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Technical Specification

**Digital cellular telecommunications system (Phase 2+);  
Universal Mobile Telecommunications System (UMTS);  
LTE;  
IMS Application Level Gateway (IMS-ALG)  
- IMS Access Gateway (IMS-AGW);  
Iq Interface;  
Stage 3  
(3GPP TS 29.334 version 10.4.0 Release 10)**



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**Reference**

RTS/TSGC-0429334va40

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**Keywords**

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## Foreword

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# Foreword

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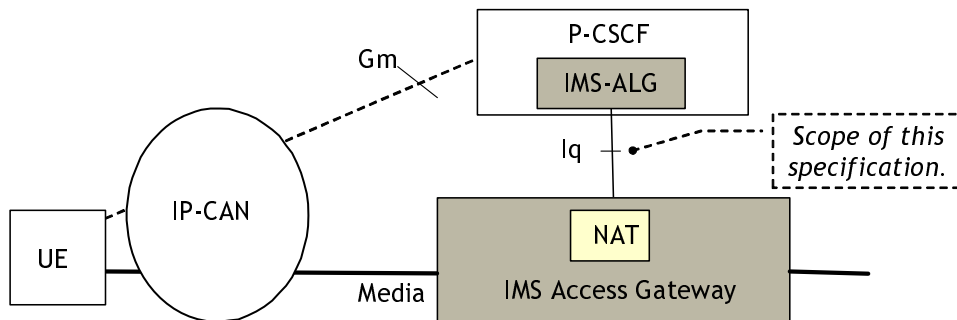
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# 1 Scope

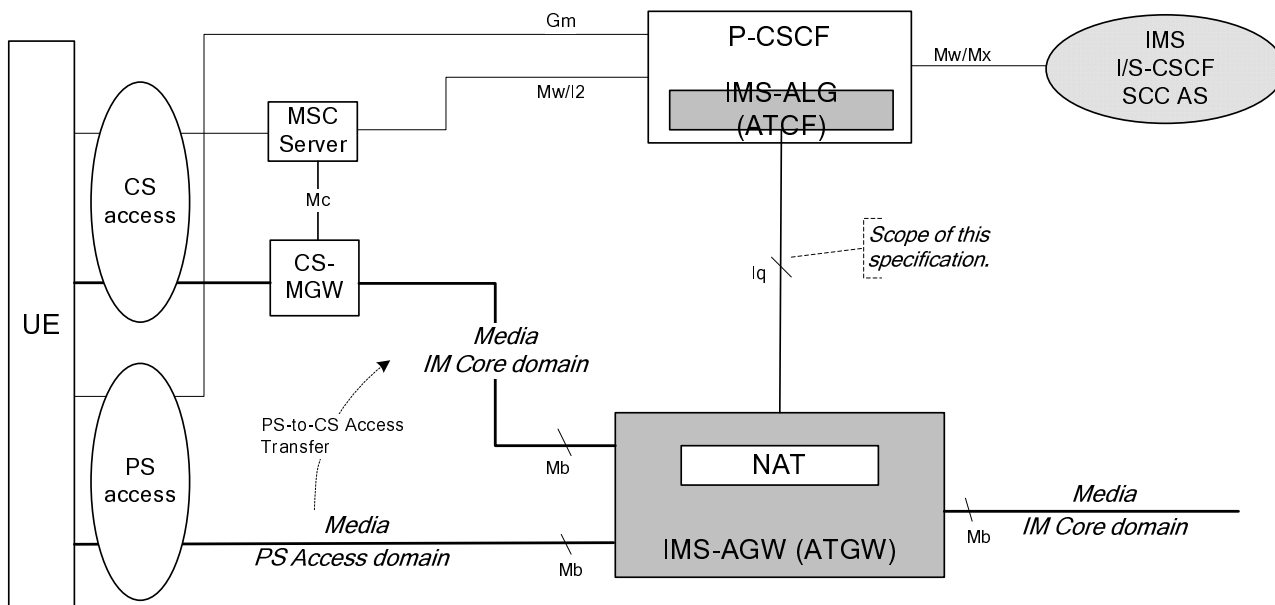
The present document describes the protocol to be used on the IMS Application Level Gateway (ALG) – IMS Access Gateway (IMS-AGW) interface. The basis for this protocol is the H.248 protocol as specified in ITU-T. The IMS architecture is described in 3GPP TS 23.228 [2]. The underlying reference model and stage 2 information is described in Annex G of 3GPP TS 23.228 [2] and in 3GPP TS 23.334 [23].

This specification describes the application of H.248 on the Iq interface (see Figure 1). 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.



**Figure 1: Reference model for IMS access**

The reference model for the IMS-ALG and the IMS-AGW supporting the ATCF/ATGW function is shown in Figure 1a below.



**Figure 1a: Reference model for IMS-ALG/IMS-AGW with ATCF/ATGW function**

See 3GPP TS 23.237 [38] subclause 5.2 for a comprehensive description of the reference model.

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## 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 TR 21.905: "Vocabulary for 3GPP Specifications".
- [2] 3GPP TS 23.228: "IP Multimedia Subsystem (IMS); Stage 2".
- [3] ETSI TS 183 018 V3.5.1 (2009-07): "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); Resource and Admission Control: H.248 Profile Version 3 for controlling Border Gateway Functions (BGF) in the Resource and Admission Control Subsystem (RACS); Protocol specification".
- [4] ITU-T Recommendation H.248.37 (06/2008): "Gateway control protocol: IP NAPT traversal package".
- [5] ITU-T Recommendation H.248.57 (06/2008): "Gateway control protocol: RTP Control Protocol Package".
- [6] ITU-T Recommendation H.248.43 (06/2008): "Gateway control protocol: Gate Management and Gate Control packages".
- [7] ITU-T Recommendation H.248.53 (03/2009): "Gateway control protocol: Traffic management packages".
- [8] ITU-T Recommendation H.248.41 Amendment 1 (06/2008): "Gateway control protocol: IP domain connection package: IP Realm Availability Package".
- [9] ITU-T Recommendation H.248.36 (09/2005): "Gateway control protocol: Hanging Termination Detection package".
- [10] ITU-T Recommendation H.248.1 (05/2002): "Gateway Control Protocol: Version 2" including the Corrigendum1 for Version 2 (03/04).
- [11] ITU-T Recommendation H.248.14 (03/2009): "Gateway control protocol: Inactivity timer package".
- [12] ITU-T Recommendation H.248.52 (06/2008): "Gateway control protocol: QoS support packages".
- [13] ITU-T Recommendation H.248.11 (11/2002): "Gateway control protocol: Media gateway overload control package".  
Inclusive Corrigendum 1 (06/2008) to H.248.11 " Gateway control protocol: Media gateway overload control package: Clarifying MG-overload event relationship to ADD commands".
- [14] ITU-T Recommendation H.248.10 (07/2001): "Media gateway resource congestion handling package".
- [15] IETF RFC 5234 (2008): "Augmented BNF for Syntax Specifications: ABNF".
- [16] IETF RFC 4960 (2007): "Stream control transmission protocol".
- [17] IETF RFC 4566 (2006): "SDP: Session Description Protocol".
- [18] IETF RFC 4975 (2007): "The Message Session Relay Protocol (MSRP)".



- [19] IETF RFC 3551 (2003): "RTP Profile for Audio and Video Conferences with Minimal Control".
- [20] IETF RFC 4145 (2005): "TCP-Based Media Transport in the Session Description Protocol (SDP)".
- [21] IETF RFC 3605 (2003): "Real Time Control Protocol (RTCP) attribute in Session Description Protocol (SDP)".
- [22] ITU-T Recommendation X.690 (11/2008): "ASN.1 encoding rules: Specification of Basic Encoding Rules (BER), Canonical Encoding Rules (CER) and Distinguished Encoding Rules (DER)".
- [23] 3GPP TS 23.334: "IMS Application Level Gateway (IMS-ALG) – IMS Access Gateway (IMS-AGW) interface: Procedures Descriptions".
- [24] ITU-T Recommendation H.248.40 (01/2007): "Gateway control protocol: Application Data Inactivity Detection package".
- [25] IETF RFC 4585 (2006): "Extended RTP Profile for Real-time Transport Control Protocol (RTCP) - Based Feedback (RTP/AVPF)".
- [26] 3GPP TS 26.114: "IP Multimedia Subsystem (IMS); Multimedia telephony; Media handling and interaction".
- [27] 3GPP TS 33.210: "Technical Specification Group Services and System Aspects; 3G Security; Network Domain Security; IP Network Layer Security".
- [28] IETF RFC 3556 (2003): "Session Description Protocol (SDP) Bandwidth Modifiers for RTP Control Protocol (RTCP) Bandwidth".
- [29] IETF RFC 4568 (2006): "Session Description Protocol (SDP) Security Descriptions for Media Streams".
- [30] IETF RFC 3711 (2004): "The Secure Real-time Transport Protocol (SRTP)".
- [31] IETF RFC 5124 (2008): "Extended Secure RTP Profile for Real-time Transport Control Protocol (RTCP)-Based Feedback (RTP/SAVPF)".
- [32] IETF RFC 2216 (1997): "Network Element Service Specification Template".
- [33] Supplement 7 to ITU-T H-series Recommendations H.Sup7 (05/2008): "Gateway control protocol: Establishment procedures for the H.248 MGC-MG control association".
- [34] 3GPP TS 33.328: "IMS Media Plane Security".
- [35] IETF RFC 3168: "The Addition of Explicit Congestion Notification (ECN) to IP".
- [36] IETF draft-ietf-avtcore-ecn-for-rtp-08 (May 2012): "Explicit Congestion Notification (ECN) for RTP over UDP".
- Editor's note:** the above document cannot be formally referenced until it is published as a RFC.
- [37] 3GPP TS 29.238: "Interconnection Border Control Functions (IBCF) – Transition Gateway (TrGW) interface, Ix Interface; Stage 3".
- [38] 3GPP TS 23.237: "IP Multimedia subsystem (IMS) Service Continuity; Stage 2".

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## 3 Definitions, symbols and abbreviations

### 3.1 Definitions

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

**Address:** term used for "network address" (IP address)

**Port:** term used for "transport port" (L4 port).

**Transcoding:** transcoding in general is the translation from one type of encoded media format to another different media format, e.g. G.711 A-law to  $\mu$ -law or vice versa, G.729 to AMR with 4.75 rate.

NOTE 1: The definition of "transcoding" is according clause 3.10/ITU-T Recommendation V.152 [23].

NOTE 2: Transcoding belongs to the category of "media aware" IP-to-IP interworking.

**Transport Address:** term used for the combination of a *Network Address* and a *Transport Port*.

## 3.2 Symbols

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

|    |  |
|----|--|
| Iq | Interface between the IMS Application Level Gateway (ALG) (IMS-ALG) and the IMS Access Gateway (IMS-AGW) |
|----|--|

## 3.3 Abbreviations

For the purposes of the present document, the abbreviations defined in 3GPP TR 21.905 [1] apply, with the following additions. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in 3GPP TR 21.905 [1].

|         |  |
|---------|--|
| ABNF    | Augmented Backus-Naur Form   |
| ATCF    | Access Transfer Control Function   |
| ATGW    | Access Transfer Gateway  |
| DSCP    | Differentiated Service Code Point  |
| ECN     | Explicit Congestion Notification   |
| IMS-AGW | IMS Access Gateway   |
| IMS-ALG | IMS Application Level Gateway  |
| IP      | Internet Protocol  |
| LD      | Local Descriptor (H.248 protocol element)  |
| MG      | Media Gateway  |
| MGC     | Media Gateway Controller   |
| NA      | Not Applicable   |
| NAPT    | Network Address and Port Translation   |
| NAPT-PT | NAPT and Protocol Translation  |
| NAT     | Network Address Translation  |
| RD      | Remote Descriptor (H.248 protocol element)   |
| RTCP    | RTP Control Protocol   |
| SCTP    | Stream Control Transport Protocol  |
| SRVCC   | Single Radio Voice Call Continuity   |
| ToS     | Type-of-Service  |
| TISPAN  | Telecommunications and Internet converged Services and Protocols for Advanced Networking |

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## 4 Applicability

The support of the Iq interface capability set shall be identified by the H.248 Iq profile and support of this profile shall be indicated in H.248 ServiceChange procedure (during the (re-)registration phase(s)).

### 4.1 Architecture

See Annex G of 3GPP TS 23.228 [2].

## 5 Profile Description

### 5.1 Profile Identification

**Table 5.1.1: Profile Identification**

|                      |                 |
|----------------------|-----------------|
| <b>Profile name:</b> | <b>threeglq</b> |
| Version:             | 2               |

### 5.2 Summary

This Profile describes the minimum mandatory settings and procedures required to fulfil the requirements of the Iq interface (see 3GPP TS 23.334 [23]):

- allocation and translation of IP addresses and port numbers (NA(P)T and NA(P)T-PT);
- opening and closing gates (i.e. packets filtering depending on "IP address / port");
- remote NA(P)T traversal;
- policing of incoming traffic;
- QoS packet marking for outgoing traffic;
- IP realm/domain indication;
- Hanging termination detection;
- RTCP handling;
- Explicit Congestion Notification support;

and when ATCF/ATGW is supported:

- handover of bearer connections between PS and CS access networks;
- IP version interworking;
- audio transcoding.

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

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

The setting or modification of elements described in the profile under the heading "Used in Command" has the meaning that the property can be set/modified with that command. The property may be present in other commands (in order to preserve its value in accordance with ITU-T Recommendation H.248.1 [10]) when those commands are used for other procedures that affect the same descriptor.

### 5.3 Gateway Control Protocol Version

Version 2 (ITU-T Recommendation H.248.1 [10]) shall be used as minimum protocol version.

## 5.4 Connection model

**Table 5.4.1: Connection Model**

|  |   |
|--|---|
| <b>Maximum number of contexts:</b>                 | Provisioned   |
| <b>Maximum number of terminations per context:</b> | 3   |
| <b>Allowed terminations type combinations:</b>     | (IP,IP) ;<br>(IP,IP,IP) (NOTE)  |
| <b>NOTE:</b>                                       | This is only a temporary context configuration, occurring during bearer access transfer phase (between PS to CS access networks or vice versa). |

## 5.5 Context attributes

**Table 5.5.1: Context Attributes**

| Context Attribute                  | Supported  | Values Supported |
|------------------------------------|--|------------------|
| <b>Topology</b>                    | Yes (NOTE 1)   | See clause 5.7.9 |
| <b>Priority Indicator</b>          | No (NOTE 2)  |                  |
| <b>Emergency Indicator</b>         | Yes  | YES/NO           |
| <b>IEPS Indicator</b>              | No   | NA               |
| <b>ContextAttribute Descriptor</b> | No   | NA               |
| <b>ContextIdList Parameter</b>     | No   | NA               |
| <b>AND/OR Context Attribute</b>    | No   | NA               |
| <b>NOTE 1:</b>                     | Stream ID in Topology Descriptor shall not be supported (because only used for SRVCC service support, which is a monomedia type of call ("voice call")). |                  |
| <b>NOTE 2:</b>                     | This Context Attribute parameter is allowed in ETSI TISPAN Ia Profile version 3.   |                  |

## 5.6 Terminations

### 5.6.1 Termination names

#### 5.6.1.1 IP Termination

##### 5.6.1.1.1 ABNF Coding Overview and prose specification

The Termination ID structure shall follow the guidelines of H.248 and shall be based on four fields:

- "ip/<group>/<interface>/<id>".

The individual fields are described and defined in table 5.6.1.1.1.1.

**Table 5.6.1.1.1.1: IP Termination Fields**

| Name      | Description  | Values                                   | CHOOSE Wildcard | ALL Wildcard |
|-----------|--|--|-----------------|--------------|
| Ip        | "ip" is a fixed prefix identifying the termination   | "ip"                                     | No              | No           |
| Group     | Group of Interface and Id  | Integer (0-65535)                        | Yes (NOTE 5)    | Yes          |
| Interface | Logical or physical interface to a network to/from which the termination will be sending/receiving media. (NOTE 1, NOTE 2) | String of max 51 alphanumeric characters | Yes (NOTE 4)    | Yes          |
| Id        | Termination specific identifier (NOTE 3)   | Non-zero 32 bit integer                  | Yes (NOTE 4)    | Yes          |

NOTE 1: A specific <Interface> may be used together with different groups.  
NOTE 2: The generic field <Interface> may relate specifically to an "IP interface", "protocol layer 2 interface" or others.  
NOTE 3: The combination of Interface and Id is unique.  
NOTE 4: The MGC shall always use CHOOSE in an ADD request command. If not, the MG shall reply with an error descriptor using error code #501 "Not Implemented".  
NOTE 5: The CHOOSE wildcard on 'Group' is *not* allowed in ETSI TISPAN "Ia Profiles".

