International Telecommunication Union

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

Series H

Supplement 7
(05/2008)

SERIES H: AUDIOVISUAL AND MULTIMEDIA SYSTEMS

Gateway control protocol: Establishment procedures for the H.248 MGC-MG control association

ITU-T H-series Recommendations – Supplement 7

Documents
Document Sharing Hub

Copyright International Telecommunication Union/ITU Telcommunication Sector
Provided by IHS Markit under license with ITU-T
No reproduction or networking permitted without license from IHS
Licensee=/, User=,
Not for Resale,
Full document details: ITU-T SERIES H SUPP 7 2008

ITU-T H-SERIES RECOMMENDATIONS

AUDIOVISUAL AND MULTIMEDIA SYSTEMS

CHARACTERISTICS OF VISUAL TELEPHONE SYSTEMS	H.100–H.199
INFRASTRUCTURE OF AUDIOVISUAL SERVICES	
General	H.200–H.219
Transmission multiplexing and synchronization	H.220–H.229
Systems aspects	H.230–H.239
Communication procedures	H.240–H.259
Coding of moving video	H.260–H.279
Related systems aspects	H.280–H.299
Systems and terminal equipment for audiovisual services	H.300–H.349
Directory services architecture for audiovisual and multimedia services	H.350–H.359
Quality of service architecture for audiovisual and multimedia services	H.360–H.369
Supplementary services for multimedia	H.450–H.499
MOBILITY AND COLLABORATION PROCEDURES	
Overview of Mobility and Collaboration, definitions, protocols and procedures	H.500–H.509
Mobility for H-Series multimedia systems and services	H.510–H.519
Mobile multimedia collaboration applications and services	H.520–H.529
Security for mobile multimedia systems and services	H.530–H.539
Security for mobile multimedia collaboration applications and services	H.540–H.549
Mobility interworking procedures	H.550–H.559
Mobile multimedia collaboration inter-working procedures	H.560–H.569
BROADBAND, TRIPLE-PLAY AND ADVANCED MULTIMEDIA SERVICES	
Broadband multimedia services over VDSL	H.610–H.619
Advanced multimedia services and applications	H.620–H.629
IPTV MULTIMEDIA SERVICES AND APPLICATIONS FOR IPTV	
General aspects	H.700–H.719
IPTV terminal devices	H.720–H.729
IPTV middleware	H.730–H.739
IPTV application event handling	H.740–H.749
IPTV metadata	H.750–H.759
IPTV multimedia application frameworks	H.760–H.769
IPTV service discovery up to consumption	H.770–H.779

For further details, please refer to the list of ITU-T Recommendations.

--`,,```,,,,````-`-`,,`,,`,`,,`---

Documents
Document Sharing Hub

Copyright International Telecommunication Union/ITU Telcommunication Sector
Provided by IHS Markit under license with ITU-T
No reproduction or networking permitted without license from IHS

Licensee=/, User=,
Not for Resale,

Full document details: ITU-T SERIES H SUPP 7 2008

Supplement 7 to ITU-T H-series Recommendations

Gateway control protocol: Establishment procedures for the H.248 MGC-MG control association

Summary

This supplement to ITU-T H-series Recommendations provides clarifications on the operation of H.248 control associations with a focus on IP-based transport connections for H.248 signalling traffic and establishment procedures, e.g., due to start-up phases or changeover scenarios of H.248 entities.

Source

Supplement 7 to ITU-T H-series Recommendations was agreed on 2 May 2008 by ITU-T Study Group 16 (2005-2008).

--`,,```,,,,````-`-`,,`,,`,`,,`---

Copyright International Telecommunication Union/ITU Telcommunication Sector
Provided by IHS Markit under license with ITU-T
No reproduction or networking permitted without license from IHS
Full document details: ITU-T SERIES H SUPP 7 2008

Licensee=/, User=,
Not for Resale,

Documents
Document Sharing Hub

FOREWORD

The International Telecommunication Union (ITU) is the United Nations specialized agency in the field of telecommunications, information and communication technologies (ICTs). The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of ITU. ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

NOTE

In this publication, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

Compliance with this publication is voluntary. However, the publication may contain certain mandatory provisions (to ensure e.g., interoperability or applicability) and compliance with the publication is achieved when all of these mandatory provisions are met. The words "shall" or some other obligatory language such as "must" and the negative equivalents are used to express requirements. The use of such words does not suggest that compliance with the publication is required of any party.

INTELLECTUAL PROPERTY RIGHTS

ITU draws attention to the possibility that the practice or implementation of this publication may involve the use of a claimed Intellectual Property Right. ITU takes no position concerning the evidence, validity or applicability of claimed Intellectual Property Rights, whether asserted by ITU members or others outside of the publication development process.

