause 6.4.4.5.1 "E*nter the 'G: pending MB_Revoke' state*";
5. SHALL insert the PoC Client into the Media Burst request queue to the position in front of all queued requests, if not inserted yet or update the position of the PoC Client in the Media Burst request queue to the position in front of all other queued requests, if already inserted;
6. SHALL send a MBCP Media Burst Request Queue Status message to the requesting PoC Client, if negotiated "queuing".

   The MBCP Media Burst Request Queue Status message:

   a. SHOULD indicate the position of the PoC Client in the Media Burst request queue; and,
   b. MAY indicate the priority level of the PoC Client in the in the Media Burst request queue.

7. SHOULD send a MBCP Media Burst Request Queue Status message with the updated status to the PoC Clients in the Media Burst request queue which negotiated "queuing", which have requested the queue status, whose queue position has been changed since the previous MBCP Media Burst Request Queue Status message and which are not the requesting PoC Client.

   The MBCP Media Burst Request Queue Status message:

   a. SHOULD indicate the position of the PoC Client in the Media Burst request queue; and,
   b. MAY indicate the priority level of the PoC Client in the Media Burst request queue.

6.4.4.3.7 Receive MBCP Media Burst Request message from permitted PoC Client (R: MB_Request)

Upon receiving a MBCP Media Burst Request message from the PoC Client that has been granted permission to send a Media Burst the PoC Server:

1. SHALL, unless Limited Segment Media Buffer Preload is used and in the preload phase, send a MBCP Media Burst Granted message to the previously granted PoC Client.

   The MBCP Media Burst Granted message:

   a. MAY include notification of the number of Participants connected to the Media-floor Control Entity;
   b. SHOULD include Alert Margin for Advanced Revocation Alert in the case Continuous Media is bound to the Media-floor Control Entity; and,
   c. SHALL include information about the T2 (Stop talking) timer, which MAY be reduced by the PoC Server as follows:

i. the value of T2 (Stop Talking) timer if only Continuous Media is bound to the Media-floor Control Entity; or,

ii. the value of T18 (end of Media-floor time) if Discrete Media is bound to the Media-floor Control Entity.

2. SHALL remain in the 'G: MB_Taken' state.

6.4.4.3.8 Sending buffered Media packets (S: Buffered Media)

As long as the PoC Server has RTP Media packets buffered the PoC Server SHALL apply the procedures in the subclause 7.8 "*Media buffering*".

The PoC Server:

1. SHALL either

   a. forward the buffered RTP Media packets towards the other PoC Clients that are not on hold, if the PoC Session is neither a 1-many-1 PoC Group Session nor a Dispatch PoC Session or if the Distinguished Participant in case of a 1-many-1 PoC Group Session or the Active PoC Dispatcher in case of a Dispatch PoC Session is sending Media;

   or,

   b. forward the buffered RTP Media packets towards the Distinguished Participant or towards the Active PoC Dispatcher, if the PoC Session is a 1-many-1 PoC Group Session or a Dispatch PoC Session, respectively, and if the Distinguished Participant or the Active PoC Dispatcher is not on hold.

NOTE: Notice that both 1-many-1 PoC Group Sessions and Dispatch PoC Sessions use the 1-many-1 communication method, so for User Plane sending and receiving Media procedures, the Active PoC Dispatcher is equivalent to the Distinguished Participant and the PoC Fleet Members are equivalent to the Ordinary Participants.

2. SHALL remain in the 'G: MB_Taken' state.

6.4.4.3.9 Congestion exists

If congestion detected, as defined in subclause 7.7 *"Media Transfer"*, the PoC Server:

NOTE: Congestion detection is optional.

1. SHALL stop the T1 (End of RTP Media) timer or the T19 (start of MSRP) timer if any of the timers are running;
2. SHALL stop the T20 (Granted re-send) timer, if running;
3. SHALL set the reason code field in the MBCP Media Burst Revoke message to 'No resources available; and,
4. SHALL perform the actions described in the subclause 6.4.4.5.1 "E*nter the 'G: pending MB_Revoke' state*".

6.4.4.3.10 Preload finished

When Limited Segment Media Buffer Preload is used, and the PoC Server determines that the preload phase has finished, the PoC Server:

NOTE: The PoC Server determines that the preload phase has finished according to local policy. For example this event might be triggered from the Control Plane when the first Confirmed Indication from an Invited PoC Client is received.

1. SHALL send a MBCP Media Burst Granted message to the requesting PoC Client;

The MBCP Media Burst Granted message:

a. MAY include notification of the number of Participants connected to the Media-floor Control Entity;

b. SHOULD include Alert Margin for Advanced Revocation Alert if Continuous Media is bound to the Media-floor Control; and,

c. SHALL include in the stop talking time field:

i. the value of T2 (Stop Talking) timer if only Continuous Media is bound to the Media-floor Control Entity; or,

ii. the value of T18 (end of Media-floor time) if Discrete Media is bound to the Media-floor Control Entity.

