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**Digital cellular telecommunications system (Phase 2+) (GSM);
Universal Mobile Telecommunications System (UMTS);
Multimedia Resource Function Controller (MRFC)
- Multimedia Resource Function Processor (MRFP)
Mp interface;
Stage 3
(3GPP TS 29.333 version 17.0.0 Release 17)**

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Contents

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This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

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need not indicates permission not to do something

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can indicates that something is possible

cannot indicates that something is impossible

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will indicates that something is certain or expected to happen as a result of action taken by an agency the behaviour of which is outside the scope of the present document

will not indicates that something is certain or expected not to happen as a result of action taken by an agency the behaviour of which is outside the scope of the present document

might indicates a likelihood that something will happen as a result of action taken by some agency the behaviour of which is outside the scope of the present document

might not indicates a likelihood that something will not happen as a result of action taken by some agency the behaviour of which is outside the scope of the present document

In addition:

is (or any other verb in the indicative mood) indicates a statement of fact

is not (or any other negative verb in the indicative mood) indicates a statement of fact

The constructions "is" and "is not" do not indicate requirements.

1 Scope

The present document describes the protocol to be used on the Multimedia Resource Function Controller (MRFC) – Multimedia Resource Function Processor (MRFP) interface (Mp interface). The IMS architecture is described in 3GPP TS 23.228 [1], the functional requirements are described in 3G TS 23.333 [25]

This specification defines a profile of the Gateway Control Protocol (H.248.1), for controlling Multimedia Resource Function Processor supporting in-band user interaction, conferencing and transcoding for multimedia-services.

The present document is valid for a 3rd generation PLMN (UMTS) complying with Release 7 and later.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document.*

[1] 3GPP TS 23.228: "IP Multimedia Subsystem (IMS); Stage 2".

[2] 3GPP TS 23.002: "Network architecture".

[3] ITU-T Recommendation H.248.1 (05/2002), Gateway control protocol: Version 2 + Corrigendum 1 (03/2004) and ITU-T Recommendation H.248.1 (09/2005), Gateway control protocol: Version 3 for Floor Control requirements.

[4] ITU-T Recommendation H.248.4 (11/2000), Gateway control protocol: Transport over Stream Control Transmission Protocol (SCTP) + Corrigendum 1 (03/2004).

[5] ITU-T Recommendation H.248.7 (03/2004), Gateway control protocol: Generic announcement package.

[6] ITU-T Recommendation H.248.9 (03/2002), Gateway control protocol: Advanced media server package.

[7] ITU-T Recommendation H.248.11 (11/2002), Gateway control protocol: Media gateway overload control package.

[8] IETF RFC 2960: "Stream Control Transmission Protocol".

[9] ITU-T Recommendation H.248.14 (03/2002), Gateway control protocol: Inactivity timer package.

[10] ITU-T Recommendation H.248.16 (11/2002), Gateway control protocol: Enhanced digit collection packages and procedures + Corrigendum 1 (03/2004).

[11] Void

[12] ITU-T Recommendation H.248.27 (07/2003), Gateway control protocol: Supplemental Tones package

[13] ITU-T Recommendation Q.1950 (12/2002), Bearer independent call bearer control protocol.

[14] ITU-T Recommendation G.711 (11/1988), Pulse code modulation (PCM) of voice frequencies.

[15] ITU-T Recommendation G.711 Appendix I (09/1999), A high quality low-complexity algorithm for packet loss concealment with G.711.

[16] ITU-T Recommendation G.711 Appendix I (09/1999), A comfort noise payload definition for ITU-T G.711 use in packet-based multimedia communication systems.

[17] ITU-T Recommendation E.180 (03/1998), Technical characteristics of tones for the telephone service.

[18] TS 183 022: Telecommunication and Internet converged Services and Protocols for Advanced Networking (TISPAN); MGC Information Package.

[19] ES 201 970 Access and Terminals (AT); Public Switched Telephone Networks (PSTN); Harmonized specification of physical and electrical characteristics at a 2-wire analogue presented Network Temination Point (NTP).

[20] IETF RFC 2327 (1998): "SDP: Session Description Protocol".

[21] IETF RFC 3551 (2003): "RTP Profile for Audio and Video Conferences with Minimal Control".

[22] IETF RFC 2833 (2000): "RTP Payload for DTMF Digits, Telephony Tones and Telephony Signals".

[23] IETF RFC 4040 (2005): "RTP payload format for a 64 kbit/s transparent call".

[24] IETF RFC 3555 (2003): "MIME Type Registration of RTP Payload Formats".

[25] 3GPP TS 23.333: "Multimedia Resource Function Controller (MRFC) – Multimedia Resource Function Processor (MRFP) Mp interface: Procedures Descriptions".

[26] ITU-T Recommendation H.248.9a1 (03/2007), "Gateway control protocol: Advanced media server package (draft work in progress)".

[27] 3GPP TS 29.163: "Interworking between the IM CN subsystem and CS networks – Stage 3".

[28] W3C Recommendation (September 2004): "Speech Synthesis Markup Language (SSML) Version 1.0".

[29] W3C Recommendation (September 2004): "Speech Recognition Grammar Specification (SRGS) Version 1.0".

[30] ITU-T Recommendation H.248.36 (09/2005): "Hanging Termination Detection Package".

[31] Void

[32] IETF RFC 4583 (2006): "Session Description Protocol (SDP) Format for Binary Floor Control Protocol (BFCP) Streams".

[33] ITU-T Recommendation H.248.19 (03/2013): "Gateway Control Protocol: Decomposed multipoint control unit, audio, video and data conferencing packages".

[34] IETF RFC 4975 (2007): "The Message Session Relay Protocol (MSRP)".

[35] ITU-T H.248.69 (03/2009): "Gateway control protocol: Packages for interworking between MSRP and H.248".

[36] Void

[37] Void

[38] Void

[39] IETF RFC 4145 (2005): "TCP-Based Media Transport in the Session Description Protocol (SDP)".

[40] IETF RFC 4585 (2006): "Extended RTP Profile for Real-time Transport Control Protocol (RTCP) - Based Feedback (RTP/AVPF)".

[41] 3GPP TS 26.114: "IP Multimedia Subsystem (IMS); Multimedia Telephony; Media handling and interaction".

[42] 3GPP TS 22.153: "Multimedia Priority Service".

[43] ITU-T Recommendation H.248.52 (06/2008): "Gateway control protocol: QoS support packages".

[44] ITU-T Recommendation H.248.82 (03/2013): "Gateway control protocol: Explicit Congestion Notification Support".

[45] IETF RFC 5285: "A General Mechanism for RTP Header Extensions".

[46] IETF RFC 6236: "Negotiation of Generic Image Attributes in the Session Description Protocol (SDP)".

[47] ITU-T Recommendation H.248.50 (2010) and Corrigendum 1 (02/12): "Gateway control protocol: NAT traversal toolkit packages".

[48] Void.

[49] 3GPP TS 24.229: "IP Multimedia Call Control Protocol based on SIP and SDP".

[50] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[51] IETF RFC 3830: "MIKEY: Multimedia Internet KEYing".

[52] IETF RFC 793: "Transmission Control Protocol - DARPA Internet Program - Protocol Specification".

[53] IETF RFC 4582: "The Binary Floor Control Protocol (BFCP)".

[54] ITU-T Recommendation H.248.89 (10/2014): "Gateway control protocol: TCP support packages".

[55] ITU-T Recommendation H.248.90 (10/2014): "Gateway control protocol: H.248 packages for control of transport security using TLS".

[56] IETF RFC 6043: "MIKEY-TICKET: Ticket-Based Modes of Key Distribution in Multimedia Internet KEYing (MIKEY)".

[57] 3GPP TS 33.328: "IP Multimedia Subsystem (IMS) media plane security".

[58] IETF RFC 4279: "Pre-Shared Key Ciphersuites for Transport Layer Security (TLS)".

[59] 3GPP TS 33.310: "Network Domain Security (NDS); Authentication Framework (AF)".

[60] 3GPP TS 24.103: "Telepresence using the IP Multimedia (IM) Core Network (CN) Subsystem (IMS); Stage 3".

[61] IETF RFC 8841: "Session Description Protocol (SDP) Offer/Answer Procedures for Stream Control Transmission Protocol (SCTP) over Datagram Transport Layer Security (DTLS) Transport".

[62] IETF RFC 8864: "Negotiation Data Channels Using the Session Description Protocol (SDP)".

[63] ITU-T Recommendation H.248.93 (10/2014): "Gateway control protocol: ITU-T H.248 support for control of transport security using the datagram transport layer security (DTLS) protocol".

[64] IETF RFC 8122: "Connection-Oriented Media Transport over the Transport Layer Security (TLS) Protocol in the Session Description Protocol (SDP)".

[65] ITU-T Recommendation H.248.78 (11/2015): "Gateway control protocol: Bearer-level message backhauling and application level gateway".

[66] IETF RFC 4573: "MIME Type Registration for RTP Payload Format for H.224".

[67] ITU-T Recommendation H.224 (01/2005): "A real time control protocol for simplex applications using the H.221 LSD/HSD/MLP channels".

[68] ITU-T Recommendation H.281 (11/1994): "A far end camera control protocol for videoconferences using H.224".

[69] IETF RFC 5939: "Session Description Protocol (SDP) Capability Negotiation".

[70] ITU-T Recommendation H.248.80 (01/2014): "Gateway control protocol: Usage of the revised SDP offer/answer model with ITU-T H.248".

[71] IETF RFC 5104: "Codec Control Messages in the RTP Audio-Visual Profile with Feedback (AVPF)".

[72] IETF RFC 4796: "The Session Description Protocol (SDP) Content Attribute".

[73] IETF RFC 8853: "Using Simulcast in Session Description Protocol (SDP) and RTP Session".

[74] IETF RFC 8851: "RTP Payload Format Restrictions".

[75] IETF RFC 7728: "RTP Stream Pause and Resume".

[76] ITU-T Recommendation H.248.98 (02/2016): "Gateway control protocol: Support of remote media pause and resume".

[77] IETF RFC 8445: "Interactive Connectivity Establishment (ICE): A Protocol for Network Address Translator (NAT) Traversal".

[78] IETF RFC 8839: "Session Description Protocol (SDP) Offer/Answer Procedures for Interactive Connectivity Establishment (ICE)".

3 Definitions and symbols

3.1 Definitions

For the purposes of the present document, the terms and definitions given in 3GPP TR 21.905 [50] and the following apply.

Media Gateway: See ITU-T Recommendation H.248.1 [3].

Media Gateway Controller: See ITU-T Recommendation H.248.1 [3].

MultiMedia Resource Function Controller: See 3GPP TS 23.002 [2].

MultiMedia Resource Function Processor: See 3GPP TS 23.002 [2].

For the purposes of the present document, the following terms and definitions as defined in 3GPP TS 23.333 [25] apply:

ICE lite

Full ICE.

For the purposes of the present document, the following terms and definitions given in IETF RFC 3830 [51] apply:

Crypto Session (CS)
Traffic-Encrypting Key (TEK).

3.2 Symbols

None.

4. Abbreviations

For the purposes of the present document, the following abbreviations apply:

BFCP Binary Floor Control Protocol

CCM	Codec Control Messages
CDR	Call Data Record
CN	Comfort Noise
CRC	Cyclic Redundancy Check
CS	Crypto Session
CVO	Coordination of Video Orientation
DBI	Delay Budget Information
DNS	Domain Name System
DTLS	Datagram Transport Layer Security
DTMF	Dual Tone Multi Frequency
CE	Congestion Experienced
ECN	Explicit Congestion Notification
FEC	Forward Error Correction
FECC	Far End Camera Control
FIR	Full Intra Request
ICE	Interactive Connectivity Establishment
IP	Internet Protocol
IPsec	IP Security
MGC	Media Gateway Controller
MGW	Media Gateway
MID	Message Identifier
MMCMH	Multi-stream Multiparty Conferencing Media Handling
MPS	Multimedia Priority Service
MRFC	MultiMedia Resource Function Controller
MRFP	MultiMedia Resource Function Processor
MSRP	Message Session Relay Protocol
OAM	Operation, Administration and Maintenance
OoS	Out of Service
PLC	Packet Loss Concealment
PSK	Pre-Shared Key
PT	Payload Type
QoS	Quality of Service
ROI	Region of Interest
SCTP	Stream Control Transmission Protocol
SDP	Session Description Protocol
SDPCapNeg	SDP Capability Negotiation
SPNE	Signal Processing Network Equipment
SSRC	Synchronisation Source
STUN	Session Traversal Utilities for NAT
TCP	Transmission Control Protocol
TEK	Traffic-Encrypting Key
TLS	Transport Layer Security
TMMBN	Temporary Maximum Media Stream Bit Rate Notification
TMMBR	Temporary Maximum Media Stream Bit Rate Request
TTL	Time To Live
UDP	User Datagram Protocol
URN	Uniform Resource Name
VBD	Voiceband Data

5 Profile Description

5.1 Profile Identification

The name and version of the profile that is sent in the service change command are:

Table 5.1.1: Profile Identification

Profile name:	MRF
Version:	8

5.2 Summary

The profile defined in the present document enables the control of media resource function processors (MRFP) supporting in-band user interaction, conferencing and transcoding for multimedia services.

This Profile describes the minimum mandatory settings and procedures required to fulfil the Media Gateway control requirements for the MRF.

In addition optional settings and procedures are described which fulfil optional features and where supported, the minimum mandatory settings within the optional procedures and packages are identified that must be supported in order to support that feature.

"Optional" or "O" means that it is optional for either the sender or the receiver to implement an element. If the receiving entity receives an optional element that it has not implemented it should send an Error Code (e.g. 445 "Unsupported or Unknown Property", 501"Not Implemented", etc.). "Mandatory" or "M" means that it is mandatory for the receiver to implement an element. Whether it is mandatory for the sender to implement depends on specific functions; detail of whether elements of the core protocol are mandatory to be sent are defined in the stage 2 procedures, stage 3 procedures and/or the descriptions of individual packages.

The setting or modification of elements described in the profile under the heading "Used in Command" has the meaning that the property can be set/modified with that command. The property may be present in other commands (in order to preserve its value in accordance with ITU-T H.248.1[3]) when those commands are used for other procedures that affect the same descriptor.

This profile supports Explicit Congestion Notification and Multimedia Priority Service.

5.3 Gateway Control Protocol Version

Version 2 shall be the minimum version supported. Support of this version implies conformance to ITU-T Recommendation H.248 Version 2 [3].

Version 3 shall be supported for the optional MRFP based Floor Control Server functionality.

5.4 Connection Model

Media Resource Function Processors shall support ephemeral terminations that sink and source IP traffic. This type of H.248 Termination is denoted IP in the following clauses.

Table 5.4.1: Connection Model

Maximum number of contexts:	Provisioned (NOTE 1)
Maximum number of terminations per context:	Unspecified(NOTE 2)
Allowed terminations type combinations in a context:	Not Applicable
NOTE 1: The actual number of supported contexts can be audited by the MRFC using the MaxNrOfContexts property defined in the Base Root Package. NOTE 2: Support of 1 termination in a context is the basic requirement for the MRFP e.g. for voice record. 2 terminations in a context are required for transcoding or any inband media detection or insertion whilst an unspecified number terminations may be required if conferencing is supported.	

5.5 Context Attributes

Table 5.5.1: Context Attributes

Context Attribute	Supported	Values Supported
Topology	Yes	See clause 5.7.8
Priority Indicator	Optional (NOTE 1)	0-15 (NOTE 2)
Emergency Indicator	No	Not Applicable
IEPS Indicator	No	
ContextAttribute Descriptor	Yes	If "yes" see clause 5.8.9 for details of supported attributes
ContextIDList Parameter	<Yes/No>	NA
NOTE 1: This Context Attribute parameter is used for MPS as specified in 3GPP TS 22.153 [42]. NOTE 2: Priority values 11 – 15 of the Priority Indicator are reserved for MPS.		

Is the AND/OR Select operation Context Attribute supported?

AND/OR Context Attribute	<Yes/No>	<AND/OR/BOTH>

5.6 Terminations

5.6.1 Termination Names

5.6.1.1 General

The Termination ID structure is provisioned in the MRFC and MRFP and is known by the MRFP and the MRFC at or before start up.

With ephemeral IP endpoint bearer types the internal structure of Termination ID is irrelevant for MRFC and MRFP and therefore Termination ID is only a numeric identifier for the termination.

5.6.1.2 ASN.1 encoding

The following general structure of TerminationID shall be used:

4 octets shall be used for the termination ID. The following defines the general structure for the termination ID:

Table 5.6.1.2.1: Termination ID

Termination type	X

Termination type:

Length 3 bits

Values:

000 Reserved

001 Ephemeral termination

011 - 110 Reserved

111 Reserved for ROOT termination Id (ROOT Termination Id = 0xFFFFFFFF)

X:

Length 29 bits.

For IP termination, its usage is un-specified.

5.6.1.3 ABNF encoding

The following general structure of termination ID shall be used:

TerminationID = "ROOT" / pathName / "$" / "*" ; according to ITU-T H.248.1 [3] Annex B.

5.6.2 Multiplexed Terminations

Table 5.6.2.1: Multiplexed Terminations

Multiplex Terminations Supported?	NO

5.7 Descriptors

5.7.1 Stream Descriptor

Table 5.7.1.1: Stream Descriptor

Maximum number of streams per termination type	ALL	Unspecified (NOTE)
NOTE: At least 1 stream for each media (e.g. video+audio = 2 streams). If only one stream is applicable, then the MRFC may omit the Stream Descriptor and the MRFP shall assume that StreamID =1.		

5.7.1.1 LocalControl Descriptor

The following tables specify the level of support required with regard to the properties in the local control descriptor.

Table 5.7.1.1.1: Reserve Group and Reserve Value

		Termination Type	**Stream Type**
Reserve group used:	NO (NOTE 1)	-	-
Reserve value used:	YES (NOTE 2) (NOTE 3)	IP	Audio, Video
NOTE 1: Support of Reserve Group in case of multiple p-time values requires further studies NOTE 2: Used for audio streams where IETF RFC 2833 [22] is also specified and for conference where participants are invited to join the conference. NOTE 3: Not used for TCP transport (see IETF RFC 793 [52]) and media types: a) "message" for MSRP (see IETF RFC 4975 [34]) and b) "application" for BFCP (see IETF RFC 4582 [53]) and ROI FECC (IETF RFC 4573 [66]) because the application control will not use them in a context ReserveValue.			

Table 5.7.1.1.2: Stream Mode

Termination Type	**Stream Type**	**Allowed StreamMode Values**
ALL except ROOT	Any	Send, Receive, Send and Receive, Inactive

5.7.2 Events Descriptor

Table 5.7.2.1: Events Descriptor

Events settable on termination types and stream types:	Yes		
If yes	**Event ID**	**Termination Type**	**Stream Type**
	g/*	IP	Audio, Video
	nt/*	IP	Audio, Video
	rtp/*	IP	Audio, Video
	aasrec/*	IP	Audio, Video
	aasb/*	IP	Audio, Video
	dd/d0-dd	IP	Audio
	it/*	ROOT	Not Applicable
	ocp/mg_overload	ROOT	Not Applicable
	aastts/*	IP	Audio
	asr/*	IP	Audio
	mrp/*	IP	Audio, Video
	mpp/*	IP	Audio, Video
	vavsp/*	IP	Audio, Video
	Hangterm/thb	IP	Audio, Video
	msrpstat/mquota	IP	Message
	mess/*	IP	Message
	fschp/*	IP	Audio, Video
	ECN Failure (ecnrous/fail, 0x010b/0x0001) see clause 5.14.3.37	IP	Audio, Video
	ICE New Peer Reflexive Candidate (ostuncc/nprc, 0x00c3/0x0002) – See clause 5.14.3.40	IP	Any, only applicable for full ICE
	ICE Connectivity Check Result (ostuncc/ccr, 0x00c3/0x0001) – See clause 5.14.3.40	IP	Any, only applicable for full ICE
	TCP connection state change ("BNC change") (tcpbcc/BNCChange, 0x0115/0x0001) see clause 5.14.3.41	IP	TCP based
	TLS session state change ("BNC change") (tlsbsc/BNCChange, 0x0117/0x0001) see clause 5.14.3.42	IP	TLS based
	Detect bearer level message (mcbalg/det, 0x0108/0x0001) – See clause 5.14.3.43	IP	Application

Table 5.7.2.2: Event Buffer Control

Event Buffer Control used:	No

Table 5.7.2.3: Keep Active

Keepactive used on events:	Yes

Table 5.7.2.4: Embedding in event

Embedded events in an event descriptor:	No
Embedded signals in an event descriptor:	No

Table 5.7.2.5: Notify Behaviour

NotifyBehaviour used on events:		No
If yes	**Supported values**	Not Applicable

5.7.3 EventBuffer Descriptor

Table 5.7.3.1: Event Buffer

Event Buffer descriptor used:	No	

5.7.4 Signals Descriptor

Table 5.7.4.1: Signals dependant on termination or streams

Signals settable dependant on termination or streams types:	Yes		
If yes	**Signal ID**	**Termination Type**	**Stream Type / ID**
	cg/*	IP	Audio
	srvtn/*	IP	Audio
	xcg/*	IP	Audio
	an/apf	IP	Audio, video
	int/*	IP	Audio
	biztn/*	IP	Audio
	aasrec/*	IP	Audio, video
	Aasdc	IP	Audio, video
	aasb/*	IP	Audio, video
	conftn/*	All except ROOT	Audio
	Tonegen/*	IP	Audio
	bcg/*	IP	Audio
	aastts/*	IP	Audio
	asr/*	IP	Audio
	mrp/*	IP	Audio, video
	mpp/*	IP	Audio, video
	mess/*	IP	Message
	recmess/*	IP	Message
	fschp/*	IP	Audio, video
	Send Additional Connectivity Check (ostuncc/sacc, 0x00c3/0x0002)	IP	Message, audio, video, only applicable for full ICE
	Send Connectivity Check (ostuncc/scc, 0x00c3/0x0001)	IP	Message, audio, video, only applicable for full ICE
	Establish BNC (tcpbcc/EstBNC, 0x0115/0x0001)	IP	TCP based
	Release BNC (tcpbcc/RelBNC, 0x0115/0x0002)	IP	TCP based
	Establish BNC (tlsbsc/EstBNC, 0x0117/0x0001)	IP	TLS based
	Release BNC (tlsbsc/RelBNC, 0x0117/0x0002)	IP	TLS based
	Send bearer level message (mcbalg/sblm, 0x0108/0x0001) – See clause 5.14.3.43	IP	Application

Table 5.7.4.2: Signal Lists

Signals Lists supported:	Yes	
If yes	**Termination Type Supporting Lists**	IP
	Stream Type Supporting lists	Audio, Video
	Maximum number of signals per signal list	Provisioned

Table 5.7.4.3: Signal type and duration

Signal type and duration supported?	Yes	
If yes	**Signal ID**	**Type or duration override**
	ALL	Both

Table 5.7.4.4: Signal Direction

Signal Direction supported:	No

Table 5.7.4.5: Notify completion

Notify completion supported:	Yes	
If yes	**Signal ID**	**Type of completion supported**
	cg/*, svrtn/*, xcg/*, an/*, int/*, biztn/*, conftn/* , tonegen/*, bcg/*, aasb/*, aastts/*, mpp/*, fschp/*	ALL

Table 5.7.4.6: RequestID Parameter

RequestID Parameter Supported:	Yes

Table 5.7.4.7: Signals played simultaneously

Signals played simultaneously:	No (NOTE)	
If yes	**Signal Ids that can be played simultaneously:**	-
NOTE: Signal for recording audio or multimedia may be played simultaneously with signals for playing announcement.		

Table 5.7.4.8: Keep Active

Keepactive used on signals:	Yes

5.7.5 DigitMap Descriptor

Table 5.7.5.1: DigitMap Descriptor

DigitMaps supported:	NO		
If yes	**DigitMap Name**	**Structure**	**Timers**

5.7.6 Statistics Descriptor

Table 5.7.6.1: Statistics Descriptor

Statistics supported on:	Both

Table 5.7.6.2: Statistics reported on Subtract

Statistics reported on Subtract:		Yes	
If yes	**Statistic IDs Reported**	**Termination Type**	**Stream Type**
	msrpstat/*	IP	Message

5.7.7 ObservedEvents Descriptor

Table 5.7.7.1: ObservedEvents Descriptor

Event detection time supported:	Yes

5.7.8 Topology Descriptor

Table 5.7.8.1: Topology Descriptor

Allowed triples:	(T1,T2, isolate) (T1,T2, oneway) (T1,T2, bothway)

5.7.9 Error Descriptor

Table 5.7.9.1: Error codes sent by the MRFC

Supported H.248.8 Error Codes:	400-403, 406, 410, 411, 421, 422, 430, 431, 442, 443, 444, 446, 458, 501-506, 533
Supported Error Codes defined in packages:	All error codes defined in supported packages are supported.

Table 5.7.9.2: Error codes sent by the MRFP

Supported H.248.8 Error Codes:	400-411, 412, 421,422,430, 431, 432-435,440,441,442, 471, 500-517, 522-539.
Supported Error Codes defined in packages:	All error codes defined in supported packages are supported.

5.8 Command API

5.8.1 Add

Table 5.8.1.1: Descriptors used by Add request

Descriptors used by Add request:	- Events, Signals, Media (TerminationState, LocalControl, Local and Remote)

Table 5.8.1.2: Descriptors used by Add reply

Descriptors used by Add reply:	Events, Signals, Media (TerminationState, LocalControl, Local and Remote)Error When command request excludes an Audit Descriptor, the MGW response shall only include descriptors which contained underspecified or overspecified properties in the command request. Furthermore, only those properties that were underspecified or overspecified in the request shall be sent in the reply. Exceptions to this rule are: - The Error Descriptor - SDP properties returned in "Reserve IMS Resources" and "Reserve and Configure IMS Resources" procedures, as specified in 15.17.2.2 and 15.17.2.4

5.8.2 Modify

Table 5.8.2.1: Descriptors used by Modify request

Descriptors used by Modify request:	Events, Signals, Media (TerminationState, LocalControl, Local and Remote)

Table 5.8.2.2: Descriptors used by Modify reply

Descriptors used by Modify reply:	Events, Signals, Media (TerminationState, LocalControl, Local and Remote),Error When command request excludes an Audit Descriptor, the MGW response shall only include descriptors which contained underspecified or overspecified properties in the command request. Furthermore, only those properties that were underspecified or overspecified in the request shall be sent in the reply. Exceptions to this rule are: - -The Error Descriptor - SDP properties returned in "Configure IMS Resources" procedure as specified in 15.17.2.3.

5.8.3 Subtract

Table 5.8.3.1: Descriptors used in Subtract request

Descriptors used by Subtract request:	Audit (empty) or None

Table 5.8.3.2: Descriptors used in Subtract reply

Descriptors used by Subtract reply:	None

5.8.4 Move

Table 5.8.4.1: Command Move

Move command used:	Yes

Table 5.8.4.2: Descriptor used by Move command

Descriptors used by Move Request:	Events, Signals, Media (TerminationState, LocalControl, Local and Remote)
Descriptors used by Move Reply:	Events, Signals, Media (TerminationState, LocalControl, Local and Remote), Error When command request excludes an Audit Descriptor, the MGW response shall only include descriptors which contained underspecified or overspecified properties in the command request. Furthermore, only those properties that were underspecified or overspecified in the request shall be sent in the reply. Exceptions to this rule are: - -The Error Descriptor

5.8.5 AuditValue

Table 5.8.5.1: Auditvalue

Audited Properties:	**Property Name and Identity**	**Descriptor**
Termination ID	ServiceState: - Root (MGW Audit)	Termination State Descriptor
Termination ID	MGC information (mgcinfo) - individualtermination (NOTE1)	LocalControl Descriptor
Termination ID	For Packages: - Root	Packages Descriptor (NOTE2)
Termination ID	None (MGW Audit) : - Root	Audit (empty) Descriptor
Termination ID	SDPCapNeg Extensions: - sdpe/*	TerminationState Descriptor
Audited Statistics:	Supported Statistics (NOTE3) (NOTE2)	
Audited Signals:	ALL	
Audited Events:	ALL	
Package Audit possible:	Yes	
NOTE1: The purpose to audit an individual Termination is to retrieve MGC Information if supported. NOTE2: Optional NOTE3: The statistics defined in the MSRP Statistics Package can be obtained via the MRFC auditing the MRFP. The supported statistics are msrpstat/nms, msrpstat/nmr, msrpstat/vms and msrpstat/vmr.		

5.8.6 AuditCapabilities

Table 5.8.6.1: AuditCapabilities

Audited Properties:	**Property Name and Identity**	**Descriptor**
	FFS	FFS
Audited Statistics:	None	
Audited Signals:	None	
Audited Events:	None	

5.8.7 Notify

Table 5.8.7.1: Notify

Descriptors used by Notify Request or Reply:	ObservedEvents, Error
NOTE : The Error Descriptor shall not be used in Notify Request.	

5.8.8 ServiceChange

Table 5.8.8.1: Service Change Methods and Reason sent by MRFC

Service Change Methods Supported:	ServiceChange Reasons supported:
Restart (NOTE 1)	"900 Service Restored" "901 Cold Boot", "902 Warm Boot".
Graceful (NOTE 1)	"905 Termination Taken Out Of Service"
Forced (NOTE 1)	"905 Termination Taken Out Of Service"
Handoff (NOTE 1, NOTE 2)	"903 MGC Directed Change"
NOTE : When a Service Change command on the Root termination with a method other than Graceful is sent, the command shall always be sent as the only command in a message. The sending node shall always wait for the reply to a Service Change command on the Root termination with a method other than Graceful before sending further command requests. A Service Change command on the Root termination with method Graceful may be combined with other commands in a single message. NOTE 1: ROOT Only. NOTE 2: Not involving more than 1 MRFC. No support of handoff relates to a network deployment scenario with "primary H.248 systems only", which translates to no geographic redundancy of the MRFC.	

Table 5.8.8.2: Service Change Methods and Reason sent by MRFP:

Service Change Methods Supported:	ServiceChange Reasons supported:
Restart (NOTE 1)	"900 Service Restored", "901 Cold Boot", "902 Warm Boot", "916 Packages Change" (Optional) "917 Capability Change" (Optional).
Graceful (NOTE 1)	"908 MG Impending Failure "
Forced (NOTE 1)	"905 Termination Taken Out Of Service"
Handoff (NOTE 1, NOTE 2)	"903 MGC Directed Change"
Failover (NOTE 3)	"909 MGC Impending Failure"
Disconnected (NOTE 1)	"900 Service Restored" "916 Packages Change" (Optional) "917 Capability Change" (Optional)
NOTE : When a Service Change command on the Root termination with a method other than Graceful is sent, the command shall always be sent as the only command in a message. The sending node shall always wait for the reply to a Service Change command on the Root termination with a method other than Graceful before sending further command requests. A Service Change command on the Root termination with method Graceful may be combined with other commands in a single message. NOTE 1: ROOT only. NOTE 2: In response to a MGC Ordered Re-Register NOTE 3: Only for TISPAN NGN MRF. Not involving more than 1 MRFP. No support of handoff relates to a network deployment scenario with "primary H.248 systems only", which translates to no geographic redundancy of the MGW.	

Table 5.8.8.3: Service Change Address

ServiceChangeAddress used:	No

Table 5.8.8.4: Service Change Delay

ServiceChangeDelay used:	No	
If yes	**Valid time period:**	-

Table 5.8.8.5: Service Change Incomplete Flag

ServiceChange Incomplete Flag used:	No

Table 5.8.8.6: Service Change Version

Version used in ServiceChangeVersion:	2

Table 5.8.8.7: Profile negotiation

Profile negotiation as per H.248.18:	No

5.8.9 Manipulating and Auditing Context Attributes

Table 5.8.9.1: Manipulating and Auditing Context Attributes

Context Attributes Manipulated:	ALL supported attributes (See table 5.5.1.) (NOTE)
Context Attributes Audited:	ALL supported attributes except Priority Indicator (See table 5.5.1.) (NOTE)
NOTE: For ContextAttribute Descriptor, the details of supported attribute include: Floor Control Algorithm (fcpoli/fca), Max Floor Users (fcpoli/mfu), Floor Control Conference Identity (fcsig/fconfid), Floor and Stream Association (fcsig/fsa) and MMCMH Policy (mmcmh/mmcmhp).	

5.9 Generic Command Syntax and Encoding

Table 5.9.1: Encoding

Supported Encodings:	Binary (optional) Text (optional) The receiver shall support: • Short Token Notation • Long Token Notation

5.10 Transactions

Table 5.10.1: Transactions

Maximum number of Transaction Requests / Replies / TransResponseAcks / Segment Replies per message:	10
NOTE : When more than one element are conveyed in one message, it is recommended that this message comprises a Transaction Request / Transaction Reply / Transaction Pending plus a Transaction Response Ack.	

Table 5.10.2: Segmentation

Segmentation Supported:	UDP : No SCTP : Inherent in transport
NOTE: The H.248 Segmentation Package according Annex E.14 of H.248.1 Version 3 is intended for H.248 transport technologies without the capability of automatic message segmentation. This method is not required for UDP- or SCTP-based H.248 signalling transport in this Profile.	

