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MTAS H.248 Support

Abstract

This Interworking Description defines the H.248 support in MTAS. The MTAS acts as a Media Gateway Controller (MGC) as defined in [1]. Any interworking MRFP acts as a Media Gateway (MG) and should support what is outlined in this document.

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1 Revision Information

Date	Rev	Author	Comments
2013-04-09	A	ealefaz	Call Return service use the playcol signal with a segmented variable announcement
2013-08-06	B	edmhov	Restart handling chapters updated. Call Return uses L timer instead of S timer in digitmap, update for trouble report HR26006. Recommended to use mstrm instead of m-stream in BFCP SDP, update for trouble report HR27703. Updated with cg/rt and cg/sit. Elevated Priority values for Priority Services support.
2013-11-22	C	eczamic	Updated 4.7.5 and 8.1.18 due to TR HR72841
2014-08-29	E	ethtzs	Updated chapter 9 References, to make the document platform-agnostic.
2014-11-07	F	ethtzs, ebarcsk	Support for hangterm package (H.248.36) added. Added 8.2.9 MTAS-MRFP reconnection after MTAS upgrade. Updated 4.6.6.1 and 4.7.8, inserted 8.2.8 due to TR HS83024: service change reason code 905 added.
2015-01-09	G	ebarcsk	Link in previous revision information entry corrected.
2015-04-16	H	exxgddi	Support min and max Number of Digits in CAPv2 PC message from 1-16.
2015-06-24	J	ebarcsk	Updated "Signals - aasdc/playcol – iv" - the unit is in ms, and it can be configured by mtasAnnouncementParameterDelay
2015-10-14	K	ethnvs	Chapter 8.2.1: H.248 protocol re-configuration is not executed during warm boot. Chapter 8.2.2: Cold boot is not requested from the controller after the SC with method

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			Disconnected, reason = 900.
2016-03-24	L	xmilmat	MTASv 1.0 -Updated References: CBA link to MOM.

2 Introductions

2.1 Purpose

The purpose with this document is to describe the H.248 protocol procedures between the MTAS and the MRFP.

2.2 Scope

This document defines the interworking between the MTAS and the MRFP on the Mp interface. The base for it is the Mp profile defined by TISpan in [3].

This document covers only the MTAS executing MMTel and MRFC functions.

The MTAS may interwork with multiple MRFPs, using SCTP as the transport protocol. The SCTP connection is initiated from the MRFPs.

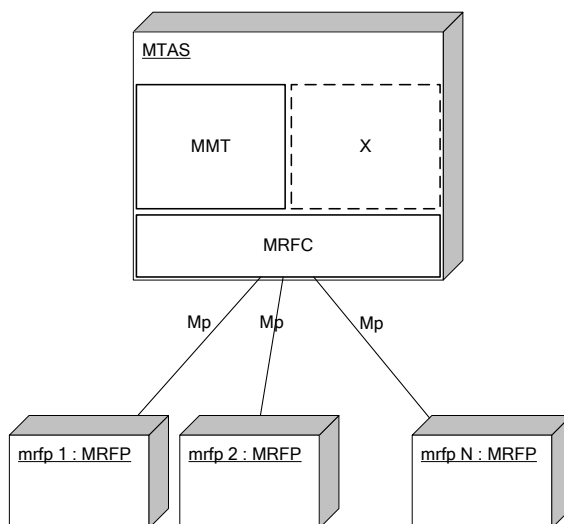


Figure 1 MTAS, MRFC interworking with MRFP

The following sub-functions of the MMTel function may use the MRFC to interwork with the MRFP:

- a Announcement during Session Establishment
- b Announcement during Established Session

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- c Announcement, IVR and Digit Collection during call completion invocation
- d Conference

Moreover, the MRFC function handles the links to multiple MRFPs.

The MTAS provides the MGC functionality. The interworking MRFP provides the MG functionality.

On network level either IPv4 or IPv6 can be used.

2.3 Overview

Chapters 4, 5 and 6 show the static view of the H.248 protocol features that are supported by the MTAS.

Chapter 4 shows the static view of the H.248 support in the MTAS, except SDP.

Chapter 5 shows the static view of the H.248 SDP support in the MTAS.

Chapter 6 describes the H.248 security mechanisms in the MTAS.

Chapter 7 shows the dynamic view of interworking with the MTAS.

3 Terminology

3.1 Definitions

Finite announcement	is an announcement that has a specific end either by a configured finite repetition number (number of cycles, iterations) and/or by a configured duration value.
Continuous announcement	is an announcement that plays continuously without a specific end by setting the repetition number to the infinite value and by omitting the duration parameter

3.2 Abbreviations

ASCII	American Standard Code for Information Interchange
aasb	Advanced Audio Server (AAS) Base package
aasdc	AAS Digit Collection package
asr	Automatic Speech Recognition package

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CM	Configuration Management
DTMF	Dual Tone Multi-Frequency
IVR	Interactive Voice Response
ITU-T	International Telecommunication Union – Telecommunication Standardization Sector
MG	Media Gateway
MGC	Media Gateway Controller
MMTel	Multimedia Telephony
MRFC	Media Resource Function Controller
MRFP	Media Resource Function Processor
RTCP	RTP Control Protocol (RFC 1889)
RTP	Real-Time Transport Protocol (RFC 1889)
SCTP	Stream Control Transmission Protocol (RFC 2960)
SDP	Session Description Protocol (RFC 2327)
XML	eXtensible Markup Language

4 H.248 Support

4.1 Version And Profile

Table 1 below shows the version and profile detail for MRFC.

	MTAS accepts	
	ServiceChangeProfile	ServiceChangeVersion
MMTel	ETSIprof_MediaServer/1	2

Table 1 Version and profile details for MRFC

The MTAS will use the MRFP for MMTel.

If the MTAS receives unknown profile or doesn't receive any profile in the ServiceChange with Restart, the message is ignored and the SCTP link is closed.

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4.2 Connection Model

The MTAS uses one of the following connection models:

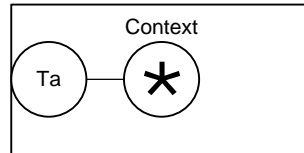


Figure 2 model used for Announcement during Session Establishment

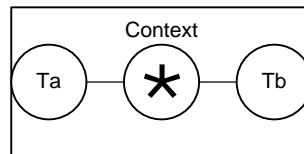


Figure 3 model used for Announcement during Established Session

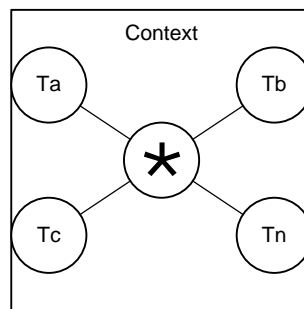


Figure 4 model used for Conference

4.2.1 Contexts

4.2.1.1 Context Model

	MTAS uses
Maximum number of contexts:	Not limited by MTAS.
Maximum number of terminations per context:	1 (Announcement during Session Establishment) 2 (Announcement during Established Session) N (Conference) Note 1
Maximum number of streams per termination:	1 (NOTE 2) 2 (NOTE 3) 10 (NOTE 4)
<p>NOTE 1: N=32 Terminations.</p> <p>NOTE 2: for conference, if only audio or only video announcement is configured</p> <p>NOTE 3: for conference, if both audio and video announcements are configured, or for Conference</p>	

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NOTE 4: for other sub-functions than conference.

Table 2 Context Model parameters

4.2.1.2 Context Properties

	MTAS uses
Context name structure	<id>
Topology	Yes (NOTE 1)
Priority	4 (Modify ROOT) 6 (Add) 9 (other commands) 11–15 (priority communication, see 4.2.1.3)
Emergency Indicator	No
NOTE 1: Announcement during Established Session may use (*, *, Isolate, StreamId) topology. Otherwise the default (*, *, Bothway) topology is used.	

Name	Description	Values	Wildcard	
			Choose (\$)	All (*)
id	Context specific identifier assigned by the MRFP	32-bit integer	Yes	Yes

Table 3 Context Properties

4.2.1.3 Priority attribute for priority communication

As part of prioritized communication, elevated values of Priority attribute may apply. In this scheme, regardless the command type, Priority value may range 11 to 15, depending on priority level of the communication flow.

4.2.2 Terminations

The following Termination types are used by the MTAS:

	MTAS uses
RTP	Yes
ROOT	Yes

4.2.2.1 RTP Termination

The MTAS uses RTP terminations to source/sink media streams. Each stream within a termination represents an RTP/RTCP media flow.

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The RTP termination is an ephemeral termination. It is created when added to a Context and deleted when subtracted from the Context.

The MTAS uses the following schema for the RTP termination IDs:

	MTAS uses
RTP Termination ID structure	prefix/<group>/<name>

Name	Description	Values	Wildcard		
			Choose (\$)	All (*)	Applicable commands
prefix	"rtp" is a fixed prefix for the termination ID.	"rtp"	No	No	–
group	Provides a grouping of TerminationIDs. This is dynamically assigned by the MRFC	Integer (0-255)	No	Yes	Subtract (*)
name	Termination specific identifier assigned by the MRFP.	assigned by the MRFP	Yes	Yes	Add (\$) Subtract (*) Modify(*) AuditValue (*)

4.2.2.2 ROOT Termination

The ROOT termination is used by the MTAS to modify parameters affecting the entire MRFP, to receive status changes of the MRFP (ServiceChange), and to receive congestion level of the MRFP (Notify).

	MTAS uses	Wildcard	
		Choose (\$)	All (*)
ROOT Termination ID structure	ROOT	No	No

4.3 Message Encoding

The MTAS sends messages using the text encoding in 'compact' form and understands messages encoded using either 'pretty' or 'compact' form.

The MTAS does not support binary message encoding.

4.3.1 Message Identifier (MID)

The MTAS uses its IP address and port as the Message Identifier in all sent messages.

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The MTAS expects each MRFP to use the same MID throughout the connection. Different MRFPs are expected to use different MIDs.

4.4 Transport

The MTAS uses single stream SCTP as a transport protocol for H.248. The MRFP creates the connection towards the MTAS.

4.5 Transactions

	MTAS uses
Transactions per Message	1
Actions per Transaction	1
Commands per Action	2 (Add-Add, Modify-Modify, Add-Modify) 1 (any command) Many (Many Modify, adding a stream to each terminations in a conference)

The MTAS does not include both requests and replies within a single H.248 message.

In the case of a link failure between the MTAS and the MRFP there may be a number of Transactions for which no responses have been received. In that case the MTAS performs an Audit between the MTAS and the MRFP to find out if the same contexts are known to the MRFP and the MTAS. See also 8.2.4.

4.6 Commands

	MTAS uses	
Command	on RTP termination	on ROOT termination
Add	Yes	No
AuditValue	Yes	Yes
Modify	Yes	Yes
Subtract	Yes	No
W-Subtract	Yes	No

	MTAS accepts	
Command	on RTP termination	on ROOT termination
Notify	Yes	Yes
ServiceChange	Yes	Yes

The MTAS does not use or support any other commands not mentioned above.

The MTAS does not use or does it support the Optional Commands (O-).

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4.6.1 Add / Modify RTP

MTAS supports both RTP/AVP and RTP/AVPF transport profiles.

4.6.1.1 Request

Add/Modify Request - RTP termination				
Descriptor	Properties Events Signals	Parameters Values	Always used	Comment
	ContextID	<context id>		Fully specified.
	TerminationID	rtp/<group>/<name>	Yes	Add - underspecified. rtp/<group>/ Modify - fully specified. rtp/<group>/<name>
	Priority	6 (Add) 9 (Modify)	Yes	Except: priority scheme described in 4.2.1.3
Media			Yes	
Stream			Yes	1 to 10 streams may be used.
	StreamID	<stream id>	Yes	Fully specified. It is an integer in the range 1..9.
LocalContr ol			Yes	
	Mode	SendOnly SendReceive ReceiveOnly Inactive	No	
	ReservedValue	ON	No	Only the ON value is sent. Absence of the ReservedValue property implies OFF.
Local			No	Add - used always. Modify - unspecified if nothing changed.
	v	0	Yes	
	c	IN IP4 \$ IN IP4 <address> IN IP6 \$ IN IP6 <address>	Yes	Add - underspecified. Modify - fully specified.