NOTE: The IMS-ALG has the ability to choose the address space in which the IMS-AGW will allocate an IP address for the termination by using the *ipdc/realm* property defined in the ITU-T Recommendation H.248.41 IP domain connection package.

H.248 wildcarding may be applied on IP Termination Identifiers. Wildcarding is limited according the two columns on the right hand side.

The corresponding ABNF grammar is given below.

ABNF (IETF RFC 5234 [15]) is used for the syntax specification. The ABNF for TerminationID and relation to pathNAME is defined in annex B.2/ ITU-T Recommendation H.248.1 [10].

```

pathNAME      = EphToken SLASH EPHsystem
EphToken      = "ip"                ; prefix
EPHsystem     = WildcardALL
               / WildcardALL SLASH Interface
               / Group SLASH WildcardALL
               / (Group / WildcardCHOOSE) SLASH (Interface / WildcardCHOOSE) SLASH (Identifier
               / WildcardALL / WildcardCHOOSE)
Group         = %d0-65535           ; data type: INT16
Interface     = 1*51ALPHANUM
Identifier    = %d1-4294967295     ; data type: INT32
ALPHANUM     = ALPHA / DIGIT
WildcardCHOOSE = "$"
WildcardALL   = "*"

```

### 5.6.1.1.2 ASN.1 Coding Overview and prose specification

The following general structure of termination ID shall be used:

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

**Table 5.6.1.1.2.1: ASN.1 coding**

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

Termination type:

Length 3 bits

Values:

000 Reserved

001 IP (Ephemeral) termination

010 Reserved (in 3GPP Mc and Mn profile used for TDM termination)

011 - 110 Reserved

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

X:

Length 29 bits.

For IP termination, its usage is un-specified.

## 5.6.2 Multiplexed terminations

**Table 5.6.2.1: Multiplexed terminations**

|  |    |
|--|----|
| <b>Multiplex terminations supported?</b> | No |
|--|----|

*If yes, then:*

**Table 5.6.2.2: Multiplex Types**

|  |    |
|--|----|
| <b>Multiplex types supported</b>                             | NA |
| <b>Maximum number of terminations connected to multiplex</b> | NA |

## 5.7 Descriptors

### 5.7.1 TerminationState Descriptor

**Table 5.7.1.1: ServiceState property**

|   |   |
|---|---|
| <b>ServiceState property used:</b>  | Yes (InService/OutOfService) NOTE 1, NOTE 2 |
| NOTE 1: This is restricted to the ROOT termination (for MGW audit).   |   |
| NOTE 2: Ephemeral H.248 Terminations have a ServiceState property according to ITU-T Recommendation H.248.1 [10], but explicit usage of the TerminationState Descriptor ServiceState property is not required by this Profile. ServiceState changes can still occur, however, and can be indicated in ServiceChange Commands (i.e. this means that the value of the ServiceState property may be implicitly changed by ServiceChange procedures). |   |

**Table 5.7.1.2: EventBufferControl property**

|  |    |
|--|----|
| <b>EventBufferControl property used:</b> | No |
|--|----|

### 5.7.2 Stream Descriptor

#### 5.7.2.0 General

**Table 5.7.2.1: Stream descriptors**

|   |    |                    |
|---|----|--------------------|
| <b>Maximum number of streams per termination type</b>   | IP | Unspecified (NOTE) |
| NOTE : At least one stream for each media component (e.g. video+audio = 2 streams). If only one stream is applicable, then the IMS-ALG may omit the Stream Descriptor and the IMS-AGW shall assume that StreamID = 1. |    |                    |

Table 5.7.2.2: Stream configuration

|                              |                                |
|------------------------------|--------------------------------|
| <b>Stream configuration:</b> | ALL configurations are allowed |
|------------------------------|--------------------------------|

## 5.7.2.1 LocalControl Descriptor

Table 5.7.2.1.1: Local Control Descriptor

|  |     | Termination Type | Stream Type         |
|--|-----|------------------|---------------------|
| <b>ReserveGroup used:</b>  | No  | NA               | NA                  |
| <b>ReserveValue used:</b>  | Yes | IP               | Audio, Video (NOTE) |
| NOTE: The value of the H.248 Stream Type is given here by the SDP "m=" line element media type (in contrast to the SDP "m=" line element transport protocol in Table 5.7.2.1.2). Usage of ReserveValue implies thus media type aware Local and Remote Descriptors. |     |                  |                     |

Table 5.7.2.1.2: Allowed Stream Modes

| Termination Type | Stream Type | Allowed StreamMode Values              |
|------------------|-------------|--|
| IP               | RTP/AVP     | SendOnly, RecvOnly, SendRecv, Inactive |
|                  | RTP/SAVP    | SendOnly, RecvOnly, SendRecv, Inactive |
|                  | RTP/AVPF    | SendOnly, RecvOnly, SendRecv, Inactive |
|                  | RTP/SAVPF   | SendOnly, RecvOnly, SendRecv, Inactive |
|                  | TCP         | SendRecv, Inactive                     |
|                  | TCP/MSRP    | SendRecv, Inactive                     |
|                  | UDPTL       | SendRecv, Inactive                     |
|                  | UDP         | SendOnly, RecvOnly, SendRecv, Inactive |

## 5.7.3 Events descriptor

Table 5.7.3.1: Events Descriptor

| Events settable on termination types and stream types: | Yes  |                  |                |
|--|--|------------------|----------------|
| <i>If yes</i>  | EventID  | Termination Type | Stream Type    |
|  | Cause (g/cause, 0x0001/0x0001) - See sub-clause 5.14.3.1                     | ALL except ROOT  | ANY            |
|  | Inactivity Timeout (it/ito, 0x0045/0x0001) – See subclause 5.14.3.6          | only ROOT        | Not applicable |
|  | MG_Overload (ocp/mg_overload, 0x0051/0x0001) – See sub-clause 5.14.3.8       | only ROOT        | Not applicable |
|  | Termination Heartbeat (hangterm/thb, 0x0098/0x0001) - See subclause 5.14.3.9 | ALL except ROOT  | ANY            |

|  |   |                 |                |
|--|---|-----------------|----------------|
|  | MGCon (chp/mgcon, 0x0029/0x0001) – See subclause 5.14.3.10                    | only ROOT       | Not Applicable |
|  | Available Realms Changed (ipra/arc, 0x00e0/0x0001) – See subclause 5.14.3.11  | only ROOT       | Not Applicable |
|  | IP Flow Stop Detection (adid/ipstop, 0x009c/0x0001) – See subclause 5.14.3.14 | ALL except ROOT | Any            |
|  | ECN Failure (ecnrous/fail, 0x010b/0x0001) see 3GPP TS 29.238 Annex B [37]     | IP              | RTP based      |

**Table 5.7.3.2: Event Buffer Control**

|                                  |    |
|----------------------------------|----|
| <b>EventBuffer Control used:</b> | No |
|----------------------------------|----|

**Table 5.7.3.3: Keep active**

|                                   |    |
|-----------------------------------|----|
| <b>KeepActive used on events:</b> | No |
|-----------------------------------|----|

**Table 5.7.3.4: Embedded events and signals**

|  |    |
|--|----|
| <b>Embedded events in an Events Descriptor:</b>  | No |
| <b>Embedded signals in an Events Descriptor:</b> | No |

**Table 5.7.3.5: Regulated Embedded events**

|  |      |
|--|------|
| <b>Regulated Embedded events are triggered on:</b> | None |
|--|------|

**Table 5.7.3.6: ResetEventsDescriptor**

|  |      |
|--|------|
| <b>ResetEventsDescriptor used with events:</b> | None |
|--|------|

**Table 5.7.3.7: Notification Behaviour**

|                         |            |
|-------------------------|------------|
| <b>NotifyImmediate:</b> | ALL Events |
| <b>NotifyRegulated:</b> | None       |
| <b>NeverNotify:</b>     | None       |

## 5.7.4 EventBuffer descriptor

**Table 5.7.4.1: Event Buffer Descriptor**

|                                     |          |   |
|-------------------------------------|----------|---|
| <b>EventBuffer Descriptor used:</b> | No       |   |
| <i>If yes</i>                       | EventIDs | - |

## 5.7.5 Signals descriptor



Table 5.7.5.1: Signals Descriptor

|   |   |                         |                         |
|---|---|-------------------------|-------------------------|
| <b>The setting of signals is dependant on termination or streams types:</b> | No<br>NOTE – “No” means that all signals can be played on any termination or stream. If “Yes”, any signal not listed below may be played on any termination or stream, except Signals on ROOT termination shall not be supported. |                         |                         |
| <i>If yes</i>   | <b>SignalID</b>   | <b>Termination Type</b> | <b>Stream Type / ID</b> |
|   | Latching (ipnapt/latch, 0x0099/0x0001)  | ALL except ROOT         | Any                     |

Table 5.7.5.2: Signal Lists

|                                 |  |   |
|---------------------------------|--|---|
| <b>Signals Lists supported:</b> | No   |   |
| <i>If yes</i>                   | <b>Termination Type Supporting Lists:</b>          | - |
|                                 | <b>Stream Type Supporting lists:</b>               | - |
|                                 | <b>Maximum number of signals to a signal list:</b> | - |
|                                 | <b>Intersignal delay parameter supported:</b>      | - |

Table 5.7.5.3: Overriding Signal type and duration

|  |                 |                                  |
|--|-----------------|----------------------------------|
| <b>Signal type and duration supported:</b> | No              |                                  |
| <i>If yes</i>                              | <b>SignalID</b> | <b>Type or duration override</b> |
|  | -               | -                                |

Table 5.7.5.4: Signal Direction

|                                    |    |
|------------------------------------|----|
| <b>Signal Direction supported:</b> | No |
|------------------------------------|----|

Table 5.7.5.5: Notify completion

|                                    |                 |                                     |
|------------------------------------|-----------------|-------------------------------------|
| <b>NotifyCompletion supported:</b> | No              |                                     |
| <i>If yes</i>                      | <b>SignalID</b> | <b>Type of completion supported</b> |
|                                    | -               | -                                   |

Table 5.7.5.6: RequestID Parameter

|                                       |    |
|---------------------------------------|----|
| <b>RequestID Parameter supported:</b> | No |
|---------------------------------------|----|

Table 5.7.5.7: Signals played simultaneously

|                                       |   |  |
|---------------------------------------|---|--|
| <b>Signals played simultaneously:</b> | No  |  |
| <i>If yes</i>                         | <b>SignalIDs that can be played simultaneously:</b> |  |

Table 5.7.5.8: Keep active

|                                    |    |
|------------------------------------|----|
| <b>KeepActive used on signals:</b> | No |
|------------------------------------|----|

## 5.7.6 DigitMap descriptor

**Table 5.7.6.1: DigitMap Descriptor**

|                             |                      |                  |               |
|-----------------------------|----------------------|------------------|---------------|
| <b>DigitMaps supported:</b> | No                   |                  |               |
| <i>If yes</i>               | <b>DigitMap Name</b> | <b>Structure</b> | <b>Timers</b> |
|                             | -                    | -                | -             |

## 5.7.7 Statistics descriptor

**Table 5.7.7.1: Statistics Descriptor support**

|                                 |   |
|---------------------------------|---|
| <b>Statistics supported on:</b> | - |
|---------------------------------|---|

**Table 5.7.7.2: Statistics Report on Subtract**

|   |                               |   |
|---|-------------------------------|---|
| <b>Statistics reported on Subtract:</b> | No                            |   |
| <i>If yes</i>                           | <b>StatisticIDs reported:</b> | - |

## 5.7.8 ObservedEvents descriptor

**Table 5.7.8.1: ObservedEvents Descriptor**

|  |    |
|--|----|
| <b>Event detection time supported:</b> | No |
|--|----|

## 5.7.9 Topology descriptor

**Table 5.7.9.1: Topology Descriptor**

|                         |  |
|-------------------------|--|
| <b>Allowed triples:</b> | (T1, T2, isolate)<br>(T1, T2, bothway)   |
| <b>NOTE:</b>            | The Topology Descriptor shall be supported by the MGW and MGC for handover only, when PS-to-CS access transfer is supported. |

## 5.7.10 Error descriptor

Table 5.7.10.1: Error Codes Sent by IMS-ALG

|  |  |
|--|--|
| <b>Supported H.248.8 Error Codes:</b>  | #400 "Syntax error in message"<br>#401 "Protocol Error"<br>#402 "Unauthorized"<br>#403 "Syntax Error in TransactionRequest"<br>#406 "Version Not Supported"<br>#410 "Incorrect identifier"<br>#411 "The transaction refers to an unknown ContextID"<br>#413 "Number of transactions in message exceeds maximum"<br>#421 "Unknown action or illegal combination of actions"<br>#422 "Syntax Error in Action"<br>#430 "Unknown TerminationID"<br>#431 "No TerminationID matched a wildcard"<br>#442 "Syntax Error in Command"<br>#443 "Unsupported or Unknown Command"<br>#444 "Unsupported or Unknown Descriptor"<br>#445 "Unsupported or Unknown property"<br>#446 "Unsupported or Unknown Parameter"<br>#447 "Descriptor not legal in this command"<br>#448 "Descriptor appears twice in a command"<br>#449 "Unsupported parameter or property value"<br>#450 "No such property in this package"<br>#451 "No such event in this package"<br>#454 "No such parameter value in this package"<br>#455 "Property illegal in this Descriptor"<br>#456 "Property appears twice in this Descriptor"<br>#457 "Missing parameter in signal or event"<br>#458 "Unexpected Event/RequestID"<br>#501 "Not Implemented"<br>#502 "Not ready"<br>#505 "Transaction Request Received before a ServiceChange Reply has been received"<br>#506 "Number of TransactionPendings Exceeded"<br>#533 "Response exceeds maximum transport PDU size" |
| <b>Supported Error Codes defined in packages:</b>  | All error codes defined in supported packages are supported.   |
| NOTE: The error codes listed need not be supplied by the IMS-ALG to differentiate each and every error described by them. The IMS-AGW shall be able to receive the error codes listed. |  |

Table 5.7.10.2: Error Codes Sent by IMS-AGW:

|   |   |
|---|---|
| <b>Supported H.248.8 Error Codes:</b>   | #400 "Syntax error in message"<br>#401 "Protocol Error"<br>#402 "Unauthorized"<br>#403 "Syntax Error in TransactionRequest"<br>#406 "Version Not Supported"<br>#410 "Incorrect identifier"<br>#411 "The transaction refers to an unknown ContextID"<br>#412 "No ContextIDs available"<br>#413 "Number of transactions in message exceeds maximum"<br>#421 "Unknown action or illegal combination of actions"<br>#422 "Syntax Error in Action"<br>#430 "Unknown TerminationID"<br>#431 "No TerminationID matched a wildcard"<br>#432 "Out of TerminationIDs or No TerminationID available"<br>#433 "TerminationID is already in a Context"<br>#434 "Max number of Terminations in a Context exceeded"<br>#435 "Termination ID is not in specified Context"<br>#440 "Unsupported or unknown Package"<br>#441 "Missing Remote or Local Descriptor"<br>#442 "Syntax Error in Command"<br>#443 "Unsupported or Unknown Command"<br>#444 "Unsupported or Unknown Descriptor"<br>#445 "Unsupported or Unknown property"<br>#446 "Unsupported or Unknown Parameter"<br>#447 "Descriptor not legal in this command"<br>#448 "Descriptor appears twice in a command"<br>#449 "Unsupported parameter or property value"<br>#450 "No such property in this package"<br>#451 "No such event in this package"<br>#452 "No such signal in this package"<br>#454 "No such parameter value in this package"<br>#455 "Property illegal in this Descriptor"<br>#456 "Property appears twice in this Descriptor"<br>#457 "Missing parameter in signal or event"<br>#471 "Implied Add for Multiplex failure"<br>#500 "Internal software Failure in MG or MGC"<br>#501 "Not Implemented"<br>#502 "Not ready"<br>#505 "Transaction Request Received before a ServiceChange Reply has been received"<br>#506 "Number of TransactionPendings Exceeded"<br>#510 "Insufficient resources"<br>#511 "Temporarily Busy"<br>#512 "Media Gateway unequipped to detect requested Event"<br>#513 "Media Gateway unequipped to generate requested Signals"<br>#515 "Unsupported Media Type"<br>#517 "Unsupported or invalid mode"<br>#522 "Functionality Requested in Topology Triple Not Supported"<br>#526 "Insufficient bandwidth"<br>#529 "Internal hardware failure in MG"<br>#530 "Temporary Network failure"<br>#531 "Permanent Network failure"<br>#532 "Audited Property, Statistic, Event or Signal does not exist"<br>#533 "Response exceeds maximum transport PDU size"<br>#534 "Illegal write of read only property"<br>#542 "Command is not allowed on this termination" |
| <b>Supported Error Codes defined in packages:</b>   | All error codes defined in supported packages need to be supported.   |
| <b>NOTE:</b> The error codes listed need not be supplied by the IMS-AGW to differentiate each and every error described |   |

|   |
|---|
| by them. The IMS-ALG shall be able to receive the error codes listed. |
|---|

