Final draft ETSI ES 283 031 V1.1.1 (2006-03)

Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); IP Multimedia: H.248 Profile for controlling Multimedia Resource Function Processors (MRFP) in the IP Multimedia System (IMS); Protocol specification

Reference

DES/TISPAN-03058-NGN-R1

Keywords

control, h.248, profile, stage 3

ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00   Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° 7803/88

Important notice

Individual copies of the present document can be downloaded from:
http://www.etsi.org

The present document may be made available in more than one electronic version or in print. In any case of existing or
perceived difference in contents between such versions, the reference version is the Portable Document Format (PDF).
In case of dispute, the reference shall be the printing on ETSI printers of the PDF version kept on a specific network drive
within ETSI Secretariat.

Users of the present document should be aware that the document may be subject to revision or change of status.
Information on the current status of this and other ETSI documents is available at
http://portal.etsi.org/tb/status/status.asp

If you find errors in the present document, please send your comment to one of the following services:
http://portal.etsi.org/chaircor/ETSI_support.asp

Copyright Notification

Contents

Intellectual Property Rights

IPRs essential or potentially essential to the present document may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: *"Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards"*, which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (http://webapp.etsi.org/IPR/home.asp).

Pursuant to the ETSI IPR Policy, no investigation, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

Foreword

This ETSI Standard (ES) has been produced by ETSI Technical Committee Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN), and is now submitted for the ETSI standards Membership Approval Procedure.

1 Scope

The present document defines a profile of the Gateway Control Protocol (H.248.1), for controlling Multimedia resource Function Processors (MRFP) supporting in-band user interaction, conferencing and transcoding for voice-based services.

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 and/or edition number or version number) or non-specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies.

Referenced documents which are not found to be publicly available in the expected location might be found at http://docbox.etsi.org/Reference.

[1]   ETSI ES 282 001: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); NGN Functional Architecture Release 1".

[2]   ETSI ES 282 002: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); PSTN/ISDN Emulation Sub-system (PES); Functional architecture".

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

[4]   ETSI TS 183 022: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); MGC Information Package".

[5]   ITU-T Recommendation H.248.1 Corrigendum 1: "Gateway control protocol: Version 2".

[6]   ITU-T Recommendation H.248.4 Corrigendum 1: "Gateway control protocol: Transport over Stream Control Transmission Protocol (SCTP)".

[7]   ITU-T Recommendation H.248.7: "Gateway control protocol: Generic announcement package".

[8]   ITU-T Recommendation H.248.9: "Gateway control protocol: Advanced Media Server packages".

[9]   ITU-T Recommendation H.248.14: "Gateway control protocol: Inactivity timer package".

[10]   ITU-T Recommendation H.248.16 Corrigendum 1: "Gateway control protocol: Enhanced digit collection packages and procedures".

[11]   ITU-T Recommendation H.248.19: "Gateway control protocol: Decomposed Multipoint Control Unit, Audio, Video and Data Conferencing package".

[12]   ITU-T Recommendation H.248.27: "Gateway control protocol: Supplemental Tones package".

[13]   ITU-T Recommendation Q.1950: "Bearer independent call bearer control protocol".

[14]   ITU-T Recommendation G.711: "Pulse code modulation (PCM) of voice frequencies".

[15]   ITU-T Recommendation G.711 Appendix I: "A high quality low-complexity algorithm for packet loss concealment with G.711".

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

[17]   ITU-T Recommendation T.38: "Procedures for real-time Group 3 facsimile communication over IP networks".

[18]   ITU-T Recommendation E.180: "Technical characteristics of tones for the telephone service".

[19]   IETF RFC 2327: "SDP: Session Description Protocol".

[20]   IETF RFC 3551: "RTP Profile for Audio and Video Conferences with Minimal Control".

[21]   IETF RFC 2833: "RTP Payload for DTMF Digits, Telephony Tones and Telephony Signals".

[22]   IETF RFC 3389: "Real-time Transport Protocol (RTP) Payload for Comfort Noise (CN)".

[23]   IETF RFC 3555: "MIME Type Registration of RTP Payload Formats".

[24]   IETF RFC 4234: "Augmented BNF for syntax specifications (ABNF)".

[25]   ETSI ES 201 235: "Access and Terminals (AT); Specification of Dual-Tone Multi-Frequency (DTMF) Transmitters and Receivers; Part 3: Receivers".

3   Definitions and abbreviations

3.1   Definitions

For the purposes of the present document, the following terms and definitions apply:

Media Gateway (MG): See ITU-T Recommendation H.248.1 [5].

Media Gateway Controller (MGC): See ITU-T Recommendation H.248.1 [5].

Multimedia Resource Function Controller (MRFC): See ES 282 001 [1].

Multimedia Resource Function Processor (MRFP): See ES 282 001 [1].

3.2   Abbreviations

AS	Application Server
ASR	Automatic Speech Recognition
CN	Comfort Noise
CRC	Cyclic Redundancy Check
DNS	Domain Name System
DTMF	Dual Tone Multi Frequency
IMS	IP Multimedia Subsystem
IP	Internet Protocol
MG	Media Gateway
MGC	Media Gateway Controller
MRFC	Multimedia Resource Function Controller
MRFP	Multimedia Resource Function Processor
PLC	Packet Loss Concealment
PT	Payload Type
RTCP	Real-time Transport Control Protocol
RTP	Real-time Transport Protocol
SCTP	Stream Control Transmission Protocol
SDP	Session Description Protocol
SSRC	Synchronization SouRCe
TST	Text to Speech Translation
TTL	Time To Live
UDP	User Datagram Protocol
UI	User Interaction

4 Applicability

4.1 Architecture

Within the IMS architecture (ES 282 002 [2]), the Mp reference point allows an MRFC to control media stream resources provided by an MRFP. The MRFC controls the MRFP, based on the information received from Application Servers, via the S-CSCF, at the Mr reference point. The MRFP sources and sinks media streams at the Mb reference point, which represents the interface to core network transport resources. Figure 1 shows the functional entities and reference points involved in the control of multimedia resources. The present document focuses on the Mp reference point. The protocol used over the Mp reference point is the gateway control protocol defined in ITU-T Recommendation H.248.1 [5]. With regards to the architecture assumed by this Recommendation, the MRFC plays the role of an MGC and the MRFP plays the role of an MG.
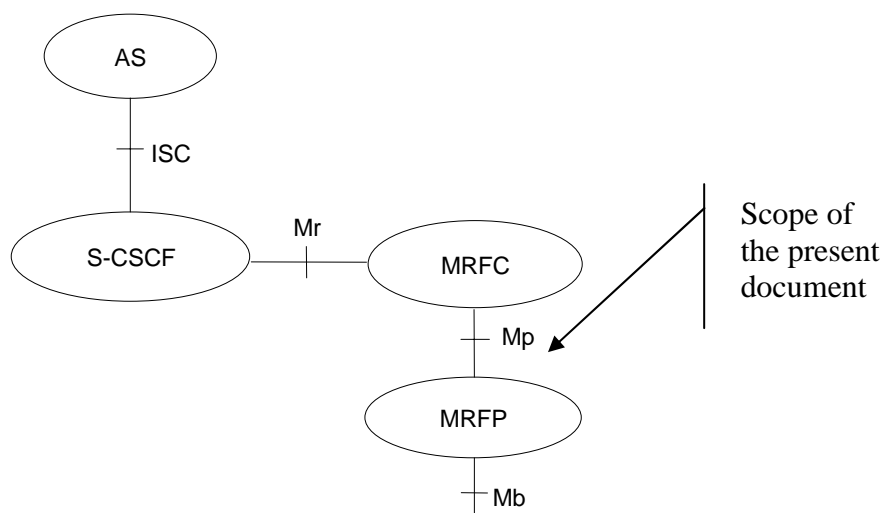
Figure 1: MRF entities and interfaces in the IMS architecture

Three categories of MRFP functionalities are identified by the present document:

- Support of User Interaction (UI). This category is subdivided into two subcategories:

    - Basic User Interaction (BASIC_UI): This includes basic support for sending tones and fixed announcements, and support of)DTMF collection.

    - Advanced User Interaction (ADVANCED_UI): This includes support for BASIC_UI,variable announcements, ASR and voice mailbox capabilities.

- Support for transcoding (TRANSCODING). This includes support for transcoding between voice codecs.

  NOTE: Support of advanced transcoding (e.g. transcoding between voice codecs and text-based codecs or ITU-T Recommendation T.38 [17]) is outside the scope of this version of the profile.

- Support for conferencing (CONFERENCING). This category is subdivided into two subcategories:

    - Basic Conferencing (BASIC_CONFERENCING): This includes support for 3-party calls.

    - Advanced conferencing (ADVANCED_CONFERENCING): This includes support for BASIC_CONFERENCING, support of large voice conferences and support for floor control procedures.

4.2   Functional requirements

Support of the packages identified in the profile definition implies support of the underlying functionalities. This clause identifies additional functional requirements that media gateways conforming to the present document shall comply with.

- Media Resource Function Processors (MRFP) shall support IPv4 and may support IPv6.

- Media Resource Function Processors (MRFP) shall support G.711 A-law voice codec and may support other codecs. Media Resource Function Processors supporting TRANSCODING are expected to support a wide range of well-known codecs. The list of codecs is outside the scope of the present document.