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Add/Modify Request - RTP termination				
Descriptor	Properties Events Signals	Parameters Values	Always used	Comment
	m	<media> \$ RTP/AVP \$ <media> \$ RTP/AVP <codecs> <media> <port> RTP/AVP <codecs> <media> \$ TCP/BFCP \$ <media> \$ TCP/TLS/BFCP \$ <media> \$ TCP/BFCP * <media> \$ TCP/TLS/BFCP * <media> <port> TCP/BFCP * <media> <port> TCP/TLS/BFCP *	Yes	Add - port is underspecified and codecs may be underspecified, fully specified or overspecified. Modify - port is fully specified and codecs may be fully specified or overspecified.
	b=AS		No	If used, it is fully specified.
	a=rtpmap		No	
	a=fmtp		No	
	a=ptime		No	
Remote			No	Add - may be used. Modify - unspecified if nothing changed.
	v	0	Yes	
	c	IN IP4 <address> IN IP6 <address>	Yes	Fully specified.
	m	<media> <port> RTP/AVP <codecs> <media> <port> TCP/BFCP * <media> <port> TCP/TLS/BFCP *	Yes	Fully specified or overspecified.
	b=AS		No	If used, it is fully specified.
	a=rtpmap		No	
	a=fmtp		No	
	a=ptime		No	
Signals			No	
	an/apf		No	1 or 2 signals are used.
		an=<announcement id>	Yes	Fully specified. It is a string of announcement name.
		Stream=<stream id>	Yes	Fully specified. It is an integer in the range 1..9.
		noc=<Number of cycles>	No	Number of cycles of repetition. 0 means continuous repetition.
		NotifyCompletion={TO, OR}	No	TO=Timeout, OR=Other Reason.
	aasdc/playcol		No	

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Add/Modify Request - RTP termination				
Descriptor	Properties Events Signals	Parameters Values	Always used	Comment
		ip="sid=<announcement id>" or ip="sid=<file://mrfppath/a nnouncement_id.wav>"	No	<p>Fully specified if used. A string in one of two formats depending on configuration:</p> <p>Format1 (Simple name): "sid=<n>", where n represents the announcement name consisting of the announcement number and the optional language prefix.</p> <p>Format2 (Full pathname): "sid=<file://path/filenam e.wav>".</p> <p>Note that for both formats of this parameter, the '<' and '>' are literal characters and must be included.</p> <p>Note: The Parameter is omitted if the asr/asrid signal contains ip.</p> <p>Note: MTAS uses Format2, and creates the filename from CM data (a fixed filename, the language prefix and the announcement number represented as a string of one or more DIGITs).</p>
		dm=<digitmap name>	Yes	<p>Fully specified if used. A string containing the name of the digit map to use in the termination. When this parameter is used, the name must match with the name in a DigitMap descriptor, which is also included in the message. See DigitMap below.</p>

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Add/Modify Request - RTP termination				
Descriptor	Properties Events Signals	Parameters Values	Always used	Comment
		duration=<sig duration>	No	Fully specified if used. Integer specifying the maximum time that the playcol should continue in units of 10ms. Note: The Parameter may be omitted if the asr/asrid signal contains duration.
		Stream=<stream id>	Yes	Fully specified. It is an integer in the range 1..9.
		eik=<end input key(s)>	No	Fully specified if used. This is an octet string specifying one or two keys from the set 0-9, A-D or a-d, *, and # representing DTMF digits.
		rik=<re-input key(s)>	No	Fully specified if used. This is a sequence of one or more characters from the set 0-9, A-D or a-d, *, and # representing DTMF digits.
		pend=<prompt end key(s)>	No	Fully specified if used. This is a sequence of one or more characters from the set 0-9, A-D or a-d, *, and # representing DTMF digits.
		nd="sid=<announcement id>" or nd="sid=<file://mrfppath/announcement_id.wav>"	No	See ip description above.
		mxatt=<number of attempts>	No	The maximum number of attempts the user is given to enter a valid digit pattern. It is an integer.
		ni={true,false}	No	Fully specified if used. This is a boolean.
		it=<number of repetitions>	No	Fully specified if used. Integer specifying the number of iterations. 0 means "repeat forever".

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Add/Modify Request - RTP termination				
Descriptor	Properties Events Signals	Parameters Values	Always used	Comment
		iv=<silence interval>	No	Fully specified if used. Integer specifying the interval of silence between consecutive prompts in units of 10 milliseconds. Its value is configured by the operator through the mtasAnnouncementParamterDelay attribute.
		ipt=<initial prompt time>	No	Fully specified if used. Integer specifying the duration of the initial prompt.
	asr/asrid		No	
		mrt=<sig duration>	Yes	Fully specified if used. Integer specifying the maximum time to detect speech after receiving user input in units of 10 ms.
		wit=<waiting time>	Yes	Fully specified if used. Integer specifying the time to wait to detect user input in units of 10 ms.

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Add/Modify Request - RTP termination

Descriptor	Properties Events Signals	Parameters Values	Always used	Comment
		ip="sid=<announcement id>" or ip="sid=<file://mrfppath/a nnouncement_id.wav>"	No	<p>Fully specified if used. A string in one of two formats depending on configuration:</p> <p>Format1 (Simple name): "sid=<n>", where n represents the announcement name consisting of the announcement number and the optional language prefix.</p> <p>Format2 (Full pathname): "sid=<file://path/filenam e.wav>".</p> <p>Note that for both formats of this parameter, the '<' and '>' are literal characters and must be included.</p> <p>Note: MTAS uses Format2, and creates the filename from CM data (a fixed filename, the langauge prefix and the announcement number represented as a string of one or more DIGITs).</p> <p>Note: The Parameter is omitted if the aasdc/playcol signal contains ip.</p>

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Add/Modify Request - RTP termination				
Descriptor	Properties Events Signals	Parameters Values	Always used	Comment
		rgid="sid=<grammar file id>" or rgid="sid=<full path>"	Yes	Fully specified if used. A string specifying the ASR grammar identifier. It refers to a grammar file which is configured to return one positive and one negative response Format1 (Simple name): "sid=<n>", where n represents the grammar number and is one or more DIGITS. Format2 (Full pathname): For example: • "sid=<file://path/ filename.ext>". • "sid=<http://path/ filename.grxml>" Note the '<' and '>' are literal characters and must be included. Note: MTAS uses Format2, and creates a filename from CM data (a fixed filename and the grammar number represented as a string of one or more DIGITS).
		rgsf=<script format>	Yes	Fully specified if used. Indicates the grammar script format. Note: MTAS only supports XML.
		rgst=<script format>	Yes	Fully specified if used. Indicates the grammar script type. Note: MTAS only supports SRGS.
		Stream=<stream id>	Yes	Fully specified. It is an integer in the range 1..9.
	aasb/play		No	

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Add/Modify Request - RTP termination				
Descriptor	Properties Events Signals	Parameters Values	Always used	Comment
		an="<segm. vector spec.>"	Yes	Fully specified. It is a string of segment vector specification that is never longer than 1024 bytes, including the leading and trailing double quotes. Its value can be configured by the operator through the mtasAnnouncementParameter Play attribute.
		it=<number of iterations>	No	Fully specified. Integer specifying the number of iterations. 0 means "repeat forever". Its value can be configured by the operator through the mtasAnnouncementParameter Repeat attribute.
		iv=<time between iterations>	No	Fully specified. Integer specifying the interval of silence between consecutive playouts in units of 10 milliseconds. Its value can be configured by the operator through the mtasAnnouncementParameter Delay attribute.
		Stream=<stream id>	Yes	Fully specified. It is an integer in the range 1..9.
		Duration	No	Fully specified. Integer specifying the maximum time that the signal applies in units of 100 milliseconds. Its value can be configured by the operator through the mtasAnnouncementParameter Duration attribute.
		sy=to	No	SignalType is only used and set to Timeout when Duration parameter is present.
		NotifyCompletion={TO, OR}	Yes	TO=Timeout, OR=Other Reason.
	conftn/enter		No	

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Add/Modify Request - RTP termination				
Descriptor	Properties Events Signals	Parameters Values	Always used	Comment
		btd=<ext int both>	Yes	Specifies the conference enter-tone's direction: external, internal or both. Directions are to be interpreted with respect to the centre of the context representing the conference.
		st=<stream id>	Yes	Fully specified. It is an integer in the range 1..9.
		nc={TO, OR}	Yes	NotifyCompletion: TO=Timeout, OR=Other Reason.
	conftn/exit		No	
		btd=<ext int both>	Yes	Specifies the conference exit-tone's direction: external, internal or both. Directions are to be interpreted with respect to the centre of the context representing the conference.
		st=<stream id>	Yes	Fully specified. It is an integer in the range 1..9.
		nc={TO, OR}	Yes	NotifyCompletion: TO=Timeout, OR=Other Reason.
	cg/rt		No	
		NotifyCompletion={TO, OR}	Yes	TO=Timeout, OR=Other Reason.
	cg/sit		No	
		NotifyCompletion={TO, OR}	Yes	TO=Timeout, OR=Other Reason.
Events			Yes	
	RequestId		Yes	
	g/cause		Yes	
	g/sc		No	May be used only when Signals descriptor is used.
	aasdc/pcolsucc		No	May be used only when corresponding Signal is used.
	aasdc/audfail		No	May be used only when corresponding Signal is used.

Prepared (also subject responsible if other)		No.		
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Add/Modify Request - RTP termination				
Descriptor	Properties Events Signals	Parameters Values	Always used	Comment
		ka	No	KeepActive flag used only when aasdc/audfail and asr/asrfail events present in request simultaneously.
	asr/asrsucc		No	May be used only when the corresponding Signal is used.
	asr/asrfail		No	May be used only when the corresponding Signal is used.
		ka	No	KeepActive flag used only when aasdc/audfail and asr/asrfail events present in request simultaneously.
	hangterm/thb		No	Only used when the timeout value for the timerx parameter is configured to a non-zero value.
		timerx=<timeout>	No	Always used for the hangterm/thb event. Valid timeout values are in the 180-7200 range, unit is seconds.
DigitMap				
	<digitmap name> e.g. InvokeCCBS	"<Invocation code>"	No	May be used only when aasdc/playcol Signal is used.
Topology		(*, *, Isolate, <stream id>)	No	May be used only when there are 2 terminations in the context. StreamId is fully specified.

4.6.1.2 Reply

Add/Modify Reply - RTP termination				
Descriptor	Properties Events Signals	Parameters Values	Always expected	Comment
	ContextID	<context id>	Yes	Fully specified.
	Termination ID	rtp/<group>/<name>	Yes	Fully specified.

Prepared (also subject responsible if other)		No.		
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Add/Modify Reply - RTP termination				
Descriptor	Properties Events Signals	Parameters Values	Always expected	Comment
Media			No	NOTE 1
Stream			No	
	StreamID	<stream id>	No	Fully specified. It is an integer in the range 1..9.
Local			No	Expected if it was underspecified or overspecified in the request.
	v	0	Yes	
	c	IN IP4 <address> IN IP6 <address>	Yes	Fully specified.
	m	<media> <port> RTP/AVP <codecs> <media> <port> TCP/BFCP * <media> <port> TCP/TLS/BFCP *	Yes	Fully specified.
	b=AS		No	If present, expected to be fully specified.
	a=rtpmap		No	
	a=fmtp		No	
	a=ptime		No	
Remote			No	Expected if it was overspecified in the request.
	v	0	Yes	
	c	IN IP4 <address> IN IP6 <address>	Yes	Fully specified.
	m	<media> <port> RTP/AVP <codecs> <media> <port> TCP/BFCP * <media> <port> TCP/TLS/BFCP *	Yes	Fully specified.
	b=AS		No	If present, expected to be fully specified.
	a=rtpmap		No	
	a=fmtp		No	
	a=ptime		No	
Error			No	NOTE 1
	ErrorCode		Yes	

NOTE 1: In Add reply either Media or Error descriptor is expected. In Modify reply Media descriptor may be missing if it was fully specified in the Modify request.

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4.6.2 AuditValue

4.6.2.1 Request

AuditValue Request				
Descriptor	Properties	Value	Always used	Comment
	ContextID	*	Yes	
	TerminationID	ROOT or group	Yes	
	Priority	9	Yes	
Audit		{ }	Yes	Empty.

4.6.2.2 Reply

AuditValue Reply				
Descriptor	Properties	Value	Always expected	Comment
	ContextID	<context id>	Yes	Multiple actions with all context IDs.

4.6.3 Modify ROOT

4.6.3.1 Request

Modify Request - ROOT termination				
Descriptor	Properties	Value	Always used	Comment
	ContextID	-	Yes	NULL context.
	TerminationID	ROOT	Yes	
	Priority	4	Yes	
Media			Yes	
TerminationState			Yes	
	root/normalMGCExecutionTime	3000 ms	Yes	Configurable by the CM, see [4].
	root/normalMGCExecutionTime	500 ms	Yes	
	root/MGProvisionalResponseTimerValue	3500 ms	Yes	
	root/MGCPProvisionalResponseTimerValue	1000 ms	Yes	

Prepared (also subject responsible if other)		No.		
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Modify Request - ROOT termination				
Descriptor	Properties	Value	Always used	Comment
	root/MGOriginatedPendingLimit	3	Yes	
	root/MGCOriginatedPendingLimit	3	Yes	
Events			Yes	
	chp/MGCon		Yes	

4.6.3.2 Reply

Modify Reply - ROOT termination				
Descriptor	Properties	Default Values	Always expected	Comment
	ContextID	-	Yes	NULL context.
	TerminationID	ROOT	Yes	
Error			No	

4.6.4 Notify on RTP Termination

4.6.4.1 Request

Notify Request				
Descriptor	Properties Events	Properties	Always expected	Comment
	ContextID	<context id>	Yes	Fully specified, not NULL context.
	Termination ID	<termination id>	Yes	Fully specified.
ObservedEvents			Yes	
	RequestId		Yes	
	g/sc		No	NOTE 1
		<yyyymmdd>T<hhmmssss>	No	Timestamp.
		Stream=<stream id>	No	Integer in the range 1..9 If not present, then Stream id is assumed to be 1.

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Notify Request				
Descriptor	Properties Events	Properties	Always expected	Comment
		SigID=an/apf or SigID=aasb/play or SigID=confn/enter or SigID=confn/exit or SigID=cg/sit or SigID=cg/rt	Yes	
		Meth=<method>	Yes	Method may be TO (Timeout) or NC (Not completed).
	g/cause		No	NOTE 1
		GeneralCause	No	Ignored. The behaviour of MTAS doesn't depend on these parameters.
		FailureCause	No	
	aasdc/pcolsucc		No	Expected when the user enters a code that matches the digit map.
		dc=<collected digits>	Yes	Collected DTMF digits as String. Format: string of characters in the range [0..9*#].
		na=<number of attempts>	Yes	The number of attempts that were made to collect a digit pattern.
	aasdc/audfail		No	Expected when the user fails to enter a code that matches the digit map.