As of the date of approval of this publication, ITU had not received notice of intellectual property, protected by patents, which may be required to implement this publication. However, implementers are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database at http://www.itu.int/ITU-T/ipr/.

© ITU 2009

All rights reserved. No part of this publication may be reproduced, by any means whatsoever, without the prior written permission of ITU.

Documents
Document Sharing Hub
Copyright International Telecommunication Union/ITU Telcommunication Sector
Provided by IHS Markit under license with ITU-T
No reproduction or networking permitted without license from IHS
Licensee=/, User=,
Not for Resale,
Full document details: ITU-T SERIES H SUPP 7 2008

CONTENTS

		Page
1	Scope	1
2	References	2
3	Definitions	4
4	Abbreviations and acronyms	4
5	Network conditions	5
5.1	Introduction	5
5.2	Constitution of a control association	6
5.3	IP-based H.248 transport	7
5.4	Relation between the address of an H.248 entity and an H.248 message identifier	9
5.5	MG database for MGC entries	9
5.6	Dedicated network applications	11
6	Procedures for IP-based H.248 control associations	16
6.1	Starting point	16
6.2	Control association establishment	17
6.3	Control association refreshment	21
7	Procedures for non-IP-based H.248 control associations	22
8	H.248 control association: summary of scenarios with usage of ServiceChangeMgcID parameter	23
8.1	Case a): Restart request (Initial registration)	23
8.2	Case b): Handoff request	24
8.3	Case c): Failover request	25
8.4	Case d): Disconnected H.248 control association renewal request	27
8.5	Case e): Forced H.248 control association closure request	28
8.6	Case f): Graceful H.248 control association release request	29
9	H.248 control association: impact of protocol version changes and/or profile changes on established control associations	30
10	H.248 control association: Impact of transport mode changes	31
10.1	Situation of transport mode changes	31
10.2	Impact on established control associations	31
10.3	Relation between profile and transport modes	32
10.4	Indication of transport mode	32
11	H.248 control association: registration of multi-mode transport capable media gateways	32
11.1	Variant A: single-mode transport capable MGC	32
11.2	Variant B: multi-mode transport capable MGC, prepared to serve all transport modes	32
11.3	Variant C: multi-mode transport capable MGC, not prepared to serve all transport modes	32

Documents
Document Sharing Hub
Copyright International Telecommunication Union/ITU Telcommunication Sector
Provided by IHS Markit under license with ITU-T
No reproduction or networking permitted without license from IHS
Licensee=/, User=,
Not for Resale,
Full document details: ITU-T SERIES H SUPP 7 2008

Page

12 H.248 control association: policing of incoming H.248 messages 33
12.1 Overview 33
12.2 Principal filter stages 34
12.3 MID Policing: filter rules, dependent on MID format and provisioned information 37

Copyright International Telecommunication Union/ITU Telcommunication Sector
Provided by IHS Markit under license with ITU-T
No reproduction or networking permitted without license from IHS
Licensee=/, User=,
Not for Resale,
Full document details: ITU-T SERIES H SUPP 7 2008
Documents
Document Sharing Hub

Supplement 7 to ITU-T H-series Recommendations

Gateway control protocol: Establishment procedures for the H.248 MGC-MG control association

1 Scope

This supplement provides clarifications on the operation of H.248 control associations (CA) and its scope includes:

- IP-based transport connections for H.248 signalling traffic, and
- Establishment procedures, e.g., due to start-up phases or changeover scenarios of H.248 entities (see Figure 1 for a possible network configuration).