Table 5.10.3: Commands per Transaction Request

Maximum number of commands per Transaction request:	Unlimited

Table 5.10.4: Commands per Transaction Reply

Maximum number of commands per Transaction reply:	Unlimited

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Table 5.10.5: Optional Commands

Commands able to be marked "Optional":	ALL
NOTE: The meaning of this table is that if one of the listed commands failed then the possibly present subsequent command within the same transaction will be processed.	

Table 5.10.6: Transaction Timers

Transaction Timer:	**Value**
NormalMGExecutionTime	Provisioned
NormalMGCExecutionTime	Provisioned
MGOriginatedPendingLimit	Provisioned
MGCOriginatedPendingLimit	Provisioned
MGProvisionalResponseTimerValue	Provisioned
MGCProvisionalResponseTimerValue	Provisioned

5.11 Messages

It is recommended that MRFP and MRFC names are in the form of fully qualified domain name. For example the domain name of the MRFC may be of the form MRFC1.whatever.net and the name of the MRFP may be of the form mg1.whatever.net.

The fully qualified domain name will be used by the MRFP and MRFC as part of the "Message Identifier" in the H.248 messages which identifies the originator of the message.

The MRFC domain name is provisioned in the MRFP or retrieved from the DNS using SRV records.

The use of a domain name provides the following benefits:

- MRFPs and MRFCs are identified by their domain name, not their network addresses. Several addresses can be associated with a domain name. If a command cannot be forwarded to one of the network addresses, implementations shall retry the transmission using another address.

- MRFPs and MRFCs may move to another platform. The association between a logical name (domain name) and the actual platform are kept in the Domain Name Service (DNS). MRFP and MRFC shall keep track of the record's time-to-live read from the DNS. They shall query the DNS to refresh the information if the time-to-live has expired.

The domain name may be used by MRFC/MRFP for authentication purposes.

5.12 Transport

Table 5.12.1: Transport

Supported Transports:	Transport over SCTP shall be supported and shall conform to Recommendation H.248.4 [4]. Support of UDP is optional, dependent on a network operator's decision, based on the network configuration. • SCTP(recommended) (NOTE1). • UDP(optional).
NOTE: If using SCTP as defined in IETF RFC 2960 [8], the MRFP shall always be the node to perform the "Initiation". NOTE1: H.248 is "SCTP user" in this case of H.248/SCTP/IP based transport according ITU-T Rec. H.248.4. The number of used SCTP Streams for traffic of the H.248 Control Association must be defined, see clause 8/H.248.4. A single SCTP Stream is the default assumption ("Single-Stream Mode") in this Profile.	

Table 5.12.2: Segmentation

Segmentation Supported:	No

Table 5.12.3: Control Association Monitoring

Control Association Monitoring Supported:	Monitoring mechanism is dependent on used H.248 transport • **SCTP**: inherent capability of SCTP (NOTE) • **UDP**: 1. H.248.14 (MRFP-driven monitoring) 2. Empty AuditValue on ROOT (MRFC-driven monitoring)
NOTE: Use of H.248.14 for this is FFS.	

5.13 Security

Table 5.13.1: Security

Supported Security:	None
NOTE: Both the MRFC and MRFP are assumed to be within a secure IP zone of a single operator.	

5.14 Packages

5.14.1 Mandatory Packages

Table 5.14.1: Mandatory packages

Mandatory Packages		
Package Name / Reference	**Package ID**	**Version**
Generic (see ITU-T Recommendation H.248.1 [3])	g, (0x0001)	1
Base Root (see ITU-T Recommendation H.248.1 [3])	root, (0x0002)	2
Network (see ITU-T Recommendation H.248.1 [3])	nt, (0x000b)	1
Hanging Termination Detection (see ITU-T Recommendation H.248.36 [30]).	hangterm, (0x0098)	1

5.14.2 Optional Packages

Table 5.14.2: Optional packages

Optional Packages			
Package Name / Reference	**Package ID**	**Version**	**Support dependent on:**
DTMF Detection Package (see ITU-T Recommendation H.248.1 [3] Annex E.6);	dd, (0x0006)	1	Support is mandatory if DTMF Detection is supported.
Tone Generator Package (see ITU-T Recommendation H.248.1 [3])	tonegen, (0x0003)	1	This package is "extension only". It must be supported if extended but shall not be published over the protocol. It is here for information only.
Basic Call Progress Tones Generator with Directionality(see ITU-T Recommendation Q.1950 [13])	bcg, (0x0023)	1	If CS type Services provided by network
Call Progress Tones Generator (see ITU-T Recommendation H.248.1 3])	cg, (0x0007)	1	If CS type Services provided by network
Basic Services Tones Generator (see ITU-T Recommendation Q.1950 [13])	srvtn, (0x0025)	1	If CS type Services provided by network
Expanded Call Progress Tones Generator (see ITU-T Recommendation Q.1950 [13])	xcg, (0x0024)	1	If CS type Services provided by network
Basic Announcement Syntax (see ITU-T Recommendation H.248.9 [6])	bannsyx, (0x0047)	1	Support is optional if playing announcement is supported.
Voice Variable Syntax (see ITU-T Recommendation H.248.9 [6])	vvsyx, (0x0048)	1	Support is optional if playing announcement is supported.
Announcement Set Syntax (see ITU-T Recommendation H.248.9 [6])	setsyx, (0x0049)	2	Support is optional if playing announcement is supported.
General text Variable type (see ITU-T Recommendation H.248.9 [6])	phrsyx, (0x004a)	2	Support is optional if playing announcement is supported.
Advanced Audio Server Base (see ITU-T Recommendation H.248.9 a1 [26])	aasb, (0x0033)	2	Support is optional if playing announcement is supported.
AAS Recording package (see ITU-T Recommendation H.248.9 [6])	aasrec, (0x0035)	1	Support is optional if Audio Record is supported.
AAS segment management (see ITU-T Recommendation H.248.9 [6])	aassm, (0x0036)	1	
Generic Announcement (see ITU-T Recommendation H.248.7 [5])	an, (0x001d)	2	Support is mandatory if playing announcement is supported.
Intrusion Tones Generation (see ITU-T Recommendation Q.1950 [13])	int, (0x0027)	1	If CS type Services provided by network
Business Tones Generation (see ITU-T Recommendation Q.1950 [13])	biztn, (0x0028)	1	If CS type Services provided by network
Conferencing Tones Generation (see ITU-T Recommendation H.248.27 [12])	conftn, (0x0038)	1	Support is optional and may be used if Audio Conference is supported.
Inactivity Timer (see ITU-T Recommendation H.248.14 [9])	it, (0x0045)	1	Support is mandatory if UDP transport is enabled for H.248 messages.
MGC Information Package (see ITU-T Recommendation H.248.45,	mgcinfo, (0x00a0)	1	This package may be supported as an operator option. For this profile the information string shall be limited to 32 octets in length.
Advanced audio server base package for TTS enhancement (see ITU-T Recommendation H.248.9 a1 [26])	aastts, (0x00a8)	1	Support is mandatory if Text to Speech is supported.
ASR package (see ITU-T Recommendation H.248.9 a1 [26])	asr, (0x00a6)	1	Support is mandatory if Automatic Speech Recognition is supported.

Multimedia Recording Package (see ITU-T Recommendation H.248.9 a1 [26])	mrp, (0x00b3)	1	Support is mandatory if Multimedia recording is supported.
Multimedia play package (see ITU-T Recommendation H.248.9 a1 [26])	mpp, (0x00a9)	1	Support is mandatory if Multimedia announcement file is supported.
Overload Control Package (see ITU-T Recommendation H.248.11 [7])	ocp, (0x0051)	1	
RTP Package (see ITU-T Recommendation H.248.1 [3])	rtp, (0x000c)	1	
MSRP Statistics Package (see ITU-T Recommendation H.248.69 [35])	msrpstat, (0x00ea)	1	Support is mandatory if Message conference is supported.
Play Message Package (see ITU-T Recommendation H.248.69 [35])	mess, (0x00ec)	1	Support is mandatory if Message conference is supported.
Message Filtering Package (see ITU-T Recommendation H.248.69 [35])	mf, (0x00ef)	1	Support is mandatory if Message conference is supported.
Record Message Package (see ITU-T Recommendation H.248.69 [35])	recmess, (0x00f1)	1	Support is mandatory if Message conference is supported.
Floor Control Package (see ITU-T Recommendation H.248.19 [33])	fcp, (0x006e)	2	Support is mandatory if Floor control is supported.
Floor Control Policy Package (see ITU-T Recommendation H.248.19 [33])	fcpoli, (0x00ab)	1	Support is mandatory if Floor control is supported.
Floor Status Change Handling Package (see ITU-T Recommendation H.248.19 [33])	fschp, (0x00aa)	1	Support is mandatory if Floor control is supported.
Floor Control Signalling Package (see ITU-T Recommendation H.248.19 [33])	fcsig, (0x00e5)	1	Support is mandatory if Floor control is supported.
Explicit Congestion Notification for RTP-over-UDP Support (see see ITU-T Recommendation H.248.82 [44])	ecnrous (0x010b)	1	Support of ECN feature
Diffserv (ITU-T Recommendation H.248.52 [43])	ds, (0x008b)	2	Support of MPS
MG Act-as STUN Server (ITU-T Recommendation H.248.50 [47])	mgastuns (0x00c2)	1	Support of incoming STUN connectivity checks. Applicable for ICE lite and full ICE
Originate STUN Continuity Check (see ITU-T Recommendation H.248.50 [47])	ostuncc (0x00c3)	1	Support of originating STUN connectivity checks Only applicable for full ICE
TCP basic connection control (ITU-T Recommendation H.248.89 [54])	tcpbcc, (0x0115)	1	Support of TCP based media.
TLS basic session control (ITU-T Recommendation H.248.90 [55])	tlsbsc, (0x0117)	1	Support of TCP based media using TLS. Support is mandatory if IMS media plane security using the pre-shared key (PSK) ciphersuites for TLS is supported.
MGC Controlled Bearer Level ALG (see ITU-T Recommendation H.248.78 [65])	mcbalg (0x0108)	2	Support of MGC controlled bearer level ALG functionality for CLUE message handling in telepresence.
Enhanced Revised Offer/Answer SDP Support ([ITU-T Recommendation H.248.80 [70])	eroas, (0x0109)	1	Support of the SDP Capability Negotiation syntax
Remote Pause and Resume Package (see ITU-T Recommendation H.248.98 [76])	rempr, (0x0123)	1	Support is mandatory if MMCMH feature is supported. Allows the MRFC to request that the MRFP issue a request to a remote endpoint to pause (and subsequently resume) the transmission of an RTP media stream.
Multi-stream Multiparty Conferencing Media Handling Package (see Annex C)	mmcmh, (0x????)	1	Support is mandatory if MMCMH feature is supported. Defines functionality that allows the MRFP to interconnect video media flows with different StreamIDs and to autonomously determine the mix of a video streams in a conference dependent on the active speaker. For example, everyone sees the active speaker and he sees the previous speaker in a normal resolution, all other conference participants (or the most recent previous speakers) are seen in low resolution.

5.14.3 Package Usage Information

5.14.3.1 Generic Package

Table 5.14.3.1.1: Package Usage Information for Generic Package

Properties	**Mandatory/ Optional**	**Used in command:**	**Supported Values:**	**Provisioned Value:**
None	-	-	-	-
Signals	**Mandatory/ Optional**	**Used in command:**		**Duration Provisioned Value:**
None	-	-		-
	Signal Parameters	**Mandatory/ Optional**	**Supported Values:**	**Duration Provisioned Value:**
	-	-	-	-
Events	**Mandatory/ Optional**	**Used in command:**		
Cause (g/cause, 0x0001/0x0001)	M	ADD, MOD, NOTIFY		
	Event Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	None	-	-	-
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	General Cause (Generalcause, 0X0001)	M	"NR" Normal Release (0x0001) "UR" Unavailable Resources (0x0002) "FT" Failure, Temporary (0x0003) "FP" Failure, Permanent (0x0004) "IW" Interworking Error (0x0005) "UN" Unsupported (0x0006)	-
	Failure Cause (FailureCause, 0x0002)	O	Octet String	-
Signal Completion. (g/sc, 0x0001/0x0002)	M	ADD, MOD, MOVE, NOTIFY		
	Event Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	None	-	-	-
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	Signal Identity (SigID, 0x0001)	M	pkgdName syntax	-
	Termination Method (Meth, 0x0002)	M	"TO" (0x0001) Signal timed out or otherwise completed on its own "EV" (0x0002) Interrupted by event "SD" (0x0003) Halted by new Signals descriptor "NC" (0x0004) Not completed, other cause	-
	Signal List Id (SLID, 0x0003)	O	Integer	Not Applicable
	Request ID (RID, 0x0004)	O	String indicating the Request ID	-

Statistics	Mandatory/ Optional	Used in command:	Supported Values:
None	-	-	-
Error Codes	**Mandatory/ Optional**		
None	-		

5.14.3.2 Base Root Package

Table 5.14.3.2.1: Package Usage Information for Base Root Package

Properties	Mandatory/ Optional	Used in command:	Supported Values:	Provisioned Value:
MaxNrOfContexts (root/maxNumberOfContexts, 0x0002/0x0001)	M	AuditValue	1 and up	Implementation Specific
MaxTerminationsPerContext (root/maxTerminationsPerContext, 0x0002/0x0002)	O	AuditValue	See 5.4	Implementation Specific
normalMGExecutionTime (root/normalMGExecutionTime, 0x0002/0x0003)	O	AuditValue	Integer	Operator Defined
normalMGCExecutionTime (root/normalMGCExecutionTime, 0x0002/0x0004)	O	AuditValue	Integer	Operator Defined
MGProvisionalResponseTimerValue（root/ MGProvisionalResponseTimerValue, 0x0002/0x0005）	O	AuditValue	Integer(NormalMGExecutionTime + networkdelay)	Operator Defined
MGCProvisionalResponseTimerValue (root/ MGCProvisionalResponseTimerValue, 0x0002/0x0006)	O	AuditValue	Integer (initially NormalMGCExecutionTime + networkdelay)	Operator Defined
MGCOriginatedPendingLimit (root/ MGCOriginatedPendingLimit, 0x0002/0x0007)	O	AuditValue	Integer	Operator Defined
MGOriginatedPendingLimit (root/ MGOriginatedPendingLimit, 0x0002/0x0008)	O	AuditValue	Integer	Operator Defined
Signals	**Mandatory/ Optional**	**Used in command:**		**Duration Provisioned Value:**
None	**-**	**-**		**< -**
	Signal Parameters	**Mandatory/ Optional**	**Supported Values:**	**Duration Provisioned Value:**
	-	-	-	-
Events	**Mandatory/ Optional**	**Used in command:**		
None	-	-		
	Event Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	-	-	-	-
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	-	-	-	-
Statistics	**Mandatory/ Optional**	**Used in command:**		**Supported Values:**
None	-	-		-
Error Codes	**Mandatory/ Optional**			
None	-			

5.14.3.3 Overload Control Package

Table 5.14.3.3.1: Package Usage Information for Overload Control Package

Properties	**Mandatory/ Optional**	**Used in command:**	**Supported Values:**	**Provisioned Value:**
None	-	-	-	
Signals	**Mandatory/ Optional**	**Used in command:**		**Duration Provisioned Value:**
None	-	-		-
	Signal Parameters	**Mandatory/ Optional**	**Supported Values:**	**Duration Provisioned Value:**
	-	-	-	-
Events	**Mandatory/ Optional**	**Used in command:**		
MG_Overload. (ocp/ mg_overload, 0x0051/0x0001)	M	ADD, MOD, NOTIFY		
	Event Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	-	-	-	-
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	-	-	-	-
Statistics	**Mandatory/ Optional**	**Used in command:**		**Supported Values:**
None	-	-		-
Error Codes	**Mandatory/ Optional**			
None	-			

5.14.3.4 Network Package

Table 5.14.3.4.1: Package Usage Information for Network Package

Properties	**Mandatory/ Optional**	**Used in command:**	**Supported Values:**	**Provisioned Value:**
Maximum Jitter Buffer (nt /jit, 0x000b/0x0007)	M	ADD, MOD, MOVE	ALL	-
Signals	**Mandatory/ Optional**	**Used in command:**		**Duration Provisioned Value:**
None	-	-		-
	Signal Parameters	**Mandatory/ Optional**	**Supported Values:**	**Duration Provisioned Value:**
	-	-	-	-
Events	**Mandatory/ Optional**	**Used in command:**		
network failure(nt / netfail, 0x000b/0x0005)	M	ADD, MOD, MOVE, NOTIFY		
	Event Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	none	-	-	-
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	cause(cs,0x0001)	M	ALL	-
quality alert (nt / qualert, 0x000b/0x0006)	M	ADD, MOD, MOVE, NOTIFY		
	Event Parameters	**Mandatory/** Optional	**Supported** Values:	Provisioned Value:
	Threshold(th,0x0001)	M	0 to 99	
	ObservedEvent Parameters	**Mandatory/** Optional	**Supported** Values:	Provisioned Value:
	Threshold(th,0x0001)	M	0 to 99	

Statistics	Mandatory/ Optional	Used in command:	Supported Values:
Duration(nt / dur, 0x000b/0x0001)	M	AUDITVALUE	ALL
Octets Sent (nt / os, 0x000b/0x0002)	M	AUDITVALUE	ALL
Octets Received(nt / or, 0x000b/0x0003)	M	AUDITVALUE	ALL
Error Codes	**Mandatory/ Optional**		
-	-		

5.14.3.5 RTP Package

Table 5.14.3.5.1: Package Usage Information for RTP Package

Properties	Mandatory/ Optional	Used in command:	Supported Values:	Provisioned Value:
None	-	-	-	-
Signals	**Mandatory/ Optional**	**Used in command:**		**Duration Provisioned Value:**
None	-	-		-
	Signal Parameters	**Mandatory/ Optional**	**Supported Values:**	**Duration Provisioned Value:**
	-	-	-	-
Events	**Mandatory/ Optional**	**Used in command:**		
Payload Transition, (rtp/pltrans, 0x000C/0x0001)	M	ADD, MOD, MOVE, NOTIFY		
	Event Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	None	-	-	-
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	rtppayload (rtppltype, 0x0001)	M	A valid encoding name	-

Statistics	Mandatory/ Optional	Used in command:	Supported Values:
Packets Sent, (rtp/ps, 0x000C/0x0004)	O	AUDITVALUE, SUBTRACT REPLY	ALL
Packets Received, (rtp/pr, 0x000C/0x0005)	O	AUDITVALUE , SUBTRACT REPLY	ALL
Packet Loss, (rtp/pl, 0x000C/0x0006)	O	AUDITVALUE , SUBTRACT REPLY	ALL
Jitter, (rtp/jit, 0x000C/0x0007)	O	AUDITVALUE , SUBTRACT REPLY	ALL
Delay, (rtp/delay, 0x000C/0x0008)	O	AUDITVALUE , SUBTRACT REPLY	ALL
Error Codes	**Mandatory/ Optional**		
None	-		

5.14.3.6 DTMF Detection Package

Table 5.14.3.6.1: Package Usage Information for DTMF Detection Package

Properties	**Mandatory/ Optional**	**Used in command:**	**Supported Values:**	**Provisioned Value:**
None	-	-	-	-
Signals	**Mandatory/ Optional**	**Used in command:**		**Duration Provisioned Value:**
None	-	-		-
	Signal Parameters	**Mandatory/ Optional**	**Supported Values:**	**Duration Provisioned Value:**
	-	-	-	-
Events	**Mandatory/ Optional**	**Used in command:**		
DTMF character 0 (dd/d0,0x0006/0x0010) DTMF character 1 (dd/d1,0x0006/0x0011) DTMF character 2 (dd/d2,0x0006/0x0012) DTMF character 3 (dd/d3,0x0006/0x0013) DTMF character 4 (dd/d4,0x0006/0x0014) DTMF character 5 (dd/d5,0x0006/0x0015) DTMF character 6 (dd/d6,0x0006/0x0016) DTMF character 7 (dd/d7,0x0006/0x0017) DTMF character 8 (dd/d8,0x0006/0x0018) DTMF character 9 (dd/d9,0x0006/0x0019) DTMF character * (dd/ds,0x0006/0x0020) DTMF character # (dd/do,0x0006/0x0021) DTMF character A (dd/da,0x0006/0x001a) DTMF character B (dd/db,0x0006/0x001b) DTMF character C (dd/dc,0x0006/0x001c) DTMF character D (dd/dd,0x0006/0x001d)	M	ADD, MOD, NOTIFY		
	Event Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	-	-	-	-
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	-	-	-	-
Statistics	**Mandatory/ Optional**	**Used in command:**		**Supported Values:**
None	-	-		-
Error Codes	**Mandatory/ Optional**			
None	-			

5.14.3.7 Call Progress Tones Generator Package

Table 5.14.3.7.1: Package Usage Information for Call Progress Tones Generator Package

Properties	**Mandatory/ Optional**	**Used in command:**	**Supported Values:**	**Provisioned Value:**
None	-	-	-	-
Signals	**Mandatory/ Optional**	**Used in command:**		**Duration Provisioned Value:**
Dial Tone, (cg/dt, 0x0007/0x030)	M	ADD, MOD, MOVE		Value
	Signal Parameters	**Mandatory/ Optional**	**Supported Values:**	**Duration Provisioned Value:**

Ringing Tone, (cg/rt, 0x0007/0x031) Busy Tone, (cg/bt, 0x0007/0x032) Congestion Tone, (cg/ct, 0x0007/0x033) Special Information Tone, (cg/sit, 0x0007/0x034) Warning Tone, (cg/wt, 0x0007/0x035) Payphone Recognition Tone, (cg/pt, 0x0007/0x036) Call Waiting Tone, (cg/cw, 0x0007/0x037) Caller Waiting Tone, (cg/cr, 0x0007/0x038)	-	-	-	-
Events	**Mandatory/ Optional**	**Used in command:**		
None	-	-		
	Event Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	-	-	-	-
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	-	-	-	-
Statistics	**Mandatory/ Optional**	**Used in command:**	**Supported Values:**	
None	-	-	-	
Error Codes	**Mandatory/ Optional**			
None	-			

5.14.3.8 Basic Services Tones Generator Package

Table 5.14.3.8.1: Package Usage Information for Basic Services Tones Generator Package

Properties	**Mandatory/ Optional**	**Used in command:**	**Supported Values:**	**Provisioned Value:**
None	**-**	**-**	**-**	**-**
Signals	**Mandatory/ Optional**	**Used in command:**		**Duration Provisioned Value:**
Recall Dial Tone (srvtn/rdt,0x0025/0x004f) Confirmation Tone (srvtn/conf,0x0025/0x0050) Held Tone (srvtn/ht,0x0025/0x0051) Message Waiting Tone (srvtn/mwt,0x0025/0x0052)	**O**	**ADD, MOD, MOVE**		**Value**
	Signal Parameters	**Mandatory/ Optional**	**Supported Values:**	**Duration Provisioned Value:**
	Tone Direction (btd, 0x0001)	M	Internal / External	Default=External
Events	**Mandatory/ Optional**	**Used in command:**		
None	-	-		
	Event Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**

	-	-	-	-
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	-	-	-	-
Statistics	**Mandatory/ Optional**	**Used in command:**		**Supported Values:**
None	-	-		-
Error Codes	**Mandatory/ Optional**			
None	-			

5.14.3.9 Expanded Call Progress Tones Generator Package

Table 5.14.3.9.1: Package Usage Information for Expanded Call Progress Tones Generator Package

Properties	**Mandatory/ Optional**	**Used in command:**	**Supported Values:**	**Provisioned Value:**
None	-	-	-	-
Signals	**Mandatory/ Optional**	**Used in command:**		**Duration Provisioned Value:**
Comfort Tone (xcg/cmft,0x0024/0x004a) Off-hook warning Tone (xcg/roh, 0x0024/0x004b) Negative Acknowledgement (xcg/nack,0x0024/0x004c) Vacant Number Tone (xcg/vac, 0x0024/0x004d) Special Conditions Dial Tone (xcg/spec,0x0024/0x004e)	O	ADD, MOD, MOVE		Value
	Signal Parameters	**Mandatory/ Optional**	**Supported Values:**	**Duration Provisioned Value:**
	Tone Direction (btd, 0x0001)	M	Internal / External	Default=External
Events	**Mandatory/ Optional**	**Used in command:**		
None	-	-		
	Event Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	-	-	-	-
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	-	-	-	-
Statistics	**Mandatory/ Optional**	**Used in command:**		**Supported Values:**
None	-	-		-
Error Codes	**Mandatory/ Optional**			
None	-			

5.14.3.10 Basic Announcement Syntax Package

Table 5.14.3.10.1: Package Usage Information for Basic Announcement Syntax Package

Properties	**Mandatory/ Optional**	**Used in command:**	**Supported Values:**	**Provisioned Value:**
None	-	-	-	-
Signals	**Mandatory/ Optional**	**Used in command:**		**Duration Provisioned Value:**
None	-	-		-
	Signal Parameters	**Mandatory/ Optional**	**Supported Values:**	**Duration Provisioned Value:**
	-	-	-	-

Events	Mandatory/ Optional	Used in command:		
None	-	-		
	Event Parameters	Mandatory/ Optional	Supported Values:	Provisioned Value:
	-	-	-	-
	ObservedEvent Parameters	Mandatory/ Optional	Supported Values:	Provisioned Value:
	-	-	-	-
Statistics	Mandatory/ Optional	Used in command:	Supported Values:	
None	-	-	-	
Error Codes	Mandatory/ Optional			
None	-			

5.14.3.11 Voice Variable Syntax Package

Table 5.14.3.11.1: Package Usage Information for Voice Variable Syntax Package

Properties	Mandatory/ Optional	Used in command:	Supported Values:	Provisioned Value:
None	-	-	-	-
Signals	Mandatory/ Optional	Used in command:		Duration Provisioned Value:
None	-	-		-
	Signal Parameters	Mandatory/ Optional	Supported Values:	Duration Provisioned Value:
	-	-	-	-
Events	Mandatory/ Optional	Used in command:		
None	-	-		
	Event Parameters	Mandatory/ Optional	Supported Values:	Provisioned Value:
	-	-	-	-
	ObservedEvent Parameters	Mandatory/ Optional	Supported Values:	Provisioned Value:
	-	-	-	-
Statistics	Mandatory/ Optional	Used in command:	Supported Values:	
None	-	-	-	
Error Codes	Mandatory/ Optional			
None	-			

5.14.3.12 Announcement Set Syntax Package

Table 5.14.3.12.1: Package Usage Information for Announcement Set Syntax Package

Properties	Mandatory/ Optional	Used in command:	Supported Values:	Provisioned Value:
None	-	-	-	-
Signals	Mandatory/ Optional	Used in command:		Duration Provisioned Value:
None	-	-		-
	Signal Parameters	Mandatory/ Optional	Supported Values:	Duration Provisioned Value:
	-	-	-	-
Events	Mandatory/ Optional	Used in command:		
None	-	-		
	Event Parameters	Mandatory/ Optional	Supported Values:	Provisioned Value:
	-	-	-	-

	ObservedEvent Parameters	Mandatory/ Optional	Supported Values:	Provisioned Value:
	-	-	-	-
Statistics	**Mandatory/ Optional**	**Used in command:**		**Supported Values:**
None	-	-		-
Error Codes	**Mandatory/ Optional**			
None	-			

5.14.3.13 General Text Variable Type Package

Table 5.14.3.13.1: Package Usage Information for General Text Variable Type Package

Properties	**Mandatory/ Optional**	**Used in command:**	**Supported Values:**	**Provisioned Value:**
None	-	-	-	-
Signals	**Mandatory/ Optional**	**Used in command:**		**Duration Provisioned Value:**
None	-	-		-
	Signal Parameters	**Mandatory/ Optional**	**Supported Values:**	**Duration Provisioned Value:**
	-	-	-	-
Events	**Mandatory/ Optional**	**Used in command:**		
None	-	-		
	Event Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	-	-	-	-
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	-	-	-	-
Statistics	**Mandatory/ Optional**	**Used in command:**		**Supported Values:**
None	-	-		-
Error Codes	**Mandatory/ Optional**			
None	-			

5.14.3.14 Advanced Audio Server Base Package

Table 5.14.3.14.1: Package Usage Information for Advanced Audio Server Base Package

Properties	**Mandatory/ Optional**	**Used in command:**	**Supported Values:**	**Provisioned Value:**
None	-	-	-	-
Signals	**Mandatory/ Optional**	**Used in command:**		**Duration Provisioned Value:**
Play (aasb/play, 0x0033/0x0001)	M	ADD, MOD, MOVE, AUDITVALUE,		-
	Signal Parameters	**Mandatory/ Optional**	**Supported Values:**	**Duration Provisioned Value:**
	Announcement (an, 0x0001)	M	Any String	-
	Iterations (it,0x0002)	O	Any Integer	1
	Interval(iv,0x0003)	O	0 upwords	-
	Announcement Direction(di,0x0006)	M	Ext (0x01) Int (0x02)	Default=External
Events	**Mandatory/ Optional**	**Used in command:**		
Audio operation failure (aasb/audfail, 0x0033 /0x0001)	M	NOTIFY		
	Event Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	-	-	-	-

	ObservedEvent Parameters	Mandatory/ Optional	Supported Values:	Provisioned Value:
	Return Code(rc, 0x0001)	M	FFS	-
Statistics	**Mandatory/ Optional**	**Used in command:**		**Supported Values:**
None	-	-		-
Error Codes	**Mandatory/ Optional**			
None	-			

5.14.3.15 Basic Call Progress Tones Generator with Directionality

Table 5.14.3.15.1: Package Usage Information For Basic Call Progress Tones Generator with Directionality Package

Properties	**Mandatory/ Optional**	**Used in command:**	**Supported Values:**	**Provisioned Value:**
None	-	-	-	-
Signals	**Mandatory/ Optional**	**Used in command:**		**Duration Provisioned Value:**
Dial Tone (bcg/bdt, 0x0023/0x0040) Ringing Tone (bcg/brt,0x0023/0x0041) Busy Tone (bcg/bbt,0x0023/0x0042) Congestion Tone (bcg/bct,0x0023/0x0043) Special Information Tone (bcg/bsit,0x0023/0x0044) Warning Tone (bcg/bwt,0x0023/0x0045) Payphone Recognition Tone (bcg/bpt,0x0023/0x0046) Call Waiting Tone (bcg/bcw,0x0023/0x0047) Caller Waiting Tone (bcg/bcr, 0x0023/0x0048) Pay Tone (bcg/bpy, 0x0023/0x0049)	O	ADD, MOD, MOVE		Value
	Signal Parameters	**Mandatory/ Optional**	**Supported Values:**	**Duration Provisioned Value:**
	Tone Direction (btd, 0x0001)	M	Internal / External	Default=External
Events	**Mandatory/ Optional**	**Used in command:**		
None	-	-		
	Event Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	-	-	-	-
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	-	-	-	-
Statistics	**Mandatory/ Optional**	**Used in command:**		**Supported Values:**
None	-	-		-
Error Codes	**Mandatory/ Optional**			
None	-			

5.14.3.16 AAS Recording Package

Table 5.14.3.16.1: Package Usage Information for AAS Recording Package

Properties	**Mandatory/ Optional**	**Used in command:**	**Supported Values:**	**Provisioned Value:**
Maximum temporary record life (aasrec/maxtrl 0x0035/0x0003)	M	ADD, MOD, MOVE	ALL	-
Signals	**Mandatory/ Optional**	**Used in command:**		**Duration Provisioned Value:**
PlayRecord (aasrec/playrec, 0x0035/0x0002)	M	ADD, MOD, MOVE		-
	Signal Parameters	**Mandatory/ Optional**	**Supported Values:**	**Duration Provisioned Value:**
	Record Length Timer(rlt, 0x0008)	O	ALL	-
	Recording Identifier (rid, 0x0009)	M	ALL	-
	EndInputKey(eik, 0x0010)	O	ALL	
	record direction (rd,0x0011)	O	Ext (0x01), Int(0x02)	Ext (0x01)
Make persistent (aasrec/makepers, 0x0035/0x0003)	Not Used	-		
	Signal Parameters	**Mandatory/ Optional**	**Supported Values:**	
Events	**Mandatory/ Optional**	**Used in command:**		
Audio operation failure (aasrec/audfail, 0x0035/0x0001)	M	NOTIFY		
	Event Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	None	-	-	-
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	Return Code(rc, 0x0001)	M	ALL	-
PlayRecord success(aasrec/precsucc, 0x0035/0x0002))	M	NOTIFY		
	Event Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	None	-	-	-
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	Recording result (res,0x0003)	M	ALL	-
	Recording id (ri, 0x0004))	M	ALL	-
	Record duration (rdur,0x0005)	M	ALL	-
Statistics	**Mandatory/ Optional**	**Used in command:**	**Supported Values:**	
None	-	-	-	
Error Codes	**Mandatory/ Optional**			
None	-			