## 5.8 Command API

### 5.8.1 Add

**Table 5.8.1.1: Descriptors used by Command Add Request**

|   |   |
|---|---|
| <b>Descriptors used by Add request:</b> | Media (Stream(LocalControl, Local, Remote)), Event, Signals |
|---|---|

**Table 5.8.1.2: Descriptors used by Command Add Reply**

|                                       |   |
|---------------------------------------|---|
| <b>Descriptors used by Add reply:</b> | Media (Stream (Local)), Error<br><br>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: <ul style="list-style-type: none"> <li>- The Error Descriptor</li> <li>- SDP properties returned in "Reserve AGW Connection Point" and "Reserve and Configure AGW Connection Point" procedures, as specified in 15.17.2.2 and 15.17.2.4.</li> </ul> |
|---------------------------------------|---|

### 5.8.2 Modify

**Table 5.8.2.1: Descriptors used by Command Modify Request**

|  |  |
|--|--|
| <b>Descriptors used by Modify request:</b> | Media (TerminationState, Stream (LocalControl, Local, Remote)), Signals, Event |
|--|--|

**Table 5.8.2.2: Descriptors used by Command Modify Reply**

|  |   |
|--|---|
| <b>Descriptors used by Modify reply:</b> | Media (Stream(Local)), Error<br><br>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: <ul style="list-style-type: none"> <li>- The Error Descriptor</li> <li>- SDP properties returned in "Configure AGW Connection Point" procedure as specified in 15.17.2.3.</li> </ul> |
|--|---|

### 5.8.3 Subtract

**Table 5.8.3.1: Descriptor used by Command Subtract Request**

|   |                    |
|---|--------------------|
| <b>Descriptors used by Subtract request:</b>              | None, Audit() NOTE |
| NOTE: This requests that no statistics are to be returned |                    |

**Table 5.8.3.2: Descriptor used by Command Subtract Reply**

|  |             |
|--|-------------|
| <b>Descriptors used by Subtract reply:</b> | None, Error |
|--|-------------|

### 5.8.4 Move

**Table 5.8.4.1: Command Move**

|                           |    |
|---------------------------|----|
| <b>Move command used:</b> | No |
|---------------------------|----|

*If used:*

**Table 5.8.4.2: Descriptor used by Move command**

|  |   |
|--|---|
| <b>Descriptors used by Move request:</b> | - |
| <b>Descriptors used by Move reply:</b>   | - |

### 5.8.5 AuditValue

**Table 5.8.5.1: Auditvalue**

| <b>Audited Properties:</b>      | <b>Property Name and Identity</b>          | <b>Descriptor</b>           |
|---------------------------------|--|-----------------------------|
|                                 | TerminationState:<br>- Root (MGW Audit)    | TerminationState Descriptor |
|                                 | For Packages:<br>Root                      | Packages Descriptor         |
|                                 | None (MGW Audit) :<br>- Root               | Audit (empty) Descriptor    |
|                                 | IP Realm Availability :<br>- ipra/* (ROOT) | TerminationState Descriptor |
|                                 | Base root properties:<br>- root/* (ROOT)   | TerminationState Descriptor |
| <b>Audited Statistics:</b>      |  | None                        |
| <b>Audited Signals:</b>         |  | None                        |
| <b>Audited Events:</b>          |  | None                        |
| <b>Packages Audit possible:</b> |  | Yes                         |

### 5.8.6 AuditCapabilities

**Table 5.8.6.1: Auditcapability**

| <b>Audited Properties:</b> | <b>Property Name and Identity</b> | <b>Descriptor</b> |
|----------------------------|-----------------------------------|-------------------|
|                            | None                              | -                 |
| <b>Audited Statistics:</b> |                                   | None              |
| <b>Audited Signals:</b>    |                                   | None              |
| <b>Audited Events:</b>     |                                   | None              |

**Table 5.8.6.2: Scoped Auditing**

|   |      |
|---|------|
| <b>Audited Properties / ContextAttributes used for a scoped audit :</b> | None |
|---|------|

## 5.8.7 Notify

**Table 5.8.7.1: Descriptors Used by Notify Request**

|   |                |
|---|----------------|
| <b>Descriptors used by Notify Request</b> | ObservedEvents |
|---|----------------|

**Table 5.8.7.2: Descriptors Used by Notify Reply**

|  |             |
|--|-------------|
| <b>Descriptors used by Notify Reply:</b> | None, Error |
|--|-------------|

## 5.8.8 ServiceChange

**Table 5.8.8.1: ServiceChangeMethods and ServiceChangeReasons sent by IMS-ALG:**

| <b>Service Change Methods Supported:</b>   | <b>ServiceChange Reasons supported:</b>                  |
|--|--|
| Handoff (NOTE 2, NOTE 3)   | "903 MGC Directed Change" (Optional, NOTE 4)             |
| Restart (NOTE 2)   | "901 Cold Boot" (Optional)<br>"902 Warm Boot" (Optional) |
| Forced (NOTE 2)  | "905 Termination Taken Out Of Service" (Optional)        |
| Graceful (NOTE 2)  | "905 Termination Taken Out Of Service" (Optional)        |
| NOTE 1: 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 2: ROOT Only.   |  |
| NOTE 3: Not involving more than 1 IMS-ALG. This does not preclude the use of the MGCId in a ServiceChange (Handoff) scenario, nor does it change the expected IMS-AGW behaviour upon receipt of such a message, as the IMS-AGW has actually no means to differentiate whether the ServiceChangeMgcId parameter that may be received in a ServiceChange (handoff) message relates to a logical IMS-ALG inside the same IMS-ALG server or is part of another IMS-ALG.                        |  |
| NOTE 4: Support of this procedure is mandatory in the IMS-AGW.   |  |

**Table 5.8.8.2: ServiceChangeMethods and ServiceChangeReasons sent by IMS-AGW:**

| <b>Service Change Methods Supported:</b>   | <b>ServiceChange Reasons supported:</b>   |
|--|---|
| Forced   | "904 Termination Malfunction", ALL except ROOT (Optional, NOTE 4)<br>"905 Termination Taken Out Of Service" , ALL (Mandatory)<br>"906 Loss Of Lower Layer Connectivity" , ALL except ROOT (Optional, NOTE 4)<br>"907 Transmission Failure" , ALL except ROOT (Optional, NOTE 4)<br>"908 MG Impending Failure" ROOT only (Mandatory)<br>"910 Media Capability Failure" , ALL except ROOT (Optional, NOTE 4)<br>"915 State Loss" ROOT only (Optional, NOTE 4) |
| Graceful (NOTE 2)  | "905 Termination Taken Out Of Service" , (Optional, NOTE 4)<br>"908 MG Impending Failure" (Optional, NOTE 4)  |
| Disconnected (NOTE 2)  | "900 Service Restored" (Mandatory)<br>"916 Packages Change" (Optional)<br>"917 Capability Change" (Optional)  |
| Restart (NOTE 2)   | "900 Service Restored" (Mandatory)<br>"901 Cold Boot" (Mandatory)<br>"902 Warm Boot" (Mandatory)<br>"916 Packages Change" (Optional)<br>"917 Capability Change "(Optional)  |
| Handoff (NOTE 2, NOTE 3)   | "903 MGC Directed Change" (Mandatory)   |
| NOTE 1: 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 2: ROOT Only.   |   |
| NOTE 3: In response to a IMS-ALG Ordered Re-Register (subclause 5.17.3.7).   |   |
| NOTE 4: Support of this procedure is mandatory in the IMS-ALG.   |   |

**Table 5.8.8.3: Service Change Address**

|                                   |    |
|-----------------------------------|----|
| <b>ServiceChangeAddress used:</b> | No |
|-----------------------------------|----|

**Table 5.8.8.4: Service Change Delay**

|                                 |                           |
|---------------------------------|---------------------------|
| <b>ServiceChangeDelay used:</b> | No                        |
| <i>If yes</i>                   | <b>Valid time period:</b> |

**Table 5.8.8.5: Service Change Incomplete Flag**

|  |    |
|--|----|
| <b>ServiceChange Incomplete Flag used:</b> | No |
|--|----|

**Table 5.8.8.6: Service Change Version**

|  |        |
|--|--------|
| <b>Version used in ServiceChangeVersion:</b>   | 2 or 3 |
| NOTE: Version 2 shall be supported as the minimum protocol version. See subclause 5.3. |        |



**Table 5.8.8.7: ServiceChangeProfile**

|  |  |
|--|--|
| <b>ServiceChangeProfile mandatory:</b> | Yes  |
| <b>NOTE:</b>                           | The ServiceChangeProfile is mandatory in the AGW Register, AGW Re-Register and AGW Capability Change procedures. |

**Table 5.8.8.8: Profile negotiation**

|   |    |
|---|----|
| <b>Profile negotiation as per H.248.18:</b> | No |
|---|----|

**Table 5.8.8.9: ServiceChangeMGCIId**

|                                  |     |
|----------------------------------|-----|
| <b>ServiceChangeMGCIId used:</b> | Yes |
|----------------------------------|-----|

## 5.8.9 Manipulating and auditing context attributes

**Table 5.8.9.1: Manipulating and auditing context attributes**

|  |                     |
|--|---------------------|
| <b>Context Attributes Manipulated:</b> | Emergency, Topology |
| <b>Context Attributes Audited:</b>     | None                |

## 5.9 Generic command syntax and encoding

**Table 5.9.1: Encodings**

|                             |   |
|-----------------------------|---|
| <b>Supported Encodings:</b> | Text (NOTE 1, NOTE 2) and Binary  |
| <b>NOTE 1:</b>              | The receiver shall be capable of receiving both Short Token Notation and Long Token Notation on an H.248 control association. |
| <b>NOTE 2:</b>              | The transmitter may select between long and short token forms per H.248 control association.                                  |
| <b>NOTE 3:</b>              | ETSI TISPAN "Ia Profile" [3] uses only text encoding.   |

## 5.10 Transactions

**Table 5.10.1: Transactions per Message**

|  |   |
|--|---|
| <b>Maximum number of TransactionRequests / TransactionReplies / TransResponseAcks / Segment Replies per message:</b> | 10 (NOTE)   |
| <b>NOTE:</b>   | ETSI TISPAN "Ia Profile" [3] maximum is "1", this is foreseen to be the typical case. |

**Table 5.10.2: Commands per Transaction Requests**

|   |   |
|---|---|
| <b>Maximum number of commands per TransactionRequest:</b> | Unspecified (NOTE)  |
| <b>NOTE:</b>  | ETSI TISPAN "Ia Profile" [3] maximum is "2", this is foreseen to be the typical case. |

**Table 5.10.3: Commands per Transaction Reply**

|   |   |
|---|---|
| <b>Maximum number of commands per TransactionReply:</b> | Unspecified (NOTE)  |
| <b>NOTE:</b>  | ETSI TISPAN "Ia Profile" [3] maximum is "2", this is foreseen to be the typical case. |

**Table 5.10.4: Optional Commands**

|   |  |
|---|--|
| <b>Commands able to be marked "Optional":</b> | <Add, Modify, Move, Subtract, Auditvalue, Auditcapability, Servicechange, All, None> |
|---|--|

**Table 5.10.5: Commands marked for Wildcarded Responses**

|   |          |
|---|----------|
| <b>Wildcarded responses may be requested for:</b> | Subtract |
|---|----------|

**Table 5.10.6: Procedures for Wildcarded Responses**

|  |                         |
|--|-------------------------|
| <b>Procedures that make use of wildcarded responses:</b> | Release AGW Termination |
|--|-------------------------|

**Table 5.10.7: Transaction Timers**

| <b>Transaction Timer:</b>               | <b>Value</b> |
|---|--------------|
| <b>normalMGExecutionTime</b>            | Provisioned  |
| <b>normalMGCExecutionTime</b>           | Provisioned  |
| <b>MGOriginatedPendingLimit</b>         | Provisioned  |
| <b>MGCOriginatedPendingLimit</b>        | Provisioned  |
| <b>MGProvisionalResponseTimerValue</b>  | Provisioned  |
| <b>MGCProvisionalResponseTimerValue</b> | Provisioned  |

## 5.11 Messages

It is recommended that IMS-AGW and IMS-ALG names are in the form of fully qualified domain name. For example the domain name of the IMS-ALG may be of the form: "ALG1.whatever.net." and the name of the IMS-AGW may be of the form: "mg1.whatever.net."

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

The IMS-ALG domain name is provisioned in the IMS-AGW or retrieved from the DNS using SRV records.

The use of a domain name provides the following benefits:

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

NOTE: There are then e.g. multiple numerical address entries per single MGC entity in the "MG database of MGC entries"; see Table 5 in ITU-T H.Sup7 [29].

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

The domain name may be used by IMS-ALG/IMS-AGW for authentication purposes.

## 5.12 Transport

Specifies what H.248 subseries transports are supported by the profile.