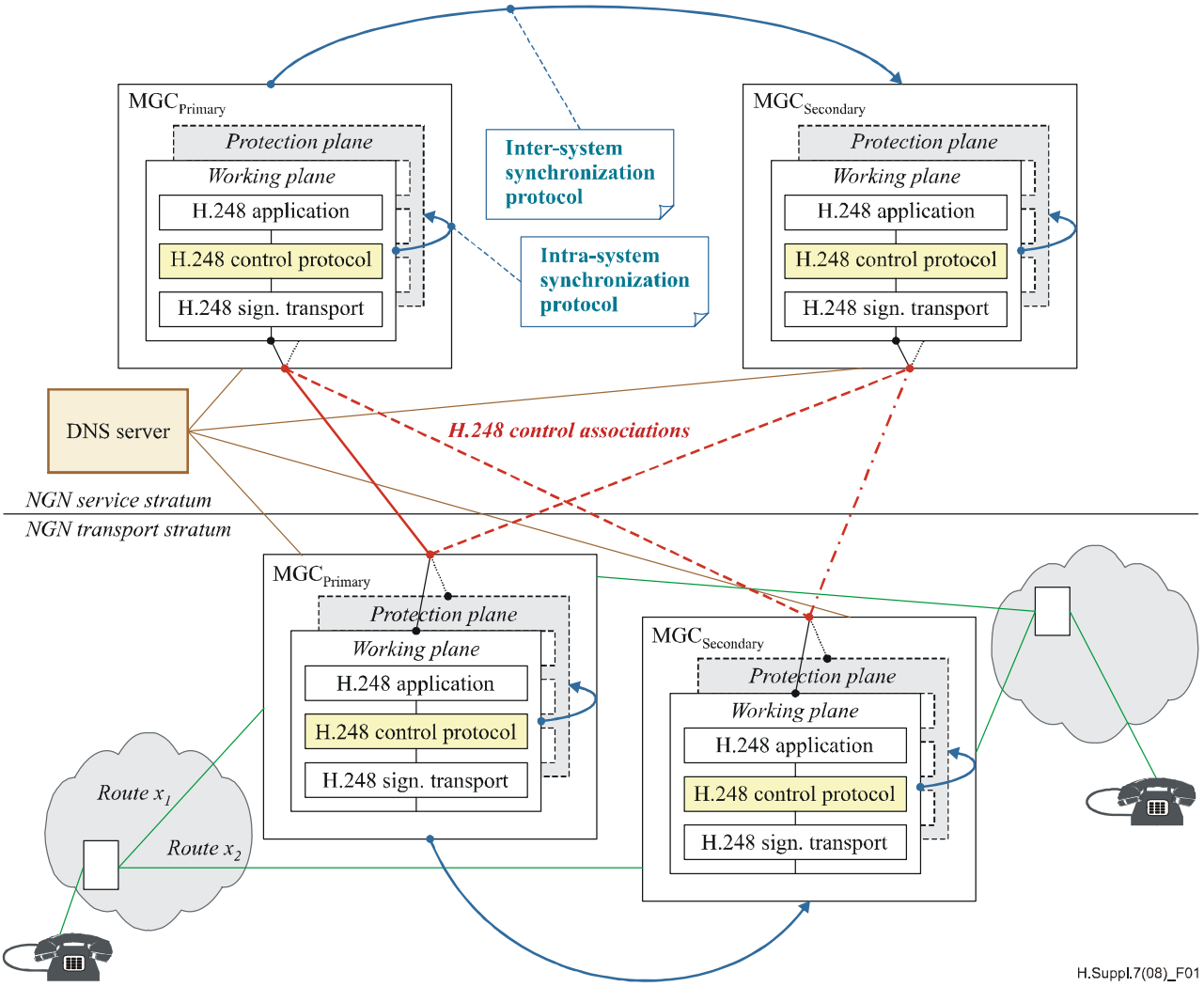


Figure 1 – Example for H.248 control associations (in a one-for-one redundancy model and an optional DNS Server)

NOTE – The concept of "primary" and "secondary" H.248 network elements is defined in clause 7.2.8 of [ITU-T H.248.1]. The number of secondary entities may vary from zero to more than one (see e.g., Table 2). Figure 1 depicts an example redundancy model with exactly one secondary entity at the media gateway controller (MGC) and at the media gateway (MG) levels.

--`,,```,,,,````-`-`,,`,,`,`,,`---
Documents Document Sharing Hub
Copyright International Telecommunication Union/ITU Telcommunication Sector
Provided by IHS Markit under license with ITU-T
No reproduction or networking permitted without license from IHS
Licensee=/, User=,
Not for Resale,
Full document details: ITU-T SERIES H SUPP 7 2008

There is one H.248 control association between the primary network elements (indicated by the solid line). The dashed lines indicate potential future control associations in case of successful changeover procedures from primary to secondary H.248 network elements.

Any H.248 network element itself may be designed for high availability. This is architecturally achieved on the basis of service or redundancy groups ("members of such a group are active and standby entities"). The corresponding entities may be abstracted by the working and protection planes internal to a network element, as indicated in Figure 1. Such network element-level architectural details are implementation-specific and beyond the scope of this supplement. A crucial point here is that, in Figure 1, such details of the internal operation of a network element are hidden from the network by a single H.248 control association endpoint of a H.248 network element.

This abstract approach leads to a network design where the intra-network element changeover procedures are fully decoupled from the network-level or inter-network element changeover procedures. For instance, a MG internal failover event does not have any impact on the externally visible H.248 control association.

Any meaningful primary/secondary concept requires some kind of synchronization between the primary and secondary. Such kind of synchronization is outlined in Figure 1, but out of the scope of ITU-T H.248.x-series of Recommendations. These mechanisms are mentioned for completeness because they are essential parts of network engineering.

Changeover between primary and secondary network elements is discussed in clause 5.6.6. The potential involvement of DNS servers (as indicated in the figure) is in scope of clause 5.6.6.2.1.