5.14.3.17 Multimedia Play Package

Table 5.14.3.17.1: Package Usage Information for Multimedia Play Package

Properties	**Mandatory/ Optional**	**Used in command:**	**Supported Values:**	**Provisioned Value:**
None	-	-	-	-
Signals	**Mandatory/ Optional**	**Used in command:**		**Duration Provisioned Value:**
Play (mpp/play, 0x00a9/0x0001)	M	ADD, MOD, MOVE		-
	Signal Parameters	**Mandatory/ Optional**	**Supported Values:**	**Duration Provisioned Value:**
	Announcement (an,0x0001)	M	ALL	-
	Interations (it,0x0002)	O	Any Integer	1
	Interval (iv,0x0003)	O	0 upwards	-
	Announcement Direction (di, 0x0006)	O	Ext (0x01) Int (0x02)	Default=External
Events	**Mandatory/ Optional**	**Used in command:**		
None	-	-		
	Event Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	-	-	-	-
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	-	-	-	-
Statistics	**Mandatory/ Optional**	**Used in command:**	**Supported Values:**	
None	-	-	-	
Error Codes	**Mandatory/ Optional**			
None	-			

5.14.3.18 Generic Announcement Package

Table 5.14.3.18.1: Package Usage Information for Generic Announcement Package

Properties	**Mandatory/ Optional**	**Used in command:**	**Supported Values:**	**Provisioned Value:**
None	-	-	-	-
Signals	**Mandatory/ Optional**	**Used in command:**		**Duration Provisioned Value:**
Fixed: Announcement play (an/apf, x001d/0x0001)	M	ADD, MOD, MOVE		-
	Signal Parameters	**Mandatory/ Optional**	**Supported Values:**	**Duration Provisioned Value:**
	Announcement name (an ,0x0001)	M	ALL	-
	Number of cycles (noc ,0x0002)	O	Any Integer	-
	Announcement Variant (av ,0x0003)	O	ALL	-
	Announcement Direction (di ,0x0004)	O	Ext (0x01) Int (0x02)	Default=External

Events	Mandatory/ Optional	Used in command:		
None	-	-		
	Event Parameters	Mandatory/ Optional	Supported Values:	Provisioned Value:
	-	-	-	-
	ObservedEvent Parameters	Mandatory/ Optional	Supported Values:	Provisioned Value:
	-	-	-	-
Statistics	Mandatory/ Optional	Used in command:	Supported Values:	
None	-	-	-	
Error Codes	Mandatory/ Optional			
None	-			

5.14.3.19 Intrusion Tones Generator Package

Table 5.14.3.19.1: Package Usage Information for Intrusion Tones Generator Package

Properties	Mandatory/ Optional	Used in command:	Supported Values:	Provisioned Value:
None	-	-	-	-
Signals	Mandatory/ Optional	Used in command:		Duration Provisioned Value:
Intrusion Pending Tone (int/pend,0x0027/0x0057) Intrusion Tone (int/int,0x0027/0x0058) Intrusion Reminder Tone (int/rem,0x0027/0x0059) Toll Break-In Tone (int/tbi,0x0027/0x005a) Intrusion Queue Tone (int/intque,0x0027/0x005b) Busy Verification Tone (int/bv,0x0027/0x005c)	O	ADD, MOD, MOVE		-
	Signal Parameters	Mandatory/ Optional	Supported Values:	Duration Provisioned Value:
	Tone Direction (btd, 0x0001)	M	Internal / External	Default=External
Events	Mandatory/ Optional	Used in command:		
None	-	-		
	Event Parameters	Mandatory/ Optional	Supported Values:	Provisioned Value:
	-	-	-	-
	ObservedEvent Parameters	Mandatory/ Optional	Supported Values:	Provisioned Value:
	-	-	-	-
Statistics	Mandatory/ Optional	Used in command:	Supported Values:	
None	-	-	-	
Error Codes	Mandatory/ Optional			
None	-			

5.14.3.20 Business Tones Generation Package

Table 5.14.3.20.1: Package Usage Information for Business Tones Generation Package

Properties	**Mandatory/ Optional**	**Used in command:**	**Supported Values:**	**Provisioned Value:**
None	-	-	-	-
Signals	**Mandatory/ Optional**	**Used in command:**		**Duration Provisioned Value:**
Off-Hook Queuing Tone (biztn/ofque,0x0028/0x005d) Expensive Route Warning Tone (biztn/erwt,0x0028/0x005e) Distinctive Dial Tone (biztn/ddt,0x0028/0x005f) Internal Dial Tone (biztn/idt,0x0028/0x0060)	O	ADD, MOD, MOVE		-
	Signal Parameters	**Mandatory/ Optional**	**Supported Values:**	**Duration Provisioned Value:**
	Tone Direction (btd, 0x0001)	M	Internal / External	Default=External
Events	**Mandatory/ Optional**	**Used in command:**		
None	-	-		
	Event Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	-	-	-	-
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	-	-	-	-
Statistics	**Mandatory/ Optional**	**Used in command:**		**Supported Values:**
None	-	-		-
Error Codes	**Mandatory/ Optional**			
None	-			

5.14.3.21 Conferencing Tones Generation Package

Table 5.14.3.21.1: Package Usage Information for Conferencing Tones Generation Package

Properties	**Mandatory/ Optional**	**Used in command:**	**Supported Values:**	**Provisioned Value:**
None	-	-	-	-
Signals	**Mandatory/ Optional**	**Used in command:**		**Duration Provisioned Value:**
Conf. Entrance Tone (conftn/enter, 0x0038/0x0061) Conf. Exit Tone (conftn/exit, 0x0038/0x0062) Conf. Lock Tone (conftn/lock, 0x0038/0x0063) Conf. Unlock Tone (conftn/unlock, 0x0038/0x0064) Time Limit Warning Tone (conftn/timelim, 0x0038/0x0065)	O	ADD, MOD, MOVE		-
	Signal Parameters	**Mandatory/ Optional**	**Supported Values:**	**Duration Provisioned Value:**
	Tone Direction (btd, 0x0001)	M	Internal / External	Default=External
Events	**Mandatory/ Optional**	**Used in command:**		
None	-	-		
	Event Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**

	-	-	-	-
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	-	-	-	-
Statistics	**Mandatory/ Optional**	**Used in command:**		**Supported Values:**
None	-	-		-
Error Codes	**Mandatory/ Optional**			
None	-			

5.14.3.22 Inactivity Timer Package

Table 5.14.3.22.1: Package Usage Information for Inactivity Timer Package

Properties	**Mandatory/ Optional**	**Used in command:**	**Supported Values:**	**Provisioned Value:**
None	-	-	-	-
Signals	**Mandatory/ Optional**	**Used in command:**		**Duration Provisioned Value:**
None	-	-		-
	Signal Parameters	**Mandatory/ Optional**	**Supported Values:**	**Duration Provisioned Value:**
	-	-	-	-
Events	**Mandatory/ Optional**	**Used in command:**		
Inactivity Timeout(it/ito, 0x0045/0x0001)	M	MOD, NOTIFY		
	Event Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	Maximum Inactivity Time(mit, 0x0001)	M	Any integer	-
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	None	-	-	-
Statistics	**Mandatory/ Optional**	**Used in command:**		**Supported Values:**
None	-	-		-
Error Codes	**Mandatory/ Optional**			
None	-			

5.14.3.23 MGC Information Package

Table 5.14.3.23.1: Package Usage Information for MGC Information Package

Properties	**Mandatory/ Optional**	**Used in command:**	**Supported Values:**	**Provisioned Value:**
Data Block(MGCInfo /db, 0x00a0/0x0001)	M	ADD, MOD, AUDITVALUE	A range of 0 to 32 octets	An empty string
Signals	**Mandatory/ Optional**	**Used in command:**		**Duration Provisioned Value:**
None	-	-		-
	Signal Parameters	**Mandatory/ Optional**	**Supported Values:**	**Duration Provisioned Value:**
	-	-	-	-
Events	**Mandatory/ Optional**	**Used in command:**		
None	-	-		
	Event Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	-	-	-	-

	ObservedEvent Parameters	Mandatory/ Optional	Supported Values:	Provisioned Value:
	-	-	-	-
Statistics	**Mandatory/ Optional**	**Used in command:**		**Supported Values:**
None	-	-		-
Error Codes	**Mandatory/ Optional**			
None	-			

5.14.3.24 Advanced audio server base package for TTS enhancement

Table 5.14.3.24.1: Package Usage Information for TTS enhancement package

Properties	**Mandatory/ Optional**	**Used in command:**	**Supported Values:**	**Provisioned Value:**
None	-	-	-	-
Signals	**Mandatory/ Optional**	**Used in command:**		**Duration Provisioned Value:**
Play Segment Identifier (aastts/playsid, 0x00a8/0x0001)	M	ADD, MOD, MOVE		-
	Signal Parameters	**Mandatory/ Optional**	**Supported Values:**	**Duration Provisioned Value:**
	Announcement (an,0x0001)	M	ALL	-
	Iterations (it, 0x0003)	O	0 upwards	1
	Interval (iv,0x0004)	O	0 upwards	-
	Direction (di,0x0005)	O	Ext (0x01) Int(0x02)	Default=External
Play script (aastts/playscript, 0x00a8/0x0002)	M	ADD, MOD,MOVE		-
	Signal Parameters	**Mandatory/ Optional**	**Supported Values:**	**Duration Provisioned Value:**
	Script (script,0x0001)	M	(NOTE 1)	-
	Iterations (it,0x0003)	O	0 upwards	1
	Interval (iv, 0x0004)	O	ALL	-
	Direction (di,0x0005)		Ext (0x01) Int(0x02)	Default=External
Events	**Mandatory/ Optional**	**Used in command:**		
TTS operation failure(aastts/ttsfail, 0x00a8/0x0001)	M	ADD, MOD, NOTIFY		
	Event Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	None	-	-	-
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	Return Code (rc ,0x0001)	M	ALL	-
Statistics	**Mandatory/ Optional**	**Used in command:**		**Supported Values:**
None	-	-		-
Error Codes	**Mandatory/ Optional**			
None	-			
NOTE 1: The value shall comply with the Annex A : "The W3C SSML Profile for TTS function".				

5.14.3.25 ASR Package

Table 5.14.3.25.1: Package Usage Information for ASR Package

Properties	**Mandatory/ Optional**	**Used in command:**	**Supported Values:**	**Provisioned Value:**
None	-	-	-	-
Signals	**Mandatory/ Optional**	**Used in command:**		**Duration Provisioned Value:**
ASR recognition with grammar script(asr/asrwgs, 0x00a6/0x0001)	M	ADD, MOD,MOVE		-
	Signal Parameters	**Mandatory/ Optional**	**Supported Values:**	**Duration Provisioned Value:**
	grammar file (rgs, 0x0002)	M	(NOTE 1)	-
	Recognition grammar script format (rgsf, 0x0004)	O	ABNF (0x0001), XML (0x0002)	ABNF (0x0001)
	recognition mode (rm, 0x0005)	O	Normal (0x0001), Hotword (0x0002)	Normal(0x0001)
	End Input Key (eik, 0x0006)	O	ALL	-
ASR recognition with grammar identifier(asr/asrid, 0x00a6/0x0002)	M	ADD, MOD,MOVE		-
	Signal Parameters	**Mandatory/ Optional**	**Supported Values:**	**Duration Provisioned Value:**
	Recognition grammar identifier (rgid, 0x0002)	M	ALL	-
	Recognition grammar script type (rgst, 0x0003)	Not Used		
	Recognition grammar script format (rgsf, 0x0004)	O	ABNF (0x0001), XML (0x0002)	ABNF (0x0001)
	recognition mode (rm, 0x0005)	O	Normal (0x0001), Hotword (0x0002)	Normal(0x0001)
	End Input Key (eik, 0x0006)	O	ALL	-
Events	**Mandatory/ Optional**	**Used in command:**		
ASR failure (asr/asrfail, 0x00a6/0x0001)	M	ADD, MOD, NOTIFY		
	Event Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	None	-	-	-
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	Return Code (rc,0x0001)	M	ALL	-
ASR success(asr/asrsucc, 0x00a6/0x0002)	M	ADD, MOD, NOTIFY		
	Event Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	None	-	-	-
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	ASR result (asrr, 0x0001)	M	ALL	-
Statistics	**Mandatory/ Optional**	**Used in command:**	**Supported Values:**	
None	-	-	-	
Error Codes	**Mandatory/ Optional**			
None	-			
NOTE 1: The value shall comply with Annex B. "the W3C SRGS Profile for ASR function".				

5.14.3.26 Multimedia Recording Package

Table 5.14.3.26.1: Package Usage Information for Multimedia Recording Package

Properties	**Mandatory/ Optional**	**Used in command:**	**Supported Values:**	**Provisioned Value:**
None	-	-	-	-
Signals	**Mandatory/ Optional**	**Used in command:**		**Duration Provisioned Value:**
PlayRecord (mrp/playrec, 0x00b3/0x0002)	M	ADD, MOD, MOVE		-
	Signal Parameters	**Mandatory/ Optional**	**Supported Values:**	**Duration Provisioned Value:**
	Record Length Timer(rlt, 0x0008)	M	ALL	-
	Recording Identifier (rid, 0x0009)	M	ALL	-
	EndInputKey(eik, 0x0010)	O	ALL	-
	record direction (rd,0x0011)	O	Ext（0x01）, Int(0x02)	Ext (0x01)
Events	**Mandatory/ Optional**	**Used in command:**		
none	-	-		
	Event Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	-	-	-	-
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	-	-	-	-
Statistics	**Mandatory/ Optional**	**Used in command:**	**Supported Values:**	
None	-	-	-	
Error Codes	**Mandatory/ Optional**			
None	-			

5.14.3.27 Tone Generator Package

Table 5.14.3.27.1: Package Usage Information for Tone Generator Package

Properties	**Mandatory/ Optional**	**Used in command:**	**Supported Values:**	**Provisioned Value:**
None	-	-	-	-
Signals	**Mandatory/ Optional**	**Used in command:**		**Duration Provisioned Value:**
Play Tone (tonegen/pt,0x0003/0x0001)	Not Used	-		-
	Signal Parameters	**Mandatory/ Optional**	**Supported Values:**	**Duration Provisioned Value:**
	-	-	-	-
Events	**Mandatory/ Optional**	**Used in command:**		
None	-	-		
	Event Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	-	-	-	-
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	-	-	-	-
Statistics	**Mandatory/ Optional**	**Used in command:**	**Supported Values:**	
None	-	-	-	
Error Codes	**Mandatory/ Optional**			
None	-			

5.14.3.28 Hanging Termination Detection Package

Table 5.14.3.28.1: Package Usage Information for Hanging Termination Detection Package

Properties	**Mandatory/ Optional**	**Used in command:**	**Supported Values:**	**Provisioned Value:**
None				
Signals	**Mandatory/ Optional**	**Used in command:**		**Duration Provisioned Value:**
None				
	Signal Parameters	**Mandatory/ Optional**	**Supported Values:**	**Duration Provisioned Value:**
Events	**Mandatory/ Optional**	**Used in command:**		
Termination Heartbeat (hangterm/ thb, (0x0098/0x0001)	M	ADD, MOD, MOVE, AUDITVALUE, NOTIFY		
	Event Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	Timer X	M	ALL	0 (no heartbeat message)
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
Statistics	**Mandatory/ Optional**	**Used in command:**	**Supported Values:**	
None				
Error Codes	**Mandatory/ Optional**			

5.14.3.29 MSRP Statistics Package

Table 5.14.3.29.1: Package Usage Information for MSRP Statistics Package

Properties	**Mandatory/ Optional**	**Used in command:**	**Supported Values:**	**Provisioned Value:**
None	-	-	-	-
Signals	**Mandatory/ Optional**	**Used in command:**		**Duration Provisioned Value:**
None	-	-		-
	Signal Parameters	**Mandatory/ Optional**	**Supported Values:**	**Duration Provisioned Value:**
	-	-	-	-
Events	**Mandatory/ Optional**	**Used in command:**		
Messaging Quota (msrpstat/mquota, 0x00ea/0x0001)	M	ADD, MOD, NOTIFY		
	Event Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	Number of Messages Sent Quota(msq, 0x0001)	**O**	0 and up	0
	Number of Messages Received Quota(mrq, 0x0002)	**O**	0 and up	0
	Messages Sent Volume Quota(msv, 0x0003)	**O**	0 and up	0
	Messages Received Volume Quota (mrv, 0x0004)	**O**	0 and up	0
	Time Quota (tm, 0x0005)	**O**	Any Integer	0
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**

	Quota Reached (qreach, 0x0001)	M	0x0001 - 0x0005	-
	Number of Messages Sent (nms, 0x0002)	O	0 and up	-
	Number of Messages Received (nmr, 0x0003)	O	0 and up	-
	Volume of Messages Sent (vms, 0x0004)	O	0 and up	-
	Volume of Messages Received (vmr, 0x0005)	O	0 and up	-
Events	**Mandatory/ Optional**	**Used in command:**		
Individual Message Information (msrpstat/imi, 0x00ea/0x0002)	Not Used	-		
	Event Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	-	-	-	-
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	-	-	-	-

Statistics	**Mandatory/ Optional**	**Used in command:**	**Supported Values:**
Number of Messages Sent (msrpstat/nms, 0x00ea/0x0001)	O	AUDITVALUE	0 and up
Number of Messages Received (msrpstat/nmr, 0x00ea/0x0002)	O	AUDITVALUE	0 and up
Volume of Messages Sent (msrpstat/vms, 0x00ea/0x0003)	O	AUDITVALUE	0 and up
Volume of Messages Received (msrpstat/vmr, 0x00ea/0x0004)	O	AUDITVALUE	0 and up
Error Codes	**Mandatory/ Optional**		
None	-		

5.14.3.30 Play Message Package

Table 5.14.3.30.1: Package Usage Information for Play Message Package

Properties	**Mandatory/ Optional**	**Used in command:**	**Supported Values:**	**Provisioned Value:**
None	-	-	-	-
Signals	**Mandatory/ Optional**	**Used in command:**		**Duration Provisioned Value:**
Send Message (mess/sm, 0x00ec/0x0001)	M	ADD, MOD, MOVE		-
	Signal Parameters	**Mandatory/ Optional**	**Supported Values:**	**Duration Provisioned Value:**
	Message Identity (mi, 0x0001)	M	Any String	-
	Message Contents by reference (mcr, 0x0002)	M	Any String	-

	Failure Report (fr, 0x0003)	O	yes/no	yes
	Success Report (sr, 0x0004)	O	yes/no	no
Events	**Mandatory/ Optional**	**Used in command:**		
Message Sending Response Status (mess/msrs, 0x00ec/0x0001)	M	ADD, MOD, NOTIFY		
	Event Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	-	-	-	-
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	Message Identity (mi, 0x0001)	M	Any String	-
	Status Code (sc, 0x0002)	M	Any String	-
Statistics	**Mandatory/ Optional**	**Used in command:**	**Supported Values:**	
None	-	-	-	
Error Codes	**Mandatory/ Optional**			
None	-			

5.14.3.31 Message Filtering Package

Table 5.14.3.31.1: Package Usage Information for Message Filtering Package

Properties	**Mandatory/ Optional**	**Used in command:**	**Supported Values:**	**Provisioned Value:**
Incoming Message Filters (mf/imf, 0x00ef/0x0001)	O	ADD, MOD	(NOTE 1)	-
Incoming Message Filters by Reference (mf/imfr, 0x00ef/0x0002)	Not Used	-	-	-
Outgoing Message Filters (mf/omf, 0x00ef/0x0003)	O	ADD, MOD	(NOTE 1)	-
Outgoing Message Filters by Reference (mf/omfr, 0x00ef/0x0004)	Not Used	-	-	-
Signals	**Mandatory/ Optional**	**Used in command:**		**Duration Provisioned Value:**
None	-	-		-
	Signal Parameters	**Mandatory/ Optional**	**Supported Values:**	**Duration Provisioned Value:**
	-	-	-	-
Events	**Mandatory/ Optional**	**Used in command:**		
Filed Message (mf/fm, 0x00ef/0x0001)	Not Used	-		
	Event Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	-	-	-	-
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	-	-	-	-
Events	**Mandatory/ Optional**	**Used in command:**		
Filtering Runtime Error (mf/fre, 0x00??/0x0002)	FFS	-		
	Event Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	-	-	-	-

	ObservedEvent Parameters	Mandatory/ Optional	Supported Values:	Provisioned Value:
	-	-	-	-
Statistics	**Mandatory/ Optional**	**Used in command:**		**Supported Values:**
None	-	-		-
Error Codes	**Mandatory/ Optional**			
Sieve Script Syntax Error (700)	FFS			
Unsupported Sieve Require Error (701)	FFS			
Sieve Actions Exceeded Error (702)	FFS			
NOTE 1: The value shall comply with Sieve [IETF RFC5228] with the exceptions described in H.248.69 [35] Clause 13.6. Fitering rules and Message treatment for Filtered message are included in the parameter.				

5.14.3.32 Record Message Package

Table 5.14.3.32.1: Package Usage Information for Record Message Package

Properties	**Mandatory/ Optional**	**Used in command:**	**Supported Values:**	**Provisioned Value:**
None	-	-	-	-
Signals	**Mandatory/ Optional**	**Used in command:**		**Duration Provisioned Value:**
Record Message (recmess/rm, 0x00f1/0x0001)	M	ADD, MOD, MOVE		-
	Signal Parameters	**Mandatory/ Optional**	**Supported Values:**	**Duration Provisioned Value:**
	Storage Location (sl, 0x0001)	M	Any String	-
	Append (app, 0x0002)	Not Used	-	-
	Direction (dir, 0x0003)	O	EXT/INT	EXT
	Maximum Record Size (mrs, 0x0004)	Not Used		
Events	**Mandatory/ Optional**	**Used in command:**		
Record Operation Failure (recmess/messfail, 0x00f1/0x001)	Not Used	-		
	Event Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	-	-	-	-
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	-	-	-	-
Statistics	**Mandatory/ Optional**	**Used in command:**		**Supported Values:**
None	-	-		-
Error Codes	**Mandatory/ Optional**			
None	-			

5.14.3.33 Floor Control Package

Table 5.14.3.33.1: Package Usage Information for Floor Control Package

Properties	**Mandatory/ Optional**	**Used in command:**	**Supported Values:**	**Provisioned Value:**
Controller's Floor Identity (fcp/cfi, 0x006e/0x0002)	M	ADD, MOD	Sub-list of Integer	-
Signals	**Mandatory/ Optional**	**Used in command:**		**Duration Provisioned Value:**
None	-	-		-
	Signal Parameters	**Mandatory/ Optional**	**Supported Values:**	**Duration Provisioned Value:**
	-	-	-	-
Events	**Mandatory/ Optional**	**Used in command:**		
None	-	-		
	Event Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	-	-	-	-
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	-	-	-	-
Statistics	**Mandatory/ Optional**	**Used in command:**	**Supported Values:**	
None	-	-	-	
Error Codes	**Mandatory/ Optional**			
None	-			

5.14.3.34 Floor Control Policy Package

Table 5.14.3.34.1: Package Usage Information for Floor Control Policy Package

Properties	**Mandatory/ Optional**	**Used in command:**	**Supported Values:**	**Provisioned Value:**
Floor Control Algorithm (fcpoli/fca, 0x00ab/0x0001)	M	ADD, MOD	Sub-list of String with (FloorID COLON Algorithm)	-
Max Floor Users (fcpoli/mfu, 0x00ab/0x0002)	M	ADD, MOD	Sub-list of String with (FloorID COLON NumUsers)	-
Signals	**Mandatory/ Optional**	**Used in command:**		**Duration Provisioned Value:**
None	-	-		-
	Signal Parameters	**Mandatory/ Optional**	**Supported Values:**	**Duration Provisioned Value:**
	-	-	-	-
Events	**Mandatory/ Optional**	**Used in command:**		
None	-	-		
	Event Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	-	-	-	-
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	-	-	-	-

Statistics	Mandatory/ Optional	Used in command:	Supported Values:
None	-	-	-
Error Codes	**Mandatory/ Optional**		
None	-		

5.14.3.35 Floor Status Change Handling Package

Table 5.14.3.35.1: Package Usage Information for Floor Status Change Handling Package

Properties	Mandatory/ Optional	Used in command:	Supported Values:	Provisioned Value:
None	-	-	-	-
Signals	**Mandatory/ Optional**	**Used in command:**		**Duration Provisioned Value:**
Confirm Media Update (fschp/cmu, 0x00aa/0x0001)	M	MOD		-
	Signal Parameters	**Mandatory/ Optional**	**Supported Values:**	**Duration Provisioned Value:**
	Floor Status(fs, 0x0001)	M	Sub-list of String with (FloorID COLON Status)	-
	Result(res, 0x0002)	M	Success/Fail	Success
Events	**Mandatory/ Optional**	**Used in command:**		
Floor Status Detection and Reporting (fschp/fsdr, 0x00aa/0x0001)	M	ADD, MOD, NOTIFY		
	Event Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	-	-	-	-
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	Floor Status(fs, 0x0001)	M	Sub-list of String with (FloorID COLON Status)	-
Statistics	**Mandatory/ Optional**	**Used in command:**		**Supported Values:**
None	-	-		-
Error Codes	**Mandatory/ Optional**			
None	-			

5.14.3.36 Floor Control Signalling Package

Table 5.14.3.36.1: Package Usage Information for Floor Control Signalling Package

Properties	Mandatory/ Optional	Used in command:	Supported Values:	Provisioned Value:
Floor Control Conference Identity (fcsig/fconfid, 0x00e5/0x0001)	M	ADD, MOD	Sub-list of Integer	-
Floor and Stream Association (fcsig/fsa, 0x00e5/0x0002)	M	ADD, MOD	Sub-list of String	-
Signals	**Mandatory/ Optional**	**Used in command:**		**Duration Provisioned Value:**
None	-	-		-
	Signal Parameters	**Mandatory/ Optional**	**Supported Values:**	**Duration Provisioned Value:**
	-	-	-	-

Events	**Mandatory/ Optional**	**Used in command:**		
Floor Control Association Timeout (fcsig/tout, 0x00e5/0x0001)	Not Used	-		
	Event Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	-	-	-	-
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	-	-	-	-
Floor Control Association Release (fcsig/rel, 0x00e5/0x0002)	Not Used	-		
	Event Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	-	-	-	-
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	-	-	-	-

Statistics	**Mandatory/ Optional**	**Used in command:**	**Supported Values:**
None	-	-	-

Error Codes	**Mandatory/ Optional**
None	-

5.14.3.37 Explicit Congestion Notification for RTP-over-UDP Support (ecnrous)

Table 5.14.3.37.1: Explicit Congestion Notification for RTP-over-UDP Support package

Properties	Mandatory/Optional	Used in command	Supported Values	Provisioned Value
ECN Enabled (ecnrous/ecnen, 0x010b/0x0001)	M	ADD, MODIFY	True, False	-
Congestion Response Method (ecnrous/crm, 0x010b/0x0002)	Not Signalled	-	-	"RDCC"(0x0002) NOTE
Initiation Method (ecnrous/initmethod, 0x010b/0x0003)	M	ADD, MODIFY	"leap", "inactive"	"leap"
ECN Mode (ecnrous/mode, 0x010b/0x0004)	Not Signalled	-	-	"setonly" (0x0001) in the Remote Descriptor and "readonly" (0x0002) in the Local Descriptor
ECT Marking (ecnrous/ectmark, 0x010b /0x0005)	Not Signalled	-	-	"0" (0x0002)
ECN Congestion Marking (ecnrous/congestmark, 0x010b/0x0006)	Not Signalled	-	-	"nomark" (0x0003)
ECN SDP Usage (ecnrous/ecnsdp, 0x010b/0x0007)	Not Signalled	-	-	"P" (0x0001)

Signals	Mandatory/Optional	Used in command		Duration Provisioned Value
None	-	-		-
	Signal Parameters	**Mandatory/ Optional**	**Supported Values**	**Duration Provisioned Value**
	-	-	-	-

Events	Mandatory/Optional	Used in command		
ECN Failure (ecnrous/fail, 0x010b/0x0001)	M	ADD, MODIFY, NOTIFY		
	Event Parameters	**Mandatory/ Optional**	**Supported Values**	**Provisioned Value**
	-	-	-	-
	-	-	-	-
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values**	**Provisioned Value**
	Failure Type (type,0x0001)	Mandatory	INIT, USE	-
	Media Sender SSRC (ssrc, 0x0002)	Not Supported	-	-

Statistics	Mandatory/Optional	Used in command	Supported Values
Source (ecnrous/ssrc, 0x010b/0x0001)	Not Supported	-	-
CE Counter (ecnrous/cecount, 0x010b/0x0002)	Not Supported	-	-
ECT0 Counter (ecnrous/ectzero, 0x010b/0x0003)	Not Supported	-	-
ECT1 Counter (ecnrous/ectone, 0x010b/0x0004)	Not Supported	-	-
Not-ECT Counter (ecnrous/notect, 0x010b/0x0005)	Not Supported	-	-
Lost Packets Counter (ecnrous/lost 0x010b/0x0006)	Not Supported	-	-
Extended Highest Sequence number (ecnrous/ehsn, 0x010b/0x0007)	Not Supported	-	-
Duplication Counter (ecnrous/dup, 0x010b/0x0008)	Not Supported	-	-

Error Codes	Mandatory/Optional
None	-

NOTE: Application Specific Rate Adaptation shall be applied in accordance with 3GPP TS 26.114 [41]. For speech this requires support of CMR and TMMBR (defined in IETF RFC 5104 [71]) for video.

5.14.3.38 Differentiated Services (ds)

Table 5.14.3.38.1: Differentiated Services package

Properties	Mandatory/Optional	Used in command	Supported Values	Provisioned Value
Differentiated Services Code Point (ds/dscp,0x008b/0x0001)	M	ADD, MODIFY	ALL	Yes
Tagging Behaviour (ds/tb, 0x008b/0x0002)	Not signalled	-	-	"MARK" (0x0000)
Signals	**Mandatory/Optional**	**Used in command**		**Duration Provisioned Value**
None	-	-		-
	Signal Parameters	**Mandatory/Optional**	**Supported Values**	**Duration Provisioned Value**
	-	-	-	-
Events	**Mandatory/Optional**	**Used in command**		
None	-	-		
	Event Parameters	**Mandatory/Optional**	**Supported Values**	**Provisioned Value**
	-	-	-	-
	ObservedEvent Parameters	**Mandatory/Optional**	**Supported Values**	**Provisioned Value**
	-	-	-	-
Statistics	**Mandatory/Optional**	**Used in command**	**Supported Values**	
None	-	-	-	
Error Codes	**Mandatory/Optional**			
None	-			

5.14.3.39 MG Act-as STUN Server (mgastuns)

Table 5.14.3.39.1: MG Act-as STUN Server

Properties	Mandatory/Optional	Used in command	Supported Values	Provisioned Value
Act-as STUN Server (mgastuns/astuns, 0x00c2/0x0001)	M	ADD, MODIFY	ALL	-
Signals	**Mandatory/Optional**	**Used in command**		**Duration Provisioned Value**
None	-	-		-
	Signal Parameters	**Mandatory/ Optional**	**Supported Values**	**Duration Provisioned Value**
	-	-	-	-
Events	**Mandatory/Optional**	**Used in command**		
None	-	-		
	Event Parameters	**Mandatory/ Optional**	**Supported Values**	**Provisioned Value**
	-	-	-	-
	-	-	-	-
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values**	**Provisioned Value**
	-	-		
Statistics	**Mandatory/Optional**	**Used in command**	**Supported Values**	
None	-	-	-	
Error Codes	**Mandatory/Optional**			
None	-			

5.14.3.40 Originate STUN Continuity Check (ostuncc)

Table 5.14.3.40.1: Originate STUN Continuity Check Package

Properties	**Mandatory/Optional**	**Used in command**	**Supported Values**	**Provisioned Value**
Host Candidate Realm (ostuncc/hcr, 0x00c3/0x0001)	O	ADD, MODIFY	ALL	Yes
Signals	**Mandatory/Optional**	**Used in command**		**Duration Provisioned Value**
Send Connectivity Check (ostuncc/scc, 0x00c3/0x0001)	M	ADD, MODIFY		Not Applicable
	Signal Parameters	**Mandatory/Optional**	**Supported Values**	**Duration Provisioned Value**
	Control (cntrl, 0x0001)	O	"controlling", "controlled"	Not Applicable
Send Additional Connectivity Check (ostuncc/sacc, 0x00c3/0x0002)	**Mandatory/Optional**	**Used in command**		**Duration Provisioned Value**
	M	MODIFY		Not Applicable
	Signal Parameters	**Mandatory/Optional**	**Supported Values**	**Duration Provisioned Value**
	Control (cntrl, 0x0001)	O	"controlling", "controlled"	Not Applicable
Events	**Mandatory/Optional**	**Used in command**		
Connectivity Check Result (ostuncc/ccr, 0x00c3/0x0001)	M	ADD, MODIFY, NOTIFY		
	Event Parameters	**Mandatory/Optional**	**Supported Values**	**Provisioned Value**
	-	-	-	-
	ObservedEvent Parameters	**Mandatory/Optional**	**Supported Values**	**Provisioned Value**
	Candidate/Transport Pair (ctp, 0x0001)	M	ALL	Not applicable
New Peer Reflexive Candidate (ostuncc/nprc, 0x00c3/0x0002)	**Mandatory/Optional**	**Used in command**		
	M	ADD, MODIFY, NOTIFY		
	Event Parameters	**Mandatory/Optional**	**Supported Values**	**Provisioned Value**
	-	-	-	-
	ObservedEvent Parameters	**Mandatory/Optional**	**Supported Values**	**Provisioned Value**
	Candidate (can, 0x0001)	M	ALL	Not applicable
Statistics	**Mandatory/Optional**	**Used in command**	**Supported Values**	
None	-	-	-	
Error Codes	**Mandatory/Optional**			
None	-			

5.14.3.41 TCP basic connection control (tcpbcc)

Table 5.14.3.41.1: TCP basic connection control package

Properties	**Mandatory/Optional**	**Used in command**	**Supported Values**	**Provisioned Value**
Incoming bearer connection establishment blocking (tcpbcc/bceb, 0x0115/0x0001)	O	ADD, MODIFY	ALL	"Unblocked"
Oneway Release Indicator (tcpbcc/ori, 0x0115/0x0002)	not supported	-	-	"False"
Signals	**Mandatory/Optional**	**Used in command**		**Duration Provisioned Value**
Establish BNC (tcpbcc/EstBNC, 0x0115/0x0001)	M	ADD, MODIFY		-
	Signal Parameters	**Mandatory/Optional**	**Supported Values**	**Duration Provisioned Value**
	-	-	-	-
Release BNC (tcpbcc/RelBNC, 0x0115/0x0002)	O (NOTE 1)	ADD, MODIFY		-
	Signal Parameters	**Mandatory/Optional**	**Supported Values**	**Duration Provisioned Value**
	-	-	-	-
Events	**Mandatory/Optional**	**Used in command**		
TCP connection state change (tcpbcc/BNCChange, 0x0115/0x0001)	O (NOTE 2)	ADD, MODIFY, NOTIFY		
	Event Parameters	**Mandatory/Optional**	**Supported Values**	**Provisioned Value**
	Type of state change (Type, 0x0001)	M	Est [0x01] Bearer Established, Rel [0x05] Bearer Released	-
	ObservedEvent Parameters	**Mandatory/Optional**	**Supported Values**	**Provisioned Value**
	Type of state change (Type, 0x0001)	M	Est [0x01] Bearer Established, Rel [0x05] Bearer Released	-
Statistics	**Mandatory/Optional**	**Used in command**	**Supported Values**	
None	-	-	-	
Error Codes	**Mandatory/Optional**			
None	-			

NOTE 1: When the MRFC wants to explicitly trigger the TCP bearer connection release procedure (instead of the implicit trigger related to the removal of the H.248 stream via a MODify.request or SUBtract.request command).
NOTE 2: When the MRFC wants to monitor the execution of TCP bearer control procedures.

