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**Digital cellular telecommunications system (Phase 2+) (GSM);
Universal Mobile Telecommunications System (UMTS);
LTE;
Interconnection Border Control Functions (IBCF)
- Transition Gateway (TrGW) interface, Ix interface;
Stage 3
(3GPP TS 29.238 version 13.1.0 Release 13)**

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Contents

Foreword

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- z the third digit is incremented when editorial only changes have been incorporated in the document.

1 Scope

The present document describes the protocol to be used on the Interconnection Border Control Function (IBCF) – Transition Gateway (TrGW) interface and the CS-IBCF – CS-TrGW interface. The basis for this protocol is the H.248 protocol as specified in ITU-T. The Profile provides MG control function for IMS and CS Border Control. The IMS architecture is described in 3GPP TS 23.228 [2]. The underlying reference model and stage 2 information is described in Annex I of 3GPP TS 23.228 [2] and in 3GPP TS 29.162 [18]. The CS architecture is described in Annex A of 3GPP TS 29.235 [17].

This specification describes the application of H.248 Ix profile for both Ix and CS-Ix interfaces (see Figure 1.1 and Figure 1.2). 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.

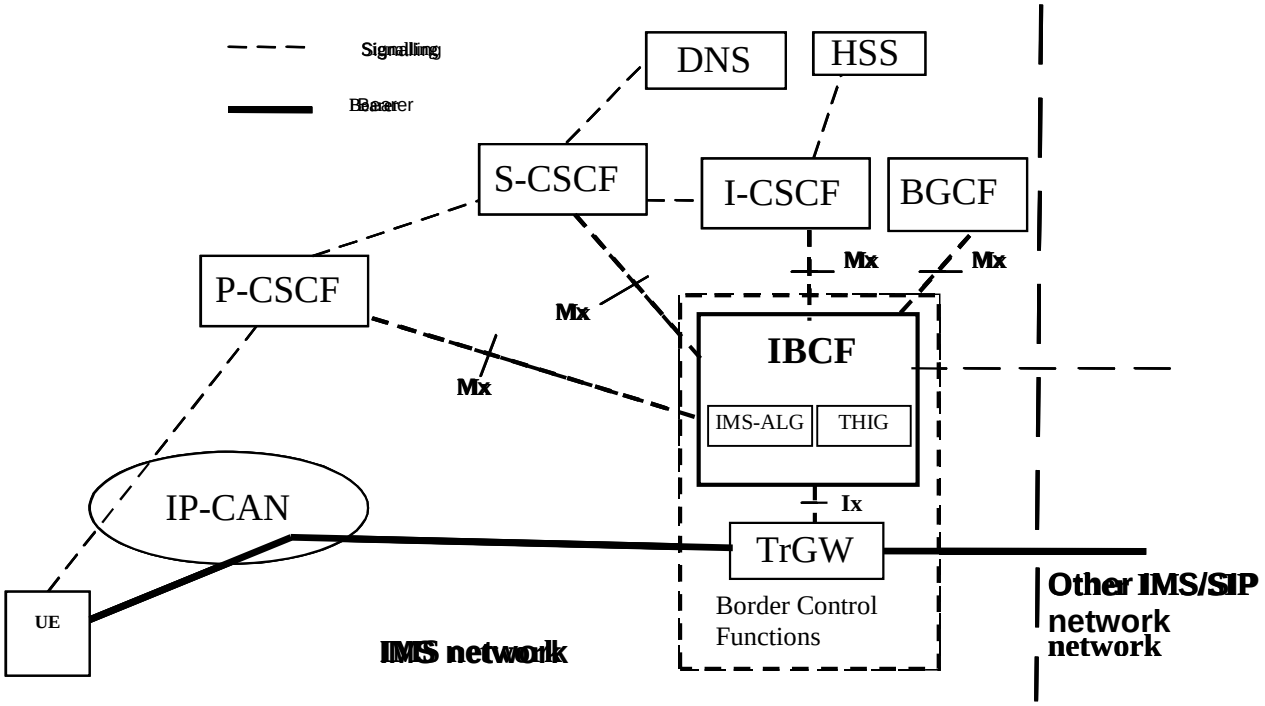

Figure 1.1: Reference model for IMS Border Control Functions

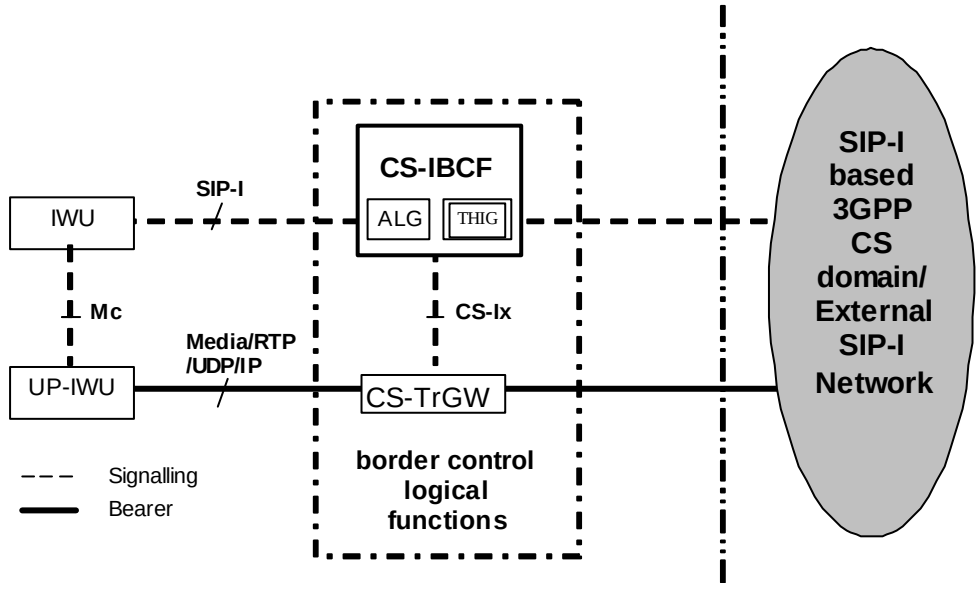

Figure 1.2: Reference model for CS Border Control Functions

The reference model for the IBCF and the TrGW supporting the ATCF/ATGW function is shown in Figure 1.x below.

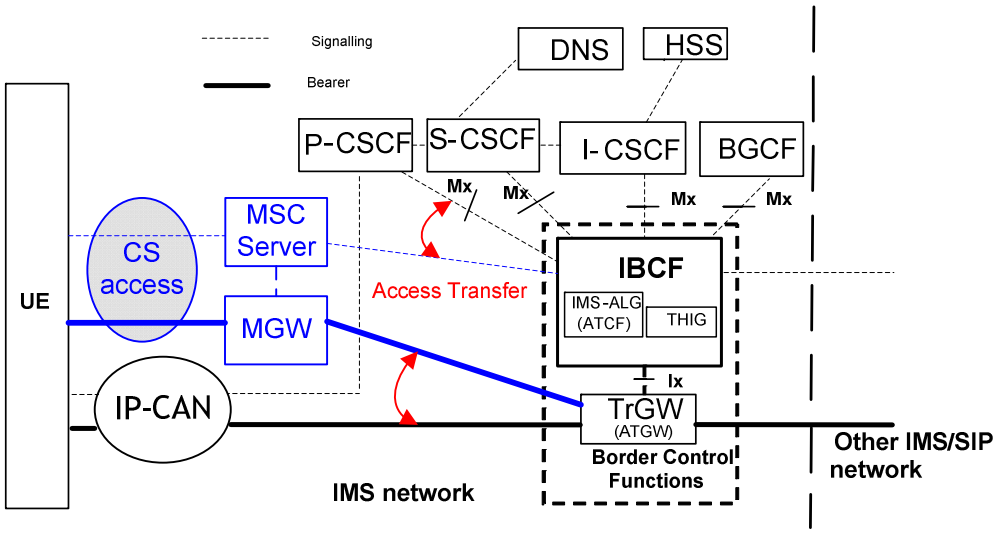

Figure 1.3: Reference model for IBCF/TrGW with ATCF/ATGW function

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

NOTE: The Ix profile is applied over both IMS and CS Ix interfaces.

In the following text the terms IBCF and TrGW also include respectively the CS-IBCF and CS-TrGW functionalities.

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] ITU-T Recommendation H.248.1 (2002): "Gateway Control Protocol: Version 2" including the Corrigendum 1 for Version 2 (03/04).

[4] 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".

[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] IETF RFC 3605 (2003): "Real Time Control Protocol (RTCP) attribute in Session Description Protocol (SDP)".

[8] IETF RFC 4566 (2006): "SDP: Session Description Protocol".

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

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

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

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

[13] ITU-T Recommendation H.248.53 (06/2008) inclusive *Revision 1* (03/2009): "Gateway control protocol: Traffic management packages".

[14] ITU-T Recommendation H.248.41 Amendment 1 (06/2008): "Gateway control protocol: IP domain connection package: IP Realm Availability Package".

[15] ITU-T Recommendation H.248.36 (09/2005): "Gateway control protocol: Hanging Termination Detection package".

[16] 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".

[17] 3GPP TS 29.235: "Interworking between SIP-I based circuit-switched core network and other networks".

[18] 3GPP TS 29.162: "Interworking between the IM CN subsystem and IP networks".

[19] ITU-T Recommendation H.248.14 (03/2009): "Gateway control protocol: Inactivity timer package".

[20] ITU-T Recommendation H.248.10 (07/2001): "Media gateway resource congestion handling package".

[21] 3GPP TS 29.232: "Media Gateway Controller (MGC) - Media Gateway (MGW) interface; Stage 3".

[22] 3GPP TS 33.210: "Technical Specification Group Services and System Aspects; 3G Security; Network Domain Security; IP Network Layer Security".

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

[24] ITU-T 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".

[25] IETF RFC 5234 (2008): "Augmented BNF for Syntax Specifications: ABNF ".

[26] IETF RFC 4960 (2007): "Stream control transmission protocol".

[27] ITU-T Recommendation H.248.40 (01/2007): "Gateway control protocol: Application Data Inactivity Detection package".

[28] 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)".

[29] IETF RFC 3556 (2003): "Session Description Protocol (SDP) Bandwidth Modifiers for RTP Control Protocol (RTCP) Bandwidth".

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

[31] 3GPP TS 26.114: "IP Multimedia Subsystem (IMS); Multimedia telephony; Media handling and interaction".

[32] IETF RFC 2216 (1997): "Network Element Service Specification Template".

[33] IETF RFC 3711 (2004): "The Secure Real-time Transport Protocol (SRTP)".

[34] IETF RFC 5124 (2008): "Extended Secure RTP Profile for Real-time Transport Control Protocol (RTCP)-Based Feedback (RTP/SAVPF)".

[35] IETF RFC 6679 (2012): "Explicit Congestion Notification (ECN) for RTP over UDP".

[36] IETF RFC 3611 (2003): "RTP Control Protocol Extended Reports (RTCP XR)".

[37] IETF RFC 3168 (2001): "The Addition of Explicit Congestion Notification (ECN) to IP".

[38] 3GPP TS 23.237: "IP Multimedia subsystem (IMS) Service Continuity; Stage 2".

[39] 3GPP TS 22.153: "Multimedia Priority Service".

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

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

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

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

[44] ITU-T Recommendation H.248.50 (09/2010) Corrigendum 1 (02/12): "Gateway control protocol: NAT traversal toolkit packages".

[45] 3GPP TS 24.229: "IP Multimedia Call Control Protocol based on SIP and SDP".

[46] Draft ITU-T Recommendation H.248.78 (Ed. 0.9, 11/2014): "Gateway control protocol: Bearer-level message backhauling and application level gateway".

Editor's Note: The above document is currently under revision by ITU-T. The latest output draft of the revised ITU-T Recommendation H.248.78 is available from the following link: http://wftp3.itu.int/av-arch/avc-site/2013-2016/1411_Seo/TD-09.zip.

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

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

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

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

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

[52] ITU-T Recommendation H.248.88 (01/2014): "Gateway control protocol: RTP topology dependent RTCP handling by ITU-T H.248 media gateways with IP terminations".

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in TR 21.905 [1] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in TR 21.905 [1].

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

CS-TrGW: packet-to-packet gateway for user plane media traffic. The CS-TrGW performs both policy enforcement functions and NA(P)T functions under the control of the CS-IBCF

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 μ-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.

Transparent Forwarding: media gateway packet forwarding behaviour with the characteristic of Lx-PDU integrity. This is a unidirectional characteristic of an Lx-PDU flow.

NOTE 3: The definition is according clause 3.2.10 of ITU-T Recommendation H.248.88 [52].

NOTE 4: The semantic covers both traffic directions when applied on H.248 Streams (due to their inherent characteristic of bidirectionality).

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

TrGW: packet-to-packet gateway for user plane media traffic. The TrGW performs both policy enforcement functions and NA(P)T functions under the control of the IBCF

NOTE 5: A Transition Gateway (TrGW) provides the interface between two IP-transport domains. The TrGW has the "H.248 MG" role in the scope of this Profile.

For the purposes of the present document, the following terms and definitions as defined in 3GPP TS 29.162 [18] apply:

ICE lite

Full ICE.

3.2 Symbols

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

Ix Interface between IBCF and TrGW or CS-IBCF and CS-TrGW.