This supplement discusses typical use cases of H.248 control associations regarding:

- basic principles,
- address assignment mechanisms,
- traversal of multiple address realms,
- security,
- authentication of H.248 entities,
- changeovers between primary and secondary H.248 entities.

If there are any discrepancies between this supplement and [ITU-T H.248.1], the procedures and specifications of [ITU-T H.248.1] take precedence over those described in this supplement.

2 References

[ITU-T H.248.1] Recommendation ITU-T H.248.1 (2005), *Gateway control protocol: Version 3*.

[ITU-T H.248.4] Recommendation ITU-T H.248.4 (2000), *Gateway control protocol: Transport over Stream Control Transmission Protocol (SCTP)*.

[ITU-T H.248.5] Recommendation ITU-T H.248.5 (2000), *Gateway control protocol: Transport over ATM*.

[ITU-T H.248.41] Recommendation ITU-T H.248.41 (2006), *Gateway control protocol: IP domain connection package*.

[ITU-T Q.2631.1] Recommendation ITU-T Q.2631.1 (2003), *IP connection control signalling protocol – Capability Set 1*.

[ITU-T Q-Sup.43] ITU-T Q-series Recommendations – Supplement 43 (2003), *Technical Report TRQ.2415: Transport control signalling requirements – Signalling requirements for IP connection control in radio access networks Capability Set 1*.

Documents
Document Sharing Hub
Copyright International Telecommunication Union/ITU Telecommunication Sector
Provided by IHS Markit under license with ITU-T
No reproduction or networking permitted without license from IHS
Licensee=/, User=,
Not for Resale,
Full document details: ITU-T SERIES H SUPP 7 2008

[ITU-T Y.2011] Recommendation ITU-T Y.2011 (2004), *General principles and general reference model for Next Generation Networks*.

[ITU-T Y.2012] Recommendation ITU-T Y.2012 (2006), *Functional requirements and architecture of the NGN Release 1*.

[ETSI ES 283 002] ETSI ES 283 002 V2.1.0 (2008-03) *Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); H.248 Profile for controlling Access and Residential Gateways*.
<http://pda.etsi.org/pda/home.asp?wki_id=Gt3yTZO0Ki_'00-43_png>

[ETSI ES 283 018] ETSI ES 283 018 v2.3.1 (2008-06), *Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); Resource and Admission Control: H.248 Profile for controlling Border Gateway Functions (BGF) in the Resource and Admission Control Subsystem (RACS); Protocol specification*.
<http://pda.etsi.org/pda/home.asp?wki_id=Vcd'l@UyBUcekkccSVDL9>

[ETSI TS 129 202] ETSI TS 129 202 v6.0.0 (2004-12), *Universal Mobile Telecommunications System (UMTS); Signalling System No. 7 (SS7) signalling transport in core network; Stage 3 (3GPP TS 29.202 version 6.0.0 Release 6)*.
<http://pda.etsi.org/pda/home.asp?wki_id=O0z2uybR4UMONVONPm3,Z>

[ETSI TS 133 210] ETSI TS 133 210 v7.3.0 (2007-10), *Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); 3G security; Network Domain Security (NDS); IP network layer security (3GPP TS 33.210 version 7.3.0 Release 7)*.
<http://pda.etsi.org/pda/home.asp?wki_id=JwRU14qfzZegljkhLY_b8>

[IETF RFC 793] IETF RFC 793 (1981), *Transmission Control Protocol*.
http://www.ietf.org/rfc/rfc0793.txt?number=793>

[IETF RFC 2131] IETF RFC 2131 (1997), *Dynamic Host Configuration Protocol*.
<http://www.ietf.org/rfc/rfc2131.txt?number=2131>

[IETF RFC 2663] IETF RFC 2663 (1999), *IP Network Address Translator (NAT) Terminology and Considerations*.
<http://www.ietf.org/rfc/rfc2663.txt?number=2663>

[IETF RFC 3054] IETF RFC 3054 (2001), *Megaco IP Phone Media Gateway Application Profile*.
<http://www.ietf.org/rfc/rfc3054.txt?number=3054>

[IETF RFC 3489] IETF RFC 3489 (2003), *STUN – Simple Traversal of User Datagram Protocol (UDP) Through Network Address Translators (NATs)*.
<http://www.ietf.org/rfc/rfc3489.txt?number=3489>

[IETF RFC 3704] IETF RFC 3704 (2004), *Ingress Filtering for Multihomed Networks*.
<http://www.ietf.org/rfc/rfc3704.txt?number=3704>

[IETF RFC 3989] IETF RFC 3989 (2005), *Middlebox Communications (MIDCOM) Protocol Semantics*.
<http://www.ietf.org/rfc/rfc3989.txt?number=3989>

[IETF RFC 4301] IETF RFC 4301 (2005), *Security Architecture for the Internet Protocol*.
<http://www.ietf.org/rfc/rfc4301.txt?number=4301>