**Table 5.12.1: Transport**

|  |  |
|--|--|
| <b>Supported transports:</b>   | <ol style="list-style-type: none"> <li>1. IPv4-based network control plane: <ul style="list-style-type: none"> <li>• SCTP/IPv4 (Recommended)</li> <li>• UDP/IPv4 (Optional)</li> </ul> </li> <li>2. IPv6-based network control plane: <ul style="list-style-type: none"> <li>• SCTP/IPv6 (Recommended)</li> <li>• UDP/IPv6 (Optional)</li> </ul> </li> </ol> |
| NOTE 1: When using SCTP as defined in IETF RFC 4960 [16] the IMS-AGW shall always be the node to perform the "Initiation". |  |

**Table 5.12.2: Segmentation**

|                                |  |
|--------------------------------|--|
| <b>Segmentation supported:</b> | SCTP: Inherent in Transport<br>UDP: No |
|--------------------------------|--|

**Table 5.12.3: Control Association**

|  |   |
|--|---|
| <b>Control Association Monitoring supported:</b> | Monitoring mechanism is dependent on used H.248 transport (see above table 5.12/1):<br><b>SCTP:</b><br>inherent capability of SCTP.<br><b>UDP:</b><br>H.248.14 (MG-driven monitoring).<br>Empty AuditValue on ROOT (MGC-driven monitoring). |
|--|---|

## 5.13 Security

**Table 5.13.1: Security**

|  |      |
|--|------|
| <b>Supported Security:</b>   | None |
| NOTE: IPsec shall not be used by the IMS-ALG or IMS-AGW for the Iq interface. Normally the Iq interface lies within a single operator's secure domain. If this is not the case then a Za interface (Security Gateway deploying IPsec) may be required, however this is a separate logical function/entity and thus is not applicable to the Iq profile, the IMS-ALG or the IMS-AGW. For further details see 3GPP TS 33.210 [27]. |      |

## 5.14 Packages

### 5.14.1 Mandatory Packages

**Table 5.14.1.1: Mandatory Packages**

| <b>Mandatory Packages:</b>  |                    |                |
|---|--------------------|----------------|
| <b>Package Name</b>   | <b>PackageID</b>   | <b>Version</b> |
| IP NAPT traversal (ITU-T Recommendation H.248.37 [4])             | ipnapt, (0x0099)   | 1              |
| Generic (ITU-T Recommendation H.248.1 [10], annex E.1)            | g, (0x0001)        | 1              |
| Base root (ITU-T Recommendation H.248.1 [10], annex E.2)          | root, (0x0051)     | 2              |
| Gate management (ITU-T Recommendation H.248.43 [6], Appendix I;   | gm, (0x008c)       | 2              |
| Traffic management (ITU-T Recommendation H.248.53 [7])            | tman, (0x008d)     | 1              |
| IP Domain Connection (ITU-T Recommendation H.248.41 [8])          | ipdc, (0x009d)     | 1              |
| Hanging Termination Detection (ITU-T Recommendation H.248.36 [9]) | hangterm, (0x0098) | 1              |
| Diffserv (ITU-T Recommendation H.248.52 [12])                     | ds, (0x008b)       | 2              |
| RTP Control Protocol Package (ITU-T Recommendation H.248.57 [5])  | rtcp. (0x00b5)     | 1              |

## 5.14.2 Optional Packages

**Table 5.14.2.1: Optional Packages**

| <b>Optional Packages:</b>  |                  |                |  |
|--|------------------|----------------|--|
| <b>Package Name</b>  | <b>PackageID</b> | <b>Version</b> | <b>Support dependent on:</b>   |
| Inactivity Timer (ITU-T Recommendation H.248.14 [11])  | it, (0x0045)     | 1              | MGC polling by MG.<br>Only applicable for UDP transport.   |
| Media Gateway Overload Control (ITU-T Recommendation H.248.11 [13])                          | ocp, (0x0051)    | 1              | Support of message throttling, based on rate limitation, from MGC towards MG.  |
| Media Gateway Resource Congestion Handling Package (see ITU-T Recommendation H.248.10 [14])  | chp, (0x0029)    | 1              | Support of message throttling, based on percentage limitation, from MGC towards MG.  |
| IP realm availability (ITU-T Recommendation H.248.41 Amendment 1) [8]                        | ipra (0x00e0)    | 1              | Support of mechanisms allowing the MGC to discover the IP realms that are available at the MG at a certain time and allowing the MG to inform the MGC about any changes in the availability of realms. |
| Application Data Inactivity Detection (ITU-T Recommendation H.248.40 [24])                   | adid (0x009c)    | 1              | MGC requires to be explicitly informed of a cessation of an application data flow.   |
| Explicit Congestion Notification for RTP-over-UDP Support (see 3GPP TS 29.238 Annex B) [37]) | ecnrous (0x010b) | 1              | Support of Transparent forwarding of ECN packets   |

## 5.14.3 Package usage information

## 5.14.3.1 Generic (g)

Table 5.14.3.1.1: Generic package

| Properties                               | Mandatory/Optional                   | Used in command    | Supported Values   | Provisioned Value          |
|--|--------------------------------------|--------------------|--|----------------------------|
| None                                     | -                                    | -                  | -  | -                          |
| Signals                                  | Mandatory/Optional                   | Used in command    |  | Duration Provisioned Value |
| None                                     | -                                    | -                  |  | -                          |
|  | Signal Parameters                    | Mandatory/Optional | Supported Values   | Duration Provisioned Value |
|  | -                                    | -                  | -  | -                          |
| Events                                   | Mandatory/Optional                   | Used in command    |  |                            |
| Cause (g/cause, 0x0001/0x0001)           | M                                    | ADD, MOD, NOTIFY   |  |                            |
|  | Event Parameters                     | Mandatory/Optional | Supported Values   | Provisioned Value          |
|  | None                                 |                    |  |                            |
|  | ObservedEvent Parameters             | Mandatory/Optional | Supported Values   | Provisioned Value          |
|  | General cause (Generalcause, 0x0001) | M                  | "NR" (0x0001)<br>Normal Release<br>"UR" (0x0002)<br>Unavailable Resources<br>"FT" (0x0003) Failure, Temporary<br>"FP" (0x0004) Failure, Permanent<br>"IW" (0x0005)<br>Interworking Error<br>"UN" (0x0006)<br>Unsupported | Not Applicable             |
|  | Failure cause (Failurecause, 0x0002) | O                  | Octet String   | Not Applicable             |
| Events                                   | Mandatory/Optional                   | Used in command    |  |                            |
| Signal Completion. (g/sc, 0x0001/0x0002) | Not Used                             | -                  |  |                            |
|  | Event Parameters                     | Mandatory/Optional | Supported Values   | Provisioned Value          |
|  | -                                    | -                  | -  | -                          |
|  | ObservedEvent Parameters             | Mandatory/Optional | Supported Values   | Provisioned Value          |
|  | -                                    | -                  | -  | -                          |
| Statistics                               | Mandatory/Optional                   | Used in command    | Supported Values   |                            |
| None                                     | -                                    | -                  | -  |                            |
| Error Codes                              | Mandatory/Optional                   |                    |  |                            |
| None                                     | -                                    |                    |  |                            |

## 5.14.3.2 Base root (root)

Table 5.14.3.2.1: Base root package

| Properties   | Mandatory/Optional       | Used in command    | Supported Values | Provisioned Value          |
|--|--------------------------|--------------------|------------------|----------------------------|
| MaxNrOfContexts<br>(root/maxNumberOfContexts, 0x0002/0x0001)                               | O                        | AUDITVALUE         | ALL              | YES                        |
| MaxTerminationsPerContext<br>(root/maxTerminationPerContext, 0x0002/0x0002)                | O                        | AUDITVALUE         | ALL              | YES                        |
| normalMGExecutionTime<br>(root/normalMGExecutionTime, 0x0002/0x0003)                       | O                        | AUDITVALUE         | ALL              | YES                        |
| normalMGCEExecutionTime<br>(root/normalMGCEExecutionTime, 0x0002/0x0004)                   | O                        | AUDITVALUE         | ALL              | YES                        |
| MGPProvisionalResponseTimerValue<br>(root/MGPProvisionalResponseTimerValue, 0x0002/0x0005) | O                        | AUDITVALUE         | ALL              | YES                        |
| MGCProvisionalResponseTimerValue<br>(root/MGCProvisionalResponseTimerValue, 0x0002/0x0006) | O                        | AUDITVALUE         | ALL              | YES                        |
| MGCOriginatedPendingLimit<br>(root/MGCOriginatedPendingLimit, 0x0002/0x0007)               | O                        | AUDITVALUE         | ALL              | YES                        |
| MGOrganatedPendingLimit<br>(root/MGOrganatedPendingLimit, 0x0002/0x0008)                   | O                        | AUDITVALUE         | ALL              | YES                        |
| Signals  | Mandatory/Optional       | Used in command    |                  | Duration Provisioned Value |
| None   | -                        | -                  |                  | -                          |
|  | Signal Parameters        | Mandatory/Optional | Supported Values | Duration Provisioned Value |
|  | -                        | -                  | -                | -                          |
| Events   | Mandatory/Optional       | Used in command    |                  |                            |
| None   | -                        | -                  |                  |                            |
|  | Event Parameters         | Mandatory/Optional | Supported Values | Provisioned Value          |
|  | -                        | -                  | -                | -                          |
|  | ObservedEvent Parameters | Mandatory/Optional | Supported Values | Provisioned Value          |
| -  | -                        | -                  | -                | -                          |
| Statistics   | Mandatory/Optional       | Used in command    |                  | Supported Values           |
| None   | -                        | -                  |                  | -                          |
| Error Codes  | Mandatory/Optional       |                    |                  |                            |
| None   | -                        |                    |                  |                            |

## 5.14.3.3 Differentiated Services (ds)

Table 5.14.3.3.1: 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)                    | O                        | ADD, MODIFY        | ALL              | Yes                        |
| Signals   | Mandatory/Optional       | Used in command    |                  | Duration Provisioned Value |
| None  | -                        | -                  |                  | -                          |
|   | Signal Parameters        | Mandatory/Optional | Supported Values | Duration Provisioned Value |
|   | -                        | -                  | -                | -                          |
| Events  | Mandatory/Optional       | Used in command    |                  |                            |
| None  | -                        | -                  |                  |                            |
|   | Event Parameters         | Mandatory/Optional | Supported Values | Provisioned Value          |
|   | -                        | -                  | -                | -                          |
|   | ObservedEvent Parameters | Mandatory/Optional | Supported Values | Provisioned Value          |
| -   | -                        | -                  | -                | -                          |
| Statistics  | Mandatory/Optional       | Used in command    | Supported Values |                            |
| None  | -                        | -                  | -                |                            |
| Error Codes   | Mandatory/Optional       |                    |                  |                            |
| None  | -                        |                    |                  |                            |

## 5.14.3.4 Gate Management (gm)

Table 5.14.3.4.1: Gate Management Package

| Properties   | Mandatory/Optional       | Used in command    | Supported Values | Provisioned Value          |
|--|--------------------------|--------------------|------------------|----------------------------|
| Remote Source Address Filtering<br>(gm/saf,0x008c/0x0001)  | M                        | ADD, MODIFY        | ALL              | Not Applicable             |
| Remote Source Address Mask<br>(gm/sam,0x008c/0x0002)       | O                        | ADD, MODIFY        | ALL              | Not Applicable             |
| Remote Source Port Filtering<br>(gm/spf,0x008c/0x0003)     | M                        | ADD, MODIFY        | ALL              | Not Applicable             |
| Remote Source Port<br>(gm/spr,0x008c/0x0004)               | O                        | ADD, MODIFY        | ALL              | Not Applicable             |
| Explicit Source Address Setting<br>(gm/esas,0x008c/0x0005) | Not Supported            | NONE               | -                | Not Applicable             |
| Local Source Address<br>(gm/lssa,0x008c/0x0006)            | Not Supported            | NONE               | -                | Not Applicable             |
| Explicit Source Port Setting<br>(gm/esps,0x008c/0x0007)    | Not Supported            | NONE               | -                | Not Applicable             |
| Local Source Port<br>(gm/lsp,0x008c/0x0008)                | Not Supported            | NONE               | -                | Not Applicable             |
| Remote Source Port Range<br>(gm/sprr,0x008c/0x000A)        | O                        | ADD, MODIFY        | ALL              | 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 |                            |
| Discarded Packets  | NOT USED                 | -                  | -                |                            |
| Error Codes  | Mandatory/Optional       |                    |                  |                            |
| None   | -                        |                    |                  |                            |



## 5.14.3.5 Traffic management (tman)

Table 5.14.3.5.1: Traffic Management Package

| Properties  | Mandatory/Optional       | Used in command    | Supported Values | Provisioned Value          |
|---|--------------------------|--------------------|------------------|----------------------------|
| Policing (tman/pol, 0x008d/0x0005)                  | M                        | ADD, MODIFY        | ALL              | Not Applicable             |
| Peak Data Rate (tman/pdr, 0x008d/0x0001)            | O                        | ADD, MODIFY        | ALL              | Not Applicable             |
| Delay Variation Tolerance (tman/dvt, 0x008d/0x0004) | O                        | ADD, MODIFY        | ALL              | ALL                        |
| Sustainable Data Rate (tman/sdr, 0x008d/0x0002)     | M                        | ADD, MODIFY        | ALL              | Not Applicable             |
| Maximum burst size (tman/mbs, 0x008d/0x0003)        | M                        | ADD, MODIFY        | ALL              | 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  | -                        |                    |                  |                            |

NOTE: The data rate shall be calculated using the packet size from IP layer upwards. The Token Bucket method as described by ITU-T Recommendation H.248.53 [7] sub-clause 9.4.3 (as per IETF RFC 2216 [32]) shall be followed where SDR = "r" and MBS = "b" (i.e. the additional "M" value does not apply).

## 5.14.3.6 Inactivity Timer (it)

Table 5.14.3.6.1: 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, 0x0045/0x0001) | M                                     | MODIFY, NOTIFY     |                  |                            |
|  | Event Parameters                      | Mandatory/Optional | Supported Values | Provisioned Value          |
|  | Maximum Inactivity Time (mit, 0x0001) | O                  | ALL              | Yes                        |
|  | ObservedEvent Parameters              | Mandatory/Optional | Supported Values | Provisioned Value          |
|  | None                                  | -                  | -                | -                          |
| Statistics                                 | Mandatory/Optional                    | Used in command    | Supported Values |                            |
| None                                       | -                                     | -                  | -                |                            |
| Error Codes                                | Mandatory/Optional                    |                    |                  |                            |
| None                                       | -                                     |                    |                  |                            |

## 5.14.3.7 IP Domain Connection (ipdc)

Table 5.14.3.7.1: IP domain connection package

| Properties   | Mandatory/Optional       | Used in command      | Supported Values | Provisioned Value          |
|--|--------------------------|----------------------|------------------|----------------------------|
| IP Realm Identifier (ipdc/realm, 0x009d/0x0001)  | M                        | ADD, MODIFY (NOTE 2) | ALL (NOTE 1)     | Yes                        |
| 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       |                      |                  |                            |
| No   | -                        |                      |                  |                            |
| NOTE 1: If the MGC uses an IP Realm Identifier ( <i>ipdc/realm</i> ) property exceeding the maximum length limitation defined in ITU-T Recommendation H.248.41 [8], the MG shall reply with an error descriptor using error code #410: "Incorrect identifier".   |                          |                      |                  |                            |
| NOTE 2: The MODIFY command is listed due to the fact that subsequent Streams may be "added" by MODIFY requests in case of multi-Stream-per-Termination structures. The subsequent Streams shall then carry the same IP Realm Identifier ( <i>ipdc/realm</i> ) property value as the very first Stream. |                          |                      |                  |                            |

## 5.14.3.8 Media Gateway Overload Control Package (ocp)

Table 5.14.3.8.1: 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<br>(ocp/mg_overload,<br>0x0051/0x0001)<br>(NOTE 1) | M                        | MODIFY, NOTIFY (NOTE 1) |                  |                            |
|  | 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   | -                        |                         |                  |                            |

NOTE 1: When the MG is overloaded, overload Events may be sent **either** only following the **first ADD.request** which creates a new Context, **or** following **all ADD.request** commands (see ITU-T Recommendation H.248.11 [13] Corrigendum 1).  
These two options result in different normalisations of the overload event rate as an indicator of the level of MG overload.

## 5.14.3.9 Hanging Termination Detection (hangterm)

Table 5.14.3.9.1: 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<br>(hangterm/thb,<br>0x0098/0x0001) | M                          | ADD, MODIFY, NOTIFY |                  |                            |
|   | Event Parameters           | Mandatory/Optional  | Supported Values | Provisioned Value          |
|   | Timer X<br>(timerx,0x0001) | M                   | ALL (NOTE1)      | YES                        |
|   | ObservedEvent Parameters   | Mandatory/Optional  | Supported Values | Provisioned Value          |
|   | -                          | -                   | -                | -                          |
| Statistics  | Mandatory/Optional         | Used in command     | Supported Values |                            |
| None  | -                          | -                   | -                |                            |
| Error Codes   | Mandatory/Optional         |                     |                  |                            |
| None  | -                          |                     |                  |                            |

NOTE1: The heartbeat timer shall be configured to a value much greater than the mean call holding time.