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
B-ALG	Bearer Level Application-Level Gateway
BGF	Border Gateway Function
CE	Congestion Experienced
CVO	Coordination of Video Orientation
ECN	Explicit Congestion Notification
FECC	Far End Camera Control
GCP	Gateway Control Protocol
IBCF	Interconnect Border Control Function
ICE	Interactive Connectivity Establishment
LD	Local Descriptor (H.248 protocol element)
MG	Media Gateway
MGC	Media Gateway Controller
MPS	Multimedia Priority Service
MSRP	Message Session Relay Protocol
NA	Not Applicable
NAPT	Network Address and Port Translation
NAPT-PT	NAPT and Protocol Translation
NAT	Network Address Translation

PCI	Protocol Control Information
RD	Remote Descriptor (H.248 protocol element)
ROI	Region of Interest
RTCP	RTP Control Protocol
SDP	Session Description Protocol
SDPCapNeg	SDP Capability Negotiation
SRVCC	Single Radio Voice Call Continuity
STUN	Session Traversal Utilities for NAT
TCP	Transmission Control Protocol
ToS	Type-of-Service
TrGW	Transition Gateway
TISPAN	Telecommunications and Internet converged Services and Protocols for Advanced Networking
WebRTC	Web Real-Time Communication

4 Applicability

The support of the IMS and CS Ix interfaces capability sets shall be identified by the H.248 Ix 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 I of 3GPP TS 23.228 [2], Annex A of 3GPP TS 29.235 [17] and 3GPP TS 29.162 [18].

5 Profile Description

5.1 Profile Identification

Table 5.1.1: Profile Identification

Profile name:	**threegIx**
Version:	4

5.2 Summary

This profile supports the control of the following functionality in (IP-to-IP) Transition Gateways:

- Allocation and translation of IP addresses and port numbers (NA(P)T and NA(P)T-PT);
- Hanging termination detection;
- IP realm/domain indication;
- Media inactivity detection;
- Opening and closing gates (i.e. packets filtering depending on "IP address / port");
- Policing of incoming traffic;
- QoS packet marking for outgoing traffic (differentiated services);
- RTCP handling;
- Explicit Congestion Notification support;
- Multimedia Priority Service;
- application-aware MSRP interworking;
- application-agnostic upper layer protocol forwarding (such as for end-to-end WebRTC).

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. 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 [3]) 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 [3]) shall be used as the minimum protocol version.

5.4 Connection model

Table 5.4.1: Connection Model

Maximum number of contexts:	Provisioned
Maximum number of terminations per context:	3
Allowed termination type combinations in a context:	(IP,IP) ; (IP,IP,IP) (NOTE)
NOTE: This is only a temporary context configuration, occurring during bearer access transfer phase (between PS to CS access networks or vice versa) or during the reservation of two sets of transport addresses/resources towards the access network to support the functionalities related to the Alternate Connectivity functionality (see 3GPP TS 29.162 [18]).	

5.5 Context attributes

Table 5.5.1: Context Attributes

Context Attribute	Supported	Values Supported
Topology	Yes (NOTE 1)	See clause 5.7.9
Priority Indicator	Optional (NOTE 2)	0-15 (NOTE 3)
Emergency Indicator	Yes	YES/NO
IEPS Indicator	No	NA
ContextAttribute Descriptor	No	NA
ContextIdList Parameter	No	NA
AND/OR Context Attribute	No	NA
NOTE 1: 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”)). NOTE 2: This Context Attribute parameter is allowed in ETSI TISPAN Ia Profile version 3. It is also used for MPS as specified in 3GPP TS 22.153 [39]. NOTE 3: Priority values 11 – 15 of the Priority Indicator are reserved for MPS.		

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 IBCF has the ability to choose the address space in which the TrGW will allocate an IP address for the termination by using the *ipdc/realm* property defined in the ITU-T Recommendation H.248.41 [14] 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 [25]) is used for the syntax specification. The ABNF for TerminationID and relation to pathNAME is defined in Annex B.2 of ITU-T Recommendation H.248.1 [3].