[IETF RFC 4302] IETF RFC 4302 (2005), *IP Authentication Header*.
<http://www.ietf.org/rfc/rfc4302.txt?number=4302>

--`,,```,,,,````-`-`,,`,,`,`,,`---

Documents
Document Sharing Hub
Copyright International Telecommunication Union/ITU Telcommunication Sector
Provided by IHS Markit under license with ITU-T
No reproduction or networking permitted without license from IHS
Licensee=/, User=,
Not for Resale,
Full document details: ITU-T SERIES H SUPP 7 2008

[IETF RFC 4303] IETF RFC 4303 (2005), *IP Encapsulating Security Payload (ESP)*. <http://www.ietf.org/rfc/rfc4303.txt?number=4303>

[IETF RFC 4960] IETF RFC 4960 (2007), *Stream Control Transmission Protocol*. <http://www.ietf.org/rfc/rfc4960.txt?number=4960>

3 Definitions

This supplement defines the following terms:

3.1 5-tuple: The commonly used tuple <source address, source port, destination address, destination port, transport protocol> of IP protocol control information fields. A 5-tuple is a subset of an address tuple.

3.2 address tuple: As defined in clause 2.3.5 of [IETF RFC 3989].

3.3 destination-2-tuple: The commonly used tuple <destination address, destination port> of IP protocol control information fields. A destination 2-tuple is a subset of 5-tuple.

3.4 IP connection: A *bidirectional* (user plane) association between two IP (signalling) endpoints (aligned with clause 3.1 of [ITU-T Q-Sup.43]). An IP connection is designated by a *pair of IP address/port number combinations* (according to clause 3.1 of [ITU-T Q.2631.1]). An IP connection is therefore related to the 4-tuple <source address, source port, destination address, destination port>.

3.5 (IP) interface redirection: Relates to a change of the destination-2-tuple fields IP DA or IP DA and IP DP (during the control association establishment phase).

3.6 (IP) port redirection: Relates to a change of the destination-2-tuple field IP DP (during the control association establishment phase).

3.7 receiver-2-tuple: The commonly used tuple <address, port> of IP protocol control information fields at an IP interface for received IP packets. In a H.248 control association, a receiver-2-tuple relates therefore to the destination-2-tuple for the peer H.248 entity.

3.8 source-2-tuple: The commonly used tuple <source address, source port> of IP protocol control information fields. A source 2-tuple is a subset of 5-tuple.

3.9 transmitter-2-tuple: The commonly used tuple <address, port> of IP protocol control information fields at an IP interface for transmitted IP packets. In a H.248 control association, a transmitter-2-tuple relates therefore to the source-2-tuple of the sending H.248 entity.

4 Abbreviations and acronyms

This supplement uses the following abbreviations and acronyms:

@, A	Address
A_{MG}	Address for MG (actual address as opposed to translated address)
A'_{MG}	Virtual Address for MG (translated address as opposed to actual address)
A_{MGC}	Address for MGC (actual address as opposed to translated address)
A'_{MGC}	Virtual Address for MGC (translated address as opposed to actual address)
B2BIH	Back-to-Back IP Host
CA	Control association (H.248)
CSN	Circuit-Switched Network
DA	Destination Address (IP)

Copyright International Telecommunication Union/ITU Telecommunication Sector
Provided by IHS Markit under license with ITU-T
No reproduction or networking permitted without license from IHS
Licensee=/, User=,
Not for Resale,
Full document details: ITU-T SERIES H SUPP 7 2008
Documents
Document Sharing Hub

DHCP	Dynamic Host Configuration Protocol
DN	Domain Name
DNS	Domain Name System
DoS	Denial of Service
DP	Destination Port (IP)
FIB	Forwarding Information Base
FQDN	Fully Qualified Domain Name (DNS: a FQDN or *absolute domain name* is a domain name that ends with a period, or "dot")
FW	Firewall
H	Host (IP)
IS	In-Service (H.248)
MID	Message Identifier (H.248)
MID_{MG}	Message Identifier for H.248 MG entity
MID_{MGC}	Message Identifier for H.248 MGC entity
MG	Media Gateway
MGC	Media Gateway Controller
NAPT	Network Address and Port Translation
NA(P)T	Network Address (and Port) Translation
NAT	Network Address Translator/Translation
NAT/FW	Network Address Translator and/or Firewall
NGN	Next Generation Network
OoS	Out-of-Service (H.248)
P	Port
PSN	Packet-Switched Network
R	Router (IP)
RIB	Routing Information Base
SA	Source Address (IP)
SC	ServiceChange (H.248)
SCTP	Stream Control Transmission Protocol
SP	Source Port (IP)
STUN	Simple Traversal of User Datagram Protocol