- Media Resource Function Processors (MRFP) shall support the procedures defined in RFC 2833 [21] to generate, detect and forward DTMF digits. DTMF shall be identified by name (see mode "Named Telephone Events" in clause 3/RFC 2833 [21]), as opposed to their waveform properties.

- All properties of tones requested by the MRFC shall be provisioned in the MRFP. The MRFC is not required to send the physical characteristics of tones to Media Resource Function Processors (MRFP).

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:	ETSIprof_MediaServer (to be registered at IANA)
Version:	1

5.2   Summary

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

NOTE: It is expected that future versions of this profile will support similar features in the context of multimedia communications.

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.248.1 Version 2 [5] and Corrigendum 1 to this Recommendation, and implementation of the corrections available in the latest version of the H.248 Implementors' Guide.

5.4   Connection model

Multimedia Resource Function Processors (MRFP) shall support ephemeral terminations that sink and source RTP traffic. This type of H.248 Termination is denoted "RTP" in the following clauses.

Only one stream type "audio" is supported by the present version of this profile. This stream type represents RTP/RTCP traffic with media type "audio" as defined in RFC 2327 [19].

Table 5.4.1: Connection Model

Maximum number of contexts:	Provisioned (See note 1)
Maximum number of terminations per context:	1 (See note 2), 2 (See note 3) 32 (See note 4)
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 sufficient in case the MRFP supports USER_INTERACTION only.	
NOTE 3: Support of 2 terminations is required if TRANSCODING is supported.	
NOTE 4: Support of up to 32 terminations may be required if CONFERENCING is supported. The actual number of supported terminations can be audited by the MRFC using the maxTerminationsPerContext property defined in the Base Root Package.	

5.5   Context attributes

Table 5.5.1: Context Attributes

Context Attribute	Supported	Values Supported
Topology	No (See note)	Not applicable
Priority Indicator	Yes	0 to 15
Emergency Indicator	No	Not applicable
ContextAttribute Descriptor	No	Not applicable
ContextIDList Parameter	No	Not applicable
AND/OR Context Attribute supported?	No	Not applicable (H.248 version 3 only)
NOTE: Use of the topology descriptor for supporting lawful interception may be required in future versions of this profile if the MRFP is used as a point of content interception.		

5.6   Terminations

5.6.1   Termination names

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.

The following naming convention is recommended:

ephemeral/<string of alphanumeric characters or '/'>, e.g., ephemeral/1/0/40000

The following ABNF [24] specification further describes the syntax for this naming convention.

```
pathName = EphToken SLASH EPHsystem
EphToken = "ephemeral" ; so called prefix
            ; The maximum length of 'pathname' is defined in Annex B.2/H.248.1.
EPHsystem = 0*(HierarchyLevelHIGHToken SLASH) HierarchyLevelLOWToken
HierarchyLevelHIGHToken = 1*alphanum
HierarchyLevelLOWToken  = Individual / Wildcard
alphanum  = ALPHA / DIGIT
Individual = 1*DIGIT
Wildcard  = "$" / "*"
```

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: Maximum number of streams per termination type

Maximum number of streams per termination type	RTP	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: LocalControl descriptor

		Termination Type	Stream Type
Reserve group used:	NO	RTP	Not Applicable
Reserve value used:	YES	RTP	Audio

- ReserveValue

The MRFC shall set the "ReserveValue" property to "true" when multiple codecs are specified within a single "m=" line of a session descriptor block and resources are required to be reserved in the MRFP for the multiple codecs. This situation occurs for example in case of user interaction procedures where the user is expected to either speaks or enter digits. The "ReserveValue" property shall be set to "true" in cases where)a low bit rate codec is used for transporting voice and the special payload type defined in RFC 2833 [21] is used for transporting DTMF.

Alternatively, if the MRFC when it specifies multiple codecs requires the MRFP to select one of the codecs, then it shall set the "ReserveValue" property to "false".

In the situation where the MRFC specifies a single codec within a "m= line", then the ReserveValue property shall be omitted or set to "false".

- Stream Mode

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

Table 5.7.1.1.3: Local control properties

Properties associated with Local Control Descriptor supported:		Yes	
If yes	**Property IDs Reported**	**Termination Type**	**Stream Type**
	MGCinfo/db	RTP	Any
	nt/jit	RTP	Any
	aassm/*	RTP	Audio
	aasrec/*	RTP	Audio
	vcp/level	RTP	Audio
	vlmp/mixlevel	RTP	Audio
	vlmp/nspeakmix	RTP	Audio
	mvlcp/mixpartnum	RTP	Audio
	mvlcp/vollevip	RTP	Audio

5.7.2   Events Descriptor

Table 5.7.2.1: Events setting

Events settable on termination types and stream types:	Yes		
If yes	**Event ID**	**Termination Type**	**Stream Type**
	g/*	RTP	Any
	nt/*	RTP	Any
	rtp/*	RTP	Any
	xdd/*	RTP	Audio
	aasrec/*	RTP	Audio
	aasdc/*	RTP	Audio
	aasb/*	RTP	Audio
	it/*	ROOT	Not Applicable
	vdp/*	RTP	Audio

Table 5.7.2.2: Event Buffer Control

Event Buffer Control used:	No

Table 5.7.2.3: Keepactive Flag

Keepactive used on events:	Yes

Table 5.7.2.4: Embedded Events

Embedded events in an event descriptor:	Yes
Embedded signals in an event descriptor:	Yes

Table 5.7.2.5: Regulated Embedded Events

Regulated Embedded events are triggered on:	None

Table 5.7.2.6: Reset Events Descriptor

ResetEventsDescriptor used with events:	None

Table 5.7.2.7: Notification Behaviour

Supported Notification Behaviour	
NotifyImmediate:	ALL events
NotifyRegulated:	None
NeverNotify:	None

5.7.3   EventBuffer Descriptor

Table 5.7.3.1: Event Buffer Descriptor

Event Buffer descriptor used:	No	
If yes	**Event IDs**	Not applicable

5.7.4   Signals Descriptor

Table 5.7.4.1: Signals Descriptor

Signals settable dependant on termination or streams types:	Yes		
If yes	**Signal ID**	**Termination Type**	**Stream Type / ID**
	cg/*	RTP	Audio
	srvtn/*	RTP	Audio
	xcg/*	RTP	Audio
	an/*	RTP	Audio
	int/*	RTP	Audio
	biztn/*	RTP	Audio
	aasrec/*	RTP	Audio
	aasdc/*	RTP	Audio
	aasb/*	RTP	Audio
	conftn/*	RTP	Any
	aassm/*	RTP	Audio
	indview/*	RTP	Any

Table 5.7.4.2: Signals Lists

Signals Lists supported:	Yes	
If yes	**Termination Type Supporting Lists**	RTP
	Stream Type Supporting lists	Audio
	Maximum number of signals per signal list	Provisioned
	Intersignal delay parameter supported:	No

Table 5.7.4.3: Overriding of signal type and duration

Overriding of 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/*, indview/*	ALL

RequestID Parameter Supported:	Yes

Table 5.7.4.6: Simultaneous signals

Signals played simultaneously:	Yes	
If yes	**Signal Ids that can be played simultaneously:**	ALL

Table 5.7.4.7: Keepactive on signals

Keepactive used on signals:	Yes

5.7.5 DigitMap Descriptor

Table 5.7.5.1: DigitMap Descriptor

DigitMaps supported:	if (ADVANCED_UI) then YES else NO		
If yes	**DigitMap Name**	**Structure**	**Timers**
	Provisioned	Network operator dependent.	Network operator dependent.

5.7.6 Statistics Descriptor

Table 5.7.6.1: Statistics Descriptor

Statistics supported on:	Not Supported

Table 5.7.2.2: Statistics reported on Subtract

Statistics reported on Subtract:	No

5.7.7 ObservedEvents Descriptor

When the event is provisioned in the media gateway, the Request Id is set to FFFFFFFF'H.

Table 5.7.7.1: Observed Events Descriptor

Event detection time supported:	Yes

5.7.8 Topology Descriptor

Table 5.7.8.1: Topology Descriptor

Allowed triples:	Not supported

5.7.9 Error Descriptor

Error codes sent by the MRFC:

Table 5.7.9.1: MRFC Error Descriptor

Supported H.248.8 Error Codes:	ALL
Supported Error Codes defined in packages:	400-411,421,422, 430, 431,440,442—458, 505, 533

Error codes sent by the MRFP:

Table 5.7.9.2: MRFP Error Descriptor

Supported H.248.8 Error Codes:	ALL
Supported Error Codes defined in packages:	400-411, 412, 421,422,430, 431, 432-435,440,441,442-458, 471, 500-540, 600-612

5.8   Command API

NOTE: It is assumed that an Error Descriptor may be returned in any command reply.