2. SHALL start the timer T1 (end of RTP Media timer); and,

3. SHALL remain in the 'G: MB_Taken' state.

6.4.4.3.11 T19 (start of MSRP) timer fires

At expiry of the T19 (start of MSRP) timer the PoC Server:

1. SHALL stop the T20 (Granted re-send) timer, if running; and,

2. SHALL perform the actions specified in the subclause 6.4.4.2.1 "*Enter state 'G: MB_Idle'*".

6.4.4.3.12 MSRP SEND request received (R: MSRP SEND)

Upon receiving an MSRP SEND request from the PoC Client with the permission to occupy the Media-floor the PoC Server:

1. SHALL stop the T19(start of MSRP) timer if running;

2. SHALL generate and send an MSRP 200 "OK" response according to rules and procedures of [OMA-PoC-IM];

3. SHALL generate an MSRP SEND request according to rules and procedures of [OMA-PoC-IM];

4. SHALL send the MSRP SEND request towards:

a. all other PoC Clients that are not on hold and whose maximum allowed message size is greater or equal to the size of the content in the received MSRP SEND request, if the PoC Session is neither a 1-many-1 PoC Group Session nor a Dispatch PoC Session;

or,

b. all Ordinary Participants or PoC Fleet Members that are not on hold and whose maximum allowed message size is greater or equal to the size of the content in the received MSRP SEND request, if the PoC Session is a 1-many-1 PoC Group Session or a Dispatch PoC Session, respectively, and the MSRP SEND request are from the Distinguished Participant or the Active PoC Dispatcher sending Media;

or,

c. the Distinguished Participant or the Active PoC Dispatcher, and whose maximum allowed message size is greater or equal to the size of the content in the received MSRP SEND request, if the PoC Session is a 1-many-1 PoC Group Session or a Dispatch PoC Session, respectively, the MSRP SEND request are from an Ordinary Participant or a PoC Fleet Member sending Media, and the Distinguished Participant or Active PoC Dispatcher is not on hold;

NOTE: Notice that both 1-many-1 PoC Group Sessions and Dispatch PoC Sessions use the 1-many-1 communication method, so for User Plane sending and receiving Media procedures, the Active PoC Dispatcher is equivalent to the Distinguished Participant and the PoC Fleet Members are equivalent to the Ordinary Participants.

5. SHALL stop the T20 (Granted re-send) timer, if running; and,
6. SHALL remain in the 'M: MB_Taken' state.

6.4.4.3.13 T18 (end of Media-floor time) timer fire

When the timer T18 (end of Media-floor time) fires the PoC Server:

1. SHALL stop the T1 (End of RTP Media) timer or the T19 (start of MSRP) timer if any of the timers are running;
2. SHALL stop the T20 (Granted re-send) timer, if running;
3. SHALL set the reason code field in the MBCP Media Burst Revoke message to 'Media Burst too long' if Continuous Media is bound to the Media-floor Control Entity;
4. SHALL set the reason code field in the MBCP Media Burst Revoke message to 'Media-floor occupied too long' if only Discrete Media is bound to the Media-floor Control Entity; and,
5. SHALL perform the actions specified in the subclause 6.4.4.5.1 "E*nter the 'G: pending MB_Revoke' state*".

6.4.4.3.14 T20 (Granted re-send) timer fired

On expiry of the T20 (Granted re-send) timer, the PoC Server:

1. SHALL send a MBCP Media Burst Granted message to the granted PoC Client;

   The MBCP Media Burst Granted message:

   a. MAY include notification of the number of Participants connected to the Media-floor Control Entity;
   b. SHOULD include Alert Margin for Advanced Revocation Alert in case Continuous Media is bound to the Media-floor Control Entity; and,
   c. SHALL include information in the stop talking time field;
      i. the value of T2 (Stop Talking) timer if only Continuous Media is bound to the Media-floor Control Entity; or,
      ii. the value of T18 (end of Media-floor time) if Discrete Media is bound to the Media-floor Control Entity.
2. SHALL start the T20 (Granted re-send) timer; and
3. SHALL remain in the 'G: MB_Taken' state.

6.4.4.3.15 T20 (Granted re-send) timer fired N times

On the N:th expiry of the T20 (Granted re-send) timer, the PoC Server:

1. SHALL remain in the 'G: MB_Taken' state.

6.4.4.4 State 'G: pending MB_Release'

The 'G: pending MB_Release' state is a transition state and the PoC Server uses this state after having received a MBCP Media Burst Release message from the permitted PoC Client.

The T1 (End of RTP) timer is running when the PoC Server is in this state if Continuous Media is bound to the Media-floor Control Entity.

The T18 (end of Media-floor) timer can be running in this state if only Discrete Media is bound to the Media-floor Control Entity.