5 Network conditions

5.1 Introduction

A pair of two H.248 entities (e.g., a primary MGC and a primary MG) constitutes a H.248 control association (see clause F.2 of [ITU-T H.248.1]). This logical concept is accompanied by a correspondent transport connection for H.248 signalling traffic (e.g., clauses D.1 and D.2 of

--`,,```,,,,````-`-`,,`,,`,`,,`---

Documents
Document Sharing Hub
Copyright International Telecommunication Union/ITU Telcommunication Sector
Provided by IHS Markit under license with ITU-T
No reproduction or networking permitted without license from IHS
Licensee=/, User=,
Not for Resale,
Full document details: ITU-T SERIES H SUPP 7 2008

[ITU-T H.248.1], [ITU-T H.248.4], clauses 4, 5 and 6 of [ITU-T H.248.5] or Annex A of [ETSI TS 129 202]).

The transport connection between a MGC/MG pair may be IP-based or non-IP-based. IP-based H.248 transport connections have many more aspects to be considered, for instance due to the connectionless network technology and/or the diversity of IP network architectures and operation.

IP-based H.248 transport connections are therefore the prime scope of this supplement. Figure 2 illustrates a possible scenario for IP-based H.248 transport connections. The general assumption is that there are a number of interim IP entities, for instance network address translators, firewalls, proxies, etc., between an MGC and MG.

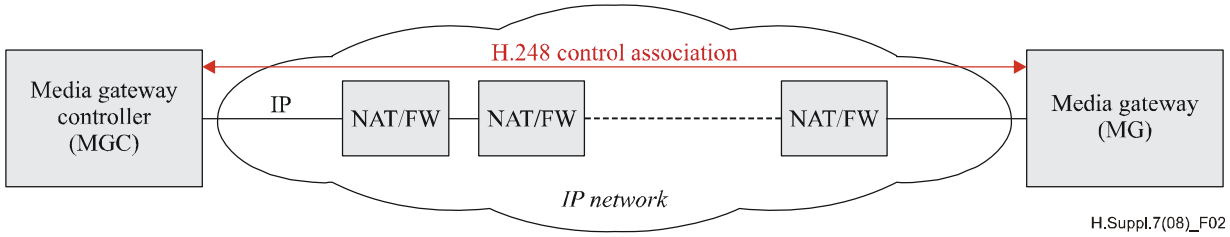


Figure 2 – IP-based transport of H.248 signalling

5.2 Constitution of a control association

An H.248 control association is unambiguously defined by the pair of H.248 Message Identifiers (MID) used by the two H.248 entities. This definition is based on clause 8.3 of [ITU-T H.248.1]:

> *"An H.248.1 entity (MG/MGC) must consistently use the same MID in all messages it originates for the duration of control association with the peer (MGC/MG)."*

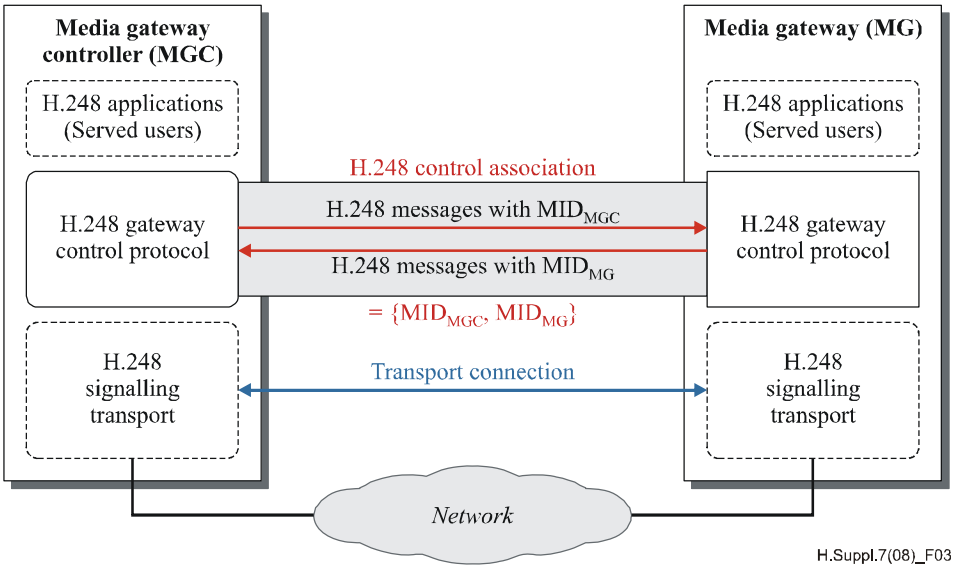


Figure 3 – Constitution of a control association

The constitution of an H.248 control association is *independent* of the underlying transport connection identifiers, e.g., like 5-tuple in case of IP-based transport (see also clause 5.3.1). The rationale behind this is a de-coupling of ServiceChange procedures from possible changeover procedures at the transport connection level.