ABNF coding:

```
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

Multiplex Terminations Supported?	No

If yes then:

Table 5.6.2.2: Multiplex Types

Multiplex Types Supported	None
Maximum Number of Terminations Connected to Multiplex	-

5.7 Descriptors

5.7.1 TerminationState Descriptor

Table 5.7.1.1: ServiceState property

ServiceState property used:	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 [3], 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

EventBufferControl property used:	No

Table 5.7.1.3: SDPCapNeg Extensions property

SDPCapNeg Extensions property used:	Yes
NOTE: The property is used in conjunction with the *Enhanced Revised Offer/Answer SDP Support* package, see clause 5.14.3.x1.	

5.7.2 Stream Descriptor

5.7.2.0 General

Table 5.7.2.1: Stream descriptor

Maximum number of streams per termination type:	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 IBCF may omit the Stream Descriptor and the TrGW shall assume that StreamID = 1.		

Table 5.7.2.2: Stream configuration

Stream Configuration:	ALL configurations are allowed

5.7.2.1 LocalControl Descriptor

Table 5.7.2.1.1: Reserve Group and Reserve Value

		Termination Type	**Stream Type**
Reserve group used:	No	NA	NA
Reserve value used:	Yes	IP	Audio, Video

Table 5.7.2.1.2: Stream Mode

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
NOTE: See table 5.15.2 for the stream types applicable to IMS-Ix and CS-Ix.		

5.7.3 Events descriptor

Table 5.7.3.1: Events Descriptor

Events settable on termination types and stream types:	Yes		
If yes	**Event ID**	**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 sub-clause 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 sub-clause 5.14.3.9	ALL except ROOT	Not applicable
	MGCon (chp/mgcon, 0x0029/0x0001) – See sub-clause 5.14.3.10	only ROOT	Not applicable
	Available Realms Changed (ipra/arc, 0x00e0/0x0001) – See sub-clause 5.14.3.11	only ROOT	Not applicable
	IP Flow Stop Detection (adid/ipstop, 0x009c/0x0001) – See sub-clause 5.14.3.14	ALL except ROOT	ANY
	ECN Failure (ecnrous/fail, 0x010b/0x0001) – See sub-clause 5.14.3.15	IP	RTP Based
	ICE New Peer Reflexive Candidate (ostuncc/nprc, 0x00c3/0x0002) – see subclause 5.14.3.17	IP	Any, only applicable for full ICE
	ICE Connectivity Check Result (ostuncc/ccr, 0x00c3/0x0001) – see subclause 5.14.3.17	IP	Any, only applicable for full ICE

Table 5.7.3.2: Event Buffer Control

Event Buffer Control used:	No

Table 5.7.3.3: Keep Active

Keepactive used on events:	No

Table 5.7.3.4: Embedding in event

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

Table 5.7.3.5: Regulated Embedded Events

Regulated Embedded events are triggered on:	None

Table 5.7.3.6: Reset Events Descriptor Flag

ResetEventsDescriptor used with events:	None

Table 5.7.3.7: Notification Behaviour

NotifyImmediate:	ALL Events
NotifyRegulated:	None
NeverNotify:	None

NOTE: tables 5.7.3.4 – 5.7.3.7 apply to version 3 of ITU-T Recommendation H.248.1 [3].

5.7.4 EventBuffer descriptor

Table 5.7.4.1: Event Buffer

Event Buffer descriptor used:	No	
If yes	**EventIDs**	

5.7.5 Signals descriptor

Table 5.7.5.1: Signals dependant on termination or streams

The setting of signals is dependant on termination or streams types:	No NOTE – "No" means that all signals can be played on any termination or stream.		
If yes	**Signal ID**	**Termination Type**	**Stream Type / ID**
	Send Connectivity Check (ostuncc/scc, 0x00c3/0x0001)	IP	Any, only applicable for full ICE
	Send Additional Connectivity Check (ostuncc/sacc, 0x00c3/0x0002)	IP	Any, only applicable for full ICE

Table 5.7.5.2: Signal Lists

Signals Lists supported:	No	
If yes	**Termination Type Supporting Lists**	-
	Stream Type Supporting lists	-
	Maximum number of signals to a signal list	-
	Intersignal delay parameter supported:	-

Table 5.7.5.3: Overriding Signal type and duration

Signal type and duration supported:	No	
If yes	**Signal ID**	**Type or duration override**
	-	-

Table 5.7.5.4: Signal Direction

Signal Direction supported:	No

Table 5.7.5.5: Notify completion

NotifyCompletion supported:	No	
If yes	**Signal ID**	**Type of completion supported**
	-	-

Table 5.7.5.6: RequestID Parameter

RequestID Parameter Supported:	No

Table 5.7.5.7: Signals played simultaneously

Signals played simultaneously:	No	
If yes	**SignalIDs that can be played simultaneously:**	-

Table 5.7.5.8: Keep Active

KeepActive used on signals:	No

5.7.6 DigitMap descriptor

Table 5.7.6.1: DigitMap Descriptor

DigitMaps supported:	No		
If yes	**DigitMap Name**	**Structure**	**Timers**
	-	-	-

5.7.7 Statistics descriptor

Table 5.7.7.1: Statistics Descriptor

Statistics supported on:	-

Table 5.7.7.2: Statistics reported on Subtract

Statistics reported on Subtract:		No	
If yes	**Statistic IDs Reported**	**Termination Type**	**Stream Type**
	-	-	-

5.7.8 ObservedEvents descriptor

Table 5.7.8.1: ObservedEvents Descriptor

Event detection time supported:	No

5.7.9 Topology descriptor

Table 5.7.9.1: Topology descriptor

Allowed triples:	(T1, T2, isolate) (T1, T2, bothway)
NOTE: 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 the IBCF

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

Table 5.7.10.2: Error codes sent by the TrGW

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

Descriptors used by Add request:	Media (Stream(LocalControl, Local, Remote)), Event, Signals

Table 5.8.1.2: Descriptors used by Add reply

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

5.8.2 Modify

Table 5.8.2.1: Descriptors used by Modify request

Descriptors used by Modify request:	Media (TerminationState, Stream (LocalControl, Local, Remote)), Signals, Event

Table 5.8.2.2: Descriptors used by Modify reply

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

5.8.3 Subtract

Table 5.8.3.1: Descriptors used in Subtract request

Descriptors used by Subtract request:	None or Audit() NOTE
NOTE: this is to explicitly avoid reporting any statistics.	

Table 5.8.3.2: Descriptors used in Subtract reply

Descriptors used by Subtract reply:	None, Error

5.8.4 Move

Table 5.8.4.1: Command Move

Move command used:	No

Table 5.8.4.2: Descriptor used by Move command

Descriptors used by Move Request:	-
Descriptors used by Move Reply:	-

5.8.5 AuditValue

Table 5.8.5.1: Descriptors used by AuditValue

Audited Properties:	**Property Name and Identity**	**Descriptor**
	Base root properties: - root/* (ROOT)	TerminationState Descriptor
	TerminationState: - Root (MGW Audit)	TerminationState Descriptor
	For Packages: - Root	Packages Descriptor
	None (MGW Audit) : - Root	Audit (empty) Descriptor
	IP Realm Availability : - ipra/* (ROOT)	TerminationState Descriptor
	SDPCapNeg Extensions: - sdpe/*	TerminationState Descriptor
Audited Statistics:	None	
Audited Signals:	None	
Audited Events:	None	
Package Audit possible:	Yes	

5.8.6 AuditCapabilities

Table 5.8.6.1: AuditCapabilities

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

Table 5.8.6.2: Scoped Auditing

Audited Properties / ContextAttributes used for a scoped audit :	None

5.8.7 Notify

Table 5.8.7.1: Descriptors used by Notify

Descriptors used by Notify Request:	ObservedEvents
Descriptors used by Notify Reply:	None, Error

5.8.8 ServiceChange

Table 5.8.8.1: ServiceChangeMethods and ServiceChangeReasons sent by IBCF

ServiceChangeMethods Supported:	**ServiceChangeReasons supported:**
Handoff (NOTE 2, NOTE 3)	"903 MGC Directed Change" (Optional, NOTE 4)
Restart (NOTE 2)	"901 Cold Boot" (Optional) "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 IBCF. This does not preclude the use of the MGCId in a ServiceChange (Handoff) scenario, nor does it change the expected TrGW behaviour upon receipt of such a message, as the TrGW has actually no means to differentiate whether the ServiceChangeMgcId parameter that may be received in a ServiceChange (handoff) message relates to a logical IBCF inside the same IBCF server or is part of another IBCF.
NOTE 4: Support of this procedure is mandatory in the TrGW.

Table 5.8.8.2: Service Change Methods and Reason sent by TrGW

Service Change Methods Supported:	ServiceChange Reasons supported:
Forced	"904 Termination Malfunction", ALL except ROOT (Optional, NOTE 4) "905 Termination Taken Out Of Service" , ALL(Mandatory) "906 Loss Of Lower Layer Connectivity" , ALL except ROOT (Optional, NOTE 4) "907 Transmission Failure" , ALL except ROOT (Optional, NOTE 4) "908 MG Impending Failure" ROOT only (Mandatory) "910 Media Capability Failure" , ALL except ROOT (Optional, NOTE 4 "915 State Loss" ROOT only (Optional, NOTE 4)
Graceful	"905 Termination Taken Out Of Service" , (Optional, NOTE 4) "908 MG Impending Failure" (Optional, NOTE 4)
Disconnected (NOTE 1)	"900 Service Restored" (Mandatory) "916 Packages Change" (Optional) "917 Capability Change" (Optional)
Restart (NOTE 1)	"900 Service Restored" (Mandatory) "901 Cold Boot" (Mandatory) "902 Warm Boot" (Mandatory) "916 Packages Change" (Optional) "917 Capability Change "(Optional)
Handoff (NOTE 1, NOTE 2)	"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 an IBCF Ordered Re-Register. NOTE 4: Support of this procedure is mandatory in the IBCF.	

Table 5.8.8.3: Service Change Address

ServiceChangeAddress used:	No

Table 5.8.8.4: Service Change Delay

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

Table 5.8.8.5: Service Change Incomplete Flag

ServiceChange Incomplete Flag used:	No

Table 5.8.8.6: Service Change Version

Version used in ServiceChangeVersion:	2 or 3
NOTE: Version 2 shall be supported as the minimum protocol version. See subclause 5.3.	

Table 5.8.8.7: ServiceChangeProfile

ServiceChangeProfile mandatory:	Yes
NOTE: The ServiceChangeProfile is mandatory in the TrGW Register and TrGW Re-Register procedures.	

Table 5.8.8.8: Profile negotiation

Profile negotiation as per H.248.18:	No

Table 5.8.8.9: ServiceChangeMGCId

ServiceChangeMGCId used:	Yes

5.8.9 Manipulating and auditing context attributes

Table 5.8.9.1: Manipulating and Auditing Context Attributes

Context Attributes Manipulated:	Emergency Indicator, Priority Indicator
Context Attributes Audited:	None

5.9 Generic command syntax and encoding

Table 5.9.1: Command Encoding

Supported Encodings:	Text (NOTE 1, NOTE 2, NOTE 3) and Binary.
NOTE 1: The receiver shall be capable of receiving both Short Token Notation and Long Token Notation on an H.248 control association.	
NOTE 2: The transmitter may select between long and short token forms per H.248 control association.	
NOTE 3: ETSI TISPAN "Ia Profile" [4] uses only text encoding.	

5.10 Transactions

Table 5.10.1: Transactions

Maximum number of Transaction Requests / Replies / TransResponseAcks / Segment Replies per message:	10 (NOTE)
NOTE: ETSI TISPAN "Ia Profile" [4] maximum is "1", this is foreseen to be the typical case	

Table 5.10.2: Commands per Transaction Request

Maximum number of commands per Transaction request:	Unspecified (NOTE)
NOTE: ETSI TISPAN "Ia Profile" [4] maximum is "2", this is foreseen to be the typical case	

Table 5.10.3: Commands per Transaction Reply

Maximum number of commands per Transaction reply:	Unspecified (NOTE)
NOTE: ETSI TISPAN "Ia Profile" [4] maximum is "2", this is foreseen to be the typical case	

Table 5.10.4: Optional Commands

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

Table 5.10.5: Commands marked for Wildcarded Responses

Wildcarded responses may be requested for:	Subtract

Table 5.10.6: Procedures for Wildcarded Responses

Procedures that make use of wildcarded responses:	Release TrGW Termination

Table 5.10.7: Transaction Timers

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

5.11 Messages

It is recommended that TrGW and IBCF names are in the form of fully qualified domain name. For example the domain name of the IBCF may be of the form: "IBCF1.whatever.net." and the name of the TrGW may be of the form: "TrGW1.whatever.net.".

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

The IBCF domain name is provisioned in the TrGW or retrieved from the DNS using SRV records.

The use of a domain name provides the following benefits:

- TrGWs and IBCFs 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 [24].

- TrGWs and IBCFs 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). TrGW and IBCF 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 IBCF/TrGW for authentication purposes.

5.12 Transport

Table 5.12.1: Transport

Supported Transports:	1. IPv4-based network control plane: • SCTP/IPv4 (Recommended) NOTE1 • UDP/IPv4 (Optional) 2. IPv6-based network control plane: • SCTP/IPv6 (Recommended) NOTE1 • UDP/IPv6 (Optional)
NOTE1: When using SCTP as defined in IETF RFC 4960 [26] the TrGW shall always be the node to perform the "Initiation".	

Table 5.12.2: Segmentation

Segmentation Supported:	SCTP: Inherent in Transport UDP: No

Table 5.12.3: Control Association

Control Association Monitoring Supported:	Monitoring mechanism is dependent on used H.248 transport (see above table 5.12.1): **SCTP:** inherent capability of SCTP. **UDP:** H.248.14 (MG-driven monitoring). Empty AuditValue on ROOT (MGC-driven monitoring).

5.13 Security

Table 5.13.1: Security

Supported Security:	None
NOTE: IPsec shall not be used by the IBCF or TrGW for the Ix interface. Normally the Ix 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 Ix profile, the IBCF or the TrGW; for further details see 3GPP TS 33.210 [22].	

5.14 Packages

5.14.1 Mandatory Packages

Table 5.14.1.1: Mandatory Packages

Mandatory Packages		
Package Name	**Package ID**	**Version**
Generic (ITU-T Recommendation H.248.1 [3], annex E.1)	g, (0x0001)	1
Base root (ITU-T Recommendation H.248.1 [3], annex E.2)	root, (0x0051)	2
RTP Control Protocol Package (ITU-T Recommendation H.248.57 [5])	rtcph. (0x00b5)	1
Gate management Source Address/Port Filtering Package (ITU-T Recommendation H.248.43, Clause 7 [6])	gm, (0x008c)	2
Traffic management (ITU-T Recommendation H.248.53 [13])	tman, (0x008d)	1
IP Domain Connection (ITU-T Recommendation H.248.41 [14])	ipdc, (0x009d)	1
Hanging Termination Detection (ITU-T Recommendation H.248.36 [15])	hangterm, (0x0098)	1
Diffserv (ITU-T Recommendation H.248.52 [12])	ds, (0x008b)	2

5.14.2 Optional Packages

Table 5.14.2.1: Optional Packages

Optional Packages			
Package Name	**Package ID**	**Version**	**Support dependent on**
Inactivity Timer (ITU-T Recommendation H.248.14 [19])	it, (0x0045)	1	MGC polling by MG. Only applicable for UDP transport.
Media Gateway Overload Control (ITU-T Recommendation H.248.11 [16])	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 [20])	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 [14])	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.
3G Interface Type package (see subclause 15.2.11 of 3GPP TS 29.232 [21])	threegint (0x00e3)	1	Indication of interface type for statistical purposes at the MG.
