



**Implementation Agreement  
for the 3GPP Mn interface**

**MSF-IA-MN.001-FINAL**

# MultiService Forum Implementation Agreement

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**Abstract:** In Release 6 of 3GPP specifications, the interworking between BICC/ISUP based legacy CS networks and the IP Multimedia Subsystem was introduced. Amongst the new interfaces identified was the Mn interface. The Mn interface connects the MGCF (Media Gateway Control Function) and the IM-Media Gateway, and is based on H.248.1 [3] with some additional packages used from Q.1950 [5] and further packages defined in the 3GPP specification itself (3GPP TS 29.332 [2]). The specification of the H.248.1 Profile for the Mn interface has also been aligned with ongoing work within TISpan Release 2 (ES 283 024 [6]) which defines a profile which is a subset of the 3GPP Release 7 profile. This contribution proposes to define an Implementation Agreement for the Mn Interface based on the Release 7 3GPP TS 29.332 [2].

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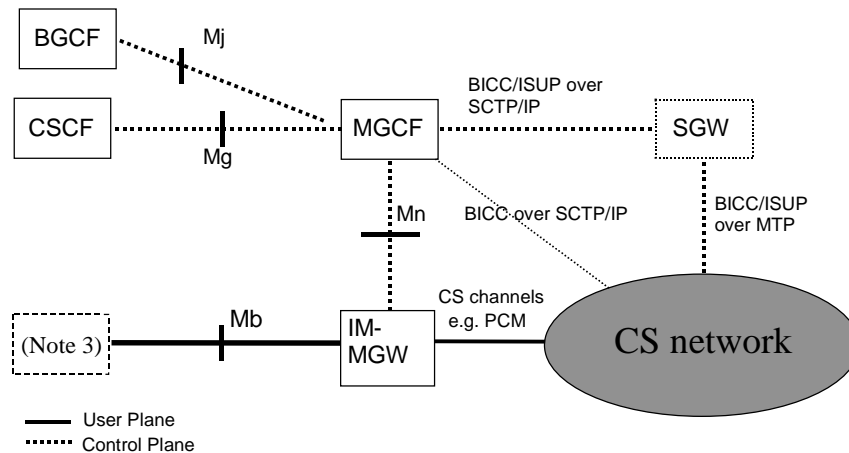
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## I Introduction

This Implementation Agreement covers the interface between a Media Gateway Control Function (MGCF) and a IP Multimedia Media Gateway (IM-MGW) to allow interworking between BICC/ISUP based legacy CS networks and the IP Multimedia Core Network Subsystem (IMS) as first defined in 3GPP Release 6. Within the 3GPP Network Architecture (3GPP TS 23.002 [1]), this interface is identified as the Mn interface.



- NOTE 1: The logical split of the signalling and bearer path between the CS network and the IM CN subsystem is as shown, however the signalling and bearer may be logically directly connected to the IM-MGW.
- NOTE 2: The SGW may be implemented as a stand-alone entity or it may be located in another entity either in the CS network or the IM-MGW.
- NOTE 3: The IM-MGW may be connected via the Mb to various network entities, such as a UE (via a GTP Tunnel to a GGSN), an MRFP, or an application server.

**Figure 1: IM CN subsystem to CS network logical interworking reference model (see 3GPP TS 29.163 [7])**

The Mn interface is defined in 3GPP TS 29.332 [2]. The document identifies that Mn interface is based on packages and procedures defined in H.248.1 [3], Q.1950 [5] and additional 3GPP specific functionality.

ETSI TISPAN has also defined an H.248.1 profile for controlling Trunking Media Gateways (TMGW) in the PSTN/ISDN Emulation Subsystem (PES), ES 283 024 [6] a subset of the 3GPP Mn interface.

Ongoing work within 3GPP Release 7 and ETSI TISPAN Release 2 has led to the two profiles being aligned, allowing H.248.1 profiling for both fixed and mobile requirements.

It is intended that this Implementation Agreement will further eliminate areas of ambiguity from implementations of the Mn interface. As such, this Implementation Agreement will define specific implementation practices for devices wishing to implement the Mn interface in an industry agreed way.