6.4.4.4.1 Enter the state 'G: pending MB_Release'

When entering this state the PoC Server:

1. SHALL set the general state to 'G: pending MB_Release'.

6.4.4.4.2 Receive last RTP Media packets (R: Last Media)

Upon receiving a RTP Media packet from the permitted PoC Client with the same (or higher) sequence number as indicated in the MBCP Media Burst Release message the PoC Server:

1. SHALL stop the T2 (Stop talking) timer, if the timer is running;
2. SHALL either
    a. forward the received last RTP Media packet to all other PoC Clients that are not on hold, if the PoC Session is neither a 1-many-1 PoC Group Session nor a Dispatch PoC Session and PoC Media Traffic Optimisation has not been negotiated or the Distinguished Participant in case of a 1-many-1 PoC Group Session or the Active PoC Dispatcher in case of a Dispatch PoC Session is sending Media and if the PoC Server does not have RTP Media packets in the Media buffer;

    or,

    b. forward the received last RTP Media packet to all PoC Clients that are not on hold whose SIP Sessions are selected for Media transmission from the PoC Server performing the Controlling PoC Function to the PoC Server performing the Participating PoC Function, if the PoC Session is neither a 1-many-1 PoC Group Session nor a Dispatch PoC Session and PoC Media Traffic Optimisation has been negotiated, if the PoC Server does not have RTP Media packets in the Media buffer;

    or,

    c. forward the received last RTP Media packet towards the Distinguished Participant or towards the Active PoC Dispatcher, if the PoC Session is a 1-many-1 PoC Group Session or a Dispatch PoC Session, respectively, and the Distinguished Participant or the Active PoC Dispatcher is not on hold if the PoC Server does not have RTP Media packets in the Media buffer.

NOTE: Notice that both 1-many-1 PoC Group Sessions and Dispatch PoC Sessions use the 1-many-1 communication method, so for User Plane sending and receiving Media procedures, the Active PoC Dispatcher is equivalent to the Distinguished Participant and the PoC Fleet Members are equivalent to the Ordinary Participants.

3. SHALL either
    a. perform the actions specified in subclause 6.4.4.8.1 "*Enter the state 'G: pending MB_Idle'*" if RTP Media packet buffering is ongoing;

    or,

    b. perform the actions specified in the subclause 6.4.4.2.1 "*Enter the 'G: MB_Idle state*' if RTP Media packet buffering is not ongoing.

6.4.4.4.3 Receive RTP Media packets (R: Media)

Upon receiving a RTP Media packet with payload from the permitted PoC Client with a sequence number lower than the sequence number indicated in the MBCP Media Burst Release message the PoC Server:

1. SHALL either
    a. forward the received RTP Media packets to all other PoC Clients that are not on hold, if the PoC Session is neither a 1-many-1 Session nor a Dispatch PoC Session and PoC Media Traffic Optimisation has not been negotiated or if the Distinguished Participant in case of a 1-many-1 PoC Group Session or the Active PoC

Dispatcher in case of a Dispatch PoC Session is sending Media and if the PoC Server does not have RTP Media packets in the Media buffer;

or,

b. forward the received RTP Media packets to all other PoC Clients that are not on hold whose SIP Sessions are selected for Media transmission from the PoC Server performing the Controlling PoC Function to the PoC Server performing the Participating PoC Function, if the PoC Session is neither a 1-many-1 PoC Group Session nor a Dispatch PoC Session and PoC Media Traffic Optimisation has been negotiated and if the PoC Server does not have RTP Media packets in the Media buffer;

or,

c. forward the received RTP Media packets towards the Distinguished Participant or towards the Active PoC Dispatcher, if the PoC Session is a 1-many-1 PoC Group Session or a Dispatch PoC Session, respectively, and the RTP Media packets are from an Ordinary Participant or from a PoC Fleet Member sending Media and the Distinguished Participant or Active PoC Dispatcher is not on hold and if the PoC Server does not have RTP Media packets in the Media buffer;

NOTE: Notice that both 1-many-1 PoC Group Sessions and Dispatch PoC Sessions use the 1-many-1 communication method, so for User Plane sending and receiving Media procedures, the Active PoC Dispatcher is equivalent to the Distinguished Participant and the PoC Fleet Members are equivalent to the Ordinary Participants.

d. buffer the received RTP Media packets in case of unconfirmed indication and if RTP Media packet buffering is ongoing or if Limited Segment Media Buffer Preload is ongoing and if the PoC Server is in the preload phase.

2. SHALL restart the T1 (End of RTP Media) timer; and,

3. SHALL remain in the 'G: pending MB_Release' state.

6.4.4.4.4 T1 (End of RTP Media) timer fired

On expiry of the T1 (End of RTP Media) timer the PoC Server:

1. SHALL stop the T2 (Stop talking) timer, if the timer is running; and,

2. SHALL either:

a. perform the actions specified in subclause 6.4.4.8.1 "*Enter the state 'G: pending MB_Idle'*" if RTP Media packet buffering is ongoing;

or,

b. perform the actions specified in the subclause 6.4.4.2.1 "*Enter the 'G: MB_Idle state*' if RTP Media packet buffering is not ongoing.