5.8.1   Add

Table 5.8.1.1: Add request

Descriptors used by Add request:	ALL except Mux

Table 5.8.1.2: Add reply

Descriptors used by Add reply:	ALL except Mux

5.8.2   Modify

Table 5.8.2.1: Modify request

Descriptors used by Modify request:	ALL except Mux

Table 5.8.2.2: Modify reply

Descriptors used by Modify reply:	ALL except Mux

5.8.3   Subtract

Table 5.8.3.1: Subtract request

Descriptors used by Subtract request:	Audit

Table 5.8.3.2: Subtract reply

Descriptors used by Subtract reply:	None

5.8.4   Move

Table 5.8.4.1: Move request

Move command used:	Yes

Table 5.8.4.2: Move reply

Descriptors used by Move Request:	ALL except Mux
Descriptors used by Move Reply:	ALL except Mux

5.8.5   AuditValue

Table 5.8.5.1: AuditValue

Audited Properties:	ALL properties	in ALL descriptors
Audited Statistics:	None	
Audited Signals:	ALL	
Audited Events:	ALL	
Packages Audit possible?	YES	

5.8.6   AuditCapabilities

This command is optional.

Table 5.8.6.1: AuditCapabilities

Audited Properties:	ALL properties	in ALL descriptors
Audited Statistics:	None	
Audited Signals:	ALL	
Audited Events:	ALL	

Table 5.8.6.2: Scoped audit

Audited Properties / ContextAttributes used for a scoped audit:	None

5.8.7   Notify

Table 5.8.7.1: Notify descriptors

Descriptors used by Notify Request or Reply:	ObservedEvents

5.8.8   ServiceChange

Table 5.8.8.1: Service change MRFC

ServiceChangeMethods and ServiceChangeReasons sent by MRFC:

Service Change Methods Supported:	ServiceChange Reasons supported:
Forced, Graceful, Restart, Handoff	900 – 917 except 908 and 909

Table 5.8.8.2: Service change MRFP

ServiceChangeMethods and ServiceChangeReasons sent by MRFP:

Service Change Methods Supported:	ServiceChange Reasons supported:
Forced, Graceful, Restart, Handoff, Failover, Disconnected	900-917

Table 5.8.8.3: Service change address

ServiceChangeAddress used:	No

Table 5.8.8.4: Service change delay

ServiceChangeDelay used:	Yes	
If yes	**Valid time period:**	Provisioned

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:	Version 2 [5] shall be the minimum version used in ServiceChangeVersion.

Table 5.8.8.7: Profile negociation

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 3)
Context attributes audited:	ALL supported attributes (See table 3)

5.9 Generic command syntax and encoding

Table 5.9.1: Syntax and ENcoding

Supported encodings:	Text encoding shall be supported by both the MRFP and the MRFC. Both the long and short form of text encoding shall be supported at the receiving side.

5.10 Transactions

Table 5.10.1: Transactions

Maximum number of Transaction Requests / Replies / TransResponseAcks / Segment Replies per message:	2 (See note)
NOTE: When two elements 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: Maximum number of commands per transaction request

Maximum number of commands per Transaction request:	32 IF ADVANCED_CONFERENCING ELSE 3

NOTE: Only one action per transaction is supported.

Table 5.10.3: Maximum number of commands per transaction reply

Maximum number of commands per Transaction reply:	32 IF ADVANCED_CONFERENCING ELSE 3

Table 5.10.4: Optional commands

Commands able to be marked 'Optional':	AUDITVALUE, AUDITCAPABILITY

Table 5.10.5: Transaction timers

Transaction Timer:	Value
NormalMGExecutionTime	Provisioned in the MRFP
NormalMGCExecutionTime	Provisioned in the MRFP
MGOriginatedPendingLimit	Provisioned in the MRFP
MGCOriginatedPendingLimit	Provisioned in the MRFP
MGProvisionalResponseTimerValue	Provisioned in the MRFP
MGCProvisionalResponseTimerValue	Provisioned in the MRFP

Transaction timers (as defined in the properties of the Base Root package) shall be in a range between 100 ms and 5 s. The MRFC may overwrite the provisioned values.

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.

5.12   Transport

Table 5.12.1: Transport

Supported transports:	Transport over UDP shall be supported. Support of SCTP is optional and shall conform to Recommendation H.248.4 [6]. Choosing one option or the other is a network operator's decision, based on the network configuration.

For UDP transport the destination IP addresses to be used for delivering the H.248 messages are retrieved through the following means:

- The MRFC stores the source IP address retrieved from the message carrying first ServiceChange command.)All subsequent messages delivered to the MRFP will use this IP address.

- The MRFP stores the source IP address retrieved from the message carrying the reply to the ServiceChange command.)All subsequent messages delivered to the MRFC uses this IP address.

NOTE: The MRFP uses the DNS lookup in order to retrieve the initial IP address to send the first ServiceChange command.)This IP address may be different than the IP address returned in the reply to ServiceChange command.

Table 5.12.2: Segmentation supported

Segmentation supported:	UDP: No SCTP: Inherent in transport (See note)
NOTE: The H.248 Segmentation Package according annex E.14 of H.248.1 [5] 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 5.12.3: Control association monitoring

Control association monitoring supported:	UDP: AuditValue on Root and ITU-T Recommendation H.248.14 SCTP: Inherent in Transport.

5.13   Security

Table 5.13.1: Security

Supported security:	For the purpose of the present document the control protocols are considered to be inside the secured zone of a single operator. The specified H.248 security options should not be used, as these interfaces are considered to be within a secured zone.

5.14   Packages

Table 5.14.1: Mandatory packages

Mandatory packages		
Package Name / Reference	**Package ID**	**Version**
Generic (H.248.1 [5])	g	1
Base Root (H.248.1 [5])	root	2
Network (H.248.1 [5])	nt	1
RTP Package (H.248.1 [5])	rtp	1

Table 5.14.2: Optional packages

Optional Packages			
Package Name / Reference	**Package ID**	**Version**	**Support dependent on:**
Extended DTMF Detection (H.248.16 [10])	xdd	1	Support is mandatory if BASIC_UI is supported and the AAS Digit Collection package is not supported, optional otherwise
Call Progress Tones Generator (H.248.1 [5])	cg	1	Support is mandatory if BASIC_UI and the Advanced Audio Server Base and the Voice Variable Syntax packages are not supported, optional otherwise
Basic Services Tones Generator (Q.1950 [13])	srvtn	1	Support is mandatory if BASIC_UI and the Advanced Audio Server Base and the Voice Variable Syntax packages are not supported, optional otherwise
Expanded Call Progress Tones Generator (Q.1950 [13])	xcg	1	Support is mandatory if BASIC_UI and the Advanced Audio Server Base and the Voice Variable Syntax packages are not supported, optional otherwise
Basic Announcement Syntax (H.248.9 [8])	bannsyx	1	Support is mandatory if ADVANCED_UI is supported, Support is mandatory if BASIC_UI is supported and the Generic Announcement package is not supported, optional otherwise.
Voice Variable Syntax (H.248.9 [8])	vvsyx	1	Support is mandatory if ADVANCED_UI is supported, optional otherwise.
Announcement Set Syntax (H.248.9 [8])	setsyx	2	Support is mandatory if ADVANCED_UI, optional otherwise.
General text Variable type (H.248.9 [8])	phrsyx	2	Support is mandatory if ADVANCED_UI, optional otherwise. (required for TTS)
Advanced Audio Server Base (H.248.9 [8])	aasb	1	Support is mandatory if ADVANCED_UI, Support is mandatory if BASIC_UI and the Generic Announcement package is not supported, optional otherwise.
AAS Digit collection (H.248.9 [8])	aasdc	2	Support is mandatory if ADVANCED_UI, optional otherwise.
AAS Recording package (H.248.9 [8])	aasrec	1	Support is mandatory if ADVANCED_UI, optional otherwise.
AAS segment management (H.248.9 [8])	aassm	1	Optional
Generic Announcement (H.248.7 [7])	an	2	Support is mandatory if BASIC_UI and the Advanced Audio Server Base package is not supported, optional otherwise.
Intrusion Tones Generation (Q.1950 [13])	int	1	Support is mandatory if BASIC_UI and the Advanced Audio Server Base and the Voice Variable Syntax packages are not supported, optional otherwise
Business Tones Generation (Q.1950 [13])	biztn	1	Support is mandatory if BASIC_UI and the Advanced Audio Server Base and the Voice Variable Syntax packages are not supported, optional otherwise
Conferencing Tones Generation (H.248.27 [12])	conftn	1	Support is mandatory if BASIC_CONFERENCING)is supported, not required otherwise.
Floor Control (H.248.19 [11])	fcp	1	Support is mandatory if ADVANCED_CONFERENCING is supported, not required otherwise.
View (H.248.19 [11])	indview	1	Support is mandatory if ADVANCED_CONFERENCING is supported, not required otherwise.
Volume Control (H.248.19 [11])	vcp	1	Support is mandatory if ADVANCED_CONFERENCING is supported, optional otherwise.
Volume Detection (H.248.19 [11])	vdt	1	Support is mandatory if ADVANCED_CONFERENCING is supported, optional otherwise.
Volume Level Mixing (H.248.19 [11])	vlm	1	Support is mandatory if ADVANCED_CONFERENCING is supported, not required otherwise.
Mixing Volume Level Control (H.248.19 [11])	mvlc	1	Support is mandatory if ADVANCED_CONFERENCING is supported, not required otherwise.
Inactivity Timer (H.248.14 [9])	it	1	Support is mandatory if UDP transport is enabled for H.248 messages.
MGC Information (TS 183 022 [4])	MGCInfo	1	This package may be supported as an operator option. For this profile the information string shall be limited to 32 octets in length.

