Source: **TSG CN WG 4**

Title: Media Gateway Control Function (MGCF) – IM Media Gateway; Mn Interface

Agenda item:

Document for: **INFORMATION,- Draft technical specification 3GPP TS 29.332v1.0.0**

Presentation of Technical Specification to TSG

Presentation to: **TSG CN Meeting #24**
Document for presentation: **TS 29.332, Version 1.0.0**
Presented for: **Information**

Abstract of document:

TS 29.332 describe the protocol to be used on the Media Gateway Control Function (MGCF) – IM Media Gateway (IM-MGW) interface. The basis for this protocol is the H.248/MEGACO protocol as specified in ITU-T and IETF. The IMS architecture is described in 23.228. The interaction of the MGCF-IM MGW interface signalling procedures in relation to the SIP, and BICC/ISUP signalling at the MGCF are described in 29.163.[4]

Changes since last presentation to TSG Meeting #:

None. The TS is presented first time to the plenary.

Outstanding Issues:

- Completed work:
  This version of the TS contains detailed definition of definition of the used H248 procedures between MGCF and IM MGW

- Remaining topics:
  -procedures related to a termination towards an ISUP network are needed to be specified.
  -definition of Formats and codes; the values used for the parameter in the packages needs to be defined.

Contentious Issues:

- None.

3GPP TS 29.332 V1.0.0 (2004-06)

Technical Specification

**3rd Generation Partnership Project;
Technical Specification Group Core Network;
Media Gateway Control Function (MGCF) – IM Media Gateway;
Mn Interface
(Release 6)**

Keywords
IP Multimedia, Mn, MGCF, IM-MGW

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Contents

Foreword

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

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version x.y.z

where:

    x the first digit:

        1 presented to TSG for information;

        2 presented to TSG for approval;

        3 or greater indicates TSG approved document under change control.

    y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.

    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 Media Gateway Control Function (MGCF) – IM Media Gateway (IM-MGW) interface. The basis for this protocol is the H.248/MEGACO protocol as specified in ITU-T and IETF. The IMS architecture is described in 23.228. The interaction of the MGCF-IM MGW interface signalling procedures in relation to the SIP, and BICC/ISUP signalling at the MGCF are described in 29.163.[4]

This specification describes the application of H.248/MEGACO on the Mn interface. Required extensions use the H.248/MEGACO standard extension mechanism.

The present document is valid for a 3rd generation PLMN (UMTS) complying with Release 6 and later.

2   References

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

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.

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

- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1]   3GPP TS 23.228: "3rd Generation Partnership Project; Technical Specification Group Services and System Aspects;IP Multimedia Subsystem (IMS);- Stage 2"

[2]   3GPP TS 29.007: "3rd Generation Partnership Project; Technical Specification Group Core Network; General requirements on interworking between the Public Land Mobile Network (PLMN) and the Integrated Services Digital Network (ISDN) or Public Switched Telephone Network (PSTN)"

[3] 3GPP TS 29.205: "3rd Generation Partnership Project; Technical Specification Group Core Network; Application of Q.1900 series to Bearer Independent CS Network architecture; Stage 3"

[4] 3GPP TS 29.163: "3rd Generation Partnership Project; Technical Specification Group Core Network; Interworking between the IM CN subsystem and CS networks – Stage 3"

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

[6] 3GPP TS 26.226: "3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; Cellular Text Telephone Modem; General Description"

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

[8] 3GPP TS 29.202: "3rd Generation Partnership Project; Technical Specification Group Core Network; Application of Q.1900 series to Bearer Independent CS Network architecture; Stage 3"

[9] ITU-T Recommendation H.248.1 (05/02): "Gateway Control Protocol"

[10] ITU-T Recommendation H.248.8, "Error Codes and Service Change Reason Description"

[11] ITU-T Recommendation H.248.2 "Facsimile, text conversation and call discrimination packages"

[12] ITU-T Recommendation H.248.10, "Media Gateway Resource Congestion Handling Package"

[13] ITU-T Recommendation T.140: "Text conversation protocol for multimedia application"

[14] ITU-T Recommendation Q.1950 "Call Bearer Control Protocol"

[15] RFC 2960 "Stream Control Transmission Protocol"

[16] RFC 3267 "Real-Time Transport Protocol (RTP) Payload Format and File Storage Format for the Adaptive Multi-Rate (AMR) and Adaptive Multi-Rate Wideband (AMR-WB) Audio Codecs"

3 Definitions, symbols and abbreviations

3.1 Definitions

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

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

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

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

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

3.2 Symbols

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

Mn   Interface between the media gateway control function and the IMS media gateway.
Mg   Interface between the MGCF and the CSCF
Mj   Interface between the MGCF and the BGCF

3.3 Abbreviations

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

BICC   Bearer Independent Call Control
IM-MGW   IP Multimedia Media Gateway
ISUP   ISDN User Part
MGCF   Media Gateway Control Function
RFC   Request For Comment; this includes both discussion documents and specifications in the IETF domain
SCTP   Stream Control Transmission Protocol

4 UMTS capability set

This capability set shall be used in its entirety whenever it is used within an H.248 profile. Failure to do so will result in a non-standard implementation.

