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Media Gateway Control Function (MGCF) – IM Media Gateway;

Mn Interface

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***3GPP***

Postal address

3GPP support office address

650 Route des Lucioles - Sophia Antipolis

Valbonne - FRANCE

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

Internet

http://www.3gpp.org

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# Foreword

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

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# 1 Scope

The present document describes the protocol to be used on the Media Gateway Control Function (MGCF) – IM Media Gateway (IM-MGW) interface. This interface provides the Media Gateway Control for interworking between the IP Multimedia Subsystem (IMS) and CS domain (ISUP, BICC and SIP-I). The basis for this protocol is the H.248 protocol as specified in ITU-T. The IMS architecture is described in 3GPP TS 23.228 [1]. The interaction of the MGCF-IM MGW interface signalling procedures in relation to the SIP, and BICC/ISUP signalling at the MGCF are described in 3GPP TS 29.163[4].

The interaction of the MGCF-IM MGW interface signalling procedures in relation to the IMS SIP and SIP-I on Nc at the MGCF are described in 3GPP TS 29.235[47].

This specification describes the application of H.248 on the Mn interface. Required extensions use the H.248 standard extension mechanism. In addition certain aspects of the base protocol H.248 are not needed for this interface and thus excluded by this profile.

In addition this profile provides support for PSTN/ISDN Emulation as required by ETSI TISPAN.

The specification contains a normative Annex defining the H.248.1 Profile in accordance with ITU-T recommendations for H.248.1 applications. Where there exists any contradiction between the normative Annex A and the rest of the specification, the Nornative Annex shall take precidence. The main body of the specification provides an introduction to the use of the profile for the Mn interface and introduces any specific functionality (e.g. new packages) associated to the Mn.

# 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 29.007: "General requirements on interworking between the Public Land Mobile Network (PLMN) and the Integrated Services Digital Network (ISDN) or Public Switched Telephone Network (PSTN)".

[3] 3GPP TS 29.205: "Application of Q.1900 series to Bearer Independent CS Network architecture; Stage 3".

[4] 3GPP TS 29.163: "Interworking between the IM CN subsystem and CS networks – Stage 3".

[5] 3GPP TS 29.232: "Media Gateway Controller (MGC); Media Gateway (MGW) interface; Stage 3".

[6] 3GPP TS 26.226: "Cellular Text Telephone Modem; General Description".

[7] 3GPP TS 26.103: "Speech codec list for GSM and UMTS".

[8] Void

[9] ITU-T Recommendation H.248.1 (05/2002): "Gateway Control Protocol: Version 2" including the Corrigendum1 for Version 2 (03/04).

[10] ITU-T Recommendation H.248.8 (09/2005): "Error Codes and Service Change Reason Description".

[11] ITU-T Recommendation H.248.2 (01/2005): "Facsimile, text conversation and call discrimination packages".

[12] ITU-T Recommendation H.248.10 (07/2001): "Media Gateway Resource Congestion Handling Package".

[13] Void

[14] ITU-T Recommendation Q.1950 (12/2002): "Call Bearer Control Protocol".

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

[16] IETF RFC 4867: "RTP Payload Format and File Storage Format for the Adaptive Multi-Rate (AMR) and Adaptive Multi-Rate Wideband (AMR-WB) Audio Codecs".

[17] IETF RFC 4566: "SDP: Session Description Protocol".

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

[19] Void

[20] Void

[21] 3GPP TS 29.415: "Core Network Nb Interface User Plane Protocols".

[22] 3GPP TS 23.153: "Out of band transcoder control".

[23] IETF RFC 768: "User Datagram Protocol".

[24] IETF RFC 3332: "Signaling System 7 (SS7) Message Transfer Part 3 (MTP3) - User Adaptation Layer (M3UA)".

[25] 3GPP TS 29.202: "SS7 Signalling Transport in Core Network".

[26] ITU-T Recommendation H.248.7 (03/2004): "Generic Announcement Package".

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

[28] ITU-T Recommendation H.248.11 (11/2002): "Media gateway overload control package".

[29] ITU-T Recommendation H.248.14 (03/2009): "Inactivity timer package".

[30] ITU-T Recommendation H.248.45 (05/2006): "MGC Information Package".

[31] Void

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

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

[34] Void

[35] IETF RFC 4040: "RTP Payload Format for a 64 kbit/s Transparent Call".

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

[37] ITU-T Recommendation V.152 (01/2005): "Procedures for supporting voice-band data over IP networks" including Corrigendum 1.

[38] ITU-T Recommendation H.248.4 (12/2009): "Gateway control protocol: Transport over Stream Control Transmission Protocol (SCTP)".

[39] IETF RFC 3556: "Session Description Protocol (SDP) Bandwidth Modifiers for RTP Control Protocol (RTCP) Bandwidth".

[40] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[41] ITU-T Recommendation H.248.12 (07/2001): "Gateway control protocol: H.248.1 packages for H.323 and H.324 interworking".

[42] ITU-T Recommendation H.248.12 Amendment 2 (08/2007): "Gateway control protocol: H.248.1 packages for H.323 and H.324 interworking Amendment 2: Transport Mechanism".

[43] IETF RFC 3309: "Stream Control Transmission Protocol (SCTP) Checksum Change".

[44] ITU-T Recommendation H.248.41 (05/2006): "IP Domain Connection package".

[45] Void

[46] ITU-T Recommendation H.248.72 (12/2009): "Gateway control protocol: ITU-T H.248 support for media-oriented negotiation acceleration (MONA)".

[47] 3GPP TS 29.235: "Interworking between SIP-I based circuit-switched core network and other networks".

[48] 3GPP TS 23.231: "SIP-I based circuit-switched core network; Stage 2".

[49] ITU-T Recommendation H.248.71 (02/2010): "Gateway Control Protocol: RTCP support packages".

[50] IETF RFC 4103: "RTP Payload for Text Conversation".

[51] ITU‑T Recommendation T.140: "Text conversation presentation protocol".

[52] IETF RFC 4102: "Registration of the text/red MIME Sub-Type".

[53] IETF RFC 2198: "RTP Payload for Redundant Audio Data".

[54] ITU-T Recommendation V.18 (11/00): "Operational and interworking requirements for DCEs operating in the text telephone mode" including V.18 (2000) Amendment 1 (11/02): "Harmonization with ANSI TIA/EIA-825 (2000) text phones".

[55] ITU-T Recommendation G.168 (03/2009): "Digital network echo cancellers".

[56] Void

[57] Void

[58] Void

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

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

[61] ITU-T Recommendation X.690: "ASN.1 encoding rules: Specification of Basic Encoding Rules (BER), Canonical Encoding Rules (CER) and Distinguished Encoding Rules (DER)".

[62] 3GPP TS 26.114: "IP Multimedia Subsystem (IMS); Multimedia Telephony; Media handling and interaction".

[63] 3GPP TS 22.153: "Multimedia Priority Service".

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

[65] ITU-T Recommendation T.38 (09/2010): "Procedures for real-time Group 3 facsimile communication over IP networks".

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

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

[68] IETF RFC 5245: "Interactive Connectivity Establishment (ICE): A Protocol for Network Address Translator (NAT) Traversal for Offer/Answer Protocols".

[69] 3GPP TS 24.229: "IP Multimedia Call Control Protocol based on SIP and SDP".

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

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

# 3 Definitions, symbols and abbreviations

## 3.1 Definitions

For the purposes of the present document, the [following] terms and definitions [given in ... and the following] apply.

**Context (H.248):** A context is an association between a number of Terminations. The context describes the topology (who hears/sees whom) and the media mixing and/or switching parameters if more than two terminations are involved in the association.

**Package (H.248):** Different types of gateways may implement terminations which have differing characteristics. Variations in terminations are accommodated in the protocol by allowing terminations to have optional properties. Such options are grouped into packages, and a termination may realise a set of such packages.

**Termination (H.248):** A termination is a logical entity on an MGW which is the source and/or sink of media and/or control streams. A termination is described by a number of characterising properties, which are grouped in a set of descriptors which are included in commands. Each termination has a unique identity (TerminationID).

**Termination Property (H.248):** Termination properties are used to describe terminations. Related properties are grouped into descriptors. Each termination property has a unique identity (PropertyID).

For the purposes of the present document, the following terms and definitions as defined in 3GPP TS 29.163 [4] apply:

**ICE lite**

**Full ICE**.

## 3.2 Symbols

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

Mn Interface between the media gateway control function and the IMS media gateway.

## 3.3 Abbreviations

For the purposes of the present document, the following abbreviations given in TR 21.905 [40] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in TR 21.905 [40].

AMR Adaptive MultiRate

BICC Bearer Independent Call Control

CN Core Network

CS Circuit-Switched

DTMF Dual Tone Multi Frequency

CE Congestion Experienced

ECN Explicit Congestion Notification

FFS For further study

GSM Global System for Mobile communications

ICE Interactive Connectivity Establishment

IETF Internet Engineering Task Force

IM IP Multimedia

IM-MGW IP Multimedia Media Gateway

IMS IP Multimedia Subsystem

IP Internet Protocol

ISDN Integrated Services Digital Network

ISUP ISDN User Part

MG/MGW Media GateWay

MGC Media Gateway Controller

MGCF Media Gateway Control Function

MIME Multipurpose Internet Mail Extensions

MPS Multimedia Priority Service

n.a. not applicable

PDH Plesiochronous Digital Hierarchy

PES PSTN/ISDN Emulation Subsystem

PSTN Public Switched Telephone Network

PT Payload Type

R2 (ETSI TISPAN NGN) Release 2

RFC Request For Comment; this includes both discussion documents and specifications in the IETF domain

RTCP RTP Control Protocol

RTP Real-time Transport Protocol

SCTP Stream Control Transmission Protocol

SDH Synchronous Digital Hierarchy

SDP Session Description Protocol

SDPCapNeg SDP Capability Negotiation

SIP Session Initiation Protocol

SONET Synchronous Optical NETwork

SS Silence Suppression

SS7 Signalling System No. 7

STUN Session Traversal Utilities for NAT

TDM Time Division Multiplexing

TISPAN Telecommunications and Internet converged Services and Protocols for Advanced Networking

TMGW Trunking MGW

TS Technical Specification (3GPP, ETSI)

VBD VoiceBand Data

# 4 UMTS capability set

## 4.1 Capability set

The support of the Mn interface capability set shall be identified by the Mn profile and support of this profile shall be indicated in ServiceChange procedure.

The mandatory parts of this capability set shall be used in their entirety whenever it is used within the H.248 profile. Failure to do so will result in a non-standard implementation.

ITU-T Recommendation H.248.1 (05/02) [9] is the basis for this Capability Set. The compatibility rules for packages, signals, events, properties and statistics and the H.248 protocol are defined in ITU-T Recommendation H.248.1 [9]. Their use or exclusion for this interface is clarified in clause 12.

# 5 Naming conventions

## 5.1 MGCF/IM-MGW naming conventions

The MGCF shall be named according to the naming structure of the underlying transport protocol which carries the H.248 protocol.

For further definition of the Termination Names see Annex A.6.

## 5.2 Void

# 6 Topology descriptor

No special behaviour, for definition of use see Annex A. 5.

# 7 Transaction timers

No special behaviour, for definition of timers see Annex A.10.

# 8 Transport

Each implementation of the Mn interface should provide SCTP (as defined in IETF RFC2960 [15] and as updated by RFC3309 [43]) , however other options are permitted within the profile. For further definition see Annex A12.

# 9 Multiple Virtual MG.

The support of multiple virtual MGW outlined in the subclause "Multiple virtual MGW" in ITU-T Recommendation H.248.1 [9] is optional.

# 10 Formats and codes

## 10.1 Signalling Objects

Table 10.1 shows the parameters which are required.

The coding rules applied in ITU‑T Recommendation H.248.1 [9] for the applicable coding technique shall be followed for the UMTS capability set.

Table 10.1: required parameters

|  |  |  |
| --- | --- | --- |
| Signalling Object | H.248 Descriptor | Coding |
| Additional Bandwidth Properties | Remote Descriptor | The "a=bw-info" SDP attribute defined in 3GPP TS 26.114 [62], see table A.15/1. |
| Allowed RTCP APP message types | Remote Descriptor | The "a=3gpp\_mtsi\_app\_adapt" SDP attribute defined in 3GPP TS 26.114 [62]. |
| Bearer Service Characteristics | Local Descriptor or Remote Descriptor | As per Q.1950 [14]. For TMR, only values "3.1 kHz audio" or "speech" are required. |
| BNC Release | EventDescriptor | As for the EventsDescriptor in subclause E.1.2.1/H.248.1 "Cause" |
| BNC Release | ObservedEvent descriptor | As for the ObservedEventsDescriptor in subclause E.1.2.1/H.248.1 "Cause" |
| 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). See Clause 10.2. 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). See Clause 10.2.  For T.38, additional SDP attributes listed in subclause 10.2.3.6 may be provided. |
| Context ID | NA | Binary Encoding: As per ITU-T Recommendation H.248.1 [9] Annex A.  Textual Encoding: As per ITU-T Recommendation H.248.1 [9] Annex B. |
| Diffserv Code Point | Local Control | Defined according to the *Differentiated Services Code Point* property in ITU-T Recommendation H.248.52 [64]. |
| ECN Enabled | Local Descriptor or Remote Descriptor | Defined according to the "ECN Enabled" property in ITU-T Recommendation H.248.82 [66]. |
| ECN Failure | Events,  Observed Events | Defined according to the "ECN Failure" Event in ITU-T Recommendation H.248.82 [66]. |
| ECN Failure Type | ObservedEvents Descriptor | As for the ObservedEventsDescriptor Parameter "Failure Type" in ITU-T Recommendation H.248.82 [66]. |
| ECN Initiation Method | Local Descriptor or Remote Descriptor | Defined according to "Initiation Method" property in ITU-T Recommendation H.248.82 [66]. |
| Forward media in MPC | Signal descriptor | As for the signal "Forward Media in Preconfigured Channel" in H.248.72 [46] subclause 7.3.2 |
| Highest Multiplex Level | Termination state | As for property "Highest multiplexing Level" in subclause 4.1.2/H.248.12 [41] |
| H245 message content | ObservedEvent descriptor | As for the ObservedEventDescriptor in subclause A.8.2.1.2/H.248.12a2 [42] "Contents of H.245 message". |
| ICE host candidate request | Local Descriptor | The "a=candidate" SDP attribute defined in IETF RFC 5245 [68] of type "host" with the transport, port and priority parameters with wildcard sign "$" to request the allocation of a host candidate |
| ICE host candidate | Local Descriptor | The "a=candidate" SDP attribute defined in IETF RFC 5245 [68] |
| ICE lite indication | Local Descriptor | The "a=ice-lite" SDP attribute defined in IETF RFC 5245 [68]. |
| ICE password request | Local Descriptor | The "a=ice-pwd" SDP attribute defined in IETF RFC 5245 [68] with wildcard sign "$". |
| ICE password | Local Descriptor | The "a=ice-pwd" SDP attribute defined in IETF RFC 5245 [68]. |
| ICE received candidate | Remote Descriptor | The "a=candidate" SDP attribute defined in IETF RFC 5245 [68] |
| ICE received password | Remote Descriptor | The "a=ice-pwd" SDP attribute defined in IETF RFC 5245 [68]. |
| ICE received Ufrag | Remote Descriptor | The "a=ice-ufrag" SDP attribute defined in IETF RFC 5245 [68]. |
| ICE Ufrag request | Local Descriptor | The "a=ice-ufrag" SDP attribute defined in IETF RFC 5245 [68] with wildcard sign "$". |
| ICE Ufrag | Local Descriptor | The "a=ice-ufrag" SDP attribute defined in IETF RFC 5245 [68]. |
| ICE Connectivity Check Result | Events,  Observed Events | Defined according to *Connectivity Check Result* event in ITU-T Recommendation H.248.50 [67]. |
| ICE Send Connectivity Check | Signals | Defined as the ostuncc/scc signal in ITU-T Recommendation H.248.50 [67]. |
| ICE New Peer Reflexive Candidate | Events,  Observed Events | Defined according to *New Peer Reflexive Candidate* event in ITU-T Recommendation H.248.50 [67]. |
| ICE Send Additional Connectivity Check | Signals | Defined as the ostuncc/sacc signal in ITU-T Recommendation H.248.50 [67]. |
| Inactivity timeout | EventDescriptor | As for the EventsDescriptor in subclause 6.2/H.248.14 "Inactivity Timeout" |
| Inactivity timeout | ObservedEvent descriptor | As for the ObservedEventDescriptor in subclause 6.2/H.248.14 " Inactivity Timeout " |
| Incoming H245 message | Event descriptor | As for the EventDescriptor in subclause A.8.2.1/H.248.12a2 [42] "Incoming H.245 message" |
| Incoming Multiplex table | Local Control | As for property "Incoming Multiplex Table" in subclause 4.1.5/H.248.12 [41] |
| Interwork H.245-RTCP | Signal descriptor | As for the EventDescriptor parameter in subclause 8.2.1.1.1/H.248.71[49] "Feedback Message Type ". |
| IP Address | Local Descriptor or Remote Descriptor | <connection address> in SDP "c-line" |
| IP interface | Local control | As for the property "IP interface type" in subclause 15.2.11.1 in 3GPP TS 29.232 [5] |
| IP realm identifier | Local control | As for the property "IP realm identifier " in subclause 5.1.1/H.248.41[44] |
| Legacy Interworking Detected | Event descriptor | As for the EventDescriptor in H.248. 72 [46] subclause 7.2.3 "Legacy Detected" |
| mediatype | Local Descriptor or Remote Descriptor | <media> in sdp m-line  "audio" for voice service, "video" for video service and "image" for T.38 service. |
| Mona Preference Channel reception | Event descriptor | As for the EventDescriptor in H.248. 72 [46] subclause 7.2.4 "MPC reception" |
| MONA Preference completed | Event descriptor | As for the EventDescriptor in H.248.72 [46] subclause 7.2.2 "MONA Preference negotiation completed" |
| MONA preference message content | ObservedEvent descriptor | As for the ObservedEventDescriptor in H.248.72 [46] subclause 7.2.1.2.1 "Contents of MONA preference message ". |
| MONA Preference recv | Event descriptor | As for the EventDescriptor in H.248. 72 [46] subclause 7.2.2.1 "MONA Preference reception" |
| MPC MUX Code | Signal descriptor | As for the additional parameter of the signal "Forward Media in Preconfigure Channel" in H.248.72 [46] subclause 7.3.2.1 |
| Muxcode | ObservedEvent descriptor | As for the ObservedEventDescriptor in H.248. 72 [46] subclause 7.2.4.2.1 "Mux Code". |
| Muxdescriptor | Multiplex Descriptor | Binary Encoding: As per ITU-T Recommendation H.248.1 [9] Annex A.  Textual Encoding: As per ITU-T Recommendation H.248.1 [9] Annex B. |
| Outgoing H245 message | Signal descriptor | As for the signal "Outgoing H.245 Message " in subclause A.8.3.1/H.248.12a2 [42] |
| Outgoing H245 message content | Signal descriptor | As for the additional parameter of the signal "Outgoing H.245 Message " in subclause A.8.3.1.1/H.248.12a2 [42] |
| Outgoing MONA preference content | Signal descriptor | As for the additional parameter of the signal " Outgoing MONA preference message" in H.248. 72 [46] subclause 7.3.1.1.1 |
| Outgoing MONA preferences | Signal descriptor | As for the signal "Outgoing MONA preference message " in H.248. 72 [46] subclause 7.3.1 |
| Outgoing multiplex table | Local Control | As for property "Outgoing Multiplex Table" in subclause 4.1.6/H.248.12 [41] |
| Port | Local Descriptor or Remote Descriptor | <port> in SDP m-line.  <transport> in SDP m-line shall be set to value "RTP/AVP" for voice or video service, and set to value "UDPTL" or "TCPTL"for T.38 service. |
| Priority Information | NA | Priority Indicator (subclause 6.1.1 of ITU-T Recommendation H.248.1 [9])  Binary Encoding: Encoding as per ITU-T Recommendation H.248.1 [9] Annex A "priority" context attribute  Textual Encoding: Encoding as per ITU-T Recommendation H.248.1 [9] Annex B "priority" context attribute |
| Remote H223 capability | Local Control | As for property "Remote H.223 capability" in subclause 4.1.4/H.248.12 [41] |
| Reserve\_Value | Local Control | ITU-T Recommendation H.248.1 [9] 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". |
| RtcpbwRR | Local Descriptor or Remote Descriptor | <bandwidth> in SDP "b:RR"-line as per IETF RFC 3556 [39]. |
| RtcpbwRS | Local Descriptor or Remote Descriptor | <bandwidth> in SDP "b:RS"-lineas per IETF RFC 3556 [39]. |
| RTCP Filter | Event descriptor | As for the EventDescriptor parameter in subclause 8.2.1.1.1/H.248.71[49] "Feedback Message Type ". |
| RTPpayload | Local Descriptor or Remote Descriptor | <fmt list> in SDP m-line |
| SCP | Event descriptor | As for the EventDescriptor parameter in H.248. 72 [46] subclause 6.2.1. 1 "SCP". |
| SDPCapNeg configuration | Local Descriptor or Remote Descriptor | The SDP attributes for SDP capability negotiation according to IETF RFC 5939 [70]. |
| SDPCapNeg Supported Capabilities | Termination State | Defined according to *SDPCapNeg Extensions* property in ITU-T Recommendation H.248.80 [71]. |
| SPC In | Observed event descriptor | As for the ObservedEventDescriptor parameter in H.248. 72 [46] subclause 6.2.2.1 ""Incoming H.245 message" |
| SPC Out | Signal descriptor | As for the additional parameter of the signal "Outgoing H.245 Message " in H.248. 72 [46] subclause 6.3.1.1 |
| Stream ID | Stream Descriptor | Binary Encoding: As per ITU-T Recommendation H.248.1 [9] Annex A.  Textual Encoding: As per ITU-T Recommendation H.248.1 [9] Annex B. |
| Termination ID | NA | Binary Encoding: As per ITU-T Recommendation H.248.1 [9] Annex A.  Textual Encoding: As per ITU-T Recommendation H.248.1 [9] Annex B. |
| Transaction ID | NA | Binary Encoding: As per ITU-T Recommendation H.248.1 [9] Annex A.  Textual Encoding: As per ITU-T Recommendation H.248.1 [9] Annex B. |
| UpdatePicture\_Event | ObservedEvent descriptor | As for the EventDescriptor parameter in subclause 8.2.1.2.1/H.248.71[49] "Update Picture ". |
| UpdatePicture\_Signal | Signal descriptor | As for the SignalDescriptor parameter "Update Picture " in subclause 8.3.1.1.1/H.248.71[49]. |
| NOTE: For binary encoding, the SDP equivalents "SDP\_V", "SDP\_M", "SDP\_C", "SDP\_A", and SDP\_B" in ITU-T Recommendation H.248.1 [9], Annex C.11, shall be used to encode the corresponding SDP lines. Other SDP equivalents may be used, for details see Annex A. The SDP equivalents shall be used in the order specified for the corresponding SDP lines in IETF RFC 2327 [17]. Rules for the usage of SDP in ITU-T Recommendation H.248.1 [9] shall also be applied to the SDP equivalents. SDP description types (v= , m=, a= etc.) are not encoded. CR/LF are not encoded. | | |

## 10.2 Codec Parameters

### 10.2.1 AMR and AMR-WB Codecs

On IMS terminations, the AMR and AMR-WB codecs are transported according to the IETF AMR RTP profile, IETF RFC 4867 [16], 3GPP TS 26.114 [62] selects options applicable within 3GPP.