5.14.1   Generic package

Table 5.14.1.1: Package usage information for generic package

Properties	Mandatory/ Optional	Used in command:	Supported Values:	Provisioned Value:
None	Not applicable	Not applicable	Not applicable	Not applicable
Signals	**Mandatory/ Optional**	**Used in command:**		**Duration Provisioned Value:**
None	Not applicable	Not applicable		Not applicable
Signal Parameters	**Mandatory/ Optional**	**Supported Values:**		**Duration Provisioned Value:**
Not applicable	Not applicable	Not applicable		Not applicable
Events	**Mandatory/ Optional**	**Used in command:**		
Cause	O	ADD, MODIFY, NOTIFY, AUDITVALUE, AUDITCAPABILITY		
	Event Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	None	Not applicable	Not applicable	Not applicable
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	General Cause	M	ALL	Not applicable
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	Failure cause	Not used	Not applicable	Not applicable
Signal Completion	M	ADD, MODIFY, NOTIFY, AUDITVALUE, AUDITCAPABILITY		
	Event Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	None	Not applicable	Not applicable	Not applicable
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	Signal identity	M	ALL	Not applicable
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	Termination medhod	M	ALL except PI	Not applicable
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	Signal List ID	O	ALL	Not applicable
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	Request ID	O	ALL	Not applicable
Statistics	**Mandatory/ Optional**	**Used in command:**	**Supported Values:**	
None	Not applicable	Not applicable	Not applicable	
Error Codes	**Mandatory/ Optional**			
None	Not appplicable			

5.14.2   Base root package

Table 5.14.2.1: Package usage information for base root package

Properties	Mandatory/ Optional	Used in command:	Supported Values:	Provisioned Value:
maxNrOfContexts, maxTerminationsPerContext	M	AUDITVALUE, AUDITCAPABILITY	ALL	Not applicable
normalMGExecutionTime normalMGCExecutionTime MGProvisionalResponseTimerValue MGCProvisionalResponseTimerValue MGCOriginatedPendingLimit MGOriginatedPendingLimit	M	AUDITVALUE, AUDITCAPABILITY, MODIFY	ALL	Not applicable
ALL	M	AUDITVALUE, AUDITCAPABILITY	ALL	Not applicable
Signals	**Mandatory/ Optional**	**Used in command:**		**Duration Provisioned Value:**
None	Not applicable	Not applicable		Not applicable
	Signal Parameters	**Mandatory/ Optional**	**Supported Values:**	**Duration Provisioned Value:**
	Not applicable	Not applicable	Not applicable	Not applicable
Events	**Mandatory/ Optional**	**Used in command:**		
None	Not applicable	Not applicable		
	Event Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	Not applicable	Not applicable	Not applicable	Not applicable
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	Not applicable	Not applicable	Not applicable	Not applicable
Statistics	**Mandatory/ Optional**	**Used in command:**		**Supported Values:**
None	Not applicable	Not applicable		Not applicable
Error Codes	**Mandatory/ Optional**			
None	Not applicable			

5.14.3   Network package

Table 5.14.3.1: Package usage information for network package

Properties	Mandatory/ Optional	Used in command:	Supported Values:	Provisioned Value:
Maximum Jitter Buffer	Should not be used by the MRFC and shall be ignored by the MRFP	Not applicable	Not applicable	Not applicable
Signals	**Mandatory/ Optional**	**Used in command:**		**Duration Provisioned Value:**
None	Not applicable	Not applicable		Not applicable
	Signal Parameters	**Mandatory/ Optional**	**Supported Values:**	**Duration Provisioned Value:**
	Not applicable	Not applicable	Not applicable	Not applicable

Events	Mandatory/ Optional	Used in command:		
Network Failure	O	ADD, MODIFY, NOTIFY, AUDITVALUE, AUDITCAPABILITY		
	Event Parameters	Mandatory/ Optional	Supported Values:	Provisioned Value:
	Not applicable	Not applicable	Not applicable	Not applicable
	ObservedEvent Parameters	Mandatory/ Optional	Supported Values:	Provisioned Value:
	Cause	M	ALL	Not applicable
Statistics	Mandatory/ Optional	Used in command:		Supported Values:
None				
Error Codes	Mandatory/ Optional			
None	Not applicable			

5.14.4 RTP package

Table 5.14.4.1: Package usage information for RTP package

Properties	Mandatory/ Optional	Used in command:	Supported Values:	Provisioned Value:
None	Not applicable	Not applicable	Not applicable	Not applicable
Signals	Mandatory/ Optional	Used in command:		Duration Provisioned Value:
None	Not applicable	Not applicable		Not applicable
	Signal Parameters	Mandatory/ Optional	Supported Values:	Duration Provisioned Value:
	Not applicable	Not applicable	Not applicable	Not applicable
Events	Mandatory/ Optional	Used in command:		
Payload transition	M	ADD, MODIFY, NOTIFY, AUDITVALUE, AUDITCAPABILITY		
	Event Parameters	Mandatory/ Optional	Supported Values:	Provisioned Value:
	Not applicable	Not applicable	Not applicable	Not applicable
	ObservedEvent Parameters	Mandatory/ Optional	Supported Values:	Provisioned Value:
	RTP Payload Type	M	ALL	Not applicable
Statistics	Mandatory/ Optional	Used in command:		Supported Values:
None				
Error Codes	Mandatory/ Optional			
None	Not applicable			

5.14.5 Extended DTMF detection package

Table 5.14.5.1: Package usage information for extended DTMF detection package

Properties	Mandatory/ Optional	Used in command:	Supported Values:	Provisioned Value:
None	Not applicable	Not applicable	Not applicable	Not applicable
Signals	Mandatory/ Optional	Used in command:		Duration Provisioned Value:
None	Not applicable	Not applicable		Not applicable
	Signal Parameters	Mandatory/ Optional	Supported Values:	Duration Provisioned Value:
	Not applicable	Not applicable	Not applicable	Not applicable

Events	Mandatory/ Optional	Used in command:		
DTMF Digits (See note)	M	ADD, MODIFY, NOTIFY, AUDITVALUE, AUDITCAPABILITY		
	Event Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	None	Not applicable	Not applicable	Not applicable
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	None	Not applicable	Not applicable	Not applicable
Extended Digit Map Completion	M	ADD, MODIFY, NOTIFY, AUDITVALUE, AUDITCAPABILITY		
	Event Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	Buffer Control	M	ALL	0
	Extra Digit Disposition	M	ALL	OFF
	Match Procedure	M	ALL	base
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	digit string	M	ALL	Not applicable
	termination method	M	ALL	Not applicable
	Unmatched Event	M	ALL	Not applicable
Statistics	**Mandatory/ Optional**	**Used in command:**		**Supported Values:**
None	Not applicable	Not applicable		Not applicable
Error Codes	**Mandatory/ Optional**			
None	Not applicable			

NOTE: DTMF detection shall conform to ES 201 235-3 [25].

5.14.6 Call progress tones generator package

Table 5.14.6.1: Package usage information for call progress tones generator package

Properties	Mandatory/ Optional	Used in command:	Supported Values:	Provisioned Value:
None	Not applicable	Not applicable	Not applicable	Not applicable
Signals	**Mandatory/ Optional**	**Used in command:**		**Duration Provisioned Value:**
All	M	ADD, MODIFY, AUDITVALUE, AUDITCAPABILITY		(See note)
	Signal Parameters	**Mandatory/ Optional**	**Supported Values:**	**Duration Provisioned Value:**
	None	Not applicable	Not applicable	Not applicable
Events	**Mandatory/ Optional**	**Used in command:**		
None	Not applicable	Not applicable		
	Event Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	Not applicable	Not applicable	Not applicable	Not applicable
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	Not applicable	Not applicable	Not applicable	Not applicable

Properties	Mandatory/ Optional	Used in command:	Supported Values:	Provisioned Value:
None	Not applicable	Not applicable	Not applicable	Not applicable
Signals	Mandatory/ Optional	Used in command:		Duration Provisioned Value:
All	M	ADD, MODIFY, AUDITVALUE, AUDITCAPABILITY		(See note)
	Signal Parameters	Mandatory/ Optional	Supported Values:	Duration Provisioned Value:
	None	Not applicable	Not applicable	Not applicable
Events	Mandatory/ Optional	Used in command:		
Properties	Mandatory/ Optional	Used in command:	Supported Values:	Provisioned Value:
Statistics	Mandatory/ Optional	Used in command:		Supported Values:
None	Not applicable	Not applicable		Not applicable
Error Codes	Mandatory/ Optional			
None	Not applicable			
NOTE: Levels, cadences and frequencies of signals shall conform to national specifications. In the absence of such specification, the following rules shall be used: Levels, cadences and frequencies of the following signals shall conform to ES 201 970 [3]: - Dial Tone; - Ringing Tone (also known as ringback tone); - Busy Tone; - Call Waiting Tone. The characteristics of other signals shall conform to ITU-T Recommendation E.180 [18].				