ITU-T Recommendation H.248.1 (05/02) (formerly referred to as H.248 version 2 [9] is supported by this Capability Set. The compatibility rules for packages, signals, events, properties and statistics and the H.248 protocol are defined in ITU-T Recommendation H.248.1 [9].

5 Naming conventions

5.1 MGCF/IM-MGW naming conventions

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

5.2 Termination names

5.2.1 Termination naming convention

For definition on termination naming convention see 3GPP TS 29.232 [5]

5.2.2 Termination naming convention for TDM terminations

For the definition of TDM terminations see 3GPP TS 29.232[5]

6 Topology descriptor

The Topology Descriptor shall be supported by the IM-MGW and MGCF. FFS

7 Transaction timers

All transaction timers specified in H.248 shall be supported in this subset of the protocol.

8 Transport

Each implementation of the Mn interface should provide SCTP as defined in RFC2960 [14]

9 Multiple Virtual MG.

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10 Formats and codes

Table 1 shows the parameters which are required.

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

Table 10.1: required parameters

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Editors note: the values used for the parameter in the procedures defined in section 13.2.1 needs to be added

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

This section shall be in accordance with the subclause "Mandatory Support of SDP and H.248.1 Annex C information elements" in ITU-T Recommendation Q.1950 [14].

12 General on packages

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13 H.248 standard packages

The following H.248 packages are used by this UMTS Capability Set:

- Generic v1 (see [9] Annex E.1);

- Base Root Package v1 (see [9] Annex E.2);

- Tone Generator Package v1 (see [9] Annex E.3);

- Tone Detection Package v1 (see [9] Annex E.4);

- Basic DTMF Generator Package v1 (see [9] Annex E.5);

- DTMF Detection Package v1 (see [9] Annex E.6);

- Call Progress Tones Generator Package v1 (see [9] Annex E.7);

- Generic Announcement Package v1 (see [6] Annex K);

- TDM Circuit Package v1 (see [9] Annex E.13);

- Media Gateway Resource Congestion Handling Package v1 (see [12]) ;

13.1 Session independent H.248 transactions

The list below shows a subset of non call-related procedure from ITU-T Recommendation Q.1950[14].

For further description of error codes and service change reasons, refer to [9].

- Termination Out-of-Service

- Termination Restoration

- Audit Value

- Audit Capability

13.1.1 IM-MGW Out of service/Maintenance Locking

This procedure is the same as described in the subclause "BIWF Service Cancellation Indication" in ITU-T Recommendation Q.1950 [13], with the following clarification.

Table 13.1:

Address Information	Control information	Bearer information

	Transaction ID = z
	Context ID = Null
	Termination ID = Root
	Service Change Reason =
	    MGW impending failure
	    Termination Taken out of service
	Service Change Method =
	    Graceful / Forced	

Delay is not used.

Note: The termination that is taken out of service is a IM-Media Gateway

13.1.2   IM-MGW Communication Up

This procedure is the same as described in the subclause "BIWF Lost Communication" in ITU-T Recommendation Q.1950 [13].

13.1.3 IM-MGW Restoration

This procedure is the same as described in the subclause "BIWF Service Restoration Indication" in ITU-T Recommendation Q.1950 [14] with the following clarification.

Table 13.2:

Address Information	Control information	Bearer information
	Transaction ID = z Context ID = Null Termination ID = Root	

Delay is not used.

13.1.4 IM-MGW Register

This procedure is the same as that described in the subclause "BIWF Registration" in ITU-T Recommendation Q.1950 [14].

13.1.5 IM-MGW Re-register

This procedure is the same as that described in the subclause "BIWF Re-Registration" in ITU-T Recommendation Q.1950 [14].

13.1.6 MGCF Ordered Re-register

This procedure is the same as described in the subclause "CCU Ordered BIWF Re-registration" in ITU-T Recommendation Q.1950 [14].

13.1.7 MGCF Restoration

This procedure is the same as described in the subclause "CCU Initiated Service Restoration" in ITU-T Recommendation Q.1950 [14] with the following clarification.