## II Profile definition

Where implementation detail is not provided within this IA, 3GPP TS 29.332 [2] implementation specification shall take precedence over that in other specifications.

Except where otherwise indicated, each section that follows has the same number as the section of 3GPP TS 29.332 [2] which it modifies.

The following notation is used to identify the differing types of changes or modifications used compared to the specification in 3GPP TS 29.332 [2].

<AP> - indicates a provision which adds precision, but no new normative content.

<NEW> - indicates new normative content. <NEW> in a section header indicates that the section heading is new relative to 3GPP TS 29.332 [2].

<CHG> - indicates changed normative content.

Note: The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", "OPTIONAL", "CONDITIONAL" and "IF" in this document are to be interpreted as described in the Technical Committee Operating Procedures.

### 1 Scope

No change.

### 2 References

The following references are shown specifically for use in this IA, but are redundant to 3GPP TS 29.332 [2]:

[1]	3GPP TS 23.002: Network Architecture; Release 7
[2]	3GPP TS 29.332: Media Gateway Control Function (MGCF) – IM Media Gateway; Mn Interface; Release 7
[3]	ITU-T Recommendation H.248.1 version 2: Gateway Control Protocol
[4]	IETF RFC2960: Stream Control Transmission Protocol
[5]	ITU-T Recommendation Q.1950: Bearer Independent Call bearer Control Protocol
[6]	ES 283 024 v1.1.3: Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN);PSTN/ISDN Emulation: H.248 Profile for controlling Trunking Media Gateways in the PSTN/ISDN Emulation Subsystem (PES);Protocol specification
[7]	3GPP TS 29.163: Interworking between the IP Multimedia (IM) Core Network (CN) subsystem and Circuit Switched (CS) networks; Release 7
[8]	3GPP TS 29.202: "Signalling System No. 7 (SS7) signalling transport in core network; Stage 3; Release 6

[9]	IETF RFC 768: "User Datagram Protocol".
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### **3 Definitions, Symbols, and Abbreviations**

No change.

### **4 UMTS Capability Set**

No change.

#### **4.1 Void**

No change.

### **5 Naming Conventions**

No change.

#### **5.1 MGCF/IM-MGW naming conventions**

No change.

#### **5.2 Void**

No change.

### **6 Topology Descriptor**

No change.

### **7 Transaction Timers**

No change.

### **8 Transport**

<AP> Each implementation of the Mn interface shall provide SCTP (as defined in IETF RFC2960 [15] and as updated by RFC3309 [43]) - no other options are permitted within the profile. For further definition see Annex A12.

### **9 Multiple Virtual MG**

<NEW> Each virtual MG SHALL be controlled over a separate SCTP association.

## **10 Formats and Codes**

No change.

### **10.1 Signalling Objects**

<NEW> Signalling Objects supported on the Mn interface SHALL be encoded in binary ASN.1 format in accordance with ITU-T Recommendation H.248.1 [3] Annex A.

### **10.2 Codec Parameters**

<NEW> Codec Parameters supported on the Mn interface SHALL be encoded in binary ASN.1 format in accordance with ITU-T Recommendation H.248.1 [3] Annex A. This applies to the following subsections.

#### **10.2.1 AMR and AMR-WB Codecs**

No change.

#### **10.2.2 DTMF Codecs**

No change.

#### **10.2.3 Other Codecs**

No change.

##### **10.2.3.1G.711 Codec**

No change.

##### **10.2.3.2Clearmode Codec**

No change.

##### **10.2.3.3Silence suppression and Comfort Noise**

No change.

##### **10.2.3.4VBD Codec**

No change.

## **11 Mandatory Support of SDP and H.248.1 Annex C Information Elements**

No change.

## **12 General On Packages and Transactions**

<AP> Changes of the service state of a Termination initiated by the MGCF (e.g. by using ServiceChange command or Modify with TerminationState descriptor) SHALL NOT be permitted.

### **12.1 Profile Details**

No change.



## **13 Void**

No change.

## **14 Call independent H.248 transactions**

No change.

## **15 Transactions towards IM CN Subsystem**

No change.

### **15.1 Procedures related to a termination towards IM CN Subsystem**

No change.