IETF RFC 4867 [16] contains the MIME registration of the IETF AMR RTP profile with media type "audio" and media subtype of "AMR" and "AMR-WB". The AMR and AMR-WB codecs shall be signaled accordingly in the SDP "a=rtpmap"-line and a dynamic RTP payload type shall be used.

The selected options are expressed as MIME parameters in SDP "a=fmtp"-line. The following MIME parameters shall be supported on the Mn interface:

- "mode-set"

- "mode-change-period"

In addition the following MIME parameters may be supported on the Mn interface:

- "octet-align"

- "mode-change-neighbor" (for IMS this parameter shall be included and set to 1)

- "maxptime"

- "ptime"

For compatibility with GSM peers, the IM-MGW shall perform mode changes only in every second sent package.

Example of encoding of AMR codec

ABNF:

Local {

v=0

c=IN IP4 $

m=audio $ RTP/AVP 96

a=rtpmap:96 AMR/8000

a=fmtp:96 mode-set=0,2,5,7;mode-change-period=2;mode-change-neighbor=1 a=maxptime:20

}

ASN.1:

LocalDescriptor{

PropertyParams{

PkgdName=0x000B001 /\*SDP\_V \* /

value= "0"

PkgdName=0x000B008 /\*SDP\_C \* /

value= "IN IP4 $"

PkgdName=0x000B00F /\*SDP\_M \* /

value= "audio $ RTP/AVP 96"

PkgdName=0x000B00C /\*SDP\_A \* /

value= "rtpmap:96 AMR/8000"

PkgdName=0x000B00C /\*SDP\_A \* /

value= "fmtp:96 mode-set=0,2,5,7;mode-change-period=2;mode-change-neighbor=1"

PkgdName=0x000B00C /\*SDP\_A \* /

value= "maxptime:20"

}}

NOTE: The c-line may be provided after m-line.

On RTP-CN (SIP-I) terminations speech codecs are supported according to 3GPP TS 29.232 [5] subclause 10.2.1.

### 10.2.2 DTMF Payload Type

On IMS and RTP-CN (SIP-I) terminations, DTMF is transported according to the IETF RFC 2833 [18] "telephone event" format.

IETF RFC 2833[18] contains the MIME registration with media type "audio" and media subtype "telephone-event". DTMF shall be signaled accordingly in the SDP "a=rtpmap"-line and a dynamic RTP payload type shall be used.

An IM-MGW supporting DTMF shall support the default options of the IETF RFC 2833 [18] "telephone event" format. Therefore, a support of optional MIME parameters of "telephone-event" is not required at the Mn interface.

### 10.2.3 Other Codecs

On IMS terminations, other codecs such as ITU-T codecs are transported according to the RTP payload formats in IETF RFC 3555[32]. 3GPP TS 29.163[4], clause B.2.5.4, specifies the options applicable within 3GPP.

IETF RFC 3555[32] contains the MIME registration with media type "audio" and corresponding media subtype.

For dynamic payload type being used the ITU-T codecs shall be signaled accordingly in the SDP "a=rtpmap"-line, where the selected options are expressed as MIME parameters in SDP "a=fmtp"-line.

For static payloads type being used ITU-T codecs shall be allowed to be signaled accordingly in the SDP "a=rtpmap"-line,when the selected options are expressed as MIME parameters in SDP "a=fmtp"-line. Otherwise the codec type is implied by the RTP payload type.

#### 10.2.3.1 G.711 Codec

On IMS and RTP-CN (SIP-I) terminations, G.711 codec is transported according to IETF RFC 3551[33].

#### 10.2.3.2 Clearmode

On IMS and RTP-CN (SIP-I) terminations, Clearmode codec is transported according to IETF RFC 4040[35].

When the MGC determines that a 64 kbit/s unrestricted bearer service is requested, the clearmode codec shall be used. A Dynamic Payload type with CLEARMODE as encoding name shall be included in both the local and remote descriptor.

The behaviour of the MGW shall then conform to IETF RFC 4040[35]. All voice and signal processing functions such as silence suppression, comfort noise insertion and gain adjustment shall be automatically turned off. The MGW shall inherit the same QoS objectives as the ISDN bearer service.

#### 10.2.3.3 Silence suppression and comfort noise

On RTP-CN (SIP-I) terminations silence suppression and comfort noise are supported according to 3GPP TS 29.232 [5] subclause 10.2.3.4.For IMS terminations the following text applies.

Silence Suppression (SS) mode is direction-independent and shall be supported call/bearer individually. Silence suppression mode must be explicitly enabled and disabled. Default shall be a disabled SS mode.

If a codec has built-in support for silence suppression and comfort noise insertion, and an a=line has been defined in IETF RFC3551[33] or IETF RFC 3555 [32] to activate or de-activate these features, the activation or deactivation of these features shall be indicated using the a= line according to IETF RFC 3551[33]and IETF RFC 3555[32]. If the selected codec does not have built in support for silence suppression and comfort noise (CN) insertion, the CN payload code defined in RFC 3389[36] may be included in the media description.

E.g (for ITU-T Recommendation G.711 A-law codec):

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 MGW shall be prepared to receive CN packets during silence periods. This action corresponds to an implicit enabling of the SS mode in receiving direction.

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

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

#### 10.2.3.4 VBD codec

Voiceband data refers to traffic from facsimile, modem or text telephony applications.

On IMS terminations, voiceband data traffic is transported for facsimile /modem or data/ modem (but not text/modem, see sub clause 10.2.3.5) according to ITU‑T Recommendation V.152 [37] and its Corrigendum 1. ITU-T Recommendation G.711 must be used as VBD codec. The RTP Payload Type (PT) codepoint, "0" or "8" or a value from the dynamic PT range , is used in the MG.

NOTE 1: Use of "0" or "8" is indicating to the MG that only inband-based VBD stimuli must be detected. Both peering MGs are consequently not directly synchronized in their state transitions between "voice" and "VBD" modes.

NOTE 2: Use of "a value from the dynamic PT range" is indicating a VBD RTP packet according to ITU‑T Recommendation V.152 [37]. The MGW may offer then an enhanced VBD service.

Upon detection of voiceband facsimile/modem or data/modem data traffic, the Media Gateway shall autonomously switch from Audio mode to VBD mode with VBD codec.

Transitioning between Audio mode and VBD mode is possible in both directions. The procedures for transitioning between these two operation modes are described in ITU-T Recommendation V.152 clause 10/V.152 [37]. Any state transition requires the detection of a "VBD stimuli" (see ITU-T Recommendation V.152 clause 9/V.152 [37]). The IM-MGW shall be compliant with ITU-T Recommendation G.168 [55] on detecting VBD.

For Real-Time Text Telephony support within IMS at the IMS termination see subclause 10.2.3.5.

#### 10.2.3.5 Real-Time Text Telephony Media

On IMS terminations, text is transported according to IETF RFC 4103 [50] "text/t140" conversation RTP payload format and coded according to ITU-T Recommendation T.140 [51].

If redundancy is used per IETF RFC 2198 [53], another payload type number needs to be provided for the redundancy format.

IETF RFC 4103 [50] contains the MIME registration with media type "text" and media subtype "t140". IETF RFC 4102 [52] contains the MIME registration with media type "text" and media subtype "red" (for redundancy coding variant).

RTP- Real-Time Text shall be signalled in a distinct SDP m-line accordingly in the SDP "a=rtpmap"-line and a dynamic RTP payload type shall be used.

Example of SDP which describes RTP Real-Time Text transport on port 11000 without redundancy:

m=text 11000 RTP/AVP 98

a=rtpmap:98 t140/1000

Example of SDP which describes RTP Real-Time Text transport on port 11000, but also utilizes IETF RFC 2198 [53] to provide two levels of redundancy for the text packets:

m=text 11000 RTP/AVP 100 98

a=rtpmap:98 t140/1000

a=rtpmap:100 red/1000

a=fmtp:100 98/98/98

When Real-Time Text Telephony is configured at the IMS Termination in the IM-MGW and G.711 encoding is configured at peer CS side Termination and the terminations are through-connected the IM-MGW shall

- monitor the CS side termination incoming PCM streams for text telephony in accordance with provisioned inband text telephony tone types at the CS side termination and, if multiple inband text telephony tone types are provisioned, in accordance with ITU-T Recommendation V.18 [54];

- forward any detected incoming text telephony media at the CS side termination towards the IMS termination text stream; and

- multiplex any Real Time Text payload received from the IMS side to the CS side termination outgoing PCM streams for text telephony in accordance with provisioned inband text telephony tone type at the CS side termination in accordance with ITU-T Recommendation V.18 [54].

#### 10.2.3.6 T.38 FAX

FAX according to ITU-T recommendation T.38 [65] may be supported at IMS terminations at an IM-MGW and at the MGCF according to the procedures in the present Clause.

Version 2 or higher of T.38 is recommended.

An IM-MGW supporting T.38 shall support the "UDPTL/UDP" and may support "TPKT/TCP" transport of FAX.

To configure FAX terminations, the MGCF shall signal "udptl" or " tcp" in an SDP m-line and may signal the T.38 SDP attributes listed in Table 10.2.3.6.1 to the IM-MGW.

Table 10.2.3.6.1: Applicable T.38 SDP attributes at the Mn Interface.

|  |  |
| --- | --- |
| Attribute | Remarks |
| **T38FaxVersion** | T.38 SDP attributes shall only be provisioned for Version 2 or higher. Version 0 applies if attribute is omitted. |
| **T38MaxBitRate** |  |
| **T38FaxMaxBuffer** |  |
| **T38FaxMaxDatagram** |  |
| **T38FaxMaxIFP** | Only if T.38 version 4 is supported by the IM-MGW |
| **T38FaxUdpEC** |  |
| **T38FaxUdpECDepth** | Only if T.38 version 4 is supported by the IM-MGW |
| **T38FaxUdpFECMaxSpan** | Only if T.38 version 4 is supported by the IM-MGW |
| **T38ModemType** | Only if T.38 version 4 is supported by the IM-MGW |

# 11 Mandatory Support of SDP and H.248 Annex C information elements

See Annex A.15.

# 12 General on packages and Transactions

The use of "Overspecified" (e.g. range of values) and "Underspecifed" (e.g. "?") parameter specification shall not be permitted except where explicitly indicated in or referenced by the Mn interface specification.

Commands on ROOT Termination shall only use the NULL Context.

## 12.1 Profile Details

VOID.

NOTE: Profile now defined in normative Annex A.

# 13 Void

# 14 Call independent H.248 transactions

See section A.17.1

# 15 Transactions towards IM CN Subsystem

15.1 Procedures related to a termination towards IM CN SubsystemFor Transactions towards IM CN Subsystem see A.17.2.

## 15.2 IMS packages

None

# 16 Transactions towards ISUP

# 16.1 Procedures relating to a termination towards ISUP

See section A.17.3.

## 16.2 ISUP packages

None

# 17 Transactions towards BICC

## 17.1 Procedures related to a termination towards BICC

See section A.17.4

## 17.2 BICC packages

This Clause is only applicable for terminations towards BICC Networks. The support of terminations towards BICC networks is optional.

No new packages for terminations towards BICC Networks are defined in the present specification. See Clause 12.1.14 for reused packages from other specifications.

If the Nb framing protocol (see 3GPP TS 29.415 [21]) is applied at the termination towards the BICC network, the following package shall be applied:

3GUP package (see subclause 15.1.1 of 3GPP TS 29.232 [5]);To enable bearer modification at OoBTC capable networks on Nb interface (see 3GPP TS 23.153 [22]) at the termination towards the BICC network, the following package shall be applied:

Modification of Link Characteristics Bearer Capability (see subclause 15.1.5 of 3GPP TS 29.232 [5]);

Annex A (normative):  
Profile Description

## A.1 Profile Identification

Table A.1/1: Profile version

|  |  |
| --- | --- |
| Profile name: | threegimscsiw |
| Version: | 6 |

## A.2 Summary

This Profile describes the minimum mandatory settings and procedures required to fulfil the Media Gateway control requirements for a) the interworking scenario between 3GPP IMS and 3GPP CS or PSTN/ISDN and b) the interworking scenario between NGN and PSTN/ISDN (i.e ETSI IMS-PSTN/ISDN, ETSI PES-PSTN/ISDN).

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 manadatory 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[9]) when those commands are used for other procedures that affect the same descriptor.

This profile supports Explicit Congestion Notification, Multimedia Priority Service and Rate Adaptation for Media Endpoints using Enhanced Bandwidth Negotiation.

## A.3 Gateway Control Protocol Version

ITU Recommendation H.248.1 Version 2 [9] shall be the version supported.

### A.4 Connection Model

Table A.4/1: Connection Model

|  |  |
| --- | --- |
| Maximum number of contexts: | No restriction |
| Maximum number of terminations per context: | 2 (NOTE 1)  32 (NOTE 2) |
| Allowed terminations type combinations in a Context | All (NOTE 3) |
| NOTE 1: Support of 2 terminations per context is required for TISPAN. Support of more than two terminations per context (e.g. for monitoring) is optional.  NOTE 2: Support of 32 termination per context is required for 3GPP  NOTE 3: For TISPAN NGN R2 only the following is required:  - Context[a](IMS, TDM),  - Context[b](TDM, TDM),  - Context [c] (TDM),  - Context [d] (IMS). | |

## A.5 Context Attributes

Table A.5/1: Context attributes

|  |  |  |
| --- | --- | --- |
| Context Attribute | Supported | Values Supported |
| Topology | Optional (NOTE 1) | All |
| Priority Indicator | Optional (NOTE 2) | 0-15 (NOTE 3) |
| Emergency Indicator | Yes | Not Applicable |
| NOTE 1: The "Topology" attribute is optional for example support of monitoring. If requested and not supported error code 444 shall be returned.  NOTE 2: This Context Attribute parameter is used for MPS as specified in 3GPP TS 22.153 [63].  NOTE 3: Priority values 11 – 15 of the Priority Indicator are reserved for MPS. | | |

## A.6 Terminations

### A.6.1 Termination Names

### A.6.1.1 General

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

With ephemeral ATM/AAL2 and IP endpoint bearer types the internal structure of Termination ID is irrelevant for MGW and MGC and therefore Termination ID is only a numeric identifier for the termination. When bearer type is a physical timeslot within TDM circuit the Termination ID structure shall follow the Termination naming convention for TDM circuit bearer.

Ephemeral terminations are further denoted in the profile by the following:

- BICC (meaning applies to terminations towards BICC)

- BICC ATM (meaning applies to terminations towards BICC with ATM transport)

- BICC IP (meaning applies to terminations towards BICC with IP transport)

- IMS (meaning applies to terminations toward IMS)

- Multiplex (meaning applies to terminations performing multiplexing)

- RTP-CN (meaning applies to terminations towards SIP-I on Nc)

#### A.6.1.2 ASN.1 Encoding

##### A.6.1.2.1 General Structure

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:

|  |  |
| --- | --- |
| Termination type | X |

Termination type:

Length 3 bits

Values:

000 Reserved

001 Ephemeral termination

010 TDM termination

011 - 110 Reserved

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

X:

Length 29 bits.

Usage dependent on Termination type. TDM terminations specified below in subclause 5.2.2. Other usage un-specified.

The use of wildcarding for the Termination Id shall be performed using 1 octet only.

##### A.6.1.2.2 Termination naming convention for TDM terminations

Table C.6.1.2.2/1 ASN.1 coding

|  |  |  |
| --- | --- | --- |
| Termination type (=010 ) | PCM system | Individual |

PCM system:

Length 24 bits

Usage unspecified. Uniquely identifies PCM interface in MGW

Individual:

Length: 5 bits

Max. of 32 individuals (timeslots) per PCM system (max. 24 for a 24 channel system)

#### A.6.1.3 ABNF coding:

##### A.6.1.3.1 General Structure

The following general structure of termination ID shall be used:

TerminationID = "ROOT" / pathName / "$" / "\*" ; according to ITU-T H.248.1 [9] Annex B.

##### A.6.1.3.2 Termination Naming Convention for TDM Terminations

###### A.6.1.3.1.1 Naming Structure

A hierarchical naming structure is recommended for physical Terminations.

The PCMsystem is recommended to follow the following physical and digital signal hierarchy:

PCMsytem = <unit-type1>\_<unit #>/<unit-type2>\_<unit #>/...

The <unit-type> identifies the particular hierarchy level.

Some example values of <unit-type> are:

"s", "su", "stm4", "stm1", "oc3", "ds3", "e3", "ds2", "e2", "ds1", "e1" where "s" indicates a slot number and "su" indicates a sub-unit within a slot.

Leading zeroes MUST NOT be used in any of the numbers ("#") above.

The <unit #> is a decimal number which is used to reference a particular instance of a <unit-type> at that level of the hierarchy. Value ranges always starting with one.

The number of levels and naming of those levels is based on the physical hierarchy within the Media Gateway.

Here are some examples of the Termination structure:

1. TDM Terminations at SDH STM-1 ports:  
tdm/s\_<Card ID>/stm1\_<STM1 ID>/e1\_<E1 ID>/<channel #>

e.g., tdm/s\_2/stm1\_3/e1\_17/25

2. TDM Terminations at PDH E1 ports (e.g., for "PCM system" only applications):  
tdm/s\_<Card ID>/e1\_<E1 ID>/<channel #>

e.g., tdm/s\_2/e1\_17/25

NOTE 1: This Termination naming convention may be used to align with ASN.1 TDM Termination names as defined in A.6.1.2.2. The alignment must take into account the numbering scheme of "<E1 ID>" with the"PCM system" field, and the upper level(s) are regarded as prefix ("tdm/s-<Card ID>" versus "3-bit codepoint for 'TDM' ").

NOTE 2: See also clause 3/H.248.33 concerning "PCM system" definition.

3. TDM Terminations at SONET OC-3 ports:  
tdm/s\_<Card ID>/oc3\_<OC3 ID>/ds1\_<DS1 ID>/<channel #>

e.g., tdm/s\_2/oc3\_3/ds1\_17/22

###### A.6.1.3.1.2 Syntactical Specification

The syntax specification may be used for the population of valid TDM TerminationID structures for.

ABNF (IETF RFC 4234) is used for the syntax specification.

pathName = TDMToken SLASH (PCMsystem / "\*")

TDMToken = "tdm"

PCMsystem = 0\*(HierarchyLevelHIGHToken SLASH) HierarchyLevelLOWToken

HierarchyLevelHIGHToken = (UnitTypeToken "\_" UnitNumber)

HierarchyLevelLOWToken = (UnitTypeToken "\_" Wildcard) / Channel / Wildcard

UnitTypeToken = "ChassisToken" / "SDHToken" / "SONETToken" / "PDHToken"

ChassisToken = "s" / "su" ; slot, sub-unit within slot

SDHToken = "stm4" / "stm1" ; relevant is capacity, but not  
 electrical or optical interface type

SONETToken = "oc12" / "oc3"

PDHToken = "ds3" / "e3" / "ds2" / "e2" /"ds1" / "e1" ; ANSI & ETSI

UnitNumber = 1\*DIGIT

Channel = %d0-31 / %d0-23 ; value range E1/T1 system

Wildcard = "\*"

###### A.6.1.3.1.3 Wildcarding

Wildcarding (CHOOSE, ALL) is allowed for number fields ("<unit #>").

Examples for wildcarding:

1. TDM Terminations at SDH STM-1 ports:

e.g., wildcarding on top level: tdm/\*

e.g., wildcarding on slot level: tdm/s\_3/\*

e.g., wildcarding on STM-1 level: tdm/s\_3/stm1\_4/\*

e.g., wildcarding on E1 level: tdm/s\_2/stm1\_4/e1\_49/\*

2. TDM Terminations at PDH E1 ports:

e.g., wildcarding on E1 level: tdm/s\_1/e1\_2/\*

###### A.6.1.3.1.4 Heterogeneous TDM Port Configurations

An homogeneous TDM port configuration relates to a MGW with a single port type for physical Terminations. There is therefore a single TDM Termination name structure in use.

Heterogeneous TDM configurations means different port types, either by different signal hierarchies, like SDH/STM-1 and SDH/STM-4, and/or a mix of SDH and PDH interfaces. The number of port types in use is determining the number of TDM Termination name structures. With heterogeneous configurations the TDM Termination name structure may be aligned, for instance, by using the "highest common digital signal hierarchy" as highest Termination name hierarchical level. There is consequently a single TDM Termination name structure with a "flattened" hierarchy.

Example:

MGW with SDH/STM-1 and PDH/E1 ports. Common denominator is "e1", a selected TDM Termination name might be therefore a common two-level structure with "**tdm/e1\_<E1 ID>/<channel #>**". The unit types "s", "su" or "stm1" are not used here.

NOTE: This concept is followed in A.6.1.2.2, ASN.1 for TDM Terminations.

##### A.6.1.3.2 Termination Naming Convention for Ephemeral Terminations

###### A.6.1.3.2.1 Naming Structure

An alphanumeric pathname structure is recommended for Ephemeral terminations:

ephemeral/<string of alphanumeric characters or "/">

e.g., Ephemeral/1/0/40000

###### A.6.1.3.2.2 Syntactical Specification

The syntax rules may be used for the population of valid ephemeral TerminationID structures for.