Application Data Inactivity Detection (ITU-T Recommendation H.248.40 [27])	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 (ITU-T Recommendation H.248.82 see [40])	ecnrous (0x010b)	1	Support of ECN feature
MG Act-as STUN Server (ITU-T Recommendation H.248.50 [44])	mgastuns (0x00c2)	1	Support of incoming STUN connectivity checks. Applicable for ICE lite and full ICE
Originate STUN Continuity Check (see ITU-T Recommendation H.248.50 [44])	ostuncc (0x00c3)	1	Support of originating STUN connectivity checks. Only applicable for full ICE
MG located Bearer Level ALG [ITU-T Recommendation H.248.78 [46])	mgbalg (0x011d)	1	Support of a bearer level application gateway (B-ALG) function for application-aware MSRP interworking.
Enhanced Revised Offer/Answer SDP Support ([ITU-T Recommendation H.248.80 [51])	eroas, (0x0109)	1	Support of the SDP Capability Negotiation syntax

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) Normal Release "UR" (0x0002) Unavailable Resources "FT" (0x0003) Failure, Temporary "FP" (0x0004) Failure, Permanent "IW" (0x0005) Interworking Error "UN" (0x0006) 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 (root/maxNumberOfContexts, 0x0002/0x0001)	O	AUDITVALUE	ALL	YES
MaxTerminationsPerContext (root/maxTerminationPerContext, 0x0002/0x0002)	O	AUDITVALUE	ALL	YES
normalMGExecutionTime (root/normalMGExecutionTime, 0x0002/0x0003)	O	AUDITVALUE	ALL	YES
normalMGCExecutionTime (root/normalMGCExecutionTime, 0x0002/0x0004)	O	AUDITVALUE	ALL	YES
MGProvisionalResponseTimerValue (root/MGProvisionalResponseTimerValue, 0x0002/0x0005)	O	AUDITVALUE	ALL	YES
MGCProvisionalResponseTimerValue (root/MGCProvisionalResponseTimerValue, 0x0002/0x0006)	O	AUDITVALUE	ALL	YES
MGCOriginatedPendingLimit (root/MGCOriginatedPendingLimit, 0x0002/0x0007)	O	AUDITVALUE	ALL	YES
MGOriginatedPendingLimit (root/MGOriginatedPendingLimit, 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 (gm/saf,0x008c/0x0001)	M	ADD, MODIFY	ALL	Not Applicable
Remote Source Address Mask (gm/sam,0x008c/0x0002)	O	ADD, MODIFY	ALL	Not Applicable
Remote Source Port Filtering (gm/spf,0x008c/0x0003)	M	ADD, MODIFY	ALL	Not Applicable
Remote Source Port (gm/spr,0x008c/0x0004)	O	ADD, MODIFY	ALL	Not Applicable
Explicit Source Address Setting (gm/esas,0x008c/0x0005)	Not Supported	NONE	-	-
Local Source Address (gm/lsa,0x008c/0x0006)	Not Supported	NONE	-	-
Explicit Source Port Setting (gm/esps,0x008c/0x0007)	Not Supported	NONE	-	-
Local Source Port (gm/lsp,0x008c/0x0008)	Not Supported	NONE	-	-
Remote Source Port Range (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 (gm/dp,0x008c/0x0001)	Not Supported	None	-	
Error Codes	**Mandatory/Optional**			
None	-			

NOTE : This package extends RTP Control Protocol package (ITU-T Recommendation H.248.57 [5]) and thus inherits RTCP Allocation Specific Behaviour property (*rsb*).

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	ANY
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 [13] 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 *ipdc/realm* property exceeding the length limitation defined in ITU-T Recommendation H.248.41 [14], the MG shall reply with an error descriptor using error code #410: "Incorrect identifier".
NOTE 2: The MODIFY command is listed due to the ETSI TISPAN "Ia profile" [4]: subsequent Streams may be "added" by MODIFY requests in case of multi-Stream-per-Termination structures. The subsequent Streams do then carry the same *ipdc/realm* 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 (ocp/mg_overload, 0x0051/0x0001) (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 [16] 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 (hangterm/thb, 0x0098/0x0001)	M	ADD, MODIFY, NOTIFY		
	Event Parameters	**Mandatory/Optional**	**Supported Values**	**Provisioned Value**
	Timer X (timerx,0x0001)	M (NOTE1)	ALL (NOTE2)	YES
	ObservedEvent Parameters	**Mandatory/Optional**	**Supported Values**	**Provisioned Value**
	-	-	-	-
Statistics	**Mandatory/Optional**	**Used in command**	**Supported Values**	
None	-	**-**	**-**	
Error Codes	**Mandatory/Optional**			
None	-			

NOTE1: Timer X is optional in the ETSI TISPAN Ia version 3 profile [4].
NOTE2: 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 (chp/mgcon, 0x0029/0x0001)	M	MODIFY, NOTIFY		
	Event Parameters	**Mandatory/Optional**	**Supported Values**	**Provisioned Value**
	None	-	-	-
	ObservedEvent Parameters	**Mandatory/Optional**	**Supported Values**	**Provisioned Value**
	Reduction (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, (ipra/ar, 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 Changed, (ipra/arc, 0x00e0/0x001)	M	MODIFY, NOTIFY		
	Event Parameters	**Mandatory/Optional**	**Supported Values:**	**Provisioned Value**
	-	-	-	-
	ObservedEvent Parameters	**Mandatory/Optional**	**Supported Values**	**Provisioned Value**
	Newly Available Realms (nar, 0x0001)	M	ALL	Not applicable
	Newly Unavailable Realms (nur, 0x0002)	M	ALL	Not applicable
Statistics	**Mandatory/Optional**	**Used in command**	**Supported Values**	
None	-	-	-	
Error Codes	**Mandatory/Optional**			
None	-			

5.14.3.12 3G Interface Type package (threegint)

Table 5.14.3.12.1: 3G Interface Type Package

Properties	Mandatory/Optional	Used in command	Supported Values	Provisioned Value
IP Interface Type (threegint /ipint, (0x00e3/0x0001)	M	ADD, MOD	"NboIP" (0x0001) "MboIP" (0x0003) "ExtSIPI" (0x0004)	None
Signals	**Mandatory/Optional**	**Used in command**		**Duration Provisioned Value**
None	-	-		-
	Signal Parameters	**Mandatory/Optional**	**Supported Values**	**Duration Provisioned Value**
	-	-	-	-
Events	**Mandatory/Optional**	**Used in command**		
None	-	-		
	Event Parameters	**Mandatory/Optional**	**Supported Values**	**Provisioned Value**
	-	-	-	-
	ObservedEvent Parameters	**Mandatory/Optional**	**Supported Values**	**Provisioned Value**
	-	-	-	-
Statistics	**Mandatory/Optional**	**Used in command**	**Supported Values**	
None	-	**-**	**-**	
Error Codes	**Mandatory/Optional**			
None	-			

5.14.3.13 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**
	-	-	-	-
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

	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)	O	ADD, MODIFY	"SDCC" (0x0001) (NOTE 2) "RDCC"(0x0002) (NOTE1)	"RDCC"(0x0002)
Initiation Method (ecnrous/initmethod, 0x010b/0x0003)	M	ADD, MODIFY	"rtp" (NOTE 2) "leap", "inactive"	"leap"
ECN Mode (ecnrous/mode, 0x010b/0x0004)	O	ADD, MODIFY	"setonly" (0x0001) (NOTE 2) "readonly" (0x0002) (NOTE 2)	"setonly" (0x0001) in the Remote Descriptor and "readonly" (0x0002) in the Local Descriptor
ECT Marking (ecnrous/ectmark, 0x010b/0x0005)	O	ADD, MODIFY	"1" (0x0001) (NOTE 2) "0" (0x0002) "Random" (0x0003) (NOTE 2)	"0" (0x0002)
ECN Congestion Marking (ecnrous/congestmark, 0x010b/0x0006)	Not Signalled	-	-	"nomark" (0x0003)
ECN SDP Usage (ecnrous/ecnsdp, 0x010b/0x0007)	Not Signalled	-	-	"P"(0x0001)

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

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

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

Error Codes	**Mandatory/Optional**
None	-

NOTE1: Application Specific Rate Adaptation shall be applied in accordance with 3GPP TS 26.114 [31]. For speech this requires support of CMR and TMMBR for video.
NOTE 2: This parameter is only supported for the termination towards the external IP network.

5.14.3.16 MG Act-as STUN Server (mgastuns)

Table 5.14.3.16.1: MG Act-as STUN Server

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

5.14.3.17 Originate STUN Continuity Check (ostuncc)

Table 5.14.3.17.1: Originate STUN Continuity Check Package

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

5.14.3.18 MG located Bearer Level ALG (mgbalg)

Table 5.14.3.18.1: MG located Bearer Level ALG package

Properties	Mandatory/Optional	Used in command	Supported Values	Provisioned Value
Protocol type bearer level ALG (mgbalg/ptbalg, 0x011d/0x0001)	M	ADD, MODIFY	ALL	"OFF"
Upper layer protocol filter (mgbalg/ulpf, 0x011d/0x0002)	O (NOTE)	ADD, MODIFY	0	"0"
Source of replaced source address information part (mgbalg/sosaip, 0x011d/0x0003)	O (NOTE)	ADD, MODIFY	ALL	"SD"
Source of replaced destination address information part (mgbalg/sodaip, 0x011d/0x0004)	O (NOTE)	ADD, MODIFY	ALL	"SD"
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: When B-ALG service configuration is provisioned in TrGW.				

5.14.3.19 Enhanced Revised Offer/Answer SDP Support (eroas)

Table 5.14.3.19.1: Enhanced Revised Offer/Answer SDP Support package

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

5.15 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 "	<nettype> <addrtype> and <connection address> are required. The network type shall be set to "IN". The address type may be IPv4 or IPv6. The MGC may apply parameter underspecification to the <connection address> subfield.
m-line	"SDP_M "	There are four fields (or SDP values) <media>, <port>, <proto> and <fmt> in the "m=" line (see IETF RFC 4566 [8]; NOTE 1). The "m=" line may be omitted from SDP. <media>, <port>, <proto > and <fmt-list> are required if the "m=" line is included. Media type <media> : The <media> field shall be set to "audio" or "video" or "message" or "-", When "-" is used for the *media* 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. Transport port <port> The *port* value may be underspecified with CHOOSE wildcard. Transport protocol <proto> As in table 5.15.2. Media format <fmt> Various values may be used for media-format, dependent on the related <media>. "-" may be used for the *format list* value if no media reservation is required at this stage. If the MG does not support the requested media format value the MG shall reject the command with error code 449.
b-line	"SDP_B "	Shall not be used without an "m=" line. The *modifier* values shall be "AS", "RS" and "RR". The "AS" *modifier* implies that the *bandwidth-value* represents the "maximum bandwidth" (see clause 5.8/IETF RFC 4566 [8]). The *bandwidth-value* relates therefore to the *peak bitrate* (NOTE 2). The *bandwidth-value* value defines the IP layer bandwidth for the specific H.248 Stream. 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 IBCF may also supply additional RTCP bandwidth modifiers (i.e. RR and RS, see IETF RFC 3556 [29]). The AS *bandwidth* value will include the bandwidth used by RTP. In the absence of the RTCP bandwidth modifiers, the TrGW shall allow an additional 5% of the AS bandwidth value for the bandwidth for RTCP, in accordance with IETF RFC 3556 [29].

o-line	"SDP_O"	The origin line consists of six fields: (<username>, <sess-id>, <sess-version>, <nettype>, <addrtype> and <unicast-address>). The MGC is not required to supply this line but shall accept it (see clause 7.1.8/ITU-T Recommendation H.248.1 [3]). The MG shall return the value received from the MGC or if there is no o-line sent by the MGC, the MG shall populate this line as follows: - <user name> should contain an hyphen - <session ID> and <version> should contain one or mode digits as described in IETF RFC 4566 [8] - <network type> shall be set to IN - <address type> shall be set to IP4 or IP6 The Address Type shall be set to "IP4" or "IP6" depending on the addressing scheme used by the network to which the MG is connected. - <address> should contain the fully qualified domain name or IP address of the gateway.
s-line	"SDP_S"	The session name "s=" line contains a single field s= <session name>. The MGC is not required to supply this line but shall accept it (see clause 7.1.8/ITU-T Recommendation H.248.1 [3]). The MG shall return the value received from the MGC or if there is no s-line sent by the MGC, the MG shall populate this line as follows: - "s=-"
t-line	"SDP_T"	The time "t=" line consists of two fields *t*= <start time> and <stop time>. The MGC is not required to supply this line but shall accept it (see clause 7.1.8/ITU-T Recommendation H.248.1 [3]). The MG shall return the value received from the MGC or if there is no t-line sent by the MGC, the MG shall populate this line as follows: "t=0 0"
NOTE 1: IETF RFC 4566 [8] enables "-" as a valid character (i.e. for both IMS-Ix and CS-Ix). NOTE 2: The unit for the *bandwidth-value* (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 *bandwidth-value* is thus independent of the traffic characteristic and relates to the peak bitrate for CBR and VBR traffic.		

Table 5.15.2: Transport Protocol

Transport Protocol <proto> in m-line:	If the MG does not support the requested transport protocol, it shall reject the command with error code 449.
RTP/AVP	RTP profile according IETF RFC 3551 [10]. Allow only L4 protocol = UDP (see NOTE 2)
RTP/AVPF	Extended RTP profile for RTCP-based Feedback (RTP/AVPF) according IETF RFC 4585 [30]. See 3GPP TS 26.114 [31]. Allow only L4 protocol = UDP (NOTE 2).
RTP/SAVP	SRTP profile according IETF RFC 3711 [33] (NOTE 4). Allow only L4 protocol = UDP (see NOTE 2)
RTP/SAVPF	Extended SRTP profile for RTCP-based Feedback (RTP/SAVPF) according IETF RFC 5124 [34] (NOTE 4). Allow only L4 protocol = UDP (see NOTE 2)
TCP	Allow only L4 protocol = TCP (NOTE 3)
TCP/MSRP	Message service using IETF RFC 4975 [9].
udp	Allow only L4 protocol = UDP (NOTE 2, NOTE 5).

udptl	Allow only L4 protocol = UDP

NOTE 1: For IMS-Ix the above transports are applicable but for CS-Ix only RTP/AVP, TCP and udptl are applicable.
NOTE 2: Parameter "udp" is introduced by IETF RFC 4566 [8].
NOTE 3: Upper case TCP is defined by IETF RFC 4145 [11] and registered by IANA. .
NOTE 4: Included for support of e2e security, in order to permit rtcph/rsb property to be applied. TrGW does not support associated SRTP/SRTCP stream handling per se. If either RTP/SAVP is signalled at any termination in a context,or if RTP/SAVPF is signalled at any termination in a context, the TrGW shall not terminate SRTP / SRTCP streams and therefore shall not reserve any associated resources, but shall pass media transparently, and shall also pass related RTCP streams (as indicated with the rtcph/rsb property) transparently (for end-to-end media security).
NOTE 5: Codepoint used for e.g. "UDP payload transparent forwarding" (such as DTLS-encrypted end-to-end WebRTC bearer traffic).

5.16 Optional support of SDP and Annex C information elements

Table 5.16.1: Optional SDP Information Elements

Information Element	Annex C Support	SDP Support