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Notify Request				
Descriptor	Properties Events	Properties	Always expected	Comment
		rc=<code>	Yes	Return code. Integer in the range 600 to 699. Note: This includes the return codes defined by the aasdc package (617..620) and the error codes inherited from the aasb package
	asr/asrsucc			Expected when the user speech is recognised
		asrr=<speech>	Yes	String of hex characters returned when speech is recognised. Two possible formats: Format 1: Ascii string returned by grammar file when the speech is recognised. Format 2: Ascii string returned by grammar file when the speech is recognised encoded in H.248 as an byte swapped hexadecimal octet.
		asrrft=<asr_result_format>	Yes	Indicates the Automatic Speech Recognition Result Format Type. Note: MTAS only supports Other (0x0002).
	asr/asrfail			Expected when the user fails to enter any speech or the speech entered is not recognised by the grammar file.
		rc=<code>	Yes	Return code. Integer in the range 600 to 699. Note: This includes the return codes defined by the asr package (625..629) and the general error codes defined in [6]
	aasb/audfail		No	This event may be received instead of aasdc/audfail.

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Notify Request				
Descriptor	Properties Events	Properties	Always expected	Comment
		rc=<code>	Yes	Return code. Integer in the range 600 to 699 Note: This includes the return codes defined by the aasb package (600..616). In some implementations it might also include return codes defined by the packages which extend aasdc.
	hangterm/thb		No	Expected when the hangterm timer in the termination expires.
Error			No	
	ErrorCode		Yes	518 is the only reason for including Error descriptor in Notify.
NOTE 1: Either g/cause or g/sc is expected.				

4.6.4.2 Reply

Notify Reply				
Descriptor	Properties Events	Value	Always used	Comment
Error			No	Sent only if unexpected parameter was received in Notify.
	ErrorCode		Yes	

Prepared (also subject responsible if other)		No.		
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4.6.5 Notify on ROOT Termination

4.6.5.1 Request

Notify Request				
Descriptor	Properties Events	Properties	Always expected	Comment
	ContextID	-	-	
	Termination ID	ROOT	Yes	Fully specified.
ObservedEvents			Yes	
	RequestId		Yes	
	chp/MGCon		No	Handled only by ROOT
		Reduction	Yes	The percentage of the load that the MTAS is requested to block. See [8].

4.6.5.2 Reply

Notify Reply				
Descriptor	Properties Events	Value	Always used	Comment
Error			No	Sent only if unexpected parameter was received in Notify.
	ErrorCode		Yes	

4.6.6 ServiceChange

4.6.6.1 MRFP Request

ServiceChange Request				
Descriptor	Properties Events Signals	Parameters Values	Always expected	Comment
	Termination ID	ROOT	Yes	
ServiceChange			Yes	

Prepared (also subject responsible if other)		No.		
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ServiceChange Request				
Descriptor	Properties Events Signals	Parameters Values	Always expected	Comment
	Method	Forced Restart Disconnected	Yes	The MTAS ignores other methods and reasons of the ServiceChange request.
	Reason	900 (Disconnected) 901 (Cold Boot) 902 (Warm Boot) 905 (Termination taken out of service) 906 (Forced)	Yes	
	Version	2	No	Expected in Restart case.
	Profile	ETSIprof_MediaServer/1	No	

4.6.6.2 MTAS Reply

ServiceChange Reply				
Descriptor	Properties Events Signals	Parameters Values	Always used	Comment
	Termination ID	ROOT	Yes	
	Version	2	No	
Error			No	
	Error		Yes	
		406 Version Not Supported	No	Used if version in the request is below 2.

4.6.6.3 MTAS Request

ServiceChange Request				
Descriptor	Properties Events Signals	Parameters Values	Always expected	Comment
	Termination ID	ROOT	Yes	
ServiceChange			Yes	

Prepared (also subject responsible if other)		No.		
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ServiceChange Request				
Descriptor	Properties Events Signals	Parameters Values	Always expected	Comment
	Method	Restart	Yes	
	Reason	901 (Cold Boot)	Yes	
	Version	2	No	Expected in Restart case.

4.6.6.4 MRFP reply

ServiceChange Reply				
Descriptor	Properties Events Signals	Parameters Values	Always used	Comment
	Termination ID	ROOT	Yes	
	Version	2	No	
Error			No	
	Error		Yes	
		406 Version Not Supported	No	Used if version in the request is below 2.

4.6.7 Subtract

4.6.7.1 Request

Subtract Request				
Descriptor	Properties Events Signals	Parameters Values	Always used	Comment
	ContextID	<context id>	Yes	Fully specified.
	Termination ID	rtp/<group>/<name>	Yes	Fully specified.
	Priority	9	Yes	Except: priority scheme described in 4.2.1.3
Audit		{ }	Yes	Empty.

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4.6.7.2 Reply

Subtract Reply				
Descriptor	Properties Events Signals	Parameters Values	Always expected	Comment
	ContextID	<context id>	Yes	Fully specified.
	Termination ID	rtp/<group>/<name>	Yes	Fully specified.

4.6.8 W-Subtract

4.6.8.1 Request

W-Subtract Request				
Descriptor	Properties Events Signals	Parameters Values	Always used	Comment
	ContextID	* <context id>	Yes	Underspecified or fully specified.
	Termination ID	rtp/<group>/ * *	Yes	Underspecified. Termination ID '*' is used together with a specified contextID when a conference is ended (last participant or moderator has left)
	Priority	9	Yes	Except: priority scheme described in 4.2.1.3
Audit		{ }	Yes	Empty.

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4.6.8.2 Reply

W-Subtract Reply				
Descriptor	Properties Events Signals	Parameters Values	Always expected	Comment
	ContextID	* <context id>	Yes	Wildcarded if ContextID was underspecified in the request.
	Termination ID	rtp/<group>/* *	Yes	Termination ID '*' is expected together with a specified contextID in a reply to a w-subtract request that was sent at the end of a conference (see table in 4.6.8.1)

4.7 Descriptors

4.7.1 Audit

Descriptor	Parameters sent	Comment
Audit	{ }	

4.7.2 Error

Descriptor	Parameters sent	Values sent
Error		
	ErrorCode	
		400 - Syntax error in message
		401 - Protocol Error
		402 - Unauthorized
		403 - Syntax error in transaction request
		406 - Version Not Supported
		410 - Incorrect identifier
		411 - The transaction refers to an unknown ContextId
		421 - Unknown action or illegal combination of actions
		422 - Syntax Error in Action
		435 - Termination ID is not in specified Context
		442 - Syntax Error in Command
		502 - Not ready.
		503 - Service Unavailable

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Descriptor	Parameters sent	Values sent
		505 - Transaction Request Received before a ServiceChange Reply has been received
		506 - Number of Transaction Pendings Exceeded
		510 - Insufficient resources
		533 - Response exceeds maximum transport PDU size

Descriptor	Parameters received	Values expected	Comment
Error			
	ErrorCode		
		518 - Event buffer full	Ignored if received in the Notify command.
		Any other	The behaviour of the MTAS doesn't depend on the value of the ErrorCode.

4.7.3 Events

Descriptor	Parameters sent	Comment
Events		
	RequestId	Integer in the range 0..4294967295
	g/cause	
	g/sc	
	aasdc/pcolsucc	
	aasdc/audfail	
	asr/asrsucc	
	asr/asrfail	
	hangterm/thb	

4.7.4 Local / Remote

Descriptor	Parameters sent and received	Comment
Local Remote	v= c= m= b=AS a=rtpmap a=fmtp a=ptime	

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4.7.5 LocalControl

Descriptor	Parameters sent		Comment
LocalControl			
	Mode		
		Inactive SendOnly ReceiveOnly SendReceive	
	ReservedValue	ON/OFF	
	ReservedGroup	ON/OFF	

4.7.6 Media

Descriptor	Parameters sent and received	Comment
Media		
	Stream descriptor	1 to 10 Stream descriptors

4.7.7 ObservedEvents

Descriptor	Parameters received		Comment
ObservedEvents			
	RequestId		
	g/sc		NOTE 1
		<yyyymmdd>T<hhmmssss>	Timestamp.
		StreamID	Integer in the range 1..9. Optional - if omitted then Stream id is assumed to be 1.
		SigID=an/apf or SigID=aasb/play or SigID=conftn/enter or SigID=conftn/exit or SigID=cg/sit or SigID=cg/rt	

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Descriptor	Parameters received		Comment
		Meth <method>	Method may be TO (Timeout) or NC (Not completed).
	g/cause		NOTE 1
	aasdc/pcolsucc		
		dc	String
		na	Integer
		StreamID	Integer in the range 1..9. Optional - if omitted then Stream id is assumed to be 1.
	aasdc/audfail		
		rc	Integer in the range 600..699
		StreamID	Integer in the range 1..9. Optional - if omitted then Stream id is assumed to be 1.
	aasb/audfail		
		rc	Integer in the range 600..699
		StreamID	Integer in the range 1..9. Optional - if omitted then Stream id is assumed to be 1.
	asr/asrsucc		
		asrr	Octet string.
		asrrft	Enumeration: Other(0x0002)
		StreamID	Integer in the range 1..9. Optional - if omitted then Stream id is assumed to be 1.
	asr/asrfail		
		rc	Integer in the range 600..699
		StreamID	Integer in the range 1..9. Optional - if omitted then Stream id is assumed to be 1.
	hangterm/thb		
NOTE 1: Either g/cause or g/sc is expected.			

4.7.8 ServiceChange

Descriptor	Parameters received	Comment
Services		
	Method	Restart Forced Disconnected
	Reason	900 (Disconnected) 901 (Cold Boot) 902 (Warm Boot) 905 (Termination taken out of service) 906 (Forced)
	Version	
	Profile	

Prepared (also subject responsible if other)		No.	
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		Reference	

Descriptor	Parameters sent	Comment
Services		
	Version	

4.7.9 Signals

Descriptor	Parameters sent		Comment
Signals			
	an/apf		
		an	Announcement name as String Format: an=<name of the announcement>
		noc	Number of cycles of repetition. 0 means continous repetition.
		StreamID	Integer in the range 1..9
		NotifyCompletion	TO or OR (TO=Timeout, OR=Other Reason)
	aasb/play		
		an	Segment vector specification as String
		it	Integer in the range 0..65535. 0 means "repeat forever".
		iv	Integer in the range 0..65535.
		Duration	Integer in the range 0..65535. If specified, the signal type is set to TimeOut(TO).
		StreamID	Integer in the range 1..9
		NotifyCompletion	TO or OR (TO=Timeout, OR=Other Reason)
	aasdc/playcol		
		ip	Initial Prompt Announcement name as a Segment vector specification as String Format: "sid=<n>", where n is one of two formats and includes the ascii representation of the announcement name. See the Modify command description of this parameter for further details.
		dm	DigitMap name as String Format: dm=<name of digitmap>.
		eik	End Input Key specified as an octet string specifying one or two keys from the set 0-9, A-D or a-d, *, and # representing DTMF digits.
		rik	Re-Input Key specified as a string of one or more characters from the set 0-9, A-D or a-d, *, and # representing DTMF digits.
		pend	Prompt End Key specified as a string of one or more characters from the set 0-9, A-D or a-d, *, and # representing DTMF.
		nd	No Digits prompt. See ip description above.
		mxatt	The maximum number of attempts the user is given to enter a valid digit pattern. It is an integer.

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Descriptor	Parameters sent		Comment
		ni	Non-Interruptable Play specified as a boolean.
		it	Iteration specified as an integer in the range 0..65535. 0 means "repeat forever".
		iv	Interval specified as an integer in the range 0..65535.
		ipt	Initial Prompt Time specified as an integer in the range 0..65535.
		Duration	Integer in the range 0..65535. If specified, the signal type is set to TimeOut(TO).
		StreamID	Integer in the range 1..9
	asr/asrid		
		mrt	Integer in the range 1..65535.
		wit	Integer in the range 1..65535.
		ip	Initial Prompt Announcement as String. See the Modify command description of this parameter for further details.
		rgid	Recognition grammar Identifier as String. See the Modify command description of this parameter for further details.
		rgsf	Enumeration: XML (0x0002)
		rgst	Enumeration: SRGS(0x0001)
		StreamID	Integer in the range 1..9
	confn/enter		
		btd	Enumeration: ext int both Direction of the conference enter-tone: external or internal or both.
		st	Integer in the range 1..9
		nc	NotifyCompletion: TO or OR (TO=Timeout, OR=Other Reason)
	confn/exit		
		btd	Enumeration: ext int both Direction of the conference exit-tone: external or internal or both.
		st	Integer in the range 1..9
		nc	NotifyCompletion: TO or OR (TO=Timeout, OR=Other Reason)
	cg/rt		
		NotifyCompletion	TO or OR (TO=Timeout, OR=Other Reason)
	cg/sit		
		NotifyCompletion	TO or OR (TO=Timeout, OR=Other Reason)

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4.7.10 Stream

Descriptor	Parameters sent	Comment
Stream		
	StreamId	Integer in the range 1..9
	LocalControl descriptor	
	Local descriptor	
	Remote descriptor	

Descriptor	Parameters received	Comment
Stream		
	StreamId	Integer in the range 1..9
	Local descriptor	
	Remote descriptor	

4.7.11 DigitMap

There is current a limitation on the maximum size of the DigitMap. It can consist of 10 patterns/strings where each pattern/string can be at most 20 characters long.

Below there is a DigitMap with two pattern/strings where the first one is three characters long and the second one is four characters long.

DigitMap example: xxx | xxxx

Descriptor	Parameters sent	Comment
DigitMap		
	<digit map name> {<digit map spec>}	MTAS uses dynamically defined digit maps. The timers used by MTAS are the T and L timers.