5.14.7   Basic Services Tones Generator Package

Table 5.14.7.1: Package usage information for basic services tones generator package

Properties	Mandatory/ Optional	Used in command:	Supported Values:	Provisioned Value:
None	Not applicable	Not applicable	Not applicable	Not applicable
Signals	Mandatory/ Optional	Used in command:		Duration Provisioned Value:
ALL	M	ADD, MODIFY, AUDITVALUE, AUDITCAPABILITY		(See note)
	Signal Parameters	Mandatory/ Optional	Supported Values:	Duration Provisioned Value:
	Tone Direction	O	ALL	ext
Events	Mandatory/ Optional	Used in command:		
None	Not applicable	Not applicable		
	Event Parameters	Mandatory/ Optional	Supported Values:	Provisioned Value:
	Not applicable	Not applicable	Not applicable	Not applicable
	ObservedEvent Parameters	Mandatory/ Optional	Supported Values:	Provisioned Value:
	Not applicable	Not applicable	Not applicable	Not applicable
Statistics	Mandatory/ Optional	Used in command:		Supported Values:
None	Not applicable	Not applicable		Not applicable
Error Codes	Mandatory/ Optional			
None	Not applicable			
NOTE: Unless specified otherwise in national specifications, the characteristics of the Message Waiting Tone signal shall be those defined in ES 201 970 [3] for the Special Dial Tone.				

5.14.8   Expanded Call Progress Tones Generator Package

Table 5.14.8.1: Package usage information for expanded call progress tones generator package

Properties	Mandatory/ Optional	Used in command:	Supported Values:	Provisioned Value:
None	Not applicable	Not applicable	Not applicable	Not applicable
Signals	Mandatory/ Optional	Used in command:		Duration Provisioned Value:
ALL	M	ADD, MODIFY, AUDITVALUE, AUDITCAPABILITY		(See note)
	Signal Parameters	Mandatory/ Optional	Supported Values:	Duration Provisioned Value:
	Tone Direction	O	ALL	ext
Events	Mandatory/ Optional	Used in command:		
None	Not applicable	Not applicable		
	Event Parameters	Mandatory/ Optional	Supported Values:	Provisioned Value:
	Not applicable	Not applicable	Not applicable	Not applicable
	ObservedEvent Parameters	Mandatory/ Optional	Supported Values:	Provisioned Value:
	Not applicable	Not applicable	Not applicable	Not applicable
Statistics	Mandatory/ Optional	Used in command:	Supported Values:	
None	Not applicable	Not applicable	Not applicable	
Error Codes	Mandatory/ Optional			
None	Not applicable			
NOTE: Unless specified otherwise in national specifications, the characteristics of the Special Condition Dial Tone (spec) shall be those of the Special Dial Tone defined in ES 201 970 [3].				

5.14.9   Basic Announcement Syntax Package

Table 5.14.9.1: Package usage information for basic announcement syntax package

Properties	Mandatory/ Optional	Used in command:	Supported Values:	Provisioned Value:
None	Not applicable	Not applicable	Not applicable	Not applicable
Signals	Mandatory/ Optional	Used in command:		Duration Provisioned Value:
None	Not applicable	Not applicable		Not applicable
	Signal Parameters	Mandatory/ Optional	Supported Values:	Duration Provisioned Value:
	Not applicable	Not applicable	Not applicable	Not applicable
Events	Mandatory/ Optional	Used in command:		
None	Not applicable	Not applicable		
	Event Parameters	Mandatory/ Optional	Supported Values:	Provisioned Value:
	Not applicable	Not applicable	Not applicable	Not applicable
	ObservedEvent Parameters	Mandatory/ Optional	Supported Values:	Provisioned Value:
	Not applicable	Not applicable	Not applicable	Not applicable
Statistics	Mandatory/ Optional	Used in command:	Supported Values:	
None	Not applicable	Not applicable	Not applicable	
Error Codes	Mandatory/ Optional			
None	Not applicable			

5.14.10 Voice variable syntax package

Table 5.14.10.1: Package usage information for voice variable syntax package

Properties	Mandatory/ Optional	Used in command:	Supported Values:	Provisioned Value:
None	Not applicable	Not applicable	Not applicable	Not applicable
Signals	**Mandatory/ Optional**	**Used in command:**		**Duration Provisioned Value:**
None	Not applicable	Not applicable		Not applicable
	Signal Parameters	**Mandatory/ Optional**	**Supported Values:**	**Duration Provisioned Value:**
	Not applicable	Not applicable	Not applicable	Not applicable
Events	**Mandatory/ Optional**	**Used in command:**		
None	Not applicable	Not applicable		
	Event Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	Not applicable	Not applicable	Not applicable	Not applicable
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	Not applicable	Not applicable	Not applicable	Not applicable
Statistics	**Mandatory/ Optional**	**Used in command:**	**Supported Values:**	
None	Not applicable	Not applicable	Not applicable	
Error Codes	**Mandatory/ Optional**			
None	Not applicable			

5.14.11 Announcement set syntax package

Table 5.14.11.1: Package usage information for announcement set syntax package

Properties	Mandatory/ Optional	Used in command:	Supported Values:	Provisioned Value:
None	Not applicable	Not applicable	Not applicable	Not applicable
Signals	**Mandatory/ Optional**	**Used in command:**		**Duration Provisioned Value:**
None	Not applicable	Not applicable		Not applicable
	Signal Parameters	**Mandatory/ Optional**	**Supported Values:**	**Duration Provisioned Value:**
	Not applicable	Not applicable	Not applicable	Not applicable
Events	**Mandatory/ Optional**	**Used in command:**		
None	Not applicable	Not applicable		
	Event Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	Not applicable	Not applicable	Not applicable	Not applicable
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	Not applicable	Not applicable	Not applicable	Not applicable
Statistics	**Mandatory/ Optional**	**Used in command:**	**Supported Values:**	
None	Not applicable	Not applicable	Not applicable	
Error Codes	**Mandatory/ Optional**			
None	Not applicable			

5.14.12   General text variable type package

Table 5.14.12.1: Package usage information for general text variable type package

Properties	Mandatory/ Optional	Used in command:	Supported Values:	Provisioned Value:
None	Not applicable	Not applicable	Not applicable	Not applicable
Signals	**Mandatory/ Optional**	**Used in command:**		**Duration Provisioned Value:**
None	Not applicable	Not applicable		Not applicable
	Signal Parameters	**Mandatory/ Optional**	**Supported Values:**	**Duration Provisioned Value:**
	Not applicable	Not applicable	Not applicable	Not applicable
Events	**Mandatory/ Optional**	**Used in command:**		
None	Not applicable	Not applicable		
	Event Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	Not applicable	Not applicable	Not applicable	Not applicable
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
Statistics	**Mandatory/ Optional**	**Used in command:**		**Supported Values:**
None	Not applicable	Not applicable		Not applicable
Error Codes	**Mandatory/ Optional**			
None	Not applicable			

5.14.13   Advanced audio server base package

Table 5.14.13.1: Package usage information for advanced audio server base package

Properties	Mandatory/ Optional	Used in command:	Supported Values:	Provisioned Value:
None	Not applicable	Not applicable	Not applicable	Not applicable
Signals	**Mandatory/ Optional**	**Used in command:**		**Duration Provisioned Value:**
Play	M	ADD, MODIFY, AUDITVALUE, AUDITCAPABILITY>		Not applicable
	Signal Parameters	**Mandatory/ Optional**	**Supported Values:**	**Duration Provisioned Value:**
	Announcement	M	ALL	Not applicable
	Interations	M	ALL	1
	Interval	M	ALL	None
	Speed	O	ALL	0
	Volume	O	ALL	0
Events	**Mandatory/ Optional**	**Used in command:**		
Audio Operation Failure	M	ADD, MODIFY, NOTIFY, AUDITVALUE, AUDITCAPABILITY		
	Event Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	Not applicable	Not applicable	Not applicable	Not applicable
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	Return Code	M	ALL	Not applicable
Statistics	**Mandatory/ Optional**	**Used in command:**		**Supported Values:**
None	Not applicable	Not applicable		Not applicable
Error Codes	**Mandatory/ Optional**			
None	Not applicable			

5.14.14 AAS digit collection package

Table 5.14.14.1: Package usage information for aas digit collection package

Properties	Mandatory/ Optional	Used in command:	Supported Values:	Provisioned Value:
None	Not applicable	Not applicable	Not applicable	Not applicable
Signals	**Mandatory/ Optional**	**Used in command:**		**Duration Provisioned Value:**
Play Collect	M	ADD, MODIFY, AUDITVALUE, AUDITCAPABILITY		Not applicable
	Signal Parameters	**Mandatory/ Optional**	**Supported Values:**	**Duration Provisioned Value:**
	Initial Prompt	M	ALL	Not applicable
	Reprompt	M	ALL	Not applicable
	Number of DIgits Prompt	M	ALL	Not applicable
	Successful announcement	M	ALL	Not applicable
	Announcement Failure	M	ALL	Not applicable
	Non Interruptable Play	M	ALL	FALSE
	Keep digits	M	ALL	FALSE
	Clear Digits Buffer	M	ALL	FALSE
	Maximum Number of Attempts	M	ALL	1
	Digit Map	M	ALL	Not applicable
	Speed	O	ALL	0
	Volume	M	ALL	0
	Offset	M	ALL	0
	Restart Key	M	ALL	0
	Re-input key	M	ALL	None
	Return Key	M	ALL	None
	Iterations	M	ALL	1
	Interval	M	ALL	None
	End Input Key	M	ALL	None
	Include End Inut Key	M	ALL	FALSE
	Voice Information	M	ALL	dtmfonly
	Voice back	M	ALL	novoiceback
	INPA Prompt timer	M	ALL	None
Events	**Mandatory/ Optional**	**Used in command:**		
Audio Operation Failure	M	ADD, MODIFY, NOTIFY, AUDITVALUE, AUDITCAPABILITY		
	Event Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	None	Not applicable	Not applicable	Not applicable
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	Return Code	M	ALL	Not applicable
Play Collect Success	M	ADD, MODIFY, NOTIFY, AUDITVALUE, AUDITCAPABILITY		
	Event Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	None	Not applicable	Not applicable	Not applicable
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	Digits Collected	M	ALL	Not applicable (NOTE)
	Number of attempts	M	ALL	Not applicable
	Amount Played	O	ALL	Not applicable
Statistics	**Mandatory/ Optional**	**Used in command:**		**Supported Values:**
None	Not applicable	Not applicable		Not applicable
Error Codes	**Mandatory/ Optional**			
None	Not applicable			
NOTE: DTMF detection shall conform to ES 201 235 [25].				