Table 13.3:

Address Information	Control information	Bearer information
	Context ID = Null Termination ID = Root Service Change Reason = Cold Boot / Warm Boot Service Change Method = Restart	

Delay is not used.

13.1.8 IM-MGW Capability Change

This procedure is the same as described in the subclause "BIWF Capability Change" in ITU-T Recommendation Q.1950 [14].

13.1.9 MGCF Out of Service

This procedure is the same as that described in the subclause "CCU Initiated Service Cancellation" in ITU-T Recommendation Q.1950 [13].

13.1.10 IM-MGW Resource Congestion Handling - Activate

This procedure is the same as that described in the subclause "MGW Resource Congestion Handling - Activate" in 3GPP TS 29.232 [5]

13.1.11 IM-MGW Resource Congestion Handling - Indication

This procedure is the same as that described in the subclause "MGW Resource Congestion Handling - Indication" in 3GPP TS 29.232 [5]

13.2 Session related H.248 transactions

13.2.1 Procedures related to a termination towards IM CN Subsystem

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

Table 13.2.1: Correspondence between ITU-T Recommendation Q.1950 [13] or 29.232 [5] call-related transactions and 3GPP TS 29.163 [4] procedures

Transaction used in ITU-T H.248[9] or Q.1950 [14]	Transaction used in TS 29.232 [5]	Procedure defined in 3GPP TS 29.163 [4]	Comment
Not defined	n. a. for reuse	Reserve IMS connection point	See 13.2.1.1
Not Defined	n. a. for reuse	Configure IMS Resources	See 13.2.1.2
Not defined	n. a. for reuse	Reserve IMS Connection Point and configure remote resources	See 13.2.1.3
Cut BNC (SUB)	Release Termination	Release IMS termination	
Cut Through	n. a. for reuse	Change IMS ThroughConnection	
Detect Digit	n. a. for reuse	Detect IMS RTP Tel Event	
Detected digit(BIWF)	n. a. for reuse	Notify IMS RTP Tel Event	
BIWF_Service_Cancel lation_ Indication	Termination Out Of Service (14.1.8)	Termination Out Of Service	
Prepare_BNC_notify	Reserve Circuit (14.2.18) amendment	Reserve TDM Circuit	
Cut Through	n. a. for reuse	Change TDM Through-connection	
Echo Canceller	n. a. for reuse	Activate TDM voice-processing function	
Insert_Tone	n. a. for reuse	Send TDM Tone	
Insert_Tone	n. a. for reuse	Stop TDM Tone	
Insert_Announcement	n. a. for reuse	Play TDM Announcement	
Signal_Completion	n. a. for reuse	TDM Announcement Completed	
Insert Announcement	n. a. for reuse	Stop TDM Announcement	
ContCheck_Tone	n. a. for reuse	Continuity Check	
ContCheck_Verify	n. a. for reuse	Continuity Check Verify	
Continuity Check_Response	n. a. for reuse	Continuity Check Response	
Cut BNC (SUB)	Release Termination	Release TDM Termination	

NOTE: A procedure defined in table 1 can be combined with another procedure in the same action. This means that they can share the same contextID and termination ID(s).

13.2.1.1   Reserve IMS Connection Point

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

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

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

Table 13.2.2:Title is needed

Information element name	Defined in	SDP
Context/Context Request	H.248.1	-
IMS Termination Request	H.248.1	-
Local IMS Resources	H.248.1 Annex C/ Acodec (1006)	m line '<fmt list>' a line rtpmap '<encoding name>' PT
ReserveValue	H.248.1	-
Local Connection Addresses Request	H.248.1 Annex C/ Ipv6 (6002), Port (6003), Porttype (6004), RTPPayload (100F)	c line'<connection address>' m line '<port>' m line '<fmt list>' (c line <network type>=IN, <address type>=IP6)

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

2   Add.resp (Reserve IMS Connection Point Ack)

Table 13.2.3:Title is needed

Information element name	Defined in	SDP
Context	H.248.1	-
IMS Termination	H.248.1	-
Local IMS Resources	H.248.1 Annex C/ Acodec	m line '<fmt list>' a line rtpmap '<encoding name>' PT
Local Connection Addresses	H.248.1 Annex C/ Ipv6 (6002), Port (6003), Porttype (6004), RTPPayload (100F)	c line'<connection address>' m line '<port>' m line '<fmt list>' (c line <network type>=IN, <address type>=IP6)