6.4.4.4.5 T2 (Stop talking) timer fired

On expiry of the T2 (Stop talking) timer the PoC Server:

1. SHALL perform the actions specified in the subclause 6.4.4.2.1 "*Enter the 'G: MB_Idle state'*".

NOTE: When the PoC Client is a PoC release version 1.0 PoC Client the PoC Server performs the actions specified in [OMA-PoC-1-UP] "*Enter the G: pending MB_Revoke' state*".

6.4.4.4.6 Sending buffered Media packets (S: Buffered Media)

As long as the PoC Server has RTP Media packets buffered the PoC Server SHALL apply the procedures in the subclause 7.8 "*Media buffering*".

The PoC Server:

1. SHALL either

    a. forward the buffered RTP Media packets towards the other PoC Clients that are not on hold, if the PoC Session is neither a 1-many-1 PoC Group Session nor a Dispatch PoC Session or if the Distinguished Participant in case of a 1-many-1 PoC Group Session or the Active PoC Dispatcher in case of a Dispatch PoC Session is talking;

    or,

    b. forward the buffered RTP media packets towards the Distinguished Participant or towards the Active PoC Dispatcher, if the PoC Session is a 1-many-1 PoC Group Session or a Dispatch PoC Session, respectively, and if the Distinguished Participant or the Active PoC Dispatcher is not on hold.

NOTE: Notice that both 1-many-1 PoC Group Sessions and Dispatch PoC Sessions use the 1-many-1 communication method, so for User Plane sending and receiving Media procedures, the Active PoC Dispatcher is equivalent to the Distinguished Participant and the PoC Fleet Members are equivalent to the Ordinary Participants.

2. SHALL remain in the 'G: pending MB_Release' state.

6.4.4.4.7 Receive last chunk in a MSRP SEND request (R: Last MSRP SEND)

Upon receiving the last chunk in a MSRP SEND request from the permitted PoC Client the PoC Server:

1. SHALL stop the T18 (end of Media-floor time) timer, if the timer is running;
2. SHALL generate and send an MSRP 200 "OK" response according to rules and procedures of [OMA-PoC-IM]; and,
3. either

    a. SHALL forward the received MSRP SEND request to all other PoC Clients that are not on hold, if the PoC Session is neither a 1-many-1 PoC Group Session nor a Dispatch PoC Session or if the Distinguished Participant in case of a 1-many-1 PoC Group Session or the Active PoC Dispatcher in case of a Dispatch PoC Session is talking;

    or,

    b. SHALL forward the received MSRP SEND request towards the Distinguished Participant or towards the Active PoC Dispatcher, if the PoC Session is a 1-many-1 PoC Group Session or a Dispatch PoC Session, respectively.

NOTE: Notice that both 1-many-1 PoC Group Sessions and Dispatch PoC Sessions use the 1-many-1 communication method, so for User Plane sending and receiving Media procedures, the Active PoC Dispatcher is equivalent to the Distinguished Participant and the PoC Fleet Members are equivalent to the Ordinary Participants.

4. SHALL perform the actions specified in the subclause 6.4.4.2.1 "*Enter the 'G: MB_Idle state*'.

6.4.4.4.8 MSRP SEND request (R: MSRP SEND)

Upon receiving a MSRP SEND request from the permitted PoC Client with a sequence number lower than the sequence number of the last chunk the PoC Server:

1. SHALL generate and send an MSRP 200 "OK" response according to rules and procedures of [OMA-PoC-IM];
2. either

    a. SHALL forward the MSRP SEND request to all other PoC Clients that are not on hold, if the PoC Session is neither a 1-many-1 PoC Group Session nor a Dispatch PoC Session or the Distinguished Participant in

case of a 1-many-1 PoC Group Session or the Active PoC Dispatcher in case of a Dispatch PoC Session is talking;

or,

b. SHALL forward the received MSRP SEND request towards the Distinguished Participant or towards the Active PoC Dispatcher, if the PoC Session is a 1-many-1 PoC Group Session or a Dispatch PoC Session, respectively;

NOTE: Notice that both 1-many-1 PoC Group Sessions and Dispatch PoC Sessions use the 1-many-1 communication method, so for User Plane sending and receiving Media procedures, the Active PoC Dispatcher is equivalent to the Distinguished Participant and the PoC Fleet Members are equivalent to the Ordinary Participants.

3. SHALL remain in the 'G: pending MB_Release' state.

6.4.4.4.9 T18 (end of Media-floor time) timer fired

On expiry of the T18 (end of Media-floor time) timer the PoC Server:

1. SHALL perform the actions specified in the subclause 6.4.4.5.1 "*Enter the 'M: pending MB_Revoke' state*".

6.4.4.5 State 'G: pending MB_Revoke'

The 'G: pending MB_Revoke' state is a transition state and the PoC Server uses this state after having sent a MBCP Media Burst Revoke message to the permitted PoC Client.

The timer T3 (Stop talking grace) is running when the PoC Server use this state.