4.7.12 TerminationState

Descriptor	Parameters sent	Comment
Termination State		
	root/normalMGExecutionTime	
	root/normalMGCEExecutionTime	
	root/MGProvisionalResponseTimerValue	
	root/MGCEProvisionalResponseTimerValue	
	root/MGOriginatedPendingLimit	
	root/MGCEOriginatedPendingLimit	

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4.7.13 Topology

Descriptor	Parameters sent	Comment
Topology		
	TerminationId	ALL wildcard
	TerminationId	ALL wildcard
	Isolate	
	StreamId	Integer in the range 1..9

4.8 Packages

This chapter specifies the packages used by the MTAS.

4.8.1 Base Root

The MTAS uses the Base Root package only in the Modify command on ROOT termination.

This package is specified in H.248.1.

Package	Properties
root	
	normalMGExecutionTime
	normalMGCEExecutionTime
	MGProvisionalResponseTimerValue
	MGCProvisionalResponseTimerValue
	MGOrientedPendingLimit
	MGCOriginatedPendingLimit

4.8.2 Generic

This package is specified in H.248.1.

Package	Events	Parameters	Comment
g			
	cause		Cause
	sc		Signal Completion
		SigID	Signal Identity
		Meth	Termination Method

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4.8.3 Call Progress Tones Generator Package

This package is specified in H.248.1.

Package	Signals	Parameters	Comment
cg			
	sit		Special Information Tone
	rt		Ringing Tone

The MTAS expects all the other parameters to be provisioned in the MRFP.

4.8.4 Generic Announcement

This package is specified in H.248.7.

Package	Signals	Parameters	Comment
an			
	apf		Fixed: Announcement Play
		an	Announcement name. It is a string.
		noc	Number of cycles of repetition. 0 means continous repetition.

The MTAS expects all the other parameters to be provisioned in the MRFP.

4.8.5 Basic announcement syntax package

This package is defined in H.248.9.

The package defines syntax only.

4.8.6 Voice variable syntax package

This package is defined in H.248.9.

The package defines syntax only.

4.8.7 Set extension to basic syntax

This package is defined in H.248.9.

The package defines syntax only.

4.8.8 Advanced audio server base package

This package is defined in H.248.9.

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Package	Signals	Parameters	Comment
aasb			
	play		Plays one or more audio segments.
		an	Announcement segment vector specification. It is a string.
		it	The maximum number of times an announcement is to be played. It is an integer.
		iv	The interval of silence to be inserted between iterative plays. Specified in units of 10 milliseconds. It is an integer.

The MTAS expects all the other parameters to be provisioned in the MRFP.

4.8.9 AAS Digit Collection

This package is specified in H.248.9. See [6].

Package	Signals	Parameters	Comment
aasdc			
	playcol		Play Collect
		ip	Initial Prompt Announcement segment vector specification. It is a string.
		dm	DigitMap name
		eik	End Input Key. This parameter indicates the digit used to signal the end of input.
		rik	Re-Input Key. This parameter indicates the digit(s) used to resume digit collection.
		pend	Prompt End Key. This parameter indicates the digit(s) used to go directly to the end of the prompt.
		nd	No digits Prompt. This prompt is played after the user has failed to enter any digits following a prompt.
		mxatt	The maximum number of attempts the user is given to enter a valid digit pattern. It is an integer.
		ni	Non Interruptible Play. This parameter specifies if barge-in is allowed or not.
		it	The maximum number of times an announcement is to be played. It is an integer.

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Package	Signals	Parameters	Comment
		iv	The interval of silence to be inserted between iterative plays. Specified in units of 10 milliseconds. It is an integer.
		ipt	INAP Prompt Timer. This parameter specifies the duration of the initial prompt.

Package	Events	Parameters	Comment
aasdc			
	pcolsucc		Play Collect Success
		dc	Digits Collected.
		na	Number of Attempts.
	audfail		Audio operation failure
		rc	Return Code

The MTAS expects all the other parameters to be provisioned in the MRFP.

4.8.10 ASR Speech Recognition

This package is specified in H.248.9. Amendment 1 See [7].

Package	Signals	Parameters	Comment
asr			
	asrid		Automatic Speech Recognition
		mrt	Maximum Recognition Time
		wit	Waiting Time for Input
		ip	Initial Prompt Announcement.
		rgid	Recognition Grammar Identifier
		rgsf	Recognition Grammar Script Format
		rgst	Recognition Grammar Script Type

Package	Events	Parameters	Comment
asr			
	asrsucc		Automatic Speech Recognition Success
		asrr	Automatic Speech Recognition Result
		asrrft	Automatic Speech Recognition Result Format Type
	asrfail		Automatic Speech Recognition failure
		rc	Return Code

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The MTAS expects all the other parameters to be provisioned in the MRFP.

4.8.11 Conference tone

This package is defined in H.248.27.

Package	Signals	Parameters	Comment
confn			Conference tone package
	enter		Conference enter-tone
		btd	Direction of tone
	exit		Conference exit-tone
		btd	Direction of tone

The MTAS expects all the other parameters to be provisioned in the MRFP.

4.8.12 Hanging Termination Detection package

This package is defined in H.248.36.

Package	Events	Parameters	Comment
hangterm			Hanging Termination Detection package
	thb		Termination Heartbeat
		timerx	Timeout value for messaging inactivity on the termination

5 Segment vector specification in the aasb/play signal

When MTAS invokes a segmented (multimedia) announcement, the segment vector specification inside the aasb/play signal or the aasdc/playcol, which is requested on the audio stream, is constructed based on the following constraints.

5.1 Basic announcement syntax

Provisioned and standalone variable segments are used. Provisioned segments with embedded variables are never requested.

Provisioned segments are always defined by using the http: URI scheme. See chapter 5.3 for further details.

5.2 Voice variable syntax

Embedded variables are not used. Among the stand-alone voice variable types, 'Date', 'Digits', 'Int', 'Money' and 'Tod' are used.

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5.3 Set extension to basic syntax

Only the language selector is used ('tatb' is not used). The provisioned- and stand-alone voice variable segments may be scoped to a wanted language by using the language selector.

For a provisioned segment, using the language selector is allowed only in that case if the provisioned segment is specified in http URL format. The selector can be provided in the query part.

```
sid=<http://localhost/new_number_is.wav?sel=lang=xy>
```

Therefore, for simplicity and for consistent MTAS behavior, provisioned segments are always defined by using the http: URI scheme, no matter if the language selector is used or not.

The base URL is configurable, but accepted in http: URI scheme only. The default base URL is: http://localhost/\$.wav.

6 H.248 SDP Support

This chapter specifies the SDP lines used and expected by the MTAS in the Local and Remote descriptors.

Line	MTAS uses	MTAS expects	Comment
v=	0	0	Mandatory
c=	IN IP4 <address> IN IP4 \$ IN IP6 <address> IN IP6 \$	IN IP4 <address> IN IP6 <address>	Mandatory
m=	<media> \$ RTP/AVP \$ <media> \$ RTP/AVP <codecs> <media> <port> RTP/AVP <codecs> <media> \$ TCP/BFCP \$ <media> \$ TCP/TLS/BFCP \$ <media> \$ TCP/BFCP * <media> \$ TCP/TLS/BFCP * <media> <port> TCP/BFCP * <media> <port> TCP/TLS/BFCP *	<media> <port> RTP/AVP <codecs> <media> <port> TCP/BFCP * <media> <port> TCP/TLS/BFCP *	Mandatory
b=	AS:<bandwidth>	AS:<bandwidth>	Optional
a=	rtpmap: fmt: ptime:	rtpmap: fmt: ptime:	Optional MTAS expects consistent attributes specifying codecs from m= line.

The MTAS ignores all unexpected lines.

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The c= line may be specified either on the session level or on the media level. Because of that, the MTAS may send and accepts SDP lines in 2 different orders. Different a= lines may be sent and are accepted in any order.

No.	Order of lines used and expected by MTAS.	
1	v=	v=
2	c=	m=
3	m=	c=
4	b=	b=
5	a=	a=

The MRFP may not change the payload types and/or a= lines regarding payload types.

7 H.248 Security

The MTAS does not support any H.248 application level security mechanisms.

The MTAS has configured a white-list of MIDs (see [4]). If the MRFP uses other MID than configured, the SCTP link to it will be closed down.

8 Use Cases

The following chapters show the examples of the use cases, not covering all the functions supported and used by the MTAS.

8.1 Session-Related Use Cases

The Termination Heartbeat (hangterm/thb) event is specified in each Add and Modify request sent by MTAS when MTAS is configured to use the hangterm package.

8.1.1 Add Single Termination for Dial-out

In this use case the MTAS adds a single termination to the existing context, for example to invite a conference participant using dial-out. In reply the MRFP lists all the supported codecs. They will be used to create the SDP offer for the new conference participant. The hangterm package is used in this example.

Request MTAS -> MRFP

```
Context=1234{
  Priority=6,
  Add=rtp/38/${
    Media{
      Stream=1{
```

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```
LocalControl{mode=inactive, ReservedValue=ON},
Local{
    v=0
    c=IN IP4 $
    m=audio $ RTP/AVP $
}
},
Stream=2{
    LocalControl{mode=inactive, ReservedValue=ON}
    Local{
        v=0
        c=IN IP4 $
        m=video $ RTP/AVP $
    }
}
},
Events=1{G/CAUSE, hangterm/thb {timerx=3600}}
}
}
```

Reply MRFP -> MTAS

```
Context=1234{
    Add=rtp/38/1
    Media{
        Stream=1{
            Local{
                v=0
                c=IN IP4 55.44.33.88
                m=audio 3100 RTP/AVP 0 8 9 4 15 18 3
                b=AS:64
                a=rtpmap:0 PCMU/8000
                a=rtpmap:8 PCMA/8000
                a=rtpmap:9 G722/8000
                a=rtpmap:4 G723/8000
                a=rtpmap:15 G728/8000
                a=rtpmap:18 G729/8000
                a=rtpmap:3 GSM/8000
            }
        },
        Stream=2{
            Local{
                v=0
                c=IN IP4 55.44.33.88
                m=video 3110 RTP/AVP 31 34
                b=AS:128
                a=rtpmap:31 H261/90000
                a=rtpmap:34 H263/90000
            }
        }
    }
}
}
```

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8.1.2 Modify Single Termination for Dial-out - Set Remote Descriptors

In this use case the MTAS sets the Remote descriptors in the termination based on the response from the invited conference participant. The hangterm package is used in this example.

Request MTAS -> MRFP

```
Context = 1234{
  Priority = 9,
  Modify = rtp/38/1{
    Media{
      Stream = 1 {
        LocalControl{mode=sendreceive, ReservedValue=ON},
        Remote{
          v=0
          c=IN IP4 111.22.33.44
          m=audio 1100 RTP/AVP 0
          b=AS:128
          a=rtpmap:0 PCMU/8000
        }
      },
      Stream = 2 {
        LocalControl{mode=sendreceive, ReservedValue=ON},
        Remote {
          v=0
          c=IN IP4 111.22.33.44
          m=video 1110 RTP/AVP 34
          b=AS:128
          a=rtpmap:34 H263/90000
        }
      }
    },
    Events=1{G/CAUSE, hangterm/thb {timerx=3600}}
  }
}
```

Reply MRFP -> MTAS

```
Context=1234{
  Modify=rtp/38/1
}
```

8.1.3 Modify Audio Codec in Single Termination

In this use case the MTAS modifies the audio codec in the termination, for example because of UPDATE received from a conference participant.

Request MTAS -> MRFP

```
Context = 1234 {
  Priority = 9,
  Modify = rtp/38/1 {
    Media {
      Stream = 1 {
        Local {
          v=0
```

```
m=audio $ RTP/AVP 97 98
c=IN IP4 $
a=rtpmap:97 G726-16/8000/1
a=rtpmap:98 G726-24/8000/1
}

Remote {
    v=0
    m=audio 10002 RTP/AVP 97 98
    c=IN IP4 alice.example.com
    a=rtpmap:97 G726-16/8000/1
    a=rtpmap:98 G726-24/8000/1
}
```

```
Context = 1234 {
    Modify = rtp/38/1 {
        Media {
            Stream = 1 {
                Local {
                    v=0
                    m=audio 40002 RTP/AVP 97
                    c=IN IP4 mrfp.ericsson.se
                    a=rtpmap:97 G726-16/8000/1
                }
                Remote {
                    v=0
                    m=audio 10002 RTP/AVP 97
                    c=IN IP4 alice.example.com
                    a=rtpmap:97 G726-16/8000/1
                }
            }
        }
    }
}
```

In this use case the MTAS plays the audio and video announcement using the existing termination.

```
Context = 1234 {
    Priority = 9,
    Modify = rtp/38/1 {
        Events = 888 {
            g/cause,
            g/sc
        }
        Signals {
            an/apf {
```

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```
        an 178,  
        Stream=1,  
        NotifyCompletion={TimeOut,OtherReason}  
    }  
    an/apf {  
        an 179,  
        Stream=2,  
        NotifyCompletion={TimeOut,OtherReason}  
    }  
}  
}
```

Reply MRFP -> MTAS

```
Context = 1234 {  
    Modify = rtp/38/1  
}
```

8.1.5

Play Segmented Announcement to the Termination

In this use case the MTAS plays the segmented audio announcement using the existing termination; exactly one iteration.

Here, the aasb/audfail event could, but not ordered. The segmented announcement is not combined with DTMF digit collection or speech recognition. Hence, the aasb/audfail event wouldn't add any value for the MTAS operation.

The aasb/audfail event could report why the Modify request is possibly rejected (the event would be provided by the MRFP right after the Modify is rejected, e.g. "Variable type not supported").

Such reason text could be inserted into the Error text of the Modify reply, hence the operator and/or system integrator could act on the possible deployment/interworking issue based on that text, unless the issue is reported by the MRFP to the OAM system by another means, e.g. in the form of an SNMP event, etc.