5.14.3.42 TLS basic session control (tlsbsc)

Table 5.14.3.42.1: TLS basic session control package

Properties	**Mandatory/Optional**	**Used in command**	**Supported Values**	**Provisioned Value**
Incoming security session establishment blocking (tlsbsc/bceb, 0x0117/0x0001)	O	ADD, MODIFY	ALL	"Unblocked"
Signals	**Mandatory/Optional**	**Used in command**		**Duration Provisioned Value**
Establish BNC (tlsbsc/EstBNC, 0x0117/0x0001)	M	ADD, MODIFY		-
	Signal Parameters	**Mandatory/Optional**	**Supported Values**	**Duration Provisioned Value**
	-	-	-	-
Release BNC (tlsbsc/RelBNC, 0x0117/0x0002)	O (NOTE 1)	ADD, MODIFY		-
	Signal Parameters	**Mandatory/Optional**	**Supported Values**	**Duration Provisioned Value**
	-	-	-	-
Events	**Mandatory/Optional**	**Used in command**		
TLS session state change (tlsbsc/BNCChange, 0x0117/0x0001)	O (NOTE 2)	ADD, MODIFY, NOTIFY		
	Event Parameters	**Mandatory/Optional**	**Supported Values**	**Provisioned Value**
	Type of state change (Type, 0x0001)	M	Est [0x01] Bearer Established, Rel [0x05] Bearer Released	-
	ObservedEvent Parameters	**Mandatory/Optional**	**Supported Values**	**Provisioned Value**
	Type of state change (Type, 0x0001)	M	Est [0x01] Bearer Established, Rel [0x05] Bearer Released	-
Statistics	**Mandatory/Optional**	**Used in command**	**Supported Values**	
None	-	-	-	
Error Codes	**Mandatory/Optional**			
None	-			

NOTE 1: When the MRFC wants to explicitly trigger the TLS bearer session release procedure (instead of the implicit trigger related to the removal of the H.248 stream via a MODify.request or SUBtract.request command).
NOTE 2: When the MRFC wants to monitor the execution of TLS bearer control procedures.

5.14.3.43 MGC Controlled Bearer Level ALG (mcbalg)

Table 5.14.3.43.1: MGC Controlled Bearer Level ALG Package

Properties	**Mandatory/Optional**	**Used in command**	**Supported Values**	**Provisioned Value**
None	-	-	-	-
Signals	**Mandatory/Optional**	**Used in command**		**Duration Provisioned Value**
Send Bearer Level Message (mcbalg/sblm, 0x0108/0x0001)	M	MODIFY		Not Applicable
	Signal Parameters	**Mandatory/ Optional**	**Supported Values**	**Duration Provisioned Value**
	Message Content (mc, 0x0001)	M	ALL	Not applicable
	Sent Application Protocol (sap, 0x0002)	O	ALL	Not applicable
	Label (lbl, 0x0003)	O	ALL	Not applicable
Events	**Mandatory/Optional**	**Used in command**		
Detect Bearer Level Message (mcbalg /det, 0x0108/0x0001)	M	MODIFY, NOTIFY		
	Event Parameters	**Mandatory/ Optional**	**Supported Values**	**Provisioned Value**
	Protocol Filter (pf, 0x0001)	Not supported	-	-
	Message Filter (mf, 0x0002)	Not supported	-	-
	Forwarding Flag (ff, 0x0003)	Not supported	-	-
	Enhanced Protocol Filter (ehpf, 0x0004)	O	ALL	Not applicable
	Label (lbl, 0x0005)	O	ALL	Not applicable
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values**	**Provisioned Value**
	Message Content (mc, 0x0001)	M	ALL	Not applicable
	Detected Protocol (dtp, 0x0002)	O	ALL	Not applicable
	Label (lbl, 0x0003)	O	ALL	Not applicable
Statistics	**Mandatory/Optional**	**Used in command**	**Supported Values**	
None	-	-	-	
Error Codes	**Mandatory/Optional**			
None	-			

5.14.3.44 Enhanced Revised Offer/Answer SDP Support (eroas)

Table 5.14.3.44.1: Enhanced Revised Offer/Answer SDP Support package

Properties	Mandatory/Optional	Used in command	Supported Values	Provisioned Value
SDPCapNeg Extensions (eroas/sdpe, 0x0109/0x0001)	M	AuditValue	"cap-v0"	"cap-v0"
Signals	**Mandatory/Optional**	**Used in command**		**Duration Provisioned Value**
None	-	-		-
	Signal Parameters	**Mandatory/Optional**	**Supported Values**	**Duration Provisioned Value**
	-	-	-	-
Events	**Mandatory/Optional**	**Used in command**		
None	-	-		
	Event Parameters	**Mandatory/Optional**	**Supported Values**	**Provisioned Value**
	-	-	-	-
	ObservedEvent Parameters	**Mandatory/Optional**	**Supported Values**	**Provisioned Value**
	-	-	-	-
Statistics	**Mandatory/Optional**	**Used in command**	**Supported Values**	
None	-	-	-	
Error Codes	**Mandatory/Optional**			
None	-			

5.14.3.45 Remote Pause and Resume (rempr)

Table 5.14.3.45.1: Remote Pause and Resume package

Properties	Mandatory/Optional	Used in command	Supported Values	Provisioned Value
Autonomous Response (rempr/ar 0x0123/0x0001)	M	ADD, MODIFY	"On MG autonomous", "Off MGC controlled"	-
Autonomous Request (rempr/aq 0x0123/0x0002)	M	ADD, MODIFY	"On MG autonomous", "Off MGC controlled"	-
Signals	**Mandatory/Optional**	**Used in command**	**Duration Provisioned Value**	
Local Pause (rempr/lpause 0x0123/0x0001)	Not Supported	-	-	
	Signal Parameters	**Mandatory/Optional**	**Supported Values**	**Duration Provisioned Value**
	Pause Identity (pauseID, 0x0001)	-	-	-
	ssrc (ssrc, 0x0002)	-	-	-
Local Resume (rempr/lresume 0x0123/0x0002)	Not Supported	-	-	
	Signal Parameters	**Mandatory/Optional**	**Supported Values**	**Duration Provisioned Value**
	Pause Identity (pauseID, 0x0001)	-	-	-
	ssrc (ssrc, 0x0002)	-	-	-
Refuse (rempr/refuse 0x0123/0x0003)	Not Supported	-	-	
	Signal Parameters	**Mandatory/Optional**	**Supported Values**	**Duration Provisioned Value**
	Pause Identity (pauseID, 0x0001)	-	-	-
	ssrc (ssrc, 0x0002)	-	-	-
Remote Pause (rempr/rpause 0x0123/0x0004)	Not Supported	-	-	
	Signal Parameters	**Mandatory/Optional**	**Supported Values**	**Duration Provisioned Value**
	Pause Identity (pauseID, 0x0001)	-	-	-

	ssrc (ssrc, 0x0002)	-	-	-
Remote Resume (rempr/rresume 0x0123/0x0005)	Not Supported	-	-	
	Signal Parameters	**Mandatory/Optional**	**Supported Values**	**Duration Provisioned Value**
	Pause Identity (pauseID, 0x0001)	-	-	-
	ssrc (ssrc, 0x0002)	-	-	-
Events	**Mandatory/Optional**	**Used in command**		
RTP Pause State (rempr/rtpps 0x0123/0x0001)	Not Supported	-		
	Event Parameters	**Mandatory/Optional**	**Supported Values**	**Provisioned Value**
	State (state, 0x0001)	-	-	-
	ssrc (ssrc, 0x0002)	-	-	-
	ObservedEvent Parameters	**Mandatory/Optional**	**Supported Values**	**Provisioned Value**
	Observed State (obstate, 0x0001)	-	-	-
	ssrc (ssrc, 0x0002)	-	-	-
Detect Pause/Resume Request (rempr/dprreq 0x0123/0x0002)	Not Supported	-		
	Event Parameters	**Mandatory/Optional**	**Supported Values**	**Provisioned Value**
	ssrc (ssrc, 0x0001)	-	-	-
	ObservedEvent Parameters	**Mandatory/Optional**	**Supported Values**	**Provisioned Value**
	Pause Identity (pauseID, 0x0001)	-	-	-
	Request Type (reqt, 0x0002)	-	-	-
	ssrc (ssrc, 0x0003)	-	-	-
Detect Pause and Resume Result (rempr/dprres 0x0123/0x0003)	Not Supported	-		
	Event Parameters	**Mandatory/Optional**	**Supported Values**	**Provisioned Value**
	ssrc (ssrc, 0x0001)	-	-	-
	ObservedEvent Parameters	**Mandatory/Optional**	**Supported Values**	**Provisioned Value**
	Pause Identity (pauseID, 0x0001)	-	-	-
	Response Type (rest, 0x0002)	-	-	-
	ssrc (ssrc, 0x0003)	-	-	-
Statistics	**Mandatory/Optional**	**Used in command**	**Supported Values**	
Local Pause duration (rempr/lpdur 0x0123/0x0001)	Not Supported	-	-	
Remote Local Pause duration (rempr/rpdur 0x0123/0x0002)	Not Supported	-	-	
Error Codes	**Mandatory/Optional**			
None	-	-	-	-

5.14.3.46 Multi-stream Multiparty Conferencing Media Handling (mmcmh)

Table 5.14.3.46.1: Multi-stream Multiparty Conferencing Media Handling package

Properties	Mandatory/Optional	Used in command	Supported Values	Provisioned Value
MMCMH policy (mmcmh/mmcmhp 0x????/0x0001)	M	ADD, MODIFY	mmcmhbp (0x0001) "MMCMH basic policy", vadv (0x0002) "Voice activity detected video", vada (0x0003) "Voice activity detected audio", ma (0x0004) "Mix audio", bfcpa (0x0005) "BFCP audio", bfcpv (0x0006) "BFCP video", bfcps (0x0007) "BFCP screenshare"	-
Signals	**Mandatory/Optional**	**Used in command**	**Duration Provisioned Value**	
None	-	-	-	
	Signal Parameters	**Mandatory/Optional**	**Supported Values**	**Duration Provisioned Value**
	-	-	-	-
Events	**Mandatory/Optional**	**Used in command**		
None	-	-		
	Event Parameters	**Mandatory/Optional**	**Supported Values**	**Provisioned Value**
	-	-	-	-
	ObservedEvent Parameters	**Mandatory/Optional**	**Supported Values**	**Provisioned Value**
	-	-	-	-
Statistics	**Mandatory/Optional**	**Used in command**	**Supported Values**	
None	-	-	-	
Error Codes	**Mandatory/Optional**			
None	-			

5.15 Mandatory Support of SDP and Annex C Information Elements

The v=, o=, s=, m=, c=, t=, a= and b= lines of the SDP [20] syntax shall be supported. All other lines should be ignored if received.

Table 5.15.1: Supported Annex C and SDP information elements

Supported Annex C and SDP information elements:

Information Element	Annex C Support	SDP Support
Protocol version (v=)	"SDP_V "	The protocol version (v=) line contains a single field: *v= <version>* and shall be used in accordance with IETF RFC 2327 [20] (i.e. v=0).
Origin (o=)	"SDP_O "	The origin line consists of 6 fields: *o= <user name> <session ID> <version> <network type> <address type> <address>.* The MRFC is not required to supply this line but shall accept it. The MRFP should populate this line as follows or use the value received from the MRFC: - <user name> should contain an hyphen - <session ID> and <version> should contain one or mode digits as described in IETF RFC 2327 [20] - <network type> shall be set to IN - <address type> shall be set to IP4 or IP6 The Address Type shall be set to "IP4" or "IP6" depending on the addressing scheme used by the network to which the MRFP is connected. - <address> should contain the fully qualified domain name of the gateway.
Session Name (s=)	"SDP_S"	The session name (s=) line contains a single field: *s= <session-name>.* The MRFC is not required to supply a session name but shall accept one. This line may be used to convey correlation information for use in CDRs. The MRFP shall use an hyphen "-" as a session name or the value received from the MRFC.
Connection data (c=)	"SDP_C "	The connection data line consists of 3 fields: *c= <network-type> <address-type> <connection-address>* - The <network-type> shall be set to "IN". - The <address-type> shall be set to "IP4" or "IP6" depending on the addressing scheme used by the network to which the MRFP is connected. - The <connection-address> sent by the MRFC in the remote descriptor is the address to which the MRFP shall send the media flows. - The <connection-address> sent by the MRFC in local descriptors may be a unicast IPv4 or IPv6 address or it may be wildcarded to allow the MRFP to choose an address. In the second case, MGs shall fill this field with a unicast IP address at which they will receive the media stream. Thus a TTL value shall not be present and a "number of addresses" value shall not be present. The field shall not be filled with a fully-qualified domain name instead of an IP address. When the <connection address> is wildcarded (i.e. choose wildcard) by the MRFC, the MRFP allocates an IP address based on the address type. The addressing space for which this address is taken may depend on the termination ID supplied by the MRFC.

Media announcements (m=)	"SDP_M "	Media Announcements (m=) lines consist of 3 fields: *m= <media> <port> <transport> <format>* - The <media> field shall be set to "audio"or "video" or "message" or "application" (NOTE 1). - The <port> field in remote descriptors is provided by the MRFC and represents the port to which the MRFP shall send the media flows. - The <port> field in local descriptors may be provided by the MRFC or wildcarded (i.e. choose wildcard) to allow the MRFP to choose a value for the port on which it wishes to receive the media stream - The <transport> field shall be according to table 5.15.2 - The <format> field may be explicitly supplied by the MRFC, wildcarded or overspecified. If the MRFC wishes to request the MRFP to choose which media formats it wishes to use for the call then the MRFC shall provide a "$" wildcard. If the MRFC wishes to suggest that the MRFP selects a media format from a list of possible media formats then it shall provide a list of appropriate media types in accordance with SDP. All conforming gateways shall support at least the default narrowband AMR codec as defined in 3GPP TS 26.114 [41]. Optionally, other codecs defined in 3GPP TS 26.114 [41] and format "8" for RTP/AVP (i.e. G.711 A-Law). Dynamic payloads shall not be used when a static RTP/AVP payload value is defined in IETF RFC 3551 [21].
Bandwidth (b=)	"SDP_B "	The Bandwitdh (b=) line consists of 2 fields: *b= <modifier>: <bandwidth-value>* Bandwidth information shall be supplied by the MRFC if the required bandwidth cannot be immediately derived from the information contained in the m= line. If absent, the MRFP shall assume a reasonable default bandwidth value for well-known codecs and shall provide this value in the response sent to the MRFC. The Modifier field shall be set to "AS". The Bandwidth Value field shall be set to the maximum bandwidth requirement of the media stream in kbit/s. The bandwidth value shall take into account all headers down to the IP layer, including a 5% bandwidth for RTCP packets.
Time (t=)	"SDP_T "	The time (t=) line consists of two fields: *t= <start-time> <stop-time>.* This line is ignored by both the MRFC and the MRFP if received in local and remote descriptors. The MRFC is not required to supply a time description but shall accept one. When supplied, this line shall be set to 0 0.

Attributes (a=)	"SDP_A "	Attributes (a=) lines consist of two fields: *a= <attribute>: <value>* One or more of the "a" attribute lines specified below may be included, depending on the payload type. An attribute line not specified below should not be used. Only the following attributes are understood by the MRFP. Other attributes are ignored. *a= rtpmap: <payload type> <encoding name>/<clock rate> [/<encoding parameters>]* *a= fmtp:<format> <format specific parameters>* *a= ptime: <time>* *a= userid: <token of user identifier>* (NOTE 3) *a= floorid: <token of Floor identifier>* (NOTE 3) *a= path:MSRP-URI* (NOTE 4) *a= rtcp-fb: <…>* (NOTE 5, NOTE 13, NOTE 14, NOTE 19) *a= extmap:<x> <CVO-URN or ROI URN>* (NOTE 6) *a= imageattr: <payload type> <…>* (NOTE 7) *a= sctp-port: <port>* (NOTE 8) *a= max-message-size: <value>* (NOTE 8) *a= dcmap:< dcmap-stream-id> < subprotocol-opt>* (NOTE 9) *a= fingerprint: <certificate fingerprint>* (NOTE 10) *a=predefined_ROI: <…>* (NOTE 11) *a=bw-info: <payload type> <dir> <MaxSupBw>; <MaxDesBw>; <MinDesBw>; <MinSupBw>; <IpVer>* (NOTE 12) *a=content: <mediacnt>* (NOTE 15) *a=simulcast: <sc-dir> <rid-id-list>* (NOTE 16) *a=rid: <rid-id> <dir> <payload type>* (NOTE 17) *a=ccc_list: <codeclist> "|" <ccc-prof>* (NOTE 18) ICE support The attributes "a=candidate", "a=ice-pwd", "a=ice-ufrag" and "a=ice-pacing" (see IETF RFC 8839 [78]) may be provided for an SDP m-line in the local and remote descriptor if the MRFP supports ICE, see also 3GPP TS 24.229 [49]. In the local descriptor, the MRFC shall provide "a=ice-pwd", and "a=ice-ufrag" with wildcard sign "$" to request the allocation of a password and user name fragment, and the "a=candidate" of type "host" with the transport, port and priority parameters with wildcard sign "$" to request the allocation of a host candidate, and "a=ice-pacing" with wildcard sign "$" to request the desired pacing value for connectivity checks. The MRFP shall then reply with completed "a=ice-pwd", "a=ice-ufrag", "a=candidate" and "a=ice-pacing" attributes in the local descriptor, and shall include "a=ice-lite" if it only supports ICE lite. In the remote descriptor, the MRFC may provide the "a=candidate", "a=ice-pwd", "a=ice-ufrag" and "a=ice-pacing". SDP Capability Negotiation support: the attributes of "a=acap", "a=tcap", "a=pcfg" and "a=acfg" (see IETF RFC 5939 [69]) may be provided in the local descriptor and/or remote descriptor.

NOTE 1: The "application" media is used to describe H.248 stream for a BFCP stream or H.248 stream for an UDP/DTLS/SCTP stream to be created for a CLUE data channel in telepresence using IMS as specified in 3GPP TS 24.103 [60]. The way to generate an "m" line for a BFCP stream follows the format specified in IETF RFC 4583 [32], where the port is always a TCP port, the transport field is "TCP/TLS/BFCP" if IMS media plane security is applied or otherwise "TCP/BFCP", the fmt (format) list is ignored. When a CLUE data channel is created, the "m" line for a UDP/DTLS/SCTP stream follows the format specified in IETF RFC 8841 [61] and IETF RFC 8864 [62], where the transport field is "UDP/DTLS/SCTP", the fmt (format) indicates the usage of the SCTP association as "webrtc-datachannel".

NOTE 2: Void

NOTE 3: The "userid" and "floorid" are SDP media-level attributes. They are used in BFCP 'm' lines. The "floorid" defines a list of Floor identifiers, indicating the available Floor(s) for the user represented by the termination. The token representing the Floor identifier is the integer representation of the Floor ID. The "userid" attributes carry the integer representation of a user ID.

NOTE 4: An MSRP-URI is an "msrp" or "msrps" URI defined as "MSRP-URI = msrp-scheme "://" authority ["/" session-id] ";" transport *(";" URI-parameter)". The authority component contains a numeric IP address and port. The session-id part identifies a particular session of the participant allowing multiple sessions to share the same TCP connection.

NOTE 5: For AVPF transport, the "rtcp-fb" SDP attribute defined in IETF RFC 4585 [40] may be used to provide the feedback message types the MRFP is allowed to send and to indicate RTCP timing information. The support is optional and dependent on RTCP-fb support as described in 3GPP TS 26.114 [41]. The list of feedback messages supported by the MRFP is preconfigured in the MRFC. The "rtcp-fb" SDP attribute shall be sent from MRFC when applicable.

NOTE 6: Support of the RTP header extension to signal CVO or Sent ROI is optional. The attribute "a=extmap" (see IETF RFC 5285 [45]) may be provided for an m-line in the local and remote descriptor. CVO-URN is "urn:3gpp:video-orientation" for a 2 bit granularity of rotation or "urn:3gpp:video-orientation:6" for a higher granularity of rotation, and ROI-URNs are "urn:3gpp:roi-sent" for arbitrary ROI information and "urn:3gpp:predefined-roi-sent" for predefined ROI information respectively, as specified in 3GPP TS 26.114 [41] and "x" represents the local identifier of the RTP header extension element as specified in IETF RFC 5285 [45] and is any number in a range [1 - 14].

NOTE 7: The support of the generic image attribute to negotiate the image size is optional. The attribute "a=imageattr" (see IETF RFC 6236 [46]) may be provided for an m-line in the local and remote descriptor if the MRFP supports the generic image attributes, see also 3GPP TS 26.114 [41]. The local descriptor indicates the image sizes which the MRFP supports in the receiving direction for the selected payload type and corresponds to the "recv" keyword (see IETF RFC 6236 [46]) in the "a=imageattr" that the MRFC will send within the SDP body on the Mr interface. The remote descriptor indicates the image sizes which the MRFP supports in the sending direction for the selected payload type and corresponds to the "send" keyword (see IETF RFC 6236 [46]) in the "a=imageattr" that the MRFC will send within the SDP body on the Mr interface.

NOTE 8: The support of the "a=sctp-port" attribute to indicate the actual SCTP port is used only when the transport field of 'm' line is "UDP/DTLS/SCTP". The SDP "a=max-message-size" attribute may be used to indicate the maximum message size that an SCTP endpoint is willing to receive on the SCTP association associated with the 'm' line.

NOTE 9: The support of the dcmap attribute to realize the CLUE data channel is used only when the transport field of 'm' line is "UDP/DTLS/SCTP", where the dcmap-stream-id field indicates the actual SCTP stream, and the subprotocol field indicates the protocol "CLUE".

NOTE 10: The attribute(s) "a=fingerprint" (see IETF RFC 8122 [64]) shall be provided for an "m=" line in the local and remote descriptor if the MRFC requests the MRFP to establish the CLUE data channel.

NOTE 11: The support of the predefined ROI attribute in the SDP is optional. The attribute "a=predefined_ROI" (see TS 26.114 [41]) may be provided for an m-line in the local and remote descriptor if the MRFP supports the predefined ROI attributes, see also 3GPP TS 26.114 [41].

NOTE 12: If the MRFP performs media transcoding and if the rate adaptation for media endpoints using the enhanced bandwidth negotiation is supported by the MRFP, attribute(s) "a=bw-info" (defined in 3GPP TS 26.114 [41], clause 19) with direction "send" or "sendrecv" may be provided for an m-line and the selected IP payload type and applicable IP version in the remote descriptor.

NOTE 13: The support of the"RTCP Codec Control Commands and Indications" signalling is optional. The "rtcp-fb" SDP attribute with the "ccm" feedback parameter and the "fir" and/or "tmmbr" ccm parameters as defined in IETF RFC 5104 [71] may be provided for an m-line in the local and remote descriptor to indicate that the MRFP shall be prepared to receive and is allowed to send, respectively, the RTCP CCM feedback messages FIR, and/or TMMBR and TMMBN (the usage of the messages have been agreed in the SDP offer/answer negotiation between the MRFC and the end user).

NOTE 14: The "rtcp-fb" SDP attribute with the "ccm" feedback parameter and the "pause" ccm parameter may be provided for an m-line in the local and remote descriptor to request the MRFP to apply "RTP-level pause and resume" procedures as defined in IETF RFC 7728 [75] and to indicate to the MRFP which RTCP feedback "CCM PAUSE-RESUME" messages the MRFP may send to the end user.

NOTE 15: The "content" SDP attribute (see IETF RFC 4796 [72]) may be provided for an m-line in the local and remote descriptor to indicate a content of the media stream.

NOTE 16: The "simulcast" SDP attribute (see IETF RFC 8853 [73]) may be provided for an m-line in the local and remote descriptor to indicate the list of the supported simulcast RTP formats in the receiving direction

and/or in the sending direction. Each simulcast RTP format is identified by a simulcast stream identifier which has the form of the RTP stream identifier. NOTE 17: The "rid" SDP attribute (see IETF RFC 8851 [74]) may be provided for an m-line in the local and remote descriptor to indicate the identity, directionality and the payload type of the simulcast RTP stream. NOTE 18: The support of "Compact Concurrent Codec Negotiation and Capabilities" is optional. The "ccc_list" SDP attribute (defined in 3GPP TS 26.114 [41], clause S.5.7.2) may be provided in the remote descriptor to indicate to the MRFP the concurrent codec capabilities of an MMCMH conference participant in a compact representation. NOTE 19: The support of the"Delay Budget Information" signalling is optional. The "rtcp-fb" SDP attribute with the "3gpp-delay-budget" feedback parameter (as defined in 3GPP TS 26.114 [41] clause 6.2.8) may be provided for an m-line in the local and remote descriptor to indicate that the MRFP shall be prepared to receive and is allowed to send, respectively, the RTCP-FB messages for "DBI" signalling (as defined in 3GPP TS 26.114 [41] clause 7.3.8) (the usage of the messages have been agreed in the SDP offer/answer negotiation between the MRFC and the end user).

Table 5.15.2: Transport Protocol

Transport Protocol <proto> in m-line:	If the MG does not support the requested transport protocol, it shall reject the command with error code 449.
RTP/AVP	RTP profile according IETF RFC 3551 [21]. For voice and video services
RTP/AVPF	Extended RTP profile for RTCP-based Feedback (RTP/AVPF) according IETF RFC 4585 [40]. For voice and video services (NOTE 1).
TCP/BFCP	For floor control service, see IETF RFC 4583 [32]. (NOTE 1)
TCP/MSRP	For message service, see IETF RFC 4975 [34]. (NOTE 1)
TCP/TLS/BFCP	For floor control service with IMS media plane security, see IETF RFC 4583 [32]). (NOTE 1)
TCP/TLS/MSRP	For message service with IMS media plane security, see IETF RFC 4975 [34]). (NOTE 1)
UDP/DTLS/SCTP	Data channel support using IETF RFC 8841 [61] and IETF RFC 8864 [62].
NOTE 1: support optional. NOTE 2: Upper case TCP is defined by IETF RFC 4145 [39] and registered by IANA.	

5.16 Optional support of SDP and Annex C information elements

Specifies what SDP attributes and Annex C information elements may be supported.

Table 5.16.1:

Optional Annex C and SDP information elements:			
Information Element	**Annex C Support**	**SDP Support**	**Support Dependent on:**
<name>	<Annex C property>	<Describe>	<Describe>

5.17 Procedures

5.17.1 Formats and Codes

Table 5.17.1.1 shows the parameters which are required for the procedures defined in the following clauses.

The coding rules applied in ITU-T Recommendation H.248.1 [3] for the applicable coding technique shall be followed for the UMTS capability set.

The binary encoding rules which are applicable to the defined Abstract Syntaxes are the Basic Encoding Rules for Abstract Syntax Notation One, defined in ITU-T Recommendation X.690 [41]. Specifically in accordance with ITU-T

Recommendation X.690 [41] clause 7.3, alternative encodings based on the definite and indefinite form of length are permitted by the basic encoding rules as a sender's option. Receivers shall support both alternatives.

Unsupported values of parameters or properties may be reported by the MGW and shall be supported by the MSC as such by using H.248.1 error code #449 "Unsupported or Unknown Parameter or Property Value". The unsupported or unknown value is included in the error text in the error descriptor.

Table 5.17.1.1: Information Elements Used in Procedures

Signalling Object	H.248 Descriptor	Coding
Additional Bandwidth Properties	Remote Descriptor	The "a=bw-info" SDP attribute defined in 3GPP TS 26.114 [41], see table 5.15.1.
Allowed RTCP APP message types	Remote Descriptor	The "a=3gpp_mtsi_app_adapt" SDP attribute defined in 3GPP TS 26.114 [41].
Announcement Cause	Events ObservedEvents	The "Meth" parameter in g/sc event per ITU-T Recommendation H.248.1 [3] Annex E.1.2
Announcement Completed	Events ObservedEvents	The g/sc event per ITU-T Recommendation H.248.1 [3] Annex E.1.2
Announcement Cycles	Signal	The "noc" parameter as per ITU-T Recommendation H.248.7 [5], Clause 4.3.1
Announcement Direction	Signal	The "di" parameter as per ITU-T Recommendation H.248.7 [5], Clause 4.3.1
Announcement Variant	Signal	The "av" parameter as per ITU-T Recommendation H.248.7 [5], Clause 4.3.1
Arbitrary ROI Sent	Local Descriptor	The "rtcp-fb" SDP attribute defined in IETF RFC 4585 [30] to indicate the " Arbitrary ROI" RTCP feedback message expressed by the "3gpp-roi-arbitrary" parameter, as described in 3GPP TS 26.114 [41].
Arbitrary ROI Received	Remote Descriptor	The "rtcp-fb" SDP attribute defined in IETF RFC 4585 [30] to indicate the " Arbitrary ROI" RTCP feedback message expressed by the "3gpp-roi-arbitrary" parameter, as described in 3GPP TS 26.114 [41].
ASR Cause	Events ObservedEvents	The "rc" parameter in asr/asrfail event as per ITU-T Recommendation H.248.9a1 [26] Clause 12.2.1.
Autonomous response	LocalControl	Defined as "Autonomous Response" property ("rempr/ar") in ITU-T Recommendation H.248.98 [76].
Autonomous request	LocalControl	Defined as "Autonomous Request" property ("rempr/aq") in ITU-T Recommendation H.248.98 [76].
Cause	Events ObservedEvents	Encoded as "Meth" parameter in g/sc event per ITU-T Recommendation H.248.1 [3] Annex E.1.2
CCM BASE	Local Descriptor or Remote Descriptor	"rtcp-fb" SDP attribute (defined in IETF RFC 4585 [30]) with the "ccm" feedback parameter and the "fir" and/or "tmmbr" ccm parameters as defined in IETF RFC 5104 [71].
CCM pause-resume	Local Descriptor or Remote Descriptor	The "rtcp-fb" SDP attribute (defined in IETF RFC 4585 [40]) with the "ccm" feedback parameter (defined in IETF RFC 5104 [71]) and the "pause" ccm parameter as defined in IETF RFC 7728 [75].
Certificate Fingerprint	Local Descriptor or Remote Descriptor	The "a=fingerprint" SDP attribute(s) as defined in IETF RFC 8122 [64], see table 5.15.1.
CLUE Message Send	Signal	Defined as the "*mcbalg/sblm*" signal with the application protocol indicating "CLUE" in ITU-T Recommendation H.248.78 [65].
CLUE Message Received	Events ObservedEvents	Defined according to *Detect Bearer Level Message* event with the application protocol indicating "CLUE" in ITU-T Recommendation H.248.78 [65].
Codec List	Local Descriptor or Remote Descriptor	<fmt list> in a single SDP m-line. For a static RTP payload type, the codec type should be implied by the RTP payload type, if not then each codec type shall be provided in a separate SDP "a=rtpmap"-line and possibly additional SDP "a=fmtp"-line(s). For a dynamic RTP payload type, for each codec information on the codec type shall be provided in a separate SDP "a=rtpmap"-line and possibly additional SDP "a=fmtp"-line(s).
Concurrent Codec Capabilities	Remote Descriptor	The "a=ccc_list" session level SDP attribute defined in 3GPP TS 26.114 [41], see table 5.15.1.
ConfID	ContextAttribute Descriptor	The "fconfid" parameter as per ITU-T Recommendation H.248.19 [33], Clause 10.6.1.1.It is defined as type integer as used over BFCP.
Context ID	NA	Binary Encoding: As per ITU-T Recommendation H.248.1 [3] Annex A. Textual Encoding: As per ITU-T Recommendation H.248.1 [3] Annex B.
ControlledByChair	TerminationState Descriptor	List of Floor Ids controlled by this termination as a chair, specified by "cfi" as defined in Clause 10.1.1.2 of ITU-T Recommendation H.248.19 [33].
Diffserv Code Point	Local Control	Defined according to the *Differentiated Services Code Point* property in ITU-T Recommendation H.248.52 [43].