Documents
Document Sharing Hub
Copyright International Telecommunication Union/ITU Telecommunication Sector
Provided by IHS Markit under license with ITU-T
No reproduction or networking permitted without license from IHS
Licensee=/, User=,
Not for Resale,
Full document details: ITU-T SERIES H SUPP 7 2008

NOTE – For example, H.248-over-SCTP (see also clause 6.1.1) and SCTP in multi-homing mode. Any changeover (i.e., failovers within a multi-homed SCTP endpoint) leads to a change of the 5-tuple, but does not affect the SCTP association as such. Such transport connection level changeovers should not impact the H.248 control association.

Any change of the MID value inherently leads to the termination of the present control association and the establishment of a new control association. See also clause 8.

5.3 IP-based H.248 transport

5.3.1 IP connection and IP transport connection

There is basically an IP connection between an MGC and an MG. Such an IP connection is represented by a 4-tuple. This connection model is extended to an IP transport connection by a dedicated transport protocol[1] (5-tuple). The specific transport protocol, and possible default port, is specific to a selected H.248 transport mode. See Table 1.

Table 1 – IP transport connections for different H.248 transport modes

H.248 transport mode (Examples)	Reference	5-Tuple_{MGC}					5-Tuple_{MG}				
		SA	DA	SP	DP	Protocol	SA	DA	SP	DP	Protocol
H.248-over-UDP (text encoded)	Annex D.1/ H.248.1	SA_{MGC}	SA_{MG}	2944	2944	17	SA_{MG}	SA_{MGC}	2944	2944	17
H.248-over-UDP (binary encoded)	Annex D.1/ H.248.1	SA_{MGC}	SA_{MG}	2945	2945	17	SA_{MG}	SA_{MGC}	2945	2945	17
H.248-over-TCP (text encoded)	Annex D.2/ H.248.1	SA_{MGC}	SA_{MG}	2944	2944	6	SA_{MG}	SA_{MGC}	2944	2944	6
H.248-over-TCP (binary encoded)	Annex D.2/ H.248.1	SA_{MGC}	SA_{MG}	2945	2945	6	SA_{MG}	SA_{MGC}	2945	2945	6
H.248-over-SCTP (text encoded)	H.248.4	SA_{MGC}	SA_{MG}	2944	2944	132	SA_{MG}	SA_{MGC}	2944	2944	132
H.248-over-SCTP (binary encoded)	H.248.4	SA_{MGC}	SA_{MG}	2945	2945	132	SA_{MG}	SA_{MGC}	2945	2945	132
…	…	…	…	…	…	…	…	…	…	…	…
NOTE – There are transport technologies with support of multi-homed transport connection endpoints (like e.g., SCTP). Then, in the case of multi-homing, multiple network addresses are provisioned.											

Port values other than the default port assignments may be used (via provisioning actions).

It may be stated that an IP transport connection (according to Table 1) unambiguously identifies an H.248 control association as long as the transport connection endpoint addresses do not change (which could be the case for multi-homed endpoints in failover situations at the transport connection level). Both 5-tuples identify both IP transport connection and H.248 control association endpoints.

5.3.2 IP addresses for H.248 entities

5.3.2.1 IP interface for H.248 traffic

There is a dedicated IP interface and an associated IP address for H.248 signalling traffic at each H.248 entity (MGC, MG types, like circuit-to-packet MGs, packet-to-packet MGs, or media servers). The interface is designated by A_{MGC} or A_{MG} addresses respectively.

[1] See: http://www.iana.org/assignments/protocol-numbers

Documents Document Sharing Hub
Copyright International Telecommunication Union/ITU Telcommunication Sector
Provided by IHS Markit under license with ITU-T
No reproduction or networking permitted without license from IHS
Licensee=/, User=,
Not for Resale,
Full document details: ITU-T SERIES H SUPP 7 2008

Address A_{MGC} (or A_{MG}) relates to a specific IP address tuple in case of IP transport connections for H.248 traffic:

- A H.248 message from the MGC towards the MG uses an IP packet with source address/port information according to A_{MGC} and destination address/port information according to A_{MG}.
- A H.248 message from the MG towards the MGC uses an IP packet with source address/port information according to A_{MG} and destination address/port information according to A_{MGC}.

It has to be noted that address A_{MG} may not have a relation with user plane traffic address(es) (e.g., RTP traffic in case of a VoIP MG). See clause 5.3.2.2.2.1 for the discussion of this aspect.

5.3.2.2 IP interfaces for H.248 entities

This clause provides further background of IP network design principles.