ABNF (IETF RFC 4234) is used for the syntax specification.

ABNF coding:

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 = "$" / "\*"

### A.6.2 Multiplexed terminations

Table A.6.2/1: Multiplexed terminations

|  |  |
| --- | --- |
| MultiplexTerminations Supported | Yes (NOTE) |
| NOTE : Yes for multimedia interworking and No for voice interworking. | |

Table A.6.2/2: Multiplex Types Supported

|  |  |
| --- | --- |
| Multiplex types supported: | H.223 |
| Maximum number of terminations connected to multiplex: | TBD (NOTE) |
| NOTE: It is not clear what is the exact purpose of this parameter; further clarification within H.248.1 core protocol is required before this property shall be used. | |

## A.7 Descriptors

### A.7.1 Stream Descriptor

Table A.7.1/1: Stream descriptors

|  |  |
| --- | --- |
| Maximum number of streams per termination type | 2 (NOTE) |
| NOTE : Value 2 for multimedia interworking and Real-Time Text interworking and value 1 for voice interworking. | |

#### A.7.1.1 Local Control Descriptor

Table A.7.1.1/1: Local Control Descriptor

|  |  |  |  |
| --- | --- | --- | --- |
|  | | Termination Type | Stream Type |
| Reserve group used: | No |  |  |
| Reserve value used: | Yes (NOTE 1) | Terminations Toward IMS and RTP-CN | Not Applicable |
| NOTE 1: The "Reserve value" parameter is, inter alia, required for negotiation of multiple payload types, ie ITU-T Rec. G.711, comfort noise (according ITU-T Rec. G.711 Appendix II), DTMF tone relay (see RFC2833 [18]). | | | |

*Table A.7.1.1/2: Allowed Stream Modes*

|  |  |  |
| --- | --- | --- |
| Termination Type | Stream Type | Allowed StreamMode Values |
| TDM | Not Applicable | SendOnly, RecvOnly, SendRecv, Inactive |
| IMS | Audio, Video, Text (NOTE 1) | SendOnly, RecvOnly, SendRecv, Inactive |
| BICC IP, RTP-CN | Not Applicable | SendOnly, RecvOnly, SendRecv, Inactive |
| BICC ATM | Not Applicable | SendOnly, RecvOnly, SendRecv, Inactive |
| Multiplex (NOTE 2) | Audio, Video | SendOnly, RecvOnly, SendRecv, Inactive |
| NOTE 1: Audio and Video for multimedia interworking, Audio and Text for Real-Time Text interworking, and Not applicable for voice interworking.  NOTE 2: Specific for multimedia interworking. | | |

### A.7.2 Events Descriptor

Table A.7.2/1: Events Descriptor

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Events settable on termination types and stream types: | Yes | | | |
|  | Event ID | Termination Type | | Stream Type |
| Detect\_Digit(Digit)  (d0 to dd, inclusive) | ALL except ROOT | | Not Applicable |
|  | BNC Established | Terminations towards BICC network | | Not Applicable |
|  | BNC Modification Failed | Terminations towards BICC network | | Not Applicable |
|  | BNC Modified | Terminations towards BICC network | | Not Applicable |
|  | Tunnel | Terminations towards BICC network with IP transport | | Not Applicable |
|  | g/cause | ALL except ROOT | | Not Applicable |
|  | g/sc | ALL except ROOT | | Not Applicable |
|  | ct/cmp | TDM | | Not Applicable |
|  | chp/mgcon | ROOT | | Not Applicable |
|  | Hangterm/thb | ALL except ROOT | | Not Applicable |
|  | ocp/mg\_overload | ROOT | | Not Applicable |
|  | it/ito | ROOT | | Not Applicable |
|  | Start tone detected (tonedet/std) | RTP-CN, IMS, TDM, BICC | | Only applicable to audio stream |
|  | End Tone detected (tonedet/etd) | IMS | | RTP-CN, TDM, BICC Only applicable to audio stream |
|  | Optimal Codec Event (threegtfoc/codec\_modify) | TDM, BICC, RTP-CN | | Not Applicable |
|  | Codec List Event (threegtfoc/ distant codec\_list) | TDM, BICC, RTP-CN | | Not Applicable |
|  | TFO Status Event (threegtfoc/TFO\_status) | TDM, BICC, RTP-CN | | Not Applicable |
|  | Incoming H.245 message (h245tp/h245msgin, 0x00 b4/0x0001) | Multiplex | | Not Applicable |
|  | MONA Preference reception (monapref/monaprefmsgin, 0x00f8/0x0001) | | Multiplex | Not Applicable |
|  | MONA Preference negotiation completed  (monapref/ monaprefcompl, 0x00f8/0x0002) | | Multiplex | Not Applicable |
|  | Legacy Detected (monapref/Legdet, 0x00f8/0x0003) | Multiplex | | Not Applicable |
|  | MPC reception (monapref/mpcrec, 0x00f8/0x0004) | | Multiplex | Not Applicable |
|  | RTCP Feedback Message Detection (rtcpfb/det, 0x00f6/0x0001) | IP | | Not Applicable |
|  | ECN Failure(ecnrous/fail, 0x010b/0x0001) | IP | | Audio, Video |
|  | ICE New Peer Reflexive Candidate (ostuncc/nprc, 0x00c3/0x0002) – See subclause A.14.38 | IP | | Only applicable for full ICE |
|  | ICE Connectivity Check Result (ostuncc/ccr, 0x00c3/0x0001) – See subclause A.14.38 | IP | | Only applicable for full ICE |
| NOTE: Events for Terminations towards BICC network dependent on option to support such interworking, e.g. not required for TISPAN NGN R2 TMGW.  NOTE1: BNC Release event is defined in formats and codes table 10.1 and refers to the g/cause event. | | | | |

Table A.7.2/2: Event Buffer Control

|  |  |
| --- | --- |
| Event Buffer Control used: | No |

Table A.7.2/3: Keep active

|  |  |
| --- | --- |
| Keepactive used on events: | Conditional (NOTE 1) |
| NOTE 1: Required for 3GPP, not required by TISPAN NGN R2 TMGW. | |

Table A.7.2/4: Embedded events

|  |  |
| --- | --- |
| Embedded events in an event descriptor: | No |

Table A.7.2/5: Embedded signals

|  |  |
| --- | --- |
| Embedded signals in an event descriptor: | Yes |
| NOTE: Used if MONA procedures are supported in the Add Multiplex Termination procedure. | |

### A.7.3 EventBuffer Descriptor

Table A.7.3/1: Event Buffer Descriptor

|  |  |
| --- | --- |
| Event Buffer descriptor used: | No |

### A.7.4 Signals Descriptor

Table A.7.4/1: Signals Descriptor

|  |  |  |  |
| --- | --- | --- | --- |
| Signals settable dependant on termination or streams types: | | Yes  NOTE: "Yes" means any signal not listed below may be played on any termination or stream, except Signals on ROOT termination shall not be supported. | |
| *If yes* | Signal ID | Termination Type | Stream Type / ID |
| ct/\* | TDM | Not Applicable |
| gb/\* | BICC | Not Applicable |
| bt/\* | BICC IP | Not Applicable |
|  | cg/rt  cg/bt  cg/ct | TDM | Not Applicable |
|  | an/apf | ALL except ROOT and Multiplex | Not Applicable |
|  | Outgoing H.245 Message (h245tp/h245msgout, 0x00b4/0x0001) | Multiplex | Not Applicable |
|  | Outgoing MONA preference message (monapref/monaprefmsgout, 0x00 f8/0x0001) | Multiplex | Not Applicable |
|  | Forward Media in Preconfigured Channel (monapref/Preconfchannelmedia, 0x00f8/0x0002) | Multiplex | Not Applicable |
|  | Feedback Message Sending (rtcpfb/fbmesssend, 0x00f6/0x0001) | IP | Not Applicable |
|  | Send Additional Connectivity Check (ostuncc/sacc, 0x00c3/0x0002) | IP | Only applicable for full ICE |
|  | Send Connectivity Check (ostuncc/scc, 0x00c3/0x0001) | IP | Only applicable for full ICE |

Table A.7.4/2: Signal Lists

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Signals Lists supported: | | Conditional (NOTE 1) | |  |
| *If yes* | Termination Type Supporting Lists: | | ALL except ROOT | |
| Stream Type Supporting lists: | | ALL | |
| Maximum number of signals to a signal list: | | FFS<integer> | |
| Intersignal delay parameter supported: | | No | |
| NOTE 1: Required for 3GPP, not required for TISPAN NGN R2 TMGW.  NOTE 2: This field requires at least version 3 of the H.248.1 protocol | | | | |

Table A.7.4/3: Overriding Signal type and duration

|  |  |
| --- | --- |
| Signal type and duration supported: | Optional |
| NOTE: Not required for TISPAN NGN R2 TMGW. | |

Table A.7.4/4: Notify completion

|  |  |  |  |
| --- | --- | --- | --- |
| Notify completion supported: | | Yes | |
| *If yes* | SignalID | | Type of completion supported |
| All Tones and Announcements | | TO, EV, SD and NC |
| RequestID Parameter Supported: | NO | | |
| NOTE: This field requires at least version 3 of the H.248.1 protocol. | | | |

Table A.7.4/5: Signals played simultaneously

|  |  |
| --- | --- |
| Signals played simultaneously: | No |

Table A.7.6/6: Keep active

|  |  |
| --- | --- |
| Keepactive used on signals: | Conditional (NOTE 1) |
| NOTE 1: Required for 3GPP, not required for TISPAN NGN R2 TMGW. | |

### A.7.5 DigitMap Descriptor

Table A.7.5/1: DigitMap Descriptor

|  |  |
| --- | --- |
| Digit Maps supported: | No |

### A.7.6 Statistics Descriptor

Table A.7.6/1: Statistics Descriptor

|  |  |
| --- | --- |
| Statistics reported on subtract: | No (for TDM Terminations) |
|  | Optional For Ephemeral Terminations (NOTE 1) |
| NOTE 1: This is required for TISPAN NGN R2 TMGW | |

### A.7.7 ObservedEvents Descriptor

Table A.7.7/1: Observed Events Descriptor

|  |  |
| --- | --- |
| Event detection time supported: | No |

### A.7.8 Topology Descriptor

Table A.7.8/1: Topology Descriptor

|  |  |
| --- | --- |
| Allowed triples: | Optional (NOTE 1) :  (T1, T2, isolate) (T1, T2, oneway) (T1, T2, bothway) |
| NOTE 1: If not supported then error code 444 shall be returned. | |

### A.7.9 Error Descriptor

Table A.7.9/1: Error Codes Sent by MGCF

|  |  |
| --- | --- |
| Supported H.248.8 Error Codes: | FFS < list of individual numbers> |
| Supported Error Codes defined in packages: | All error codes defined in supported packages shall be supported. |

Table A.7.9/2: Error Codes Sent by MGW:

|  |  |
| --- | --- |
| Supported H.248.8 Error Codes: | FFS< list of individual numbers> |
| Supported Error Codes defined in packages: | All error codes defined in supported packages shall be supported. |

### A.7.10 TerminationState Descriptor

Table A.7.10/1: TerminationState Descriptor

|  |  |
| --- | --- |
| TerminationState: ServiceStates: | InService/OutofService |
| TerminationState: EventBufferControl: | OFF |

## A.8 Command API

### A.8.1 Add

Table A.8.1/1: Descriptors used by Command Add Request

|  |  |
| --- | --- |
| Descriptors used by Add Request: | Events, Signals, Media (LocalControl, Local And Remote), Audit |

Table A.8.1/2: Descriptors used by Command Add Reply

|  |  |
| --- | --- |
| Descriptors used by Add Reply: | Events, Signals, Media (LocalControl, Local And Remote), Error, Audit  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 Connection Point" and "Reserve IMS Connection Point and Configure Remote Resources" procedures, as specified in A.17.2.2 and A.17.2.4 |

### A.8.2 Modify

Table A.8.2/1: Descriptors used by Command Modify Request

|  |  |
| --- | --- |
| Descriptors used by Modify Request: | Events, Signals, Media (LocalControl, Local And Remote), Audit |

Table A.8.2/2: Descriptors used by Command Modify Reply

|  |  |
| --- | --- |
| Descriptors used by Modify Reply: | Events, Signals, Media (LocalControl, Local And Remote), Error, Audit  When command request excludes an Audit Descriptor, the MGW response shall only include descriptors which contained underspecified or overspecified properties in the command reques. 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 A.17.2.3. |

### A.8.3 Subtract

Table A.8.3/1: Descriptor used by Command Subtract Request

|  |  |
| --- | --- |
| Descriptors used by Subtract Request: | AUDIT (empty) or NONE |

Table A.8.3/2: Descriptor used by Command Subtract Reply

|  |  |
| --- | --- |
| Descriptors used by Subtract Reply: | None or Statistics  When command request contains "Audit(empty)", then no statistics are returned. Otherwise, connection statistics are returned in the Subtract reply dependent on the supported packages (see clause A.14). |

### A.8.4 Move

Table A.8.4/1: Command Move

|  |  |
| --- | --- |
| Move command used: | Optional(NOTE) |
| NOTE: If not supported then error code 443 shall be returned. | |

Table A.8.4/2: Descriptors used by Move Request

|  |  |
| --- | --- |
| Descriptors used by Move Request: | Events, Signals, Media (LocalControl, Local And Remote), Audit |

Table A.8.4/3: Descriptors used by Move Reply

|  |  |
| --- | --- |
| Descriptors used by Move Reply | Events, Signals, Media (LocalControl, Local And Remote), Error, Audit.  When command request excludes an Audit Descriptor, the MGW response shall only include descriptors which contained underspecified or overspecified properties in the command request, with the exception of the Error Descriptor. Furthermore, only those properties that were underspecified or overspecified in the request shall be sent in the reply. |

### A.8.5 Auditvalue

Table A.8.5/1: Auditvalue

|  |  |  |
| --- | --- | --- |
| Audited Properties: | Property Name and Identity | Descriptor |
| Termination ID | TerminationState:  - TDM: ALL (indicating 1 TDM group NOTE3), individual termination (NOTE 4)  - ATM/IP: individual termination  - Root (MGW Audit) | TerminationState Descriptor |
| Termination ID | MGC information (mgcinfo)  TDM: Individual Termination | LocalControl Descriptor |
| Termination ID | For Packages:  - Root  - TDM/ATM/IP: individual  termination (NOTE1) | Packages Descriptor (NOTE2) |
| Termination ID | None (MGW Audit) :  - Root | Audit (empty) Descriptor |
| Termination ID | SDPCapNeg Extensions:  - sdpe/\* | TerminationState Descriptor |
| Audited Statistics: | None | |
| Audited Signals: | None | |
| Audited Events: | None | |
| Packages Audit Possible | Yes | |
| NOTE1: The purpose to audit an individual Termination is to retrieve MGC Information if supported.  NOTE2: Support of this capability is optional.  NOTE3: TDM Group equates to an E1 or T1 PCM System.  NOTE 4: Auditing a single termination of a TDM group is an alternative to the wildcarded audit (TDM: ALL) to derive the service state of the TDM group. All the terminations of the TDM group share the same service state. | | |

### A.8.6 Auditcapability

Table A.8.6/1: Auditcapability

|  |  |  |
| --- | --- | --- |
| Audited Properties: | Property Name and Identity | Descriptor |
|  | FFS | FFS |
| Audited Statistics: | None | |
| Audited Signals: | None | |
| Audited Events: | None | |
| NOTE: AuditCapability command is not supported by the ETSI TISPAN profile. | | |

### A.8.7 Notify

*Table A.8.7/1: Descriptors Used Notify*

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

### A.8.8 Service Change

Table A.8.8/1: Service Change Methods and Reasons Sent By MGCF

|  |  |
| --- | --- |
| ServiceChange Methods supported: | ServiceChange Reasons supported: |
| Restart (NOTE1) | "901 Cold Boot" (Optional)  "902 Warm Boot" (Optional) |
| Handoff (NOTE1, NOTE 2) | "903 MGC Directed Change" (Mandatory) |
| Forced (NOTE1) | "905 Termination Taken Out Of Service" (Optional) |
| Graceful (NOTE1) | "905 Termination Taken Out Of Service" (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: Not involving more than 1 MGCF. No support of handoff relates to a network deployment scenario with "primary H.248 systems only", which translates to no geographic redundancy of the MGCF. | |

Table A.8.8/2: Service Change Methods and Reasons Sent By MGW

|  |  |
| --- | --- |
| ServiceChange Methods supported: | ServiceChange Reasons supported: |
| Restart | "900 Service Restored" (Mandatory) "901 Cold Boot" (Mandatory) (NOTE1) "902 Warm Boot" (Mandatory) (NOTE1)  "910 Media Capability Failure " ALL except ROOT  (Optional)  "913 Signal Capability Failure " ALL except ROOT  (Optional)  "914 Event Capability Failure " ALL except ROOT  (Optional)"916 Packages Change (Optional)  "917 Capability Change (Optional) |
| Graceful | "904 Termination Malfunction" ,ALL except ROOT, (Mandatory)  "905 Termination Taken Out Of Service",(Mandatory)  "906 Loss Of Lower Layer Connectivity" , ALL except ROOT,(Mandatory)  "907 Transmission Failure" ALL except ROOT,(Mandatory)  "908 MG Impending Failure" ROOT only (Mandatory) |
| Forced | "904 Termination Malfunction" ,ALL except ROOT, (Mandatory)  "905 Termination Taken Out Of Service" (Mandatory)  "906 Loss Of Lower Layer Connectivity" ALL except ROOT, (Mandatory)  "907 Transmission Failure" ALL except ROOT, (Mandatory)  "908 MG Impending Failure" ROOT only (Mandatory) |
| Handoff (NOTE1, NOTE 2) | "903 MGC Directed Change" (Mandatory) |
| Disconnected (NOTE1) | "900 Service Restored" (Mandatory)  "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. | |

Table A.8.8/3: Service Change Address

|  |  |
| --- | --- |
| ServiceChangeAddress used: | No |

Table A.8.8/4: Service Change Delay

|  |  |
| --- | --- |
| ServiceChangeDelay used: | No |

Table A.8.8/5: Service Change Incomplete Flag

|  |  |
| --- | --- |
| ServiceChange Incomplete Flag used: | No |
| NOTE: This field requires at least version 3 of the H.248.1 protocol. | |

Table A.8.8/6: Service Change Version

|  |  |
| --- | --- |
| Version used in ServiceChangeVersion: | 2 |

Table A.8.8/6: Service Change Profile

|  |  |
| --- | --- |
| ServiceChangeProfile mandatory: | Yes |

Table A.8.8/8: H.248.18 Profile negotiation

|  |  |
| --- | --- |
| Profile negotiation as per H.248.18: | No |

### A.8.9 Manipulating and auditing context attributes

Table A.8.9/1: Manipulating and auditing context attributes

|  |  |
| --- | --- |
| Context Attributes Manipulated: | Topology (Optional) , Emergency Indicator, Priority Indicator |
| Context Attributes Audited: | None |

## A.9 Generic command syntax and encoding

Table A.9/1: Encodings

|  |  |
| --- | --- |
| Supported Encodings: | Binary (optional) (NOTE 1)  Text (optional) (NOTE 2) :  The receiver shall support:  Short Token Notation  Long Token Notation |
| If binary encoding, is indefinite length encoding supported: | Yes (NOTE3) |
| NOTE 1: For 3GPP Mn interface binary encoding is strongly recommended if only one encoding is selected to ensure interoperability.  NOTE 2: Text encoding is required by TISPAN NGN R2 TMGW. For implementations providing both 3GPP Mn and TISPAN functionality text encoding is required as a minimum.  NOTE3: 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 [61]. Specifically in accordance with ITU-T Recommendation X.690 [61] section 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. | |

## A.10 Transactions

Table A.10/1: Transactions per Message

|  |  |
| --- | --- |
| Maximum number of TransactionRequests / TransactionReplies / TransResponseAcks / Segment Replies per message: | 2(NOTE 1)  10(NOTE 2) |
| NOTE 1: Maximum required by TISPAN NGN R2  NOTE 2: Maximum required by 3GPP | |

Table A.10/2: Commands per Transaction Requests

|  |  |
| --- | --- |
| Maximum number of commands per Transaction request: | 2(NOTE 1)  Unspecified(NOTE 2) |
| NOTE 1: Maximum required by TISPAN NGN R2  NOTE 2: Not specified by 3GPP | |

Table A.10/3: Commands per Transaction Reply

|  |  |
| --- | --- |
| Maximum number of commands per Transaction reply: | 2 (NOTE 1)  Unspecified (NOTE 2) |
| NOTE 1: Maximum required by TISPAN NGN R2  NOTE 2: Not specified by 3GPP however for auditing with wildcarded requests (e.g TDM E1) then the reply may include up to 32 commands to indicate the termination state. | |

Table A.10/4: Commands for Wildcarded Responses

|  |  |
| --- | --- |
| Wildcarded responses may be requested for: | Modify, Subtract, AuditValue |

Table A.10/5: Procedures for Wildcarded Responses

|  |  |
| --- | --- |
| Procedures that make use of wildcarded responses: | Release Bearer, Release Termination, Audit Value, Release IMS Termination, Release TDM Termination |
| NOTE: Used when multiple terminations are released with one command and in audit responses where multiple terminations are implied by the audit request. | |

Table A.10/6: Optional Commands

|  |  |
| --- | --- |
| Commands able to be marked "Optional": | ALL |

Table A.10/7: Transaction Timers

|  |  |
| --- | --- |
| Transaction Timer: | Value |
| normalMGExecutionTime | Provisioned |
| normalMGCExecutionTime | Provisioned |
| MGOriginatedPendingLimit | Provisioned |
| MGCOriginatedPendingLimit | Provisioned |
| MGProvisionalResponseTimerValue | Provisioned |
| MGCProvisionalResponseTimerValue | Provisioned |

## A.11 Messages

The MGC/MGW may be named according to the naming structure of the underlying transport protocol which carries the H.248 protocol.

It is however recommended that MGC and MG names are in the form of fully qualified domain names. For example the domain name of the MGC may be of the form mgc1.whatever.net and the name of the MG may be of the form mg1.whatever.net.

The "Message Identifier" in the H.248 messages may be used by the MGC and MG to identify the originator of the message.