13.2.1.2   Configure IMS Resources

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

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

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

Table 13.2.4: Title is needed

Information element name	Defined in	SDP
Context	H.248.1	-
IMS Termination	H.248.1	-
Local IMS Resources	H.248.1 Annex C/ Acodec (1006)	m line '<fmt list>' a line rtpmap '<encoding name>' PT
Remote IMS Resources	H.248.1 Annex C/ Acodec (1006)	m line '<fmt list>' a line rtpmap '<encoding name>' PT
Local Connection Addresses	H.248.1 Annex C/ Ipv6 (6002), Port (6003), Porttype (6004), RTPPayload (100F)	c line'<connection address>' m line '<port>' m line '<fmt list>' (c line <network type>=IN, <address type>=IP6)
Remote Connection Addresses	H.248.1 Annex C/ Ipv6 (6002), Port (6003), Porttype (6004), RTPPayload (100F)	c line'<connection address>' m line '<port>' m line '<fmt list>' (c line <network type>=IN, <address type>=IP6)
Reserve Value	H.248.1	-

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

2   Mod.resp (Configure IMS Resources Ack)

Table 13.2.5: Title is needed

Information element name	Defined in	SDP
Context	H.248.1	-
IMS Termination	H.248.1	-
Local IMS Resource	H.248.1 Annex C/ Acodec (1006)	m line '<fmt list>' a line rtpmap '<encoding name>' PT
Remote IMS Resource	H.248.1 Annex C/ Acodec (1006)	m line '<fmt list>' a line rtpmap '<encoding name>' PT
Local Connection Address	H.248.1 Annex C/ Ipv6 (6002), Port (6003), Porttype (6004), RTPPayload (100F)	c line'<connection address>' m line '<port>' m line '<fmt list>' (c line <network type>=IN, <address type>=IP6)
Remote Connection Address	H.248.1 Annex C/ Ipv6 (6002), Port (6003), Porttype (6004), RTPPayload (100F)	c line'<connection address>' m line '<port>' m line '<fmt list>' (c line <network type>=IN, <address type>=IP6)

13.2.1.3   Reserve IMS Connection Point and configure remote resources

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

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

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

Table 13.2.6: Title is needed

Information element name	Defined in	SDP
Context/Context Request	H.248.1	-
IMS Termination/IMS Termination Request	H.248.1	-
Local IMS Resources	H.248.1 Annex C/ Acodec (1006)	m line '<fmt list>' a line rtpmap '<encoding name>' PT
Remote IMS Resources	H.248.1 Annex C/ Acodec (1006)	m line '<fmt list>' a line rtpmap '<encoding name>' PT
Reserve Value	H.248.1	-
Local Connection Address request	H.248.1 Annex C/Ipv6 (6002), Port (6003), Porttype (6004), RTPPayload (100F)	c line'<connection address>' m line '<port>' m line '<fmt list>' (c line <network type>=IN, <address type>=IP6)
Remote Connection Addresses	H.248.1 Annex C/ Ipv6 (6002), Port (6003), Porttype (6004), RTPPayload (100F)	c line'<connection address>' m line '<port>' m line '<fmt list>' (c line <network type>=IN, <address type>=IP6)

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

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

Table 13.2.7: Title is needed

Information element name	Defined in	SDP
Context	H.248.1	-
IMS Termination	H.248.1	-
Local IMS Resources	H.248.1 Annex C/ Acodec (1006)	m line '<fmt list>' a line rtpmap '<encoding name>' dynamic PT
Remote IMS Resources	H.248.1 Annex C/ Acodec (1006)	m line '<fmt list>' PT a line rtpmap '<encoding name>' PT
Local Connection Addresses	H.248.1 Annex C/ Ipv6 (6002), Port (6003), Porttype (6004), RTPPayload (100F	c line'<connection address>' m line '<port>' m line '<fmt list>' (c line <network type>=IN, <address type>=IP6)

13.2.2 Procedures related to a termination towards an ISUP network

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13.2.3 Procedures related to a termination towards a BICC network

The procedures detailed in ITU.T Q.1950 [14] shall be applied.

14 IMS packages

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14.1 Mandatory IMS packages

FFS

14.2 Optional IMS packages

FFS

15 PSTN packages

FFS

Annex <A (informative):
Change history

Change history							
Date	**TSG #**	**TSG Doc.**	**CR**	**Rev**	**Subject/Comment**	**Old**	**New**
2002-09					Initial draft		0.0.0
2002-10					Editorial cleanup after CN4#16	0.0.0	0.0.1
2002-12					Changes after CN4#17	0.0.1	0.1.0
2003-02					Changes after CN4 #18	0.1.0	0.2.0
2003-05					Changes after CN4 #19	0.2.0	0.3.0
2004-02					Changes after CN4 #22	0.3.0	0.4.0
2004-05					Changes after CN4 #23	0.4.0	0.5.0