In this state the PoC Server forwards RTP Media packets or MSRP SEND messages to other PoC Clients.

6.4.4.5.1 Enter the 'G: pending MB_Revoke' state

When entering this state the PoC Server:

1. SHALL send the MBCP Media Burst Revoke message to the permitted PoC Client.

   The MBCP Media Burst Revoke message:

   a. SHALL include a reason code field; and,

   b. SHALL include a reason phrase.

NOTE: The value of the reason code field depends on why the permission to send a Media Burst is revoked and is described elsewhere in this document.

2. SHALL start the T3 (Stop talking grace) timer; and,

3. SHALL set the general state to 'G: pending MB_Revoke'.

6.4.4.5.2 Receive RTP Media packets (R: Media)

Upon receiving RTP Media packets with payload and with a sequence number lower than the sequence number indicated in the MBCP Media Burst Release message the PoC Server:

NOTE 1: The sequence number of the last RTP Media packet is received in the MBCP Media Burst Release message. Prior to the receipt of the MBCP Media Burst Release message all RTP Media packets are regarded to not be the last RTP Media packet.

1. SHALL either

a. forward the received RTP Media packets towards the other PoC Clients that are not on hold, if the PoC Session is neither a 1-many-1 PoC Group Session nor a Dispatch PoC Session and PoC Media Traffic Optimisation has not been negotiated or if the Distinguished Participant in case of a 1-many-1 PoC Group Session or the Active PoC Dispatcher in case of a Dispatch PoC Session is sending Media and if the PoC Server does not have RTP Media packets in the Media buffer;

or,

b. forward the received RTP Media packets to all PoC Clients that are not on hold whose SIP Sessions are selected for Media transmission from the PoC Server performing the Controlling PoC Function to the PoC Server performing the Participating PoC Function, if the PoC Session is neither a 1-many-1 PoC Group Session nor a Dispatch PoC Session and PoC Media Traffic Optimisation has been negotiated and if the PoC Server does not have RTP Media packets in the Media buffer;

or,

c. forward the received RTP Media packets towards the Distinguished Participant or towards the Active PoC Dispatcher, if the PoC Session is a 1-many-1 PoC Group Session or a Dispatch PoC Session, respectively, and the RTP Media packets are from an Ordinary Participant or from a PoC Fleet Member sending Media and the Distinguished Participant or Active PoC Dispatcher is not on hold and if the PoC Server does not have RTP Media packets in the Media buffer;.

NOTE 2: Notice that both 1-many-1 PoC Group Sessions and Dispatch PoC Sessions use the 1-many-1 communication method, so for User Plane sending and receiving Media procedures, the Active PoC Dispatcher is equivalent to the Distinguished Participant and the PoC Fleet Members are equivalent to the Ordinary Participants.

or,

d. buffer the received RTP Media packets in case of unconfirmed indication and if RTP Media packet buffering is ongoing or if Limited Segment Media Buffer Preload is ongoing and if the PoC Server is in the preload phase.

2. SHALL restart the T1 (End of RTP Media) timer; and,

3. SHALL remain in the 'G: pending MB_Revoke' state.

6.4.4.5.3 Receive MBCP Media Burst Release message (R: MB_Release (from permitted PoC Client))

Upon receiving a MBCP Media Burst Release message and,

1. if the sequence number is not marked as invalid and last RTP Media packet is not received, then the PoC Server:

   a. SHALL store the sequence number of the last RTP Media packet; and,

   b. SHALL remain in the 'G: pending MB_Revoke' state.

2. or, if the sequence number is not marked as invalid and last RTP Media packet is already received, then the PoC Server:

   a. SHALL stop the T1 (End of RTP Media) timer if it is running;

   b. SHALL stop the T3 (Stop talking grace) timer; and,

   c. SHALL either

      i. perform the actions specified in subclause 6.4.4.8.1 "*Enter the state 'G: pending MB_Idle'*" if RTP Media packet buffering is ongoing;

      or,

ii. perform the actions specified in the subclause 6.4.4.2.1 "*Enter the 'G: MB_Idle state'*" if RTP Media packet buffering is not ongoing.

3. or, if the sequence number is marked as invalid, then the PoC Server:

   a. SHALL stop the T1 (End of RTP Media) timer if it is running;

   b. SHALL stop the T3 (Stop talking grace) timer; and,

   c. SHALL either

      i. perform the actions specified in subclause 6.4.4.8.1 "*Enter the state 'G: pending MB_Idle'*" if RTP Media packet buffering is ongoing;

      or,

      ii. perform the actions specified in the subclause 6.4.4.2.1 "*Enter the 'G: MB_Idle state'*" if RTP Media packet buffering is not ongoing.

4. If only Discrete Media is bound to the Media-floor Control Entity the PoC Server:

   a. SHALL stop the T3 (Stop talking grace) timer;

   b. SHALL stop the T19 (start of MSRP) timer if it is running; and,

   c. SHALL perform the actions in subclause 6.4.4.2.1 "*Enter the 'G: MB_Idle state'*".