5.14.15   AAS recording package

Table 5.14.15.1: Package usage information for AAS recording package

Properties	Mandatory/ Optional	Used in command:	Supported Values:	Provisioned Value:
Maximum temporary record file	O	ADD, MODIFY, AUDITVALUE, AUDITCAPABILITY	ALL	None
Signals	**Mandatory/ Optional**	**Used in command:**		**Duration Provisioned Value:**
PlayRecord	M	ADD, MODIFY, AUDITVALUE AUDITCAPABILITY>		Not applicable
	Signal Parameters	**Mandatory/ Optional**	**Supported Values:**	**Duration Provisioned Value:**
	Initial Prompt	M	ALL	Not applicable
	No Speech prompt	M	ALL	Not applicable
	Success announcement	M	ALL	Not applicable
	Failure Announcement	M	ALL	Not applicable
	Pre-speech timer	M	ALL	None
	Post Speech Timer	M	ALL	None
	Record Length Timer	M	ALL	None
	Recording Identifier	M	ALL	None
	Speed	O	ALL	0
	Volume	M	ALL	0
	Offset	M	ALL	0
	Restart Key	M	ALL	0
	Re-input key	M	ALL	None
	Return Key	M	ALL	None
Make Persistent	M	ADD, MODIFY, AUDITVALUE AUDITCAPABILITY>		Not applicable
	Signal Parameters	**Mandatory/ Optional**	**Supported Values:**	**Duration Provisioned Value:**
	Recording Identifier	M	ALL	None
Events	**Mandatory/ Optional**	**Used in command:**		
Audio Operation Failure	M	ADD, MODIFY, NOTIFY, AUDITVALUE, AUDITCAPABILITY		
	Event Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	Not applicable	Not applicable	Not applicable	Not applicable
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	Return Code	M	ALL	Not applicable
Play Record Success	M	ADD, MODIFY, NOTIFY, AUDITVALUE, AUDITCAPABILITY		
	Event Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	None	**Not applicable**	**Not applicable**	**Not applicable**
Properties	**Mandatory/ Optional**	**Used in command:**	**Supported Values:**	**Provisioned Value:**
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	Amount Played	M	ALL	1
	Number of attempts	M	ALL	1
	Recording result	M	ALL	None
	Recording Identity	M	ALL	None
	Recording Duration	M	ALL	None
Statistics	**Mandatory/ Optional**	**Used in command:**	**Supported Values:**	
None	Not applicable	Not applicable	Not applicable	
Error Codes	**Mandatory/ Optional**			
None	Not applicable			

5.14.16   AAS segment management package

Table 5.14.16.1: Package usage information for AAS segment management package

Properties	Mandatory/ Optional	Used in command:	Supported Values:	Provisioned Value:
AAS segment control termination name	M	MODIFY, AUDITVALUE, AUDITCAPABILITY	ALL	Not applicable
Signals	**Mandatory/ Optional**	**Used in command:**		**Duration Provisioned Value:**
Delete Persistent	M	MODIFY, AUDITCAPABILITY		Not applicable
	Signal Parameters	**Mandatory/ Optional**	**Supported Values:**	**Duration Provisioned Value:**
	Segment Identifier	M	ALL	Not applicable
Override Audio	M	MODIFY, AUDITCAPABILITY		Not applicable
	Signal Parameters	**Mandatory/ Optional**	**Supported Values:**	**Duration Provisioned Value:**
	Target Segment	M	ALL	Not applicable
	Overriding Segment	M	ALL	Not applicable
Restore Audio	M	MODIFY, AUDITCAPABILITY		Not applicable
	Signal Parameters	**Mandatory/ Optional**	**Supported Values:**	**Duration Provisioned Value:**
	Targert Segment	M	ALL	Not applicable
Events	**Mandatory/ Optional**	**Used in command:**		
None	Not applicable	Not applicable		
	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	Not applicable	Not applicable	Not applicable	
Error Codes	**Mandatory/ Optional**			
None	Not applicable			

5.14.17   Generic announcement package

Table 5.14.17.1: Package usage information for generic announcement package

Properties	Mandatory/ Optional	Used in command:	Supported Values:	Provisioned Value:
None	Not applicable	Not applicable	Not applicable	Not applicable
Signals	**Mandatory/ Optional**	**Used in command:**		**Duration Provisioned Value:**
Fixed Announcement Play	M	ADD, MODIFY, AUDITVALUE, AUDITCAPABILITY		Not applicable
	Signal Parameters	**Mandatory/ Optional**	**Supported Values:**	**Duration Provisioned Value:**
	Announcement Name	M	ALL	Not applicable
	Announcement Number of Cycles	M	ALL	Not applicable
	Announcement Variant	M	Any language tag as defined in RFC 3066	Not applicable
	Announcement Direction	M	ALL	Not applicable

Variable Announcement Play	M	ADD, MODIFY, AUDITVALUE, AUDITCAPABILITY		Not applicable
	Signal Parameters	**Mandatory/ Optional**	**Supported Values:**	**Duration Provisioned Value:**
	Announcement Name	M	ALL	Not applicable
	Announcement Number of Cycles	M	ALL	Not applicable
Properties	**Mandatory/ Optional**	**Used in command:**	**Supported Values:**	**Provisioned Value:**
	Announcement Variant	M	Any language tag as defined in RFC 3066	Not applicable
	Announcement Direction	M	ALL	Not applicable
	Specific Parameters Interpretation	M	time (ISO 8601), date (ISO 8601), digits, integer	Not applicable
	Specific Parameters	M	ALL	Not applicable
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	Not applicable	Not applicable	Not applicable	
Error Codes	**Mandatory/ Optional**			
None	Not applicable			

5.14.18   Intrusion tones generator package

Table 5.14.18.1: Package usage information for intrusion tones generator package

Properties	**Mandatory/ Optional**	**Used in command:**	**Supported Values:**	**Provisioned Value:**
None	Not applicable	Not applicable	Not applicable	Not applicable
Signals	**Mandatory/ Optional**	**Used in command:**		**Duration Provisioned Value:**
ALL	M	ADD, MODIFY, AUDITVALUE, AUDITCAPABILITY		Not applicable
	Signal Parameters	**Mandatory/ Optional**	**Supported Values:**	**Duration Provisioned Value:**
	Tone Direction	O	External	Not applicable
Events	**Mandatory/ Optional**	**Used in command:**		
None	Not applicable	Not applicable		
	Event Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	Not applicable	Not applicable	Not applicable	Not applicable
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	Not applicable	Not applicable	Not applicable	Not applicable
Statistics	**Mandatory/ Optional**	**Used in command:**	**Supported Values:**	
None	Not applicable	Not applicable	Not applicable	
Error Codes	**Mandatory/ Optional**			
None	Not applicable			

5.14.19 Business tones generation package

Table 5.14.19.1: Package usage information for business tones generation package

Properties	Mandatory/ Optional	Used in command:	Supported Values:	Provisioned Value:
None	Not applicable	Not applicable	Not applicable	Not applicable
Signals	**Mandatory/ Optional**	**Used in command:**		**Duration Provisioned Value:**
ALL	M	ADD, MODIFY, AUDITVALUE, AUDITCAPABILITY		Not applicable
	Signal Parameters	**Mandatory/ Optional**	**Supported Values:**	**Duration Provisioned Value:**
	Tone Direction	O	External	Not applicable
Events	**Mandatory/ Optional**	**Used in command:**		
None	Not applicable	Not applicable		
	Event Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	Not applicable	Not applicable	Not applicable	Not applicable
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	Not applicable	Not applicable	Not applicable	Not applicable
Statistics	**Mandatory/ Optional**	**Used in command:**	**Supported Values:**	
None	Not applicable	Not applicable	Not applicable	
Error Codes	**Mandatory/ Optional**			
None	Not applicable			

5.14.20 Conferencing tones generation package

Table 5.14.20.1: Package usage information for conferencing tones generation package

