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Media Server Control Protocol Requirements
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Abstract

This document addresses the communication between an application server and media server. The current work in SIPING and XCON working groups show these logical entities but do not address the physical decomposition and the protocol between the entities.

This document presents the requirements from a media server control protocol (MCP) that enables an application server to use a media

server. It will address the aspects of announcements, IVR and conferencing media services.

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1. Introduction

The IETF SIPING conferencing framework [RFC 4353](#)[\[CARCH\]](#) presents an architecture that is built of several functional entities. The framework document does not specify the protocols between the functional entities since it is considered out of scope.

There is an interest to work on a protocol that will enable one physical entity that includes the conference/media policy server, notification server and the focus also known as Application server to interact with one or more physical entities, called Media Server, that serves as mixer or media server.

The Media server may also be used for announcements and IVR (Interactive Voice Response) functions.

The decomposition to a media server and application server is described in the media control framework document`[mediactrl-fw]`.

This document presents the requirements from a media server control protocol (MCP) that enables an application server to use a media server. It will address the aspects of announcements, IVR and conferencing media services.

The requirements are from the protocol and do not address the AS or MS functionality discussed in the media control framework.

2. Terminology

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [RFC2119](#)[\[RFC2119\]](#) and indicate requirement levels for compliant RTP implementations.

The Media Server work uses, when appropriate, and expands on the terminology introduced in the SIP conferencing framework[\[CARCH\]](#) and XCON conferencing framework`[xcon-framework]`. The following additional terms are defined:

Application Server (AS) - A functional entity that hosts one or more instances of a communications application. The application server includes the conference policy server, the focus and the conference notification server as defined in [\[CARCH\]](#). It can include also communication applications that use IVR or announcements services.

Media Server (MS) - The media server includes the mixer as defined in [\[CARCH\]](#). The media server source media streams for announcements, it

process media streams for functions like DTMF detection and transcoding. The media server may also record media streams for supporting IVR functions like announcing participants

Media Resource Broker (MRB) - A logical entity that is responsible for both collection of appropriate published Media Server (MS) information and supplying of appropriate MS information to consuming entities.

Notification - A notification is used when there is a need to report event related information from the MS to the AS.

Request - A request is sent from the controlling entity, such as an Application Server, to another resource, such as a Media Server, asking that a particular type of operation be executed.

Response - A response is used to signal information such as an acknowledgement or error code in reply to a previously issued request.

3. Requirements

3.1. Media Control Requirements

The following are the media control requirements:

REQ-MCP-01 - The MS control protocol SHALL enable one or more Application Servers to control one or more media servers.

REQ-MCP-02 The MS control protocol SHALL be independent from the transport protocol.

REQ-MCP-03 The MS control protocol SHALL use a reliable transport protocol.

REQ-MCP-04 - The application scope of the protocol shall include Conferencing and Interactive Voice Response media services.

Note: Though the protocol enables these services, the functionality is invoked through other mechanisms.

REQ-MCP-05 - Media types supported in the context of the applications shall include audio, tones, text and video.

REQ-MCP-06- The MS control protocol should allow, but must not require, a media resource broker (MRB) or intermediate proxy to exist with the Application Server and Media Server.

REQ-MCP-07 - The solution MUST enable one control channel between an AS and MS, and SHOULD allow for the support of multiple channels.

One control channel could control multiple sessions, but you could have multiple control channels controlling one or more sessions.

REQ-MCP-8 - On the MS control channel, there shall be requests to the MS, responses from the MS and notifications to the AS.

REQ-MCP-9 - SIP/SDP SHALL be used to establish and modify media connections to a Media Server.

REQ-MCP-10 - It should be possible to support a single conference spanning multiple Media Servers.

Note: It is probable that spanning multiple MS can be accomplished by the AS and does not require anything in the protocol for the scenarios we have in mind. However, the concern is that if this requirement is treated too lightly, one may end up with a protocol that precludes its support.

REQ-MCP-11 - It must be possible to split call legs individually or in groups away from a main conference on a given Media Server, without performing re-establishment of the call legs to the MS (e.g., for purposes such as performing IVR with a single call leg or creating sub-conferences, not for creating entirely new conferences).

REQ-MCP-12 - The MS control protocol should be extendable, facilitating forward and backward compatibility.

REQ-MCP-13 - The MS control protocol shall include security mechanisms.

REQ-MCP-14 - During session establishment, there shall be a capability to negotiate parameters that are associated with media streams.

REQ-MCP-15 - The AS shall be able to define operations that the MS will perform on streams like mute and gain control.

- REQ-MCP-16 - The AS shall be able to instruct the MS to play a specific announcement.
- REQ-MCP-17 - The AS shall be able to request the MS to create, delete, and manipulate a mixing, IVR or announcement session.
- REQ-MCP-18 - The AS shall be able to instruct the MS to play announcements to a single user or to a conference mix.
- REQ-MCP-19 - The MS control protocol SHOULD enable the AS to ask the MS for session summary report.
- REQ-MCP-20 - The MS shall be able to notify the AS of events received in the media stream if requested by AS. (Examples - STUN request, Flow Control, etc.)

3.2. Media mixing Requirements

- REQ-MCP-21 - The AS shall be able to define a conference mix.
- REQ-MCP-22 - The AS may be able to define a separate mix for each participant.
- REQ-MCP-23 - The AS may be able to define a custom video layout built of rectangular sub windows.
- REQ-MCP-24 - For video the AS shall be able to map a stream to a specific sub-window or to define to the MS how to decide which stream will go to each sub window. The number of sub-windows will start from one.
- REQ-MCP-25 - The MS shall be able to notify the AS who is the active speaker.
- REQ-MCP-26 - The MS shall be able to inform the AS which layouts it supports.
- REQ-MCP-27 - The MS control protocol should enable the AS to instruct the MS to record a specific conference mix.

3.3. IVR Requirements

- REQ-MCP-28 - The AS shall be able to load one or more IVR script to the MS and receive the results.

REQ-MCP-29 - The AS shall be able to manage the IVR session by sending announcements and receiving the response (e.g., DTMF).

REQ-MCP-30 - The AS should be able to instruct the MS to record a short participant stream and play it back to the conference. This is not a recording requirement.

3.4. Operational Requirements

These requirements may be applicable to the MRB.

REQ-MCP-31 - The MS control protocol must allow the AS to audit the MS state, during an active session.

REQ-MCP-32 - The MS shall be able to inform the AS about its status during an active session.

4. IANA consideration

There are no IANA considerations.

5. Security Considerations

The protocol shall include security mechanisms.

6. Acknowledgment

would also like to acknowledge the work of Gary Munson from AT & T Labs and James Rafferty from Cantata who helped with drafting [draft-dolly-xcon-mediactrlframe-02](#) on which this work is based.

7. References

7.1. Normative References

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [BCP 14](#), [RFC 2119](#), March 1997.

7.2. Informative References

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