## A.12 Transport

Table A.12/1: Transport

|  |  |
| --- | --- |
| Supported Transports: | SCTP(recommended) (NOTE1).  SCTP/M3UA(optional) optional – as defined in IETF RFC 3332 [24] with options detailed in 3GPP TS 29.202 [25] (NOTE2).  UDP(optional). |
| NOTE: If using SCTP as defined in IETF RFC 2960 [15] the MGW 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 [38]. The number of used SCTP Streams for traffic of the H.248 Control Association must be defined, see § 8/H.248.4 [38]. A single SCTP Stream is the default assumption ("Single-Stream Mode") in this Profile.  NOTE2 This is slightly different with regards to SCTP encapsulation. H.248 is "M3UA user" in this case of H.248/M3UA/SCTP/IP based transport. H.248 Messages are corresponding to M3UA user protocol data units. "SCTP multistreaming" may be also applied (see § 1.4.7/RFC 3332). If not then the complete M3UA traffic is mapped on a single SCTP Stream, i.e., the Single-Stream Mode.  NOTE3 Checksum calculation for SCTP shall be supported as specified in RFC 3309 [43] instead of the method specified in RFC 2960 [15]. | |

Table A.12/2: Segmentation

|  |  |
| --- | --- |
| Segmentation Supported: | No |
| NOTE: This field requires at least version 3 of the H.248.1 protocol. | |

Table A.12/3: Support of Control Association Monitoring

|  |  |
| --- | --- |
| Control Association Monitoring Supported: | Monitoring mechanism is dependent on used H.248 transport (see Table A.12/1):  **SCTP**: inherent capability of SCTP (NOTE 1)  **SCTP/M3UA**: inherent capability of SCTP  **UDP**:  1. H.248.14 (MGW-driven monitoring)  2. Empty AuditValue on ROOT (MGC-driven monitoring) |
| NOTE 1: Use of H.248.14 [29] for this is FFS | |

## A.13 Security

Table A.13/1: Security

|  |  |
| --- | --- |
| Supported Security: | None |

## A.14 Packages

Table A.14/1: Mandatory packages

|  |  |  |
| --- | --- | --- |
| Package Name | Package ID | Version |
| Generic (see ITU-T Recommendation H.248.1 [9] Annex E.1); | g, (0x0001) | v1 |
| Base Root Package (see ITU-T Recommendation H.248.1 [9] Annex E.2); | root, (0x0002) | v2 |
| Basic Continuity Package (see ITU-T Recommendation H.248.1 [9] Annex E.10); | ct, (0x000a) | v1 |
| TDM Circuit Package (see ITU-T Recommendation H.248.1 [9] Annex E.13); | tdmc, (0x000d) | v1 |
| Hanging Termination Detection package (see ITU-T Recommendation H.248.36 [27]). | hangterm (0x0098) | v1 |

Table A.14/2: Optional packages

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Package Name | Package ID | | Version | | Support dependent on: | |
| Tone Detection Package (see ITU-T Recommendation H.248.1 [9] Annex E.4); | tonedet, (0x0004)  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. | | v1 | | Mandatory for 3GPP | |
| Basic DTMF Generator Package (see ITU-T Recommendation H.248.1 [9] Annex E.5); | dg, (0x0005) | | v1 | | Mandatory for 3GPP | |
| DTMF Detection Package (see ITU-T Recommendation H.248.1 [9] Annex E.6); | dd, (0x0006) | | v1 | | Mandatory for 3GPP | |
| Media Gateway Resource Congestion Handling Package (see ITU-T Recommendation H.248.10 [12]). | chp, (0x0029) | | v1 | | Mandatory for 3GPP | |
| Generic Announcement Package (see ITU-T Recommendation H.248.7 [26]). Only Fixed Part is required. | an(0x001d) | | v1 | | 3GPP applications | |
| Bearer Characteristics Package (see ITU-T Recommendation Q.1950 [14] annex A.3). | bcp (0x001e | | v2 | | Terminations Towards BICC | |
| Generic Bearer Connection Package (see ITU-T Recommendation Q.1950 [14] annex A.6). | Gb, (0x0021) | | v1 | | Interworking with BICC | |
| Tone Generator Package (see ITU-T Recommendation H.248.1 [9] Annex E.3); | tongen, (0x0003) | | v1 | | 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. | |
| Call Progress Tones Generator Package (see ITU-T Recommendation H.248.1 [9] annex E.7). | Cg, (0x0007) | | v1 | |  | |
| Basic Call Progress Tones Generator with Directionality, (see ITU-T Recommendation Q.1950 [14] annex A.8). | bcg, (0x0023) | | v1 | | Services provided by network | |
| Expanded Call Progress tones Generator Package (see ITU-T Recommendation Q.1950 [14] annex A.9). | xcg, (0x0024 | | v1 | | Services provided by network | |
| Basic Services Tones Generation Package, (see ITU-T Recommendation Q.1950 [14] annex A.10). | srvtn, (0x0025) | | v1 | | Services provided by network | |
| Bearer Control Tunnelling Package (see ITU-T Recommendation Q.1950 [14] annex A.7). | Bt, (0x0022) | | v1 | | Interworking with BICC and IP transport | |
| Expanded Services Tones Generation Package (see ITU-T Recommendation Q.1950 [14] annex A.11). | xsrvtn, (0x0026) | | v1 | | Services provided by network | |
| Intrusion Tones Generation Package (see ITU-T Recommendation Q.1950 [14] annex A.12). | Int, (0x0027) | | v1 | | Services provided by network | |
| 3GUP package (see subclause 15.1.1 of 3GPP TS 29.232 [5]) | threegup, (0x002f) | | v1 | | Interworking with BICN PLMN | |
| Modification of Link Characteristics Bearer Capability (see subclause 15.1.5 of 3GPP TS 29.232 [5]) | threegmlc, (0x0046) | | v1 | | Interworking with BICN PLMN with Codec Modification | |
| Inactivity timer package (see ITU-T Recommendation H.248.14 [29]) | it, (0x0045) | | v1 | | Only applicable for UDP transport. | |
| TFO package (see subclause 15.2.2 of 3GPP TS 29.232 [5]) | | threegtfoc, (0x0031) | | v2 | |  |
| Media Gateway Overload Control Package (see ITU-T Recommendation H.248.11 [28]). | | ocp, (0x0051) | | v1 | |  |
| MGC Information Package (see ITU-T Recommendation H.248.45 [30]) | | mgcinfo,  (0x00a0) | | v1 | | This package may be supported as an operator option.  For this Profile the information string shall be limited to 32 octets in length. |
| RTP (ITU-T Recommendation H248.1 [9] Annex E.12) (NOTE 1) | | rtp, (0x000c) | | v1 | | Used for connection statistics |
| H324 package (see ITU-T Recommendation H.248.12 [41]) | | h324,(0x002c) | | v1 | | Multimedia calls |
| H.245 Transport Package (see ITU-T Recommendation H.248.12a2 [42]) | | h245tp, (0x00b4) | | v1 | | Multimedia calls |
| IP Domain connection package (see ITU-T Recommendation H.248.41 [44]) | | ipdc, (0x009d) | | v1 | | Multiple IP realms supported |
| H.245 Transport Package for SPC use (see ITU-T Recommendation H.248.72 [46] subclause 6) | | h245tpspc, (0x00f7) | | v1 | | Multimedia calls with MONA |
| MONA preference package (see ITU-T Recommendation H.248.72 [46] subclause 7) | | monapref, (0x00f8) | | v1 | | Multimedia calls with MONA |
| 3G Interface Type package (see subclause 15.2.11 of 3GPP TS 29.232 [5]) | | threegint (0x00e3) | | v1 | |  |
| RTCP Feedback Message package (see ITU-T Recommendation H.248.71 [49] subclause 8) | rtcpfb, (0x00f6) | | v1 | | Multimedia interworking between the H.245 messages in 3G-324M at the CS side and the corresponding RTCP messages used by MTSI terminals at the IMS side | |
| Explicit Congestion Notification for RTP-over-UDP Support (see ITU-T Recommendation H.248.82 [66]) | ecnrous(0x010b) | | v1 | | Support of ECN feature | |
| Diffserv (ITU-T Recommendation H.248.52 [64]) | ds, (0x008b) | | v2 | | Support of MPS | |
| MG Act-as STUN Server (ITU-T Recommendation H.248.50 [67]) | mgastuns (0x00c2) | | v1 | | Support of incoming STUN connectivity checks.  Applicable for ICE lite and full ICE | |
| Originate STUN Continuity Check (see ITU-T Recommendation H.248.50 [67]) | ostuncc (0x00c3) | | v1 | | Support of originating STUN connectivity checks Only applicable for full ICE | |
| Enhanced Revised Offer/Answer SDP Support ([ITU-T Recommendation H.248.80 [71]) | eroas, (0x0109) | | v1 | | Support of the SDP Capability Negotiation syntax | |
| NOTE 1: support of RTP Package does not require support of Network Package. | | | | | | |

Table A.14/3: Package Provisioning Information

|  |  |  |
| --- | --- | --- |
| Package Name | Property, Parameter, Signal, Event ID | Provisioned Value: |
| Generic Announcement (see ITU-T Recommendation H.248.7 [26]) | Fixed Announcement Play, AV | Provisioned |
| NOTE: This may not be required by TISPAN NGN R2 TMGW. | | |

### A.14.1 Generic Package

Table A.14.1/1: 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)  (NOTE) | M | ADD, MOD, NOTIFY | | | |
| Event  Parameters | Mandatory/  Optional | Supported  Values: | | Provisioned Value: |
| None | - | - | | - |
| ObservedEvent  Parameters | Mandatory/  Optional | Supported  Values: | | Provisioned Value: |
| Generalcause | M | "NR" Normal Release (0x0001)  "UR" Unavailable Resources (0x0002)  "FT" Failure, Temporary (0x0003) "FP" Failure, Permanent (0x0004) "IW" Interworking Error (0x0005) "UN" Unsupported (0x0006) | | Not Applicable |
| Failure Cause (FailureCause, 0x0002) | O | Octet String | | Not Applicable |
| Events | Mandatory/  Optional | Used in command: | | | |
| 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 | M | pkgdName syntax | | - |
| Termination Method | 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 | O | Integer | | - |
| Statistics | Mandatory/  Optional | Used in command: | | Supported Values: | |
| None | - | - | | - | |
| Error Codes | Mandatory/ Optional | | | | |
| - | - | | | | |
| NOTE: This event may also be used to report temporary errors in the MGW for both IMS, BICC and TDM connections where the termination is not out of service and thus sending a Service Change is inappropriate. On receipt of this event, the MGC is expected to release the connection in the MGW and force release the associated call. An example of such an error could be loss of RTP on an IMS termination. | | | | | |

### A.14.2 Base Root Package

Table A.14.2/1: Package Usage Information For Base Root Package

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Properties | Mandatory/  Optional | Used in command: | Supported Values: | | Provisioned Value: |
| root/maxNumberOfContexts | O | AuditValue | 1 and up | | Implementation Specific |
| root/maxTerminationPerContext | O | AuditValue | See A.4 | | Implementation Specific |
| root/normalMGExecutionTime | O | MOD | Integer | | Operator Defined |
| root/normalMGCExecutionTime | O | MOD | Integer | | Operator Defined |
| root/MGProvisionalResponseTimerValue | O | MOD | Integer(NormalMGExecutionTime + networkdelay) | | Operator Defined |
| root/MGCProvisionalResponseTimerValue | O | MOD | Integer( NormalMGCExecutionTime + networkdelay) | | Operator Defined |
| root/MGCOriginatedPendingLimit | O | MOD | Integer | | Operator Defined |
| root/MGOriginatedPendingLimit | O | MOD | 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 | - | | | | |
| NOTE : All transaction timers specified in H.248 shall be supported for 3GPP | | | | | |

### A.14.3 Basic DTMF Generator Package

Table A.14.3/1: Package Usage Information For Basic DTMF Generator Package

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Properties | Mandatory/  Optional | Used in command: | Supported Values: | | Provisioned Value: |
| None | - | - | - | | - |
| Signals | Mandatory/  Optional | Used in command: | | | Duration Provisioned Value: |
| DTMF character 0  ,d0  DTMF character 1  d1  DTMF character 2  d2  DTMF character 3  d3  DTMF character 4  d4  DTMF character 5  d5  DTMF character 6  d6  DTMF character 7  d7  DTMF character 8  d8  DTMF character 9  d9  DTMF character \*  ds  DTMF character #  do  DTMF character A  da  DTMF character B  db  DTMF character C  dc  DTMF character D  dd | M | ADD, MOD, MOVE | | |  |
| Signal Parameters | Mandatory/  Optional | Supported  Values: | | Duration Provisioned Value: |
| None | - | - | | - |
| 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 | - | | | | |
| NOTE: Only the DTMF Signal Ids shall be used, not the Tone Ids within the PlayTone Signal Id. | | | | | |

### A.14.4 Basic DTMF Detection Package

Table A.14.4/1: Package Usage Information For Basic DTMF Generator 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: | | | |
| d0, "0"  d1, "1"  d2, "2"  d3, "3"  d4, "4"  d5, "5"  d6, "6"  d7, "7"  d8, "8"  d9, "9"  ds, "\*"  do, "#"  da, "A" or "a"  db, "B" or "b"  dc, "C" or "c"  dd, "D" or "d" | M | ADD, MOD, NOTIFY | | | |
| Event  Parameters | Mandatory/  Optional | Supported  Values: | | Provisioned Value: |
| None | - | - | | - |
| ObservedEvent  Parameters | Mandatory/  Optional | Supported  Values: | | Provisioned Value: |
| None | - | - | | - |
| Statistics | Mandatory/  Optional | Used in command: | | Supported Values: | |
| None | - | - | | - | |
| Error Codes | Mandatory/ Optional | | | | |
| None | - | | | | |

### A.14.5 TDM Circuit Package

Table A.14.5/1: Package Usage Information For TDM Circuit Package

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Properties | Mandatory/  Optional | Used in command: | Supported Values: | | Provisioned Value: |
| Echo Cancellation, tdmc/ec | M | ADD, MOD, MOVE | ALL | | Default= Off (False) |
| Gain Control, tdmc/gc | 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: | | | |
| 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 | - | | | | |

### A.14.6 MGW Congestion Package

Table A.14.6/1: Package Usage Information For Media Gateway 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 Congestion, chp/mgcon(0x0001) | M/ | MOD, NOTIFY | | | |
| Event  Parameters | Mandatory/  Optional | Supported  Values: | | Provisioned Value: |
| None | - | - | | - |
| ObservedEvent  Parameters | Mandatory/  Optional | Supported  Values: | | Provisioned Value: |
| Reduction  (0x0001) | M | 0-100 | | Not Applicable |
| Statistics | Mandatory/  Optional | Used in command: | | Supported Values: | |
| None | - | - | | - | |
| Error Codes | Mandatory/ Optional | | | | |
| None | - | | | | |

### A.14.7 Continuity Package

Table A.14.7.1: Package Usage Information For Basic Continuity Package

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Properties | Mandatory/  Optional | Used in command: | Supported Values: | | Provisioned Value: |
| None | - | - | - | | - |
| Signals | Mandatory/  Optional | Used in command: | | | Duration Provisioned Value: |
| Continuity Test, ct/ct  Respond, ct/rsp | M | ADD, MOD, MOVE | | | Default |
| Signal Parameters | Mandatory/  Optional | Supported  Values: | | Duration Provisioned Value: |
| None | - | - | | - |
| Events | Mandatory/  Optional | Used in command: | | | |
| Completion, ct/cmp(0x0005) | M/ | ADD, MOD, MOVE, NOTIFY | | | |
| Event  Parameters | Mandatory/  Optional | Supported  Values: | | Provisioned Value: |
| None | - | - | | - |
| ObservedEvent  Parameters | Mandatory/  Optional | Supported  Values: | | Provisioned Value: |
| result, res(0x0008) | M | success, failure | | Not Applicable |
| Statistics | Mandatory/  Optional | Used in command: | | Supported Values: | |
| None | - | - | | - | |
| Error Codes | Mandatory/ Optional | | | | |
| None | - | | | | |

### A.14.8 Announcement Package

Table A.14.8/1: Package Usage Information For 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, apf(0x0001) | M | ADD, MOD, MOVE | | | <Value / Not Applicable> |
| Signal Parameters | Mandatory/  Optional | Supported  Values: | | Duration Provisioned Value: |
| Announcement name, an(0x0001) | M | enumeration | | <Value / Not Applicable> |
| Number Of Cycles, noc(0x0002) | M | Any Integer | | - |
| Announcement Variant, av(0x0003) | O | string | | - |
| Announcement Direction, di(0x0004) | M | Internal, 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 | - | | | | |

### A.14.9 Bearer Characteristics Package

Table A.14.9/1: Package Usage Information For Bearer Characteristics Package

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Properties | Mandatory/  Optional | Used in command: | Supported Values: | | Provisioned Value: |
| BNC Characteristics (BCP/BNCChar,0x001e/0x01) | M | ADD | AAL type 2 / IP/RTP | | Not Applicable |
| 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 | - | | | | |

### A.14.10 Generic Bearer Connection Package

Table A.14.10/1: Package Usage Information For Generic Bearer Connection Package

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Properties | Mandatory/  Optional | Used in command: | | Supported Values: | | Provisioned Value: |
| None | - | - | | - | | - |
| Signals | Mandatory/  Optional | Used in command: | | | | Duration Provisioned Value: |
| Establish BNC (GB/EstBNC,0x0021/0x01) | M | ADD, MOD | | | | Not Applicable |
| Signal Parameters | Mandatory/  Optional | | Supported  Values: | | Duration Provisioned Value: |
| Not Applicable | - | | - | | Not Applicable |
| Modify BNC (GB/ModBNC,0x0021/0x02) | O | MOD | | | | Not Applicable |
| Signal Parameters | Mandatory/  Optional | | Supported  Values: | | Duration Provisioned Value: |
| Not Applicable | **-** | | - | | Not Applicable |
| Release BNC (GB/RelBNC,0x0021/0x03) | M (NOTE 1) | MOD | | | | Not Applicable |
| Signal Parameters | Mandatory/  Optional | | Supported  Values: | | Duration Provisioned Value: |
| General cause (Generalcause,0x01) | O | | Normal Release/ Unavailable Resources/ Failure Temporary/ Failure Permanent/ Interworking Error/ Unsupported | | Not Applicable |
| Failure Cause (Failurecause,0x02) | O | | OCTET STRING | | Not Applicable |
| Reset (Reset,0x03) | O | 0/ 1 | | | Not Applicable |
| Events | Mandatory/  Optional | Used in command: | | | | |
| BNC Change (GB/BNCChange,0x0021/0x01) | M | ADD, MOD,NOTIFY | | | | |
| Event  Parameters | Mandatory/  Optional | | Supported  Values: | | Provisioned Value: |
| Type (Type ,0x01) | M | | Bearer Established / Bearer Modified/ Bearer Modification Failure | | Not Applicable |
| ObservedEvent  Parameters | Mandatory/  Optional | | Supported  Values: | | Provisioned Value: |
| Type (Type,0x01) | M/ | | Bearer Established / Bearer Modified/ Bearer Modification Failure | | Not Applicable |
| Statistics | Mandatory/  Optional | Used in command: | | | Supported Values: | |
| None |  |  | | |  | |
| Error Codes | Mandatory/ Optional | | | | | |
| None |  | | | | | |
| NOTE 1: Mandatory for BICC ATM Terminations, not used otherwise | | | | | | |

### A.14.11 Call Progress Tones Generator Package v1

Table A.14.11/1: 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: |
| Ringing Tone, cg/rt | M | ADD, MOD, MOVE | | | Not Applicable |
| Signal Parameters | Mandatory/  Optional | Supported  Values: | | Duration Provisioned Value: |
| - | - | - | | - |
| Busy Tone,  cg/bt | O | ADD, MOD, MOVE | | | Not Applicable |
| Signal Parameters | Mandatory/  Optional | Supported  Values: | | Duration Provisioned Value: |
| - | - | - | | - |
| Congestion Tone,  cg/ct | O | ADD, MOD, MOVE | | | Not Applicable |
| 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 | - | | | | |

### A.14.12 Basic Call Progress Tones Generator with Directionality

Table A.14.12/1: 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 | - | | | | |

### A.14.13 Expanded Call Progress Tones Generator Package

Table A.14.13/1: 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 | - | | | | |

### A.14.14 Basic Services Tones Generation Package

Table A.14.14/1: Package Usage Information For Basic Services Tones Generation 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 | - | | | | |

### A.14.15 Bearer Control Tunnelling Package

Table A.14.15/1: Package Usage Information For Bearer Control Tunnelling Package

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Properties | Mandatory/  Optional | Used in command: | Supported Values: | | Provisioned Value: |
| Tunneling Options (BT/TunOpt, 0x0022/0x01) | M | ADD, MOD | 1 /2 | | Not Applicable |
| Signals | Mandatory/  Optional | Used in command: | | | Duration Provisioned Value: |
| Bearer Information Transport (BT/BIT, 0x0022/0x01) | M | ADD, MOD | | | Not Applicable |
| Signal Parameters | Mandatory/  Optional | Supported  Values: | | Duration Provisioned Value: |
| Bearer Information Tunnel (BIT,0x01) | M | Octet String | | Not Applicable |
| Events | Mandatory/  Optional | Used in command: | | | |
| Tunnel Indication (BT/TIND. 0x0022/0x01) | M | ADD, MOD, NOTIFY | | | |
| Event  Parameters | Mandatory/  Optional | Supported  Values: | | Provisioned Value: |
| Not applicable | - | - | | - |
| ObservedEvent  Parameters | Mandatory/  Optional | Supported  Values: | | Provisioned Value: |
| Bearer Information transport (BIT,0x01) | M | Octet String | | Not Applicable |
| Statistics | Mandatory/  Optional | Used in command: | | Supported Values: | |
| None | - | - | | - | |
| Error Codes | Mandatory/ Optional | | | | |
| None | - | | | | |

### A.14.16 Expanded Services Tones Generation Package

Table A.14.16/1: Package Usage Information For Expanded Services Tones Generation Package