## 5.14.3.10 Media Gateway Resource Congestion handling Package (chp)

Table 5.14.3.10.1: Media Gateway Resource Congestion handling 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    |                  |                            |
| MGCon<br>(chp/mgcon,<br>0x0029/0x0001) | M                               | MODIFY, NOTIFY     |                  |                            |
|  | Event Parameters                | Mandatory/Optional | Supported Values | Provisioned Value          |
|  | None                            | -                  | -                | -                          |
|  | ObservedEvent Parameters        | Mandatory/Optional | Supported Values | Provisioned Value          |
|  | Reduction<br>(reduction,0x0001) | M                  | 0-100            | Not Applicable             |
| Statistics                             | Mandatory/Optional              | Used in command    | Supported Values |                            |
| None                                   | -                               | -                  | -                |                            |
| Error Codes                            | Mandatory/Optional              |                    |                  |                            |
| None                                   | -                               |                    |                  |                            |

## 5.14.3.11 IP Realm Availability (ipra)

Table 5.14.3.11.1: IP Realm Availability Package

| Properties  | Mandatory/Optional                           | Used in command    | Supported Values  | Provisioned Value          |
|---|--|--------------------|-------------------|----------------------------|
| Available Realms,<br>(ipra/ar,<br>0x00e0/0x0001)          | M  | AUDITVALUE         | ALL               | 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    |                   |                            |
| Available Realms<br>Changed, (ipra/arc,<br>0x00e0/0x0001) | M  | MODIFY, NOTIFY     |                   |                            |
|   | Event Parameters                             | Mandatory/Optional | Supported Values: | Provisioned Value          |
|   | -  | -                  | -                 | -                          |
|   | ObservedEvent Parameters                     | Mandatory/Optional | Supported Values  | Provisioned Value          |
|   | Newly Available<br>Realms (nar,<br>0x0001)   | M                  | ALL               | Not applicable             |
|   | Newly Unavailable<br>Realms (nur,<br>0x0002) | M                  | ALL               | Not applicable             |
| Statistics  | Mandatory/Optional                           | Used in command    | Supported Values  |                            |
| None  | -  | -                  | -                 |                            |
| Error Codes   | Mandatory/Optional                           |                    |                   |                            |
| None  | -  |                    |                   |                            |

## 5.14.3.12 IP NAPT Traversal (ipnapt)

Table 5.14.3.12.1: IP NAPT Traversal Package

| Properties                             | Mandatory/Optional                       | Used in command    | Supported Values | Provisioned Value          |
|--|--|--------------------|------------------|----------------------------|
| None                                   | -  | -                  | -                | -                          |
| Signals                                | Mandatory/Optional                       | Used in command    |                  | Duration Provisioned Value |
| Latching (ipnapt/latch) 0x0099/0x0001) | M  | ADD, MODIFY        |                  | Not Applicable             |
|  | Signal Parameters                        | Mandatory/Optional | Supported Values | Duration Provisioned Value |
|  | NAPT Traversal Processing (napt, 0x0001) | M                  | ALL              | Not Applicable             |
| Events                                 | Mandatory/Optional                       | Used in command    |                  |                            |
| None                                   | -  | -                  |                  |                            |
|  | Event Parameters                         | Mandatory/Optional | Supported Values | Provisioned Value          |
|  | -  | -                  | -                | -                          |
|  | ObservedEvent Parameters                 | Mandatory/Optional | Supported Values | Provisioned Value          |
|  | -  | -                  | -                | -                          |
| Statistics                             | Mandatory/Optional                       | Used in command    | Supported Values |                            |
| None                                   | -  | -                  | -                |                            |
| Error Codes                            | Mandatory/Optional                       |                    |                  |                            |
| None                                   | -  |                    |                  |                            |

## 5.14.3.13 RTCP Handling Package (rtcph)

Table 5.14.3.13.1: RTCP Handling Package

| Properties   | Mandatory/Optional       | Used in command    | Supported Values | Provisioned Value          |
|--|--------------------------|--------------------|------------------|----------------------------|
| RTCP Allocation Specific Behaviour (rtcph/rsb,0x00b5/0x0009) | M                        | ADD, MODIFY        | ALL              | OFF                        |
| Signals  | Mandatory/Optional       | Used in command    |                  | Duration Provisioned Value |
| None   | -                        | -                  |                  | -                          |
|  | Signal Parameters        | Mandatory/Optional | Supported Values | Duration Provisioned Value |
|  | -                        | -                  | -                | -                          |
| Events   | Mandatory/Optional       | Used in command    |                  |                            |
| None   | -                        | -                  |                  |                            |
|  | Event Parameters         | Mandatory/Optional | Supported Values | Provisioned Value          |
|  | -                        | -                  | -                | -                          |
|  | ObservedEvent Parameters | Mandatory/Optional | Supported Values | Provisioned Value          |
|  | -                        | -                  | -                | -                          |
| Statistics   | Mandatory/Optional       | Used in command    | Supported Values |                            |
| None   | -                        | -                  | -                |                            |
| Error Codes  | Mandatory/Optional       |                    |                  |                            |
| None   | -                        |                    |                  |                            |

## 5.14.3.14 Application Data Inactivity Detection (adid)

Table 5.14.3.14.1: Application Data Inactivity 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     |                  |                            |
| IP Flow Stop Detection (adid/ipstop, 0x009c/0x0001) | M                           | ADD, MODIFY, NOTIFY |                  |                            |
|   | Event Parameters            | Mandatory/Optional  | Supported Values | Provisioned Value          |
|   | Detection time (dt, 0x0001) | M                   | ALL              | Yes                        |
|   | Direction (dir, 0x002)      | M                   | ALL              | Yes                        |
|   | ObservedEvent Parameters    | Mandatory/Optional  | Supported Values | Provisioned Value          |
| None  | -                           | -                   | -                |                            |
| Statistics  | Mandatory/Optional          | Used in command     | Supported Values |                            |
| None  | -                           | -                   | -                |                            |
| Error Codes   | Mandatory/Optional          |                     |                  |                            |
| None  |                             |                     |                  |                            |

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

Table 5.14.3.15.1: 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)<br>(NOTE 1, NOTE 2) |
| Initiation Method (ecnrous/initmethod, 0x010b/0x0003)  | M                                | ADD, MODIFY         | "inactive", "leap" | "inactive"                         |
| ECN Mode (ecnrous/mode, 0x010b/0x0004)   | Not Signalled                    | -                   | -                  | "setread"<br>(0x0002)<br>(NOTE 2)  |
| ECT Marking (ecnrous/ectmark, 0x010b/0x0005)   | Not Signalled                    | -                   | -                  | "0" (0x0002)<br>(NOTE 2)           |
| ECN Congestion Marking (ecnrous/congestmark, 0x010b/0x0006)  | Not Signalled                    | -                   | -                  | "nomark"<br>(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)  | O (NOTE 2)                       | 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                    | -                   | -                  |                                    |
| Error Codes  | Mandatory/Optional               |                     |                    |                                    |
| None   | -                                |                     |                    |                                    |
| NOTE 1: Application Specific Rate Adaptation shall be applied in accordance with 3GPP TS 26.114 [26]. For speech this requires support of CMR and TMMBR for video. |                                  |                     |                    |                                    |
| NOTE 2: Not used for ECN transparent. Mandatory for ECN endpoint.  |                                  |                     |                    |                                    |

## 5.15 Mandatory support of SDP and Annex C information elements

Table 5.15.1: Mandatory 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   |
| c-line              | "SDP_C "        | <p>&lt;nettype&gt; &lt;addrtype&gt; and &lt;connection address&gt; 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 &lt;connection address&gt; subfield.</p>  |
| m-line              | "SDP_M "        | <p>There are four fields (or SDP values) &lt;media&gt;, &lt;port&gt;, &lt;proto&gt; and &lt;fmt&gt; in the "m=" line (see IETF RFC 4566 [17];NOTE 1). The "m=" line may be omitted from SDP.</p> <p>&lt;media&gt;, &lt;port&gt;, &lt;proto &gt; and &lt;fmt-list&gt; are required if the "m=" line is included.</p> <p>Media type &lt;media&gt; :</p> <p>The &lt;media&gt; field shall be set to "audio" or "video" or "-". When "-" is used for the <i>media</i> value then no media resources are required to be reserved at this stage (NOTE 1). If the MG does not support the requested media value it shall reject the command with error code 515.</p> <p>Transport port &lt;port&gt;<br/>The <i>port</i> value may be underspecified with CHOOSE wildcard.</p> <p>Transport protocol &lt;proto&gt;<br/>As in table 5.15.2.</p> <p>Media format &lt;fmt&gt;<br/>Various values may be used for media-format, dependent on the related &lt;media&gt;.</p> <p>"-" may be used for the <i>format list</i> value if no media reservation is required at this stage.<br/>If the MG does not support the requested media format value the MG shall reject the command with error code 449.</p> |
| b-line              | "SDP_B "        | <p>Shall not be used without a "m=" line.</p> <p>The <i>modifier</i> values shall be "AS", "RS" and "RR".</p> <p>The AS <i>modifier</i> implies that the <i>bandwidth-value</i> represents the "maximum bandwidth" (see clause 5.8/ IETF RFC 4566 [17]). The <i>bandwidth-value</i> relates therefore to the <i>peak bitrate</i> (NOTE 2).</p> <p>The <i>bandwidth-value</i> value defines the IP layer bandwidth for the specific H.248 Stream.</p> <p>For RTP flows, where RTCP resources are reserved together with the RTP resources using the "RTP Specific Behaviour" property of the Gate Management package (gm) property, the IMS-ALG may also supply additional RTCP bandwidth modifiers (i.e. RR and RS, see IETF RFC 3556 [28]). The AS <i>bandwidth</i> value will include the bandwidth used by RTP. In the absence of the RTCP bandwidth modifiers the IMS-AGW shall allow an additional 5% of the AS bandwidth value for the bandwidth for RTCP, in accordance with IETF RFC 3556 [28].</p>   |



|   |         |   |
|---|---------|---|
| o-line  | "SDP_O" | <p>The origin line consists of six fields: (&lt;username&gt;, &lt;sess-id&gt;, &lt;sess-version&gt;, &lt;nettype&gt;, &lt;addrtype&gt; and &lt;unicast-address&gt;).</p> <p>The MGC is not required to supply this line but shall accept it (see clause 7.1.8/ITU-T Recommendation H.248.1 [10]).</p> <p>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:</p> <ul style="list-style-type: none"> <li>- &lt;user name&gt; should contain an hyphen</li> <li>- &lt;session ID&gt; and &lt;version&gt; should contain one or more digits as described in IETF RFC 4566 [17]</li> <li>- &lt;network type&gt; shall be set to IN</li> <li>- &lt;address type&gt; 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.</li> <li>- &lt;address&gt; should contain the fully qualified domain name or IP address of the gateway.</li> </ul> |
| s-line  | "SDP_S" | <p>The session name "s=" line contains a single field s= &lt;session name&gt;.</p> <p>The MGC is not required to supply this line but shall accept it (see clause 7.1.8/ITU-T Recommendation H.248.1 [10]).</p> <p>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:</p> <ul style="list-style-type: none"> <li>- "s=-"</li> </ul>  |
| t-line  | "SDP_T" | <p>The time "t=" line consists of two fields t= &lt;start time&gt; and &lt;stop time&gt;.</p> <p>The MGC is not required to supply this line but shall accept it (see clause 7.1.8/ITU-T Recommendation H.248.1 [10]).</p> <p>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:</p> <ul style="list-style-type: none"> <li>"t=0 0"</li> </ul>   |
| <p>NOTE 1: IETF RFC 4566 [17] enables "-" as a valid character.</p> <p>NOTE 2: The unit for the <i>bandwidth-value</i> (peak bitrate) is "kbit/s". The "b=" line is not providing any information about the traffic characteristic, i.e. whether the traffic flow has a Constant BitRate (CBR) or Variable BitRate (VBR). The <i>bandwidth-value</i> is thus independent of the traffic characteristic and relates to the peak bitrate for CBR and VBR traffic.</p> |         |   |

Table 5.15.2: Transport Protocol

|                                       |  |
|---------------------------------------|--|
| Transport Protocol <proto> in m-line: | If the MG does not support the requested transport protocol, it shall reject the command with error code 449.  |
| udp                                   | Allow only L4 protocol = UDP (NOTE 1).   |
| TCP                                   | Allow only L4 protocol = TCP (NOTE 2)  |
| TCP/MSRP                              | Message service using IETF RFC 4975 [18].  |
| RTP/AVP                               | RTP profile according IETF RFC 3551 [19]. Allow only L4 protocol = UDP (see NOTE 1)  |
| RTP/SAVP                              | SRTP profile according IETF RFC 3711 [30] (NOTE 3). Allow only L4 protocol = UDP (see NOTE 1)  |
| RTP/SAVPF                             | Extended SRTP profile for RTCP-based Feedback (RTP/SAVPF) according IETF RFC 5124 [31] (NOTE 3).. Allow only L4 protocol = UDP (see NOTE 1)              |
| RTP/AVPF                              | Extended RTP profile for RTCP-based Feedback (RTP/AVPF) according IETF RFC 4585 [25]. See 3GPP TS 26.114 [26]. Allow only L4 protocol = UDP (see NOTE 1) |
| udptl                                 | Allow only L4 protocol = UDP   |

NOTE 1: Parameter "udp" is introduced by IETF RFC 4566 [17] but not yet registered by IANA (see <http://www.iana.org/assignments/sdp-parameters>).

NOTE 2: Upper case TCP is defined by IETF RFC 4145 [20] and registered by IANA.

NOTE 3: The IMS AGW does not need to reserve resources for end-to-access media security en-/decryption at this stage if RTP profile identifiers "RTP/SAVP" or "RTP/SAVPF" are signalled without the "a=crypto" property for that stream. For e2e media security either "RTP/SAVP" is signalled at all terminations in a context, or "RTP/SAVPF" is signalled at all terminations in a context and no media attribute will be signalled; the IMS AGW shall then not terminate the SRTP / SRTCP protocol, but shall pass the encrypted media and control flows (as indicated with the rtcp/rsb property) transparently.

## 5.16 Optional support of SDP and Annex C information elements

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

**Table 5.16.1: Optional Annex C and SDP information elements**

| Information Element                   | Annex C Support | SDP Support  |
|---------------------------------------|-----------------|--|
| a-line                                | "SDP_A "        | <p>1) Application "RTCP transport address control":<br/>The attribute "a=rtcp" line may either contain (a=rtcp: &lt;port&gt;) or (a=rtcp: &lt;port&gt; &lt;network type&gt; &lt;address type&gt; &lt;connection address&gt;) when the "a=" line is used for RTCP transport port and optionally network address transmission (see IETF RFC 3605 [21]). .<br/>The MGC shall supply the "a=rtcp" line in the RD when non-default RTCP network address or transport port values are used by the peer media entity.<br/>"RTCP transport address control" should be supported by MG.</p> <p>2) Media related parameters in general:<br/>The "a=" line provides the complementary information for the "m=" line with regards to a specified media type/format (e.g. an optional SDP „a=ptime" line for a particular media format).<br/>For a dynamic RTP payload type, for each media information on the codec type shall be provided in a separate SDP "a=rtpmap" line and possibly additional SDP "a=fmtp"-line(s).</p> <p>3) Application " Media interworking (transcoding)":<br/>See "a=" line specification in (2). Media interworking is limited to audio transcoding only.</p> <p>4) IMS media plane security related parameters:<br/>The attribute "a=crypto" (see IETF RFC 4568 [29]) shall be provided for an m-line in the local and remote descriptor of an access network termination if the IMS-ALG wants that the corresponding media is encrypted, decrypted and/or integrity protected by the IMS-AGW (IMS end-to-access-edge media plane security). For each m-line, only a single "a=crypto" attribute shall be provisioned (i.e. only information related to a single crypto suite is provisioned to the IMS-AGW). The "a=crypto" attribute may contain several master keys. An IMS-AGW supporting end-to-access-edge media plane security shall support parameters within the "a=crypto" attribute in accordance with the profile in Annex of 3GPP TS 33.328 [34].</p> |
| NOTE: Media Interworking is optional. |                 |  |

## 5.17 Procedures

### 5.17.1 Formats and Codes

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

The coding rules applied in ITU-T Recommendation H.248.1 [10] for the applicable coding technique shall be followed for the UMTS capability set.

The binary encoding rules which are applicable to the defined Abstract Syntaxes are the Basic Encoding Rules for Abstract Syntax Notation One, defined in ITU-T Recommendation X.690 [22]. Specifically in accordance with ITU-T Recommendation X.690 [22] 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.