Properties	Mandatory/ Optional	Used in command:	Supported Values:	Provisioned Value:
None	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Signals	**Mandatory/ Optional**	**Used in command:**		**Duration Provisioned Value:**
ALL	M	ADD, MODIFY, AUDITVALUE, AUDITCAPABILITY		Not applicable
	Signal Parameters	**Mandatory/ Optional**	**Supported Values:**	**Duration Provisioned Value:**
	Tone Direction	O	External	Not applicable
Events	**Mandatory/ Optional**	**Used in command:**		
None	Not applicable	Not applicable		
	Event Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	Not applicable	Not applicable	Not applicable	Not applicable
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	Not applicable	Not applicable	Not applicable	Not applicable
Statistics	**Mandatory/ Optional**	**Used in command:**	**Supported Values:**	
None	Not applicable	Not applicable	Not applicable	
Error Codes	**Mandatory/ Optional**			
None	Not applicable			

5.14.21 Floor control package

Table 5.14.21.1: Package usage information for floor controlpackage

Properties	Mandatory/ Optional	Used in command:	Supported Values:	Provisioned Value:
Activate Floor Controller	M	ADD, MODIFY, AUDITVALUE, AUDITCAPABILITY	ALL	Not applicable
Signals	**Mandatory/ Optional**	**Used in command:**		**Duration Provisioned Value:**
None	Not applicable	Not applicable		Not applicable
	Signal Parameters	**Mandatory/ Optional**	**Supported Values:**	**Duration Provisioned Value:**
	Not applicable	Not applicable	Not applicable	Not applicable
Events	**Mandatory/ Optional**	**Used in command:**		
None	Not applicable	Not applicable		
	Event Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	Not applicable	Not applicable	Not applicable	Not applicable
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	Not applicable	Not applicable	Not applicable	Not applicable
Statistics	**Mandatory/ Optional**	**Used in command:**		**Supported Values:**
None	Not applicable	Not applicable		Not applicable
Error Codes	**Mandatory/ Optional**			
None	Not applicable			

5.14.22 View package

Table 5.14.22.1: Package usage information for view package

Properties	Mandatory/ Optional	Used in command:	Supported Values:	Provisioned Value:
None	Not applicable	Not applicable	Not applicable	Not applicable
Signals	**Mandatory/ Optional**	**Used in command:**		**Duration Provisioned Value:**
Being Viewed	M	ADD, MODIFY, AUDITVALUE, AUDITCAPABILITY		Not applicable
	Signal Parameters	**Mandatory/ Optional**	**Supported Values:**	**Duration Provisioned Value:**
	Viewed by whom	M	ALL	Not applicable
	Viewer Identity	M	ALL	Not applicable
No Viewer	M	ADD, MODIFY, AUDITVALUE, AUDITCAPABILITY		Not applicable
	Signal Parameters	**Mandatory/ Optional**	**Supported Values:**	**Duration Provisioned Value:**
	None			
Events	**Mandatory/ Optional**	**Used in command:**		
None	Not applicable	Not applicable		
	Event Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	Not applicable	Not applicable	Not applicable	Not applicable
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	Not applicable	Not applicable	Not applicable	Not applicable
Statistics	**Mandatory/ Optional**	**Used in command:**		**Supported Values:**
None	Not applicable	Not applicable		Not applicable
Error Codes	**Mandatory/ Optional**			
None	Not applicable			

5.14.23 Volume control package

Table 5.14.23.1: Package usage information for volume control package

Properties	Mandatory/ Optional	Used in command:	Supported Values:	Provisioned Value:
Volume Level	M	ADD, MODIFY, AUDITVALUE, AUDITCAPABILITY	ALL	Not applicable
Signals	**Mandatory/ Optional**	**Used in command:**		**Duration Provisioned Value:**
None	Not applicable	Not applicable		Not applicable
	Signal Parameters	**Mandatory/ Optional**	**Supported Values:**	**Duration Provisioned Value:**
	Not applicable	Not applicable	Not applicable	Not applicable
Events	**Mandatory/ Optional**	**Used in command:**		
None	Not applicable	Not applicable		
	Event Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	Not applicable	Not applicable	Not applicable	Not applicable
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	Not applicable	Not applicable	Not applicable	Not applicable
Statistics	**Mandatory/ Optional**	**Used in command:**		**Supported Values:**
None	Not applicable	Not applicable		Not applicable
Error Codes	**Mandatory/ Optional**			
None	Not applicable			

5.14.24 Volume detection package

Table 5.14.24.1: Package usage information for volume detection package

Properties	Mandatory/ Optional	Used in command:	Supported Values:	Provisioned Value:
None	Not applicable	Not applicable	Not applicable	Not applicable
Signals	**Mandatory/ Optional**	**Used in command:**		**Duration Provisioned Value:**
None	Not applicable	Not applicable		Not applicable
	Signal Parameters	**Mandatory/ Optional**	**Supported Values:**	**Duration Provisioned Value:**
	Not applicable	Not applicable	Not applicable	Not applicable
Events	**Mandatory/ Optional**	**Used in command:**		
Volume Activity Detection	M	ADD, MODIFY, NOTIFY, AUDITVALUE, AUDITCAPABILITY		
	Event Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	Volume Threshold	M	ALL	Not applicable
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	None	Not applicable	Not applicable	Not applicable
Statistics	**Mandatory/ Optional**	**Used in command:**		**Supported Values:**
None	Not applicable	Not applicable		Not applicable
Error Codes	**Mandatory/ Optional**			
None	Not applicable			

5.14.25 Volume level mixing package

Table 5.14.25.1: Package usage information for volume level mixing package

Properties	Mandatory/ Optional	Used in command:	Supported Values:	Provisioned Value:
Volume Mixing Level	M	ADD, MODIFY, AUDITVALUE, AUDITCAPABILITY	ALL	Not applicable
N Speakers Mixing	O	ADD, MODIFY, AUDITVALUE, AUDITCAPABILITY	ALL	Not applicable
Signals	**Mandatory/ Optional**	**Used in command:**		**Duration Provisioned Value:**
None	Not applicable	Not applicable		Not applicable
	Signal Parameters	**Mandatory/ Optional**	**Supported Values:**	**Duration Provisioned Value:**
	Not applicable	Not applicable	Not applicable	Not applicable
Events	**Mandatory/ Optional**	**Used in command:**		
None	Not applicable	Not applicable		
	Event Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	Not applicable	Not applicable	Not applicable	Not applicable
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	Not applicable	Not applicable	Not applicable	Not applicable
Statistics	**Mandatory/ Optional**	**Used in command:**		**Supported Values:**
None	Not applicable	Not applicable		Not applicable
Error Codes	**Mandatory/ Optional**			
None	Not applicable			

5.14.26 Mixing volume level control package

Table 5.14.26.1: Package usage information for mixing volume level control package

Properties	Mandatory/ Optional	Used in command:	Supported Values:	Provisioned Value:
Mix Participant Number	M	ADD, MODIFY, AUDITVALUE, AUDITCAPABILITY	ALL	Not applicable
Volume Level Input to Mix	M	ADD, MODIFY, AUDITVALUE, AUDITCAPABILITY	ALL	Not applicable
Signals	**Mandatory/ Optional**	**Used in command:**		**Duration Provisioned Value:**
None	Not applicable	Not applicable		Not applicable
	Signal Parameters	**Mandatory/ Optional**	**Supported Values:**	**Duration Provisioned Value:**
	Not applicable	Not applicable	Not applicable	Not applicable
Events	**Mandatory/ Optional**	**Used in command:**		
None	Not applicable	Not applicable		
	Event Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	Not applicable	Not applicable	Not applicable	Not applicable
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	Not applicable	Not applicable	Not applicable	Not applicable
Statistics	**Mandatory/ Optional**	**Used in command:**		**Supported Values:**
None	Not applicable	Not applicable		Not applicable
Error Codes	**Mandatory/ Optional**			
None	Not applicable			

5.14.27 Inactivity timer package

Table 5.14.27.1: Package usage information for inactivity timer package

Properties	Mandatory/ Optional	Used in command:	Supported Values:	Provisioned Value:
None	Not applicable	Not applicable	Not applicable	Not applicable
Signals	**Mandatory/ Optional**	**Used in command:**		**Duration Provisioned Value:**
None	Not applicable	Not applicable		Not applicable
	Signal Parameters	**Mandatory/ Optional**	**Supported Values:**	**Duration Provisioned Value:**
	Not applicable	Not applicable	Not applicable	Not applicable
Events	**Mandatory/ Optional**	**Used in command:**		
Inactivity Timeout	M	MODIFY, NOTIFY, AUDITVALUE, AUDITCAPABILITY		
	Event Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	Maximum Inactivity Time	M	ALL	None
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	None	Not applicable	Not applicable	Not applicable
Statistics	**Mandatory/ Optional**	**Used in command:**		**Supported Values:**
None	Not applicable	Not applicable		Not applicable
Error Codes	**Mandatory/ Optional**			
None	Not applicable			

5.14.28 MGC information package

Table 5.14.28.1: Package usage information for mgc information package

Properties	Mandatory/ Optional	Used in command:	Supported Values:	Provisioned Value:
\<name and Identity e.g. Packets Sent (rtp/ps, 0x00c/0x0004), ALL or None>	M	ADD, MODIFY, AUDITVALUE, AUDITCAPABILITY	ALL	Not applicable
Signals	**Mandatory/ Optional**	**Used in command:**		**Duration Provisioned Value:**
None	Not applicable	Not applicable		Not applicable
	Signal Parameters	**Mandatory/ Optional**	**Supported Values:**	**Duration Provisioned Value:**
	Not applicable	Not applicable	Not applicable	Not applicable
Events	**Mandatory/ Optional**	**Used in command:**		
None	Not applicable	Not applicable		
	Event Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	Not applicable	Not applicable	Not applicable	Not applicable
	ObservedEvent Parameters	**Mandatory/ Optional**	**Supported Values:**	**Provisioned Value:**
	None	Not applicable	Not applicable	Not applicable
Statistics	**Mandatory/ Optional**	**Used in command:**		**Supported Values:**
None	Not applicable	Not applicable		Not applicable
Error Codes	**Mandatory/ Optional**			
None	Not applicable			

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 (RFC 2327 [19]) syntax shall be supported. All other lines should be ignored if received.