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Properties | Mandatory/  Optional | Used in command: | Supported Values: | | Provisioned Value: |
| None | - | - | - | | - |
| Signals | Mandatory/  Optional | Used in command: | | | Duration Provisioned Value: |
| Call Transfer Dial Tone (xsrvtn/xferdt,0x0026/0x0053)  Call Forward Tone (xsrvtn/cft,0x0026/0x0054)  Credit Card service Tone (xsrvtn/ccst,0x0026/0x0055)  Special Recall Dial Tone (xsrvtn/srdt,0x0026/0x0056) | 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 | - | | | | |

### A.14.17 Intrusion Tones Generation Package

Table A.14.17/1: Package Usage Information For Intrusion Tones Generation 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 | | | 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 | - | | | | |

### A.14.18 3GUP Package

Table A.14.18/1: Package Usage Information For 3GUP Package

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Properties | Mandatory/  Optional | Used in command: | Supported Values: | | Provisioned Value: |
| UP Mode of operation (threegup/mode, 0x002f/0x0001) | M | ADD, MOD, MOVE | See 3GPP TS 29.232 | | See 3GPP TS 29.232 |
| UP versions (threegup/ upversions, 0x002f/0x0002) | M | ADD, MOD, MOVE | See 3GPP TS 29.232 | | See 3GPP TS 29.232 |
| Delivery of erroneous SDUs (threegup/ delerrsdu, 0x002f/0x0003) | M | ADD, MOD, MOVE | See 3GPP TS 29.232 | | See 3GPP TS 29.232 |
| Interface (threegup/ interface, 0x002f/0x0004) | M | ADD, MOD, MOVE | See 3GPP TS 29.232 | | See 3GPP TS 29.232 |
| Initialisation Direction (threegup/ initdir, 0x002f/0x0005) | M | ADD, MOD, MOVE | See 3GPP TS 29.232 | | See 3GPP TS 29.232 |
| 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 | - | | | | |

### A.14.19 Modification of Link Characteristics Bearer Capability

Table A.14.19/1: Package Usage Information For Modification of Link Characteristics 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: | | | |
| Bearer Modification Support Event.( threegmlc/ mod\_link\_supp, 0x0046/0x0001) | M | ADD, MOD, NOTIFY | | | |
| Event  Parameters | Mandatory/  Optional | Supported  Values: | | Provisioned Value: |
| None | - | - | | - |
| ObservedEvent  Parameters | Mandatory/  Optional | Supported  Values: | | Provisioned Value: |
| None | - | - | | - |
| Statistics | Mandatory/  Optional | Used in command: | | Supported Values: | |
| None | - | - | | - | |
| Error Codes | Mandatory/ Optional | | | | |
| None | - | | | | |

### A.14.20 Hanging Termination Detection Package

Table A.14.20/1: 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 | 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 | | | | |
|  |  | | | | |

### A.14.21 TFO package

Table A.14.21/1: Package Usage Information For TFO

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Properties | Mandatory/  Optional | Used in command: | Supported Values: | | Provisioned Value: |
| TFO Activity Control  (threegtfoc /tfoenable, (0x0031/0x0001) | M | ADD, MOD, MOVE | See 3GPP TS 29.232 | | See 3GPP TS 29.232 |
| TFO Codec List  (threegtfoc / codeclist, (0x0031/0x0002) | M | ADD, MOD, MOVE | See 3GPP TS 29.232 | | See 3GPP TS 29.232 |
| 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: | | | |
| Optimal Codec Event  (threegtfoc / codec\_modify, (0x0031/0x0010) | O | ADD, MOD, MOVE, NOTIFY | | | |
| Event  Parameters | Mandatory/  Optional | Supported  Values: | | Provisioned Value: |
| None |  |  | |  |
| ObservedEvent  Parameters | Mandatory/  Optional | Supported  Values: | | Provisioned Value: |
| Optimal Codec Type | M | See 3GPP TS 29.232 | | See 3GPP TS 29.232 |
| Codec List Event  (threegtfoc / distant codec\_list, (0x0031/0x0012) | O | ADD, MOD, MOVE, NOTIFY | | | |
| Event  Parameters | Mandatory/  Optional | Supported  Values: | | Provisioned Value: |
| None |  |  | |  |
| ObservedEvent  Parameters | Mandatory/  Optional | Supported  Values: | | Provisioned Value: |
| Distant Codec List | M | See 3GPP TS 29.232 | | See 3GPP TS 29.232 |
| TFO Status Event  (threegtfoc /  TFO\_status) (0x0031/0x0014) | O | ADD, MOD, MOVE, NOTIFY | | | |
| Event  Parameters | Mandatory/  Optional | Supported  Values: | | Provisioned Value: |
| None |  |  | |  |
| ObservedEvent  Parameters | Mandatory/  Optional | Supported  Values: | | Provisioned Value: |
| TFO Status | M | See 3GPP TS 29.232 | | See 3GPP TS 29.232 |
| Statistics | Mandatory/  Optional | Used in command: | | Supported Values: | |
| None |  |  | |  | |
| Error Codes | Mandatory/ Optional | | | | |
|  |  | | | | |

### A.14.22 Media Gateway Overload Control Package

Table A.14.22/1: Media Gateway 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 | M | MOD, NOTIFY | | | |
| Event Parameters | Mandatory/ Optional | Supported Values: | | Provisioned Value: |
| None |  |  | |  |
| ObservedEvent Parameters | Mandatory/ Optional | Supported Values: | | Provisioned Value: |
| None |  |  | |  |
| Statistics | Mandatory/ Optional | Used in command: | | Supported Values: | |
| None |  |  | |  | |
| Error Codes | Mandatory/Optional | | | | |
| None |  | | | | |

### A.14.23 Inactivity Timer Package

Table A.14.23/1: 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 | M | MOD, NOTIFY | | | |
| Event  Parameters | Mandatory/  Optional | Supported  Values: | | Provisioned Value: |
| Maximum Inactivity Time,  mit | M | Any integer | | Unspecified, if not sent a value must be provisioned. |
| ObservedEvent  Parameters | Mandatory/  Optional | Supported  Values: | | Provisioned Value: |
| None | - | - | | - |
| Statistics | Mandatory/  Optional | Used in command: | | Supported Values: | |
| None | - | - | | - | |
| Error Codes | Mandatory/ Optional | | | | |
| None | - | | | | |

### A.14.24 MGC Information Package

Table A.14.24/1: MGC Information Package

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Properties | Mandatory/  Optional | Used in command: | Supported Values: | | Provisioned Value: |
| Data Block, MGCInfo/db | 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 | - | | | | |

### A.14.25 RTP Package

Table A.14.25/1: 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 | - | NA | | | | | |
| Event Parameters | Mandatory/Optional | Supported  Values: | | | Provisioned Value: | |
| None | - | - | | | - | |
| ObservedEvent  **Parameters** | Mandatory/  **Optional** | Supported  Values: | | | Provisioned Value: | |
| rtppayload, rtppltype | - | A valid encoding name | | | - | |
| Statistics | Mandatory/  Optional | Used in command: | | | Supported Values: | | |
| Packets Sent, rtp/ps | M | SUBTRACT REPLY | | | ALL | | |
| Packets Received, rtp/pr | M | SUBTRACT REPLY | | | ALL | | |
| Packet Loss, rtp/pl | M | SUBTRACT REPLY | | | ALL | | |
| Jitter, rtp/jit | M | SUBTRACT REPLY | | | ALL | | |
| Delay, rtp/delay | M | SUBTRACT REPLY | | | ALL | | |
| Error Codes | Mandatory/ Optional | | | | | | |
| None | - | | | | | | |

### A.14.26 Tone Generator Package

Table A.14.26/1: 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 | - | | | | |

### A.14.27 Tone Detection Package

Table C.14.27/1: Package Usage Information For Tone 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: | | | |
| Start tone detected (tonedet/std, 0x0004/0x0001) | O | ADD, MOD, MOVE, NOTIFY | | | |
| Event  Parameters | Mandatory/  Optional | Supported  Values: | | Provisioned Value: |
| Tone ID List (tl,0x0001) | M | wildcard | | Not Applicable |
| ObservedEvent  Parameters | Mandatory/  Optional | Supported  Values: | | Provisioned Value: |
| Tone ID (tid,0x0003) | M | Value | | Not Applicable |
| Events | Mandatory/  Optional | Used in command: | | | |
| End Tone detected (tonedet/etd, 0x0004/0x0002) | M | ADD, MOD, MOVE, NOTIFY | | | |
| Event  Parameters | Mandatory/  Optional | Supported  Values: | | Provisioned Value: |
| Tone ID List (tl,0x0001) | M | wildcard | | Not Applicable |
| ObservedEvent  Parameters | Mandatory/  Optional | Supported  Values: | | Provisioned Value: |
| Tone ID (tid,0x0003) | M | Value | | Not Applicable |
| Duration (dur,0x0002) | O | Value | | Not Applicable |
| Events | Mandatory/  Optional | Used in command: | | | |
| Long Tone detected (tonedet/ltd, 0x0004/0x0003) | 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 | - | | | | |

### A.14.28 H324 Package

Table A.14.28/1: Package Usage Information For H324 Package

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Properties** | **Mandatory/**  **Optional** | **Used in command:** | **Supported Values:** | | **Provisioned Value:** |
| Communication mode (h324/cmod,0x002c/0x0001) | Not used | - | - | | - |
| Highest Multiplexing Level  (h324/muxlv,0x002c/0x0002) | Not Used | - | - | | Based on capability of IM-MGW |
| Demultiplex  (h324/demux,0x002c/0x0003) | Not used | - | - | | - |
| Remote H.223 capability  (h324/h223capr,0x002c/0x0004) | M | MOD | OCTET STRING | | Not Applicable |
| Incoming Multiplex Table  (h324/muxtbl\_in,0x002c/0x0005) | M | MOD | OCTET STRING | | Not Applicable |
| Outgoing Multiplex Table (h324/muxtbl\_out,0x002c/0x0006) | M | MOD | OCTET STRING | | Not Applicable |
| **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:** | |
| MUXPDU sent (h324/muxsent,0x002c/0x0001) | Not used | - | | - | |
| MUXPDU received (h324/muxrec,0x002c/0x0002) | Not used | - | | - | |
| MUXPDU error (h324/muxerr,0x002c/0x0003) | Not used | - | | - | |
| **Error Codes** | **Mandatory/ Optional** | | | | |
| None | - | | | | |

### A.14.29 H.245 Transport Package

Table A.14.29/1: Package Usage Information For H.245 Transport Package

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Properties** | **Mandatory/**  **Optional** | **Used in command:** | **Supported Values:** | | **Provisioned Value:** |
| None | - | - | - | | - |
| **Signals** | **Mandatory/**  **Optional** | **Used in command:** | | | **Duration Provisioned Value:** |
| Outgoing H.245 Message (h245tp/h245msgout, 0x00b4/0x0001) | M | MOD | | | **-** |
| **Signal Parameters** | **Mandatory/ Optional** | **Supported Values:** | | **Duration**  **Provisioned Value:** |
| Contents of H.245 message (h245mc,0x0001) | M | OCTET STRING | | - |
| **Events** | **Mandatory/**  **Optional** | **Used in command:** | | | |
| Incoming H.245 message (h245tp/h245msgin, 0x00b4/0x0001) | M | ADD, NOTIFY | | | |
| **Event**  **Parameters** | **Mandatory/**  **Optional** | **Supported**  **Values:** | | **Provisioned Value:** |
| None | - | - | | - |
| **ObservedEvent**  **Parameters** | **Mandatory/**  **Optional** | **Supported**  **Values:** | | **Provisioned Value:** |
| Contents of H.245 message (h245mc,0x0001) | M | OCTET STRING | | Not Applicable |
| **Statistics** | **Mandatory/**  **Optional** | **Used in command:** | | **Supported Values:** | |
| None | - | - | | - | |
| **Error Codes** | **Mandatory/ Optional** | | | | |
| None | - | | | | |

### A.14.30 IP domain connection

Table C.14.30: Package usage information for IP domain connection package

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Properties | Mandatory/  Optional | Used in command: | Supported Values: | | Provisioned Value: |
| IP Realm Identifier  (ipdc /realm, 0x009d /0x0001) | M | ADD | String | | Operator Defined (NOTE1) |
| 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 | - | | | | |
| NOTE1: A default IP realm may be configured such that if the MGW has not received the IP realm identifier and the MGW supports multiple IP realms then the default IP realm shall be used. | | | | | |

### A.14.31 H.245 Transport Package for SPC use

Table A.14.31/1: Package Usage Information For H.245 Transport Package for SPC use

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Properties** | **Mandatory/**  **Optional** | **Used in command:** | **Supported Values:** | | **Provisioned Value:** |
| None | - | - | - | | - |
| **Signals** | **Mandatory/**  **Optional** | **Used in command:** | | | **Duration Provisioned Value:** |
| None (NOTE 1) | M | MOD | | | - |
| **Signal Parameters** | **Mandatory/ Optional** | **Supported Values:** | | **Duration**  **Provisioned Value:** |
| Signalling Preconfigured Channel (spc, 0x0002) | O | ON  OFF | | OFF |
| Repetition (rep, 0x0003) | O | ON OFF | | ON |
| **Events** | **Mandatory/**  **Optional** | **Used in command:** | | | |
| None (NOTE 2) | M | ADD, NOTIFY | | | |
| **Event**  **Parameters** | **Mandatory/**  **Optional** | **Supported**  **Values:** | | **Provisioned Value:** |
| Signalling Preconfigured Channel (spc, 0x0001) | O | H245, SPC, Both | | H245 |
| **ObservedEvent**  **Parameters** | **Mandatory/**  **Optional** | **Supported**  **Values:** | | **Provisioned Value:** |
| Signalling Preconfigured Channel (spc, 0x0002) | O | ON  OFF | | OFF |
| **Statistics** | **Mandatory/**  **Optional** | **Used in command:** | | **Supported Values:** | |
| None | - | - | | - | |
| **Error Codes** | **Mandatory/ Optional** | | | | |
| None | - | | | | |
| NOTE 1: The package does not define any new signal. The defined signal parameter can be used in the Outgoing H.245 Message signal (h245tpspc/h245msgout, 0x00f7/0x0001) defined in the base package (H.245 Transport package).  NOTE 2: The package does not define any new event. The defined event and observed event parameters can be used in the Incoming H.245 Message event (h245tpspc/h245msgin, 0x00f7/0x0001) defined in the base package (H.245 Transport package). | | | | | |

### A.14.32 MONA preference package

Table A.14.32/1: Package Usage Information for MONA preference Package

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Properties | Mandatory/  Optional | Used in command: | Supported Values: | | Provisioned Value: |
| MONA Class (monapref/class, 0x00f8/0x0001) | Not used | - | - | | - |
| Supported Media Preconfigured Channels Receive (monapref/mpcrx, 0x00f8/0x0002) | Not used | - | - | | - |
| Supported Media Preconfigured Channels Transmit (monapref/mpctx, 0x00f8/0x0003) | Not used | - | - | | - |
| Signals | Mandatory/  Optional | Used in command: | | | Duration Provisioned Value: |
| Outgoing MONA preference message (monapref/monaprefmsgout, 0x00f8/0x0001) | M | MOD | | | - |
| Signal Parameters | Mandatory/ Optional | Supported Values: | | Duration  Provisioned Value: |
| Contents of MONA preference message (prefmsgc,0x0001) | M | OCTET STRING | | - |
| Forward Media in Preconfigured Channel (monapref/Preconfchannelmedia, 0x00f8/0x0002) | O | MOD | | | - |
| **Signal Parameters** | **Mandatory/ Optional** | **Supported Values:** | | Duration  **Provisioned Value:** |
| Mux Code (muxcode,0x0003) | M | sub-list of OCTET STRING | | - |
| Events | Mandatory/  Optional | Used in command: | | | |
| MONA Preference reception (monapref/monaprefmsgin, 0x00f8/0x0001) | M | ADD, NOTIFY | | | |
| Event  Parameters | Mandatory/  Optional | Supported  Values: | | Provisioned Value: |
| None | - | - | | - |
| ObservedEvent  Parameters | Mandatory/  Optional | Supported  Values: | | Provisioned Value: |
| Contents of MONA preference message (prefmsgc,0x0001) | M | OCTET STRING | | Not Applicable |
| MONA Preference negotiation completed (monapref/monaprefcompl, 0x00f8/0x0002) | M | ADD, NOTIFY | | | |
| Event  Parameters | Mandatory/  Optional | Supported  Values: | | Provisioned Value: |
| None | - | - | | - |
| ObservedEvent  Parameters | Mandatory/  Optional | Supported  Values: | | Provisioned Value: |
| None | - | - | | - |
| Legacy Detected (monapref/legdet, 0x00f8/0x0003) | M | ADD, NOTIFY | | | |
| Event  Parameters | Mandatory/  Optional | Supported  Values: | | Provisioned Value: |
| None | - | - | | - |
| ObservedEvent  Parameters | Mandatory/  Optional | Supported  Values: | | Provisioned Value: |
| None | - | - | | - |
| MPC reception (monapref/mpcrec, 0x00f8/0x0004) | O | ADD, NOTIFY | | | |
| Event  Parameters | Mandatory/  Optional | Supported  Values: | | Provisioned Value: |
| None | - | - | | - |
| ObservedEvent  Parameters | Mandatory/  Optional | Supported  Values: | | Provisioned Value: |
| Mux Code (muxcode,0x0001) | M | OCTET STRING | | Not Applicable |
| Statistics | Mandatory/  Optional | Used in command: | | Supported Values: | |
| None | - | - | | - | |
| Error Codes | Mandatory/ Optional | | | | |
| None | - | | | | |

### A.14.33 3G Interface Type package

Table A.14.31/1: Package Usage Information For 3G Interface Type

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Properties | Mandatory/  Optional | Used in command: | Supported Values: | | Provisioned Value: |
| IP Interface Type  (threegint /ipint, (0x00e3/0x0001) | M | ADD, MOD | "NboIP" (0x0001)  "MboIP" (0x0003) | | 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 | - | | | | |

### A.14.34 RTCP Feedback Message package

Table A.14.34/1: Package Usage Information for RTCP Feedback Message package

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Properties | Mandatory/  Optional | Used in command: | Supported Values: | | Provisioned Value: |
| None | - | - | - | | - |
| Signals | Mandatory/  Optional | Used in command: | | | Duration Provisioned Value: |
| Feedback Message Sending (rtcpfb/fbmesssend, 0x00f6/0x0001) | M | MOD | | | - |
| Signal Parameters | Mandatory/ Optional | Supported Values: | | Duration  Provisioned Value: |
| Update Picture (upic,0x0001) | O | Enumeration | | - |
| Max Bitrate (mbr,0x0002) | O | Unsigned Integer | | - |
| Events | Mandatory/  Optional | Used in command: | | | |
| RTCP Feedback Message Detection (rtcpfb/det, 0x00f6/0x0001) | M | MOD, NOTIFY | | | |
| Event  Parameters | Mandatory/  Optional | Supported  Values: | | Provisioned Value: |
| Feedback Message Type  (type,0x0001) | M | Sub-list of String | | - |
| ObservedEvent  Parameters | Mandatory/  Optional | Supported  Values: | | Provisioned Value: |
| Update Picture (upic,0x0001) | O | Enumeration | | - |
| Max Bitrate (mbr,0x0002) | O | Unsigned Integer | | - |
| Statistics | Mandatory/  Optional | Used in command: | | Supported Values: | |
| None | - | - | | - | |
| Error Codes | Mandatory/ Optional | | | | |
| None | - | | | | |

### A.14.35 Explicit Congestion Notification for RTP-over-UDP Support (ecnrous)

Table A.14.35.1: 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" | | "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 [62]. For speech this requires support of CMR and TMMBR for video. | | | | | | |

### A.14.36 Differentiated Services (ds)

Table A.14.36.1: 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 | - | | | | |
|  | | | | | |

### A.14.37 MG Act-as STUN Server (mgastuns)

Table A.14.3.37.1: 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 | - | | | | | |
|  | | | | | | |

### A.14.38 Originate STUN Continuity Check (ostuncc)

Table A.14.3.38.1: 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 | - | | | | | |

### A.14.39 Enhanced Revised Offer/Answer SDP Support (eroas)

Table A.14.39/1: 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 | - | | | | |