DBI	Local Descriptor or Remote Descriptor	"rtcp-fb" SDP attribute defined in IETF RFC 4585 [30] with the "3gpp-delay-budget" feedback parameter as defined in 3GPP TS 26.114 [41] clause 6.2.8.
Digit	Observed Events	Encoding as per ITU-T Recommendation H.248.1 Annex E.6.2. Digits are reported individually by the MRFP.
DTMFTrigger	Signal Descriptor	"endinputkey, eik" see H.248.9a1 [26] Clause 16.3.1.1.16.
ECN Enabled	Local Descriptor or Remote Descriptor	Defined according to the "ECN Enabled" property in ITU-T Recommendation H.248.82 [44].
ECN Failure	Events, Observed Events	Defined according to the "ECN Failure" Event in ITU-T Recommendation H.248.82 [44].
ECN Failure Type	ObservedEvents Descriptor	As for the ObservedEventsDescriptor Parameter "Failure Type" in ITU-T Recommendation H.248.82 [44].
ECN Initiation Method	Local Descriptor or Remote Descriptor	Defined according to "Initiation Method" property in ITU-T Recommendation H.248.82 [44].
End of Recording Notification	Events ObservedEvents	Enables the MRFC to be informed of the end of a recording. Corresponds to aasrec/audfail (mrp/audfail) and aasrec/precsucc, (mrp/precsucc) events see ITU-T Recommendation H.248.9a1 [26] 12.2.
Establish TCP Connection	Signals	Defined according to the Establish BNC signal (tcpbcc/EstBNC) in ITU-T Recommendation H.248.89 [54].
Establish (D)TLS session	Signals	Defined according to the Establish BNC signal (tlsbsc/EstBNC) in ITU-T Recommendation H.248.90 [55] and for DTLS usage in ITU-T Recommendation H.248.93 [63].
Extended Header for CVO	Local Descriptor or Remote Descriptor	"extmap" attribute in SDP a-line as defined in IETF RFC 5285 [45], see table 5.15.1.
Extended RTP Header for Sent ROI	Local Descriptor or Remote Descriptor	"extmap" attribute in SDP a-line to pass on the ROI extended RTP header as defined by IETF RFC 5285 [45] for carriage of predefined and/or arbitrary ROI information, see table 5.15.1
FloorControlAlgorithm	Context Attrribute (NOTE 1)	Sub-list of (Floorid, Algorithm). "fca" as defined in Clause 10.4.1.2 of ITU-T Recommendation H.248.19 [33].
FloorID	Local Descriptor	"a= floorid" SDP line as specified in Table 5.15.1.
FloorRequestResult	Signal Descriptor	The "res" parameter as per ITU-T Recommendation H.248.19 [33], Clause 10.5.3.1.1.2. It is defined as Boolean (success or fail)
FloorResAssociations	Context Attribute (NOTE 1)	The "fsa" parameter as per ITU-T Recommendation H.248.19 [33], Clause 10.6.1.2. It is defined as sub-list of (Floorid, StreamID).
FloorStatus	Observed Events	"Floor Status, fs" as defined in ITU-T Recommendation H.248.19 [33]. This is a list of FloorIds and status (e.g. granted, revoked)
Generic Image Attribute	Local Descriptor or Remote Descriptor	"imageattr" attribute in SDP a-line as defined in IETF RFC 6236 [46], see table 5.15.1.
ICE host candidate request	Local Descriptor	The "a=candidate" SDP attribute defined in IETF RFC 8839 [78] of type "host" with the transport, port and priority parameters with wildcard sign "$" to request the allocation of a host candidate
ICE host candidate	Local Descriptor	The "a=candidate" SDP attribute defined in IETF RFC 8839 [78].
ICE lite indication	Local Descriptor	The "a=ice-lite" SDP attribute defined in IETF RFC 8839 [78].
ICE pacing	Local Descriptor	The "a=ice-pacing" SDP attribute defined in IETF RFC 8839 [78]. Only applicable for full ICE as specified in IETF RFC 8445 [77].
ICE pacing request	Local Descriptor	The "a=ice-pacing" SDP attribute defined in IETF RFC 8839 [78] with wildcard sign "$". Only applicable for full ICE as specified in IETF RFC 8445 [77].
ICE password request	Local Descriptor	The "a=ice-pwd" SDP attribute defined in IETF RFC 8839 [78] with wildcard sign "$".
ICE password	Local Descriptor	The "a=ice-pwd" SDP attribute defined in IETF RFC 8839 [78].
ICE received candidate	Remote Descriptor	The "a=candidate" SDP attribute defined in IETF RFC 8839 [78].
ICE received pacing	Remote Descriptor	The "a=ice-pacing" SDP attribute defined in IETF RFC 8839 [78]. Only applicable for full ICE as specified in IETF RFC 8445 [77].
ICE received password	Remote Descriptor	The "a=ice-pwd" SDP attribute defined in IETF RFC 8839 [78].
ICE received Ufrag	Remote Descriptor	The "a=ice-ufrag" SDP attribute defined in IETF RFC 8839 [78].
ICE Ufrag request	Local Descriptor	The "a=ice-ufrag" SDP attribute defined in IETF RFC 8839 [78] with wildcard sign "$".
ICE Ufrag	Local Descriptor	The "a=ice-ufrag" SDP attribute defined in IETF RFC 8839 [78].
ICE Connectivity Check Result	Events, Observed Events	Defined according to *Connectivity Check Result* event in ITU-T Recommendation H.248.50 [47].
ICE Send Connectivity Check	Signals	Defined as the ostuncc/scc signal in ITU-T Recommendation H.248.50 [47].
ICE New Peer Reflexive Candidate	Events, Observed Events	Defined according to *New Peer Reflexive Candidate* event in ITU-T Recommendation H.248.50 [47].

ICE Send Additional Connectivity Check	Signals	Defined as the ostuncc/sacc signal in ITU-T Recommendation H.248.50 [47].
IncMessageFilters	LocalControl Descriptor	"Incoming Message Filters, imf" parameter in H.248.69 [35] Clause 13.1.1, which is defined as string and complies with Sieve [IETF RFC5228] with the exceptions described in H.248.69 [35] Clause 13.6.
IP Address	Local Descriptor or Remote Descriptor	<connection address> in SDP "c-line"
Iterations	Signal	" Iterations, it" parameter in H.248.9a1 [26] Clause 13.3.1.1.3 or Clause 13.3.2.1.3
MaxFloorHolder	Context Attribute (NOTE 1)	Sub-list of (FloorID, Number). "mfu" as defined in Clause 10.4.1.2 of ITU-T Recommendation H.248.19 [33].
Maximum Record Time	Signal	"Record Length Timer, rlt" parameter in H.248.9a1 [26] Clause 16.3.1.1.8 for multimedia recording or Clause 10.3.1.1.8 for audio recording
Media Identifier	Signal	TBD
Mediatype	Local Descriptor or Remote Descriptor	<media> in sdp m-line "audio" for voice service, and "image" for T.38 service.
MessageContentType		TBD as enumeration to indicate the content type of message. (e.g. video, audio)
MessageContentFmt		TBD as enumeration to indicate the content format (e.g. mpeg, jpeg for picture)
MessageIdentifier	Signal	"mcr" parameter in the mess/sm signal in H.248.69 [35] Clause 10.3.1.1.2, which is defined as URI that points to the message data that shall be sent.
MessagePlayResultReport	Signal	"fr" or "sr" parameter in the mess/sm signal in H.248.69 [35], which is defined as Enumeration to indicate the request of report result of message play (Success Report, Failure Report, Both or None)
MessagePlayCause	ObservedEvents	"sc" parameter in the mess/msrs event in H.248.69 [35] Clause 10.2.1.2.2 , which is defined as Enumeration to notify the result of the message play.
MessageRecordFileIdentifier	Signal	"sl" parameter in the recmess/rm signal in H.248.69 [35] Clause 15.3.1.1.1, which is defined as a URI where the messages are to be stored.
MessagesReceivedNumQuota	Events	"mrq" parameter in the msrpstat/mquota event in H.248.69 [35] Clause 8.2.1.1.2, which is defined as integer to define the quota for number of messages that may be received on the termination for the messaging Stream.
MessagesReceivedVolQuota	Events	"mrv" parameter in the msrpstat/mquota event in H.248.69 [35] Clause 8.2.1.1.4, which is defined as integer to define the quota for cumulative total size of messages that may be received on the Termination for the messaging Stream.
MessagesreceivedNum	ObservedEvents Statistics	"nmr" parameter in the msrpstat/mquota event or statistics in H.248.69 [35], which is defined as integer to define the number of messages that have been received on the termination for the messaging Stream.
MessagesReceivedVol	ObservedEvents Statistics	"vmr" parameter in the msrpstat/mquota event or statistics in H.248.69 [35], which is defined as integer to define the cumulative total size of messages that have been received on the Termination for the messaging Stream.
MessagesSentNumQuota	Events	"msq" parameter in the msrpstat/mquota event in H.248.69 [35] Clause 8.2.1.1.1, which is defined as integer to define the quota for number of messages that may be sent from the termination for the messaging Stream.
MessagesSentVolQuota	Events	"msv" parameter in the msrpstat/mquota event in H.248.69 [35] Clause 8.2.1.1.3, which is defined as integer to define the quota for cumulative total size of messages that may be sent from the Termination for the messaging Stream.
MessagesSentNum	ObservedEvents Statistics	"nms" parameter in the msrpstat/mquota event or or statistics in H.248.69 [35], which is defined as integer to define the number of messages that have been sent from the termination for the messaging Stream.
MessagesSentVol	ObservedEvents Statistics	"vms" parameter in the msrpstat/mquota event or statistics in H.248.69 [35], which is defined as integer to define the cumulative total size of messages that may be sent from the Termination for the messaging Stream.

MMCMH policy	Context Attrribute (NOTE 1)	Defined as "MMCMH policy" property in Annex C, clause C.2.2.1.
MSRP session identity	Local Descriptor or Remote Descriptor	<session-id> in SDP "a= path:MSRP-URI"-line.
Notify TCP Connection Establishment Failure Event	ObservedEvents	As for the ObservedEvent Parameter in clause E.1.2 of ITU-T Recommendation H.248.1 [3] "General cause".
Notify (D)TLS session establishment Failure Event	ObservedEvents	As for the ObservedEvent Parameter in clause E.1.2 of ITU-T Recommendation H.248.1 [3] "General cause".
OutMessageFilters	LocalControl Descriptor	"Outgoing Message Filters, omf" parameter in H.248.69 [35] Clause 13.1.3, which is defined as string and complies with Sieve [IETF RFC5228] with the exceptions described in H.248.69 [35] Clause 13.6.
Port	Local Descriptor or Remote Descriptor	<port> in SDP m-line.
Predefined ROI Sent	Local Descriptor	The "rtcp-fb" SDP attribute defined in IETF RFC 4585 [30] to indicate the "Predefined ROI" RTCP feedback message expressed by the "3gpp-roi-predefined" parameter, as described in 3GPP TS 26.114 [41].
Predefined ROI Received	Remote Descriptor	The "rtcp-fb" SDP attribute defined in IETF RFC 4585 [30] to indicate the "Predefined ROI" RTCP feedback message expressed by the "3gpp-roi-predefined" parameter, as described in 3GPP TS 26.114 [41].
Pre-Shared Key	LocalControl Descriptor	Traffic-Encrypting Key (TEK) associated with the Crypto Session (CS) as defined in IETF RFC 6043 [56] and Annex H of 3GPP TS 33.328 [57] that will be used in TLS handshake. (NOTE 2)
Priority Information	NA	Priority Indicator (clause 6.1.1 of ITU-T Recommendation H.248.1 [3]) Binary Encoding: Encoding as per ITU-T Recommendation H.248.1 [3] Annex A "priority" context attribute Textual Encoding: Encoding as per ITU-T Recommendation H.248.1 [3] Annex B "priority" context attribute
Recognition Result	ObservedEvents	"asrr" parameter to "asrsucc" event in H.248.9a1 [26] Clause 12.2.2.2.1. Each result may be able to be structured by multiple parts in time sequence with the input time, may be able to include the text token that the value will correspond to tokens as defined by the SRGS grammar, may be able to include the interpretation of application specific markup, may be able to include the confidence score that represents the recognition quality.
Record File Format	Signal	To Be Defined
Record File Identifier	Signal	"rid" parameter in playrec signal H.248.9a1 [26] Clause 16.3.1.1.9 for multimedia recording or Clause 10.3.1.1.9 for audio recording
Release TCP Connection	Signals	Defined according to the Release BNC signal (tcpbcc/RelBNC) in ITU-T Recommendation H.248.89 [54].
Release TLS session	Signals	Defined according to the Release BNC signal (tlsbsc/RelBNC) in ITU-T Recommendation H.248.90 [55].
Reserve_Value	Local Control	ITU-T Recommendation H.248.1 [3] Mode property. Binary Encoding: Encoding as per ITU-T Recommendation H.248.1 Annex A "reserveValue" Textual Encoding: Encoding as per ITU-T Recommendation H.248.1 Annex B "reservedValueMode".
RtcpbwRS	Local Descriptor or Remote Descriptor	<bandwidth> in SDP "b:RS"-line.
RtcpbwRR	Local Descriptor or Remote Descriptor	<bandwidth> in SDP "b:RR"-line.
RTPpayload	Local Descriptor or Remote Descriptor	<fmt list> in SDP m-line
SCTP Max Message Size	Local Descriptor or Remote Descriptor	The "a=max-message-size" SDP attribute as defined in IETF RFC 8841 [61], see table 5.15.1.
SCTP Port	Local Descriptor or Remote Descriptor	The "a=sctp-port" SDP attribute as defined in IETF RFC 8841 [61], see table 5.15.1.
SCTP Stream ID	Local Descriptor or Remote Descriptor	<dcmap-stream-id> in SDP "a=dcmap" line as defined in IETF RFC 8864 [62], see table 5.15.1.
SCTP Subprotocol	Local Descriptor or Remote Descriptor	<subprotocol-opt> in SDP "a=dcmap" line as defined in IETF RFC 8864 [62], see table 5.15.1.

SDPCapNeg configuration	Local Descriptor or Remote Descriptor	The SDP attributes for SDP capability negotiation according to IETF RFC 5939 [69].
SDPCapNeg Supported Capabilities	Termination State	Defined according to *SDPCapNeg Extensions* property in ITU-T Recommendation H.248.80 [70].
SenderAddr		TBD
Simulcast desc	Local Descriptor or Remote Descriptor	The "a=simulcast" SDP attribute as defined in IETF RFC 8853 [73], see table 5.15.1.
Simulcast format	Local Descriptor or Remote Descriptor	The "a=rid" SDP attribute as defined in IETF RFC 8851 [74], see table 5.15.1.
SRGS Grammar	Signal	"grammar file, gf" parameter in asr/asr signal in H.248.9a1 [26] Clause 12.3.1.1.2
SRGS grammar URI	Signal	" Recognition grammar identifier, rgid" parameter in asr/ asrid signal in H.248.9a1 [26] Clause 12.3.2.1.2
SSML	Signal	"an" parameter in the aastts/play signal in H.248.9a1 [26] Clause 14.3.1.1.1
StatRepReason	ObservedEvents	"qreach" parameter in the msrpstat/mquota event in H.248.69 [35] Clause 8.2.1.2.1, which is defined as enumeration to indicate the quota that has triggered the reporting of the event.
StatValTime	Events	"tm" parameter in the msrpstat/mquota event in H.248.69 [35] Clause 8.2.1.1.5, which is defined as integer to define how long for the quotas associated are active for.
Stream content	Local Descriptor or Remote Descriptor	The "a=content" SDP attribute as defined in IETF RFC 4796 [72], see table 5.15.1.
Stream Number	Stream	Encoding as per ITU-T Recommendation H.248.1 Annex B "Stream"/"ST". For a single stream, this may be omitted by the MRFC.
STUN server request	LocalControl	Encoding as per ITU-T Recommendation H.248.50 [47] "MG Act-as STUN Server" (mgastuns) package "Act-as STUN Server" (astuns, 0x0001) property.
Termination heartbeat	Events ObservedEvents	The hangterm/thb event as per ITU-T Recommendation H.248.36 [30] Clause 5.2.1.
Termination ID	NA	Binary Encoding: As per ITU-T Recommendation H.248.1 [3] Annex A. Textual Encoding: As per ITU-T Recommendation H.248.1 [3] Annex B.
Timing	Events	As in dd package H.248.1 [3] Annex E.6.2, (end tone detected shall be used)
Tone Completed	Events ObservedEvents	"g/sc" see H.248.1 [3] Annex E.1.2
Tone Duration	Signal	As in the respective tone package
Tone Identity	Signal	Encoding as per ITU-T Recommendation H.248.1 Annex B and the package which defines the tone (Tone Signal Ids only).
Transaction ID	NA	Binary Encoding: As per ITU-T Recommendation H.248.1 [3] Annex A. Textual Encoding: As per ITU-T Recommendation H.248.1 [3] Annex B.
TTS Completed	Events ObservedEvents	"g/sc" see H.248.1 [3] Annex E.1.2 if successful, aastts/ttsfail H.248.9a1 [26] Clause 14.2.1 if not successful.
Transport	Local Descriptor or Remote Descriptor	<transport> in SDP m-line, see 5.15
UserID	Local Descriptor	"a= userid" SDP line as specified in Table 5.15.1.
NOTE 1: H.248.1 version 3 required. NOTE 2: Pre-Shared Key information element needs to be specified in ITU-T Recommendation H.248.90 [55].		

5.17.2 Call Related Procedures

5.17.2.1 General

This clause describes the various call related procedures performed by the MRFP, which are listed in table 15.17.2.1.

Table 5.17.2.1.1: MRFP Call Related Procedures

Transaction defined in 3GPP TS 23.333 [25]	Transaction used from TS 29.163 [27]	Supported	Comment
Reserve IMS Resources	Reserve IMS Connection point	Mandatory	See 5.17.2.2
Configure IMS Resources	Configure IMS Resources	Mandatory	See 5.17.2.3
Reserve and Configure IMS Resources	Reserve IMS Connection Point and configure remote resources	Mandatory	See 5.17.2.4
Release IMS termination	Release IMS termination	Mandatory	See 5.17.2.5
Detect DTMF	Detect IMS RTP Tel Event	Optional	See 5.17.2.18
Stop DTMF Detection	End IMS RTP Tel Event	Optional	See 5.17.2.20
Report DTMF	Notify IMS RTP Tel Event	Optional	See 5.17.2.19
Start Playing Multimedia	n.a for re-use	Optional	See 5.17.2.24
Stop Playing Multimedia	n.a for re-use	Optional	See 5.17.2.25
Playing Multimedia Completed	n.a for re-use	Optional	See 5.17.2.26
Send Tone	n.a for re-use	Optional	See 5.17.2. 6
Stop Tone	IMS Stop Tone	Optional	See 5.17.2.7
Tone Completed	IMS Tone Completed	Optional	See 5.17.2.8
Start Announcement	n.a for re-use	Optional	See 5.17.2.9
Stop Announcement	Stop Announcement	Optional	See 5.17.2.10
Announcement Completed	Announcement Completed	Optional	See 5.17.2.11
Start Audio Record	n.a for re-use	Optional	See 5.17.2.15
Stop Audio Record	n.a for re-use	Optional	See 5.17.2.16
Audio Record Complete	n.a for re-use	Optional	See 5.17.2.17
Start Multimedia Record	n.a for re-use	Optional	See 5.17.2.27
Stop Multimedia Record	n.a for re-use	Optional	See 5.17.2.28
Multimedia Record Completed	n.a for re-use	Optional	See 5.17.2.29
Start TTS	n.a for re-use	Optional	See 5.17.2.12
Stop TTS	n.a for re-use	Optional	See 5.17.2.13
TTS Completed	n.a for re-use	Optional	See 5.17.2.14
Start ASR	n.a for re-use	Optional	See 5.17.2.21
Stop ASR	n.a for re-use	Optional	See 5.17.2.23
ASR Completed	n.a for re-use	Optional	See 5.17.2.22
Adhoc Audio Conference	n.a for re-use	Optional	See 5.17.2.30
Multi-Media Conferencing	n.a for re-use	Optional	See 5.17.2.31
Termination heartbeat Indication	Termination heartbeat Indication	Mandatory	See 5.17.2.32
Configure BFCP Termination	n.a for re-use	Optional	See 5.17.2.33
Configure Conference For Floor Control	n.a for re-use	Optional	See 5.17.2.34
Designate Floor Chair	n.a for re-use	Optional	See 5.17.2.35
Floor Request Decision	n.a for re-use	Optional	See 5.17.2.36
Report Floor Request Decision	n.a for re-use	Optional	See 5.17.2.37
Modify Media	n.a for re-use	Optional	See 5.17.2.38
Confirm Media Update	n.a for re-use	Optional	See 5.17.2.39
Start Playing Message	n.a for re-use	Optional	See 5.17.2.40
Stop Playing Message	n.a for re-use	Optional	See 5.17.2.41
Playing Message Completed	n.a for re-use	Optional	See 5.17.2.42
Start Message Record	n.a for re-use	Optional	See 5.17.2.43
Stop Message Record	n.a for re-use	Optional	See 5.17.2.44
Message Record Completed	n.a for re-use	Optional	See 5.17.2.45
Configure Granted Quota	n.a for re-use	Optional	See 5.17.2.46
Report Message Statistics	n.a for re-use	Optional	See 5.17.2.47
Configure Filtering Rules	n.a for re-use	Optional	See 5.17.2.48
ECN Failure Indication	n.a for re-use	Optional	See 5.17.2.49
ICE Connectivity Check Result Notification	n.a for re-use	Optional	See 5.17.2.50 Only applicable if full ICE is supported
ICE New Peer Reflexive Candidate Notification	n.a for re-use	Optional	See 5.17.2.51 Only applicable if full ICE is supported

Notify TCP connection establishment Failure Indication	n.a for re-use	Optional	See 5.17.2.52
Notify TLS session establishment Failure Indication	n.a for re-use	Optional	See 5.17.2.53
CLUE Message Send	n.a for re-use	Optional	See 5.17.2.54
CLUE Messge Received	n.a for re-use	Optional	See 5.17.2.55
NOTE: A procedure defined in this table can be combined with another procedure in the table. This means that they can share the same contextID and termination ID(s) and that they can be combined in the same H.248 command.			

5.17.2.2 Reserve IMS Resources

The MRFC sends an ADD request command as in Table 5.17.2.2.1.

Table 5.17.2.2.1: Reserve IMS Resources Request

Address Information	Control information	Bearer information

Local Descriptor {
Port = $
IP Address = $
If media is "message":
MSRP session identity = $
If media is "application":
If CLUE data channel required:
SCTP Port = $
}
	Transaction ID = x
	Context ID= $
	If MPS call/session:
	Priority Indicator = x
	ContextAttribute Descriptor {
	If MMCMH feature:
	MMCMH policy
	}
	
	Termination ID = $
	If Stream Number specified:-
	Stream Number
	If Resources for multiple Codecs required:
	Reserve_Value
	NotificationRequested (Event ID = x, "termination heartbeat")
	If ECN transparent support required:
	ECN Enable = "True"
	Initiation Method = "inactive"
	
	If ECN Endpoint support required
	ECN Enable = "True"
	Initiation Method = "ECN Initiation Method" (NOTE 1)
	
	If notification of ECN Failure Report:
	NotificationRequested
	(Event ID = x,"ECN Failure")
	
	If diffserv required:
	Diffserv Code Point
	
	If ICE is applied:
	STUN server request
	
	If indication on TCP connection establishment failure requested:
	NotificationRequested
	(Event ID = x, "TCP connection establishment failure")
	
	If indication on CLUE message received requested:
	NotificationRequested
	(Event ID = x, "CLUE message received")
	
	If MMCMH feature:
	If RTP-level pause and resume:
	Autonomous request
	Autonomous response
		Local Descriptor {
		If media is "audio" or "video":
		Codec List = Codec List
		RTP Payloads = RTP Payload
		Stream content
		If MMCMH feature:
		Simulcast format
		Simulcast desc
		If RTP-level pause and resume:
		CCM pause-resume
		
		If media is "video":
		If CVO required:
		Extended Header for CVO
		(NOTE 2)
		If media is "video":
		If imageattr negotiation:
		Generic Image Attribute
		(NOTE 3)
		If media is "video":
		If Predefined ROI required:
		Extended Header For Sent ROI
		If termination towards ROI-sending client:
		RTCP feedback for Predefined ROI Sent
		If Arbitrary ROI required:
		Extended Header For Sent ROI
		If termination towards ROI-sending client:
		RTCP feedback for Arbitrary ROI Sent
		
		If media is "message":
		If IMS media plane security required:
		Transport = TCP/TLS/MSRP
		Else
		Transport = TCP/MSRP
		If media is "application":
		If CLUE data channel required:
		Transport = UDP/DTLS/SCTP
		Certificate fingerprint = $
		SCTP Stream ID
		Subprotocol = CLUE
		Max message size = $
		
		If ICE is applied:
		ICE host candidate request
		ICE password request
		ICE Ufrag request
		ICE pacing request
		
		If SDPCapNeg is signalled to the gateway:
		SDPCapNeg configuration
		}
		or
		Local Descriptor {
		RTP Payloads = $
		}

NOTE 1:	This shall be set to a value other than "inactive".
NOTE 2:	If the MRFP supports the extended RTP header it shall pass any received extended RTP header with CVO bits on to succeeding RTP streams. If the MRFP transcodes between video payloads and it supports the extended RTP header with CVO bits it shall keep the video orientation unchanged during the transcoding and convey received RTP CVO header bytes on the succeeding RTP streams after transcoding associated packets as specified in 3GPP TS 26.114 [41], clause 7.4.5.
NOTE 3:	The support of the generic image attributes is optional for the MRFP. The list of image sizes per payload type supported by the MRFP is preconfigured in the MRFC. If none of the image sizes received within an SDP body on Mr interface is supported by the MRFP then the MRFC will not send the generic image attribute parameter to the MRFP.

On reserving the IMS termination, the MRFP responds as in Table 5.17.2.2.2.

Table 5.17.2.2.2: Reserve IMS Resources Request Acknowledge

Address Information	Control information	Bearer information

Local Descriptor {
Port
IP Address
If media is "message":
MSRP session identity
If media is "application":
If CLUE data channel required:
SCTP Port
}
	Transaction ID = x
	Context ID = C1
	Termination ID = T1
	Stream Number
		Local Descriptor {
		If media is "audio" or "video":
		Codec List
		RTP Payloads
		Stream content
		If MMCMH feature:
		Simulcast format
		Simulcast desc
		If RTP-level pause and resume:
		CCM pause-resume
		
		If media is "video":
		If CVO extension header provided in the request:
		Extended Header for CVO
		If media is "video":
		If imageattr negotiation:
		Generic Image Attribute
		If media is "video":
		If Predefined ROI provided in the request:
		Extended Header For Sent ROI
		If termination towards ROI-sending client:
		RTCP feedback for Predefined ROI Sent
		If Arbitrary ROI provided in the request:
		Extended Header For Sent ROI
		If termination towards ROI-sending client:
		RTCP feedback for Arbitrary ROI Sent
		
		If ICE is applied:
		ICE host candidate
		ICE password
		ICE Ufrag
		ICE pacing
		If ICE lite implementation
		ICE lite indication
		
		If media is "message":
		If IMS media plane security required:
		Transport = TCP/TLS/MSRP
		Else
		Transport = TCP/MSRP
		If media is "application":
		If CLUE data channel required:
		Transport = UDP/DTLS/SCTP
		Certificate fingerprint
		SCTP Stream ID
		Subprotocol = CLUE
		Max message size
		
		If SDPCapNeg is signalled to the gateway:
		SDPCapNeg configuration
		}

5.17.2.3 Configure IMS Resources

The MRFC sends a MODIFY request command as in Table 5.17.2.3.1.

Table 5.17.2.3.1: Configure IMS Resources Request

Address Information	Control information	Bearer information

If local resources are modified:
Local Descriptor {
Port
IP Address
If media is "message":
MSRP session identity
}
If remote resources are modified:
Remote Descriptor {
Port
IP Address
If media is "message":
MSRP session identity
If media is "application":
If CLUE data channel required:
SCTP Port
}
	Transaction ID = x
	Context ID = C1
	Termination ID = T1
	
	If Stream Number specified:
	Stream Number
	
	If Resources for multiple Codecs required:
	Reserve_Value
	
	If detection of hanging termination is requested: (NOTE1)
	NotificationRequested (Event ID = x, "termination heartbeat")
	If ECN transparent support required:
	ECN Enable = "True"
	Initiation Method = "inactive"
	
	If ECN Endpoint support required
	ECN Enable = "True"
	Initiation Method = "ECN Initiation Method" NOTE2
	
	If notification of ECN Failure Report:
	NotificationRequested (Event ID
	= x,"ECN failure")
	
	If full ICE is applied:
	Send Connectivity Check ("Control")
	If notification of ICE Connectivity Check Result Report:
	NotificationRequested (Event ID= xx, "Connectivity Check Result")
	If notification of New Peer Reflexive Candidate:
	NotificationRequested (Event ID = xy," New Peer Reflexive Candidate ")
	Send Additional Connectivity Check ("Control")
	
	If TCP connection establishment required:
	Establish TCP connection
	
	If indication on TCP connection establishment failure requested:
	NotificationRequested (Event ID = x, "TCP connection establishment failure")
	
	f (D)TLS session establishment required:
	Establish (D)TLS session
	
	If indication on (D)TLS session establishment failure requested:
	NotificationRequested (Event ID = x, "(D)TLS session establishment failure")
	
	If IMS media plane security required:
	Pre-Shared Key (NOTE 6)
		If local resources are modified:
		Local Descriptor {
		If media is "audio" or "video":
		Codec List
		RTP Payloads
		Stream content
		If MMCMH feature:
		Simulcast format
		Simulcast desc
		If RTP-level pause and resume:
		CCM pause-resume
		If RTCP Codec Control Commands and Indications:
		CCM BASE
		If RTCP Delay Budget Information:
		DBI
		
		If media is "video":
		If CVO required:
		Extended Header for CVO (NOTE 3)
		If media is "video":
		If imageattr negotiation:
		Generic Image Attribute (NOTE 4)
		If media is "video":
		If Predefined ROI required:
		Extended Header For Sent ROI
		If termination towards ROI-sending client:
		RTCP feedback for Predefined ROI Sent
		If Arbitrary ROI required:
		Extended Header For Sent ROI
		If termination towards ROI-sending client:
		RTCP feedback for Arbitrary ROI Sent
		
		If media is "message":
		If IMS media plane security required:
		Transport = TCP/TLS/MSRP
		Else
		Transport = TCP/MSRP
		If media is "application":
		If CLUE data channel required:
		Transport = UDP/DTLS/SCTP
		Certificate fingerprint
		Max message size
		
		If SDPCapNeg is signalled to the gateway:
		SDPCapNeg configuration
		}
		
		If remote resources are modified:
		Remote Descriptor {
		If signalling of concurrent codec capabilities in compact form for MMCMH conference:
		Concurrent Codec Capabilities (NOTE 8)
		
		If media is "audio" or "video":

	If MMCMH feature:
	If RTP-level pause and resume:
	Autonomous request
	Autonomous response
		Codec List
		RTP Payloads
		Stream content
		If MMCMH feature:
		Simulcast format
		Simulcast desc
		If RTP-level pause and resume:
		CCM pause-resume
		If rate adaptation for media endpoints:
		Additional Bandwidth Properties (NOTE 7)
		If RTCP Codec Control Commands and Indications:
		CCM BASE
		If RTCP Delay Budget Information:
		DBI
		
		If media is "video":
		If CVO required:
		Extended Header for CVO (NOTE 3)
		If media is "video":
		If imageattr negotiation:
		Generic Image Attribute (NOTE 4)
		If media is "video":
		If Predefined ROI required:
		Extended Header For Sent ROI
		If termination towards ROI-receiving client:
		RTCP feedback for Predefined ROI Received
		If Arbitrary ROI required:
		Extended Header For Sent ROI
		If termination towards ROI-receiving client:
		RTCP feedback for Arbitrary ROI Received
		
		If media is "message"
		If IMS media plane security required:
		Transport = TCP/TLS/MSRP
		Else
		Transport = TCP/MSRP
		
		If RTCP APP messages allowed
		Allowed RTCP APP message types
		
		If ICE is applied:
		ICE received candidate
		ICE received password
		ICE received Ufrag (NOTE 5)
		ICE received pacing (NOTE 9)
		
		If SDPCapNeg is signalled to the gateway:
		SDPCapNeg configuration
		}

NOTE1: It is highly recommended to request termination heartbeat notification to detect hanging context and termination in the MRFP that may result e.g. from a loss of communication between the MRFC and the MRFP.
NOTE 2: This shall be set to a value other than "inactive".
NOTE 3: If the MRFP supports the extended RTP header it shall pass any received extended RTP header with CVO bits on to succeeding RTP streams. If the MRFP transcodes between video payloads and it supports the extended RTP header with CVO bits it shall keep the video orientation unchanged during the transcoding and convey received RTP CVO header bytes on the succeeding RTP streams after transcoding associated packets as specified in 3GPP TS 26.114 [41], clause 7.4.5.
NOTE 4: The support of the generic image attributes is optional for the MRFP. The list of image sizes per payload type supported by the MRFP is preconfigured in the MRFC. If none of the image sizes received within an SDP body on Mr interface is supported by the MRFP then the MRFC will not send the generic image attribute parameter to the MRFP.
NOTE 5: The support of ICE received candidate, ICE received password, ICE received Ufrag are optional for ICE lite, as specified in 3GPP TS 23.333 [25].
NOTE 6: The MRFC and the MRFP may support IMS media plane security i.e. end-to-end media security for session-based messaging (MSRP) using the pre-shared key (PSK) ciphersuites for TLS (specified in IETF RFC 4279 [58] and profiled as specified in Annex E of 3GPP TS 33.310 [59]). The list of PSK ciphersuites for TLS supported by the MRFP is preconfigured in the MRFC.
NOTE 7: The support of rate adaptation for media endpoints using the additional bandwidth properties is optional for the MRFP. If media transcoding is required the MRFC may provide for the selected payload type and the used IP version the additional bandwidth properties.
NOTE 8: The support of "Compact Concurrent Codec Negotiation and Capabilities" is optional. If the MRFC received from the MMCMH conference participant the session level "ccc_list" SDP attribute, the MRFC may indicate to the MRFP the concurrent codec capabilities of the conference participant in a compact representation.
NOTE 9: The ICE received pacing is only applicable for full ICE, as specified in IETF RFC 8445 [77].