Request MTAS -> MRFP

```
Context = 1234 {  
    Priority = 9,  
    Modify = rtp/38/1 {  
        Events = 888 {  
            g/cause,  
            g/sc  
        }  
        Signals {  
            aasb/play {  
                an="sid=<http://localhost/NewNumIs.wav>,  
                var=<t=digits,v=3811973>,  
                sid=<http://localhost/AreaCodeIs.wav>,  
                var=<t=digits,v=0211>",  
                Stream=1,  
            }  
        }  
    }  
}
```

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```
        NotifyCompletion={TimeOut,OtherReason}
    }
}
}
```

Reply MRFP -> MTAS

```
Context = 1234 {
    Modify = rtp/38/1
}
```

8.1.6 Play Segmented Multimedia Announcement to the Termination

In this use case the MTAS plays the segmented multimedia announcement using the existing termination; exactly one iteration on the audio stream.

The goal is: play the video for the whole duration of the audio. Therefore, the video is requested being played endless. The video will be stopped when the termination is subtracted.

Request MTAS -> MRFP

```
Context = 1234 {
    Priority = 9,
    Modify = rtp/38/1 {
        Events = 888 {
            g/cause,
            g/sc
        }
        Signals {
            aasb/play {
                an="sid=<http://localhost/NewNumIs.wav>,
                var=<t=digits,v=3811973>,
                sid=<http://localhost/AreaCodeIs.wav>,
                var=<t=digits,v=0211>",
                Stream=1,
                NotifyCompletion={TimeOut,OtherReason}
            }
            an/apf {
                an=179,
                Stream=2,
                NotifyCompletion={TimeOut,OtherReason}
            }
        }
    }
}
```

Reply MRFP -> MTAS

```
Context = 1234 {
    Modify = rtp/38/1
}
```

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8.1.7 Play Announcement to the Termination – language prefix

In this use case the MTAS plays a language dependent audio using the existing termination.

Request MTAS -> MRFP

```
Context = 1234 {
    Priority = 9,
    Modify = rtp/38/1 {
        Events = 888 {
            g/cause,
            g/sc
        }
        Signals {
            an/apf {
                an=en-GB_178,
                Stream=1,
                NumberOfCycles=0,
                NotifyCompletion={TimeOut,OtherReason}
            }
        }
    }
}
```

Reply MRFP -> MTAS

```
Context = 1234 {
    Modify = rtp/38/1
```

8.1.8 Play Segmented Announcement to the Termination – language selector

In this use case the MTAS plays language dependent segmented audio announcement using the existing termination.

Request MTAS -> MRFP

```
Context = 1234 {
    Priority = 9,
    Modify = rtp/38/1 {
        Events = 888 {
            g/cause,
            g/sc
        }
        Signals {
            aasb/play {
                an="sid=<http://localhost/NewNumIs.wav?sel=lang=en-GB>,
                var=<t=digits,v=3811973&sel=lang=en-GB>,
                sid=<http://localhost/AreaCodeIs.wav?sel=lang=en-
GB>,
                var=<t=digits,v=0211&sel=lang=en-GB>",
                Stream=1,
                NotifyCompletion={TimeOut,OtherReason}
```

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```
}  
}  
}  
}
```

Reply MRFP -> MTAS

```
Context = 1234 {  
    Modify = rtp/38/1  
}
```

8.1.9 Play Announcement to the Termination – detailed parameter control

In this use case the MTAS plays an audio announcement using the existing termination. The duration of the announcement, the number of iterations and the time between iterations are controlled by MTAS.

Request MTAS -> MRFP

```
Context = 1234 {  
    Priority = 9,  
    Modify = rtp/38/1 {  
        Events = 888 {  
            g/cause,  
            g/sc  
        }  
        Signals {  
            aasb/play {  
                an=sid=<http://localhost/annc.wav>,  
it=5,  
iv=5,  
                Stream=1,  
                sy=to,  
                Duration=1500,  
NotifyCompletion={TimeOut,OtherReason}  
            }  
        }  
    }  
}
```

Reply MRFP -> MTAS

```
Context = 1234 {  
    Modify = rtp/38/1  
}
```

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8.1.10 Play Announcement to the Termination and Collect DTMF Digits – Single Stream

In this use case the MTAS plays an audio using the existing termination and collects DTMF digits simultaneously.

Request MTAS -> MRFP

```
Context = 1234 {  
    Priority = 9,  
    Modify = rtp/38/1 {  
        Events = 888 {  
            aasdc/pcolsucc,  
            aasdc/audfail,  
            g/cause  
        }  
        Signals {  
            aasdc/playcol {  
                ip="sid=<file://ect/opt/annoucements/an_178.wav>",  
                dm=InvokeCCBS,  
                Stream=1,  
                duration=200  
            }  
        }  
        Digitmap = InvokeCCBS { E37F }  
    }  
}
```

Reply MRFP -> MTAS

```
Context = 1234 {  
    Modify = rtp/38/1  
}
```

8.1.11 Play Announcement to the Termination and Collect DTMF Digits – Single Stream with detailed control

In this use case the MTAS plays an audio using the existing termination and collects DTMF digits simultaneously. The digits to collect are specified by the DigitMap. MTAS support minimum and maximum number of digits from 1-16. It means there can be maximum 16 digitStrings in DigitMap, and the maximum length of a string is 32(TxSx...Sx). In this example the DigitMap specifies a match of a string with length of three characters or four characters, where any number between 0-9 is accepted hence x is coded in the DigitMap. Since eik parameter is present the long timer, L, is not present in the DigitMap. The value of start timer, T, and long timer, L, is not always set, some use cases will use the default value configured on the MRFP. MTAS applies the signal with several parameters to get detailed control over the signal behavior. Note also the usage of timers in the digit map definition. In case of no eik parameter the DigitMap would have taken the following structure: Digitmap = pcDigitMap {T:3, L:4, TxSxSx | TxSxSxSx }

The value for ND parameter will either be same as for IP or read from the CM parameter mtasNccCapPcAnnHelpUri.

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Request MTAS -> MRFP

```
Context = 1234 {
    Priority = 9,
    Modify = rtp/38/1 {
        Events = 888 {
            aasdc/pcolsucc,
            aasdc/audfail,
            g/cause
        }
        Signals {
            aasdc/playcol {
                ip="sid=<178>",
                eik=#,
                rik=99,
                pend=00,
                nd="sid=<178>",
                mxatt=2,
                ni="true",
                it=5,
                iv=5,
                ipt=200,
                dm=pcDigitMap,
                Duration=1000,
                Stream=1
            }
        }
        Digitmap = pcDigitMap {T:3,Txxx | Txxxxx }
    }
}
```

Reply MRFP -> MTAS

```
Context = 1234 {
    Modify = rtp/38/1
}
```

8.1.12 Play Announcement to the Termination and Collect DTMF Digits – language prefix

In this use case the MTAS plays a language dependent audio using the existing termination and collects DTMF digits simultaneously.

Request MTAS -> MRFP

```
Context = 1234 {
    Priority = 9,
    Modify = rtp/38/1 {
        Events = 888 {
            g/cause,
            g/sc,
            aasb/audfail
        }
    }
}
```

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```

    }
    Signals {
        aasdc/playcol {
            ip="sid=<http://localhost/en-GB_an_178.wav>",
            dm=InvokeCCBS,
            Stream=1,
            duration=200
        }
    }
    Digitmap = InvokeCCBS { E37F }
}

```

Reply MRFP -> MTAS

```

Context = 1234 {
    Modify = rtp/38/1
}

```

8.1.13 Play Announcement to the Termination and Collect Speech and DTMF – Single Stream

In this use case the MTAS plays an audio announcement using the existing termination and collects speech and DTMF digits simultaneously.

Request MTAS -> MRFP

```

Context = 1234 {
    Priority = 9,
    Modify = rtp/38/1 {
        Events = 888 {
            asr/asrsucc,
            asr/asrfail{ka},
            aasdc/pcolsucc,
            aasdc/audfail{ka},
            g/cause
        }
    }
    Signals {
        asr/asrid {
            mrt=2000,wit=2000,
            rgid="sid=<http://grammarfilepath/grammar.grxml>",
            rgst=XML,
            rgst=SRGS,
            stream=1
        }
        aasdc/playcol {
            ip="sid=<file://announcementspath/an_yy.wav>",
            dm=InvokeCCBS,
            Stream=1,
            duration=20000
        }
    }
    Digitmap = InvokeCCBS { E37F }
}

```

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}

Notes

1. ip could be added to either the asr/asrid or aasdc/playcol signals. The aasdc/playcol signal was chosen because it allows the user to enter speech before the announcement ends.
2. All the timers (mrt, wit, duration) are the same length. This ensures that the user has the same length of time to enter digits when only digits are collected and when speech and digits are collected.

Reply MRFP -> MTAS

```
Context = 1234 {  
    Modify = rtp/38/1  
}
```

8.1.14 Play Announcement to the Termination and Collect DTMF Digits – Dual Stream

In this use case the MTAS plays the audio and video announcement using the existing termination and collects DTMF digits simultaneously.

Request MTAS -> MRFP

```
Context = 1234 {  
    Priority = 9,  
    Modify = rtp/38/1 {  
        Events = 888 {  
            aasdc/pcolsucc,  
            aasdc/audfail  
        }  
        Signals {  
            aasdc/playcol {  
                ip="sid=<file://ect/opt/annoucements/an_178.wav>",  
                dm=InvokeCCBS,  
                Stream=1,  
                duration=200  
            }  
            aasdc/playcol {  
                ip="sid=<file://ect/opt/annoucements/an_179.wav>",  
                dm=InvokeCCBS,  
                Stream=2,  
                duration=200  
            }  
        }  
        Digitmap = InvokeCCBS { E37F }  
    }  
}
```

Reply MRFP -> MTAS

```
Context = 1234 {
```

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```
        Modify = rtp/38/1  
    }
```

8.1.15 Play Tone to the Termination

In this use case the MTAS plays the Special Information Tone using the existing termination.

Request MTAS -> MRFP

```
Context = 1234 {  
    Priority = 9,  
    Modify = rtp/38/1 {  
        Events = 888 {  
            g/cause,  
            g/sc  
        }  
        Signals {  
            cg/sit {  
                NotifyCompletion={TimeOut,OtherReason}  
            }  
        }  
    }  
}
```

Reply MRFP -> MTAS

```
Context = 1234 {  
    Modify = rtp/38/1  
}
```

8.1.16 Add Two Terminations for Channel

In this use case the MTAS adds 2 new terminations to prepare for HOLD between caller and callee. The first termination of the request in this example represents the user who initiated HOLD. The second termination represents the party put on hold to which MTAS will initiate a re-negotiation once having received the local descriptor response from the MRFP.

Request ADD MTAS--->MRFP

```
Context=${Topology {*,*,isolate,Stream=1},  
    Priority=6,  
    Add=rtp/1/${  
        Media{  
            Stream=1{  
                LocalControl{Mode=receiveonly, ReservedValue=ON }  
                Local{  
                    v=0  
                    c=IN IP4 $  
                    m=audio $ RTP/AVP 0 3 5  
                    b=AS:64  
                    a=rtpmap: 0 PCMU/8000  
                    a=rtpmap: 3 GSM/8000
```

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```
        a=rtpmap: 5 DVI4/8000
        a=ptime:60
    },
    Remote{
        v=0
        c=IN IP4 130.100.90.105
        m=audio 8078 RTP/AVP 0 3 5
        b=AS:64
        a=rtpmap: 0 PCMU/8000
        a=rtpmap: 3 GSM/8000
        a=rtpmap: 5 DVI4/8000
        a=ptime:60
    }
},
Events=1{G/CAUSE}
},
Add=rtp/1/{
    Media{
        Stream=1{
            LocalControl{Mode=sendonly, ReservedValue=ON }
            Local{
                v=0
                c=IN IP4 $
                m=audio $ RTP/AVP 0 3 5
                b=AS:64
                a=rtpmap: 0 PCMU/8000
                a=rtpmap: 3 GSM/8000
                a=rtpmap: 5 DVI4/8000
                a=ptime:60
            }
        }
    }
},
Events=1{G/CAUSE}
}
}
```

Reply MRFP--->MTAS

```
Context=2{
    Add=rtp/1/3{
        Media{
            Stream=1{
                Local{
                    v=0
                    o=user 0 0 IN IP4 127.0.0.1
                    s=-
                    t=0 0
                    m=audio 11313 RTP/AVP 0
                    c=IN IP4 130.100.209.15
                    b=AS:64
                    a=rtpmap:0 PCMU/8000/1
                },
            }
        }
    },
    Add=rtp/1/4{
```

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```

Media{
  Stream=1{
    Local{
      v=0
      o=user 0 0 IN IP4 127.0.0.1
      s=-
      t=0 0
      m=audio 14933 RTP/AVP 0
      c=IN IP4 130.100.209.15
      b=AS:64
      a=rtpmap:0 PCMU/8000/1
    }
  }
}

```

8.1.17 Modify Termination for Channel - Set Remote Descriptors

Request MTAS-->MRFP Modify

```

Context=3{
  modify=rtp/3/4{Media{
    stream=1{
      remote{
        v=0
        c=IN IP4 130.100.126.77
        m=audio 8020 RTP/AVP 0
        b=AS:64
        a=rtpmap:0 PCMU/8000
      }
    }
  }
}

```

Reply MRFP-->MTAS Modify

```

Context=3{
  Modify=rtp/3/4
}

```

8.1.18 Modify Audio Stream in existing Termination containing Audio / Video

In this Ad-Hoc conferencing use case the MTAS has added an audio and a video stream, offered audio and video to a conference participant and received audio only from the participant. MTAS needs to modify the termination to audio only in the existing audio video conference.