## A.15 Mandatory support of SDP and H.248 Annex C information elements

Table A.15/1: **Supported Annex C and SDP information elements**

|  |  |  |
| --- | --- | --- |
| Information Element | Annex C Support | SDP Support |
| v-line | "SDP\_V " | The value must always be equal to zero:  v=0. |
| m-line | "SDP\_M " | <port> <transport> and <fmt-list> are required. Both static and dynamic payload types shall be supported.  The MGC may underspecify the <fmt-list> subfield in place of a single dynamic payload type. In this case the mapping between the underspecified payload type and the <encoding name>/<clock rate> shall be provided in the rtpmap attribute.  For <transport> see table 5.15/2. |
| c-line | "SDP\_C " | <nettype> <addrtype> and <connection address> are required  The network type shall be set to "IN".  The address type may be IPv4 or IPv6. The MGC may apply parameter underspecification to the <address type> subfield. (NOTE 2) |
| a-line | "SDP\_A " | 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). See Clause 10.2.  For AVPF transport, the "rtcp-fb" SDP attribute defined in IETF RFC 4585 [60] may be used to provide the feedback message types the MG is allowed to send and to indicate RTCP timing information.  (NOTE 3)  For T.38, additional SDP attributes listed in subclause 10.2.3.6 may be provided.  ICE support  The attributes "a=candidate", "a=ice-pwd", and "a=ice-ufrag" (see IETF RFC 5245 [68]) may be provided for an SDP m-line in the local and remote descriptor if the IM-MGW supports ICE, see also 3GPP TS 24.229 [69]. In the local descriptor, the MGC 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. The IM-MGW shall then reply with completed "a=ice-pwd", and "a=ice-ufrag" and "a=candidate" attributes in the local descriptor, and shall include "a=ice-lite" if it only supports ICE lite. In the remote descriptor, the MGC may provide the "a=candidate", "a=ice-pwd", and "a=ice-ufrag".  Rate adaptation for media endpoints:  If the IM-MGW performs media transcoding and if the rate adaptation for media endpoints using the enhanced bandwidth negotiation is supported by the IM-MGW, attribute(s) "a=bw-info" 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.  The following bandwidth properties, as defined in 3GPP TS 26.114 [62], clause 19, may be included in "a=bw-info" line: <payload type> <dir> <MaxSupBw>, <MaxDesBw>, <MinDesBw>, <MinSupBw> and <IpVer>.  SDP Capability Negotiation:  The attributes of "a=acap", "a=tcap", "a=pcfg" and "a=acfg" (see IETF RFC 5939 [70]) may be provided in the local descriptor and/or remote descriptor. |
| b-line | "SDP\_B " | (NOTE1).  B:RS and b:RR bandwidth modifiers required  Bandwidth information shall be supplied by the MGC if the required bandwidth cannot be immediately derived from the information contained in the m= line. If the MGC is using parameter underspecification, the MG shall assume a reasonable default bandwidth value for well-known codecs and shall provide this value in the response sent to the MGC. 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 and shall take into account all headers down to the IP layer.  The MGC may also supply additional RTCP bandwidth modifiers (i.e. RR and RS, see IETF RFC 3556 [39]). If the RTCP modifiers are not supplied, the bandwidth value for the AS modifier shall take into account an extra 5% bandwidth for RTCP packets. |
| o-line | "SDP\_O" | The origin line consists of 6 fields:  *o= <user name> <session ID> <version> <network type> <address type> <address>.*  The MGC is not required to supply this line but shall accept it.  The MG shall return the value received from the MGC or if there is no o-line sent by the MGC, the MG shall populate this line as follows:  - <user name> should contain an hyphen  - <session ID> and <version> should contain one or mode digits as described in RFC 4566 [17]  - <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 MG is connected.  - <address> should contain the fully qualified domain name or IP address of the gateway. |
| s-line | "SDP\_S" | The session name (s=) line contains a single field:  *s= <session-name>.*  The MGC 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 MG shall return the value received from the MGC or if there is no s-line sent by the MGC, the MG shall populate this line as follows:  - "s=-" |
| t-line | "SDP\_T" | The time (t=) line consists of two fields:  *t= <start-time> <stop-time>.*  The MGC is not required to supply a time description but shall accept one.  The MG shall return the value received from the MGC or if there is no t-line sent by the MGC, the MG shall populate this line as follows:  - "t=0 0" |
| NOTE a: SDP or SDP\_equivalents are only used for terminations towards the IM CN Subsystem.  NOTE b: For BICC terminations, mandatory support of SDP and Annex C information elements shall be in accordance with the subclause "Mandatory Support of SDP and H.248.1 annex C information elements" in ITU‑T Recommendation Q.1950 [14]. For IP the IANA ICP IDI format of the NSAP addressing format as specified in X.213 [33] shall be used. For Ipv4 networks the IPv4 format recommended by X.213 shall be adopted.  The BIR length shall be fixed at 4 Octets and the NSAP length shall be fixed at 20 Octets..  NOTE 1: b-line is optional in TISPAN NGN R2.  NOTE 2: The address type may be IPv4 or IPv6. The default IP version (i.e. IPv4 or IPv6) may be provisioned in the H.248 MG. The MGC may apply H.248 parameter underspecification. If the MGC does require a different IP version than the provisioned default, then the MGC applies complete H.248 parameter specification.  NOTE3: Support is optional and dependent on RTCP-fb support as described in 3GPP TS 26.114 [62]. The list of feedback types supported by the MG is preconfigured in the MGC. The "rtcp-fb" SDP attribute shall be sent from MGC when applicable. | | |

Table A.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. |
| TCP | (NOTE 1, NOTE 2) |
| RTP/AVP | RTP profile according IETF RFC 3551 [33]. |
| RTP/AVPF | Extended RTP profile for RTCP-based Feedback (RTP/AVPF) according IETF RFC 4585 [60]. (NOTE 1). |
| udptl | (NOTE 1) |
| NOTE 1: support optional.  NOTE 2: Upper case TCP is defined by IETF RFC 4145 [59] and registered by IANA. . | |

## A.16 Optional support of SDP and H.248 Annex C information elements

Table A.16/1: Optional **Supported Annex C and SDP information elements**

|  |  |  |
| --- | --- | --- |
| Information Element | Annex C Support | SDP Support |
|  | | |

## A.17 Procedures

### A.17.1 Call Independent Procedures

Table A.17.1/1 shows the relationship between each non call-related procedure in 3GPP TS 29.232 [5] and the corresponding procedure defined in 3GPP TS 29.163 [4].

For further description of error codes and service change reasons, refer to ITU-T Recommendation H.248.8 [10].

Table A.17.1/1: Non call-related transaction reused from 3GPP TS 29.232 [5]

|  |  |  |  |
| --- | --- | --- | --- |
| Procedure defined in  3GPP TS 29.163 [4] | Procedure defined in 3GPP TS 29.232 [5] | Support | Comment |
| IM-MGW Out of service | MGW Out of Service | Mandatory |  |
| IM-MGW Communication Up | MGW Communication Up | Mandatory |  |
| IM-MGW Restoration | MGW Restoration | Mandatory |  |
| IM-MGW Register | MGW Register | Mandatory |  |
| IM-MGW Re-register | MGW Re-register | Mandatory |  |
| MGCF Ordered Re-register | (G)MSC Server Ordered Re-register | Mandatory |  |
| MGCF Restoration | (G)MSC Server Restoration | Optional |  |
| MGCF Out of Service | (G)MSC Server Out of Service | Optional |  |
| Termination Out-of-Service | Termination Out-of-Service | Mandatory |  |
| Termination Restoration | Termination Restoration | Mandatory |  |
| Audit Value | Audit Value | Mandatory | Mandatory support only for audit of Termination Service State and for periodic audit of MGW (empty Audit descriptor).  Optional support for audit of Packages or to retrieve MGC Information. |
| Audit Capability | Audit Capability | Optional |  |
| Command Rejected | Command Rejected | Mandatory | The "Command Rejected" procedure may be used in response both to call-related and non-call-related ITU-T Recommendation H.248 Commands |
| IM-MGW Capability Change | Capability Update | Optional |  |
| IM-MGW Resource Congestion Handling - Activate | MGW Resource Congestion Handling - Activate | Mandatory |  |
| IM-MGW Resource Congestion Handling - Indication | MGW Resource Congestion Handling - Indication | Mandatory |  |
| Inactivity Timeout - Activate | Inactivity Timeout - Activate | Optional |  |
| Inactivity Timeout - Indication | Inactivity Timeout - Indication | Optional |  |

### A.17.1.2 Profile registration

The following description is based on H.248.1 profile registration procedure with some clarifications. The reply to the ServiceChange Request containing the SCP parameter indicates if the MGCF supports the requested profile or if it does not support it and wants to propose an alternative profile. The profile (name and version) is only returned in the reply if the MGCF cannot support the specified profile in the ServiceChangeRequest. The returned reply shall indicate the profile and version supported. Upon reception of a profile in the reply, if the IM-MGW supports the indicated profile, it shall issue a new ServiceChange Request with the agreed profile to explicitly confirm the acceptance of the profile to the MGCF ; otherwise, if the IM-MGW does not support the indicated profile, it may continue the registration or re-registration procedure by issuing a new ServiceChange Request with an alternative profile ; until such procedure is successfully completed the IM-MGW shall remain out of service. If the profile is not returned the MGCF shall use the capabilities specified by the Profile indicated in the service change request.

NOTE: It should be observed that the profile registration is not a "cold calling" negotiation; it is expected that the operator will have configured the network to support certain profiles and so the profile registration within the Mn interface permits network upgrade scenarios but otherwise is simply a means to confirm the connection of the profile to be used over the Mn interface between MGCF and IM-MGW.

### A.17.2 IMS Terminations Procedures

#### A.17.2.1 Summary of Procedures related to a termination towards IM CN Subsystem

Table 1 shows the relationship between each call-related procedure in ITU‑T Recommendation Q.1950 [14] (see 3GPP TS 29.205 [3]) or TS 29.232 [5] and the corresponding stage 2 procedure defined in 3GPP TS 29.163 [4].

Table A.17.2.1/1: Correspondence between ITU-T Recommendation Q.1950 [14] or 29.232 [5] call-related transactions and 3GPP TS 29.163 [4] procedures

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Procedure defined in 3GPP TS 29.163 [4] | Transaction used in Q.1950 [14] | Transaction used in TS 29.232 [5] | Supported | Comment |
| Reserve IMS Connection point | Not defined | Not Defined | Mandatory | See A.17.2. 2 |
| Configure IMS Resources | Not Defined | Not Defined | Mandatory | See A.17.2. 3 |
| Reserve IMS Connection Point and configure remote resources | Not defined | Not Defined | Mandatory | See A.17.2. 4 |
| Release IMS termination | n. a. for reuse | Release Termination | Mandatory | See A.17.2. 5 |
| Change IMS ThroughConnection | n. a. for reuse | Change Through Connection | Mandatory | only the Explicit (MGC Controlled Cut-Through) procedure is supported |
| Detect IMS RTP Tel Event | n. a. for reuse | Detect DTMF | Optional | Only applicable if termination towards IMS is connected with a termination towards a BICC network. |
| End IMS RTP Tel Event | n. a. for reuse | Stop Detect DTMF | Optional | Only applicable if termination towards IMS is connected with a termination towards a BICC network. |
| Notify IMS RTP Tel Event | n. a. for reuse | Report DTMF | Optional | Only applicable if termination towards IMS is connected with a termination towards a BICC network. |
| Send IMS RTP Tel Event | n. a. for reuse | Send DTMF | FFS |  |
| Stop IMS RTP Tel Event | n. a.for reuse | Stop DTMF | FFS |  |
| IMS Send Tone | n. a. for reuse | Send Tone | Optional |  |
| IMS Stop Tone | n. a. for reuse | Stop Tone | Optional |  |
| IMS Tone Completed | n. a. for reuse | Tone Completed | Optional |  |
| Termination heartbeat Indication | Not defined | Termination hearbeat Indication | Mandatory | To allow detection of hanging contexts and terminations in the MGW that may result e.g. from a loss of communication between the MGCF and the IM-MGW. |
| IMS Bearer Released | n. a. for reuse. | Bearer Released | Mandatory |  |
| Request RTCP-Interworking | Not defined | Not defined | Optional | Only applicable if RTCP AVPF message to feedback on the quality of the media distribution from the IMS side is required to be interworked with corresponding H.245 message towards the CS side. |
| Notify of RTCP-Interworking | Not defined | Not defined | Optional | Only applicable if RTCP AVPF message to feedback on the quality of the media distribution from the IMS side is required to be interworked with corresponding H.245 message towards the CS side. |
| Signal H.245-Interworking | Not defined | Not defined | Optional | Only applicable if H.245 message to feedback on the quality of the media distribution from the CS side is required to be interworked with corresponding RTCP AVPF messag towards the IMS side. |
| ECN Failure Indication | Not defined | ECN Failure Indication | Optional | Only applicable if ECN capability is supported. |
| ICE Connectivity Check Result Notification | Not defined | Optional | Optional | See A.17.2.11  Only applicable if full ICE is supported |
| ICE New Peer Reflexive Candidate Notification | Not defined | Optional | Optional | See A.17.2.12  Only applicable if full ICE is supported |
| NOTE 1: A procedure defined in table 13.2.1 can be combined with another procedure in the same 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. | | | | |

#### A.17.2.2 Reserve IMS Connection Point

When the procedure "Reserve IMS Connection Point" is required the following procedure is initiated:

The MGCF sends an Add.req command with the following information.

1 Add.req (Reserve IMS Connection Point) MGCF to IM-MGW

Table A.17.2.2/1: Reserve IMS Connection Point Request

|  |  |  |
| --- | --- | --- |
| Address Information | Control information | Bearer information |
| Stream ID  Local Descriptor {  Port = ?  IP Address = ?  } | Transaction ID = z  Termination ID = ?  If Context Requested:  Context ID = ?  If Context Provided:  Context ID = c1  If MPS call/session:  Priority Indicator = x  If IP Interface Type:  IP interface = "IP interface type"  If Resources for multiple Codecs shall be reserved:  Reserve\_Value  NotificationRequested (Event ID = x,  "termination heartbeat")  If indication on Bearer Released requested:  NotificationRequested (Event ID = x, "BNC Release (Cause)") – as defined in ITU‑T Recommendation Q.1950  If multiple IP realms: IP realm Identifier = required IP realm identifier  If ECN Endpoint support required  ECN Enable = "True"  Initiation Method = "ECN Initiation  Method"  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 | Stream ID  Local Descriptor {  Codec List  RTP Payloads  RtcpbwRS  RtcpbwRR  If ICE is applied:  ICE host candidate request  ICE password request  ICE Ufrag request  If SDPCapNeg is signalled to the gateway:  SDPCapNeg configuration  } |

When the processing of command (1) is complete, the IM-MGW initiates the following procedure.

2 Add.resp (Reserve IMS Connection Point Ack)

Table A.17.2.2/2: Reserve IMS Connection Point Acknowledge

|  |  |  |
| --- | --- | --- |
| Address Information | Control information | Bearer information |
| Stream ID  Local Descriptor {  Port  IP Address  } | Transaction ID  Termination ID  Context ID | Stream ID  Local Descriptor {  Codec List  RTP Payloads  RtcpbwRS  RtcpbwRR  If ICE is applied:  ICE host candidate  ICE password  ICE Ufrag  If ICE lite implementation  ICE lite indication  If SDPCapNeg is signalled to the gateway:  SDPCapNeg configuration  } |

#### A.17.2.3 Configure IMS Resources

When the procedure "Configure IMS Resources" is required the following procedure is initiated:

The MGCF sends a Mod.req command with the following information.

1 Mod.req (Configure IMS Resources) MGCF to IM-MGW

Table A.17.2.3/1: Configure IMS Resources Request

|  |  |  |
| --- | --- | --- |
| Address Information | Control information | Bearer information |
| If local resources are modified:  Stream ID  Local Descriptor {  Port  IP Address  }  If remote resources are modified:  Remote Descriptor {  Port  IP Address  } | Transaction ID  Termination ID  Context ID  If IP Interface Type:  IP interface = "IP interface type"(NOTE 1)  If Resources for multiple Codecs shall be reserved:  Reserve\_Value  If ECN Endpoint support required  ECN Enable = "True"  Initiation Method = "ECN Initiation  Method"  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 local resources are modified:  Stream ID  Local Descriptor {  Codec List  RTP Payloads  RtcpbwRS  RtcpbwRR  If SDPCapNeg is signalled to the gateway:  SDPCapNeg configuration  }  If remote resources are modified:  Remote Descriptor {  Codec List  RTP Payloads  If rate adaptation for media  endpoints:  Additional Bandwidth  Properties (NOTE 3)  RtcpbwRS  RtcpbwRR  If RTCP APP messages allowed  Allowed RTCP APP message  types  If ICE is applied:  ICE received candidate  ICE received password  ICE received Ufrag  (NOTE 2)  If SDPCapNeg is signalled to the gateway:  SDPCapNeg configuration  } |
| NOTE 1: If this property is included within the "Reserve IMS Connection Point" procedure or the "Reserve IMS Connection Point and configure remote resource" procedure then it shall not be modified by this procedure.  NOTE 2: The support of ICE received candidate, ICE received password, ICE received Ufrag are optional for ICE lite, as specified in 3GPP TS 23.232 [5].  NOTE 3: The support of rate adaptation for media endpoints using the additional bandwidth properties is optional for the IM-MGW. If media transcoding is required the MGCF may provide for the selected payload type and the used IP version the additional bandwidth properties. | | |

When the processing of command (1) is complete, the IM-MGW initiates the following procedure.

2 Mod.resp (Configure IMS Resources Ack)

Table A.17.2.3/2: Configure IMS Resources Acknowledge

|  |  |  |
| --- | --- | --- |
| Address Information | Control information | Bearer information |
| If local resources were provided in request:  Stream ID  Local Descriptor {  Port  IP Address  }  If remote resources were provided in request:  Remote Descriptor {  Port  IP Address  } | Transaction ID  Context ID  Termination ID | If local resources were provided in request:  Stream ID  Local Descriptor {  Codec List  RTP Payloads  RtcpbwRS  RtcpbwRR  If SDPCapNeg is signalled to the gateway:  SDPCapNeg configuration  }  If remote resources were provided in request:  Remote Descriptor {  Codec List  RTP Payloads  If rate adaptation for media  endpoints:  Additional Bandwidth  Properties  RtcpbwRS  RtcpbwRR  If SDPCapNeg is signalled to the gateway:  SDPCapNeg configuration  } |

#### A.17.2.4 Reserve IMS Connection Point and configure remote resources

When the procedure "Reserve IMS Connection Point and configure remote resources" is required the following procedure is initiated:

The MGCF sends an Add.req command with the following information.

1 Add.req (Reserve IMS Connection Point and configure remote resources) MGCF to IM-MGW

Table A.17.2.4/1: Reserve IMS Connection Point and configure remote resources Request

|  |  |  |
| --- | --- | --- |
| Address Information | Control information | Bearer information |
| Stream ID  Local Descriptor {  Port = ?  IP Address = ?  }  Remote Descriptor {  Port  IP Address  } | Transaction ID  Termination ID = ?  If Context Requested:  Context ID = ?  If Context Provided:  Context ID = c1  If MPS call/session:  Priority Indicator = x  If IP Interface Type:  IP interface = "IP interface type"  If Resources for multiple Codecs shall be reserved:  Reserve\_Value  NotificationRequested (Event ID = x,  "termination heartbeat")  If indication on Bearer Released requested:  NotificationRequested (Event ID = x, "BNC Release (Cause)") – as defined in ITU‑T Recommendation Q.1950  If multiple IP realms: IP realm Identifier = required IP realm identifier  If ECN Endpoint support required  ECN Enable = "True"  Initiation Method = "ECN Initiation  Method"  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")  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 ") | Stream ID  Local Descriptor {  Codec List  RTP Payloads  RtcpbwRS  RtcpbwRR  If ICE is applied:  ICE host candidate request  ICE password request  ICE Ufrag request  If SDPCapNeg is signalled to the gateway:  SDPCapNeg configuration  }  Remote Descriptor {  Codec List  RTP Payloads  If rate adaptation for media  endpoints:  Additional Bandwidth Properties (NOTE 2)  RtcpbwRS  RtcpbwRR  If RTCP APP messages allowed  Allowed RTCP APP message  types  If ICE is applied:  ICE received candidate  ICE received password  ICE received Ufrag  (NOTE 1)  If SDPCapNeg is signalled to the gateway:  SDPCapNeg configuration  } |
| NOTE 1: The support of ICE received candidate, ICE received password, ICE received Ufrag are optional for ICE lite, as specified in 3GPP TS 23.232 [5].  NOTE 2: The support of rate adaptation for media endpoints using the additional bandwidth properties is optional for the IM-MGW. If media transcoding is required the MGCF may provide for the selected payload type and the used IP version the additional bandwidth properties. | | |

When the processing of command (1) is complete, the IM-MGW initiates the following procedure.

2 Add.resp (Reserve IMS Connection Point and configure remote resources Ack)

Table A.17.2.4/2: Reserve IMS Connection Point and configure remote resources Acknowledge

|  |  |  |
| --- | --- | --- |
| Address Information | Control information | Bearer information |
| Stream ID  Local Descriptor {  Port  IP Address  }  Remote Descriptor {  Port  IP Address  } | Transaction ID  Termination ID  Context ID | Stream ID  Local Descriptor {  Codec List  RTP Payloads  RtcpbwRS  RtcpbwRR  If ICE is applied:  ICE host candidate  ICE password  ICE Ufrag  If ICE lite implementation  ICE lite indication  If SDPCapNeg is signalled to the gateway:  SDPCapNeg configuration  }  Remote Descriptor {  Codec List  RTP Payloads  If rate adaptation for media  endpoints:  Additional Bandwidth Properties  RtcpbwRS  RtcpbwRR  If SDPCapNeg is signalled to the gateway:  SDPCapNeg configuration  } |

#### A.17.2.5 VOID

#### A.17.2.6 Termination heartbeat indication

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

Table A.17.2.6/1: NOT.req (Termination heartbeat) MGW to MGC

|  |  |  |
| --- | --- | --- |
| Address Information | Control information | Bearer information |
|  | Transaction ID = z  Context ID = c1  Termination ID = bearer1  Event\_ID (Event ID = x,  "termination heartbeat") |  |

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

Table A.17.2.6/2: NOT.resp (Termination heartbeat) MGC to MGW

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

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

The MGCF is in charge of correcting any detected mismatch, by substracting hanging terminations or clearing hanging contexts as specified for the hanging termination detection procedure in 3GPP TS 29.163 [4].

#### A.17.2.7 Request RTCP-Interworking

When the procedure "Request RTCP-Interworking" is required the following procedure is initiated:

the MGCF sends a Mod.req command with the following information.

Table A.17.2.7/1: Request RTCP-Interworking Request

|  |  |  |
| --- | --- | --- |
| Address Information | Control information | Bearer information |
|  | Transaction ID = z  Context ID = c1  Termination ID = bearer1  NotificationRequested (Event ID = x, "Incoming RTCP Interworking (RTCP Filter)") |  |

When the processing of command is complete, the IM-MGW initiates the following procedure.

Table A.17.2.7/2: Request RTCP-Interworking Acknowledge

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

#### A.17.2.8 Notify RTCP-Interworking

When the procedure "Notify RTCP-Interworking" is required the following procedure is initiated:

the IM-MGW sends a NOT.req command with the following information.

Table A.17.2.8/1: Notify RTCP-Interworking Request

|  |  |  |
| --- | --- | --- |
| Address Information | Control information | Bearer information |
|  | Transaction ID = z  Context ID = c1  Termination ID = bearer1  if RTCP PLI message received and the interworking required:  Update Picture = UpdatePicture\_Event  if RTCP TMMBR message received and the interworking required:  Max BitRate = MaxBitRate\_Event |  |

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

Table A.17.2.8/2: Notify RTCP-Interworking Acknowledge

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

The MGCF is in charge of sending the corresponding H.245 message to the CS side to request for the media adaption. as specified for the "Interworking between RTCP messages and H.245 messages" in 3GPP TS 29.163 [4].

#### A.17.2.9 Signal H.245-Interworking

When the procedure "Signal H.245-Interworking" is required the following procedure is initiated:

the MGCF sends a Mod.req command with the following information.