The MRFP responds as in 5.17.2.3.2.

Table 5.17.2.3.2: Configure IMS Resources Request Acknowledge

Address Information	Control information	Bearer information

If local resources were provided in request:
Local Descriptor {
Port
IP Address
If media is "message":
MSRP session identity
}
If remote resources are provided in request:
Remote Descriptor {
Port
IP Address
If media is "message":
MSRP session identity
}
	Transaction ID = x
	Context ID = C1
	Termination ID = T1
	
	If Stream Number Specified:
	Stream Number
		If local resources were provided in request:
		Local Descriptor {
		If media is "audio" or "video":
		Codec List
		RTP Payloads
		Stream content
		If MMCMH feature:
		Simulcast format
		Simulcast desc
		If RTP-level pause and resume:
		CCM pause-resume
		If RTCP Codec Control Commands and Indications:
		CCM BASE
		If RTCP Delay Budget Information:
		DBI
		
		If media is "video":
		If CVO extension header provided in the request:
		Extended Header for CVO
		If media is "video":
		If imageattr negotiation:
		Generic Image Attribute
		If media is "video":
		If Predefined ROI provided in the request:
		Extended Header For Sent ROI
		If termination towards ROI-sending client:
		RTCP feedback for Predefined ROI Sent
		If Arbitrary ROI provided in the request:
		Extended Header For Sent ROI
		If termination towards ROI-sending client:
		RTCP feedback for Arbitrary ROI Sent
		
		If media is "message":
		If IMS media plane security required:
		Transport = TCP/TLS/MSRP
		Else
		Transport = TCP/MSRP
		}
		
		If remote resources are provided in request:
		Remote Descriptor {
		If signalling of concurrent codec capabilities in compact form for MMCMH conference:
		Concurrent Codec Capabilities
		
		If media is "audio" or "video":
		Codec List
		RTP Payloads
		Stream content
		If MMCMH feature:
		Simulcast format
		Simulcast desc

		If RTP-level pause and resume:
		CCM pause-resume
		If rate adaptation for media endpoints:
		Additional Bandwidth Properties
		If RTCP Codec Control Commands and Indications:
		CCM BASE
		If RTCP Delay Budget Information:
		DBI
		
		If media is "video":
		If CVO extension header provided in the request:
		Extended Header for CVO
		If media is "video":
		If imageattr negotiation:
		Generic Image Attribute
		If media is "video":
		If Predefined ROI provided in the request:
		Extended Header For Sent ROI
		If termination towards ROI-receiving client:
		RTCP feedback for Predefined ROI Received
		If Arbitrary ROI provided in the request:
		Extended Header For Sent ROI
		If termination towards ROI-receiving client:
		RTCP feedback for Arbitrary ROI Received
		
		If media is "message":
		If IMS media plane security required:
		Transport = TCP/TLS/MSRP
		Else
		Transport = TCP/MSRP
		If media is "application":
		If CLUE data channel required:
		Transport = UDP/DTLS/SCTP
		}

5.17.2.4 Reserve and Configure IMS Resources

The MRFC sends an ADD request command as in Table 5.17.2.4.1.

Table 5.17.2.4.1: Reserve and Configure IMSresources Request

Address Information	Control information	Bearer information

Local Descriptor {
Port = $
IP Address = $
If media is "message":
MSRP session identity = $
If media is "application":
If CLUE data channel required:
SCTP Port = $
}
Remote Descriptor {
Port
IP Address
If media is "message":
MSRP session identity
If media is "application":
If CLUE data channel required:
SCTP Port
}
	Transaction ID = x
	Context ID = $
	If MPS call/session:
	Priority Indicator = x
	ContextAttribute Descriptor {
	If MMCMH feature:
	MMCMH policy
	}
	
	Termination ID = $
	
	If Stream Number Specified:
	Stream Number
	If Resources for multiple Codecs shall be reserved:
	Reserve_Value
	
	If detection of hanging termination is requested: (NOTE1)
	NotificationRequested (Event ID = x, "termination heartbeat")
	
	If ECN transparent support required:
	ECN Enable = "True"
	Initiation Method = "inactive"
	
	If ECN Endpoint support required
	ECN Enable = "True"
	Initiation Method = "ECN Initiation Method" NOTE2
	
	If notification of ECN Failure Report:
	NotificationRequested (Event ID
	= x,"ECN Failure")
	
	If diffserv required:
	Diffserv Code Point
	
	If ICE is applied:
	STUN server request
	If full ICE is applied
	Send Connectivity Check ("Control")
	If notification of ICE Connectivity Check Result Report:
	NotificationRequested (Event ID = xx,"Connectivity Check Result")
	If notification of New Peer Reflexive Candidate:
	NotificationRequested (Event ID = xy," New Peer Reflexive Candidate ")
	
	If TCP connection establishment required:
	Establish TCP connection
	
	If indication on TCP connection establishment failure requested:
	NotificationRequested (Event ID = x, "TCP connection establishment failure")
	
	If (D)TLS session establishment required:
		Local Descriptor {
		If media is "audio" or "video":
		Codec List
		RTP Payloads
		Stream content
		If MMCMH feature:
		Simulcast format
		Simulcast desc
		If RTP-level pause and resume:
		CCM pause-resume
		If RTCP Codec Control Commands and Indications:
		CCM BASE
		If RTCP Delay Budget Information:
		DBI
		
		If media is "video":
		If CVO required:
		Extended Header for CVO (NOTE 3)
		If media is "video":
		If imageattr negotiation:
		Generic Image Attribute (NOTE 4)
		If media is "video":
		If Predefined ROI required:
		Extended Header For Sent ROI
		If termination towards ROI-sending client:
		RTCP feedback for Predefined ROI Sent
		If Arbitrary ROI required:
		Extended Header For Sent ROI
		If termination towards ROI-sending client:
		RTCP feedback for Arbitrary ROI Sent
		
		If media is "message":
		If IMS media plane security required:
		Transport = TCP/TLS/MSRP
		Else
		Transport = TCP/MSRP
		If media is "application":
		If CLUE data channel required:
		Transport = UDP/DTLS/SCTP
		Certificate fingerprint = $
		SCTP Stream ID
		Subprotocol = CLUE
		Max message size = $
		If ICE is applied:
		ICE host candidate request
		ICE password request
		ICE Ufrag request
		ICE pacing request
		
		If SDPCapNeg is signalled to the gateway:
		SDPCapNeg configuration
		
		}
		
		Remote Descriptor { If signalling of concurrent codec capabilities in compact form for MMCMH conference:

	Establish (D)TLS session If indication on (D)TLS session establishment failure requested: NotificationRequested (Event ID = x, "(D)TLS session establishment failure") If IMS media plane security required: Pre-Shared Key (NOTE 6) If indication on CLUE message received requested: NotificationRequested (Event ID = x, "CLUE message received") If MMCMH feature: If RTP-level pause and resume: Autonomous request Autonomous response	Concurrent Codec Capabilities (NOTE 8) If media is "audio" or "video": Codec List RTP Payloads Stream content If MMCMH feature: Simulcast format Simulcast desc If RTP-level pause and resume: CCM pause-resume If rate adaptation for media endpoints: Additional Bandwidth Properties (NOTE 7) If RTCP Codec Control Commands and Indications: CCM BASE If RTCP Delay Budget Information: DBI If media is "video": If CVO required: Extended Header for CVO (NOTE 3) If media is "video": If imageattr negotiation: Generic Image Attribute (NOTE 4) If media is "video": If Predefined ROI required: Extended Header For Sent ROI If termination towards ROI-receiving client: RTCP feedback for Predefined ROI Received If Arbitrary ROI required: Extended Header For Sent ROI If termination towards ROI-receiving client: RTCP feedback for Arbitrary ROI Received If media is "message": If IMS media plane security required: Transport = TCP/TLS/MSRP Else Transport = TCP/MSRP If media is "application": If CLUE data channel required: Transport = UDP/DTLS/SCTP Certificate fingerprint Max message size If RTCP APP messages allowed Allowed RTCP APP message types If ICE is applied: ICE received candidate ICE received password ICE received Ufrag (NOTE 5) ICE received pacing (NOTE 9)

		If SDPCapNeg is signalled to the gateway: SDPCapNeg configuration }

NOTE1: It is highly recommended to request termination heartbeat notification to detect hanging context and termination in the MRFP that may result e.g. from a loss of communication between the MRFC and the MRFP.
NOTE 2: This shall be set to a value other than "inactive".
NOTE 3: If the MRFP supports the extended RTP header it shall pass any received extended RTP header with CVO bits on to succeeding RTP streams. If the MRFP transcodes between video payloads and it supports the extended RTP header with CVO bits it shall keep the video orientation unchanged during the transcoding and convey received RTP CVO header bytes on the succeeding RTP streams after transcoding associated packets as specified in 3GPP TS 26.114 [41], clause 7.4.5.
NOTE 4: The support of the generic image attributes is optional for the MRFP. The list of image sizes per payload type supported by the MRFP is preconfigured in the MRFC. If none of the image sizes received within an SDP body on Mr interface is supported by the MRFP then the MRFC will not send the generic image attribute parameter to the MRFP.
NOTE 5: The support of ICE received candidate, ICE received password, ICE received Ufrag are optional for ICE lite, as specified in 3GPP TS 23.333 [25].

NOTE 6: The MRFC and the MRFP may support IMS media plane security i.e. end-to-end media security for session-based messaging (MSRP) using the pre-shared key (PSK) ciphersuites for TLS (specified in IETF RFC 4279 [58] and profiled as specified in Annex E of 3GPP TS 33.310 [59]). The list of PSK ciphersuites for TLS supported by the MRFP is preconfigured in the MRFC.
NOTE 7: The support of rate adaptation for media endpoints using the additional bandwidth properties is optional for the MRFP. If media transcoding is required the MRFC may provide for the selected payload type and the used IP version the additional bandwidth properties.
NOTE 8: The support of "Compact Concurrent Codec Negotiation and Capabilities" is optional. If the MRFC received from the MMCMH conference participant the session level "ccc_list" SDP attribute, the MRFC may indicate to the MRFP the concurrent codec capabilities of the conference participant in a compact representation.
NOTE 9: The ICE received pacing is only applicable for full ICE, as specified in IETF RFC 8445 [77].

The MRFP responds as in Table 5.17.2.4.2.

Table 5.17.2.4.2: Reserve and Configure IMS Resources Request Acknowledge

Address Information	Control information	Bearer information

Local Descriptor {
Port
IP Address
If media is "message":
MSRP session identity
If media is "application":
If CLUE data channel required:
SCTP Port
}
Remote Descriptor {
Port
IP Address
If media is "message":
MSRP session identity
}
	Transaction ID = x
	Context ID = C1
	Termination ID = T1
	Stream Number
		Local Descriptor {
		If media is "audio" or "video":
		Codec List
		RTP Payloads
		Stream content
		If MMCMH feature:
		Simulcast format
		Simulcast desc
		If RTP-level pause and resume:
		CCM pause-resume
		If RTCP Codec Control Commands and Indications:
		CCM BASE
		If RTCP Delay Budget Information:
		DBI
		
		If media is "video":
		If CVO extension header provided in the request:
		Extended Header for CVO
		If media is "video":
		If imageattr negotiation:
		Generic Image Attribute
		If media is "video":
		If Predefined ROI provided in the request:
		Extended Header For Sent ROI
		If termination towards ROI-sending client:
		RTCP feedback for Predefined ROI Sent
		If Arbitrary ROI provided in the request:
		Extended Header For Sent ROI
		If termination towards ROI-sending client:
		RTCP feedback for Arbitrary ROI Sent
		
		If media is "message":
		If IMS media plane security required:
		Transport = TCP/TLS/MSRP
		Else
		Transport = TCP/MSRP
		If media is "application":
		If CLUE data channel required:
		Transport = UDP/DTLS/SCTP
		Certificate fingerprint
		SCTP Stream ID
		Subprotocol = CLUE
		Max message size
		
		If ICE is applied:
		ICE host candidate
		ICE password
		ICE Ufrag
		ICE pacing
		If ICE lite implementation
		ICE lite indication
		
		If SDPCapNeg is signalled to the gateway:
		SDPCapNeg configuration
		}
		
		Remote Descriptor {

		If signalling of concurrent codec capabilities in compact form for MMCMH conference:
		Concurrent Codec Capabilities
		
		If media is "audio" or "video":
		Codec List
		RTP Payloads
		Stream content
		If MMCMH feature:
		Simulcast format
		Simulcast desc
		If RTP-level pause and resume:
		CCM pause-resume
		If rate adaptation for media endpoints:
		Additional Bandwidth Properties
		If RTCP Codec Control Commands and Indications:
		CCM BASE
		If RTCP Delay Budget Information:
		DBI
		
		If media is "video":
		If CVO extension header provided in the request:
		Extended Header for CVO
		If media is "video":
		If imageattr negotiation:
		Generic Image Attribute
		If media is "video":
		If Predefined ROI provided in the request:
		Extended Header For Sent ROI
		If termination towards ROI-receiving client:
		RTCP feedback for Predefined ROI Received
		If Arbitrary ROI provided in the request:
		Extended Header For Sent ROI
		If termination towards ROI-receiving client:
		RTCP feedback for Arbitrary ROI Received
		
		If media is "message":
		If IMS media plane security required:
		Transport = TCP/TLS/MSRP
		Else
		Transport = TCP/MSRP
		If media is "application":
		If CLUE data channel required:
		Transport = UDP/DTLS/SCTP
		
		If SDPCapNeg is signalled to the gateway:
		SDPCapNeg configuration
		}

5.17.2.5 Release IMS Termination

The MRFC sends a SUBTRACT command as in Table 5.17.2.5.1.

Table 5.17.2.5.1: Release IMS Termination Request

Address Information	Control information	Bearer information
	Transaction ID = x Context ID= C1 Termination ID = T1	

On releasing the IMS termination, the MRFP responds as in Table 5.17.2.5.2

Table 5.17.2.5.2: Release IMS Termination Request Acknowledge

Address Information	Control information	Bearer information
	Transaction ID = x Context ID = C1 Termination ID = T1	

5.17.2.6 Send Tone

This procedure is used to play a tone.

The MRFC sends an ADD or MODIFY command as in table 5.17.2.6.1.

Table 5.17.2.6.1: Send Tone

Address information	Control information	Bearer information

	Transaction ID = x
	If context already exists:
	  Context ID = C1
	Else
	  Context = $
	If Termination exists:
	  Termination ID = T1
	Else
	  Termination ID = $
	
	If Stream Number specified:
	  Stream Number
	
	Signal ID = Tone Identity
	If override Signal Direction
	  Direction = Signal Direction
	
	If DTMF override
	  Override = DTMFTrigger
	
	If MRFC wishes to override the default tone duration:
	  Tone Duration
	
	If MRFC requires to be informed of the end of the tone :-
	  Request End Of Signal Notification
	If detection of hanging termination is requested: (NOTE3)
	NotificationRequested (Event ID = x, "termination heartbeat")	

NOTE1: Signal Direction shall be either "internal" or "external". NOTE2: Only the Tone Signal Ids shall be used, not the Tone Ids within the PlayTone Signal Id. NOTE3: The termination heartbeat event shall be configured when requesting a new bearer termination.

The MRFP responds as shown in Table 5.17.2.6.2.

Table 5.17.2.6.2: SendTone Acknowledge

Address information	Control information	Bearer information
	Transaction ID = x Context ID = C1 Termination ID = T1 If local resources were provided in request: Stream Number	

5.17.2.7 Stop Tone

This procedure is used to stop a tone. This procedure is the same as the procedure Start Tone however the signal descriptor shall not include the started tone signal. Note that a tone may also be stopped by releasing the IMS termination.

5.17.2.8 Tone Completed

This procedure is used to report that a tone has ended.

The MRFP sends a NOTIFY to the MRFC as shown in table 5.17.2.q.1.

Table 5.17.2.8.1: Tone Completed

Address information	Control information	Bearer information
	Transaction ID = x Context ID = C1 Termination ID = T1 End Of Signal Notification = Tone Completed Cause	

The MRFC responds as shown in Table 5.17.2.8.2.

Table 5.17.2.8.2: Tone Completed Ack

Address information	Control information	Bearer information
	Transaction ID = x Context ID = C1 Termination ID = T1	

5.17.2.9 Start Announcement

This procedure is used to play an announcement, which may be fixed or variable.

The MRFC sends an ADD or MODIFY command as in Table 5.17.2.9.1.

Table 5.17.2.9.1: Start Announcement

Address information	Control information	Bearer information
	Transaction ID = x If context already exists: Context ID = C1 Else Context = $ If Termination exists: Termination ID = T1 Else Termination ID = $ If Stream number specified: Stream Number Announcement Identity If override Signal Direction Direction = Announcement Direction If DTMF override Override = DTMFTrigger If MRFC wishes to override the default number of cycles: Announcement Cycles If MRFC wishes to override the default announcement variant: Announcement Variant If MRFC requires to be informed of the end of the fixed announcement :- Request End Of Signal Notification If detection of hanging termination is requested: (NOTE4) NotificationRequested (Event ID = x, "termination heartbeat")	
NOTE1: Signal Direction shall be either "internal" or "external". NOTE2: Stream mode may be maintained as for the ongoing call or may be restricted to "send only". NOTE3: Signal Lists shall be supported. NOTE4: The termination heartbeat event shall be configured when requesting a new bearer termination.		

The MRFP responds as shown in Table 5.17.2.9.2.

Table 5.17.2.9.2: Start Announcement Acknowledge

Address information	Control information	Bearer information
	Transaction ID = x Context ID = C1 Termination ID = T1 If local resources were provided in request: Stream Number	

5.17.2.10 Stop Announcement

This procedure is used to stop an announcement. This procedure is the same as the procedure Start Announcement however the signal descriptor shall not include the started announcement signal. Note that an announcement may also be stopped by releasing the IMS termination.

5.17.2.11 Announcement Completed

This procedure is used to report that an announcement has ended.

The MRFP sends a NOTIFY to the MRFC as shown in table 5.17.2.11.1.

Table 5.17.2.11.1: Announcement Completed

Address information	Control information	Bearer information
	Transaction ID = x Context ID = C1 Termination ID = T1 End Of Signal Notification = Announcement Completed Cause = Announcement Cause	

The MRFC responds as shown in Table 5.17.2.11.2.

Table 5.17.2.11.2: Announcement Completed Ack

Address information	Control information	Bearer information
	Transaction ID = x Context ID = C1 Termination ID = T1	

5.17.2.12 Start TTS

This procedure is used to play out a text file as speech.

The MRFC sends an ADD or MODIFY command as in Table 5.17.2.12.1.

Table 5.17.2.12.1: Start TTS request

Address information	Control information	Bearer information
	Transaction ID = x If context already exists: Context ID = C1 Else Context = $ If Termination exists: Termination ID = T1 Else Termination ID = $ If Stream number specified: Stream Number If override Direction TTS Direction = Signal Direction If DTMF override DTMF Stop TTS =DTMFTrigger Text Block = SSML If MRFC wishes to override the default number of cycles: number of cycles = Iterations If MRFC requires to be informed of the end of TTS:- Request End Of Signal Notification If detection of hanging termination is requested: (NOTE1) NotificationRequested (Event ID = x, "termination heartbeat")	
NOTE1: The termination heartbeat event shall be configured when requesting a new bearer termination.		

The MRFP responds as shown in Table 5.17.2.12.2.

Table 5.17.2.12.2: Start TTS Acknowledge

Address information	Control information	Bearer information
	Transaction ID = x Context ID = C1 Termination ID = T1 If local resources were provided in request: Stream Number	

5.17.2.13 Stop TTS

This procedure is used to stop TTS play. This procedure is the same as the procedure Start TTS however the signal descriptor shall not include the started TTS signal. Note that an TTS play may also be stopped by releasing the IMS termination.

5.17.2.14 TTS Completed

This procedure is used to report that an TTS play has ended.

The MRFP sends a NOTIFY to the MRFC as shown in table 5.17.2.14.1.

Table 5.17.2.14.1: TTS Completed

Address information	Control information	Bearer information
	Transaction ID = x Context ID = C1 Termination ID = T1 End Of Signal Notification = TTS Completed Cause	

The MRFC responds as shown in Table 5.17.2.14.2.

Table 5.17.2.14.2: TTS Completed Ack

Address information	Control information	Bearer information
	Transaction ID = x Context ID = C1 Termination ID = T1	

5.17.2.15 Start Audio Record

This procedure enables a caller to leave/record a voice message (e.g. in a voice mail application).

The MRFC sends an ADD or MODIFY command as in table 5.17.2.15.1.

Table 5.17.2.15.1: Start Audio Record

Address information	Control information	Bearer information
	Transaction ID = x If context already exists: Context ID = C1 Else Context = $ If Termination exists: Termination ID = T1 Else Termination ID = $ If Stream Number specified: Stream Number If specific record file Recording File Identity = Record File Identifier If request record file Identity Recording File Identity = ? If maximum record time Maximum Recording Length = Maximum Record Time If MRFC requires to be informed of the end of the recording :- End Of Recording Notification If override Signal Direction Direction = Signal Direction If detection of hanging termination is requested: (NOTE1) NotificationRequested (Event ID = x, "termination heartbeat")	
NOTE1: The termination heartbeat event shall be configured when requesting a new bearer termination. NOTE2: Signal Direction shall be either "internal" or "external". NOTE3: Multiple signals shall be supported.		

The MRFP responds as shown in table 5.17.2.15.2.

Table 5.17.2.15.2: Start Audio Record acknowledge

Address information	Control information	Bearer information
	Transaction ID = x Context ID = C1 Termination ID = T1 If local resources were provided in request: Stream Number If requested record file identity Recording File Identity = Record File Identifier	

5.17.2.16 Stop Audio Record

This procedure is used to stop recording of audio. Note that Audio Record may also be stopped by releasing the IMS termination.

Table 5.17.2.16.1: Stop Audio Record

Address information	Control information	Bearer information
	Transaction ID = x Context ID = C1 Termination ID = T1 Stop Audio Record Indication If End of Audio Record Notification previously requested : Stop End of Record Notification	

The MRFP responds as shown in Table 5.17.2.16.2.

Table 5.17.2.16.2: Stop Audio Record Response

Address information	Control information	Bearer information
	Transaction ID = x Context ID = C1 Termination ID = T1	

5.17.2.17 Audio Record Complete

This procedure enables the MRFP to inform the MRFC when an audio recording is complete.

The MRFP sends a NOTIFY command as in table 5.17.2.17.1.

Table 5.17.2.17.1: Audio Record Complete

Address information	Control information	Bearer information
	Transaction ID = x Context ID = C1 Termination ID = T1 End Of Recording Notification	

The MRFC responds as shown in table 5.17.2.17.2.

Table 5.17.2.17.2: Audio Record Complete Acknowledge

Address information	Control information	Bearer information
	Transaction ID = x Context ID = C1 Termination ID = T1	

5.17.2.18 Detect DTMF

This procedure is used to collect DTMF digits.

The MRFP applies the procedures defined in RFC 4733 [22] to receive DTMF digits at the user plane, however only complete single digits shall be reported, i.e. the MRFP shall wait until E-bit is set to 1 before reporting the digit to the MRFC.

The MRFC sends an ADD or MODIFY command as in Table 5.17.2.18.1.

Table 5.17.2.18.1: Detect DTMF

Address information	Control information	Bearer information

	Transaction ID = x
	If context already exists:
	  Context ID = C1
	Else
	  Context = $
	If Termination exists:
	  Termination ID = T1
	Else
	  Termination ID = $
	
	If Stream Number specified:
	  Stream Number
	
	NotificationRequested (Event ID = x, "Report_DTMF (Digit,Timing)")	

NOTE1: Only "end tone detected" shall be requested by the MRFC. NOTE2: All digits shall be requested i.e. ToneId shall be wildcarded.		

The MRFP responds as shown in Table 5.17.2.18.2.

Table 5.17.2.18.2: Detect DTMF acknowledge

Address information	Control information	Bearer information
	Transaction ID = x Context ID = C1 Termination ID = T1 If local resources were provided in request: Stream Number	

5.17.2.19 Report DTMF

This procedure is used to notify the MRFC of detected DTMF digits.

The MRFP sends a NOTIFY command as in Table 5.17.2.19.1.

Table 5.17.2.19.1: Report DTMF

Address information	Control information	Bearer information
	Transaction ID = x Context ID = C1 Termination ID = T1 Digit Notification = digit	

The MRFC responds as shown in Table 5.17.2.19.2.

Table 5.17.2.19.2: Report DTMF Digit Acknowledge

Address information	Control information	Bearer information
	Transaction ID = x Context ID = C1 Termination ID = T1	

5.17.2.20 Stop DTMF Detection

This procedure is used to stop DTMF digit detection.

The MRFC sends a MODIFY command as in Table 5.17.2.20.1.

Table 5.17.2.20.1: Stop DTMF Detection

Address information	Control information	Bearer information
	Transaction ID = x Context ID = C1 Termination ID = T1 Stop DTMF Digit Collection	

The MRFP responds as shown in Table 5.17.2.20.2.

Table 5.17.2.20.2: Stop DTMF Digit Detection acknowledge

Address information	Control information	Bearer information
	Transaction ID = x Context ID = C1 Termination ID = T1	

5.17.2.21 ASR Request

This procedure enables the MRFC to request the MRFP to perform automatic speech recognition; an advanced interaction with the user involving guidance announcements and collection of user input via speech and also possibly DTMF. In turn, the MRFP attempts to recognize and match the detected speech to the specified grammar file and report this to the MRFC.

The MRFC sends an ADD or MODIFY command as in table 5.17.2.21.1.

Table 5.17.2.21.1: ASR request

Address information	Control information	Bearer information
	Transaction ID = x If context already exists: Context ID = C1 Else Context = $ If Termination exists: Termination ID = T1 Else Termination ID = $ If Stream Number specified: Stream Number If recognition with grammar script ASR Grammar = SRGS grammar Else recognition with grammar identifier ASR Grammar = SRGS grammar URI If MRFC requires to be informed of the end of the ASR :- NotificationRequested (Event ID = x, "Notify ASR Completion (recognition result)") If detection of hanging termination is requested: (NOTE1) NotificationRequested (Event ID = x, "termination heartbeat")	
NOTE1: The termination heartbeat event shall be configured when requesting a new bearer termination.		

The MRFP responds as shown in table 5.17.2.21.2.

Table 5.17.2.21.2: ASR request acknowledge

Address information	Control information	Bearer information
	Transaction ID = x Context ID = C1 Termination ID = T1 If local resources were provided in request: Stream Number	

5.17.2.22 ASR Completed

This procedure enables the MRFP to inform the MRFC of the result of an ASR request.

The MRFP sends a NOTIFY command as in table 5.17.2.22.1.

Table 5.17.2.22.1: ASR Completed

Address information	Control information	Bearer information
	Transaction ID = x Context ID = C1 Termination ID = T1 If ASR fails: ASR Cause Else recognition result	

The MRFP responds as shown in table 5.17.2.22.2.

Table 5.17.2.22.2: ASR Completed acknowledge

Address information	Control information	Bearer information
	Transaction ID = x Context ID = C1 Termination ID = T1	

5.17.2.23 Stop ASR

This procedure is used to stop the ASR procedure.

The MRFC sends a MODIFY command as in Table 5.17.2.23.1.

Table 5.17.2.23.1: Stop ASR

Address information	Control information	Bearer information
	Transaction ID = x Context ID = C1 Termination ID = T1 Stop ASR	

The MRFP responds as shown in Table 5.17.2.23.2.

Table 5.17.2.23.2: Stop ASR acknowledge

Address information	Control information	Bearer information
	Transaction ID = x Context ID = C1 Termination ID = T1	

5.17.2.24 Start Playing Multimedia

This procedure enables a caller to be connected to a playback of previously recorded multimedia segments. This procedure is similar to that of 5.17.2.9 with the difference that multiple H.248 streams will be used to reflect the multimedia content to be played out.

The MRFC sends an ADD or MODIFY command as in Table 5.17.2.24.1.

Table 5.17.2.24.1: Start Playing Multimedia

Address information	Control information	Bearer information
	Transaction ID = x If context already exists: Context ID = C1 Else Context = $ If Termination exists: Termination ID = T1 Else Termination ID = $ If multiple media sources Stream NumberX: Media IdentifierX Stream numberY: Media IdentifierY Else Stream NumberX, Stream NumberY: Media Identifier If override multimedia format Format = Multimedia File Format If override Signal Direction Direction = Signal Direction If DTMF override Multimedia Override = DTMFTrigger If MRFC wishes to override the default number of cycles: play Cycles= iteration If MRFC wishes to override the default announcement variant: Announcement Variant If MRFC requires to be informed of the end of the multimedia play Request End Of Signal Notification If detection of hanging termination is requested: (NOTE4) NotificationRequested (Event ID = x, "termination heartbeat")	
NOTE1: Signal Direction shall be either "internal" or "external". NOTE2: Stream mode may be maintained as for the ongoing call or may be changed be restricted to "send only". NOTE3: Signal Lists shall be supported NOTE4: The termination heartbeat event shall be configured when requesting a new bearer termination.		

The MRFP responds as shown in Table 5.17.2.24.2.

Table 5.17.2.24.2: Start Playing Multimedia Acknowledge

Address information	Control information	Bearer information
	Transaction ID = x Context ID = C1 Termination ID = T1 If local resources were provided in request: Stream Number	

5.17.2.25 Stop Playing Multimedia

This procedure is used to stop an announcement. This procedure is the same as the procedure Start Playing Multimedia however the signal descriptor shall not include the started multimedia signal. Note that playing multimedia may also be stopped by releasing the IMS termination.

5.17.2.26 Playing Multimedia Completed

This procedure is used to report that a playing multimedia has ended.

The MRFP sends a NOTIFY to the MRFC as shown in table 5.17.2.26.1.

Table 5.17.2.26.1: Playing Multimedia Completed

Address information	Control information	Bearer information
	Transaction ID = x Context ID = C1 Termination ID = T1 End Of Signal Notification = Playing Multimedia Completed Cause = Announcement Cause	

The MRFC responds as shown in Table 5.17.2.26.2.

Table 5.17.2.26.2: Playing Multimedia Completed Ack

Address information	Control information	Bearer information
	Transaction ID = x Context ID = C1 Termination ID = T1	

5.17.2.27 Start Multimedia Record

This procedure enables a caller to leave/record a multimedia message. This procedure is similar to that of Audio Record (5.17.2.15) with the difference that multiple H.248 streams will be used and both audio and video codecs are specified for each participant in the conference. Any prompting "announcements" are played out in the appropriate format by the MRFP based on the fact that multimedia codecs are specified by the MRFC in the Remote Descriptor. Similarly, the MRFP records all received media streams that are consistent with the Local Descriptor of the termination.

The MRFC sends an ADD or MODIFY command as in table 5.17.2.27.1.