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

Table 5.17.1.1: Information Elements Used in Procedures

| Signalling Object            | H.248 Descriptor                      | Coding   |
|------------------------------|---------------------------------------|--|
| Alternate MGC Id             | ServiceChange                         | The MGCIIdToTry parameter in ITU-T Recommendation H.248.1 [10].  |
| Available Realms             | Termination State                     | According to <i>Available Realms</i> property in ITU-T Recommendation H.248.41 [8].  |
| BNC Release                  | Events,<br>ObservedEvents             | As for the Events/ObservedEvents Descriptor in subclause E.1.2.1/ ITU-T Recommendation H.248.1 [10] "Cause"  |
| Cause                        | ObservedEvents                        | As for the ObservedEvent Parameter in subclause E.1.2.1/ ITU-T Recommendation H.248.1 [10] "General cause"   |
| Changed Realms               | Observed Events                       | According to Observed Events Parameters for <i>Available Realms Changed</i> event in ITU-T Recommendation H.248.41 [8].  |
| Codec List                   | Local Descriptor or Remote Descriptor | <fmt list> in a single SDP m-line.<br>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).<br>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). |
| Connectivity Mode            | Local Control                         | ITU-T Recommendation H.248.1 [10] Mode property.<br>Binary Encoding: Encoding as per ITU-T Recommendation H.248.1 Annex A [10] "streamMode"<br>Textual Encoding: Encoding as per ITU-T Recommendation H.248.1 Annex B [10] "streamMode".   |
| Context ID                   | NA                                    | Binary Encoding: As per ITU-T Recommendation H.248.1 [10] Annex A.<br>Textual Encoding: As per ITU-T Recommendation H.248.1 [10] Annex B.  |
| Cryptographic SDES Attribute | Local Descriptor or Remote Descriptor | "crypto" attribute in SDP a-line as defined in IETF RFC 4568 [29], see 5.16  |
| Delay Variation Tolerance    | Local Control                         | This is the tman/dvt property from ITU-T Recommendation H.248.53 [7].  |
| Diffserv Code Point          | Local Control                         | Defined according to the <i>Differentiated Services Code Point</i> property in ITU-T Recommendation H.248.52 [12].   |
| Diffserv Tagging Behaviour   | Local Control                         | Defined according to the <i>Tagging Behaviour</i> property in ITU-T Recommendation H.248.52 [12].  |
| ECN Enabled                  | Local Descriptor or Remote Descriptor | Defined according to the "ECN Enabled" property in 3GPP TS 29.238 Annex B [37].  |
| ECN Failure                  | Events,<br>Observed Events            | Defined according to the "ECN Failure" Event in 3GPP TS 29.238 Annex B [37].   |
| ECN Failure Type             | ObservedEvents Descriptor             | As for the ObservedEventsDescriptor Parameter "Failure Type" in 3GPP TS 29.238 Annex B [37].   |
| ECN Initiation Method        | Local Descriptor or Remote Descriptor | Defined according to "Initiation Method" property in 3GPP TS 29.238 Annex B [37].  |
| Emergency Call Indication    | NA                                    | ITU-T Recommendation H.248.1 [3] 6.1.1 Emergency Call Indicator<br>Binary Encoding: Encoding as per ITU-T Recommendation H.248.1 [10] Annex A "Emergency" context attribute<br>Textual Encoding: Encoding as per ITU-T Recommendation H.248.1 [10] Annex B "EmergencyToken" context attribute  |
| Inactivity Timer             | Events,<br>Observed Events            | Defined according to <i>Inactivity Timeout</i> event in ITU-T Recommendation H.248.14 [11].  |
| IP Address                   | Local Descriptor or Remote Descriptor | <connection address> in SDP "c-line"   |
| IP Realm                     | Local Control                         | According to <i>IP Realm Identifier</i> property in ITU-T Recommendation H.248.41 [8].   |
| IP Version                   | Local Descriptor or Remote Descriptor | <address type> in SDP "c-line", see 5.15   |
| Latching                     | Signals                               | This is the ipnapt/latch signal in ITU-T Recommendation H.248.37 [4].  |
| Maximum Burst Size           | Local Control                         | This is the tman/mbs property from ITU-T Recommendation H.248.53 [7]   |
| Media Inactivity Detection   | Events,<br>Observed Events            | Defined according to <i>ipstop</i> event in ITU-T Recommendation H.248.40 [24].  |
| Media Inactivity Detection   | Events                                | As for the Event Parameter in ITU-T Recommendation H.248.40 [24]   |

|                                      |                                       |   |
|--------------------------------------|---------------------------------------|---|
| Time                                 |                                       | "Detection Time"  |
| Media Inactivity Detection Direction | Events                                | As for the Event Parameter in ITU-T Recommendation H.248.40 [24]<br>"Direction"   |
| Media Type                           | Local Descriptor or Remote Descriptor | <media> in SDP m-line<br>"audio" or "video" or "-"  |
| Overload Notification                | Events, ObservedEvents                | This is the chp/mgcon event from ITU-T Recommendation H.248.10 [14] or the ocp/mg_overload event from ITU-T Recommendation H.248.11 [13].   |
| Peak Data Rate                       | LocalControl                          | This is the tman/pdr property from ITU-T Recommendation H.248.53 [7].   |
| Policing Required                    | LocalControl                          | This is the tman/pol property from ITU-T Recommendation H.248.53 [7].   |
| Port                                 | Local Descriptor or Remote Descriptor | <port> in SDP m-line.   |
| Realm Availability Change            | Events, Observed Events               | According to <i>Available Realms Changed</i> event in ITU-T Recommendation H.248.41 [8].  |
| Reduction                            | ObservedEvent Descriptor              | As for the ObserverdEventDescriptor in subclause 4.2.1/ ITU-T Recommendation H.248.10 [14] "MGCongestion".  |
| Remote Source Address Filtering      | Local Control                         | Defined according to <i>Remote Source Address Filtering</i> property in ITU-T Recommendation H.248.43 [6].  |
| Remote Source Address Mask           | Local Control                         | Defined according to <i>Remote Source Address Mask</i> property in ITU-T Recommendation H.248.43 [6].   |
| Remote Source Port Filtering         | Local Control                         | Defined according to <i>Remote Source Port Filtering</i> property in ITU-T Recommendation H.248.43 [6].   |
| Remote Source Port                   | Local Control                         | Defined according to <i>Remote Source Port</i> property in ITU-T Recommendation H.248.43 [6].   |
| Remote Source Port Range             | Local Control                         | Defined according to <i>Remote Source Port Range</i> property in ITU-T Recommendation H.248.43 [6].   |
| Reserve_Value                        | Local Control                         | ITU-T Recommendation H.248.1 [10] Reserve property.<br>Binary Encoding: Encoding as per ITU-T Recommendation H.248.1 Annex A [10] "reserveValue"<br>Textual Encoding: Encoding as per ITU-T Recommendation H.248.1 Annex B "reservedValueMode". |
| ROOT Properties                      | Termination State                     | The properties in subclause E.2.1/ ITU-T Recommendation H.248.1 [10]  |
| RTCP allocation                      | Local Control                         | Defined according to <i>RTCP Allocation Specific Behaviour</i> property in ITU-T Recommendation H.248.57 [5].   |
| RtcpbwRR                             | Local Descriptor or Remote Descriptor | <bandwidth> in SDP "b:RR"-line. see 5.15  |
| RtcpbwRS                             | Local Descriptor or Remote Descriptor | <bandwidth> in SDP "b:RS"-line. see 5.15  |
| Rtpbw                                | Local Descriptor or Remote Descriptor | <bandwidth> in SDP "b:AS"-line. see 5.15  |
| RTPpayload                           | Local Descriptor or Remote Descriptor | <fmt list> in SDP m-line. This may be set to CHOOSE (\$) in a LD sent from the IMS-ALG toward the IMS-AGW.  |
| Stream Number                        | Stream                                | Encoding as per ITU-T Recommendation H.248.1 Annex B [10] "Stream"/"ST".<br>For a single stream, this may be omitted by the IMS-ALG.  |
| Sustainable Data Rate                | Local Control                         | This is the tman/sdr property from ITU-T Recommendation H.248.53 [7].   |
| Termination heartbeat                | Events ObservedEvents                 | As per <i>Termination Heartbeat</i> defined in ITU-T Recommendation H.248.36 [9] Clause 5.2.1.  |
| Termination ID                       | NA                                    | Binary Encoding: As per ITU-T Recommendation H.248.1 [10] Annex A.<br>Textual Encoding: As per ITU-T Recommendation H.248.1 [10] Annex B.   |
| Transaction ID                       | NA                                    | Binary Encoding: As per ITU-T Recommendation H.248.1 [10] Annex A.<br>Textual Encoding: As per ITU-T Recommendation H.248.1 [10] Annex B.   |
| Transport                            | Local Descriptor or Remote Descriptor | <transport> in SDP m-line, see 5.15   |

## 5.17.2 Call Related Procedures

### 5.17.2.1 General

This section describes the various call related procedures performed by the IMS-AGW, which are listed in table 5.17.2.1.1

**Table 5.17.2.1.1: IMS-AGW Call Related Procedures**

| Transaction defined in 3GPP TS 23.334 [23] | Supported | Comment  |
|--|-----------|--|
| Reserve AGW Connection Point               | Mandatory | See 5.17.2.2   |
| Configure AGW Connection Point             | Mandatory | See 5.17.2.3   |
| Reserve and Configure AGW Connection Point | Mandatory | See 5.17.2.4   |
| Release AGW Termination                    | Mandatory | See 5.17.2.5   |
| Termination Heartbeat Indication           | Mandatory | See 5.17.2.6   |
| IP Bearer Released                         | Mandatory | See 5.17.2.7   |
| Media Inactivity Notification              | Optional  | See 5.17.2.8   |
| Change Through Connection                  | Mandatory | See 5.17.2.9   |
| Change Flow Direction                      | Optional  | See 5.17.2.10.   |
| ECN Failure Indication                     | Optional  | See 5.17.2.11<br>Only applicable if ECN endpoint capability is supported |

### 5.17.2.2 Reserve AGW Connection Point

The IMS-ALG sends an ADD request command as in Table 5.17.2.2.1.

Table 5.17.2.2.1: Reserve AGW Connection Point Request

| Address Information  | Control information  | Bearer information  |
|--|--|---|
| Local Descriptor {<br>Port = \$<br>IP Address = \$<br>IP Version = IPv4 or IPv6<br>} | Transaction ID = x<br>If Context Requested:<br>Context ID= \$<br>If Emergency Call:<br>Emergency Call Indication<br><br>If Context Provided:<br>Context ID = c1<br><br>Termination ID = \$<br>If Stream Number specified:-<br>Stream Number<br>If Resources for multiple Codecs<br>required:<br>Reserve_Value<br><br>If IP Interface Type:<br>IP interface = "IP interface type"<br><br>If indication on Bearer Released<br>requested:<br>NotificationRequested (Event ID =<br>x, "BNC Release")<br><br>If diffserv required:-<br>Diffserv Code Point<br>If tagging behaviour<br>Diffserv Tagging Behaviour<br><br>If Remote Source Address Filtering<br>required:-<br>Remote Source Address Filtering<br>If Remote Source Address range<br>required:<br>Remote Source Address<br>Mask<br><br>If Remote Source Port Filtering<br>required:-<br>Remote Source Port Filtering<br>If individual port:<br>Remote Source Port<br>If range of ports<br>Remote Source Port Range<br><br>NotificationRequested (Event ID = x,<br>"termination heartbeat")<br><br>If IP Realm specified:-<br>IP Realm<br><br>If Latching Required:-<br>Latching<br><br>If Sustainable Data Rate Policing<br>Required:-<br>Policing Required<br>Sustainable Data Rate<br>Maximum Burst Size<br><br>If Peak Data Rate Policing Required:<br>Policing Required<br>Peak Data Rate<br>If Delay Variation Required<br>Delay Variation Tolerance | Local Descriptor {<br>If media is "audio" or "video":<br>Codec List = Codec List<br>RTP Payloads = RTP Payload<br>Rtpbw<br>If RTCP bandwidth<br>RtcpbwRS<br>RtcpbwRR<br>If IMS media plane security<br>required:<br>Cryptographic SDES Attribute<br>} |

|  |   |  |
|--|---|--|
|  | <p>If Media Inactivity Detection Required:<br/>                 NotificationRequested (Event ID = x, "Media Inactivity Detection( Media Inactivity Detection Time, Media Inactivity Detection Direction) ")<br/>                 (NOTE 1)</p> <p>If RTCP handling required:<br/>                 RTCP allocation</p> <p>If ECN transparent support required:<br/>                 ECN Enable = "True"<br/>                 Initiation Method = "inactive"</p> <p>If ECN Endpoint support required<br/>                 ECN Enable = "True"<br/>                 Initiation Method = "ECN Initiation Method" (NOTE 2)</p> <p>If notification of ECN Failure Report:<br/>                 NotificationRequested (Event ID = x, "ECN Failure")</p> |  |
| <p>NOTE 1: The event parameters "Media Inactivity Detection Time" and "Media Inactivity Detection Direction" are optional.</p> <p>NOTE 2: This shall be set to a value other than "inactive". See Table 5.14.3.15.1.</p> |   |  |

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

**Table 5.17.2.2.2: Reserve AGW Connection Point Acknowledge**

| Address Information   | Control information   | Bearer information   |
|---|---|--|
| Local Descriptor {<br>Port<br>IP Address<br>IP Version<br>} | Transaction ID = x<br>Context ID = C1<br>Termination ID = T1<br>Stream Number | Local Descriptor {<br>If media is "audio" or "video":<br><br>Codec List<br>RTP Payloads<br>Rtpbw<br>If RTCP bandwidth<br>RtcpbwRS<br>RtcpbwRR<br>If IMS media plane security was provided in the request:<br>Cryptographic SDES Attribute<br>} |

### 5.17.2.3 Configure AGW Connection Point

This procedure is used to configure the AGW connection point during session establishment or to reconfigure it during session establishment or after the session is established

The IMS-ALG sends a MODIFY request command as in Table 5.17.2.3.1.



Table 5.17.2.3.1: Configure AGW Connection Point Request

| Address Information  | Control information   | Bearer information   |
|--|---|--|
| If local resources are modified:<br>Local Descriptor {<br>Port<br>IP Address<br>IP Version<br>}<br>If remote resources are modified:<br>Remote Descriptor {<br>Port<br>IP Address<br>IP Version<br>} | Transaction ID = x<br>Context ID = C1<br>Termination ID = T1<br><br>If Stream Number specified:<br>Stream Number<br><br>If Resources for multiple Codecs required:<br>Reserve_Value<br><br>If diffserv required:-<br>Diffserv Code Point<br>If tagging behaviour<br>Diffserv Tagging Behaviour<br><br>If Remote Source Address Filtering required:-<br>Remote Source Address Filtering<br>If Remote Source Address range required:<br>Remote Source Address<br>Mask<br><br>If Remote Source Port Filtering required:-<br>Remote Source Port Filtering<br>If individual port:<br>Remote Source Port<br>If range of ports<br>Remote Source Port Range<br><br>NotificationRequested (Event ID = x, "termination heartbeat")<br><br>If IP Realm specified:-<br>IP Realm (NOTE 1)<br><br>If Latching Required:-<br>Latching<br><br>If Sustainable Data Rate Policing Required:-<br>Policing Required<br>Sustainable Data Rate<br>Maximum Burst Size<br><br>If Peak Data Rate Policing Required:<br>Policing Required<br>Peak Data Rate<br>If Delay Variation Required<br>Delay Variation Tolerance<br><br>If Media Inactivity Detection Required:<br>NotificationRequested (Event ID = x, "Media Inactivity Detection( Media Inactivity Detection Time, Media Inactivity Detection Direction)")<br>(NOTE 2)<br><br>If RTCP handling required:<br>RTCP allocation<br><br>If ECN transparent support required: | If local resources are modified:<br>Local Descriptor {<br>If media is "audio" or "video":<br>Codec List<br>RTP Payloads<br>Rtpbw<br>If RTCP bandwidth<br>RtcpbwRS<br>RtcpbwRR<br>If IMS media plane security required:<br>Cryptographic SDES Attribute<br>}<br>If remote resources are modified:<br>Remote Descriptor {<br>If media is "audio" or "video":<br>Codec List<br>RTP Payloads<br>Rtpbw<br>If RTCP bandwidth<br>RtcpbwRS<br>RtcpbwRR<br>If IMS media plane security required:<br>Cryptographic SDES Attribute<br>} |

|   |   |  |
|---|---|--|
|   | ECN Enable = "True"<br>Initiation Method = "inactive"<br><br>If ECN Endpoint support required<br>ECN Enable = "True"<br>Initiation Method = "ECN Initiation Method" (NOTE 3)<br><br>If notification of ECN Failure Report:<br>NotificationRequested (Event ID = x, "ECN Failure") |  |
| NOTE 1: This can only be set to the same realm as at the reservation stage. If a different realm is specified, the IMS-AGW shall return error 501 "Not Implemented".<br>NOTE 2: The event parameters "Media Inactivity Detection Time" and "Media Inactivity Detection Direction" are optional.<br>NOTE 3: This shall be set to a value other than "inactive". See Table 5.14.3.15.1. |   |  |

The IMS-AGW responds as in Table 5.17.2.3.2.