a-line	"SDP_A "	1) Application "RTCP transport address control": The attribute "a=rtcp" line may either contain (a=rtcp: <port>) or (a=rtcp: <port> <network type> <address type> <connection address>) when the "a=" line is used for RTCP transport port and optionally network address transmission, see IETF RFC 3605 [7]. 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. "RTCP transport address control" should be supported by MG. 2) Application " Media interworking (transcoding)": 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). 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). For AVPF transport, the "rtcp-fb" SDP attribute defined in IETF RFC 4585 [30] may be used to provide the feedback message types the TrGW is allowed to send and to indicate RTCP timing information. For ECN interworking, the "rtcp-xr" SDP attribute defined in IETF RFC 3611 [36] may be used with "ecn-sum" value as defined in IETF RFC 6679 [35]. (NOTE) 3) Coordination of Video Orientation The attribute "a=extmap" (see IETF RFC 5285 [41]) with CVO information may be provided for an m-line in the local and remote descriptor if the TrGW supports the extended RTP header with Coordination of Video Orientation information, see also 3GPP TS 26.114 [31]. 4) Generic Image Attribute The attribute "a=imageattr" (see IETF RFC 6236 [42]) may be provided for an m-line in the local and remote descriptor if the TrGW supports the generic image attributes, see also 3GPP TS 26.114 [31]. The local descriptor indicates the image sizes which the TrGW supports in the receiving direction for the selected payload type and corresponds to the "recv" keyword (see IETF RFC 6236 [42]) in the "a=imageattr" that the IBCF will send within the SDP body on the Mx interface. The remote descriptor indicates the image sizes which the TrGW supports in the sending direction for the selected payload type and corresponds to the "send" keyword (see IETF RFC 6236 [42]) in the "a=imageattr" that the IBCF will send within the SDP body on the Mx interface. 5) Interactive Connectivity Establishment support The attributes "a=candidate", "a=ice-pwd", and "a=ice-ufrag" (see IETF RFC 5245 [43]) may be provided for an SDP m-line in the local and remote descriptor if the TrGW supports ICE, see also 3GPP TS 24.229 [45]. In the local descriptor, the IBCF shall provide "a=ice-pwd", and "a=ice-ufrag" with wildcard sign "$" to request the allocation of a password and user name fragment, and the "a=candidate" of type "host" with the transport, port and priority parameters with wildcard sign "$" to request the allocation of a host candidate. The TrGW shall then reply with completed "a=ice-pwd", and "a=ice-ufrag" and "a=candidate" attributes in the local descriptor, and shall include "a=ice-lite" if it only supports ICE lite. In the remote descriptor, the IBCF may provide the "a=candidate", "a=ice-pwd", and "a=ice-ufrag". 6) Handling of RTCP APP messages when transcoding between EVS and non EVS codecs: The attribute "a=3gpp_mtsi_app_adapt" (see 3GPP TS 26.114 [31]) containing the allowed RTCP APP message types shall be provided when the TrGW is allowed to send RTCP APP messages. 7) Pre-defined Video Region-of-Interest (ROI): The attribute a=rtcp-fb" with the "Predefined ROI" type expressed by the parameter "3gpp-roi-predefined" may be provided for an m-line in

		the local and remote descriptor if the TrGW supports the Predefined ROI mode, see also 3GPP TS 26.114 [31]. In addition, the attribute "a=extmap" (see IETF RFC 5285 [41]) may be provided for an m-line in the local and remote descriptor if the TrGW supports the extended RTP header for carriage of predefined video Region of Interest (ROI) information in the sent video, see also 3GPP TS 26.114 [31]. 8) Arbitrary Video Region of Interest (ROI): The attribute a=rtcp-fb" with the "Arbitrary ROI" type expressed by the parameter "3gpp-roi-arbitrary" may be provided for an m-line in the local and remote descriptor if the TrGW supports the Arbitrary ROI mode, see also 3GPP TS 26.114 [31]. In addition, the attribute "a=extmap" (see IETF RFC 5285 [41]) may be provided for an m-line in the local and remote descriptor if the TrGW supports the extended RTP header for carriage of arbitrary video Region of Interest (ROI) information in the sent video, see also 3GPP TS 26.114 [31]. 9) SDP Capability Negotiation: The attributes of "a=acap", "a=tcap", "a=pcfg" and "a=acfg" (see IETF RFC 5939 [50]) may be provided in the local descriptor and/or remote descriptor. 10) Rate adaptation for media endpoints: If the TrGW performs media transcoding and if the rate adaptation for media endpoints using the enhanced bandwidth negotiation is supported by the TrGW, attribute(s) "a=bw-info" with direction "send" may be provided for an m-line and the selected IP payload type and applicable IP version in the remote descriptor. The following bandwidth properties, as defined in 3GPP TS 26.114 [31], clause 19, may be included in "a=bw-info" line: <payload type> <dir> <MaxSupBw>, <MaxDesBw>, <MinDesBw>, <MinSupBw> and <IpVer>.
NOTE: Media Interworking is optional for IMS-Ix and not required for CS-Ix.		

5.17 Procedures

5.17.1 Formats and Codes

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

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

The binary encoding rules which are applicable to the defined Abstract Syntaxes are the Basic Encoding Rules for Abstract Syntax Notation One, defined in ITU-T Recommendation X.690 [28]. Specifically in accordance with ITU-T Recommendation X.690 [28] 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 TrGW and shall be supported by the IBCF as such by using H.248.1 error code #449 "Unsupported or Unknown Parameter or Property Value". The unsupported or unknown value is included in the error text in the error descriptor.

Table 5.17.1.1: Information Elements Used in Procedures

Signalling Object	H.248 Descriptor	Coding
Additional Bandwidth Properties	Remote Descriptor	The "a=bw-info" SDP attribute defined in 3GPP TS 26.114 [31], see table 5.16.1.
Alternate MGC Id	ServiceChange	The MGCIdToTry parameter in ITU-T Recommendation H.248.1 [3].
Allowed RTCP APP message types	Remote Descriptor	The "a=3gpp_mtsi_app_adapt" SDP attribute defined in 3GPP TS 26.114 [31].
Application-aware MSRP interworking request	LocalControl	This is the *ptbalg* property from ITU-T Recommendation H.248.78 [46] concerning the configuration of a B-ALG service (for MSRP traffic).
Arbitrary ROI	Local Descriptor or Remote Descriptor	The "rtcp-fb" SDP attribute defined in IETF RFC 4585 [30] to indicate the "Arbitrary ROI" RTCP feedback message expressed by the "3gpp-roi-arbitrary" parameter, as described in 3GPP TS 26.114 [31].
Available Realms	Termination State	According to *Available Realms* property in ITU-T Recommendation H.248.41 [14].
BNC Release	Events, ObservedEvents Descriptor	As for the Events/ObservedEvents Descriptor in subclause E.1.2.1/ITU-T Recommendation H.248.1 [3] "Cause"
Cause	ObservedEvents Descriptor	As for the ObservedEventsDescriptor Parameter in subclause E.1.2.1/ ITU-T Recommendation H.248.1 [3] "General cause"
Changed Realms	Observed Events	According to Observed Events Parameters for *Available Realms Changed* event in ITU-T Recommendation H.248.41 [14].
Codec List	Local Descriptor or Remote Descriptor	<fmt list> in a single SDP m-line. For a static RTP payload type, the codec type should be implied by the RTP payload type, if not then each codec type shall be provided in a separate SDP "a=rtpmap"-line and possibly additional SDP "a=fmtp"-line(s). For a dynamic RTP payload type, for each codec information on the codec type shall be provided in a separate SDP "a=rtpmap"-line and possibly additional SDP "a=fmtp"-line(s).
Connectivity Mode	Local Control	ITU-T Recommendation H.248.1 [3] Mode property. Binary Encoding: Encoding as per ITU-T Recommendation H.248.1 Annex A [3] "streamMode" Textual Encoding: Encoding as per ITU-T Recommendation H.248.1 Annex B [3]"streamMode".
Context ID	NA	Binary Encoding: As per ITU-T Recommendation H.248.1 [3] Annex A. Textual Encoding: As per ITU-T Recommendation H.248.1 [3] Annex B.
Delay Variation Tolerance	Local Control	This is the tman/dvt property from ITU-T Recommendation H.248.53 [13]
Diffserv Code Point	Local Control	Defined according to the *Differentiated Services Code Point* property in ITU-T Recommendation H.248.52 [12].
Diffserv Tagging Behaviour	Local Control	Defined according to the *Tagging Behaviour* property in ITU-T Recommendation H.248.52 [12].
ECN Congestion Response	Local descriptor or Remote Descriptor	Defined according to "Congestion Response Method" property in ITU-T Recommendation H.248.82 [40]. (NOTE)
ECN ECT Marking	Local descriptor or Remote Descriptor	Defined according to "ECT Marking" property in ITU-T Recommendation H.248.82 [40]. (NOTE)
ECN Enabled	Local Descriptor or Remote Descriptor	Defined according to the "ECN Enabled" property in ITU-T Recommendation H.248.82 [40].
ECN Failure	Events, Observed Events	Defined according to the "ECN Failure" Event in ITU-T Recommendation H.248.82 [40].
ECN Failure Type	ObservedEvents Descriptor	As for the ObservedEventsDescriptor Parameter "Failure Type" in ITU-T Recommendation H.248.82 [40].
ECN Initiation Method	Local Descriptor or Remote Descriptor	Defined according to "Initiation Method" property in ITU-T Recommendation H.248.82 [40].
ECN Mode	Local Descriptor or Remote Descriptor	Defined according to the "ECN Mode" property in ITU-T Recommendation H.248.82 [40]. (NOTE)
ECN RTCP Feedback	Local Descriptor or Remote Descriptor	"rcfp-fb" SDP attribute with the "nack" feedback parameter as derfined in IETF RFC 4585 and the "ecn" parameter value according to IETF RFC 6679 [35]
ECN XR Summary Report	Local Descriptor or Remote Descriptor	"ecn-sum" value as defined in IETF RFC 6679 [35] within a "rtcp-xr" SDP attribute in accordance with IETF RFC 3611 [36]

Emergency Call Indication	NA	ITU-T Recommendation H.248.1 [3] 6.1.1 Emergency Call Indicator Binary Encoding: Encoding as per ITU-T Recommendation H.248.1 [3] Annex A "Emergency" context attribute Textual Encoding: Encoding as per ITU-T Recommendation H.248.1 [3] Annex B "EmergencyToken" context attribute
Extended Header for CVO	Local Descriptor or Remote Descriptor	"extmap" attribute in SDP a-line as defined in IETF RFC 5285 [41], see table 5.16.1.
Extended RTP Header for Sent ROI	Local Descriptor or Remote Descriptor	"extmap" attribute in SDP a-line to pass on the ROI extended RTP header as defined by IETF RFC 5285 [41] for carriage of predefined and/or arbitrary ROI information, see 5.16
Generic Image Attribute	Local Descriptor or Remote Descriptor	"imageattr" attribute in SDP a-line as defined in IETF RFC 6236 [42], see table 5.16.1.
ICE host candidate request	Local Descriptor	The "a=candidate" SDP attribute defined in IETF RFC 5245 [43] of type "host" with the transport, port and priority parameters with wildcard sign "$" to request the allocation of a host candidate
ICE host candidate	Local Descriptor	The "a=candidate" SDP attribute defined in IETF RFC 5245 [43]
ICE lite indication	Local Descriptor	The "a=ice-lite" SDP attribute defined in IETF RFC 5245 [43].
ICE password request	Local Descriptor	The "a=ice-pwd" SDP attribute defined in IETF RFC 5245 [43] with wildcard sign "$".
ICE password	Local Descriptor	The "a=ice-pwd" SDP attribute defined in IETF RFC 5245 [43].
ICE received candidate	Remote Descriptor	The "a=candidate" SDP attribute defined in IETF RFC 5245 [43]
ICE received password	Remote Descriptor	The "a=ice-pwd" SDP attribute defined in IETF RFC 5245 [43].
ICE received Ufrag	Remote Descriptor	The "a=ice-ufrag" SDP attribute defined in IETF RFC 5245 [43].
ICE Ufrag request	Local Descriptor	The "a=ice-ufrag" SDP attribute defined in IETF RFC 5245 [43] with wildcard sign "$".
ICE Ufrag	Local Descriptor	The "a=ice-ufrag" SDP attribute defined in IETF RFC 5245 [43].
ICE Connectivity Check Result	Events, Observed Events	Defined according to *Connectivity Check Result* event in ITU-T Recommendation H.248.50 [44].
ICE Send Connectivity Check	Signals	Defined as the ostuncc/scc signal in ITU-T Recommendation H.248.50 [44].
ICE New Peer Reflexive Candidate	Events, Observed Events	Defined according to *New Peer Reflexive Candidate* event in ITU-T Recommendation H.248.50 [44], only applicable for full ICE.
ICE Send Additional Connectivity Check	Signals	Defined as the ostuncc/sacc signal in ITU-T Recommendation H.248.50 [44], only applicable for full ICE.
Inactivity Timeout	Events, Observed Events	Defined according to *Inactivity Timeout* event in ITU-T Recommendation H.248.14 [19].
IP Address	Local Descriptor or Remote Descriptor	<connection address> in SDP "c-line"
IP Interface	Local control	As for the property "IP interface type" in subclause 15.2.11.1 in 3GPP TS 29.232 [21]
IP Realm Identifier	Local Control	According to *IP Realm Identifier* property in ITU-T Recommendation H.248.41 [14].
IP Version	Local Descriptor or Remote Descriptor	<address type> in SDP "c-line", see 5.15
Maximum Burst Size	Local Control	This is the tman/mbs property from ITU-T Recommendation H.248.53 [13]
Media Inactivity Detection	Events, Observed Events	Defined according to IP Flow Stop Detection event in ITU-T Recommendation H.248.40 [27].
Media Inactivity Detection Time	Events	As for the Event Parameter in ITU-T Recommendation H.248.40 [27] "Detection Time"
Media Inactivity Detection Direction	Events	As for the Event Parameter in ITU-T Recommendation H.248.40 [27] "Direction"
Media Type	Local Descriptor or Remote Descriptor	<media> in SDP m-line "audio", "video" or "-"
MSRP Path	Remote Descriptor	The "a=path" SDP attribute defined in IETF RFC 4975 [9].
Overload Notification	Events, Observed Events	This is the chp/mgcon event from ITU-T Recommendation H.248.10 [20] or the ocp/mg_overload event from ITU-T Recommendation H.248.11 [16].
Peak Data Rate	Local Control	This is the tman/pdr property from ITU-T Recommendation H.248.53 [13].
Policing Required	Local Control	This is the tman/pol property from ITU-T Recommendation H.248.53 [13].
Port	Local Descriptor or Remote Descriptor	<port> in SDP m-line.

Predefined ROI	Local Descriptor or Remote Descriptor	The "rtcp-fb" SDP attribute defined in IETF RFC 4585 [30] to indicate the "Predefined ROI" RTCP feedback message expressed by the "3gpp-roi-predefined" parameter, as described in 3GPP TS 26.114 [31].
Priority Information	NA	Priority Indicator (subclause 6.1.1 of ITU-T Recommendation H.248.1 [3]) Binary Encoding: Encoding as per ITU-T Recommendation H.248.1 [3] Annex A "priority" context attribute Textual Encoding: Encoding as per ITU-T Recommendation H.248.1 [3] Annex B "priority" context attribute
Realm Availability Change	Events, Observed Events	According to *Available Realms Changed* event in ITU-T Recommendation H.248.41 [14].
Reduction	ObservedEvent Descriptor	As for the ObservedEventDescriptor in subclause 4.2.1/ ITU-T Recommendation H.248.10 [20] "MGCongestion".
Remote Source Address Filtering	Local Control	Defined according to *Remote Source Address Filtering* property in ITU-T Recommendation H.248.43 [6].