6.4.4.5.4 Receive last RTP Media packets (R: Last Media)

Upon receiving a RTP Media packet with payload from the permitted PoC Client with the same (or higher) sequence number as indicated in the MBCP Media Burst Release message the PoC Server:

1. SHALL either

   a. forward the RTP Media packet to all other PoC Clients that are not on hold, if the PoC Session is neither a 1-many-1 PoC Group Session nor a Dispatch PoC Session and PoC Media Traffic Optimisation has not been negotiated or if the Distinguished Participant in case of a 1-many-1 PoC Group Session or the Active PoC Dispatcher in case of a Dispatch PoC Session is sending Media and if the PoC Server does not have RTP Media packets in the Media buffer;

   or,

   b. forward the received RTP Media packet to all PoC Clients that are not on hold whose SIP Sessions are selected for Media transmission from the PoC Server performing the Controlling PoC Function to the PoC Server performing the Participating PoC Function, if the PoC Session is neither a 1-many-1 PoC Group Session nor a Dispatch PoC Session and PoC Media Traffic Optimisation has been negotiated and if the PoC Server does not have RTP Media packets in the Media buffer;

   or,

   c. forward the received RTP Media packets towards the Distinguished Participant or towards the Active PoC Dispatcher, if the PoC Session is a 1-many-1 PoC Group Session or a Dispatch PoC Session, respectively, if the RTP Media packet has the same sequence number as the sequence number indicated in the MBCP Media Burst Release message and if the PoC Server does not have RTP Media packets in the Media buffer;

NOTE: Notice that both 1-many-1 PoC Group Sessions and Dispatch PoC Sessions use the 1-many-1 communication method, so for User Plane sending and receiving Media procedures, the Active PoC Dispatcher is equivalent to the Distinguished Participant and the PoC Fleet Members are equivalent to the Ordinary Participants.

or,

d. buffer the received RTP Media packets in case of unconfirmed indication and if RTP Media packet buffering is ongoing or if Limited Segment Media Buffer Preload is ongoing and if the PoC Server is in the preload phase.

2. SHALL stop the T1 (End of RTP Media) timer if it is running;

3. SHALL stop T3 (Stop talking grace) timer; and,

4. SHALL perform the actions specified in the subclause 6.4.4.2.1 "*Enter the 'G: MB_Idle state'*".

6.4.4.5.5 T3 (Stop talking grace) timer fired

On expiry of the T3 (Stop talking grace) timer the PoC Server:

1. SHALL perform the actions specified in the subclause 6.4.4.2.1 "*Enter the 'G: MB_Idle state'*".

6.4.4.5.6 Sending buffered Media packets (S: Buffered Media)

As long as the PoC Server has RTP Media packets buffered the PoC Server SHALL apply the procedures in the subclause 7.8 "*Media buffering*".

The PoC Server:

1. SHALL

   a. forward the buffered RTP Media packets towards the other PoC Clients that are not on hold, if the PoC Session is neither a 1-many-1 PoC Group Session nor a Dispatch PoC Session or if the Distinguished Participant in case of a 1-many-1 PoC Group Session or the Active PoC Dispatcher in case of a Dispatch PoC Session is talking;

      or,

   b. forward the buffered RTP media packets towards the Distinguished Participant or towards the Active PoC Dispatcher, if the PoC Session is a 1-many-1 PoC Group Session or a Dispatch PoC Session, respectively, and if the Distinguished Participant or the Active PoC Dispatcher is not on hold.

NOTE: Notice that both 1-many-1 PoC Group Sessions and Dispatch PoC Sessions use the 1-many-1 communication method, so for User Plane sending and receiving Media procedures, the Active PoC Dispatcher is equivalent to the Distinguished Participant and the PoC Fleet Members are equivalent to the Ordinary Participants.

6.4.4.5.7 MSRP SEND request received (R: MSRP SEND)

Upon receiving an MSRP SEND request from the PoC Client with the permission to occupy the Media-floor the PoC Server:

1. SHALL generate and send an MSRP 200 response according to rules and procedures of [OMA-PoC-IM];

2. SHALL generate an MSRP SEND request according to rules and procedures of [OMA-PoC-IM];

3. SHALL send the MSRP SEND request towards:

   a. all other PoC Clients that are not on hold and whose maximum allowed message size is greater or equal to the size of the content in the received MSRP SEND request, if the PoC Session is neither a 1-many-1 PoC Group Session nor a Dispatch PoC Session;

      or,

   b. all Ordinary Participants or PoC Fleet Members that are not on hold and whose maximum allowed message size is greater or equal to the size of the content in the received MSRP SEND request, if the PoC Session is a 1-many-1 PoC Group Session or a Dispatch PoC Session, respectively, and the MSRP SEND request are from the Distinguished Participant or from the Active PoC Dispatcher sending Media;

or,

c. the Distinguished Participant or the Active PoC Dispatcher and whose maximum allowed message size is greater or equal to the size of the content in the received MSRP SEND request, if the PoC Session is a 1-many-1 PoC Group Session or a Dispatch PoC Session, respectively, the MSRP SEND request are from an Ordinary Participant or from a PoC Fleet Member sending Media, and the Distinguished Participant or the Active PoC Dispatcher is not on hold;

NOTE: Notice that both 1-many-1 PoC Group Sessions and Dispatch PoC Sessions use the 1-many-1 communication method, so for User Plane sending and receiving Media procedures, the Active PoC Dispatcher is equivalent to the Distinguished Participant and the PoC Fleet Members are equivalent to the Ordinary Participants.