**Table 5.17.2.3.2: Configure AGW Connection Point Request Acknowledge**

| Address Information  | Control information  | Bearer information  |
|--|--|---|
| If local resources were provided in request:<br>Local Descriptor {<br>Port<br>IP Address<br>IP Version<br>}<br>If remote resources are provided in request:<br>Remote Descriptor {<br>Port<br>IP Address<br>IP Version<br>} NOTE | Transaction ID = x<br>Context ID = C1<br>Termination ID = T1<br><br>If Stream Number Specified:<br>Stream Number | If local resources were provided in request:<br>Local Descriptor {<br>If media is "audio" or "video":<br>Codec List<br>RTP Payloads<br>Rtpbw<br>If RTCP bandwidth<br>RtcpbwRS<br>RtcpbwRR<br>If IMS media plane security was provided in request:<br>Cryptographic SDES Attribute<br>}<br>If remote resources are provided in request:<br>Remote Descriptor {<br>If media is "audio" or "video":<br>Codec List<br>RTP Payloads<br>Rtpbw<br>If RTCP bandwidth<br>RtcpbwRS<br>RtcpbwRR<br>If IMS media plane security was provided in the request:<br>Cryptographic SDES Attribute<br>}<br>} NOTE |
| NOTE: Sending of the Remote Descriptor is optional.  |  |   |

**5.17.2.4 Reserve and Configure AGW Connection Point**

The IMS-ALG sends an ADD request command as in Table 5.17.2.4.1.

Table 5.17.2.4.1: Reserve and Configure AGW Connection Point Request

| Address Information  | Control information  | Bearer information   |
|--|--|--|
| Local Descriptor {<br>Port = \$<br>IP Address = \$<br>IP Version = IPv4 or IPv6<br>}<br>Remote Descriptor {<br>Port<br>IP Address<br>IP Version<br>} | Transaction ID = x<br>If Context Requested:<br>Context ID = \$<br>If Emergency Call:<br>Emergency Call Indication<br><br>If Context Provided:<br>Context ID = c1<br><br>Termination ID = \$<br><br>If Stream Number Specified:<br>Stream Number<br>If Resources for multiple Codecs shall be reserved:<br>Reserve_Value<br><br>If IP Interface Type:<br>IP interface = "IP interface type"<br><br>If indication on Bearer Released requested:<br>NotificationRequested (Event ID = x, "BNC Release")<br><br>If diffserv required:-<br>Diffserv Code Point<br>If tagging behaviour<br>Diffserv Tagging Behaviour<br><br>If Remote Source Address Filtering required:-<br>Remote Source Address Filtering<br>If Remote Source Address range required:<br>Remote Source Address<br>Mask<br><br>If Remote Source Port Filtering required:-<br>Remote Source Port Filtering<br>If individual port:<br>Remote Source Port<br>If range of ports<br>Remote Source Port Range<br><br>NotificationRequested (Event ID = x, "termination heartbeat")<br><br>If IP Realm specified:-<br>IP Realm<br><br>If Latching Required:-<br>Latching<br><br>If Sustainable Data Rate Policing Required:-<br>Policing Required<br>Sustainable Data Rate<br>Maximum Burst Size<br><br>If Peak Data Rate Policing Required:<br>Policing Required<br>Peak Data Rate<br>If Delay Variation Required | Local Descriptor {<br>If media is "audio" or "video":<br>Codec List<br>RTP Payloads<br>Rtpbw<br>If RTCP bandwidth<br>RtcpbwRS<br>RtcpbwRR<br>If IMS media plane security required:<br>Cryptographic SDES Attribute<br>}<br>Remote Descriptor {<br>If media is "audio" or "video":<br>Codec List<br>RTP Payloads<br>Rtpbw<br>If RTCP bandwidth<br>RtcpbwRS<br>RtcpbwRR<br>If IMS media plane security required:<br>Cryptographic SDES Attribute<br>}<br>} |

|  |   |  |
|--|---|--|
|  | <p style="text-align: center;">Delay Variation Tolerance</p> <p>If Media Inactivity Detection Required:<br/>                 NotificationRequested (Event ID = x, "Media Inactivity Detection( Media Inactivity Detection Time, Media Inactivity Detection Direction)")<br/>                 (NOTE 1)</p> <p>If RTCP handling required:<br/>                 RTCP allocation</p> <p>If ECN transparent support required:<br/>                 ECN Enable = "True"<br/>                 Initiation Method = "inactive"</p> <p>If ECN Endpoint support required<br/>                 ECN Enable = "True"<br/>                 Initiation Method = "ECN Initiation Method" (NOTE 2)</p> <p>If notification of ECN Failure Report:<br/>                 NotificationRequested (Event ID = x, "ECN Failure")</p> |  |
| <p>NOTE 1: The event parameters "Media Inactivity Detection Time" and "Media Inactivity Detection Direction" are optional.</p> <p>NOTE 2: This shall be set to a value other than "inactive". See Table 5.14.3.15.1.</p> |   |  |

The IMS-AGW responds as in Table 5.17.2.4.2.

**Table 5.17.2.4.2: Reserve and Configure AGW Connection Point Request Acknowledge**

| Address Information  | Control information   | Bearer information  |
|--|---|---|
| Local Descriptor {<br>Port<br>IP Address<br>IP Version<br>}<br>Remote Descriptor {<br>Port<br>IP Address<br>IP Version<br>} NOTE | Transaction ID = x<br>Context ID = C1<br>Termination ID = T1<br>Stream Number | Local Descriptor {<br>If media is "audio" or "video":<br>Codec List<br>RTP Payloads<br>Rtpbw<br>If RTCP bandwidth<br>RtcpbwRS<br>RtcpbwRR<br>If IMS media plane security was provided in the request:<br>Cryptographic SDES Attribute<br>}<br>Remote Descriptor {<br>If media is "audio" or "video":<br>Codec List<br>RTP Payloads<br>Rtpbw<br>If RTCP bandwidth<br>RtcpbwRS<br>RtcpbwRR<br>If IMS media plane security was provided in the request:<br>Cryptographic SDES Attribute<br>}<br>} NOTE |
| <p>NOTE: Sending of the Remote Descriptor is optional.</p>   |   |   |

### 5.17.2.5 Release AGW Termination

The IMS-ALG sends a SUBTRACT command as in Table 5.17.2.5.1.

**Table 5.17.2.5.1: Release AGW Termination Request**

| Address Information | Control information   | Bearer information |
|---------------------|---|--------------------|
|                     | Transaction ID = x<br>Context ID= C1/ALL<br>Termination ID = T1/ALL |                    |

On releasing the termination, the IMS-AGW responds as in Table 5.17.2.5.2

**Table 5.17.2.5.2: Release AGW Termination Request Acknowledge**

| Address Information | Control information  | Bearer information |
|---------------------|--|--------------------|
|                     | Transaction ID = x<br>Context ID = C1/ALL<br>Termination ID = T1/ALL |                    |

### 5.17.2.6 Termination Heartbeat Indication

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

#### 5.17.2.6.1 NOT.req (Termination heartbeat)

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

When the processing of command is complete, the IMS-ALG initiates the following procedure.

#### 5.17.2.6.2 NOT.resp (Termination heartbeat)

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

The IMS-ALG shall correct any detected mismatch, by subtracting hanging terminations or clearing hanging contexts.

### 5.17.2.7 IP Bearer Released

When the procedure "IP Bearer Released" is required the following procedure is initiated: the IMS-AGW sends a NOT.req command with the following information.

**5.17.2.7.1 NOT.req (IP Bearer Released)**

| Address Information | Control information   | Bearer information |
|---------------------|---|--------------------|
|                     | Transaction ID = x<br>Context ID = C1<br>Termination ID = T1<br><br>Event_ID (Event ID = x,<br>"BNC Release (Cause)") |                    |

When the processing of command is complete, the IMS-ALG initiates the following procedure.

**5.17.2.7.2 NOT.resp (IP Bearer Released)**

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

**5.17.2.8 Media Inactivity Notification**

When the procedure "Media Inactivity Notification" is required the following procedure is initiated: the IMS-AGW sends a NOT.req command with the following information.

**5.17.2.8.1 NOT.req (Media Inactivity)**

| Address Information | Control information  | Bearer information |
|---------------------|--|--------------------|
|                     | Transaction ID = x<br>Context ID = C1<br>Termination ID = T1<br><br>Event_ID (Event ID = x, "Media<br>Inactivity Detection") |                    |

When the processing of command is complete, the IMS-ALG initiates the following procedure.

**5.17.2.8.2 NOT.resp (Media Inactivity)**

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

**5.17.2.9 Change Through Connection**

The IMS-ALG sends an ADD or a MODIFY request command as in Table 5.17.2.9.1.

### 5.17.2.9.1 Change Through Connection Request

| Address Information | Control information  | Bearer information |
|---------------------|--|--------------------|
|                     | Transaction ID = x<br>If Context Requested:<br>Context ID = \$<br>If Context Provided:<br>Context ID = c1<br><br>If Termination Requested:<br>Termination ID = \$<br>If Termination Provided:<br>Termination ID = T1<br><br>Through-Connection = Connectivity Mode |                    |

The IMS-AGW responds as in Table 5.17.2.9.2.

### 5.17.2.9.2 Change Through Connection Request Acknowledge

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

### 5.17.2.10 Change Flow Direction

The IMS-ALG sends an ADD or a MODIFY request command as in Table 5.17.2.10.1.

#### 5.17.2.10.1 Change Flow Direction

| Address Information | Control information   | Bearer information |
|---------------------|---|--------------------|
|                     | Transaction ID = x<br>If Context Requested:<br>Context ID = \$<br>If Context Provided:<br>Context ID = c1<br><br>If Termination Requested:<br>Termination ID = \$<br>If Termination Provided:<br>Termination ID = T1<br><br>Connection Configuration =<br>(TerminationID= x1,<br>TerminationID=x2,<br>[type = x]),... |                    |

The IMS-AGW responds as in Table 5.17.2.10.2.

#### 5.17.2.10.2 Change Flow Direction Acknowledge

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

### 5.17.2.11 ECN Failure Indication

The IMS-AGW sends a NOTIFY request command as in Table 5.17.2.11.1.

**Table 5.17.2.11.1: ECN Failure Indication**

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

The IMS-ALG responds as in Table 5.17.2.11.2

**Table 5.17.2.11.2: ECN Failure Indication Ack**

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

## 5.17.3 Non-Call Related Procedures

### 5.17.3.1 General

This section describes the various non-call related procedures which are listed in Table 5.17.3.1.1



**Table 5.17.3.1.1: IMS-AGW Non-Call Related Procedures**

| Transaction in 3GPP TS 23.334 [23]  | Support              | Comment  |
|---|----------------------|--|
| IMS-AGW Out of service  | Mandatory            | 5.17.3.2   |
| IMS-AGW Communication Up  | Mandatory            | 5.17.3.3   |
| IMS-AGW Restoration   | Mandatory            | 5.17.3.4   |
| IMS-AGW Register  | Mandatory            | 5.17.3.5   |
| IMS-AGW Re-register   | Optional<br>(NOTE 3) | 5.17.3.6   |
| IMS-ALG Ordered Re-register   | Optional<br>(NOTE 3) | 5.17.3.7   |
| IMS-ALG Restoration   | Optional             | 5.17.3.8   |
| IMS-ALG Out of Service  | Optional             | 5.17.3.9   |
| Audit Value   | Optional<br>(NOTE 3) | 5.17.3.10  |
| 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 – 5.17.3.11 |
| Capability Update   | Optional             | 5.17.3.12  |
| IMS-AGW Resource Congestion Handling – Activate   | Optional             | 5.17.3.13  |
| IMS-AGW Resource Congestion Handling – Indication   | Optional             | 5.17.3.14  |
| Inactivity timeout activation   | Optional<br>(NOTE 4) | 5.17.3.15  |
| Inactivity timeout indication   | Optional<br>(NOTE 4) | 5.17.3.16  |
| Realm Availability Change activation  | Optional             | 5.17.3.17  |
| Realm Availability Change indication  | Optional             | 5.17.3.18  |
| Termination Out of Service  | Optional<br>(NOTE 1) | 5.17.3.19 (NOTE 2)   |
| NOTE 1: Support of this procedure is mandatory in the IMS-ALG.                                  |                      |  |
| NOTE 2: The "Termination Out-of-Service procedure" is also used as a call-related H.248 command |                      |  |
| NOTE 3: Support of this procedure is mandatory in the IMS-AGW.                                  |                      |  |
| NOTE 4: Support of this procedure is mandatory in the IMS-AGW if UDP transport is supported.    |                      |  |

### 5.17.3.2 IMS-AGW Out Of Service

The IMS-AGW sends a SERVICE CHANGE request command as in Table 5.17.3.2.1.

**Table 5.17.3.2.1: IMS-AGW Out Of Service Request**

| Address Information | Control information   | Bearer information |
|---------------------|---|--------------------|
|                     | Transaction ID = x<br>Context ID= -<br>Termination ID = ROOT<br>SC Method = FORCED or GRACEFUL<br>SC Reason = 905 Termination Taken OOS or 908, MG Impending Failure, or 915 State Loss |                    |

The IMS-ALG responds as in Table 5.17.3.2.2.

**Table 5.17.3.2.2: IMS-AGW Out Of Service Request Ack**

| Address Information | Control information   | Bearer information |
|---------------------|---|--------------------|
|                     | Transaction ID = x<br>Context ID = -<br>Termination ID = ROOT |                    |

**5.17.3.3 IMS-AGW Communication Up**

The IMS-AGW sends a SERVICE CHANGE request command as in Table 5.17.3.3.1 to the IMS-ALG address to which the control link association was previously established.

**Table 5.17.3.3.1: IMS-AGW Communication Up**

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

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

**Table 5.17.3.3.2: IMS-AGW Communication Up Ack**

| Address Information | Control information  | Bearer information |
|---------------------|--|--------------------|
|                     | Transaction ID = x<br>Context ID = -<br>Termination ID = ROOT<br>If required to register to a new IMS-ALG:<br>Alternate MGC Id |                    |

**5.17.3.4 IMS-AGW Restoration**

When the IMS-AGW has recovered, the IMS-AGW sends a SERVICE CHANGE as in Table 5.17.3.4.1,

**Table 5.17.3.4.1: IMS-AGW Restoration**

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

The IMS-ALG responds as in Table 5.17.3.4.2.

**Table 5.17.3.4.2: IMS-AGW Restoration Ack**

| Address Information | Control information  | Bearer information |
|---------------------|--|--------------------|
|                     | Transaction ID = x<br>Context ID = -<br>Termination ID = ROOT<br>If required to register to a new IMS-ALG:<br>Alternate MGC Id |                    |

### 5.17.3.5 IMS-AGW Register

The IMS-AGW sends a SERVICE CHANGE request command as in Table 5.17.3.5.1.

**Table 5.17.3.5.1: IMS-AGW Register**

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

The IMS-ALG responds as in Table 5.17.3.5.2.

**Table 5.17.3.5.2: IMS-AGW Register Ack**

| Address Information  | Control information  | Bearer information |
|--|--|--------------------|
|  | Transaction ID = x<br>Context ID = -<br>Termination ID = ROOT<br>If applicable (NOTE):<br>H248 Protocol Version<br>If applicable:-<br>H248 Profile Identity<br>If required to register to a new IMS-ALG:<br>Alternate MGC Id |                    |
| NOTE: The IMS-ALG shall include the H.248 Protocol Version if the protocol version it supports or offers is lower than that proposed by the IMS-AGW. The IMS-ALG may include the H.248 Protocol Version if the protocol version it supports or offers is the protocol version proposed by the IMS-AGW. |  |                    |

### 5.17.3.6 IMS-AGW Re-Register

The IMS-AGW sends a SERVICE CHANGE request command as in Table 5.17.3.6.1.

**Table 5.17.3.6.1: IMS-AGW Re-Registration**

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

The IMS-ALG responds as in Table 5.17.3.6.2.