Request MTAS-->MRFP Modify

```

Context=1234{
  Modify=rtp/3/4{Media{
    Stream=1{
      LocalControl{Mode=sendrecv,ReservedValue=ON},
    }
  }
}

```

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```

Remote{
    v=0
    c=IN IP4 130.100.126.77
    m=audio 8020 RTP/AVP 0
    b=AS:64
    a=rtpmap:0 PCMU/8000
}
},
Stream=2{
    LocalControl{Mode=Inactive, ReservedGroup=OFF,
ReservedValue=OFF},
    Local{},
    Remote{}
}
}
}

```

Reply MRFP-->MTAS Modify

```

Context=1234{
    Modify=rtp/3/4{Media{
        Stream=1{
            Remote{
                v=0
                c=IN IP4 130.100.126.77
                m=audio 8020 RTP/AVP 0
                b=AS:64
                a=rtpmap:0 PCMU/8000
            }
        },
        Stream=2{
            Local{},
            Remote{}
        }
    }
}
}

```

8.1.19 Isolate Stream in Terminations

In this use cases the MTAS isolates the stream between the terminations.

8.1.19.1 During Add

Request MTAS -> MRFP

```

Context = $ {
    Priority = 6,
    Topology {
        *, *, Isolate, Stream=1
    }
    Add = rtp/38/$ {
        [...]
    }
    Add = rtp/38/$ {
        [...]
    }
}

```

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```
    }  
}
```

Reply MRFP -> MTAS

```
Context = 1234 {  
  Topology {  
    rtp/38/1, rtp/38/2, Isolate, Stream=1  
  }  
  Add = rtp/38/1 {  
    [...]  
  }  
  Add = rtp/38/2 {  
    [...]  
  }  
}
```

8.1.19.2 During Modify

Request MTAS -> MRFP

```
Context = 1234 {  
  Priority = 9,  
  Topology {  
    *, *, Isolate, Stream=1  
  }  
  Modify = rtp/38/2 {  
    [...]  
  }  
}
```

Reply MRFP -> MTAS

```
Context = 1234 {  
  Topology {  
    rtp/38/1, rtp/38/2, Isolate, Stream=1  
  }  
  Modify = rtp/38/2 {  
    [...]  
  }  
}
```

8.1.19.3 Standalone

Request MTAS -> MRFP

```
Context = 1234 {  
  Priority = 9,  
  Topology {  
    *, *, Isolate, Stream=1  
  }  
}
```

Reply MRFP -> MTAS

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```
Context = 1234 {  
    Topology {  
        rtp/38/1, rtp/38/2, Isolate, Stream=1  
    }  
}
```

8.1.20 Subtract Single Termination

In this use case the MTAS removes the single termination from the context, for example because of BYE received from the conference participant.

Request MTAS -> MRFP

```
Context = 1234 {  
    Priority = 9,  
    Subtract = rtp/38/1 {  
        Audit {}  
    }  
}
```

Reply MRFP -> MTAS

```
Context = 1234 {  
    Subtract = rtp/38/1  
}
```

8.1.21 Subtract All Terminations from a Context

In this use case the MTAS removes all terminations from the context, for example because of BYE received from the conference creator.

Request MTAS -> MRFP

```
Context=1234{  
    Priority=9,  
    W-Subtract={  
        Audit {}  
    }  
}
```

Reply MRFP -> MTAS

```
Context=1234{  
    Subtract=*  
}
```

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8.1.22 Single Signal Completion – an/apf

In this use case MTAS has previously requested an announcement and now the MRFP informs the MTAS about completed signals.

Request MRFP -> MTAS

```
Context = 1234 {  
  Notify = rtp/38/1 {  
    ObservedEvents = 888 {  
      g/sc {  
        Stream=1,  
        SigID an/apf,  
        Meth TO  
      }  
    }  
  }  
}
```

Reply MTAS -> MRFP

```
Context = 1234 {  
  Notify = rtp/38/1  
}
```

8.1.23 Single Signal Completion – aasb/play

In this use case MTAS has previously requested a segmented (multimedia) announcement and now the MRFP informs the MTAS about the completion of the signal on the audio stream.

Request MRFP -> MTAS

```
Context = 1234 {  
  Notify = rtp/38/1 {  
    ObservedEvents = 888 {  
      g/sc {  
        Stream=1,  
        SigID=aasb/play,  
        Meth=TO  
      }  
    }  
  }  
}
```

Reply MTAS -> MRFP

```
Context = 1234 {  
  Notify = rtp/38/1  
}
```

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8.1.24 Double Signal Completion

In this use case the MTAS has previously requested announcements on two streams and now the MRFP informs the MTAS about completed signals on both streams.

8.1.24.1 Single Transaction

Request MRFP -> MTAS

```
Context = 1234 {  
  Notify = rtp/38/1 {  
    ObservedEvents = 888 {  
      g/sc {  
        Stream=1,  
        SigID an/apf,  
        Meth TO  
      }  
      g/sc {  
        Stream=2,  
        SigID an/apf,  
        Meth TO  
      }  
    }  
  }  
}
```

Reply MTAS -> MRFP

```
Context = 1234 {  
  Notify = rtp/38/1  
}
```

8.1.24.2 Separate Transactions

Request MRFP -> MTAS

```
Context = 1234 {  
  Notify = rtp/38/1 {  
    ObservedEvents = 888 {  
      g/sc {  
        Stream=1,  
        SigID an/apf,  
        Meth TO  
      }  
    }  
  }  
}
```

Reply MTAS -> MRFP

```
Context = 1234 {  
  Notify = rtp/38/1  
}
```

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Request MRFP -> MTAS

```
Context = 1234 {
  Notify = rtp/38/1 {
    ObservedEvents = 888 {
      g/sc {
        Stream=2,
        SigID an/apf,
        Meth TO
      }
    }
  }
}
```

Reply MTAS -> MRFP

```
Context = 1234 {
  Notify = rtp/38/1
}
```

8.1.25 Single Play Collect Signal Completion

In this use case MTAS has previously requested Play Collect and now the MRFP informs the MTAS about the completed signal.

Note that in the following example “Stream” is optional and may not be present.

Note also that g/sc is not requested by MTAS for playcol requests and therefore no notification of g/sc occurs here.

Request MRFP -> MTAS

```
Context = 1234 {
  Notify = rtp/38/1 {
    ObservedEvents = 888 {
      aasdc/pcolsucc {
        Stream=1,
        dc=*37#,
        na=1
      }
    }
  }
}
```

Reply MTAS -> MRFP

```
Context = 1234 {
  Notify = rtp/38/1
}
```

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8.1.26 ASR Signal Completion

In this use case MTAS has previously requested ASR and now the MRFP informs the MTAS about the completed signal sent when the user inputs speech matching the grammar file.

Request MRFP -> MTAS

```
Context = 1234 {  
    Notify = rtp/38/1 {  
        ObservedEvents = 888 {  
            asr/asrsucc {  
                asrr="yes",  
                asrrft=Other(0x0002)  
            }  
        }  
    }  
}
```

Note: MTAS supports the sending of the asr result as a string ("Yes") or byte encoded octet ("9AA2CA"). Only the simple text string is shown in the above example.

Reply MTAS -> MRFP

```
Context = 1234 {  
    Notify = rtp/38/1  
}
```

8.1.27 Double Signal Play Collect Unsuccessful

In this use case the MTAS has previously requested play collect on one or two streams and now the MRFP informs the MTAS about unsuccessful digit collection, where the user entered the wrong code on one of the streams.

Note that if the user enters an incorrect code, then the return code (rc) parameter contains the value 619. If the user does not enter a code at all, then the parameter contains the value 620.

8.1.27.1 Separate Transactions

Request MRFP -> MTAS

```
Context = 1234 {  
    Notify = rtp/38/1 {  
        ObservedEvents = 888 {  
            aasdc/audfail {  
                Stream=1,  
                rc=619  
            }  
        }  
    }  
}
```

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Reply MTAS -> MRFP

```
Context = 1234 {
    Notify = rtp/38/1
}
```

Request MRFP -> MTAS

```
Context = 1234 {
    Notify = rtp/38/1 {
        ObservedEvents = 888 {
            aasdc/audfail {
                Stream=2,
                rc=620
            }
        }
    }
}
```

Reply MTAS -> MRFP

```
Context = 1234 {
    Notify = rtp/38/1
}
```

Note: Some MRFP may return aasb/audfail instead of aasdc/audfail.

8.1.28 ASR voice Unsuccessful

8.1.28.1 ASR Event Received

In this use case MTAS has previously requested ASR and now the MRFP informs the MTAS about unsuccessful voice collection.

Request MRFP -> MTAS

```
Context = 1234 {
    Notify = rtp/38/1 {
        ObservedEvents = 888 {
            asr/asrfail{
                Stream=1,
                rc=625
            }
        }
    }
}
```

Reply MTAS -> MRFP

```
Context = 1234 {
    Notify = rtp/38/1
}
```

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Note that the return code (rc) returned by MRFP is dependent on the type of error. For example:

- Error code 628: Recognition grammar syntax error.
- Error code 627: Recognition grammar failed
- Error code 625: User does not input voice before the "Waiting Time for Input" timeout
- Error code 629: "Maximum Recognition Time" timeout expired before the speech was recognized.

8.1.28.2 aasdc/playco Event Received

In this use case MTAS has previously requested digit collection in addition to voice recognition and the MRFP informs the MTAS about unsuccessful digit collection.

Request MRFP -> MTAS

```
Context = 1234 {  
  Notify = rtp/38/1 {  
    ObservedEvents = 888 {  
      aasdc/audfail {  
        Stream=1,  
        rc=619  
      }  
    }  
  }  
}
```

Reply MTAS -> MRFP

```
Context = 1234 {  
  Notify = rtp/38/1  
}
```

Note that the return code (rc) returned by MRFP is dependent on the type of error. For example:

- Error code 619: User enters an incorrect code.
- Error code 620: "duration" timeout expired.

Note: Some MRFP may return aasb/audfail instead of aasdc/audfail.

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8.1.29 Bearer Failure

In this use case the MRFP informs the MTAS about the bearer failure.

Request MRFP -> MTAS

```
Context = 1234 {  
  Notify = rtp/38/1 {  
    ObservedEvents = 888 {  
      g/cause {  
        Stream=1,  
        GeneralCause=FT  
      }  
    }  
  }  
}
```

Reply MTAS -> MRFP

```
Context = 1234 {  
  Notify = rtp/38/1  
}
```

8.1.30 MG Failure

In this use case the MRFP informs the MTAS about the failure of some terminations.

Request MRFP -> MTAS

```
Context = 1234 {  
  ServiceChange = rtp/38/1 {  
    Services = {  
      Method = Forced,  
      Reason = "906 Loss of lower layer connectivity"  
    }  
  }  
}
```

Reply MTAS -> MRFP

```
Context = 1234 {  
  ServiceChange = rtp/38/1  
}
```

8.1.31 Add conference participant

8.1.31.1 Ad-hoc conference creator dials-in and creates a conference

Request MTAS -> MRFP

```
Context=$ {  
  Priority=6,  
  Add=rtp/3/$ {
```

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```

Media {
  Stream=1 {
    LocalControl{mode=sendrecv, ReservedValue=ON},
    Local {
      v=0
      c=IN IP4 $
      m=audio $ RTP/AVP $
    },
    Remote {
      v=0
      c=IN IP4 192.168.0.2
      m=audio 10010 RTP/AVP 0
      b=AS:128
      a= rtpmap:0 PCMU/8000
    }
  },
},
Events=1{G/CAUSE}
}

```

Reply MRFP -> MTAS

```

Context=10000 {
  Add=rtp/3/100001 {
    Media {
      Stream=1 {
        Local {
          v=0
          c=IN IP4 55.44.33.22
          m=audio 30010 RTP/AVP 0
          b=AS:128
          a=rtpmap:0 PCMU/8000
        }
      }
    }
  }
}

```

8.1.31.2 Ad-hoc conference creator dial out to invite a conference participant

A pre-requisite for this example is that the conference creator has dialed in and created the ad-hoc conference as shown in section 8.1.30.1.

The ADD request and reply sequence to allocate resources for the participant to invite is as defined in section 8.1.1.

The subsequent MODIFY request and reply sequence as a result of the conference participant accepting the invitation, is defined in the section 8.1.2.

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8.1.31.3 Scheduled conference participant dial-in

This example shows a dial-in to a scheduled conference.

The only difference between the first and subsequent dial-in sequence is the value of the contextID attribute.

When MTAS adds the first conference participant a new context has to be allocated, which is requested by setting the contextID to value '\$' (CHOOSE-ONE). Subsequent participants of the same conference will be added using the contextID as of the first participant.

Stream mode is 'inactive' for participants who join the conference in a waiting-for-moderator state, 'sendrecv' otherwise. In this use case, the first participant enters the conference in waiting-for-moderator state ('inactive' stream mode).