4. SHALL remain in the 'M: MB_Taken' state.

6.4.4.6 State: Any state

This subclause describes the actions to be taken in all states defined for the general state diagram with the exception of the 'Start-stop' state.

6.4.4.6.1 Receive PoC Session release - 1 or the Media-floor Control is terminated

This subclause is valid when a PoC Session is released or when the Media-floor Control Entity is terminated.

Upon receiving a PoC Session release stage 1 request from the Control Plane, the PoC Server:

1. SHALL stop sending MBCP messages, MSRP SEND message/responses and RTP Media packets towards all PoC Clients; and,
2. SHALL enter the 'Releasing' state.

6.4.4.6.2 PoC Client joins an existing Media-floor Control Entity

When a PoC Client connects to a Media-floor Control Entity the PoC Server:

1. SHALL remain in the current state.

6.4.4.6.3 PoC Client leaves an existing Media-floor Control Entity

When a PoC Client disconnects from the Media-floor Control Entity the PoC Server:

1. if the PoC Client is the PoC Client that has the permission to send Media the PoC Server:
   a. SHALL stop all running timers; and,
   b. SHALL perform the actions in subclause 6.4.4.2.1 "*Enter state 'M: MB_Idle'*".
2. If another PoC Client is the PoC Client that has the permission to send Media the PoC Server:
   a. SHALL remain in the current state.

6.4.4.7 State: 'Releasing'

The 'Releasing' state is a transition state. The PoC Server uses this state while waiting for the Control Plane to finalize the disconnection of a PoC Session.

6.4.4.7.1 Receive PoC Session release - 2

Upon receiving a PoC Session release stage 2 request from the Control Plane, the PoC Server:

1. SHALL release all resources reserved in the User Plane including the instances used for the general state machine, and basic state machines and any running timers associated with the general and basic state machines; and,

2. SHALL enter the 'Start-stop' state and terminate the PoC Session control state machine.

6.4.4.8 State: 'G: pending MB_Idle'

The 'G: pending MB_Idle' state is a transition state. The PoC Server uses this state when buffered RTP Media packets are sent to Participants in the PoC Session before entering the 'G: MB_Idle' state.

This state is optional and only supported if the PoC Server supports RTP Media buffering.

6.4.4.8.1 Enter the state 'G: pending MB_Idle'

When entering this state the PoC Server:

1. SHALL set the general state to 'G: pending MB_Idle'.

6.4.4.8.2 Sending buffered Media packets (S: Buffered Media)

As long as the PoC Server has RTP Media packets buffered the PoC Server SHALL apply the procedures in the subclause 7.8 "*Media buffering*".

The PoC Server:

1. SHALL

   a. forward the buffered RTP Media packets towards the other PoC Clients that are not on hold, if the PoC Session is neither a 1-many-1 PoC Group Session nor a Dispatch PoC Session or if the Distinguished Participant in case of a 1-many-1 PoC Group Session or the Active PoC Dispatcher in case of a Dispatch PoC Session is talking;

   or,

   b. forward the buffered RTP media packets towards the Distinguished Participant or towards the Active PoC Dispatcher, if the PoC Session is a 1-many-1 PoC Group Session or a Dispatch PoC Session, respectively, and if the Distinguished Participant or the Active PoC Dispatcher is not on hold.

NOTE: Notice that both 1-many-1 PoC Group Sessions and Dispatch PoC Sessions use the 1-many-1 communication method, so for User Plane sending and receiving Media procedures, the Active PoC Dispatcher is equivalent to the Distinguished Participant and the PoC Fleet Members are equivalent to the Ordinary Participants.

2. SHALL

   a. remain in the 'pending MB_Idle' state as long as Media packets are buffered;

   or,

   b. perform the actions specified in the subclause 6.4.4.8.3 "*The last RTP Media packet is sent (S: Last Media in buffer)*" when the last buffered Media packet is sent.

6.4.4.8.3 The last RTP Media packet is sent (S: Last Media in buffer)

When the last RTP Media packet is sent the PoC Server:

1. SHALL perform the actions specified in the subclause 6.4.4.2.1 "*Enter the 'G: MB_Idle state'*".

6.4.5 PoC Server state transition diagram for basic Media Burst operation to the PoC Client

The PoC Server SHALL support the state diagram and the state transitions specified in this subclause when Continuous Media or Discrete Media or both are bound to a Media-floor Control Entity.