**Table 5.17.3.6.2: IMS-AGW Re-Registration Ack**

| Address Information  | Control information  | Bearer information |
|--|--|--------------------|
|  | Transaction ID = x<br>Context ID = -<br>Termination ID = ROOT<br>If applicable (NOTE):<br>H248 Protocol Version<br>If applicable:-<br>H248 Profile Identity<br>If required to register to a new IMS-ALG:<br>Alternate MGC Id |                    |
| NOTE: The IMS-ALG shall include the H.248 Protocol Version if the protocol version it supports or offers is lower than that proposed by the IMS-AGW. The IMS-ALG may include the H.248 Protocol Version if the protocol version it supports or offers is the protocol version proposed by the IMS-AGW. |  |                    |

### 5.17.3.7 IMS-ALG Ordered Re-register

The IMS-ALG sends a SERVICE CHANGE request command as in Table 5.17.3.7.1.

**Table 5.17.3.7.1: IMS-ALG Ordered Re-Register**

| Address Information | Control information  | Bearer information |
|---------------------|--|--------------------|
|                     | Transaction ID = x<br>Context ID = -<br>Termination ID = ROOT<br>SC Method = HANDOFF<br>SC Reason = 903, MGC Directed Change<br>Alternate MGC Id |                    |

The IMS-AGW responds as in Table 5.17.3.7.2.

**Table 5.17.3.7.2: IMS-ALG Ordered Re-Register Ack**

| Address Information | Control information   | Bearer information |
|---------------------|---|--------------------|
|                     | Transaction ID = x<br>Context ID = -<br>Termination ID = ROOT |                    |

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

### 5.17.3.8 IMS-ALG Restoration

When the IMS-ALG has recovered, the IMS-ALG sends a SERVICE CHANGE as in Table 5.17.3.8.1,

**Table 5.17.3.8.1: IMS-ALG Restoration**

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

The IMS-AGW responds as in Table 5.17.3.8.2.

**Table 5.17.3.8.2: IMS-ALG Restoration Ack**

| Address Information | Control information   | Bearer information |
|---------------------|---|--------------------|
|                     | Transaction ID = x<br>Context ID = -<br>Termination ID = ROOT |                    |

### 5.17.3.9 IMS-ALG Out of Service

The IMS-ALG sends a SERVICE CHANGE request command as in Table 5.17.3.9.1.

**Table 5.17.3.9.1: IMS-ALG Out Of Service**

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

The IMS-AGW responds as in Table 5.17.3.9.2.

**Table 5.17.3.9.2: IMS-ALG Out Of Service Ack**

| Address Information | Control information   | Bearer information |
|---------------------|---|--------------------|
|                     | Transaction ID = x<br>Context ID = -<br>Termination ID = ROOT |                    |

### 5.17.3.10 Audit Value

The IMS-ALG sends an AUDIT VALUE request command as in Table 5.17.3.10.1.

**Table 5.17.3.10.1: Audit Value**

| Address Information   | Control information  | Bearer information |
|---|--|--------------------|
|   | Transaction ID = x<br>Context ID= -/ALL/C1<br>Termination ID =<br>ROOT/ALL/T1/PartialWildcard<br>(NOTE 4, NOTE 5)<br><br>Audit Packages (NOTE 1)<br><br>Audit Descriptor =<br>IndAuditParameter:=<br>IndAudMediaDescriptor:=<br>IndAudTerminationStateDescriptor:=<br>serviceState<br>Audit Descriptor = Empty (NOTE 2)<br><br>Audit Descriptor =<br>IndAuditParameter:=<br>IndAudMediaDescriptor:=<br>IndAudTerminationStateDescriptor:=<br>Available Realms (NOTE 3)<br><br>Audit Descriptor =<br>IndAuditParameter:=<br>IndAudMediaDescriptor:=<br>IndAudTerminationStateDescriptor:=<br>ROOT properties (NOTE 6) |                    |
| NOTE 1: Packages is for Null/Root Combination.<br>NOTE 2: Used for control association monitoring.<br>NOTE 3: Used for auditing available IP realms<br>NOTE 4: The partial wildcard termination is used for the context audit (see table 5.17.3.10.3) and specifies the "group" part of the termination identity (e.g. "ip/5/*").<br>NOTE 5: Partial wildcard shall only be used when text encoding is used on the H.248 interface.<br>NOTE 6: Used for auditing ROOT properties. |  |                    |

The IMS-AGW responds as in Table 5.17.3.10.2.

**Table 5.17.3.10.2: Audit Value Ack**

| Address Information | Control information   | Bearer information |
|---------------------|---|--------------------|
|                     | Transaction ID = x<br>Context ID = -/C1<br>Termination ID = ROOT/T1<br>Packages List<br>serviceState<br>Available Realms<br>ROOT Properties |                    |

Upon reception of the command in the IMS-AGW:

- The Service State returns the current Service State
- When Packages are requested, the Package Names and Versions are returned
- When realm availability is audited, the list of available realms is returned.
- When root properties are audited, the values of root properties are returned.

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

**Table 5.17.3.10.3: Combinations of AuditValue Command**

| ContextID  | TerminationID    | Information Obtained   |
|--|------------------|--|
| Specific   | Wildcard         | Audit of matching Terminations in a Context  |
| Specific   | Specific         | Audit of a single Termination in a Context   |
| Null   | Root             | Audit of Media Gateway state and/or control association or available realms, or supported packages or ROOT properties. |
| All  | Specific         | (Non-null) ContextID in which the Termination currently exists   |
| All  | Partial Wildcard | (Non-null) ContextIDs in which the Terminations currently exist  |
| NOTE: Partial wildcard shall only be used when text encoding is used on the H.248 interface. |                  |  |

### 5.17.3.11 Command Rejected

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

The IMS-AGW / IMS-ALG sends .a response to any command.req with the following information.

**Table 5.17.3.11.1: ANYcommand.resp (command reject ) IMS-AGW / IMS-ALG to IMS-ALG/ IMS-AGW**

| Address Information | Control information   | Bearer information |
|---------------------|---|--------------------|
|                     | Transaction ID = z<br>Context ID = c1 or no context<br>Termination ID = T1 or no termination ID<br><br>Reason=Error |                    |

### 5.17.3.12 AGW Capability Change

The IMS-AGW sends a SERVICE CHANGE request command as in Table 5.17.3.12.1.

**Table 5.17.3.12.1: AGW Capability Update**

| Address Information | Control information   | Bearer information |
|---------------------|---|--------------------|
|                     | Transaction ID = x<br>Context ID= -<br>Termination ID = ROOT<br>SC Method = RESTART<br>SC Reason = 917, Capability Change<br>H248 Profile Identity<br>H248 Protocol Version |                    |

The IMS-ALG responds as in table 5.17.3.12.2.

**Table 5.17.3.12.2 AGW Capability Update Ack**

| Address Information | Control information   | Bearer information |
|---------------------|---|--------------------|
|                     | Transaction ID = x<br>Context ID = -<br>Termination ID = ROOT |                    |

### 5.17.3.13 IMS-AGW Resource Congestion Handling – Activate

The IMS-ALG sends a MODIFY request command as in Table 5.17.3.13.1

**Table 5.17.3.13.1: IMS-AGW Resource Congestion Handling – Activate**

| Address Information | Control information   | Bearer information |
|---------------------|---|--------------------|
|                     | Transaction ID = x<br>Context ID= -<br>Termination ID = ROOT<br><br>NotificationRequested (Event ID = x, "Overload Notification") |                    |

The IMS-AGW responds as in Table 5.17.3.13.2.

**Table 5.17.3.13.2: IMS-AGW Resource Congestion Handling – Activate Ack**

| Address Information | Control information   | Bearer information |
|---------------------|---|--------------------|
|                     | Transaction ID = x<br>Context ID = -<br>Termination ID = ROOT |                    |

**5.17.3.14 IMS-AGW Resource Congestion Handling – Indication**

The IMS-AGW sends a NOTIFY request command as in Table 5.17.3.14.1

**Table 5.17.3.14.1: IMS-AGW Resource Congestion Handling – Indication**

| Address Information | Control information  | Bearer information |
|---------------------|--|--------------------|
|                     | Transaction ID = x<br>Context ID= -<br>Termination ID = ROOT<br><br>If H.248.11 used:<br>Event_ID (Event ID = x, "Overload Notification")<br><br>If H.248.10 used:<br>Event_ID (Event ID = x, "Overload Notification (Reduction)") |                    |

The IMS-ALG responds as in Table 5.17.3.14.2

**Table 5.17.3.14.2: IMS-AGW Resource Congestion Handling – Indication Ack**

| Address Information | Control information   | Bearer information |
|---------------------|---|--------------------|
|                     | Transaction ID = x<br>Context ID = -<br>Termination ID = ROOT |                    |

**5.17.3.15 Inactivity Timeout – Activation**

The IMS-ALG sends a MODIFY request command as in Table 5.17.3.15.1

**Table 5.17.3.15.1: Inactivity Timeout – Activation**

| Address Information | Control information   | Bearer information |
|---------------------|---|--------------------|
|                     | Transaction ID = x<br>Context ID= NULL<br>Termination ID = ROOT<br><br>NotificationRequested (Event ID = x, "Inactivity Timeout") |                    |



The IMS-AGW responds as in Table 5.17.3.15.2.

**Table 5.17.3.15.2: Inactivity Timeout – Activation Ack**

| Address Information | Control information  | Bearer information |
|---------------------|--|--------------------|
|                     | Transaction ID = x<br>Context ID = NULL<br>Termination ID = ROOT |                    |

### 5.17.3.16 Inactivity Timeout – Indication

The IMS-AGW sends a NOTIFY request command as in Table 5.17.3.16.1.

**Table 5.17.3.16.1: Inactivity Timeout – Indication**

| Address Information | Control information   | Bearer information |
|---------------------|---|--------------------|
|                     | Transaction ID = x<br>Context ID = NULL<br>Termination ID = ROOT<br>Event_ID (Event ID = x, "Inactivity Timeout") |                    |

The IMS-ALG responds as in Table 5.17.3.16.2

**Table 5.17.3.16.2: Inactivity Timeout – Indication Ack**

| Address Information | Control information  | Bearer information |
|---------------------|--|--------------------|
|                     | Transaction ID = x<br>Context ID = NULL<br>Termination ID = ROOT |                    |

### 5.17.3.17 Realm Availability Change – Activation

The IMS-ALG sends a MODIFY request command as in Table 5.17.3.17.1.

**Table 5.17.3.17.1: Realm Availability Change – Activation**

| Address Information | Control information  | Bearer information |
|---------------------|--|--------------------|
|                     | Transaction ID = x<br>Context ID = -<br>Termination ID = ROOT<br><br>NotificationRequested (Event ID = x, "Realm Availability Change") |                    |

The IMS-AGW responds as in Table 5.17.3.17.2.

**Table 5.17.3.17.2: Realm Availability Change – Activation Ack**

| Address Information | Control information   | Bearer information |
|---------------------|---|--------------------|
|                     | Transaction ID = x<br>Context ID = -<br>Termination ID = ROOT |                    |

### 5.17.3.18 Realm Availability Change – Indication

The IMS-AGW sends a NOTIFY request command as in Table 5.17.3.18.1.

**Table 5.17.3.18.1: Realm Availability Change – Indication**

| Address Information  | Control information   | Bearer information |
|--|---|--------------------|
|  | Transaction ID = x<br>Context ID= -<br>Termination ID = ROOT<br><br>Event_ID (Event ID = x,<br>"Realm Availability Change<br>(Changed Realms)") |                    |
| NOTE: The ObservedEvent Parameters returned within the Changed Realms are defined as mandatory since it shall contain at minimum 1 parameter but may contain both Newly Available Realms and Newly Unavailable Realms. |   |                    |

The IMS-ALG responds as in Table 5.17.3.18.2

**Table 5.17.3.18.2: Realm Availability Change – Indication Ack**

| Address Information | Control information   | Bearer information |
|---------------------|---|--------------------|
|                     | Transaction ID = x<br>Context ID = -<br>Termination ID = ROOT |                    |

### 5.17.3.19 Termination Out Of Service

This procedure only applies when text encoding is used on the H.248 interface.

The IMS-AGW sends a SERVICE CHANGE request command as in Table 5.17.3.19.1.

**Table 5.17.3.19.1: Termination Out Of Service Request**

| Address Information  | Control information  | Bearer information |
|--|--|--------------------|
|  | Transaction ID = x<br>Context ID= C1/ALL<br>Termination ID = T1 or Wildcarded<br>Termination (NOTE)<br>SC Method = FORCED<br>SC Reason = 904 ("Termination Malfunction") or 905 ("Termination Taken OOS") or 906 ("Loss of Lower Layer Connectivity"), or 907 ("Transmission Failure") or 910 ("Media Capability Failure") |                    |
| NOTE: This is set to a specific termination identity or a partially wildcarded identity (i.e. specifying the "interface" part of the termination ID and wildcarding the "group" and "Id" parts) or a wholly wildcarded identity (i.e. ip/*). |  |                    |

The IMS-ALG responds as in Table 5.17.3.19.2.

**Table 5.17.3.19.2: Termination Out Of Service Request Ack**

| Address Information | Control information   | Bearer information |
|---------------------|---|--------------------|
|                     | Transaction ID = x<br>Context ID = C1/ALL<br>Termination ID = As received |                    |

## Annex A (informative): Change history

| Change history |       |           |      |     |   |        |        |
|----------------|-------|-----------|------|-----|---|--------|--------|
| Date           | TSG # | TSG Doc.  | CR   | Rev | Subject/Comment   | Old    | New    |
| 2009-12        | CT#46 | CP-090823 |      |     | 3GPP TS Presented for information and approval in CT#46                     | 1.0.0  | 9.0.0  |
| 2010-03        | CT#47 | CP-100050 | 0001 | 2   | IMS media plane security stage 3  | 9.0.0  | 9.1.0  |
|                |       | CP-100044 | 0002 | 1   | Non-call Related Procedures Naming update                                   |        |        |
|                |       | CP-100044 | 0006 | 1   | Correction to table notes and references                                    |        |        |
|                |       | CP-100044 | 0007 | 1   | Termination Type Alignment  |        |        |
|                |       | CP-100044 | 0008 |     | Returned SDP Properties   |        |        |
|                |       | CP-100044 | 0009 | 1   | Manipulating and Auditing Context Attributes                                |        |        |
|                |       | CP-100044 | 0010 | 1   | Inactivity Timeout  |        |        |
|                |       | CP-100044 | 0011 | 1   | Clean-up Proposals  |        |        |
| 2010-06        | CT#48 | CP-100289 | 0012 | 1   | Transport protocol to be indicated to gateway for end-to-end media security | 9.1.0  | 9.2.0  |
|                |       |           | 0015 |     | Profiling of SDES crypto attribute for e2a media security                   |        |        |
|                |       | CP-100284 | 0013 | 1   | Handling of Stream mode   |        |        |
| 2010-09        | CT#49 | CP-100461 | 0016 |     | Procedures for Emergency indicator  | 9.2.0  | 9.3.0  |
|                |       | CP-100461 | 0017 | 1   | Error Descriptor  |        |        |
| 2011-03        | CT#51 | CP-110278 | 0019 | 10  | ECN Support in Iq Interface   | 9.3.0  | 10.0.0 |
| 2011-06        | CT#52 | CP-110368 | 0021 | 1   | Alignment of 3GPP profiles with SG16 ECN package definition                 | 10.0.0 | 10.1.0 |
| 2011-09        | CT#53 | CP-110573 | 0022 | 1   | Transcoding at ATCF/ATGW during eSRVCC                                      | 10.1.0 | 10.2.0 |
| 2011-12        | CT#54 | CP-110798 | 0023 | 1   | Explicit Congestion Notification  | 10.2.0 | 10.3.0 |
|                |       | CP-110796 | 0024 | 1   | Update of reference to H.248.52   |        |        |
| 2012-06        | CT#56 | CP-120226 | 0025 | 1   | Reference update: draft-ietf-avtcore-ecn-for-rtp                            | 10.3.0 | 10.4.0 |

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## History

| <b>Document history</b> |              |             |
|-------------------------|--------------|-------------|
| V10.0.0                 | May 2011     | Publication |
| V10.1.0                 | June 2011    | Publication |
| V10.2.0                 | October 2011 | Publication |
| V10.3.0                 | January 2012 | Publication |
| V10.4.0                 | July 2012    | Publication |