Request MTAS -> MRFP

```
Context=$ {
  Priority=6,
  Add=rtp/3/$ {
    Media {
      Stream=1 {
        LocalControl{mode=inactive, ReservedValue=ON},
        Local {
          v=0
          c=IN IP4 $
          m=audio $ RTP/AVP $
        },
        Remote {
          v=0
          c=IN IP4 192.168.0.2
          m=audio 10010 RTP/AVP 0
          b=AS:128
          a= rtpmap:0 PCMU/8000
        }
      },
    },
    Events=1{G/CAUSE}
  }
}
```

Reply MRFP -> MTAS

```
Context=10000 {
  Add=rtp/3/100001 {
    Media {
      Stream=1 {
        Local {
          v=0
          c=IN IP4 55.44.33.22
          m=audio 30010 RTP/AVP 0
          b=AS:128
          a=rtpmap:0 PCMU/8000
        }
      }
    }
  }
}
```

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```

    }
  }
}

```

8.1.32 Remove conference participant

8.1.32.1 Remove a conference participant (not the last)

See section 8.1.19.

8.1.32.2 Remove the last conference participant

See section 8.1.20

8.1.33 Play enter tone for scheduled conference participant

In this use case, the MTAS plays an enter tone for a newly entered scheduled conference participant.

Request MTAS -> MRFP

```

Context=10000 {
    Priority=9,
    Modify=rtp/3/100000 {
Events=1 {G/CAUSE, G/SC},
Signals {
    conftn/enter {
        st=1,
        nc={to,or},
        btd=both
    }
}
}
}

```

Reply MRFP -> MTAS

```

Context=10000 {
    Modify=rtp/3/100000 {
    }
}

```

Request MRFP -> MTAS (Notify from MRFP about completion of the enter tone signal)

```

Context = 10000 {
    Notify = rtp/3/100000 {
        ObservedEvents = 1 {
            G/SC {
                SigID=conftn/enter,

```

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```

        meth=TO,
        Stream=1
    }
}
}
}

```

Reply MTAS -> MRFP (Notify reply from MTAS)

```

Context = 10000 {
    Notify = rtp/3/100000
}

```

8.1.34 Play exit tone for scheduled conference participant

In this use case, the MTAS plays an exit tone to scheduled conference participants to inform them that a participant has left the conference.

Request MTAS -> MRFP

```

Context=10000 {
    Priority=9,
    Modify=rtp/3/100000 {
Events=1 {G/CAUSE, G/SC},
Signals {
    conftn/exit {
        st=1,
        nc={to,or},
        btd=int
    }
}
}
}
}

```

Reply MRFP -> MTAS

```

Context=10000 {
    Modify=rtp/3/100000 {
    }
}

```

Request MRFP -> MTAS (Notify from MRFP about completion of the exit tone signal)

```

Context = 10000 {
    Notify = rtp/3/100000 {
        ObservedEvents = 1 {
            G/SC {
                SigID=conftn/exit,
                meth=TO,
                Stream=1
            }
        }
    }
}

```

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```
}
```

Reply MTAS -> MRFP (Notify reply from MTAS)

```
Context = 10000 {  
    Notify = rtp/3/100000  
}
```

8.1.35 Ad-hoc conference participant adds video to an existing session

In ad-hoc conference only the conference creator add video to an existing session, with these messages:

Request MTAS -> MRFP

```
Context=10000 {  
    Priority=9,  
    Modify = rtp/1/100001{  
        Media {  
            Stream=2 {  
                LocalControl{mode=sendrecv, ReservedValue=ON},  
                Local {  
                    v=0  
                    c=IN IP4 $  
                    m=video $ RTP/AVP $  
                },  
                Remote {  
                    v=0  
                    c=IN IP4 192.168.0.1  
                    m=video 11500 RTP/AVP 34  
                    b=AS:128  
                    a= rtpmap:34 H263/90000  
                }  
            },  
        }  
    }  
}
```

Reply MRFP -> MTAS

```
Context=10000 {  
    Add=rtp/1/100001 {  
        Media {  
            Stream=2 {  
                Local {  
                    v=0  
                    c=IN IP4 55.44.33.22  
                    m=video 31500 RTP/AVP 34  
                    b=AS:128  
                    a=rtpmap:34 H263/90000  
                }  
            }  
        }  
    }  
}
```

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```
}  
}  
}  
}
```

8.1.36 Scheduled conference participant adds video to an existing session

In this use case the participant adds new video stream to an existing session in the scheduled conference. The mode is 'inactive' while in waiting state, and 'sendrecv' when the conference is active

Request MTAS -> MRFP

```
Context=10000 {  
    Priority=9,  
    Modify = rtp/1/100001{  
        Media {  
            Stream=2 {  
                LocalControl{mode=inactive, ReservedValue=ON},  
                Local {  
                    v=0  
                    c=IN IP4 $  
                    m=video $ RTP/AVP $  
                },  
                Remote {  
                    v=0  
                    c=IN IP4 192.168.0.1  
                    m=video 11500 RTP/AVP 34  
                    b=AS:128  
                    a= rtpmap:34 H263/90000  
                }  
            },  
        }  
    }  
}
```

Reply MRFP -> MTAS

```
Context=10000 {  
    Add=rtp/1/100001 {  
        Media {  
            Stream=2 {  
                Local {  
                    v=0  
                    c=IN IP4 55.44.33.22  
                    m=video 31500 RTP/AVP 34  
                    b=AS:128  
                    a=rtpmap:34 H263/90000  
                }  
            }  
        }  
    }  
}
```

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```
}  
}
```

8.1.37 Scheduled conference participant removes video from an existing session

In this use case the participant removes video stream from an existing video session in the scheduled conference. The mode is 'inactive' while in waiting state, and 'sendrecv' when the conference is active.

Request MTAS -> MRFP

```
Context=10000 {  
    Priority=9,  
    Modify = rtp/2/100001{  
        Media {  
            Stream=2 {  
                LocalControl{mode=inactive|sendrecv, Reserved  
Group=OFF, Reserved Value=OFF},  
                Local {  
  
                },  
                Remote {  
  
                },  
            },  
        },  
    },  
}
```

Reply MRFP -> MTAS

```
Context=10000 {  
    Add=rtp/2/100001 {  
  
    },  
}
```

8.1.38 Negotiate content sharing stream

In this use case the participant dials-in to a service number requesting use of video conferencing together with floor control stream but without content sharing video stream

SDP Transparency: When MTAS is modifying a stream, whose Local Descriptor was already set then the previous SDP will not be sent and port and format for the stream is set to '\$' (except for BFCP, where format is always set to '*')

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Request MTAS > MRFP

```
Context=$ {
  Priority=6,
  Add = rtp/3/${
    Media {
      Stream=3 {
        LocalControl{mode=SendRecv, ReservedValue=ON},
        Local {
          v=0
          c=IN IP4 $
          m=application $ TCP/BFCP $
          a=floorctrl:s-only
          a=setup:active
          a=connection:new
        },
        Remote {
          v=0
          c=IN IP4 192.168.0.1
          m=application 30000 TCP/BFCP *
          a=connection:new
          a=setup:actpass
          a=floorctrl:c-s
        }
      },
    }
  }
}
```

Reply MRFP > MTAS

```
Context=10000 {
  Add = rtp/3/100000{
    Media {
      Stream=3 {
        Local {
          v=0
          c=IN IP4 55.44.33.22
          m=application 31000 TCP/BFCP *
          a=floorctrl:s-only
          a=setup:active
          a=connection:new
        }
      }
    }
  }
}
```

8.1.39 Initialize content sharing stream

In this use case the participant dials-in to a service number requesting use of video conferencing together with slides content sharing.

SDP Transparency: When MTAS is modifying a stream, whose Local Descriptor was already set then the previous SDP will not be sent and port and format for the stream is set to '\$' (except for BFCP, where format is always set to '*')

Request MTAS > MRFP

```
Context=$ {
  Priority=6,
```

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```

Add = rtp/4/${
  Media {
    Stream=4 {
      LocalControl{mode=Inactive, ReservedValue=ON},
      Local {
        v=0
        c=IN IP4 $
        m=application $ TCP/BFCP *
        a=floorctrl:s-only
        a=confid:1
        a=userid:1
        a=floorid:1 mstrm:4
      },
      Remote {
        v=0
        c=IN IP4 192.168.0.1
        m=application 40000 TCP/BFCP *
        a=connection:new
        a=floorctrl:c-s
        a=setup:actpass
      }
    },
  },
}

```

Reply MRFP > MTAS

```

Context=10000 {
  Add = rtp/4/100000{
    Media {
      Stream=4 {
        Local {
          v=0
          c=IN IP4 55.44.33.22
          m=application 41000 TCP/BFCP *
          a=floorctrl:s-only
          a=confid:1
          a=userid:1
          a=floorid:1 mstrm:4
          a=setup:active
          a=connection:new
        }
      }
    }
  }
}

```

8.1.40

The Termination Heartbeat timer expires during a call

In this use case the MRFP informs the MTAS about the timeout of the hangterm timer of a termination in the MRFP. The MTAS deems the termination still to be used.

Request MRFP -> MTAS

```

Context = 1234 {
  Notify = rtp/38/1 {
    ObservedEvents = 1 {
      hangterm/thb
    }
  }
}

```

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Reply MTAS -> MRFP

```
Context = 1234 {  
    Notify = rtp/38/1  
}
```

8.1.41 The Termination Heartbeat timer expires after a call

In this use case the MRFP informs the MTAS about the timeout of the hangterm timer of a termination in the MRFP. The MTAS deems the termination to be hanging.

Request MRFP -> MTAS

```
Context = 1234 {  
    Notify = rtp/38/1 {  
        ObservedEvents = 1 {  
            hangterm/thb  
        }  
    }  
}
```

Reply MTAS -> MRFP

```
Context = 1234 {  
    Notify = rtp/38/1 {  
        Error = 411 {"The transaction refers to  
                    an unknown ContextID"}  
    }  
}
```

After the error indication, MTAS subtracts the context or the termination (the latter one applies when error = 435 "Termination ID is not in specified Context" is indicated). See the use case in chapter 8.1.21 (or chapter 8.1.20).

8.2 Non-Session-Related Use Cases

8.2.1 MMTel MRFP Restart - Cold/Warm Boot

The sequences in this chapter are the same for both reasons - Cold Boot and Warm Boot.

Cold boot happens when a new MRFP is taken into operation for the first time, or when the MRFP is restarted with cold boot. After successful registration of the MRFP with cold boot, MTAS sends configuration parameters to the MRFP, see 8.2.6.

In case of Warm Boot, MTAS does not send configuration parameters, and MTAS may initiate audit or removal of all contexts, see 8.2.4 or 8.2.5.

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8.2.1.1 Version 1

Request MRFP -> MTAS

```
MEGACO/1 [127.0.0.1]:2944
Transaction = 1 {
  Context = - {
    ServiceChange = ROOT {
      Services {
        Method = Restart,
        Reason = "901 Cold Boot",
        Version = 1,
        Profile = ETSIprof_MediaServer/1
      }
    }
  }
}
```

Reply MTAS -> MRFP

```
MEGACO/1 mrfp
Reply= 1 {
  Context = - {
    ServiceChange = ROOT {
      Error = 406 {"Version Not Supported"}
    }
  }
}
```

8.2.1.2 Version 2

Request MRFP -> MTAS

```
MEGACO/1 [127.0.0.1]:2944
Transaction = 1 {
  Context = - {
    ServiceChange = ROOT {
      Services {
        Method = Restart,
        Reason = "901 Cold Boot",
        Version = 2,
        Profile = ETSIprof_MediaServer/1
      }
    }
  }
}
```

Reply MTAS -> MRFP

```
MEGACO/1 [10.35.38.161]:2944
Reply = 1 {
  Context = - {
    ServiceChange = ROOT {
      Services {
        Version = 2,
        20130418T01120200
      }
    }
  }
}
```

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Note: subsequent messages are encoded according to version 2 (MEGACO/2).

8.2.1.3 Version 3 or higher

The MRFP registers to MTAS by cold booting the MRFP with protocol version 3 or higher. MTAS falls back to version 2.

Request MRFP -> MTAS

```
MEGACO/1 [127.0.0.1]:2944
Transaction = 1 {
  Context = - {
    ServiceChange = ROOT {
      Services {
        Method = Restart,
        Reason = "901 Cold Boot",
        Version = 3,
        Profile = ETSIprof_MediaServer/1
      }
    }
  }
}
```

Reply MTAS -> MRFP

```
MEGACO/1 [10.35.38.161]:2944
Reply = 1 {
  Context = - {
    ServiceChange = ROOT {
      Services {
        Version = 2,
        20130418T01153100
      }
    }
  }
}
```

Note: subsequent messages are encoded according to version 2 (MEGACO/2).