Table 5.17.2.27.1 – Start Multimedia Record

Address information	Control information	Bearer information
	Transaction ID = x If context already exists: Context ID = C1 Else Context = $ If Termination exists: Termination ID = T1 Else Termination ID = $ If Stream Number specified: Stream Number If specific record file Recording File Identity = Record File Identifier If override multimedia format Format = Multimedia File Format If maximum record time Maximum Recording Length = Maximum Record Time If MRFC requires to be informed of the end of the recording :- End Of Recording Notification If request record file identity Recording File Identity = ? If DTMF override Override = DTMFTrigger If detection of hanging termination is requested: (NOTE1) NotificationRequested (Event ID = x, "termination heartbeat")	
NOTE1: The termination heartbeat event shall be configured when requesting a new bearer termination. NOTE2: Multiple signals shall be supported.		

The MRFP responds as shown in table 5.17.2.27.2.

Table 5.17.2.27.2: Start Multimedia Record acknowledge

Address information	Control information	Bearer information
	Transaction ID = x Context ID = C1 Termination ID = T1 If local resources were provided in request: Stream Number If requested record file identity Recording File Identity = Record File Identifier	

5.17.2.28 Stop Multimedia Record

This procedure is used to stop recording of multimedia. Note that Audio Record may also be stopped by releasing the IMS termination.

Table 5.17.2.28.1: Stop Multimedia Record

Address information	Control information	Bearer information
	Transaction ID = x Context ID = C1 Termination ID = T1 Stop Multimedia Record Indication If End of Multimedia Record Notification previously requested : Stop End of Record Notification	

The MRFP responds as shown in Table 5.17.2.28.2.

Table 5.17.2.28.2: Stop Multimedia Record Response

Address information	Control information	Bearer information
	Transaction ID = x Context ID = C1 Termination ID = T1	

5.17.2.29 Multimedia Record Completed

This procedure enables the MRFP to inform the MRFC when multimedia recording is complete.

The MRFP sends a NOTIFY command as in table 5.17.2.29.1.

Table 5.17.2.29.1: Multimedia Record Completed

Address information	Control information	Bearer information
	Transaction ID = x Context ID = C1 Termination ID = T1 End Of Recording Notification	

The MRFC responds as shown in table 5.17.2.29.2.

Table 5.17.2.29.2: Multimedia Record Completed Acknowledge

Address information	Control information	Bearer information
	Transaction ID = x Context ID = C1 Termination ID = T1	

5.17.2.30 Adhoc Audio Conference

This includes support for N-party conferences plus the support of audio transcoding. In this case, up to N ephemeral terminations may be placed in a context and appropriate audio transcoding performed by the MRFP between any codec differences between the terminations. In terms of the media mixing, the MRFP mixes audio from terminations N-1, N-2 etc plays to termination N and so forth.

This procedure consists of the creation of the first ephemeral termination of a conference within a context using procedure "Reserve and Configure IMS Resources" and then subsequent parties are added using procedures "Reserve IMS Resources" and "Configure IMS Resources".

5.17.2.31 Multi-Media Conferencing

This is similar to audio conferencing (5.17.2.y) with the difference that multiple H.248 streams will be used and both audio and video codecs are specified for each participant in the conference. The MRFP shall only transcode and mix between streams of the same media type.

5.17.2.32 Termination heartbeat indication

When the procedure "Termination heartbeat indication" is required the following procedure is initiated: the MRFP sends a NOT.req command with the following information.

5.17.2.32.1 NOT.req (Termination heartbeat) MRFP to MRFC

Address Information	Control information	Bearer information
	Transaction ID = x Context ID = C1 Termination ID = T1 Event_ID (Event ID = x, "termination heartbeat")	

When the processing of command is complete, the MRFC initiates the following procedure.

5.17.2.32.2 NOT.resp (Termination heartbeat) MRFC to MRFP

Address Information	Control information	Bearer information
	Transaction ID = x Context ID = C1 Termination ID = T1	

The heartbeat timer shall be configured to a value much greater than the mean call holding time.

The MRFC is in charge of correcting any detected mismatch, by substracting hanging terminations or clearing hanging contexts.

5.17.2.33 Configure BFCP Termination

This procedure configures a termination to support Binary Floor Control Protocol.

The MRFC sends an ADD or MODIFY command as in Table 5.17.2.33.1.

Table 5.17.2.33.1: Configure BFCP Termination MRFC to MRFP

Address Information	Control information	Bearer information

Local Descriptor {
Port = $
IP Address = $
}
Remote Descriptor {
Port
IP Address
}
	Transaction ID = x
	If context already exists:
	Context ID = C1
	Else
	Context = $
	If Termination exists:
	Termination ID = T1
	Else
	Termination ID = $
	
	If Stream Number Specified:
	Stream Number
	
	If detection of hanging termination is requested: (NOTE 1)
	NotificationRequested
	(Event ID = x,
	"termination heartbeat")
	
	If TCP connection establishment required:
	Establish TCP connection
	
	If indication on TCP connection establishment failure requested:
	NotificationRequested
	(Event ID = x, "TCP connection establishment failure")
	
	If indication on TLS session establishment failure requested:
	NotificationRequested
	(Event ID = x, "TLS session establishment failure")
	
	If IMS media plane security required:
	Pre-Shared Key (NOTE 3)
		Local Descriptor {
		
		If IMS media plane security required:
		Transport = TCP/TLS/BFCP
		Else
		Transport = TCP/BFCP
		
		User Identifier = UserID
		Available Floors = FloorId-x, FloorID-y…(NOTE 2)
		
		}
		
		Remote Descriptor {
		
		If IMS media plane security required:
		Transport = TCP/TLS/BFCP
		Else
		Transport = TCP/ BFCP
		
		}

NOTE 1: It is highly recommended to request termination heartbeat notification to detect hanging context and termination in the MRFP that may result e.g. from a loss of communication between the MRFC and the MRFP.

NOTE 2: Properties are configured against the local stream descriptor for BFCP but infact applies to the whole termination (user), i.e. all streams.

NOTE 3: The MRFC and the MRFP may support IMS media plane security i.e. end-to-end media security for conferencing (BFCP) using the pre-shared key (PSK) ciphersuites for TLS (specified in IETF RFC 4279 [58] and profiled as specified in Annex E of 3GPP TS 33.310 [59]). The list of PSK ciphersuites for TLS supported by the MRFP is preconfigured in the MRFC.

The MRFP responds as in Table 5.17.2.33.2.

Table 5.17.2.33.2: Configure BFCP Termination Acknowledge MRFP to MRFC

Address Information	Control information	Bearer information

Local Descriptor {
Port
IP Address
}
Remote Descriptor {
Port
IP Address
}
	Transaction ID = x
	Context ID = C1
	Termination ID = T1
	Stream Number
		Local Descriptor {
		If IMS media plane security required:
		Transport = TCP/TLS/BFCP
		Else
		Transport = TCP/ BFCP
		}
		
		Remote Descriptor {
		If IMS media plane security required:
		Transport = TCP/TLS/BFCP
		Else
		Transport = TCP/ BFCP
		}

5.17.2.34 Configure Conference

This procedure configures or modifies Context properties required to support a MRFP based Floor Control Server.

The MRFC sends an ADD or MODIFY command as in Table 5.17.2.34.1.

Table 5.17.2.34.1: Configure Conference MRFC to MRFP

Address Information	Control information	Bearer information

	Transaction ID = x
	If context already exists:
	Context ID = C1
	Else
	Context = $
	
	ContextAttribute Descriptor
	{
	Conference Identifier = ConfID
	
	Floor Control Algorithm =
	FloorControlAlgorithm
	
	MaxNumber of Floor Holders =
	MaxFloorHolder
	
	Floor Resource Associations =
	FloorResAssociations
	}	

The MRFP responds as in Table 5.17.2.34.2.

Table 5.17.2.34.2: Configure Conference Acknowledge MRFP to MRFC

Address Information	Control information	Bearer information
	Context ID = C1	

5.17.2.35 Designate Floor Chair

This procedure configures a termination to be Floor Chair support Binary Floor Control Protocol.

Pre-requisites:

- This procedure is dependent on "Configure Conference" procedure having been successfully completed or it may be combined in the same ADD command.

- This procedure is dependent on "Configure BFCP Termination" procedure having been successfully completed or it may be combined in the same command.

The MRFC sends an ADD or MODIFY command as in Table 5.17.2.35.1.

Table 5.17.2.35.1: Designate Floor Chair MRFC to MRFP

Address Information	Control information	Bearer information

	Transaction ID = x
	
	Context ID = C1
	
	If Termination exists:
	  Termination ID = T1
	Else
	  Termination ID = $
	
	If Stream Number Specified:
	  Stream Number
	
	Floors Controlled by Chair =
	  ControlledByChair
	
	If detection of hanging termination is requested: (NOTE1)
	NotificationRequested (Event ID = x, "termination heartbeat")	

NOTE1: It is highly recommended to request termination heartbeat notification to detect hanging context and termination in the MRFP that may result e.g. from a loss of communication between the MRFC and the MRFP.		

The MRFP responds as in Table 5.17.2.35.2.

Table 5.17.2.35.2: Designate Floor Chair Acknowledge MRFP to MRFC

Address Information	Control information	Bearer information
	Transaction ID = x Context ID = C1 Termination ID = T1 Stream Number	

5.17.2.36 Floor Request Decision

This procedure requests the MRFP to notify the MRFC when a decision has been made by the FCS in response to a BFCP Floor Request.

The MRFC sends an ADD or MODIFY command as in Table 5.17.2.yx.1.

Table 5.17.2.36.1: Floor Request Decision MRFC to MRFP

Address Information	Control information	Bearer information
	Transaction ID = x Context ID = C1 Termination ID = T1 NotificationRequested (Event ID = x, "FloorRequestDecision")	

The MRFP responds as in Table 5.17.2.36.2.

Table 5.17.2.36.2: Floor Request Decsion Acknowledge MRFP to MRFC

Address Information	Control information	Bearer information
	Transaction ID = x Context ID = C1 Termination ID = T1	

5.17.2.37 Report Floor Request Decision

This procedure indicates the decision made by the FCS in response to a BFCP Floor Request. The MRFP indicates the agreed Floor Permissions so that any required changes to the streams can be managed by the MRFC.

The MGW sends a NOT.req command with the following information.

Table 5.17.2.37.1: NOT.req (FloorRequestDecision) MRFP to MRFC

Address Information	Control information	Bearer information
	Transaction ID = z Context ID = c1 Termination ID = bearer1 Event_ID (Event ID = x, " FloorRequestDecision (Floor ID1 + FloorStatus1, Floor ID2 + FloorStatus2) ")	

When the processing of command (1) is complete, the MGC initiates the following procedure.

Table 5.17.2.37.2: NOT.resp (FloorRequestDecision) MRFC to MRFP

Address Information	Control information	Bearer information
	Transaction ID = z Context ID = c1 Termination ID = bearer1	

5.17.2.38 Modify Media

This procedure modifies the termination(s) in accordance with the agreed Floor Permissions granted by the FCS in response to a BFCP Floor Request (notified to the MRFC via the "Report Floor Request Decision" procedure).

The MRFC sends a MODIFY command as in Table 5.17.2.38.1.

Table 5.17.2.38.1: Modify Media MRFC to MRFP

Address Information	Control information	Bearer information

	Transaction ID = x
	Context ID = C1
	Termination ID
		Local Descriptor {
		If stream modified
		Stream Mode = mode.
		If attributes modified
		[SDP…]
		}
		
		Remote Descriptor {
		If stream modified
		Stream Mode = mode.
		If attributes modified
		[SDP…]
		
		}

The MRFP responds as in Table 5.17.2.38.2.

Table 5.17.2.38.2: Modify Media Acknowledge MRFP to MRFC

Address Information	Control information	Bearer information
	Transaction ID = x Context ID = C1 Termination ID = T1 Stream Number	

5.17.2.39 Confirm Media Update

This procedure indicates to the MRFP when the media modification for a given Floor Request (notified to the MRFC via the "Report Floor Request Decision" procedure) has been performed.

The MRFC sends a MODIFY command as in Table 5.17.2.39.1.

Table 5.17.2.39.1: Confirm Media Update MRFC to MRFP

Address Information	Control information	Bearer information
	Transaction ID = x Context ID = C1 Termination ID If Stream Number Specified: Stream Number Floor Request Status = FloorStatus Result = FloorRequestResult	

The MRFP responds as in Table 5.17.2.39.2.

Table 5.17.2.39.2: Confirm Media Update Acknowledge MRFP to MRFC

Address Information	Control information	Bearer information
	Transaction ID = x Context ID = C1 Termination ID = T1 Stream Number	

5.17.2.40 Start Playing Message

This procedure enables a caller to be connected to a playback of previously recorded message segments. This procedure is similar to that of 5.17.2.24 with the difference that message streams will be used to reflect the message content to be played out.

The MRFC sends an ADD or MODIFY command as in Table 5.17.2.40.1.

Table 5.17.2.40.1: Start Playing Message

Address information	Control information	Bearer information
	Transaction ID = x If context already exists: Context ID = C1 Else Context = $ If Termination exists: Termination ID = T1 Else Termination ID = $ If Stream Number specified: Stream Number Message identifier = MessageIdentifier If override Signal Direction Direction = Signal Direction If MRFC requires to be informed of the end of the message play: Result of message play = MessagePlayResultReport If detection of hanging termination is requested: (NOTE4) NotificationRequested (Event ID = x, "termination heartbeat")	
NOTE1: Signal Direction shall be either "internal" or "external". NOTE2: Stream mode may be maintained as for the ongoing call or may be changed be restricted to "send only". NOTE3: Signal Lists shall be supported NOTE4: The termination heartbeat event shall be configured when requesting a new bearer termination.		

The MRFP responds as shown in Table 5.17.2.40.2.

Table 5.17.2.40.2: Start Playing Message Acknowledge

Address information	Control information	Bearer information
	Transaction ID = x Context ID = C1 Termination ID = T1 If local resources were provided in request: Stream Number	

5.17.2.41 Stop Playing Message

This procedure is used to stop an announcement. This procedure is the same as the procedure Start Playing Message however the signal descriptor shall not include the started message signal. Note that playing message may also be stopped by releasing the IMS termination.

5.17.2.42 Playing Message Completed

This procedure is used to report that a playing message has ended.

The MRFP sends a NOTIFY to the MRFC as shown in table 5.17.2.aa+3.1.

Table 5.17.2.42.1: Playing Message Completed

Address information	Control information	Bearer information
	Transaction ID = x Context ID = C1 Termination ID = T1 End Of Signal Notification = Playing Message Completed Cause = MessagePlayCause	

The MRFC responds as shown in Table 5.17.2.42.2.

Table 5.17.2.42.2: Playing Message Completed Ack

Address information	Control information	Bearer information
	Transaction ID = x Context ID = C1 Termination ID = T1	

5.17.2.43 Start Message Record

This procedure enables a caller to leave/record a messaging message. This procedure is similar to that of Multimedia Record (5.17.2.27) with the difference that messaging H.248 stream will be used. Similarly, the MRFP records all received media streams that are consistent with the Local Descriptor of the termination.

The MRFC sends an ADD or MODIFY command as in table 5.17.2.43.1.

Table 5.17.2.43.1 – Start Message Record

Address information	Control information	Bearer information

	Transaction ID = x
	If context already exists:
	  Context ID = C1
	Else
	  Context = $
	If Termination exists:
	  Termination ID = T1
	Else
	  Termination ID = $
	
	If Stream Number specified:
	  Stream Number
	
	If specific record file
	Recording File Identity =
	  MessageRecordFileIdentifier
	Else
	Recording File Identity = ?
	
	If maximum record time
	  Maximum Recording Length =
	  Maximum Record Time
	
	If override Signal Direction
	Direction = Signal Direction
	
	If MRFC requires to be informed
	  of the end of the recording :-
	  End Of Recording Notification	

The MRFP responds as shown in table 5.17.2.43.2.

Table 5.17.2.43.2: Start Message Record acknowledge

Address information	Control information	Bearer information
	Transaction ID = x Context ID = C1 Termination ID = T1 If local resources were provided in request: Stream Number If requested record file identity Recording File Identity = MessageRecordFileIdentifier	

5.17.2.44 Stop Message Record

This procedure is used to stop recording of message. Note that Message Record may also be stopped by releasing the IMS termination.

Table 5.17.2.44.1: Stop Message Record

Address information	Control information	Bearer information
	Transaction ID = x Context ID = C1 Termination ID = T1 Stop Multimedia Record Indication If End of Multimedia Record Notification previously requested: Stop End of Record Notification	

The MRFP responds as shown in Table 5.17.2.44.2.

Table 5.17.2.44.2: Stop Message Record Response

Address information	Control information	Bearer information
	Transaction ID = x Context ID = C1 Termination ID = T1	

5.17.2.45 Message Record Completed

This procedure enables the MRFP to inform the MRFC when message recording is complete.

The MRFP sends a NOTIFY command as in table 5.17.2.bb+3.1.

Table 5.17.2.45.1: Message Record Completed

Address information	Control information	Bearer information
	Transaction ID = x Context ID = C1 Termination ID = T1 End Of Recording Notification	

The MRFC responds as shown in table 5.17.2.45.2.

Table 5.17.2.45.2: Message Record Completed Acknowledge

Address information	Control information	Bearer information
	Transaction ID = x Context ID = C1 Termination ID = T1	

5.17.2.46 Configure Granted Quota

This procedure configures a termination of the granted quota to support message statistics.

The MRFC sends an ADD or MODIFY command as in Table 5.17.2.46.1.

Table 5.17.2.46.1: Configure Granted Quota MRFC to MRFP

Address Information	Control information	Bearer information
	Transaction ID = x If context already exists: Context ID = C1 Else Context = $ If Termination exists: Termination ID = T1 Else Termination ID = $ If Stream Number Specified: Stream Number If report of message statistics on quota is requested: NotificationRequested (Event ID = x, "Messaging Quota" (If Quota for number of messages sent specified: Number of Messages Sent Quota = MessagesSentNumQuota If Quota for number of messages received specified: Number of Messages received Quota = MessagesreceivedNumQuota If Quota for volume of messages sent specified: Volume of Messages Sent Quota = MessagesSentVolQuota If Quota for volume of messages received specified: Volume of Messages Received Quota = MessagesReceivedVolQuota If Valid Time specified: Valid Time = StatValTime))	

The MRFP responds as in Table 5.17.2.46.2.

Table 5.17.2.46.2: Configure Granted Quota Acknowledge MRFP to MRFC

Address Information	Control information	Bearer information
	Transaction ID = x Context ID = C1 Termination ID = T1 Stream Number	

5.17.2.47 Report Message Statistics

This procedure is used to notify the MRFC of message statistics.

The MRFP sends a NOTIFY command as in Table 5.17.2.47.1.

Table 5.17.2.47.1: Report Message Statistics

Address information	Control information	Bearer information
	Transaction ID = x Context ID = C1 Termination ID = T1 Reason For Report = StatRepReason If number of messages sent requested: Number of Messages Sent = MessagesSentNum If number of messages received requested: Number of Messages received = MessagesreceivedNum If volume of messages sent requested: Volume of Messages Sent = MessagesSentVol If volume of messages received requested: Volume of Messages Received = MessagesReceivedVol	

The MRFC responds as shown in Table 5.17.2.47.2.

Table 5.17.2.47.2: Report Message Statistics Acknowledge

Address information	Control information	Bearer information
	Transaction ID = x Context ID = C1 Termination ID = T1	

5.17.2.48 Configure Filtering Rules

This procedure configures a termination of the filtering rules to support message filtering.

The MRFC sends an ADD or MODIFY command as in Table 5.17.2.48.1.

Table 5.17.2.48.1: Configure Filtering Rules MRFC to MRFP

Address Information	Control information	Bearer information
	Transaction ID = x If context already exists: Context ID = C1 Else Context = $ If Termination exists: Termination ID = T1 Else Termination ID = $ If Stream Number Specified: Stream Number If requested message filtering on incoming messages: Incoming Message Filters = IncMessageFilters (NOTE) If requested message filtering on outgoing messages: Outgoing Message Filters = OutMessageFilters (NOTE)	
NOTE: The value shall comply with Sieve [IETF RFC5228] with the exceptions described in H.248.69 [35] Clause 13.6. Filtering rules and Message treatment for Filtered message are included in the parameter. The filtering rules include Sender address, Message size, Message content type, Message content format and Message subject, and the filtering rules can be applied in different combination. The Message treatment for Filtered message include Block the delivery of the message, Store the message content and Redirect the message to another address. If the message treatment is "Store the message content" the Store URL should be specified, if the message treatment is "Redirect the message" the Redirect URL should be specified.		

The MRFP responds as in Table 5.17.2.48.2.

Table 5.17.2.48.2: Configure Filtering Rules Acknowledge MRFP to MRFC

Address Information	Control information	Bearer information
	Transaction ID = x Context ID = C1 Termination ID = T1 Stream Number	

5.17.2.49 ECN Failure Indication

The MRFP sends a NOTIFY request command as in Table 5.17.2.49.1.

Table 5.17.2.49.1: ECN Failure Indication

Address Information	Control information	Bearer information
	Transaction ID = x Context ID= C1 Termination ID = T1 Event_ID (Event ID = x, " ECN Failure (ECN Failure Type)")	

The MRFC responds as in Table 5.17.2.49.2

Table 5.17.2.49.2: ECN Failure Indication Ack

Address Information	Control information	Bearer information
	Transaction ID = x Context ID = C1 Termination ID = T1	

5.17.2.50 ICE Connectivity Check Result Notification

The MRFP sends a NOTIFY request command as defined in Table 5.17.2.50.1.

Table 5.17.2.50.1: ICE Connectivity Check Result Notification

Address Information	Control information	Bearer information
	Transaction ID = x Context ID= C1 Termination ID = T1 Event_ID (Event ID = x, " Connectivity Check Result (Candidate/Transport Pair)")	

The MRFC responds as defined in Table 5.17.2.50.2

Table 5.17.2.50.2: ICE Connectivity Check Result Notification Ack

Address Information	Control information	Bearer information
	Transaction ID = x Context ID = C1 Termination ID = T1	

5.17.2.51 ICE New Peer Reflexive Candidate Notification

The MRFP sends a NOTIFY request command as defined in Table 5.17.2.51.1.

Table 5.17.2.51.1: ICE New Peer Reflexive Candidate Notification

Address Information	Control information	Bearer information
	Transaction ID = x Context ID= C1 Termination ID = T1 Event_ID (Event ID = x, " New Peer Reflexive Candidate (Candidate)")	

The MRFC responds as defined in Table 5.17.2.51.2

Table 5.17.2.51.2: ICE New Peer Reflexive Candidate Ack

Address Information	Control information	Bearer information
	Transaction ID = x Context ID = C1 Termination ID = T1	

5.17.2.52 Notify TCP connection establishment Failure Indication

If the MRFC has requested reporting of TCP connection establishment failures the MRFP sends a NOTIFY request command as defined in table 5.17.2.52.1 when a TCP connection establishment failure occurs.

Table 5.17.2.52.1: Notify TCP connection establishment Failure Indication

Address Information	Control information	Bearer information
	Transaction ID = x Context ID = C1 Termination ID = T1 Event_ID (Event ID = y, "TCP connection establishment Error Indication")	

The MRFC responds as defined in table 5.17.2.52.2.

Table 5.17.2.52.2: Notify TCP connection establishment Failure Indication Ack

Address Information	Control information	Bearer information
	Transaction ID = x Context ID = C1 Termination ID = T1	

5.17.2.53 Notify TLS session establishment Failure Indication

If the MRFC has requested reporting of TLS session establishment failures the MRFP sends a NOTIFY request command as defined in table 5.17.2.53.1 when an unsuccessful TLS session set-up occurs.

Table 5.17.2.53.1: Notify TLS session establishment Failure Indication

Address Information	Control information	Bearer information
	Transaction ID = x Context ID = C1 Termination ID = T1 Event_ID (Event ID = y, "(TLS session establishment Error Indication")	

The MRFC responds as defined in table 5.17.2.53.2.

Table 5.17.2.53.2: Notify TLS session establishment Failure Indication Ack

Address Information	Control information	Bearer information
	Transaction ID = x Context ID = C1 Termination ID = T1	

5.17.2.54 CLUE Message Send

This procedure is used in a telepresence session by the MRFC to request the MRFP to send a CLUE message.

The MRFC sends a MODIFY command as in table 5.17.2.54.1.

Table 5.17.2.54.1: CLUE Message Send

Address information	Control information	Bearer information
	Transaction ID = x Context ID= C1 Termination ID = T1 CLUE Message Send (enhanced protocol=CLUE,label, message content)	

The MRFP responds as shown in table 5.17.2.54.2.

Table 5.17.2.54.2: CLUE Message Send acknowledge

Address information	Control information	Bearer information
	Transaction ID = x Context ID= C1 Termination ID = T1	

5.17.2.55 CLUE Message Received

This procedure enables the MRFP to inform the MRFC when a CLUE message received.

The MRFP sends a NOTIFY command as in table 5.17.2.55.1.

Table 5.17.2.55.1: CLUE Message Received

Address information	Control information	Bearer information
	Transaction ID = x Context ID = C1 Termination ID = T1 Detect bearer level message (protocol= CLUE, message content)	

The MRFC responds as shown in table 5.17.2.55.2.

Table 5.17.2.55.2: CLUE Message Received Acknowledge

Address information	Control information	Bearer information
	Transaction ID = x Context ID = C1 Termination ID = T1	

5.17.3 Non-Call Related Procedures

5.17.3.1 General

This clause describes the various non-call related procedures which are listed in table 5.17.3.1.1

Table 5.17.3.1.1: MRFP Non-Call Related Procedures

Transaction defined in 3GPP TS 23.333 [25]	Support	Comment
MRFP Out of service	Mandatory	5.17.3.2
MRFP Communication Up	Mandatory	5.17.3.3
MRFP Register	Mandatory	5.17.3.4
MRFP Re-register	Mandatory	5.17.3.5
MRFC Ordered Re-register	Mandatory	5.17.3.6
MRFC Restoration	Optional	5.17.3.7
MRFC Out of Service	Optional	5.17.3.8
Audit Value	Mandatory	5.17.3.9
Audit Capability	Optional	5.17.3.10
Capability Update	Optional	5.17.3.11
MRFP Resource Congestion Handling – Activate	Mandatory	5.17.3.12
MRFP Resource Congestion Handling – Indication	Mandatory	5.17.3.13
Command Rejected	Mandatory	5.17.3.14 The "Command Rejected" procedure may be used in response both to call-related and non-call-related ITU-T Recommendation H.248 Commands
MRFP Restoration	Mandatory	5.17.3.15

5.17.3.2 MRFP Out Of Service

The MRFP sends a SERVICE CHANGE request command as in Table 5.17.3.2.1.

Table 5.17.3.2.1: MRFP Out Of Service Request

Address Information	Control information	Bearer information
	Transaction ID = x Context ID= - Termination ID = ROOT SC Method = FORCED or GRACEFUL SC Reason = 905 Termination Taken OOS or 908, MG Impending Failure	

The MRFC responds as in table 5.17.3.2.2.

Table 5.17.3.2.2: MRFP Out Of Service Request Ack

Address Information	Control information	Bearer information
	Transaction ID = x Context ID = - Termination ID = ROOT	

5.17.3.3 MRFP Communication Up

The MRFP sends a SERVICE CHANGE request command as in Table 5.17.3.3.1 to the MRFC address to which the control link association was previously established.

Table 5.17.3.3.1: MRFP Communication Up

Address Information	Control information	Bearer information
	Transaction ID = x Context ID= - Termination ID = ROOT SC Method = DISCONNECTED SC Reason = 900 , Service Restored	

The MRFC may respond as in table 5.17.3.3.2. If a response is received, the control link association is re-established and the inactivity timer would be restarted.

Table 5.17.3.3.2: MRFP Communication Up Ack

Address Information	Control information	Bearer information
	Transaction ID = x Context ID = - Termination ID = ROOT	

5.17.3.4 MRFP Register

The MRFP sends a SERVICE CHANGE request command as in Table 5.17.3.4.1.

Table 5.17.3.4.1: MRFP Register

Address Information	Control information	Bearer information
	Transaction ID = x Context ID= - Termination ID = ROOT SC Method = RESTART SC Reason =901Cold Boot or 902, Warm Boot H248 Profile Identity H248 Protocol Version	

The MRFC responds as in table 5.17.3.4.2.

Table 5.17.3.4.2: MRFP Register Ack

Address Information	Control information	Bearer information
	Transaction ID = x Context ID = - Termination ID = ROOT H248 Protocol Version If applicable:- H248 Profile Identity	

5.17.3.5 MRFC Restoration

When the MRFC has recovered, the MRFC sends a SERVICE CHANGE as in Table 5.17.3.5.1,

The MRFP may respond as in Table 5.17.3.5.2.

The MRFC sends a SERVICE CHANGE as in Table 5.17.3.5.1

Table 5.17.3.5.1: MRFC Restoration

Address Information	Control information	Bearer information
	Transaction ID = x Context ID= - Termination ID = ROOT SC Method = RESTART SC Reason = 901, Cold Boot OR 902, Warm Boot	

The MRFP responds as in table 5.17.3.5.2.

Table 5.17.3.5.2: MRFC Restoration Ack

Address Information	Control information	Bearer information
	Transaction ID = x Context ID = - Termination ID = ROOT	

5.17.3.6 MRFP Re-Register

The MRFP sends a SERVICE CHANGE request command as in Table 5.17.3.6.1.

Table 5.17.3.6.1: Re-Registration

Address Information	Control information	Bearer information
	Transaction ID = x Context ID= - Termination ID = ROOT SC Method = Handoff SC Reason = 903, MGC Directed Change H248 Profile Identity H248 Protocol Version	

The MRFC responds as in table 5.17.3.6.2.

Table 5.17.3.6.2: Re-Registration Ack

Address Information	Control information	Bearer information
	Transaction ID = x Context ID = - Termination ID = ROOT H248 Protocol Version If applicable:- H248 Profile Identity	

5.17.3.7 MRFC Ordered Re-register

The MRFC sends a SERVICE CHANGE request command as in Table 5.17.3.7.1.

Table 5.17.3.7.1: MRFC Ordered Re-Register

Address Information	Control information	Bearer information
	Transaction ID = x Context ID= - Termination ID = ROOT SC Method = HANDOFF SC Reason = 903, MGC Directed Change	

The MRFP responds as in table 5.17.3.7.2.

Table 5.17.3.7.2: MRFC Ordered Re-Register Ack

Address Information	Control information	Bearer information
	Transaction ID = x Context ID = - Termination ID = ROOT	

The MRFP then performs an MRFP Re-Register procedure according to Clause 5.17.3.6.

5.17.3.8 Audit Value

The MRFC sends an AUDIT VALUE request command as in Table 5.17.3.8.1.

Table 5.17.3.8.1: Audit Value

Address Information	Control information	Bearer information

	Transaction ID = x
	Context ID= -/ALL
	Termination ID = ROOT/ALL/T1
	Audit Packages (NOTE1)
	Audit Descriptor =
	Empty/IndAuditParameter:=
	IndAudMediaDescriptor:=
	streams
	{
	IndAudStreamParms:=
	{
	Stream Number,
	IndAudStreamParms:=
	IndAudLocalControlDescriptor:=
	IndAudPropertyParm:=
	mgcinfo
	}
	}
	
	Audit Descriptor =
	IndAuditParameter:=
	IndAudMediaDescriptor:=
	IndAudTerminationStateDescriptor:=
	SDPCapNeg Supported Capabilities (NOTE 2)	

NOTE 1: Packages are used for Null/Root Combination. NOTE 2: Used for auditing SDPCapNeg Extensions when SDPCapNeg signalling to the gateway is supported.		

The MRFP responds as in table 5.17.3.8.2.

Table 5.17.3.8.2: Audit Value Ack

Address Information	Control information	Bearer information
	Transaction ID = x Context ID = -/Context ID Termination ID = ROOT/T1 Packages List Mgcinfo SDPCapNeg Extensions	

Upon reception of the command in the MRFP:

- The Service State returns the current Service State
- When Packages are requested, the Package Names and Versions are returned

The following table illustrates the allowed combinations that can be obtained with the AuditValue Command:

Table 15.17.3.8.3: Combinations of AuditValue Command

ContextID	TerminationID	Information Obtained
Specific	Wildcard	Audit of matching Terminations in a Context
Specific	Specific	Audit of a single Termination in a Context
Null	Root	Audit of Media Gateway state and events
All	Specific	(Non-null) ContextID in which the Termination currently exists

5.17.3.9 Audit Capabilities

The MRFC sends an AUDIT CAPABILITY request command as in Table 5.17.3.9.1.

Table 5.17.3.9.1: Audit Capability Request

Address Information	Control information	Bearer information
	Transaction ID = x Context ID= - Termination ID = ROOT Audited Capabilities	

The MRFP responds as in table 5.17.3.9.2.

Table 5.17.3.8.2.2: Audit Capability Ack

Address Information	Control information	Bearer information
	Transaction ID = x Context ID = - Termination ID = ROOT Capabilities	

5.17.3.10 Capability Update

The MRFP sends a SERVICE CHANGE request command as in Table 5.17.3.10.1.

Table 5.17.3.10.1: Capability Update

Address Information	Control information	Bearer information
	Transaction ID = x Context ID= - Termination ID = ROOT SC Method = RESTART or DISCONNECTED SC Reason = 916, Packages Change or 917, Capability Change	

The MRFC responds as in table 5.17.3.10.2.