Table A.17.2.9/1: Signal H.245-Interworking Request

|  |  |  |
| --- | --- | --- |
| Address Information | Control information | Bearer information |
|  | Transaction ID = z  Context ID = c1  Termination ID = bearer1  if H.245 VideoFastUpdatePicture message received and the interworking required:  Interwork H.245-RTCP (UpdatePicture\_Signal)  if H.245 Flow Control Command received and the interworking required:  Interwork H.245-RTCP (MaxBitRate\_Signal) |  |

When the processing of command is complete, the IM-MGW initiates the following procedure.

Table A.17.2.9/2: Signal H.245-Interworking Acknowledge

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

The IM-MGW is in charge of constructing and sending the corresponding RTCP message to the IMS side to request for the media adaption as specified for the "Interworking between RTCP messages and H.245 messages" in 3GPP TS 29.163 [4].

#### A.17.2.10 ECN Failure Indication

The IM-MGWsends a NOTIFY request command as in Table A.17.2.10.1.

Table A.17.2.10.1: 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 MGCF responds as in Table A.17.2.10.2

Table A.17.2.10.2: ECN Failure Indication Ack

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

#### A.17.2.11 ICE Connectivity Check Result Notification

The IM-MGW sends a NOTIFY request command as defined in Table A.17.2.11.1.

Table A.17.2.11.1: 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 MGCF responds as defined in Table A.17.2.11.2

Table A.17.2.11.2: ICE Connectivity Check Result Notification Ack

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

#### A.17.2.12 ICE New Peer Reflexive Candidate Notification

The IM-MGW sends a NOTIFY request command as defined in Table A.17.2.12.1.

Table A.17.2.12.1: 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 MGCF responds as defined in Table 5.17.2.12.2

Table A.17.2.12.2: ICE New Peer Reflexive Candidate Ack

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

### A.17.3 TDM Terminations Procedures

#### A.17.3.1 Summary Procedures related to a termination towards ISUP

Table A.17.3.1/1: Correspondence between ITU-T Recommendation Q.1950 [14] or 29.232 [5] call-related transactions and 3GPP TS 29.163 [4] procedures related to a termination towards an ISUP network

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Procedure defined in 3GPP TS 29.163 [4] | Transaction used in ITU-T Q.1950 [14] | Transaction used in TS 29.232 [5] | Support | Comment |
| Reserve TDM Circuit | n. a. for reuse | n. a. for reuse, (NOTE 2) | Optional  (NOTE 4) | See Clause A.17.3.2 |
| Change TDM Through-connection | n. a. for reuse | Change Through-connection | Optional  (NOTE 4) | only the Explicit (MGC Controlled Cut-Through) procedure is supported |
| Activate TDM voice-processing function | n. a. for reuse | Activate Voice Processing Function | Optional  (NOTE 4) |  |
| Send TDM Tone | n. a. for reuse | Send Tone | Optional  (NOTE 4) |  |
| Stop TDM Tone | n. a. for reuse | Stop Tone | Optional  (NOTE 4) |  |
| TDM Tone Completed | n. a. for reuse | Tone Completed | Optional  (NOTE 4) |  |
| Play TDM Announcement | n. a. for reuse | Play Announcement | Optional  (NOTE 4) |  |
| TDM Announcement Completed | n. a. for reuse | Announcement Completed | Optional  (NOTE 4) |  |
| Stop TDM Announcement | n. a. for reuse | Stop Announcement | Optional  (NOTE 4) |  |
| Continuity Check | Continuity Check Tone | n. a. for reuse | Optional  (NOTE 4) | The addition to "Prepare BNC Notify" defined in Annex B.7.1.1 of Q.1950 [14] shall be applied instead to "Reserve TDM Circuit", as defined in Clause A.17.3.2 |
| Continuity Check Verify | Continuity Check Verify | Continuity Check Verify | Optional  (NOTE 4) |  |
| Continuity Check Response | Continuity Check Response | n. a. for reuse | Optional  (NOTE 4) | The addition to "Prepare BNC Notify" defined in Annex B.7.1.2 of Q.1950 [14] shall be applied instead to "Reserve TDM Circuit", as defined in Clause A.17.3.2 |
| Release TDM Termination | n. a. for reuse | n. a. for reuse | Optional  (NOTE 4) | See Clause A.17.3.3 |
| Termination heartbeat Event | Not defined | Termination heartbeat Indication | Optional | See Clause A.17.3.4 |
| Not defined | Not defined | TFO Activation | Optional | See Clause A.14.21 |
| Not defined | Not defined | Codec Modify | Optional | See Clause A.14.21 |
| Not defined | Not defined | Optimal Codec and Distant List\_Notify | Optional | See Clause A.14.21 |
| Not defined | Not defined | Distant Codec List | Optional | See Clause A.14.21 |
| Not defined | Not defined | TFO status Notify | Optional | See Clause A.14.21 |
| Not defined | Not defined | TFO status | Optional | See Clause A.14.21 |
| Bearer Released | n. a. for reuse. | Bearer Released | Optional  (NOTE 4) |  |
| NOTE 1: A procedure defined in table 13.2.2 can be combined with another procedure in the same 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.  NOTE 2: The reserve circuit procedure of 29.232 is not to be used only a reduced set of the parameters is required for reserve TDM circuit.  NOTE 3: VOID  NOTE 4: Required for TDM terminations towards an ISUP based network  . | | | | |

#### A.17.3.2 Reserve TDM Circuit

When the procedure "Reserve TDM Circuit" is required the following procedure is initiated:

The MGCF sends an Add.req command with the following information.

Table A.17.3.2/1: Add.req (Reserve TDM Circuit) MGCF to IM-MGW

|  |  |  |
| --- | --- | --- |
| Address Information | Control information | Bearer information |
|  | Transaction ID  Termination ID  If Context Requested:  Context ID = ?  If Context Provided:  Context ID = c1  If detection of hanging termination is requested:  NotificationRequested (Event ID = x,  "termination heartbeat")  If indication on Bearer Released requested:  NotificationRequested (Event ID = x, "BNC Release (Cause)") – as defined in ITU‑T Recommendation Q.1950 | Bearer Service Characteristics |

When the processing of command (1) is complete, the IM-MGW initiates the following procedure.

Table A.17.3.2/2: Add.resp (Reserve TDM Circuit) IM-MGW to MGCF

|  |  |  |
| --- | --- | --- |
| Address Information | Control information | Bearer information |
|  | Transaction ID  Termination ID  Context ID |  |

#### A.17.3.3 Release TDM Termination

When the procedure "Release TDM Termination" is required the following procedure is initiated:

The MGCF sends an Sub.req command with the following information.

Table A.17.3.3/1: Sub.req (Release TDM Termination) MGCF to IM-MGW

|  |  |  |
| --- | --- | --- |
| Address Information | Control information | Bearer information |
|  | Transaction ID  Termination ID  Context ID |  |

When the processing of command (1) is complete, the IM-MGW initiates the following procedure.

Table A.17.3.3/2: Sub.resp (Release TDM Termination) IM-MGW to MGCF

|  |  |  |
| --- | --- | --- |
| Address Information | Control information | Bearer information |
|  | Transaction ID  Termination ID  Context ID |  |

#### A.17.3.4 Termination heartbeat indication

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

Table A.17.3.4/1: NOT.req (Termination heartbeat) MGW to MGC

|  |  |  |
| --- | --- | --- |
| Address Information | Control information | Bearer information |
|  | Transaction ID = z  Context ID = c1  Termination ID = bearer1  Event\_ID (Event ID = x,  "termination heartbeat") |  |

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

Table A.17.3.4/2: NOT.resp (Termination heartbeat) MGC to MGW

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

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

The MGCF is in charge of correcting any detected mismatch, by substracting hanging terminations or clearing hanging contexts as specified for the hanging termination detection procedure in 3GPP TS 29.163 [4].

### A.17.4 BICC Terminations Procedures

#### A.17.4.1 Procedures related to a termination towards BICC

Table A.17.4.1/1: Correspondence between ITU-T Recommendation Q.1950 [14] or 3GPP TS 29.232 [5] call-related transactions and 3GPP TS 29.163 [4] procedures related to a termination towards a BICC network

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Procedure defined in 3GPP TS 29.163 [4] | Transaction used in Q.1950 [14] | Transaction used in TS 29.232 [5] | Support | Comment |
| Establish Bearer | Establish\_BNC\_Notify +(tunnel) | Establish Bearer (NOTE 1) | Optional  (NOTE 5) |  |
| Prepare Bearer | Prepare\_BNC\_Notify +(tunnel) | Prepare Bearer (NOTE 1), (NOTE 2) | Optional  (NOTE 5) |  |
| Change Through-Connection | n. a. for reuse | Change Through-Connection | Optional  (NOTE 5) | only the Explicit (MGC Controlled Cut-Through) procedure is supported |
| Release Bearer | n. a. for reuse | Release Bearer | Optional  (NOTE 5) | (NOTE 3) |
| Release Termination | n. a. for reuse | Release Termination | Optional  (NOTE 5) | Includes Subtract in the transaction. Statistics about "Ctmbits" are not applicable in Sub.resp |
| Bearer Established | n. a. for reuse | Bearer Established | Optional  (NOTE 5) |  |
| Bearer Released | n. a. for reuse | Bearer Released | Optional  (NOTE 5) |  |
| Send Tone | n. a. for reuse | Send Tone | Optional  (NOTE 5) |  |
| Stop Tone | n. a. for reuse | Stop Tone | Optional  (NOTE 5) |  |
| Tone Completed | n. a. for reuse | Tone Completed | Optional  (NOTE 5) |  |
| Play Announcement | n. a. for reuse | Play Announcement | Optional  (NOTE 5) |  |
| Stop Announcement | n. a. for reuse | Stop Announcement | Optional  (NOTE 5) |  |
| Announcement Completed | n. a. for reuse | Announcement Completed n | Optional  (NOTE 5) |  |
| Bearer Modification Support | Not defined | Bearer Modification Support | Optional  (NOTE 5) |  |
| Confirm Char | Confirm\_Char | Confirm Bearer Characterictics (NOTE 1) | Optional  (NOTE 6) |  |
| Modify Bearer Characteristics | Modify Char | Modify Bearer Characteristics (NOTE 1) | Optional  (NOTE 6) |  |
| Reserve Char | Reserve\_Char\_Notify | Reserve Bearer Characteristics (NOTE 1) | Optional  (NOTE 6) |  |
| Bearer Modified | BNC Modified | Bearer Modified | Optional  (NOTE 6) |  |
| Activate Voice Processing Function | n. a. for reuse | Activate Voice Processing Function | Optional  (NOTE 5) |  |
| Tunnel Information Down | Tunnel (MGC-MGW) | Tunnel Information Down | Optional  (NOTE 7) | For IP Transport at BICC termination |
| Tunnel Information Up | Tunnel (MGW-MGC) | Tunnel Information Up | Optional  (NOTE 7) | For IP Transport at BICC termination |
| Termination heartbeat | Not defined | Termination heartbeat indication | Mandatory |  |
| Not defined | Not defined | TFO Activation | Optional |  |
| Not defined | Not defined | Codec Modify | Optional |  |
| Not defined | Not defined | Optimal Codec and Distant List\_Notify | Optional |  |
| Not defined | Not defined | Distant Codec List | Optional |  |
| Not defined | Not defined | TFO status Notify | Optional |  |
| Not defined | Not defined | TFO status | Optional |  |
| NOTE 1: The procedure is only applicable if the Nb framing protocol is applied at the BICC termination. Only requesting of Observed events defined in the corresponding TS 29.232 and parameters defined in the "3GUP" package of TS 29.232 are applicable in addition the parameters of the corresponding Q.1950 procedure. Those parameters shall be applies as follows: UP mode = Supported mode; UP versions = 2; interface = CN;  NOTE 2: Parameters and Observed events defined for Cellular Text telephone Modem Text Transport in the corresponding procedure of TS 29.232 are not applicable.  NOTE 3: VOID  NOTE 4: VOID  NOTE 5: Necessary for optional terminations towards BICC  NOTE 6: Optional for optional terminations towards BICC  NOTE 7: Necessary for optional terminations towards BICC network with IP transport | | | | |

### A.17.5 Multiplex Termination Procedures

#### A.17.5.1 Procedures related to a Multiplex termination

Table A.17.5.1/1: Correspondence between ITU-T Recommendation Q.1950 [14] or 3GPP TS 29.232 [5] call-related transactions and 3GPP TS 29.163 [4] procedures related to a multiplex termination

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Procedure defined in 3GPP TS 29.163 [4]** | **Transaction used in Q.1950 [14]** | **Transaction used in TS 29.232 [5]** | **Support** | **Comment** |
| Add Multiplex Termination | Not defined | Not defined | Optional  (NOTE 1) | See A.17.5.2 |
| Configure Multiplex Termination | Not defined | Not defined | Optional  (NOTE 1) | See A.17.5.3 |
| Signal H245 Message | Not defined | Not defined | Optional  (NOTE 1) | See A.17.5.4 |
| Notify H245 message | Not defined | Not defined | Optional  (NOTE 1) | See A.17.5.5 |
| Notify MONA Preference Reception | Not defined | Not defined | Optional  (NOTE 1) | See A.17.5.6 |
| Notify MONA Preference Completed | Not defined | Not defined | Optional  (NOTE 1) | See A.17.5.7 |
| Signal SPC | Not defined | Not defined | Optional  (NOTE 1) | See A.17.5.8 |
| Notify SPC | Not defined | Not defined | Optional  (NOTE 1) | See A.17.5.9 |
| Notify MPC | Not defined | Not defined | Optional  (NOTE 1) | See A.17.5.10 |
| Notify Detection of Legacy Interworking | Not defined | Not defined | Optional  (NOTE 1) | See A.17.5.11 |
| Stop MPC | Not defined | Not defined | Optional  (NOTE 1) | See A.17.5.12 |
| Stop SPC | Not defined | Not defined | Optional  (NOTE 1) | See A.17.5.13 |
| Stop MONA Negotiation | Not defined | Not defined | Optional  (NOTE 1) | See A.17.5.14 |
| NOTE 1: Necessary for interworking of multimedia calls | | | | |

#### A.17.5.2 Add Multiplex Termination

When the procedure "Add Multiplex Termination" is required the following procedure is initiated:

The MGCF sends an Add.req command with the following information.

1 Add.req (Add Multiplex Termination) MGCF to IM-MGW

Table A.17.5.2/1: Add Multiplex Termination Request

|  |  |  |
| --- | --- | --- |
| **Address Information** | **Control information** | **Bearer information** |
|  | Transaction ID = z  Context ID = c1  Termination ID = ?  Muxdescriptor  If MONA procedures not supported:  NotificationRequested (Event ID = x,  "Incoming H245 message")  f MONA procedures supported:  NotificationRequested (Event ID = x,  "Incoming H245 message (SPC=Both)")  NotificationRequested (Event ID = x,  "termination heartbeat")  If indication on Bearer Released requested:  NotificationRequested (Event ID = x, "BNC Release (Cause)") – as defined in ITU‑T Recommendation Q.1950  If MONA procedures supported:  Signal = Outgoing MONA preferences  (Outgoing MONA preference content) (NOTE)  NotificationRequested (Event ID = x,  "MONA Preference recv")  NotificationRequested (Event ID = x,  "MONA Preference completed")  NotificationRequested (Event ID = x,  "Legacy Interworking Detected" (Signal = Outgoing H245 message  (Outgoing H.245 message content)  ) )  NotificationRequested (Event ID = x,  "Mona Preference Channel reception")  Signal = Forward media in MPC (MPC MUX Code)    Incoming Multiplex Table |  |
| NOTE: The frequent retransmissions of MONA preference messages required by MONA procedures are to be performed by the IM-MGW autonomously to avoid unnecessary load at the Mn interface and the MGCF. | | |

On receipt of this procedure, and the setting of the muxdescriptor, the IM-MGW shall initiate the H.324 negotiation, with connection mode H.324M and predefined Highest Multiplexing Level.

When the processing of command (1) is complete, the IM-MGW initiates the following procedure.

2 Add.resp (Add Multiplex Termination Ack)

Table A.17.5.2/2: Add Multiplex Termination Acknowledge

|  |  |  |
| --- | --- | --- |
| **Address Information** | **Control information** | **Bearer information** |
|  | Transaction ID = z  Context ID = c1  Termination ID = mux1 |  |

#### A.17.5.3 Configure Multiplex Termination

When the procedure "Configure Multiplex Termination" is required the following procedure is initiated:

The MGCF sends an Mod.req command with the following information.

1 Mod.req (Configure Multiplex Termination) MGCF to IM-MGW

Table A.17.5.3/1: Configure Multiplex Termination Request

|  |  |  |
| --- | --- | --- |
| **Address Information** | **Control information** | **Bearer information** |
|  | Transaction ID = z  Context ID = c1  Termination ID = mux1  If MONA completed or MONA not supported:  Remote H223 Capability  Incoming Multiplex table  Outgoing Multiplex table  If MONA MPC sending is requested:  Signal = Forward media in MPC (MPC MUX Code) |  |

When the processing of command (1) is complete, the IM-MGW initiates the following procedure.

2 Mod.resp (Configure Multiplex Termination Ack)

Table A.17.5.3/2: Configure Multiplex Termination Acknowledge

|  |  |  |
| --- | --- | --- |
| **Address Information** | **Control information** | **Bearer information** |
|  | Transaction ID = z  Context ID = c1  Termination ID = mux1 |  |

#### A.17.5.4 Signal H245 Message

When the procedure "Signal H245 Message" is required the following procedure is initiated:

The MGCF sends an Mod.req command with the following information.

1 Mod.req (Signal H245 Message) MGCF to IM-MGW

Table A.17.5.4/1: Signal H245 Message Request

|  |  |  |
| --- | --- | --- |
| **Address Information** | **Control information** | **Bearer information** |
|  | Transaction ID = z  Context ID = c1  Termination ID = mux1  Signal = Outgoing H245 message  (Outgoing H.245 message content) |  |

When the processing of command (1) is complete, the IM-MGW initiates the following procedure.

2 Mod.resp (Signal H245 Message Ack)

Table A.17.5.4/2: Signal H245 Message Acknowledge

|  |  |  |
| --- | --- | --- |
| **Address Information** | **Control information** | **Bearer information** |
|  | Transaction ID = z  Context ID = c1  Termination ID = mux1 |  |

#### A.17.5.5 Notify H.245 Message

When the procedure "Notify H.245 message" is required the following procedure is initiated: the IM-MGW sends a NOT.req command with the following information.

1 Not.req (Notify H245 Message) IM-MGW to MGCF

Table A.17.5.5/1: Notify H245 Message Request

|  |  |  |
| --- | --- | --- |
| Address Information | Control information | Bearer information |
|  | Transaction ID = z  Context ID = c1  Termination ID = mux1  Event\_ID (Event ID = x,  "Incoming H245 message (H245 message content)") |  |

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

2 Not.resp (Notify H245 Message Ack) MGCF to IM-MGW

Table A.17.5.5/2: Notify H245 Message Acknowledge

|  |  |  |
| --- | --- | --- |
| Address Information | Control information | Bearer information |
|  | Transaction ID = z  Context ID = c1  Termination ID = mux1 |  |

#### A.17.5.6 Notify MONA Preference Reception

When the procedure "Notify MONA Preference Reception" is required the following procedure is initiated: the IM-MGW sends a NOT.req command with the following information.

1 Not.req (Notify MONA Preference Reception) IM-MGW to MGCF

Table A.17.5.6/1: Notify MONA Preference Reception Request

|  |  |  |
| --- | --- | --- |
| Address Information | Control information | Bearer information |
|  | Transaction ID = z  Context ID = c1  Termination ID = mux1  Event\_ID (Event ID = x,  "MONA Preference recv (MONA preference message content)") |  |

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

2 Not.resp (Notify MONA Preference Reception) MGCF to IM-MGW

Table A.17.5.6/2: Notify MONA Preference Reception Acknowledge

|  |  |  |
| --- | --- | --- |
| Address Information | Control information | Bearer information |
|  | Transaction ID = z  Context ID = c1  Termination ID = mux1 |  |

#### A.17.5.7 Notify MONA Preference Completed

When the procedure "Notify MONA Preference Completed" is required the following procedure is initiated: the IM-MGW sends a NOT.req command with the following information.

1 Not.req (Notify MONA Preference Completed) IM-MGW to MGCF

Table A.17.5.7/1: Notify MONA Preference Completed Request

|  |  |  |
| --- | --- | --- |
| Address Information | Control information | Bearer information |
|  | Transaction ID = z  Context ID = c1  Termination ID = mux1  Event\_ID (Event ID = x,  "MONA Preference completed ") |  |

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

2 Not.resp (Notify MONA Preference Completed) MGCF to IM-MGW

Table A.17.5.7/2: Notify MONA Preference Completed Acknowledge

|  |  |  |
| --- | --- | --- |
| Address Information | Control information | Bearer information |
|  | Transaction ID = z  Context ID = c1  Termination ID = mux1 |  |

#### A.17.5.8 Signal SPC

When the procedure "Signal SPC" is required the following procedure is initiated:

The MGCF sends an Mod.req command with the following information.

1 Mod.req (Signal SPC) MGCF to IM-MGW

Table A.17.5.8/1: Signal SPC Request

|  |  |  |
| --- | --- | --- |
| **Address Information** | **Control information** | **Bearer information** |
|  | Transaction ID = z  Context ID = c1  Termination ID = mux1  Signal = Outgoing H245 message  (Outgoing H.245 message content, SPC Out=ON) |  |

When the processing of command (1) is complete, the IM-MGW initiates the following procedure.

2 Mod.resp (Signal SPC Ack)

Table A.17.5.8/2: Signal SPC Acknowledge

|  |  |  |
| --- | --- | --- |
| **Address Information** | **Control information** | **Bearer information** |
|  | Transaction ID = z  Context ID = c1  Termination ID = mux1 |  |

#### A.17.5.9 Notify SPC

When the procedure "Notify SPC" is required the following procedure is initiated: the IM-MGW sends a NOT.req command with the following information.

1 Not.req (Notify SPC) IM-MGW to MGCF

Table A.17.5.9/1: Notify SPC Request

|  |  |  |
| --- | --- | --- |
| Address Information | Control information | Bearer information |
|  | Transaction ID = z  Context ID = c1  Termination ID = mux1  Event\_ID (Event ID = x,  "(Incoming H245 message (H245 message content, SPC In=ON)") |  |

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

2 Not.resp (Notify SPC Ack) MGCF to IM-MGW

Table A.17.5.9/2: Notify SPC Acknowledge

|  |  |  |
| --- | --- | --- |
| Address Information | Control information | Bearer information |
|  | Transaction ID = z  Context ID = c1  Termination ID = mux1 |  |

#### A.17.5.10 Notify MPC

When the procedure "Notify MPC" is required the following procedure is initiated: the IM-MGW sends a NOT.req command with the following information.