Remote Source Address Mask	Local Control	Defined according to *Remote Source Address Mask* property in ITU-T Recommendation H.248.43 [6].
Remote Source Port Filtering	Local Control	Defined according to *Remote Source Port Filtering* property in ITU-T Recommendation H.248.43 [6].
Remote Source Port	Local Control	Defined according to *Remote Source Port* property in ITU-T Recommendation H.248.43 [6].
Remote Source Port Range	Local Control	Defined according to *Remote Source Port Range* property in ITU-T Recommendation H.248.43 [6].
Reserve_Value	Local Control	ITU-T Recommendation H.248.1 [3] Reserve property. Binary Encoding: Encoding as per ITU-T Recommendation H.248.1[3] Annex A "reserveValue" Textual Encoding: Encoding as per ITU-T Recommendation H.248.1 [3] Annex B "reservedValueMode".
ROOT Properties	Termination State	The properties in subclause E.2.1/ITU-T Recommendation H.248.1 [3]
RTCP allocation	Local Control	Defined according to *RTCP Allocation Specific Behaviour* 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 IBCF toward the TrGW.
SDPCapNeg configuration	Local Descriptor or Remote Descriptor	The SDP attributes for SDP capability negotiation according to IETF RFC 5939 [50].
SDPCapNeg Supported Capabilities	Termination State	Defined according to *SDPCapNeg Extensions* property in ITU-T Recommendation H.248.80 [51].
Stream Number	Stream	Encoding as per ITU-T Recommendation H.248.1 [3]Annex B "Stream"/"ST". For a single stream, this may be omitted by the CS-IBCF.
STUN server request	LocalControl	Encoding as per ITU-T Recommendation H.248.50 [44] "MG Act-as STUN Server" (mgastuns) package "Act-as STUN Server" (astuns, 0x0001) property.
Sustainable Data Rate	Local Control	This is the tman/sdr property from ITU-T Recommendation H.248.53 [13]
Termination heartbeat	Events ObservedEvents	As per *Termination Heartbeat* defined in ITU-T Recommendation H.248.36 [15] Clause 5.2.1.
Termination ID	NA	Binary Encoding: As per ITU-T Recommendation H.248.1 [3] Annex A. Textual Encoding: As per ITU-T Recommendation H.248.1 [3] Annex B.
Transaction ID	NA	Binary Encoding: As per ITU-T Recommendation H.248.1 [3] Annex A. Textual Encoding: As per ITU-T Recommendation H.248.1 [3] Annex B.
Transport	Local Descriptor or Remote Descriptor	<transport> in SDP m-line, see 5.15
NOTE: This property is only signalled for IP terminations towards external IP network		

5.17.2 Call Related Procedures

5.17.2.1 General

This section describes the various call related procedures performed by the TrGW, which are listed in table 15.17.2.1.1

Table 5.17.2.1.1: TrGW Call Related Procedures

Transaction defined in 3GPP TS 29.235 [17] or 3GPP TS 29.162 [18]	Supported	Comment
Reserve TrGW Connection Point	Mandatory	See 5.17.2.2
Configure TrGW Connection Point	Mandatory	See 5.17.2.3
Reserve and Configure TrGW Connection Point	Mandatory	See 5.17.2.4
Release TrGW 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
ECN Failure Indication	Optional	See 5.17.2.10
Change Flow Direction	Optional	See 5.17.2.11
ICE Connectivity Check Result Notification	Optional	See 5.17.2.12 Only applicable if full ICE is supported
ICE New Peer Reflexive Candidate Notification	Optional	See 5.17.2.13 Only applicable if full ICE is supported

5.17.2.2 Reserve TrGW Connection Point

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

Table 5.17.2.2.1: Reserve TrGW Connection Point Request

Address Information	Control information	Bearer information

Local Descriptor {
Port = $
IP Address = $
IP Version = IPv4 or IPv6
 	
}
	Transaction ID = x
	If Context Requested:
	Context ID= $
	If Emergency Call:
	Emergency Call Indication
	
	If MPS call/session:
	Priority Indicator = x
	
	If Context Provided:
	Context ID = c1
	
	Termination ID = $
	If Stream Number specified:-
	Stream Number
	If Resources for multiple Codecs required:
	Reserve_Value
	
	If IP Interface Type:
	IP interface = "IP interface type"
	
	If indication on Bearer Released requested:
	NotificationRequested (Event ID = x, "BNC Release ")
	
	If diffserv required:-
	Diffserv Code Point
	If tagging behaviour
	Diffserv Tagging Behaviour
	
	If Remote Source Address Filtering required:-
	Remote Source Address Filtering
	If Remote Source Address range required:-
	Remote Source Address Mask
	If Remote Source Port Filtering required:-
	Remote Source Port Filtering
	If individual port:-
	Remote Source Port
	If range of ports:
	Remote Source Port Range
	
	NotificationRequested (Event ID = x, "termination heartbeat")
	
	If multiple IP realms: IP realm Identifier = required IP realm identifier
	
	If Media Inactivity Detection Required:
	NotificationRequested (Event ID = x, "Media Inactivity Detection (Media Inactivity Detection Time, Media Inactivity Detection Direction) ") (NOTE 1)
	
	If Sustainable Data Rate Policing Required:-
	Policing Required
	Sustainable Data Rate
	Maximum Burst Size
	
	If peak data rate policing
		Local Descriptor {
		If media is "audio" or "video":
		Codec List = Codec List
		RTP Payloads = RTP Payload
		Rtpbw
		If RTCP bandwidth
		RtcpbwRS
		RtcpbwRR
		If media is "video":
		If CVO required:
		Extended Header for CVO (NOTE 4, NOTE 5)
		If media is "video":
		If imageattr negotiation:
		Generic Image Attribute (NOTE 6)
		If Predefined ROI required:
		RTCP feedback for Predefined ROI
		Extended Header for Sent ROI
		If Arbitrary ROI required:
		RTCP feedback for Arbitrary ROI
		Extended Header for Sent ROI
		
		If ICE is applied:
		ICE host candidate request
		ICE password request
		ICE Ufrag request
		
		If SDPCapNeg is signalled to the gateway:
		SDPCapNeg configuration
		
		}

	Policing Required Peak Data Rate If Delay Variation required Delay Variation Tolerance If RTCP handling required: RTCP allocation If ECN transparent support required: ECN Enable = "True" Initiation Method = "inactive" If ECN Endpoint support required ECN Enable = "True" Initiation Method = "ECN Initiation Method" NOTE 2 Congestion Response = "ECN Congestion Response" NOTE 3 ECN Mode = "ECN mode" NOTE 3 ECT Marking = "ECN ECT marking" NOTE 3 RTCP Feedback = "ECN RTCP Feedback" NOTE 3 XR Summary Report = "ECN XR Summary Report" NOTE 3 If notification of ECN Failure Report: NotificationRequested (Event ID = x," ECN Failure") If ICE is applied: STUN server request If media is "message": If B-ALG for MSRP required: Application-aware MSRP interworking request	

NOTE 1: The event parameters "Media Inactivity Detection Time" and "Media Inactivity Detection Direction" are optional.
NOTE 2: This shall be set to a value other than "inactive"
NOTE 3: For the IMS side/3GPP ECN profile terminations this property does not need to be signalled; default provisioned values are defined for this profile. For procedures to handle interworking between different ECN property settings see 3GPP TS 29.162 [18].
NOTE 4: The support of the CVO feature is optional for the TrGW. The IBCF shall send the "extended RTP header for CVO" information element only with supported CVO URN(s) to the TrGW. If the TrGW does not support the CVO feature, the IBCF shall not send the "extended RTP header for CVO" information element to the TrGW.
NOTE 5: If the TrGW supports the extended RTP header with Coordination of Video Orientation information it shall pass any received extended RTP header with CVO bits on to outgoing RTP streams. If the TrGW transcodes between video payloads and it supports the extended RTP header with CVO bits it shall keep the video orientation unchanged during the transcoding and convey received RTP header bytes on the outgoing RTP stream after transcoding associated packets as specified in 3GPP TS 26.114 [31], subclause 7.4.5.
NOTE 6: The support of the generic image attributes is optional for the TrGW. The list of image sizes per payload type supported by the TrGW is preconfigured in the IBCF. If none of the image sizes received within an SDP body on Mx interface is supported by the TrGW then the IBCF shall not send the generic image attribute parameter to the TrGW.

Editor's Note: IP Interface Type needs to be further clarified in stage 2 – possible exclusion for IMS Ix.

On reserving the termination, the TrGW responds as in Table 5.17.2.2.2.

Table 5.17.2.2.2: Reserve TrGW Connection Point Acknowledge

Address Information	Control information	Bearer information

Local Descriptor {
Port
IP Address
IP Version
}
	Transaction ID = x
	Context ID = C1
	Termination ID = T1
	Stream Number
		Local Descriptor {
		If media is "audio" or "video":
		
		Codec List
		RTP Payloads
		Rtpbw
		If RTCP bandwidth
		RtcpbwRS
		RtcpbwRR
		If media is "video":
		If CVO extension header provided in the request:
		Extended Header for CVO
		If media is "video":
		If image attribute negotiation:
		Generic Image Attribute
		If Predefined ROI provided in the request:
		RTCP feedback for Predefined ROI
		Extended Header for Sent ROI
		If Arbitrary ROI provided in the request:
		RTCP feedback for Arbitrary ROI
		Extended Header for Sent ROI
		
		If ICE is applied:
		ICE host candidate
		ICE password
		ICE Ufrag
		If ICE lite implementation
		ICE lite indication
		
		If SDPCapNeg is signalled to the gateway:
		SDPCapNeg configuration
		
		}

5.17.2.3 Configure TrGW Connection Point

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

Table 5.17.2.3.1: Configure TrGW Connection Point Request

Address Information	Control information	Bearer information

If local resources are modified:
Local Descriptor {
Port
IP Address
IP Version
}
If remote resources are modified:
Remote Descriptor {
Port
IP Address
IP Version
}
	Transaction ID = x
	Context ID = C1
	Termination ID = T1
	
	If MPS priority is modified:
	Priority Indicator = x (NOTE 5)
	
	If Stream Number specified:
	Stream Number
	
	If Resources for multiple Codecs required:
	Reserve_Value
	
	If diffserv required:-
	Diffserv Code Point
	If tagging behaviour
	Diffserv Tagging Behaviour
	
	If Remote Source Address Filtering required:-
	Remote Source Address Filtering
	If Remote Source Address range required:-
	Remote Source Address Mask
	If Remote Source Port Filtering required:-
	Remote Source Port Filtering
	If individual port:-
	Remote Source Port
	If range of ports:
	Remote Source Port Range
	
	NotificationRequested (Event ID = x, "termination heartbeat")
	
	If multiple IP realms: IP realm Identifier = required IP realm (NOTE 1)
	
	If Media Inactivity Detection Required:
	NotificationRequested (Event ID = x, "Media Inactivity Detection (Media Inactivity Detection Time, Media Inactivity Detection Direction) ") (NOTE 2)
	
	If Sustainable Data Rate Policing Required:-
	Policing Required
	Sustainable Data Rate
	Maximum Burst Size
	
	If peak data rate policing
	Policing Required
	Peak Data Rate
	If Delay Variation required
	Delay Variation Tolerance
	
	If RTCP handling required:
	RTCP allocation
	
	If ECN transparent support required:
	ECN Enable = "True"
	Initiation Method = "inactive"
	
	If ECN Endpoint support required
		If local resources are modified:
		Local Descriptor {
		If media is "audio" or "video":
		Codec List
		RTP Payloads
		Rtpbw
		If RTCP bandwidth
		RtcpbwRS
		RtcpbwRR
		If media is "video":
		If CVO required:
		Extended Header for CVO (NOTE 6, NOTE 7)
		If media is "video":
		If imageattr negotiation:
		Generic Image Attribute (NOTE 8)
		If Predefined ROI required:
		RTCP feedback for Predefined ROI
		Extended Header for Sent ROI
		If Arbitrary ROI required:
		RTCP feedback for Arbitrary ROI
		Extended Header for Sent ROI
		
		If SDPCapNeg is signalled to the gateway:
		SDPCapNeg configuration
		
		}
		If remote resources are modified:
		Remote Descriptor {
		If media is "audio" or "video":
		Codec List
		RTP Payloads
		Rtpbw
		If rate adaptation for media endpoints:
		Additional Bandwidth Properties (NOTE 10)
		If RTCP bandwidth
		RtcpbwRS
		RtcpbwRR
		If media is "video":
		If CVO required:
		Extended Header for CVO (NOTE 6, NOTE 7)
		If media is "video":
		If imageattr negotiation:
		Generic Image Attribute (NOTE 8)
		If Predefined ROI required:
		RTCP feedback for Predefined ROI
		Extended Header for Sent ROI
		If Arbitrary ROI required:
		RTCP feedback for Arbitrary ROI
		Extended Header for Sent ROI
		If media is "message":
		If B-ALG for MSRP required:
		MSRP Path
		
		If RTCP APP messages allowed
		Allowed RTCP APP message types
		
		If ICE is applied:
		ICE received candidate

	ECN Enable = "True" Initiation Method = "ECN Initiation Method" NOTE 3 Congestion Response = "ECN Congestion Response" NOTE 4 ECN Mode = "ECN mode" NOTE 4 ECT Marking = "ECN ECT marking" NOTE 4 RTCP Feedback = "ECN RTCP Feedback" NOTE 4 XR Summary Report = "ECN XR Summary Report" NOTE 4 If notification of ECN Failure Report: NotificationRequested (Event ID = x," ECN Failure") If full ICE is applied: Send Connectivity Check ("Control") If notification of ICE Connectivity Check Result Report: NotificationRequested (Event ID= xx, "Connectivity Check Result") If notification of New Peer Reflexive Candidate: NotificationRequested (Event ID = xy," New Peer Reflexive Candidate ") Send Additional Connectivity Check ("Control") If media is "message": If B-ALG for MSRP required: Application-aware MSRP interworking request	ICE received password ICE received Ufrag (NOTE 9) If SDPCapNeg is signalled to the gateway: SDPCapNeg configuration }

NOTE 1: This shall only be set to the same IP realm as at the reservation stage which is specified in Table 5.17.2.2.1. If a different IP realm is specified, the TrGW shall return error 501 “Not Implemented”. Additional streams may be added by the Configure_TrGW_Connection_Point procedure. The additional streams shall then carry the same IP Realm Identifier as the first stream.
NOTE 2: The event parameters "Media Inactivity Detection Time" and "Media Inactivity Detection Direction" are optional.
NOTE 3: This shall be set to a value other than "inactive".
NOTE 4: For the IMS side/3GPP ECN profile terminations this property does not need to be signalled; default provisioned values are defined for this profile. For procedures to handle interworking between different ECN property settings see 3GPP TS 29.162 [18].
NOTE 5: The support of the modification of the Priority Indicator value is optional for the TrGW and depends on implementation solution for Priority call/session authorisation (see 3GPP TS 29.162 [18]).
NOTE 6: The support of the CVO feature is optional for the TrGW. The IBCF shall send the "extended RTP header for CVO" information element only with supported CVO URN(s) to the TrGW. If the TrGW does not support the CVO feature, the IBCF shall not send the "extended RTP header for CVO" information element to the TrGW.