Table 5.17.3.10.2 Capability Update Ack

Address Information	Control information	Bearer information
	Transaction ID = x Context ID = - Termination ID = ROOT	

5.17.3.11 MRFC Out of Service

The MRFC sends a SERVICE CHANGE request command as in Table 5.17.3.11.1.

Table 5.17.3.11.1: MRFC Out Of Service

Address Information	Control information	Bearer information
	Transaction ID = x Context ID= - Termination ID = ROOT SC Method = FORCED or GRACEFUL SC Reason = 905, Termination Taken OOS	

The MRFP responds as in table 5.17.3.11.2.

Table 5.17.3.11.2: MRFC Out Of Service Ack

Address Information	Control information	Bearer information
	Transaction ID = x Context ID = - Termination ID = ROOT	

5.17.3.12 MRFP Resource Congestion Handling – Activate

The MRFC sends a MODIFY request command as in Table 5.17.3.12.1.

Table 5.17.3.12.1: MRFP Resource Congestion Handling – Activate

Address Information	Control information	Bearer information
	Transaction ID = x Context ID= - Termination ID = ROOT If required : Set Inactivity Timer Request Overload Notification	

The MRFP responds as in table 5.17.3.12.2.

Table 5.17.3.12.2: MRFP Resource Congestion Handling – Activate Ack

Address Information	Control information	Bearer information
	Transaction ID = x Context ID = - Termination ID = ROOT	

5.17.3.13 MRFP Resource Congestion Handling – Indication

The MRFP sends a NOTIFY request command as in Table 5.17.3.13.1.

Table 5.17.3.13.1: MRFP Resource Congestion Handling – Indication

Address Information	Control information	Bearer information
	Transaction ID = x Context ID= - Termination ID = ROOT Overload Notification	

The MRFC responds as in table 5.17.3.13.2.

Table 5.17.3.13.2: MRFP Resource Congestion Handling – Indication Ack

Address Information	Control information	Bearer information
	Transaction ID = x Context ID = - Termination ID = ROOT	

5.17.3.14 Command Rejected

When the procedure "Command Reject" is required the following procedure is initiated:

The MGW/MGC sends .resp to any command.req with the following information.

Table 5.17.3.14.1: NYcommand.resp (command reject) MRFP/MRFC to MRFC/MRFP

Address Information	Control information	Bearer information
	Transaction ID = z Context ID = c1 or no context Reason=Error	

5.17.3.15 MRFP Restoration

When the MRFP has recovered, the MRFP sends a SERVICE CHANGE as in Table 5.17.3.15.1,

The MRFC may respond as in Table 5.17.3.15.2.

The MRFP sends a SERVICE CHANGE as in Table 5.17.3.15.1

Table 5.17.3.15.1: MRFC Restoration

Address Information	Control information	Bearer information
	Transaction ID = x Context ID= - Termination ID = ROOT SC Method = RESTART SC Reason = 900, Service Restored	

The MRFC responds as in table 5.17.3.15.2.

Table 5.17.3.15.2: MRFC Restoration Ack

Address Information	Control information	Bearer information
	Transaction ID = x Context ID = - Termination ID = ROOT	

Annex A (normative): The W3C SSML Profile for TTS function

A.1 Introduction

This annex contains a profile to the W3C Speech Synthesis Markup Language (SSML) specification [28].The SSML specification is a W3C Recommendation, and is designed to provide a rich, XML-based markup language for assisting the generation of synthetic speech in Web and other applications. The essential role of the markup language is to provide authors of synthesizable content a standard way to control aspects of speech such as pronunciation, volume, pitch, rate, etc. across different synthesis-capable platforms.

This annex provides a profile for SSML according to the stage 2 specification of the Mp interface. This profile is referenced by the advanced audio server base package for TTS enhancement.

A.2 TTS Profile

Table A.2.1: The profile of SSML

Element or attribute	Description	Support
speak	This is the root element that can contain text to be rendered and the following elements: **audio, break, emphasis, lexicon, mark, meta, metadata, p, phoneme, say-as, sub, s, voice**	Mandatory.
xml:lang	This attribute defines the language that applied to the element, subelements and its attributes. The **phoneme, emphasis, break, p,** and **s** elements are language specific dependent	Mandatory
xml:base	This attribute defines the base URI for resolving relative URI that may be used for the following elements: - The optional **src** attribute of **audio** element - The **uri** attribute of **lexicon** element	Optional
lexicon	An SSML document may reference one or more external pronunciation documents, the **lexicon** element is used to identified the URI of this external document. A lexicon document contains pronunciation for tokens that can appear in a text to be spoken. A **lexicon** element shall contain an uri.	Mandatory
meta and metadata	The **metadata** and **meta** elements are containers in which information about the document can be placed	Optional

p and s	A **p** element represents a paragraph and **s** element represents a sentence. The use of **p** and **s** elements is optional. Where text occurs without an enclosing p or s element the synthesis processor should attempt to determine the structure using language-specific knowledge of the format of plain text. The **p** element can only contain text to be rendered and the following elements: **audio**, **break**, **emphasis**, **mark**, **phoneme**, **prosody**, **say-as**, **sub**, **s**, **voice**. The **s** element can only contain text to be rendered and the following elements: **audio**, **break**, **emphasis**, **mark**, **phoneme**, **prosody**, **say-as**, **sub**, **voice**.	Optional
say-as	The **say-as** element allows the author to indicate information on the type of text construct contained within the element and to help specify the level of detail for rendering the contained text. For example for English when "$200" appears in a document it may be spoken as "two hundred dollars", similarly, "1/2" may be spoken as "half", "one of two".. Defining a comprehensive set of text format types is difficult because of the variety of languages that have to be considered and because of the innate flexibility of written languages. SSML only specifies the **say-as** element, its attributes, and their purpose. It does not enumerate the possible values for the attributes. The Working Group expects to produce a separate document that will define standard values and associated normative behavior for these values. The **say-as** element has three attributes: interpret-as, format and detail The **say-as** element can only contains text to be rendered	Optional
phoneme	The phoneme element provides a phonemic/phonetic pronunciation for the contained text. The **ph** attribute is a required attribute that specifies the phoneme/phone string. The **alphabet** attribute is an optional attribute that specifies the phonemic/phonetic alphabet. An alphabet in this context refers to a collection of symbols to represent the sounds of one or more human languages. The only valid values for this attribute are "**ipa**" (see the next paragraph) and vendor-defined strings of the form "**x-organization**" or "**x-organization-alphabet**". Example: <phoneme alphabet="ipa" ph="təmei̥ɾou̥"> tomato </phoneme>	Optional

sub	The **sub** element is employed to indicate that the text in the alias attribute value replaces the contained text for pronunciation. The required alias attribute specifies the string to be spoken instead of the enclosed string. The sub element can only contain text (no elements). Example: _{W3C}	Optional
Voice	The **voice** element indicates the characteristics of the voice rendering. The **voice** element is commonly used to change the language The following attributes are used: - gender: male, female or neutral - age - variant: indicates a preferred variant of the other voice characteristics - name indicates the processor-specific voice name	Optional
emphasis	The **emphasis** element requests that the contained text be spoken with emphasis (also referred to as prominence or stress). the optional level attribute indicates the strength of emphasis to be applied. Defined values are "strong", "moderate", "none" and "reduced". The **emphasis** element can only contain text to be rendered and the following elements: audio, break, emphasis, mark, phoneme, prosody, say-as, sub, voice.	Optional
break	The **break** element is an empty element that controls the pausing or other prosodic boundaries between words. The **break** element is most often used to override the typical automatic behaviour of a synthesis processor. The following attributes are used on the break element: - **strength: "none", "x-weak", "weak" "medium", "strong", or "x-strong"**. It indicates the strength of the prosodic break in the speech output. For example, the breaks between paragraphs are typically much stronger than the breaks between words within a sentence. - **Time**: the time attribute is an option attribute indicating the duration of a pause to be inserted in the output in seconds or milliseconds e.g. "250ms", "3s"	Optional

prosody	The **prosody** element permits control of the pitch, speaking rate and volume of the speech output, the optional attributes are: - **pith**: this attribute indicates the baseline pitch. legal value are: a number followed by "Hz", a relative change (+10Hz or +5st, a semitone is half of a tone on the standard diatonic scale), or a "x-low", "low", "medium", high", x-high", or "default". The exact meaning of baseline pitch may vary across synthesis processors - **pitch contour**: the pitch contour is a set of the form (time position,target), the first value is a percentage of the period of the contained text (a number followed by "%") and the second value is the value of the pitch attribute. e.g. (20%,"+10Hz) (40%, "+20Hz) means increase the pitch of 10Hz at 20% of the period of the contained text and 20Hz at 40% of the text duration. - **Range**: the pitch range although the exact meaning may vary across synthesis processor. The same value as for pitch are legal value from SSML. - **Rate**: change the speaking rate. Legal values are: a relative change or **"x-slow", "slow", "medium", "fast", "x-fast" or "default"**. - **Duration**: a value in seconds or milliseconds for the desired time to take to read the element contents. - **Volume**: the volume for the contained text in the range 0.0 to 100.0. Legal values are: a number, a relative change or **"silent", "x-soft", "soft", "medium", "loud", "x-loud", or "default".**	Optional
audio	The **audio** element supports the insertion of recorded audio files.	Optional
Mark	The **mark** element is an empty element that places a marker into the text/tag sequence that the environment will be informed to detect the corresponding position within the rendered output and may report an event when encountered. This element has a **name** attribute.	Optional
Desc	The **desc** element can only occur within the content of the audio element. It describes the textual content of the audio source that may be used when text-only output is being produced by the synthesis processor.	Optional

Annex B (normative): The W3C SRGS Profile for ASR function

B.1 Introduction

This annex contains a profile to the W3C Speech Recognition Grammar Specification (SRGS) [29]. The SGRS are intended for use by speech recognizers and other grammar processors so that developers can specify the words and patterns of words to be listened for by a speech recognizer.

This annex provides a profile for SRGS according to the stage 2 specification of the Mp interface. This profile is referenced by the ASR Package.

B.2 SRGS Profile

Table B.2.1: The profile of SRGS

Declaration Item	Description	Support or not
Language	The **language** declaration of a grammar provides the language identifier that indicates the primary language contained by the document and optionally indicates a country or other variation. Additionally, any legal rule expansion may be labeled with a language identifier. The language declaration is required for all speech recognition grammars.	Mandatory
Mode	The mode of a grammar indicates the type of input that the user agent should be detecting. The default mode is "**voice**" for speech recognition grammars. An alternative input mode is "**dtmf**" input. For the Mp interface, only voice mode is supported.	Mandatory
Root rule	Both the XML Form and ABNF Form permit the grammar header to optionally declare a single rule to be the root rule of the grammar. The rule declared as the root rule must be defined within the scope of the grammar. The rule declared as the root rule may be scoped as either **public** or **private**.	Mandatory

Tag format	The **tag-format** declaration is an optional declaration of a tag-format identifier that indicates the content type of all rule tags and header tags contained within a grammar. The tag-format identifier is a URI. It is recommended that the tag format identifier indicate both the content type and a version. Tags typically contain content for a semantic interpretation processor and in such cases the identifier, if present, should indicate the semantic processor to use. Tag-format identifier values beginning with the string "semantics/x.y" (where x and y are digits) are reserved for use by the W3C Semantic Interpretation for Speech Recognition specification [SEM] or future versions of the specification.	Mandatory
Base URI	Relative URIs are resolved according to a base URI, which may come from a variety of sources. The base URI declaration allows authors to specify a document's base URI explicitly. The path information specified by the base URI declaration only affects URIs in the document where the element appears. The base URI declaration is permitted but optional in both the XML Form and the ABNF Form.	Optional
Pronounciation lexicon	A grammar may optionally reference one or more external pronunciation lexicon documents. A lexicon document is identified by a URI with an optional media type. The pronunciation information contained within a lexicon document is used only for tokens defined within the enclosing grammar. The W3C Voice Browser Working Group is developing the Pronunciation Lexicon Markup Language [LEX]. The specification will address the matching process between tokens and lexicon entries and the mechanism by which a speech recognizer handles multiple pronunciations from internal and grammar-specified lexicons. Pronunciation handling with proprietary lexicon formats will necessarily be specific to the speech recognizer. Pronunciation lexicons are necessarily language-specific. Pronunciation lookup in a lexicon and pronunciation inference for any token may use an algorithm that is language-specific. (See Clause 2.1 for additional information on token handling and pronunciations.)	Mandatory
Metadata	Grammar documents let authors specify metadata — information about a document rather than document content — in a number of ways. A **meta** declaration in either the ABNF Form or XML Form may be used to express metadata information in both XML	Not Applicable

	Form and ABNF Form grammars or to reference metadata available in an external resource. The XML Form also supports a **metadata** element that provides a more general and powerful treatment of metadata information than **meta**. Since **metadata** requires an XML metadata schema which cannot be expressed in ABNF, there is no equivalent of **metadata** in the ABNF Form of grammars.	
Tag	A grammar may optionally specify one or more **tag** declarations in the header. The content of a **tag** in the header, just like a tag in rule expansions, is an arbitrary string which may be used for semantic interpretation.	Mandatory

Annex C (normative): H.248 Package for Multi-stream Multiparty Conferencing Media Handling (MMCMH)

C.1 Introduction

This annex contains a Multi-party Multimedia Conference Media Handling Package that is required for the Multi-stream Multiparty Conferencing Media Handling (MMCMH) feature as specified in 3GPP TS 23.333 [25] clause 5.11.3. The MMCMH feature requires support of simulcast RTP media streams, see IETF RFC 8853 [73].

NOTE: The ID value of Packages, Properties, Events, Parameters, Signals, etc. are designated below by "textID" (a string representing its text ID) and by "0x????" (the ID hexadecimal representation).

C.2 Specification of Multi-party Multimedia Conference Media Handling Package

C.2.1 Multi-party Multimedia Conference Media Handling Package

Package name:	Multi-party Multimedia Conference Media Handling
Package ID:	mmcmh (0x????)
Description:	This package defines functionality that allows the MP to interconnect video media flows with different StreamIDs and to autonomously determine the mix of video streams in a conference dependent on the active speaker. For example, everyone sees the active speaker and he sees the previous speaker in high resolution, and some or all other conference participants can be seen in low resolution ("thumbnail" videos).
Designed to be extended only:	No
Version:	1
Extends:	None

C.2.2 Properties

C.2.2.1 MMCMH Policy

Property name:	MMCMH Policy
Property ID:	mmcmhp (0x0001)
Description:	This property indicates how the MP shall interconnect media streams.

Type: Sub-list of Enumeration

Possible values: mmcmhbp (0x0001) "MMCMH basic policy":
The StreamID of a received media stream does not determine on which outgoing media streams the media are to be forwarded. The MP shall not send media streams received on a termination towards that termination. The MP shall forward a received media stream of a particular media type (i.e. audio, main video or screenshare video) only towards outgoing media streams of the same media type. The MP shall select the video streams to be sent to a conference participant from among the videos received from the other conference participants in such a way that:
a) from each other conference participant at most one main video is sent to this conference participant; and
b) at most one screenshare video stream is sent to this conference participant.

If the MP does not pass a received media stream to any conference participant and the "RTP-level pause resume" capability was configured for that media stream (using the "rtcp-fb" SDP attribute, defined in IETF RFC 4585 [40], with the "ccm" feedback parameter, defined in IETF RFC 5104 [71], and the "pause" ccm parameter as defined in IETF RFC 7728 [75]), the MP should signal to the sender of that media stream to pause sending that media stream in accordance with IETF RFC 7728 [75]. If the MP has previously signalled to a sender to pause sending a media stream and decides to pass that media stream to some conference participant(s), based on any of the criteria above, the MP shall signal to the sender to resume sending that media stream in accordance with IETF RFC 7728 [75].

NOTE: The media level SDP attribute "a=content" defined in IETF RFC 4796 [72] determines whether the video media stream is a main video or a screenshare video.

vadv (0x0002) "Voice activity detected video":
The MP shall detect voice activity on audio streams. The MP shall forward the main video received from the active speaker (i.e. from the media sender from which an audio stream is received where voice activity is currently detected) to all other conference participant. If several video streams are simulcasted from the active speaker, the MP should select for each other conference participant the simulcast format that matches the configured encoding and resolution of the main video stream towards that conference participant to avoid transcoding. The MP should forward the main video of the previous speaker (i.e. received from the media sender from which an audio stream was received where the most recent past voice activity has been detected) to the active speaker (i.e. towards the media receiver associated with the media sender from which an audio stream is received where voice activity is currently detected). If several video streams are simulcasted from the previous speaker, the MP should select the simulcast format that matches the configured encoding and resolution of the main video stream towards the active speaker to avoid transcoding. The MP should forward received thumbnail video streams from the most recent previous speaker(s) (i.e. from the media sender(s) from which audio stream(s) was/were received where the most recent past voice activities have been detected). If several video streams are simulcasted from a previous speaker, the MP should select for each other conference participant the simulcast format that matches the configured encoding and resolution of a thumbnail video stream towards that conference participant to avoid transcoding. In order to avoid a too frequent switching of video images, the MP should wait for a short period when detecting voice activity from a new source before switching the video image. If the MP receives RTCP feedback about increased packet loss from a media receiver, the MP should reduce the number of video streams sent towards that media receiver and select only video streams with lower resolution (e.g. thumbnail video streams). The MP should select video streams received from the most recent speaker(s) (i.e. from the media sender(s) from which audio stream(s) are received where the most recent voice activities are or have been detected).

vada (0x0003) "Voice activity detected audio":
The MP shall detect voice activity on audio streams. The MP should forward the received audio stream of the active speaker (i.e. the audio stream where voice activity is detected) to all other conference participants. If simulcasted audio streams are received from the active speaker, the MP should select for each other conference participant an audio encoding among the received audio simulcast formats that is supported at the termination towards that participant to avoid transcoding.

ma (0x0004) "Mix audio":
The MP shall mix all the received audio streams from all other conference participants in the context and send the resulting audio stream(s) to each conference participant. If two audio streams were reserved towards a conference participant, the MP may distribute the received audio stream from each other conference participant in a specific way to render a stereo impression.

bfcpa (0x0005) "BFCP audio":
If the MP receives BFCP messages, the MP shall select received audio streams to forward or mix based on these BFCP messages.

bfcpv (0x0006) "BFCP video":
If the MP receives BFCP messages, the MP shall select received video streams to forward or mix based on these BFCP messages.

bfcps (0x0007) "BFCP screenshare":
If the MP receives BFCP messages, the MP shall select received screenshare streams to forward or mix based on these BFCP messages.

Default: None

Defined in: ContextAttribute

Characteristics: Read/Write

C.2.3 Events

None.

C.2.4 Signals

None.

C.2.5 Statistics

None.

C.2.6 Error Codes

None.

C.2.7 Procedures

To enable the Multi-party Multimedia Conference Media Handling functionality, the MC:

a) shall reserve a context and indicate the applicable MMCMH policies via the *mmcmhp* property, including at least the "mmcmhbp" value;

b) for each conference participant, shall allocate a termination within that context and place all streams towards/from that participant within that termination; and

c) for each media stream:

- shall indicate the media type for each stream;
- may indicate the video media type via the "a=content" SDP attribute (defined in IETF RFC 4796 [72]) in the local descriptor and the remote descriptor;
- may provide the "a=simulcast" attribute (defined in IETF RFC 8853 [73]), and the corresponding "a=rid" attributes (defined in IETF RFC 8851 [74]) with the "pt" parameter defining the simulcast stream identification in the local descriptor and the remote descriptor; and
- may provide the "a=rtcp-fb" line (see IETF RFC 4585 [40]) with the "pause" CCM parameter (defined in IETF RFC 5104 [71]), the "nowait" pause attribute and the "config" pause attribute (defined in IETF RFC 7728 [75]) in the local descriptor and the remote descriptor and the "*Autonomous Response (rempr/ar)*" and the "*Autonomous Request" (rempr/aq)*" properties defined in ITU-T Recommendation H.248.98 [76] in the LocalControl descriptor.

NOTE: The SDP "a=rid" attribute lines with a "pt" parameter define the simulcast stream identifications within a single media description.

Upon reception of the *mmcmhp* property, the MP shall execute the policies defined for the received values.

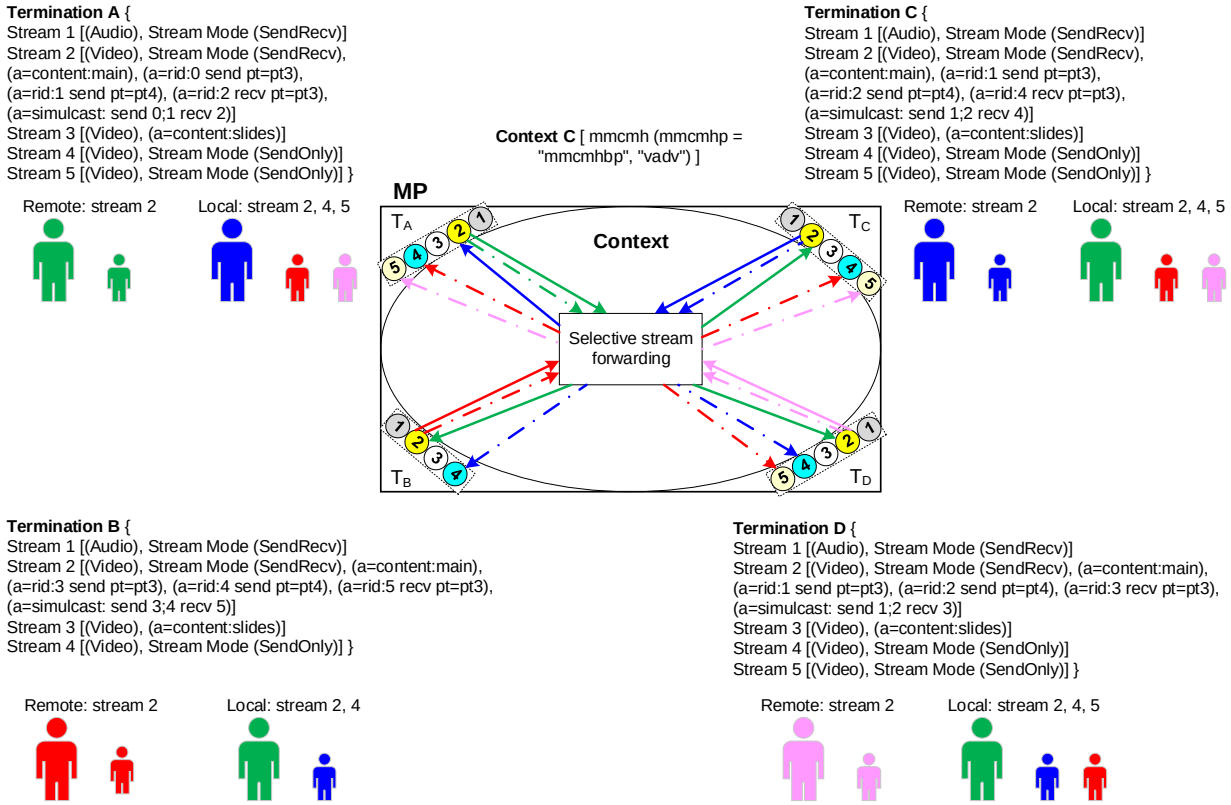

Figure C.2.7.1: Example of MMCMH switching

Figure C.2.7.1 shows an example of MMCMH switching where video media flows with different StreamIDs can be interconnected. The context level *mmcmhp* property is set to "mmcmhbp, vadv". Value "vadv" indicates that the MP shall detect voice activity on the incoming audio streams. The MP shall forward the main video received from the active speaker (i.e. from the media sender from which the audio stream is received where voice activity is currently detected) to all other conference participant. The MP should forward the main video of the previous speaker (i.e. received from the media sender from which an audio stream was received where the most recent past voice activity has been detected) to the active speaker (i.e. towards the media receiver associated with the media sender from which an audio stream is received where voice activity is currently detected). The MP should forward received thumbnail video streams from the

most recent previous speaker(s) (i.e. from the media sender(s) from which audio stream(s) was/were received where the most recent past voice activities have been detected). The MP should select video streams received from the most recent speaker(s) (i.e. from the media sender(s) from which audio stream(s) are received where the most recent voice activities are or have been detected).

Stream ID = 1 is an audio stream whose volume level on each termination is being monitored. Main video stream Stream ID = 2 is configured with a simulcast property on each termination: two simulcast RTP video streams with "recv" property and one RTP video stream with "send" property. Stream ID = 3 is a screenshare video stream. StreamID =4 and StreamID = 5 are thumbnail video streams with the *StreamMode* property set to "SendOnly". On termination B only one thumbnail video stream StreamID =4 can be sent. Termination A is the active speaker. Termination C was the previous speaker. As the *mmcmhp* property is set to "mmcmhbp, vadv", the received incoming videos are sent as outgoing videos according to the figure C.2.7.1. Local image shows the simulcast streams of main video: one video stream in high resolution and the other video stream in low resolution (thumbnail-sized simulcast format of the main video) received by the MP on StreamID = 2 and the remote image shows the video streams sent to each user: main video stream of active speaker in high resolution on StreamID = 2, and thumbnail videos of the other participants on StreamID =4 and StreamID = 5. Active speaker A will receive the main video of the previous speaker C in high resolution on StreamID = 2. On termination B only the thumbnail video from the previous speaker C is sent.

Annex D (informative): Change history

Date	TSG #	TSG Doc.	CR	Rev	Cat	Subject/Comment	New
06-2007	CT#36	CP-070336				V7.0.0 approved in CT#36	7.0.0
09-2007	CT#37	CP-070539	0001	2		Alignment of stage 3 to proposed stage 2 changes for Audio Record and Multimedia Record	7.1.0
09-2007	CT#37	CP-070539	0002	1		Completion of formats and codes	7.1.0
09-2007	CT#37	CP-070539	0003	1		Corrections to Stage 3 Profile	7.1.0
09-2007	CT#37	CP-070539	0004	1		Editorial corrections	7.1.0
12-2007	CT#38	CP-070745	0005	1		Properties returned in commands	7.2.0
12-2007	CT#38	CP-070745	0007			Add the tone generator package	7.2.0
12-2007	CT#38	CP-070745	0008	1		Align parameters for configure remote IMS resources	7.2.0
12-2007	CT#38	CP-070745	0009	1		Amend iterations parameter in start TTS procedure	7.2.0
12-2007	CT#38	CP-070745	0010	1		Amendment of the ASR procedure	7.2.0
12-2007	CT#38	CP-070745	0011	1		Clean-up of hanging contexts and terminations	7.2.0
12-2007	CT#38	CP-070745	0012	1		Correct the usage information of the recording package	7.2.0
12-2007	CT#38	CP-070745	0014	1		Implementation of multiple signals played simultaneously	7.2.0
12-2007	CT#38	CP-070745	0015	1		Align the profile with stage 2	7.2.0
03-2008	CT#39	CP-080017	0016			Alignment of IMS resources procedures' title	7.3.0
03-2008	CT#39	CP-080017	0018	1		Amend the notify completion table	7.3.0
03-2008	CT#39	CP-080021	0017	1		Mandatory use termination heartbeat	8.0.0
06-2008	CT#40	CP-080263	0019			Usage of H.248.45 MGC Information Package	8.1.0
06-2008	CT#40	CP-080263	0022	1		Alignment of 3GPP Mp Codec Requirements	8.1.0
06-2008	CT#40	CP-080263	0023	2		Introduction of stage 3 procedure for Messaging Conference	8.1.0
06-2008	CT#40	CP-080273	0021	1		Alignment of SDP usage	8.1.0
09-2008	CT#41	CP-080465	0025	1		Alignment of Supported Transports	8.2.0
09-2008	CT#41	CP-080465	0026	2		Floor Control Procedures, Stage 3	8.2.0
09-2008	CT#41	CP-080465	0027			Message Conference Procedure for Stage 3	8.2.0
12-2008	CT#42	CP-080694	0028	3		Update stage 3 profile for Message conference	8.3.0
			0029	1		Update stage 3 profile for Floor control	
			0030	1		Alignment of Audit Value Procedure	
			0032			Remove Editor's Note on MSRP Session Identity	
			0033			Remove Editor's Note on Draft Version Indication	
03-2009	CT#43	CP-090040	0034	2		Alignment of Audit Value Procedure	8.4.0
			0035	1		Modification of Reference for eMp	
03-2009						CR 0034 was removed since it was Rel-7 only	8.4.1
2009-12	-	-	-	-		Update to Rel-9 version (MCC)	9.0.0
2011-03	CT#51	CP-110275	0040	10		ECN Support in Mp Interface	10.0.0
		CP-110058	0041	1		Handling of rtcp-fb SDP attribute and SDP attribute for RTCP APP feedback messages	
2011-06	CT#52	CP-110368	0042	1		ECN Failure improvements	10.1.0
		CP-110368	0044	1		Alignment of 3GPP profiles with SG16 ECN package definition	
2011-12	Ct#54	CP-110776	0048			Missing ASN.1 encoding of H.248.69 packages	10.2.0
		CP-110798	0045			Explicit Congestion Notification	
		CP-110796	0049			Missing ASN.1 encoding of mandatory and optional package tables	
		CP-110789	0050	1		ECN Improvements	
2012-03	CT#55	CP-120015	0053			Missing Floor control signalling package ASN.1 encoding	10.3.0
2012-06	CT#56	CP-120226	0054	1		Reference update: draft-ietf-avtcore-ecn-for-rtp	10.4.0
2012-09	CT#57	CP-120478	0055	3		Support of Multimedia Priority Service (MPS) over Mp Interface – Stage 3	11.0.0
2012-12	CT#58	CP-120723	0061	-		Mp interface updates of ECN Support Package	11.1.0
2013-03	CT#59	CP-130013	0067	1		Support of RTCP-FB for MTSI	11.2.0
2013-06	CT#60	CP-130294	0063	2		ECN relying reference change	11.3.0
2013-09	CT#61	CP-130452	0068	3		Introduction of support for Coordination of Video Orientation (CVO)	12.0.0
		CP-130471	0069	3		Introduction of support for Generic Image Attribute/signalling of image size	
2013-12	CT#62	CP-130636	0070	1		No indication of generic image attributes in Mp	12.1.0
2014-06	CT#64	CP-140248	0071	2		ICE support for MRF in Mp interface	12.2.0
2014-09	CT#65	CP-140520	0072	1		MRFP Capability Change	12.3.0
2014-12	CT#66	CP-140788	0075	1		Adding support for EVS codec	12.4.0
2014-12	CT#66	CP-140786	0076	1		E2e media security procedures for TCP based media (MSRP, BFCP) using TLS and KMS	12.4.0
2015-03	CT#67	CP-150026	0077	2		Support of CLUE bearer level signalling	12.5.0
		CP-150026	0078	2		CLUE carriage over Mp interface	
2015-06	CT#68	CP-150255	0079	1		Updates on IMS Telepresence	12.6.0
2015-12	CT#70	CP-150753	0082	2		Reference update: IETF drafts	12.7.0
2015-12	CT#70	CP-150783	0081	4		Support for Video Enhancements by Region-of-Interest Information Signalling	13.0.0
2016-03	CT#71	CP-160048	0083	-		Removal of references to TS 26.235	13.1.0
2016-03	CT#71	CP-160034	0084	1		Support of enhanced bandwidth negotiation mechanism for MTSI sessions	13.1.0
2016-03	CT#71	CP-160021	0085	2		Mp stage 3 to support SDP Capability Negotiation	13.1.0
2016-06	CT#72	CP-160229	0086	-		Clarifications related to the rate adaptation for media endpoints	13.2.0
2017-03	CT#75	CP-170023	0087	-		RFC 4572 obsoleted by draft-ietf-mmusic-4572-update	13.3.0

2017-03	CT#75	CP-170051	0088	1		RTCP Codec Control Commands and Indications	14.0.0
2017-03	CT#75	CP-170051	0089	1		Support of multi-party multimedia conference using simulcast	14.0.0
2017-06	CT#76	CP-171015	0091	-		Reference update: RFC 8122	14.1.0
2017-06	CT#76	CP-171037	0092	-		Support of "Compact Concurrent Codec Negotiation and Capabilities"	14.1.0
2017-06	CT#76	CP-171037	0093	-		Reference update: ITU-T H.248.19	14.1.0
2017-06	CT#76	CP-171037	0094	2		New H.248 MMCMH package	14.1.0
2017-06	CT#76	CP-171014	0097	-		Reference update: draft-ietf-mmusic-sctp-sdp	14.1.0
2017-06	CT#76	CP-171037	0098	-		Reference update: MMCMH related IETF drafts	14.1.0
2018-06	CT#80					Update to Rel-15 version (MCC)	15.0.0
2019-06	CT#84	CP-191053	0099	3		Mp interface enhancements to support DBI	16.0.0
2020-12	CT#90e	CP-203024	0104	-		Update on draft references	16.1.0
2021-03	CT#91e	CP-210064	0109	-		Reference update: RFC 8841 and RFC 8864	16.2.0
2021-03	CT#91e	CP-210067	0112	-		Reference update: RFC 8851 and RFC 8853	16.2.0
2022-03	CT#95e	CP-220052	0113	-	B	Update of IETF references for ICE	17.0.0

History

Document history		
V17.0.0	May 2022	Publication