5.3.2.2.1 MGC

The MGC is an IP host (H) system. The MGC may be a single-homed host from the MG perspective. In case of a multi-homed IP host MGC, the MGC could carry out IP interface redirections (via the ServiceChangeAddress parameter) during the CA establishment phase (see clause 5.6.1.2).

5.3.2.2.2 MG

The MG is located in the NGN transport stratum (see [ITU-T Y.2011] and [ITU-T Y.2012]), thus there are more aspects in regard to IP interfaces and addressing.

5.3.2.2.2.1 Single versus multiple IP interfaces

The number of physical and logical IP interfaces per MG depends mainly on:

- the MG capacity for RTP traffic, i.e., engineered capacity for H.248 RTP terminations ("limited UDP resources for RTP sessions"),
- the network position of the MG (e.g., residential MGs versus trunking MGs), and/or
- the specific IP network design (e.g., driven by aspects of security, QoS, resilience, VPN, etc.).

5.3.2.2.2.2 Host versus embedded router function

The MG is fundamentally an IP host (H) system. The MG is a single-homed host from the MGC perspective. The VoIP MG is also basically a host system for RTP traffic, either a single- or multi-homed host (see previous clause 5.3.2.2.2.1).

Another example is the category of IP-to-IP MGs, which fundamentally may serve multiple IP interfaces, distributed over different IP address realms (see e.g., [ITU-T H.248.41]). For instance, the MG type according to the profile in [ETSI ES 283 018] defines an (IP, IP) connection model, which represents a "back-to-back IP host" (B2BIH) configuration.

5.3.3 IP routing

Databases for IP routing, like routing information base (RIB) or forwarding information base (FIB), are beyond the scope of this supplement because these tables do not affect addresses A_{MGC} or A_{MG}. They are only used for the "next hop" determination from the MGC or MG perspective.

NOTE – A MGC or MG embedded RIB/FIB may be either configured ("static routing") or dynamically adapted using IP routing protocols (like for instance RIP as distance vector protocol or link state based OSPF).

Documents
Document Sharing Hub
Copyright International Telecommunication Union/ITU Telecommunication Sector
Provided by IHS Markit under license with ITU-T
No reproduction or networking permitted without license from IHS
Licensee=/, User=,
Not for Resale,
Full document details: ITU-T SERIES H SUPP 7 2008

5.4 Relation between the address of an H.248 entity and an H.248 message identifier

5.4.1 General

Clause 8.3 of [ITU-T H.248.1] defines the H.248 message identifier (MID; H.248.1 offers presently a choice of five different identifier formats):

> *"The Message Identifier (MID) of a message is set to a provisioned name (e.g., domain address/domain name/device name) of the entity transmitting the message. Domain name is a suggested default. An H.248.1 entity (MG/MGC) must consistently use the same MID in all messages it originates for the duration of control association with the peer (MGC/MG)."*

Therefore, there is a single MID assigned to an H.248 entity. The MID unambiguously identifies an MGC or MG, thus, also a logical endpoint identifier of the present active control association.

However, there is no relation defined in H.248 between the MID of an H.248 entity and its correspondent (transport) address. Both parameters are firstly decoupled and disjoint from an H.248 perspective.

NOTE – Both parameters may be coupled by additional functions, but other, non-ServiceChange based mechanisms for the correlation of MID with H.248 entity address(es), are beyond the scope of (existing) H.248 Recommendations.

5.4.2 Correlation via ServiceChange parameter "MgcID"

There is one possibility for the MGC, but not for MGs, to correlate MID and address by using parameter ServiceChangeMgcID in ServiceChange commands (from MGC towards MG). Parameter ServiceChangeMgcID is of type "MID". The allowed procedures are defined in clause F.5.7 of [ITU-T H.248.1] (see also clause 5.6.5.2).

The new MID_{MGC} is extracted from the received parameter ServiceChangeMgcID by the MG. The derivation of the actual IP address of the MGC (address A_{MGC}) may require an additional translation step (e.g., DNS query) dependent on the chosen MID_{MGC} encoding scheme.

5.5 MG database for MGC entries

Connection data for control associations is maintained in a database. This clause illustrates a possible MG database for IP-based H.248 transport.

5.5.1 Database structure

H.248 control associations are established via ServiceChange procedures. The contact attempt, initiated always by the MG, is based on a database (see clause 11.5 of [ITU-T H.248.1]). Below is a possible table for such a database in the MG. The pre-provisioned list contains here K entries for MGCs. The table contains more than the minimum required information. (The minimum table information is column "MGC role" with an associated "IP address entry").

Documents
Document Sharing Hub
Copyright International Telecommunication Union/ITU Telcommunication Sector
Provided by IHS Markit under license with ITU-T
No reproduction or networking permitted without license from IHS
Licensee=/, User=,
Not for Resale,
Full document details: ITU-T SERIES H SUPP 7 2008