### **15.2 IMS packages**

No change.

## **16 Transactions towards ISUP**

### **16.1 Procedures relating to a termination towards ISUP**

No change.

### **16.2 ISUP packages**

No change.

## **17 Transactions towards BICC**

### **17.1 Procedures related to a termination towards BICC**

No change.

### **17.2 BICC packages**

No change.

## **Annex A Profile Description**

### **A.1 Profile Identification**

No change.

### **A.2 Summary**

No change.

### **A.3 Gateway Control Protocol Version**

No change.

## **A.4 Connection Model**

No change.

## **A.5 Context Attributes**

<NEW> The Topology descriptor SHALL be used for lawful interception.

<NEW> If the emergency indicator is set to true the IM-MGW SHALL NOT reject or drop that H.248 request message from the MGCF if the IM-MGW is in an overload scenario.

<NEW> If the priority indicator is supported by both the MGCF and the IM-MGW, then an operator defined or regional policy SHALL be supported so that appropriately marked H.248 messages are not rejected or dropped when the IM-MGW is in overload.

## **A.6 Terminations**

No change.

### **A.6.1 Termination Names**

No change.

#### **A.6.1.1 General**

<AP> The wildcarding of Termination names SHALL be supported.

#### **A.6.1.2 ASN.1 Encoding**

No change.

##### **A.6.1.2.1 General Structure**

No change.

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

No change.

##### **A.6.1.3 ABNF coding:**

<NEW> Text encoding of terminations SHALL NOT be supported on the Mn Interface. This applies to all following subclauses.

###### **A.6.1.3.1 General Structure**

No change.

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

No change.

###### **A.6.1.3.1.1 Naming Structure**

No change.

###### **A.6.1.3.1.2 Syntactical Specification**

No change.

###### **A.6.1.3.1.3 Wildcarding**

No change.

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

No change.

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

No change.

##### **A.6.1.3.2.1 Naming Structure**

No change.

##### **A.6.1.3.2.2 Syntactical Specification**

No change.

#### **A.6.2 Multiplexed terminations**

No change.

#### **A.7 Descriptors**

<AP> Replacement of descriptors SHALL be handled as described in ITU-T Recommendation H.248.1 [3].

<AP> TerminationState descriptor SHALL be used in this Profile.

<AP> Audit Descriptor SHALL be used in this Profile.

<AP> ServiceChange Descriptor SHALL be used in this Profile.

##### **A.7.1 Stream Descriptor**

No change.

###### **A.7.1.1 Local Control Descriptor**

No change.

###### **A.7.2 Events Descriptor**

No change.

###### **A.7.3 EventBuffer Descriptor**

No change.

###### **A.7.4 Signals Descriptor**

No change.

###### **A.7.5 DigitMap Descriptor**

No change.

###### **A.7.6 Statistics Descriptor**

No change.

###### **A.7.7 ObservedEvents Descriptor**

No change.

### **A.7.8 Topology Descriptor**

<NEW> Stream ID in Topology Descriptor SHALL NOT be supported.

<NEW> The Topology descriptor SHALL be used for lawful interception.

### **A.7.9 Error Descriptor**

No change.

## **A.8 Command API**

No change.

### **A.8.1 Add**

No change.

### **A.8.2 Modify**

No change.

### **A.8.3 Subtract**

No change.

### **A.8.4 Move**

<NEW> The MOVE command SHALL be supported by both the MGCF and the IM-MGW.

### **A.8.5 Auditvalue**

<NEW> Audit commands SHALL NOT be combined with commands that initiate Context manipulation.

### **A.8.6 Auditcapabilities**

<NEW> The AUDITCAPABILITIES command SHALL NOT be supported by the MGCF or the IM-MGW.

### **A.8.7 Notify**

No change.

### **A.8.8 Service Change**

No change.

### **A.8.9 Manipulating and auditing context attributes**

No change.

## **A.9 Generic command syntax and encoding**

<NEW> H.248.1 [3] commands sent on the Mn interface SHALL be encoded in binary ASN.1 format in accordance with ITU-T Recommendation H.248.1 [3] Annex A.