NOTE 1: The sending or receiving of reports related to Discrete Media are described in subclauses 7.12 "*Discrete Media Transfer Final Report*" and 7.13 "*Discrete Media Transfer Progress Report*".

NOTE 2: In this subclause the sending of MBCP messages are described, but they are not sent, if they are already sent according to the subclause 6.4.4 "*PoC Server state transition diagram for general Media Burst operation*".

NOTE 3: The optional MBCP features "queuing" and "tb_priority" are specified in [OMA-PoC-CP] "*Media Burst Control Protocol MIME registration*".

Figure 12 "*PoC Server state transition diagram for normal Media Burst operation to the PoC Client*" shows the states and state transitions for Media Burst Control for a specific PoC User (U states) in the PoC Server.

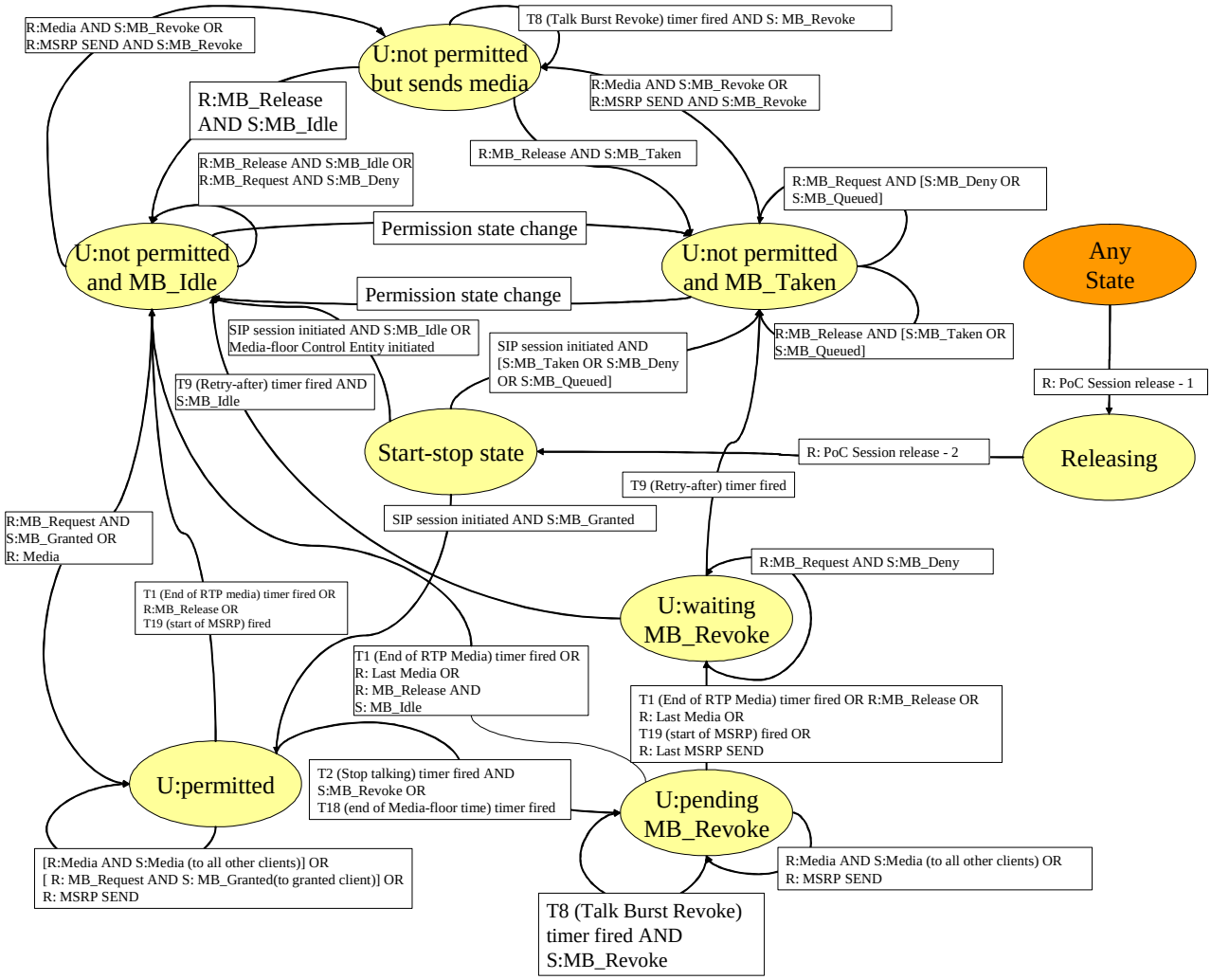


Figure 12: PoC Server state transition diagram for normal Media Burst operation to the PoC Client

The PoC Server SHALL create one instance of the state machine for every PoC Client served by the PoC Server, when the PoC Session is established, as follows:

In case of an originating PoC Client, the PoC Session SHALL be established when the PoC Server sends the SIP 200 "OK" response to the originating PoC Client.