NOTE 7: If the TrGW supports the extended RTP header with Coordination of Video Orientation information it shall pass any received extended RTP header with CVO bits on to outgoing RTP streams. If the TrGW transcodes between video payloads and it supports the extended RTP header with CVO bits it shall keep the video orientation unchanged during the transcoding and convey received RTP header bytes on the outgoing RTP stream after transcoding associated packets as specified in 3GPP TS 26.114 [31], subclause 7.4.5.
NOTE 8: The support of the generic image attributes is optional for the TrGW. The list of image sizes per payload type supported by the TrGW is preconfigured in the IBCF. If none of the image sizes received within an SDP body on Mx interface is supported by the TrGW then the IBCF shall not send the generic image attribute parameter to the TrGW.
NOTE 9: The support of ICE received candidate, ICE received password, ICE received Ufrag are optional for ICE lite, as specified in 3GPP TS 29.162 [18].
NOTE 10: The support of rate adaptation for media endpoints using the additional bandwidth properties is optional for the TrGW. If media transcoding is required the IBCF may provide for the selected payload type and the used IP version the additional bandwidth properties.

The TrGW responds as in Table 5.17.2.3.2.

Table 5.17.2.3.2: Configure TrGW Connection Point Request Acknowledge

Address Information	Control information	Bearer information

If local resources were provided in request:
Local Descriptor {
Port
IP Address
IP Version
}
If remote resources are provided in request:
Remote Descriptor {
Port
IP Address
IP Version
} NOTE
	Transaction ID = x
	Context ID = C1
	Termination ID = T1
	
	If Stream Number Specified:
	Stream Number
		If local resources were provided in request:
		Local Descriptor {
		If media is "audio" or "video":
		Codec List
		RTP Payloads
		Rtpbw
		If RTCP bandwidth
		RtcpbwRS
		RtcpbwRR
		If media is "video":
		If CVO extension header provided in the request:
		Extended Header for CVO
		If media is "video":
		If image attribute negotiation:
		Generic Image Attribute
		If Predefined ROI provided in the request:
		RTCP feedback for Predefined ROI
		Extended Header for Sent ROI
		If Arbitrary ROI provided in the request:
		RTCP feedback for Arbitrary ROI
		Extended Header for Sent ROI
		
		}
		
		If remote resources are provided in request:
		Remote Descriptor {
		If media is "audio" or "video":
		Codec List
		RTP Payloads
		Rtpbw
		If rate adaptation for media endpoints:
		Additional Bandwidth Properties
		If RTCP bandwidth
		RtcpbwRS
		RtcpbwRR
		If media is "video":
		If CVO extension header provided in the request:
		Extended Header for CVO
		If media is "video":
		If image attribute negotiation:
		Generic Image Attribute
		If Predefined ROI provided in the request:
		RTCP feedback for Predefined ROI
		Extended Header for Sent ROI
		If Arbitrary ROI provided in the request:
		RTCP feedback for Arbitrary ROI
		Extended Header for Sent ROI
		
		} NOTE

NOTE: Sending of the Remote Descriptor is optional		

5.17.2.4 Reserve and Configure TrGW Connection Point

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

Table 5.17.2.4.1: Reserve and Configure TrGW Connection Point Request

Address Information	Control information	Bearer information

Local Descriptor {
Port = $
IP Address = $
IP Version = IPv4 or IPv6
}
Remote Descriptor {
Port
IP Address
IP Version
}
	Transaction ID = x
	If Context Requested:
	Context ID = $
	If Emergency Call:
	Emergency Call Indication
	
	If MPS call/session:
	Priority Indicator = x
	
	If Context Provided:
	Context ID = c1
	
	Termination ID = $
	
	If Stream Number Specified:
	Stream Number
	If Resources for multiple Codecs shall be reserved:
	Reserve_Value
	
	If IP Interface Type:
	IP interface = "IP interface type"
	
	If indication on Bearer Released requested:
	NotificationRequested (Event ID = x, "BNC Release ")
	
	If diffserv required:-
	Diffserv Code Point
	If tagging behaviour
	Diffserv Tagging Behaviour
	
	If Remote Source Address Filtering required:-
	Remote Source Address Filtering
	If Remote Source Address range required:-
	Remote Source Address Mask
	
	If Remote Source Port Filtering required:-
	Remote Source Port Filtering
	If individual port:-
	Remote Source Port
	If range of ports:
	Remote Source Port Range
	
	NotificationRequested (Event ID = x, "termination heartbeat")
	
	If multiple IP realms: IP realm Identifier = required IP realm identifier
	
	If Media Inactivity Detection Required:
	NotificationRequested (Event ID = x, "Media Inactivity Detection (Media Inactivity Detection Time, Media Inactivity Detection Direction) ") (NOTE 1)
	
	If Sustainable Data Rate Policing Required:-
	Policing Required
	Sustainable Data Rate
	Maximum Burst Size
		Local Descriptor {
		If media is "audio" or "video":
		Codec List
		RTP Payloads
		Rtpbw
		If RTCP bandwidth
		RtcpbwRS
		RtcpbwRR
		If media is "video":
		If CVO required:
		Extended Header for CVO (NOTE 4, NOTE 5)
		If media is "video":
		If imageattr negotiation:
		Generic Image Attribute (NOTE 6)
		If Predefined ROI required:
		RTCP feedback for Predefined ROI
		Extended Header for Sent ROI
		If Arbitrary ROI required:
		RTCP feedback for Arbitrary ROI
		Extended Header for Sent ROI
		
		If ICE is applied:
		ICE host candidate request
		ICE password request
		ICE Ufrag request
		
		If SDPCapNeg is signalled to the gateway:
		SDPCapNeg configuration
		}
		
		Remote Descriptor {
		If media is "audio" or "video":
		Codec List
		RTP Payloads
		Rtpbw
		If rate adaptation for media endpoints:
		Additional Bandwidth Properties (NOTE 8)
		If RTCP bandwidth
		RtcpbwRS
		RtcpbwRR
		If media is "video":
		If CVO required:
		Extended Header for CVO (NOTE 4, NOTE 5)
		If media is "video":
		If imageattr negotiation:
		Generic Image Attribute (NOTE 6)
		If Predefined ROI required:
		RTCP feedback for Predefined ROI
		Extended Header for Sent ROI
		If Arbitrary ROI required:
		RTCP feedback for Arbitrary ROI
		Extended Header for Sent ROI
		
		If media is "message":
		If B-ALG for MSRP required:
		MSRP Path
		
		If RTCP APP messages allowed
		Allowed RTCP APP message

	If peak data rate policing Policing Required Peak Data Rate If Delay Variation required Delay Variation Tolerance If RTCP handling required: RTCP allocation If ECN transparent support required: ECN Enable = "True" Initiation Method = "inactive" If ECN Endpoint support required ECN Enable = "True" Initiation Method = "ECN Initiation Method" NOTE 2 Congestion Response = "ECN Congestion Response" NOTE 3 ECN Mode = "ECN mode" NOTE 3 ECT Marking = "ECN ECT marking" NOTE 3 RTCP Feedback = "ECN RTCP Feedback" NOTE 3 XR Summary Report = "ECN XR Summary Report" NOTE 3 If notification of ECN Failure Report: NotificationRequested (Event ID = x," ECN Failure") If ICE is applied: STUN server request If full ICE is applied Send Connectivity Check ("Control") If notification of ICE Connectivity Check Result Report: NotificationRequested (Event ID = xx,"Connectivity Check Result") If notification of New Peer Reflexive Candidate: NotificationRequested (Event ID = xy," New Peer Reflexive Candidate ") If media is "message": If B-ALG for MSRP required: Application-aware MSRP interworking request	types If ICE is applied: ICE received candidate ICE received password ICE received Ufrag (NOTE 7) If SDPCapNeg is signalled to the gateway: SDPCapNeg configuration }

NOTE 1: The event parameters "Media Inactivity Detection Time" and "Media Inactivity Detection Direction" are optional.
NOTE 2: This shall be set to a value other than "inactive"
NOTE 3: For the IMS side/3GPP ECN profile terminations this property does not need to be signalled; default provisioned values are defined for this profile. For procedures to handle interworking between different ECN property settings see 3GPP TS 29.162 [18].
NOTE 4: The support of the CVO feature is optional for the TrGW. The IBCF shall send the "extended RTP header for CVO" information element only with supported CVO URN(s) to the TrGW. If the TrGW does not support the CVO feature, the IBCF shall not send the "extended RTP header for CVO" information element to the TrGW.
NOTE 5: If the TrGW supports the extended RTP header with Coordination of Video Orientation information it shall pass any received extended RTP header with CVO bits on to outgoing RTP streams. If the TrGW transcodes between video payloads and it supports the extended RTP header with CVO bits it shall keep the video orientation unchanged during the transcoding and convey received RTP header bytes on the outgoing RTP stream after transcoding associated packets as specified in 3GPP TS 26.114 [31], subclause 7.4.5.
NOTE 6: The support of the generic image attributes is optional for the TrGW. The list of image sizes per payload type supported by the TrGW is preconfigured in the IBCF. If none of the image sizes received within an SDP body on Mx interface is supported by the TrGW then the IBCF shall not send the generic image attribute parameter to the TrGW.
NOTE 7: The support of ICE received candidate, ICE received password, ICE received Ufrag are optional for ICE lite, as specified in 3GPP TS 29.162 [18].
NOTE 8: The support of rate adaptation for media endpoints using the additional bandwidth properties is optional for the TrGW. If media transcoding is required the IBCF may provide for the selected payload type and the used IP version the additional bandwidth properties.

The TrGW responds as in Table 5.17.2.4.2.

Table 5.17.2.4.2: Reserve and Configure TrGW Connection Point Request Acknowledge

Address Information	Control information	Bearer information

Local Descriptor {
Port
IP Address
IP Version
}
Remote Descriptor {
Port
IP Address
IP Version
} NOTE
	Transaction ID = x
	Context ID = C1
	Termination ID = T1
	Stream Number
		Local Descriptor {
		If media is "audio" or "video":
		Codec List
		RTP Payloads
		Rtpbw
		If RTCP bandwidth
		RtcpbwRS
		RtcpbwRR
		If media is "video":
		If CVO extension header provided in the request:
		Extended Header for CVO
		If media is "video":
		If image attribute negotiation:
		Generic Image Attribute
		If Predefined ROI provided in the request:
		RTCP feedback for Predefined ROI
		Extended Header for Sent ROI
		If Arbitrary ROI provided in the request:
		RTCP feedback for Arbitrary ROI
		Extended Header for Sent ROI
		
		If ICE is applied:
		ICE host candidate
		ICE password
		ICE Ufrag
		If ICE lite implementation
		ICE lite indication
		
		If SDPCapNeg is signalled to the gateway:
		SDPCapNeg configuration
		
		}
		Remote Descriptor {
		If media is "audio" or "video":
		Codec List
		RTP Payloads
		Rtpbw
		If rate adaptation for media endpoints:
		Additional Bandwidth Properties
		If RTCP bandwidth
		RtcpbwRS
		RtcpbwRR
		If media is "video":
		If CVO extension header provided in the request:
		Extended Header for CVO
		If media is "video":
		If image attribute negotiation:
		Generic Image Attribute
		If Predefined ROI provided in the request:
		RTCP feedback for Predefined ROI
		Extended Header for Sent ROI
		If Arbitrary ROI provided in the request:
		RTCP feedback for Arbitrary ROI
		Extended Header for Sent ROI
		
		If SDPCapNeg is signalled to the gateway:
		SDPCapNeg configuration

		} NOTE
NOTE: Sending of the Remote Descriptor is optional		

5.17.2.5 Release TrGW Termination

The IBCF sends a SUBTRACT command as in Table 5.17.2.5.1.

Table 5.17.2.5.1: Release TrGW Termination Request

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

On releasing the termination, the TrGW responds as in Table 5.17.2.5.2

Table 5.17.2.5.2: Release TrGW Termination Request Acknowledge

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

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

5.17.2.6.2 NOT.resp (Termination heartbeat)

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

The IBCF is in charge of correcting 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 TrGW 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 Context ID = C1 Termination ID = T1 Event_ID (Event ID = x, "BNC Release (Cause)")	

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

5.17.2.7.2 NOT.resp (IP Bearer Released)

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

5.17.2.8 Media Inactivity Notification

When the procedure "Media Inactivity Notification" is required the following procedure is initiated: the TrGW 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 Context ID = C1 Termination ID = T1 Event_ID (Event ID = x, "Media Inactivity Detection")	

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

5.17.2.8.2 NOT.resp (Media Inactivity)

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

5.17.2.9 Change Through Connection

The IBCF 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 If Context Requested: Context ID = $ If Context Provided: Context ID = c1 If Termination Requested: Termination ID = $ If Termination Provided: Termination ID = T1 Through-Connection = Connectivity Mode	

The TrGW 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 Context ID = C1 Termination ID = T1	

5.17.2.10 ECN FailureIndication

The TrGW sends a NOTIFY request command as in Table 5.17.2.10.1.

Table 5.17.2.10.1: ECN Failure Indication

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

The IBCF responds as in Table 5.17.2.10.2

Table 5.17.2.10.2: ECN Failure Indication Ack

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

5.17.2.11 Change Flow Direction

The TrGW sends an ADD or a MODIFY request command as in Table 5.17.2.11.1.

5.17.2.11.1 Change Flow Direction

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

The IBCF responds as in Table 5.17.2.11.2.

5.17.2.11.2 Change Flow Direction Acknowledge

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

5.17.2.12 ICE Connectivity Check Result Notification

The TrGW sends a NOTIFY request command as defined in Table 5.17.2.12.1.

Table 5.17.2.12.1: ICE Connectivity Check Result Notification

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

The IBCF responds as defined in Table 5.17.2.12.2

Table 5.17.2.12.2: ICE Connectivity Check Result Notification Ack

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

5.17.2.13 ICE New Peer Reflexive Candidate Notification

The TrGW sends a NOTIFY request command as defined in Table 5.17.2.13.1.

Table 5.17.2.13.1: ICE New Peer Reflexive Candidate Notification

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

The IBCF responds as defined in Table 5.17.2.13.2

Table 5.17.2.13.2: ICE New Peer Reflexive Candidate Ack

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

5.17.3 Non-Call Related Procedures

5.17.3.1 General

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

Table 5.17.3.1.1: TrGW Non-Call Related Procedures