## **A.10 Transactions**

<AP> TransactionPending indication SHALL be used between MGCF and IM-MGW as specified in ITU-T Recommendation H.248.1 [3].

#### **A.11 Messages**

No change.

#### **A.12 Transport**

<NEW> The Mn interface protocol SHALL be transported over SCTP/IP.

<NEW> M3UA as specified for 3GPP in 3GPP TS 29.202 [8] SHALL NOT be included in the protocol stack.

<NEW> UDP as specified in IETF RFC 768 [9] SHALL NOT be included in the protocol stack.

<NEW> Each H.248 control association SHALL be established over a single SCTP association.

<NEW> IPv4 transport SHALL be required in this version of the Interoperability Agreement. IPv6 is a potential future requirement.

<NEW> SCTP multi-homing functionality SHALL be supported as described in RFC2960 [4].

<NEW> There shall be no limit placed on the maximum message size by the IP protocol implementation.

#### **A.13 Security**

No change.

#### **A.14 Packages**

No change.

##### **A.14.1 Generic Package**

No change.

##### **A.14.2 Base Root Package**

No change.

##### **A.14.3 Basic DTMF Generator Package**

No change.

##### **A.14.4 Basic DTMF Detection Package**

No change.

##### **A.14.5 TDM Circuit Package**

No change.

##### **A.14.6 MGW Congestion Package**

No change.

##### **A.14.7 Continuity Package**

No change.

**A.14.8 Announcement Package**

No change.

**A.14.9 Bearer Characteristics Package**

No change.

**A.14.10 Generic Bearer Connection Package**

No change.

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

No change.

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

No change.

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

No change.

**A.14.14 Basic Services Tones Generation Package**

No change.

**A.14.15 Bearer Control Tunnelling Package**

No change.

**A.14.16 Expanded Services Tones Generation Package**

No change.

**A.14.17 Intrusion Tones Generation Package**

No change.

**A.14.18 3GUP Package**

No change.

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

No change.

**A.14.20 Hanging Termination Detection Package**

No change.

**A.14.21 TFO package**

No change.

**A.14.22 Media Gateway Overload Control Package**

No change.

**A.14.23 Inactivity Timer Package**

No change.

#### **A.14.24 MGC Information Package**

No change.

#### **A.14.25 RTP Package**

No change.

#### **A.14.26 Tone Generator Package**

No change.

#### **A.14.27 Tone Detection Package**

No change.

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

<AP> For BICC terminations, the following properties (defined in ITU-T Recommendation H.248.1 [3]) SHALL be supported for session description:

- ACodec
- TMR
- BIR
- NSAP
- USI

The support of this set of properties is defined in ITU-T Recommendation Q.1950 [5] as a mandatory requirement.

<AP> The NSAP and BIR properties are required only for AAL2 transport.

<AP> For terminations towards IM CN Subsystem, the following properties (defined in ITU-T Recommendation H.248.1[3]) SHALL be supported for session description:

- SDP\_V
- SDP\_M
- SDP\_C
- SDP\_A
- SDP\_B
- SDP\_O
- SDP\_S
- SDP\_T

<NEW> Properties supported on the Mn interface SHALL be encoded in binary ASN.1 format in accordance with ITU-T Recommendation H.248.1 [3] Annex A.

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

No change.

### **A.17 Procedures**

No change.

### **A.17.1 Call Independent Procedures**

No change.

#### **A.17.1.2 Profile registration**

No change.

### **A.17.2 IMS Terminations Procedures**

No change.

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

No change.

#### **A.17.2.2 Reserve IMS Connection Point**

No change.

#### **A.17.2.3 Configure IMS Resources**

No change.

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

No change.

#### **A.17.2.5 Release IMS Termination**

No change.

#### **A.17.2.6 Termination heartbeat indication**

No change.

### **A.17.3 TDM Terminations Procedures**

No change.

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

No change.

#### **A.17.3.2 Reserve TDM Circuit**

No change.

#### **A.17.3.3 Release TDM Termination**

No change.

#### **A.17.3.4 Termination heartbeat indication**

No change.

### **A.17.4 BICC Terminations Procedures**

No change.

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



No change.

## **Annex B**

No change.