8.2.1.4 Unknown Profile

Request MRFP -> MTAS

```
MEGACO/1 [127.0.0.1]:2944
Transaction = 1 {
  Context = - {
    ServiceChange = ROOT {
      Services {
        Method = Restart,
        Reason = "901 Cold Boot",
        Version = 2,
        Profile = UnknownProfile/1
      }
    }
  }
}
```

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```
}  
}  
}  
}
```

As a result the MTAS terminates the SCTP connection without sending any response.

8.2.2 MTAS Initiated MRFP Restoration

To request that the MRFP restart itself, the MTAS sends a ServiceChange Command to the MRFP with ServiceChangeMethod "Restart" and ServiceChangeReason 901 ("Cold Boot"). The MRFP must establish a new control association sending a ServiceChange with ServiceChangeMethod "Restart" and ServiceChangeReason 901 ("Cold Boot").

This is the case when the MTAS recovers from a Zone Reload. The MRFP will only notice that the transport link has been down so it will follow the MRFP/Service Change Disconnected procedure. The MTAS however, has lost the information that the MRFP has already registered. When the Service Change Disconnected arrives from the MRFP, the MTAS will request the MRFP to restore (including to re-register).

When MTAS recovers from a Small Restart or Smooth Upgrade (context are not deleted) it will not request MRFP restart and the signaling from chapter 8.2.3 applies.

After this MTAS normally sends the configuration parameters to the MRFP, see 8.2.6.

Example:

Request MRFP -> MTAS

```
MEGACO/2 [127.0.0.1]:2944  
Transaction = 1 {  
  Context = - {  
    ServiceChange = ROOT {  
      Services {  
        Method = Disconnected,  
        Reason = "900 Service Restored"  
      }  
    }  
  }  
}
```

Reply MTAS -> MRFP

```
MEGACO/1 [10.35.38.161]:2944  
Error = 401 {  
  "Protocol Error"  
}
```

Request MTAS -> MRFP

```
MEGACO/2 [10.35.38.161]:2944  
Transaction = 2 {
```

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```
Context = - {  
    ServiceChange = ROOT {  
        Services {  
            Method = Restart,  
            Reason = "901 Cold Boot",  
                20130418T00480100  
        }  
    }  
}
```

Reply MRFP -> MTAS

```
MEGACO/2 [127.0.0.1]:2944  
Reply = 2 {  
    Context = - {  
        ServiceChange = ROOT  
    }  
}
```

Request MRFP -> MTAS

```
MEGACO/1 [127.0.0.1]:2944  
Transaction = 3 {  
    Context = - {  
        ServiceChange = ROOT {  
            Services {  
                Method = Restart,  
                Reason = "901 Cold Boot",  
                Version = 2,  
                Profile = ETSPprof_MediaServer/1  
            }  
        }  
    }  
}
```

Reply MTAS -> MRFP

```
MEGACO/1 [10.35.38.161]:2944  
Reply = 3 {  
    Context = - {  
        ServiceChange = ROOT {  
            Services {  
                Version=2,  
                20130418T00480100  
            }  
        }  
    }  
}
```

8.2.3

MMTel MRFP Disconnected - Service Restored

In this use case the MRFP informs the MTAS that the link was down and has been restored. After restoration, MTAS may initiate audit and/or removal of all contexts, see 8.2.4 and 8.2.5.

Request MRFP -> MTAS

```
MEGACO/2 [127.0.0.1]:2944  
Transaction = 3 {  
    Context = - {  
        ServiceChange = ROOT {  
            Services {  
                Method = Disconnected,  
                Reason = "900 Service Restored"  
            }  
        }  
    }  
}
```

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```
} } }
```

Reply MTAS -> MRFP

```
MEGACO/2 [10.35.38.161]:2944
Reply = 3 {
  Context = - {
    ServiceChange = ROOT {
      Services {20130418T01332700}
    }
  }
}
```

8.2.4 Audit of All Active Contexts

In this use case the MTAS asks the MRFP about active contexts to synchronize after failure.

8.2.4.1 Termination groups

The MTAS can Audit all Termination groups independently in order to Audit an entire MRFP. This example is shown in tabular form for clarity.

Termination Group	MTAS->MRFP (AuditValue request)	MRFP->MTAS (AuditValue reply)
32	MEGACO/2 [192.168.55.54] Transaction = 100 { Context = * { Priority = 4, AuditValue = rtp/32/* { Audit {} } } }	MEGACO/2 [129.192.57.1] Reply = 100 { Context = 21 { AuditValue = rtp/32/473, AuditValue = rtp/32/3723 }, Context = 38 { AuditValue = rtp/32/13, AuditValue = rtp/32/233 } }
31	MEGACO/2 [192.168.55.54] Transaction = 101 { Context = * { Priority = 4, AuditValue = rtp/31/* { Audit {} } } }	MEGACO/2 [129.192.57.1] Reply = 101 { Context = 2 { AuditValue = rtp/31/6233, AuditValue = rtp/31/23 }, Context = 109 { AuditValue = rtp/31/3, AuditValue = rtp/31/3428 }, Context = 345 { AuditValue = rtp/31/2384, AuditValue = rtp/31/342 } }
30	MEGACO/2 [192.168.55.54] Transaction = 102 { Context = * { Priority = 4, AuditValue = rtp/30/* { Audit {} } } }	MEGACO/2 [129.192.57.1] Reply = 102 { Context = 9 { AuditValue = rtp/30/8534, AuditValue = rtp/30/33442 } }
29-2	Similar to above	Similar to above

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Termination Group	MTAS->MRFP (AuditValue request)	MRFP->MTAS (AuditValue reply)
1	MEGACO/2 [192.168.55.54] Transaction = 132 { Context = * { Priority = 4, AuditValue = rtp/1/* { Audit {} } } }	MEGACO/2 [129.192.57.1] Reply = 132 { Context = 5 { AuditValue = rtp/1/4528, AuditValue = rtp/1/32 }, Context = 81 { AuditValue = rtp/1/37, AuditValue = rtp/1/328 } } }

8.2.5 Subtract of All Terminations

In this use case the MTAS removes all the terminations from the MRFP.

8.2.5.1 Termination Groups

The MTAS can Subtract all Termination groups independently in order to Subtract all Terminations. This example is shown in tabular form for clarity.

Termination Group	MTAS->MRFP (Subtract request)	MRFP->MTAS (Subtract reply)
32	MEGACO/2 [129.192.56.1] Transaction = 101 { Context = * { Priority = 9, W-Subtract = rtp/32/* { Audit {} } } }	MEGACO/2 [129.192.57.1] Reply = 101 { Context = * { Subtract = rtp/32/* } }
31	MEGACO/2 [129.192.56.1] Transaction = 102 { Context = * { Priority = 9, W-Subtract = rtp/31/* { Audit {} } } }	MEGACO/2 [129.192.57.1] Reply = 102 { Context = * { Subtract = rtp/31/* } }
30	MEGACO/2 [129.192.56.1] Transaction = 103 { Context = * { Priority = 9, W-Subtract = rtp/30/* { Audit {} } } }	MEGACO/2 [129.192.57.1] Reply = 103 { Context = * { Subtract = rtp/30/* } }
29-2	Similar to above	Similar to above
1	MEGACO/2 [129.192.56.1] Transaction = 132 { Context = * { Priority = 9, W-Subtract = rtp/1/* { Audit {} } } }	MEGACO/2 [129.192.57.1] Reply = 132 { Context = * { Subtract = rtp/1/* } }

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8.2.6 Modify on ROOT Termination

In this use case MTAS sets the overall parameters on the MRFP

Example:

Request MTAS -> MRFP

```
MEGACO/2 [192.168.55.54]
Transaction = 222 {
  Context = - {
    Priority = 4,
    Modify = ROOT {
      Media {
        TerminationState {
          root/normalMGExecutionTime = 3000
          root/normalMGCEExecutionTime = 500
          root/MGProvisionalResponseTimerValue = 3500
          root/MGCPProvisionalResponseTimerValue = 1000
          root/MGOriginatedPendingLimit = 3
          root/MGCOriginatedPendingLimit = 3
        }
      },
      Events = 123 {
        chp/MGCon
      }
    }
  }
}
```

Reply MRFP -> MTAS

```
MEGACO/2 [127.0.0.1]:2944
Reply = 222 {
  Context = - {
    Modify = ROOT
  }
}
```

8.2.7 Notification of Congestion

In this use case, the MRFP informs the MTAS of the percentage of load that should be blocked.

Request MRFP -> MTAS

```
MEGACO/2 [127.0.0.1]:2944
Transaction = 162 {
  Context = - {
    Notify = ROOT {
      ObservedEvents = 888 {
        CHP/MGCON {
          reduction = 10
        }
      }
    }
  }
}
```

Reply MTAS -> MRFP

```
MEGACO/2 [192.168.55.54]
Reply=162 {
  Context = - {
```

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```
        Notify = ROOT  
    } }
```

8.2.8 MG Failure on Root Termination

In this use case the MRFP informs the MTAS about the failure of the root termination. This happens e.g. when the MG link is locked by command in the MG.

Request MRFP -> MTAS

```
!/2 [10.168.17.9]:2944  
Transaction = 1404453637 {  
    Context = - {  
        ServiceChange = ROOT {  
            Services {  
                Method = Forced,  
                Reason = "905 TerminationTakenOutOfService"  
            }  
        }  
    }  
}
```

Reply MTAS -> MRFP

```
!/2 [10.168.17.52]:2944  
Reply = 1404453637 {  
    Context = - {  
        ServiceChange = ROOT {  
            Services {20140710T08441200}  
        }  
    }  
}
```

8.2.9 Configurable Announcement Parameters

MTAS enables the arbitrary configuration of the play, repeat, delay and duration parameters of a simple announcement by using the MtasAnnouncementParameter Managed Objects.

When an MtasAnnouncementParameter Managed Object is provisioned for an announcement, the aasb/play signal will be used for playing the announcement. The mapping of the announcement parameters to signal parameters is described in Table 4.

CM Parameter	Equivalent aasb/play Signal Parameter	Conversion
play	an	The CM parameter is embedded into the string "sid=<play>"
repeat	it	The CM parameter is not converted
delay	iv	The CM parameter is divided by 10.
duration	duration	The CM parameter is divided by 10.

Table 4 Announcement parameter mapping

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The most services in MTAS request finite announcements. When the operator configures a continuous announcement but the service logic expects a finite announcement the operator configured repeat and duration parameters will be overridden and the service logic configured values will be applied.

Continuous announcement can be configured by the operator by setting the repeat parameter to “forever” and by omitting the duration parameter.

8.2.10

Reconnection to MMTel MRFP after MTAS upgrade

This chapter sums up what communication takes place between MTAS and MRFP while MTAS is upgrading. At the start of the upgrade, the bearer link goes down. After MTAS upgrade is finished, the bearer link revives. For example, if H.248 uses SCTP:

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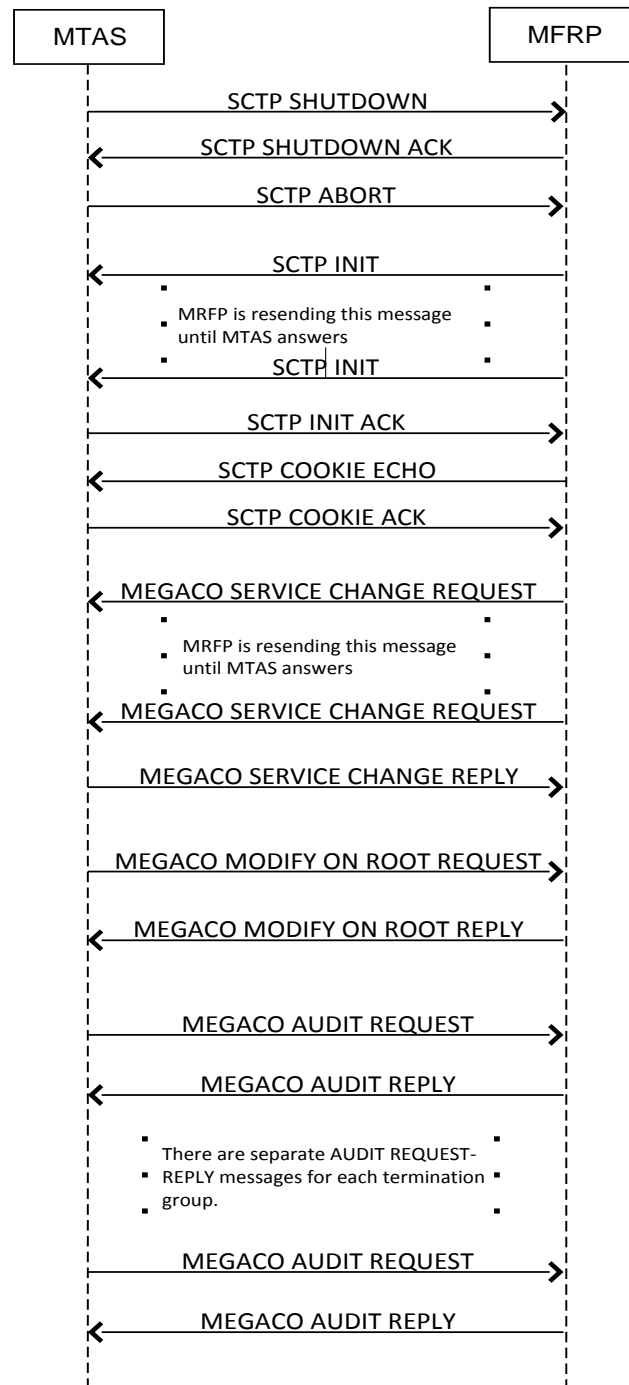


Figure 5 MTAS-MRFP reconnection

After the bearer link is connected, the H.248 link is re-established between MRFP and MTAS:

MRFP sends Service Restored message, see 8.2.3 for details.
 MTAS sends Modify on ROOT, see 8.2.6.
 MTAS requests Audit on all contexts, see 8.2.4.

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Approved BUCIICEBC [Péter Barta]	Checked	Date 2016-03-25	Rev L	Reference

References

- [1] ITU-T Recommendation H.248.1 (2002), Gateway control protocol: Version 2
- [2] ITU-T Recommendation H.248.1 (2004), Gateway control protocol: Version 2, Corrigendum 1
- [3] 3GPP TS 29.333 Multimedia Resource Function Controller (MRFC) - Multimedia Resource Function Processor (MRFP) Mp interface
- [4] TSP: MTAS Parameter Description, 1/190 84-AVA 901 09/n**
CBA: Managed Object Model MTAS 155 54-LZN 765 0163/n**
- [5] RFC 2327 SDP: Session Description Protocol
- [6] ITU-T Recommendation H.248.9, Gateway control protocol: Advanced media server packages
- [7] ITU-T Recommendation H.248.9 Amendment 1, Gateway control protocol: Advanced media server packages; Amendment 1: ASR, TTS and multimedia enhancement
- [8] ITU-T Recommendation H.248.10, Gateway control protocol: Media gateway resource congestion handling package
- [9] ITU-T Recommendation H.248.7, Gateway control protocol: Generic Announcement package

**See the Customer or Support library for the Application System in question to get the correct document version.