1 Not.req (Notify MPC) IM-MGW to MGCF

Table A.17.5.10/1: Notify MPC Request

|  |  |  |
| --- | --- | --- |
| Address Information | Control information | Bearer information |
|  | Transaction ID = z  Context ID = c1  Termination ID = mux1  Event\_ID (Event ID = x,  "(Mona Preference Channel reception (Muxcode)") |  |

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

2 Not.resp (Notify MPC Ack) MGCF to IM-MGW

Table A.17.5.10/2: Notify MPC Acknowledge

|  |  |  |
| --- | --- | --- |
| Address Information | Control information | Bearer information |
|  | Transaction ID = z  Context ID = c1  Termination ID = mux1 |  |

#### A.17.5.11 Notify Detection of Legacy Interworking

When the procedure "Notify Detection of Legacy Interworking " is required the following procedure is initiated: the IM-MGW sends a NOT.req command with the following information.

1 Not.req (Notify Detection of Legacy Interworking) IM-MGW to MGCF

Table A.17.5.11/1: Notify Detection of Legacy Interworking Request

|  |  |  |
| --- | --- | --- |
| Address Information | Control information | Bearer information |
|  | Transaction ID = z  Context ID = c1  Termination ID = mux1  Event\_ID (Event ID = x,  "Legacy Interworking Detected ") |  |

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

2 Not.resp (Notify Detection of Legacy Interworking ) MGCF to IM-MGW

Table A.17.5.11/2: Notify Detection of Legacy Interworking Acknowledge

|  |  |  |
| --- | --- | --- |
| Address Information | Control information | Bearer information |
|  | Transaction ID = z  Context ID = c1  Termination ID = mux1 |  |

#### A.17.5.12 Stop MPC

When the procedure "Stop MPC" is required the following procedure is initiated:

The MGCF sends an Mod.req command with the following information.

1 Mod.req (Stop MPC) MGCF to IM-MGW

Table A.17.5.12/1: Stop MPC Request

|  |  |  |
| --- | --- | --- |
| Address Information | Control information | Bearer information |
|  | Transaction ID = z  Context ID = c1  Termination ID = mux1  Signal = x, NOTE 1  NotificationRequested (Event ID = x, NOTE 2 ) |  |
| NOTE 1: The signal descriptor shall not include the "Forward media in MPC" signal.  NOTE 2: The event descriptor shall not include the "Mona Preference Channel reception" event. | | |

When the processing of command (1) is complete, the IM-MGW initiates the following procedure.

2 Mod.resp (Stop MPC Ack)

Table A.17.5.12/2: Stop MPC Acknowledge

|  |  |  |
| --- | --- | --- |
| Address Information | Control information | Bearer information |
|  | Transaction ID = z  Context ID = c1  Termination ID = mux1 |  |

#### A.17.5.13 Stop SPC

When the procedure "Stop SPC" is required the following procedure is initiated:

The MGCF sends a Mod.req command with the following information.

1 Mod.req (Stop SPC) MGCF to IM-MGW

Table A.17.5.13/1: Stop SPC Request

|  |  |  |
| --- | --- | --- |
| Address Information | Control information | Bearer information |
|  | Transaction ID = z  Context ID = c1  Termination ID = mux1  If legacy H.245 or accelerated H.245 required:  Signal = Outgoing H245 message  (Outgoing H.245 message  content, SPC Out=OFF)  NotificationRequested (Event ID =  x, "Incoming H245 message  (SPC=H245)") NOTE 3  If legacy H.245 or accelerated H.245 not required:  Signal = x, NOTE 1  NotificationRequested (Event ID = x,  NOTE 2 ) |  |
| NOTE 1: The signal descriptor shall not include the "Outgoing H.245 message" signal.  NOTE 2: The event descriptor shall not include the "Incoming H.245 message" event.  NOTE 3: SPC parameter may be omitted, as SPC=H245 is the default value. | | |

When the processing of command (1) is complete, the IM-MGW initiates the following procedure.

2 Mod.resp (Stop SPC Ack)

Table A.17.5.13/2: Stop SPC Acknowledge

|  |  |  |
| --- | --- | --- |
| Address Information | Control information | Bearer information |
|  | Transaction ID = z  Context ID = c1  Termination ID = mux1 |  |

#### A.17.5.14 Stop MONA Negotiation

When the procedure "Stop MONA negotiation" is required the following procedure is initiated:

The MGCF sends a Mod.req command with the following information.

1 Mod.req (Stop MONA Negotiation) MGCF to IM-MGW

Table A.17.5.14/1: Stop MONA Negotiation Request

|  |  |  |
| --- | --- | --- |
| Address Information | Control information | Bearer information |
|  | Transaction ID = z  Context ID = c1  Termination ID = mux1  Signal = x, NOTE 1  NotificationRequested (Event ID = x, NOTE 2 )  If legacy H.245 or accelerated H.245 required:  Signal = Outgoing H245 message  (Outgoing H.245 message  content, SPC Out=OFF)  NotificationRequested (Event ID =  x, "Incoming H245 message  (SPC=H245)") NOTE 3 |  |
| NOTE 1: The signal descriptor shall not include any of the signals "Outgoing MONA preferences" and "Forward media in MPC". If legacy H.245 or accelerated H.245 is not required the signal descriptor shall also not include the "Outgoing H.245 message" signal.  NOTE 2: The event descriptor shall not include any of the events "MONA Preference recv", "MONA Preference completed" and "Mona Preference Channel reception". If legacy H.245 or accelerated H.245 is not required the event descriptor shall also not include the "Incoming H.245 message" event.  NOTE 3: SPC parameter may be omitted, as SPC=H245 is the default value. | | |

When the processing of command (1) is complete, the IM-MGW initiates the following procedure.

2 Mod.resp (Stop MONA Negotiation Ack)

Table A.17.5.14/2: Stop MONA Negotiation Acknowledge

|  |  |  |
| --- | --- | --- |
| Address Information | Control information | Bearer information |
|  | Transaction ID = z  Context ID = c1  Termination ID = mux1 |  |

### A.17.6 SIP-I on Nc Terminations Procedures

#### A.17.6.1 Summary of Procedures related to a termination towards SIP-I on Nc CN Subsystem

The interworking between IMS domain and SIP-I on Nc is specified by 3GPP TS 29.235 [47] which requires the procedures for SIP-I on Nc as specified in 3GPP TS 23.231 [48] Clause 15.2.

Table A.17.6.1/1 shows the relationship between each call-related procedure in ITU‑T Recommendation Q.1950 [14] (see 3GPP TS 29.205 [3]) or TS 29.232 [5] and the corresponding stage 2 procedure defined in 3GPP TS 23.231 [48].

Table A.17.6.1/1: Correspondence between ITU-T Recommendation Q.1950 [14] or 29.232 [5] call-related transactions and 3GPP TS 23.231 [48] procedures

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Procedure defined in 3GPP TS 23.231 [48] | Transaction used in Q.1950 [14] | Transaction used in TS 29.232 [5] | Supported | Comment |
| Reserve RTP Connection Point | Not defined | Reserve RTP Connection Point  (NOTE 2) | Optional  (NOTE1) | See A.17.2. 2 |
| Configure RTP Connection Point | Not Defined | Configure RTP Connection Point  (NOTE 2) | Optional  (NOTE1) | See A.17.2. 3 |
| Reserve and Configure RTP Connection Point | Not defined | Reserve and Configure RTP Connection Point  (NOTE 2) | Optional  (NOTE1) | See A.17.2. 4 |
| Release Termination | n. a. for reuse | Release Termination | Mandatory | Includes Subtract in the transaction. Statistics about "Ctmbits" are not applicable in Sub.resp |
| Change Through-Connection | n. a. for reuse | Change Through-Connection | Optional  (NOTE 1) | only the Explicit (MGC Controlled Cut-Through) procedure is supported |
| Bearer Released | n. a. for reuse | Bearer Released | Optional  (NOTE 1) |  |
| Send Tone | n. a. for reuse | Send Tone | Optional  (NOTE 1) |  |
| Stop Tone | n. a. for reuse | Stop Tone | Optional  (NOTE 1) |  |
| Tone Completed | n. a. for reuse | Tone Completed | Optional  (NOTE 1) |  |
| Play Announcement | n. a. for reuse | Play Announcement | Optional  (NOTE 1) |  |
| Stop Announcement | n. a. for reuse | Stop Announcement | Optional  (NOTE 1) |  |
| Announcement Completed | n. a. for reuse | Announcement Completed n | Optional  (NOTE 1) |  |
| Activate Voice Processing Function | n. a. for reuse | Activate Voice Processing Function | Optional  (NOTE 1) |  |
| Termination heartbeat | Not defined | Termination heartbeat indication | Mandatory |  |
| Not defined | Not defined | TFO Activation | Optional |  |
| Not defined | Not defined | Codec Modify | Optional |  |
| Not defined | Not defined | Optimal Codec and Distant List\_Notify | Optional |  |
| Not defined | Not defined | Distant Codec List | Optional |  |
| Not defined | Not defined | TFO status Notify | Optional |  |
| Not defined | Not defined | TFO status | Optional |  |
| NOTE 1: Mandatory for connections towards SIP-I on Nc.  NOTE 2: The existing IMS Connection Point Procedures are functionally similar to these 29.232 procedures as they were derived from the IMS ones. | | | | |

Annex B (normative):  
Void

Annex C (normative):  
Void

Annex D (informative):  
Change history

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Date** | **TSG #** | **TSG Doc.** | **CR** | **Rev** | **Subject/Comment** | **New** |
| 2004-09 | CN#25 |  |  |  | Approved in CN#25 | 6.0.0 |
| 2005-03 | CN#27 | NP-050045 | 001 | 1 | Introduction Of Formal Profile | 6.1.0 |
|  |  |  | 002 | 1 | Corrections to Mn Specification |  |
| 2005-06 | CT#28 | CP-050208 | 0001 | 4 | Introduction Of Formal Profile | 6.2.0 |
|  |  | CP-050208 | 0005 |  | Inclusion of Insert Digit Procedure at IMS termination |  |
| 2005-09 | CT#29 | CP-050442 | 0007 | 3 | Alignment of Mn Profile with ITU template and Mc interface decisions | 6.3.0 |
|  |  | CP-050454 | 0008 | 3 | Alignment of Mn Profile with TISPAN TMGW | 7.0.0 |
| 2005-12 | CT#30 | CP-050630 | 0015 | 3 | Clean-up of hanging contexts and terminations | 7.1.0 |
|  |  | CP-050619 | 0017 | 1 | Addition of TFO procedure |  |
|  |  | CP-050630 | 0019 | 2 | Add virtual media gateway function |  |
|  |  | CP-050619 | 0022 |  | Alignment with TISPAN |  |
|  |  | CP-050619 | 0023 |  | Open Mn |  |
| 2006-03 | CT#31 | CP-060077 | 0024 | 1 | Add the UDPTL/TCPTL transport and mediatype for T.38 | 7.2.0 |
|  |  | CP-060077 | 0026 | 2 | Clarification the SDP used in the BICC termination |  |
|  |  | CP-060077 | 0028 |  | Remove the redundant symbols |  |
|  |  | CP-060066 | 0030 | 1 | Bearer Released Event to Reserve TDM Circuit procedure |  |
|  |  | CP-060066 | 0032 | 1 | BICC packages in Mn profile |  |
|  |  | CP-060066 | 0034 |  | Service Change Method "Disconnected" and "Failover" removal from Service Changes sent by MGCF |  |
| 2006-06 | CT#32 | CP-060314 | 0037 | 1 | Alignment with TISPAN TGW profile | 7.3.0 |
|  |  | CP-060306 | 0036 | 1 | Corrections to Mn Specification for Inter Vendor Operability |  |
|  |  |  | 0041 |  | Update of Mn profile with packages defined in 29.232 |  |
|  |  |  | 0044 | 1 | Adding of Bearer Released Event to Procedures related to a termination towards IM CN Subsystem |  |
|  |  |  | 0046 | 1 | Mode-change-period support on Mn interface |  |
| 2006-09 | CT#33 | CP-060401 | 0048 | 1 | AuditValue procedure | 7.4.0 |
|  |  | CP-060410 | 0051 |  | Alignment Mn towardsTISPAN Endorsement |  |
|  |  | CP-060410 | 0052 | 2 | Removal of duplicated functionality in body of specification |  |
|  |  | CP-060401 | 0053 | 1 | Definition of the use of mandatory and optional in Mn Profile Template |  |
|  |  | CP-060401 | 0054 | 1 | Missing Procedures Towards IMS |  |
|  |  | CP-060410 | 0055 | 2 | Correction to Terminations chapter |  |
|  |  | CP-060401 | 0058 | 1 | Corrections to Profile Description: Descriptors |  |
|  |  | CP-060401 | 0060 |  | Corrections to Profile Description: Command API |  |
|  |  | CP-060401 | 0062 | 1 | Corrections to Profile Description: Packages |  |
| 2006-12 | CT#34 | CP-060570 | 0068 | 1 | Alignment of Mn towards TISPAN Endorsement | 7.5.0 |
|  |  | CP-060570 | 0069 | 1 | Setting of 3GPP manadatory parameters to conditional |  |
|  |  | CP-060570 | 0074 |  | CR miss implementation Call independent procedures and packages |  |
|  |  | CP-060570 | 0075 | 2 | Removal of TBD for Number of Commands Per Transaction |  |
|  |  | CP-060570 | 0080 |  | Missing Procedures Towards IMS |  |
|  |  | CP-060725 | 0071 | 1 | Profile registration procedure |  |
|  |  | CP-060725 | 0073 | 2 | Rules for SDP equivalents |  |
|  |  | CP-060725 | 0077 | 3 | Codec Parameters |  |
| 2007-03 | CT#35 | CP-070013 | 0081 | 1 | Further Alignment of Mn Towards TISPAN Endorsement | 7.6.0 |
| 2007-06 | CT#36 | CP-070323 | 0087 | 1 | Addition of missing references and text corrections | 7.7.0 |
|  |  | CP-070434 | 0088 | 3 | Multimedia interworking Mn procedures |  |
|  |  | CP-070323 | 0089 | 1 | Wrong implementation of CP-060401 / C4-060998 (CR 0048r1 29.332 Rel-7) |  |
|  |  | CP-070315 | 0091 |  | RFC 3309 for SCTP checksum |  |
| 2007-09 | CT#37 | CP-070538 | 0092 | 1 | Corrections to Multimedia Interworking | 7.8.0 |
|  |  |  | 0094 | 3 | Service Change Methods and Reasons |  |
|  |  |  | 0095 |  | Correction to Package Ids |  |
|  |  |  | 0097 |  | Priority Indicator in Context Attributes |  |
|  |  |  | 0099 | 1 | H.248 Message Encoding |  |
|  |  |  | 0101 | 2 | Correction to Reuse of Procedures |  |
|  |  |  | 0103 | 1 | Correction to Signals Descriptor |  |
|  |  |  | 0105 | 1 | Correction to Events Descriptor |  |
|  |  |  | 0107 | 1 | Clarification of Message Identifier |  |
|  |  |  | 010 | 1 | IP realm connection indication |  |
|  |  |  | 011 | 2 | Correction of parameter in Sending H.245 Message |  |
|  |  |  | 0112 | 2 | Mn profile corrections |  |
|  |  |  | 0117 | 1 | Corrections to maxptime syntax in SDP of encoding of AMR codec |  |
| 2007-12 | CT#38 | CP-070742 | 0123 | 1 | Properties returned in commands | 7.9.0 |
|  |  | CP-070746 | 0119 | 1 | Inactivity timout procedures – Alignment to Mc profile |  |
|  |  | CP-070746 | 0125 | 1 | Audit of individual TDM terminations |  |
| 2007-12 | CT#38 | CP-070757 | 0118 |  | Termination heartbeat – Alignment to Mc profile | 8.0.0 |
| 2008-03 | CT#39 | CP-080023 | 0126 |  | IP version in SDP\_C | 8.1.0 |
|  |  | CP-080012 | 0129 | 1 | Correction on the Mn profile: BNC Release event |  |
| 2008-06 | CT#40 | CP-080272 | 0130 |  | Updating Mn interface profile "threegimscsiw" to version 3 | 8.2.0 |
| 2008-09 | CT#41 | CP-080469 | 0131 | 2 | Mona H.248 package definitions | 8.3.0 |
|  |  | CP-080454 | 0134 |  | Service Change Reason in (G)MSC Server Out of Service |  |
| 2008-12 | CT#42 | CP-080704 | 0135 | 1 | Mona H.248 package definitions update | 8.4.0 |
|  |  | CP-080704 | 0136 |  | Mn profile update for Mona H.248 package definitions |  |
|  |  | CP-080701 | 0137 | 1 | Clarification of RTCP messages usage in the interworking gateways |  |
|  |  | CP-080686 | 0138 | 3 | Alignment of stage 3 MGCF-IM\_MGW protocol with Stage 2 for SIP-I on Nc interworking to IMS |  |
| 2009-03 | CT#43 | CP-090031 | 0139 | 1 | Mn profile update for H.245 and RTCP Interactions H.248 package definitions | 8.5.0 |
|  |  |  | 0140 |  | Updating H.248.12 amendment 2 to reference list |  |
| 2009-06 | CT#44 | CP-090298 | 0141 | 1 | Update of stage 3 MONA to newest H.248.72 (ex. H.248.MONA) draft | 8.6.0 |
|  |  |  | 0142 |  | Update of MONA stage 3 due to MONA procedures stage 2 changes |  |
| 2009-12 | CT#46 | CP-090967 | 0147 |  | Correction to Profile for Commands marked optional | 8.7.0 |
|  |  | CP-090763 | 0148 |  | Commands Using IP Interface Type |  |
| 2009-12 | CT#46 |  |  |  | Upgraded unchanged from Rel-8 | 9.0.0 |
| 2010-03 | CT#47 | CP-100028 | 0152 |  | MONA H.248 package update | 9.1.0 |
|  |  | CP-100028 | 0154 | 1 | ASN.1 encoding of RTCP Feedback Message package |  |
|  |  | CP-100028 | 0157 |  | MONA alignments to H.324 |  |
|  |  | CP-100037 | 0150 | 1 | Global Text Telephony Interworking between IMS and Circuit Switched |  |
|  |  | CP-100037 | 0155 | 1 | Resolution of External TISPAN Referencing |  |
| 2010-09 | CT#47 | CP-100450 | 0159 | - | ITU-T H.248.71 and H.248.72 publication | 9.2.0 |
| 2011-03 | CT#51 | CP-110276 | 0160 | 10 | ECN Support in Mn Interface | 10.0.0 |
|  |  | CP-110070 | 0161 | 1 | Complete Inactivity Timeout Indication Procedure |  |
|  |  | CP-110058 | 0163 | 1 | Handling of rtcp-fb SDP attribute and SDP attribute for RTCP APP feedback messages |  |
| 2011-06 | CT#52 | CP-110352 | 0168 | 1 | Missing Tone Completed procedures | 10.1.0 |
|  |  | CP-110368 | 0165 | 1 | ECN Failure improvements |  |
|  |  | CP-110368 | 0170 | 1 | Alignment of 3GPP profiles with SG16 ECN package definition |  |
| 2011-09 | CT#53 | CP-110568 | 0171 | 1 | Solving Incorrect references | 10.2.0 |
| 2011-12 | CT#54 | CP-110798 | 0172 | - | Explicit Congestion Notification |  |
|  |  | CP-110789 | 0173 | 1 | Reference update: 26.114 | 10.3.0 |
| 2012-06 | CT#56 | CP-120226 | 0175 | 1 | Reference update: draft-ietf-avtcore-ecn-for-rtp | 10.4.0 |
|  |  |  |  |  | Editorial fix to history table | 10.4.1 |
| 2012-09 | CT#57 | CP-120443 | 0181 | - | Reference alignment for RTP Payload Format for AMR and AMR-WB Audio Codecs | 10.5.0 |
| 2012-09 | CT#57 | CP-120478 | 0176 | 3 | Support of Multimedia Priority Service (MPS) over Mn Interface – Stage 3 | 11.0.0 |
|  |  | CP-120684 | 0178 | 1 | Support of T.38 related SDP attributes |  |
| 2012-12 | CT#58 | CP-120723 | 0185 | - | Mn interface updates of ECN Support Package | 11.1.0 |
|  |  | CP-120738 | 0186 | - | T.38 default version |  |
| 2013-03 | CT#59 | CP-130013 | 0192 | 1 | Support of RTCP-FB for MTSI | 11.2.0 |
| 2013-06 | CT#60 | CP-130294 | 0188 | 2 | ECN relying reference change | 11.3.0 |
| 2014-06 | CT#64 | CP-140248 | 0193 | 2 | ICE support in Mn interface | 12.0.0 |
| 2014-06 | CT#66 | CP-140788 | 0194 | 1 | Adding support for EVS codec | 12.1.0 |
| 2015-09 | CT#69 | CP-150430 | 0196 | 1 | Correction on SDP for Real-Time Text | 13.0.0 |
| 2016-03 | CT#71 | CP-160048 | 0197 | - | Removal of references to TS 26.236 | 13.1.0 |
| 2016-03 | CT#71 | CP-160034 | 0198 | 1 | Support of enhanced bandwidth negotiation mechanism for MTSI sessions | 13.1.0 |
| 2016-03 | CT#71 | CP-160021 | 0199 | 1 | Mn stage 3 to support SDP Capability Negotiation | 13.1.0 |
| 2016-06 | CT#72 | CP-160229 | 0200 | - | Rate adaptation clarification | 13.2.0 |
| 2016-06 | CT#72 | CP-160229 | 0201 | - | Clarifications related to the rate adaptation for media endpoints | 13.2.0 |
| 2017-03 | CT#75 | - | - | - | Update to Rel-14 version (MCC) | 14.0.0 |
| 2018-06 | CT#80 | - | - | - | Update to Rel-15 version (MCC) | 15.0.0 |
| 2020-07 | CT#88e | - | - | - | Update to Rel-16 version (MCC) | 16.0.0 |