Transaction defined in 3GPP TS 29.235 [17] or 3GPP TS 29.162 [18]	Support	Comment
TrGW Out of service	Mandatory	5.17.3.2
TrGW Communication Up	Mandatory	5.17.3.3
TrGW Restoration	Mandatory	5.17.3.4
TrGW Register	Mandatory	5.17.3.5
TrGW Re-register	Optional (NOTE 3	5.17.3.6
IBCF Ordered Re-register	Optional (NOTE 3	5.17.3.7
IBCF Restoration	Optional	5.17.3.8
IBCF Out of Service	Optional	5.17.3.9
Audit Value	Optional (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
TrGW Capability Change	Optional	5.17.3.12
TrGW Resource Congestion Handling – Activate	Optional	5.17.3.13
TrGW Resource Congestion Handling – Indication	Optional	5.17.3.14
Inactivity timeout activation	Optional (NOTE 4)	5.17.3.15
Inactivity timeout indication	Optional (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 (NOTE 1)	5.17.3.19 (NOTE 2)
NOTE 1: Support of this procedure is mandatory in the IBCF. 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 TrGW. NOTE 4: Support of this procedure is mandatory in the TrGW if UDP transport is supported.		

5.17.3.2 TrGW Out Of Service

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

Table 5.17.3.2.1: TrGW Out Of Service Request

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

The IBCF responds as in Table 5.17.3.2.2.

Table 5.17.3.2.2: TrGW Out Of Service Request Ack

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

5.17.3.3 TrGW Communication Up

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

Table 5.17.3.3.1: TrGW Communication Up

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

The IBCF 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: TrGW Communication Up Ack

Address Information	Control information	Bearer information
	Transaction ID = x Context ID = - Termination ID = ROOT If required to register to new IBCF: Alternate MGC Id	

5.17.3.4 TrGW Restoration

When the TrGW has recovered, the TrGW sends a SERVICE CHANGE as in Table 5.17.3.4.1,

Table 5.17.3.4.1: TrGW Restoration

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

The IBCF responds as in Table 5.17.3.4.2.

Table 5.17.3.4.2: TrGW Restoration Ack

Address Information	Control information	Bearer information
	Transaction ID = x Context ID = - Termination ID = ROOT If required to register to new IBCF : Alternate MGC Id	

5.17.3.5 TrGW Register

The TrGW sends a SERVICE CHANGE request command as in Table 5.17.3.5.1.

Table 5.17.3.5.1: TrGW Register

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

The IBCF responds as in Table 5.17.3.5.2.

Table 5.17.3.5.2: TrGW Register Ack

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

5.17.3.6 TrGW Re-Register

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

Table 5.17.3.6.1: Re-Registration

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

The IBCF responds as in Table 5.17.3.6.2.

Table 5.17.3.6.2: Re-Registration Ack

Address Information	Control information	Bearer information
	Transaction ID = x Context ID = - Termination ID = ROOT If applicable (NOTE 1): H248 Protocol Version If applicable:- H248 Profile Identity If required to register to a new IBCF: Alternate MGC Id	
NOTE 1: The IBCF shall include the H.248 Protocol Version if the protocol version it supports or offers is lower than that proposed by the TrGW. The IBCF may include the H.248 Protocol Version if the protocol version it supports or offers is the protocol version proposed by the TrGW. NOTE 2: The ServiceChangeMGCId parameter may be returned in the TrGW Re-register response. If present in the response, the TrGW shall not consider itself registered and should preferably attempt to re-register with the IBCF specified in the ServiceChangeMgcID before any further alternate IBCFs.		

5.17.3.7 IBCF Ordered Re-register

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

Table 5.17.3.7.1: IBCF Ordered Re-Register

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

The TrGW responds as in Table 5.17.3.7.2.

Table 5.17.3.7.2: IBCF Ordered Re-Register Ack

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

The TrGW then performs a TrGW Re-Register procedure according to Clause 5.17.3.6.

5.17.3.8 IBCF Restoration

When the IBCF has recovered, the IBCF sends a SERVICE CHANGE as in Table 5.17.3.8.1,

Table 5.17.3.8.1: IBCF Restoration

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

The TrGW responds as in Table 5.17.3.8.2.

Table 5.17.3.8.2: IBCF Restoration Ack

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

5.17.3.9 IBCF Out of Service

The IBCF sends a SERVICE CHANGE request command as in Table 5.17.3.9.1.

Table 5.17.3.9.1: BCF Out Of Service

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

The TrGW responds as in Table 5.17.3.9.2.

Table 5.17.3.9.2: IBCF Out Of Service Ack

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

5.17.3.10 Audit Value

The IBCF 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 Context ID= -/ALL/C1 Termination ID = ROOT/ALL/T1/PartialWildcard (NOTE 4, NOTE5) Audit Packages (NOTE 1) Audit Descriptor = IndAuditParameter:= IndAudMediaDescriptor:= IndAudTerminationStateDescriptor:= serviceState Audit Descriptor = Empty (NOTE 2) Audit Descriptor = IndAuditParameter:= IndAudMediaDescriptor:= IndAudTerminationStateDescriptor:= Available Realms (NOTE 3) Audit Descriptor = IndAuditParameter:= IndAudMediaDescriptor:= IndAudTerminationStateDescriptor:= ROOT properties (NOTE 6) Audit Descriptor = IndAuditParameter:= IndAudMediaDescriptor:= IndAudTerminationStateDescriptor:= SDPCapNeg Supported Capabilities (NOTE 7)	
NOTE 1: Packages is for Null/Root Combination. NOTE 2: Used for control association monitoring. NOTE 3: Used for auditing available IP realms 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/*"). NOTE 5: Partial wildcard shall only be used when text encoding is used on the H.248 interface. NOTE 6: Used for auditing ROOT properties. NOTE 7: Used for auditing SDPCapNeg Extensions when SDPCapNeg signalling to the gateway is supported.		

The TrGW 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 Context ID = -/C1 Termination ID = ROOT/T1 Packages List serviceState Available Realms ROOT Properties SDPCapNeg Extensions	

Upon reception of the command in the TrGW:

- 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 TrGW / IBCF sends a response to any command.req with the following information.

Table 5.17.3.11.1: ANYcommand.resp (command reject) TrGW/IBCF to IBCF/TrGW

Address Information	Control information	Bearer information
	Transaction ID = z Context ID = c1 or no context Termination ID = T1 or no termination ID Reason=Error	

5.17.3.12 TrGW Capability Change

The TrGW sends a SERVICE CHANGE request command as in Table 5.17.3.12.1.

Table 5.17.3.12.1: Capability Update

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

The IBCF responds as in table 5.17.3.12.2.

Table 5.17.3.12.2 Capability Update Ack

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

5.17.3.13 TrGW Resource Congestion Handling – Activate

The IBCF sends a MODIFY request command as in Table 5.17.3.13.1

Table 5.17.3.13.1: TrGW Resource Congestion Handling – Activate

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

The TrGW responds as in Table 5.17.3.13.2.

Table 5.17.3.13.2: TrGW Resource Congestion Handling – Activate Ack

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

5.17.3.14 TrGW Resource Congestion Handling – Indication

The TrGW sends a NOTIFY request command as in Table 5.17.3.14.1

Table 5.17.3.14.1: TrGW Resource Congestion Handling – Indication

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

The IBCF responds as in Table 5.17.3.14.2

Table 5.17.3.14.2: TrGW Resource Congestion Handling – Indication Ack

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

5.17.3.15 Inactivity Timeout – Activation

The IBCF 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 Context ID= NULL Termination ID = ROOT NotificationRequested (Event ID = x, "Inactivity Timeout")	

The TrGW 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 Context ID = NULL Termination ID = ROOT	

5.17.3.16 Inactivity Timeout – Indication

The TrGW 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 Context ID= NULL Termination ID = ROOT Event_ID (Event ID = x, "Inactivity Timeout")	

The IBCF 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 Context ID = NULL Termination ID = ROOT	

5.17.3.17 Realm Availability Change – Activation

The IBCF 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 Context ID= - Termination ID = ROOT NotificationRequested (Event ID = x, "Realm Availability Change")	

The TrGW 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 Context ID = - Termination ID = ROOT	

5.17.3.18 Realm Availability Change – Indication

The TrGW 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 Context ID= - Termination ID = ROOT Event_ID (Event ID = x, "Realm Availability Change (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 IBCF 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 Context ID = - 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 TrGW 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 Context ID= C1/ALL Termination ID = T1 or Wildcarded Termination (NOTE) SC Method = FORCED 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 IBCF 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 Context ID = C1/ALL Termination ID = As received	

Annex A (informative): Illustration of Gate/Pinhole Concept

A.1 General

The purpose of this informative annex is the illustration of the H.248 Stream/Termination model by showing exemplary realisations of gates for unidirectional versus bidirectional media flows.

Only point-to-point sessions are in scope of this H.248 Profile (see clause 5.4). Interconnection of individual H.248 Streams is based on the basic principle described in clause 7.1.6/ ITU-T Recommendation H.248.1 [3]. The H.248 Multiplex Descriptor is therefore not necessary (see clause 5.6.2). The H.248 Topology Descriptor definition includes individual H.248 Streams, but is also not necessary (see clause 5.7.8).

NOTE: all sessions have unicast media flows. Potential multicast applications are transparent for MG point of view.

A.2 Relationships between gates and H.248 Streams

The realization of a gate is illustrated in figure A.2.1. There is a unidirectional media flow in that example, and there is a single H.248 Stream per Termination. A **H.248 Stream** covers per definition a single **bidirectional** media flow (clause 7.1.6/ITU-T Recommendation H.248.1 [3]). Media flows are interconnected by using the same **StreamID** (here: StreamID equals to S1 for T1 and T2).

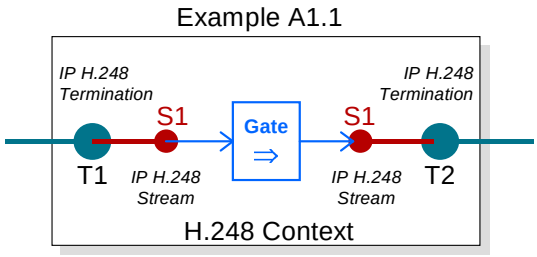

Figure A.2.1: H.248 Context - Illustration of Gate, Stream and Terminations

The uni- or bidirectional application of an H.248 Streams is controlled via usage of Local Descriptor (LD) and Remote Descriptor (RD). Figure A.2.2 shows a bidirectional session. There is again a single H.248 Stream per Termination. Gates are direction-dependent, there are consequently two gates in this example.

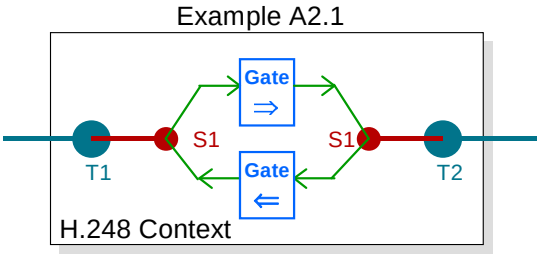

Figure A.2.2: H.248 Context Bidirectional Session using single H.248 Streams

Annex B (informative): Void

Annex C (informative): Change history

Change history							
Date	**TSG #**	**TSG Doc.**	**CR**	**Rev**	**Subject/Comment**	**Old**	**New**
2009-12	CT#46	CP-090821			3GPP TS Presented for approval in CT#46	2.0.0	9.0.0
2010-03	CT#47	CP-100043	0006	1	Another Reference Tidy-Up	9.0.0	9.1.0
			0007	1	ServiceChange Correction		
			0008	1	Termination Type Alignment		
			0009	1	Error Code Additions		
			0010		Returned SDP Properties		
			0011	1	Package Usage		
			0012	2	Call Related Procedures		
			0013	1	Non-Call Related Procedures		
			0014	1	Clean-up Proposals		
			0015		Resolution of Editor's Notes		
2010-06	CT#48	CP-100289	0016	1	Transport protocol to be indicated to gateway for end-to-end media security	9.1.0	9.2.0
		CP-100283	0017	1	Handling of Stream mode		
		CP-100283	0018	1	Package Updates		
		CP-100283	0019	1	Descriptor Updates		
2010-09	CT#49	CP-100460	0020		Procedures for Emergency indicator	9.2.0	9.3.0
		CP-100460	0021		Priority indicator		
2011-03	CT#51	CP-110274	0022	10	ECN Support in Ix Interface	9.3.0	10.0.0
		CP-110058	0023	1	Handling of rtcp-fb SDP attribute and SDP attribute for RTCP APP feedback messages		
2011-06	CT#52	CP-110368	0024		ECN Failure improvements	10.0.0	10.1.0
		CP-110368	0026	1	Interworking with Non-3GPP ECN networks		
		CP-110368	0027	1	Alignment of 3GPP profiles with SG16 ECN package definition		
2011-09	CT#53	CP-110564	0028	1	Incorportation of latest ITU-T ECN package and proposed ammendment	10.1.0	10.2.0
2011-12	CT#54	CP-110798	0029	1	Adding of stage 3 for ATCF/ATGW function	10.2.0	10.3.0
		CP-110796	0030		Update of reference to H.248.52		
		CP-110789	0031	1	ECN Improvements		
		CP-110789	0032		Missing "rtcp-xr" SDP attribute in Table about Optional SDP Information Elements		
2012-06	CT#56	CP-120226	0033	1	Reference update: draft-ietf-avtcore-ecn-for-rtp	10.3.0	10.4.0
2012-09	CT#57	CP-120478	0034	3	Support of Multimedia Priority Service (MPS) over Ix Interface – Stage 3	10.4.0	11.0.0
2012-12	CT#58	CP-120723	0040	1	Ix interface updates of ECN Support Package	11.0.0	11.1.0

		CP-120734	0041	3	Support of Multimedia Priority Service (MPS) in Modify over Ix Interface – Stage 3	
2013-06	CT#60	CP-130294	0043	2	Replacement of ECN for RTP-over-UDP Support package	11.1.0 11.2.0
2013-09	CT#61	CP-130452	0048	3	Introduction of support for Coordination of Video Orientation (CVO)	11.2.0 12.0.0
		CP-130471	0049	3	Introduction of support for Generic Image Attribute/signalling of image size	
2014-03	CT#63	CP-140025	0050	1	Clarification on CVO handling	12.0.0 12.1.0
		CP-140037	0051	1	Clarification on SIS handling	
2014-06	CT#64	CP-140248	0052	3	ICE support in Ix interface	12.1.0 12.2.0
2014-09	CT#65	CP-140520	0053	1	Corrections to Transport Protocol table	12.2.0 12.3.0
		CP-140520	0054	1	TrGW Capability Change	
2014-12	CT#66	CP-140786	0055	1	Application-aware MSRP interworking	12.3.0 12.4.0
		CP-140788	0056	1	Adding support for EVS codec	
		CP-140973	0057	-	Alternative connection (ALTC) addresses management	
2015-03	CT#67	CP-150023	0058	1	MG located Bearer Level ALG package	12.4.0 12.5.0
2015-12	CT#70	CP-150783	0061	3	Support for Video Enhancements by Region-of-Interest Information Signalling	12.5.0 13.0.0
2016-03	CT#71	CP-160032	0062	1	TrGW configuration for end-to-end WebRTC calls (stage 3)	13.0.0 13.1.0
		CP-160034	0063	1	Support of enhanced bandwidth negotiation mechanism for MTSI sessions	
		CP-160021	0064	1	Ix stage 3 to support SDP Capability Negotiation	

History

Document history		
V13.0.0	March 2016	Publication
V13.1.0	April 2016	Publication