Table 5.15.1: Supported annex C and SDP information elements

Information Element	Annex C Support	SDP Support
Protocol version (v=)	Not Supported	The protocol version (v=) line contains a single field: *v= <version>* and shall be used in accordance with RFC2327 (i.e. v=0).
Origin (o=)	Not Supported	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 RFC 2327 [19] - <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 MRFP.
Session Name (s=)	Not Supported	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=)	Not Supported	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, MRFPs 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=)	Not Supported	Media Announcements (m=) lines consist of 3 fields: *m= <media> <port> <transport> <format>* 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 set to "RTP/AVP". Dynamic payloads shall not be used when a static RTP/AVP payload value is defined in RFC 3551 [20].

Information Element	Annex C Support	SDP Support
Protocol version (v=)	Not Supported	The protocol version (v=) line contains a single field: *v= <version>* and shall be used in accordance with RFC2327 (i.e. v=0).
Origin (o=)	Not Supported	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 RFC 2327 [19] - <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 MRFP.
Session Name (s=)	Not Supported	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=)	Not Supported	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, MRFPs 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.
Bandwidth (b=)	Not Supported	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=)	Not Supported	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.

Information Element	Annex C Support	SDP Support
Protocol version (v=)	Not Supported	The protocol version (v=) line contains a single field: *v= <version>* and shall be used in accordance with RFC2327 (i.e. v=0).
Origin (o=)	Not Supported	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 RFC 2327 [19] - <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 MRFP.
Session Name (s=)	Not Supported	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=)	Not Supported	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, MRFPs 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.
Attributes (a=)	Not Supported	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>
NOTE:	How to specify different ptime values for different codecs when the m= line specifies multiple payload formats is outside the scope of TISPAN NGN R1.	

5.16   Procedures

Procedures for ephemeral H.248 Terminations (here IP only) are described in clause 6.

6   Procedures

6.1   General procedures

Media Resource Function Processors shall discard packets with RTP payload types (PT) that do not match the Local Descriptor contents.

> NOTE: Besides an incorrect RTP PT field might be also other reasons for discarding packets (invalid SSRC field, invalid CRC etc.).

When sending packets from a termination, Media Resource Function Processors shall use the address and port in the Local Descriptor as a source address and port.

6.2   Use of voice Codecs

6.2.1   Comfort noise insertion and silence suppression for voice codecs

If a codec has built-in support for silence suppression and comfort noise insertion, the activation or deactivation of these features shall be indicated using the a= line according to RFC 3551 [20] and RFC 3555 [23].

If the selected codec does not have built in support for silence suppression and comfort noise (CN) insertion, the CN payload code [22] may be included in the media description.

> E.g. for ITU-T Recommendation G.711 [14], A-Law:

```
v= 0
c= IN <address type> <connection address>
m = audio <port number> RTP/AVP 8 13
a= ptime: 10
```

If the CN payload is included in the Local Descriptor, the MRFP shall be prepared to receive CN packets during silence periods. This action also corresponds to an implicit enabling of the silence suppression mode in receiving direction.

If the CN payload is included in the Remote Descriptor, the MRFP shall send CN packets during silence periods. This action corresponds to an implicit enabling of the silence suppression mode in sending direction.

Comfort noise generation, voice activity detection and discontinuous transmission algorithms are outside the scope of the present document.

6.2.2   DTMF transmission

When a G.711 codec is used, Media Resource Function Processors shall be able to generate, detect and forward DTMF tones inband.

When other codecs are used, the MRFC should request the use of the procedures defined in RFC 2833 [21] to send and receive DTMF tones.

- If the Local Descriptor sent by the MRFC includes the support for RFC 2833 [21], Media Resource Function Processors (MRFP) shall be prepared to receive and detect DTMF tones in the form of named events.

- If the Remote Descriptor indicates that RFC 2833 [21] is supported, Media Resource Function Processors (MRFP) shall be prepared to relay in the form of named events, any DTMF tone that may be received from other ephemeral terminations.

- Media Gateways supporting CONFERENCING or TRANSCODING shall support transcoding between in-band DTMF and named events defined RFC 2833 [21], based on the contents of the Local and Remote descriptors of the involved terminations.

A Dynamic Payload type shall be used to indicate support of RFC 2833 [21] for DTMF relay.

EXAMPLE:
```
v= 0
c= IN <address type> <connection address>
m= audio <port number> RTP/AVP 18 110
a= ptime: 10
a= rtpmap: 110 telephone-event/8000
a= fmtp: 110 0-15
```

6.2.3 Support of G.711 variants

6.2.3.1 G.711 Encoding law

Media Resource Function Processors conforming to the present document are required to support G.711 A-Law and may also support μ-Law in order to avoid call failure or transcoding in case the remote entity supports μ-Law only. How and where to perform transcoding in IP networks in case both terminals/gateways do not support the same variant is outside the scope of this profile.

6.2.3.2 G.711 silence suppression mode

G.711-over-IP may be operated with or without silence suppression. In case of silence suppression, comfort noise generation shall be based on ITU-T Recommendation G.711 Appendix II [16]. These features may be enabled/disabled on a per session basis, using the procedure described in clause 6.4.

6.2.3.3 G.711 packet loss concealment

G.711-over-IP may be operated with or without error loss concealment. Typically is that decision dependent on the IP packet loss rate conditions. G.711 error loss concealment is based on RTP packet granularity, therefore called as Packet Loss Concealment (PLC). ITU-T Recommendation G.711 Appendix I [15] provides a framework for G.711 PLC mode.

6.3 Procedures for basic user interaction

User Interaction procedures are applied to the ephemeral termination representing the media flow to/from the user involved in the interaction procedure. The ephemeral termination may already be in a context or may have to be created in a new context.

Signals representing tones and announcements are applied to this termination and played towards the exterior of the context. Events representing DTMF digits are detected on this termination.

6.4 Procedures for advanced user interaction

User Interaction procedures are applied to the ephemeral termination representing the media flow to/from the user involved in the interaction procedure. The ephemeral termination may already be in a context or may have to be created in a new context.

Signals representing tones and announcements are applied to this termination and played towards the exterior of the context.

Events representing DTMF digits or recognized speeched segments are detected on this termination.

Voice-messaging services are implemented by applying the playrec signal from the AAS Recording package and detecting related event on this termination.

6.5 Procedures for conferencing

Conference services are implemented by creating H.248 contexts with the appropriate number of terminations using native H.248 mixing and transcoding capabilities. Each conference participant is represented by an ephemeral termination.

Floor control procedures are implemented according to the procedures described in H.248.19 [11].

6.6   Procedures for transcoding

The MRFP may be required to perform transcoding in the context of a conference setup or in the context of basic two party calls. This clause describes the procedures for controlling transcoding in case of a two party call. Procedures for controlling transcoding in conferences are described in clause 6.5.

> NOTE: Media Transcoding is performed by the MRFP under the control an MRFC. The criteria that trigger the insertion of an MRFC in the SIP signalling path is outside the scope of the present document.

On receipt of a transcoding request for a two-party session between A and B, the MRCF shall request the MRFP to create a context with one ephemeral termination representing the A party (Ta) and one ephemeral termination representing the B party (Tb).

Remote and Local Descriptors shall be populated as follows:

- The Remote Descriptor for termination Ta shall be set according to the SDP Offer initially received from the A party.

- The Remote Descriptor for termination Tb shall be set according to the SDP Answer received from the B party.

- The media format in the Local Descriptor for termination Ta shall be set according to the SDP Offer initially received from the A party. The IP address and port shall be wildcarded.

- The media format in the Local Descriptor for termination Tb shall be set according to the SDP Answer received from the B party. The IP address and port shall be wildcarded.

The value of the Local Descriptor returned by the MRFP for the termination Ta shall be sent as an SDP Answer to the A party (via the S-CSCF/AS).

The value of the Local Descriptor returned by the MRFP for the termination Tb shall be sent as a new SDP Offer to the B party (via the S-CSCF/AS).

The MRFC is responsible for sending the SDP information in SIP messages that are compatible with the state of the SIP dialogue.

History

Document history		
V1.1.1	March 2006	Membership Approval Procedure MV 20060526: 2006-03-28 to 2006-05-26