

International Telecommunication Union

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

H.248.37

(06/2008)

SERIES H: AUDIOVISUAL AND MULTIMEDIA SYSTEMS
Infrastructure of audiovisual services – Communication
procedures

Gateway control protocol: IP NAPT traversal package

Recommendation ITU-T H.248.37

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 AND TRIPLE-PLAY 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

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

Recommendation ITU-T H.248.37

Gateway control protocol: IP NAT traversal package

Summary

Session border controllers (SBCs) are an important part of the Internet infrastructure. Some of these session border controllers are being split into media gateway controller (MGC) and media gateway (MG) components. One important function of an SBC is to perform network address and port translation (NAPT). This Recommendation allows the MGC to instruct an MG to latch to an address provided by an incoming Internet protocol (IP) application data stream rather than the address provided by the call/bearer control. This enables the MG to open a pinhole for data flow.

This revision of Recommendation ITU-T H.248.37 adds clarifications for latch and re-latch behaviour and new packages for address reporting and statistics.

Source

Recommendation ITU-T H.248.37 was approved on 13 June 2008 by ITU-T Study Group 16 (2005-2008) under Recommendation ITU-T A.8 procedure.

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

Compliance with this Recommendation is voluntary. However, the Recommendation may contain certain mandatory provisions (to ensure e.g. interoperability or applicability) and compliance with the Recommendation 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 Recommendation is required of any party.

INTELLECTUAL PROPERTY RIGHTS

ITU draws attention to the possibility that the practice or implementation of this Recommendation 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 Recommendation development process.

As of the date of approval of this Recommendation, ITU had not received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. 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.

CONTENTS

Page

1	Scope	1
1.1	Adaptation on new or changes of remote source address information.....	1
1.2	Reporting of new or detected changes of remote address information	3
1.3	Counting the packets dropped based on implicit filtering.....	4
2	References.....	4
3	Definitions	4
3.1	Terms defined elsewhere	4
3.2	Terms defined in this Recommendation.....	4
4	Abbreviations and acronyms	4
5	Conventions	5
6	IP NAPT traversal package	5
6.1	Properties.....	6
6.2	Events	6
6.3	Signals	6
6.4	Statistics.....	6
6.5	Error codes.....	6
6.6	Procedures	7
7	Address reporting package	12
7.1	Properties.....	12
7.2	Events	12
7.3	Signals	14
7.4	Statistics.....	14
7.5	Procedures	14
8	Latch statistics package	15
8.1	Properties.....	15
8.2	Events	15
8.3	Signals	16
8.4	Statistics.....	16
8.5	Error codes.....	16
8.6	Procedures	16
	Appendix I – Temporary interruptions of IP connection.....	17

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

Gateway control protocol: IP NAPT traversal package

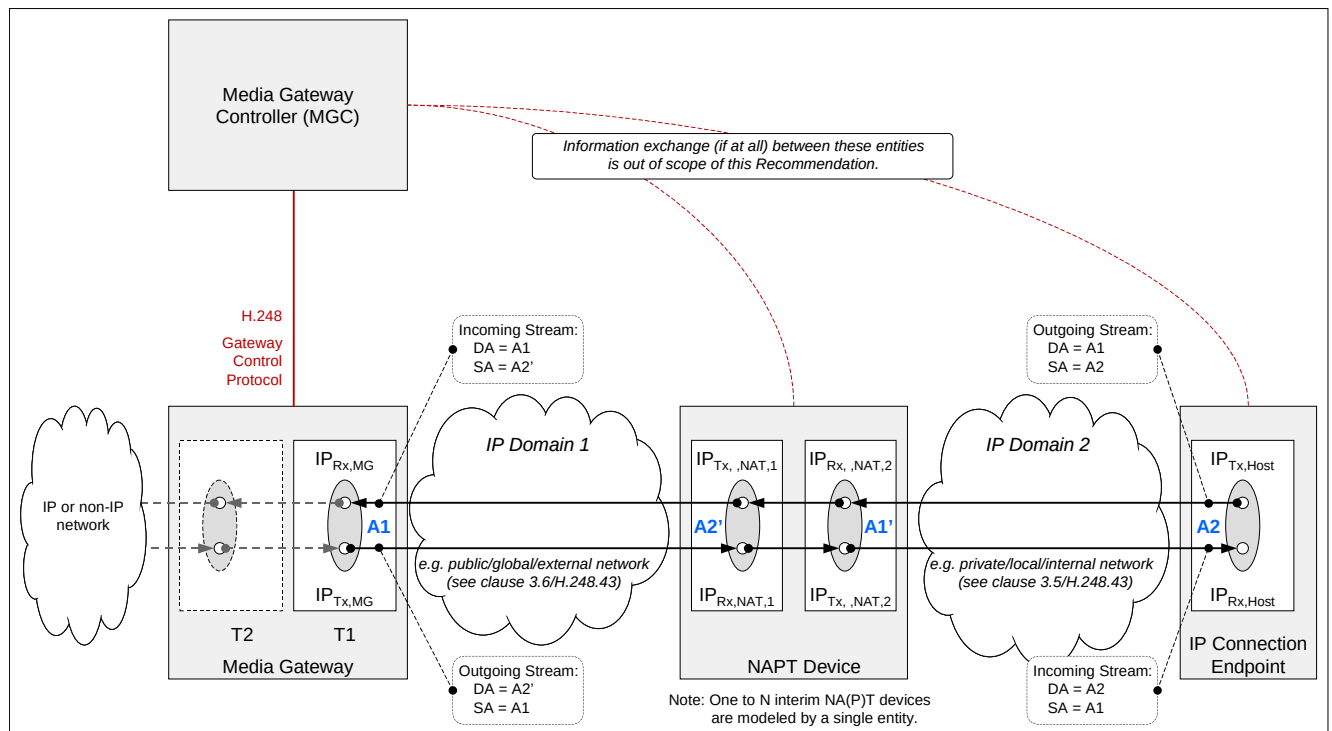
1 Scope

This Recommendation allows a media gateway controller to control Internet protocol (IP) network address and port translation (NAPT) traversal.

1.1 Adaptation on new or changes of remote source address information

The use of IP NAPT traversal (see clause 6) is especially useful in session border controllers (SBCs) where media traversal is required.

Figure 1 illustrates a model for NAT traversal processing. The media gateway (MG) latches or re-latches, respectively, using the incoming H.248 stream (see termination T1). The peer IP connection endpoint is behind a NA(P)T device.



NOTE – The single H.248 stream at Termination T1 relates to the two IP flows of the bidirectional IP connection.

Figure 1 – Model for NAPT traversal processing

The network assumptions for H.248.37 are as follows:

[Assumption 1] IP host equipment

In scope are translated transport addresses A2 to A2' by interim NAT devices.

[Assumption 2] Symmetry assumption for remote address A2

The remote IP connection endpoint is using symmetrical addresses (e.g., Figure 1: the network address and port values of $IP_{Tx,Host}$ and $IP_{Rx,Host}$ are identical). This symmetry condition is valid both for latching and address reporting.

[Assumption 3] Dynamic of address changes

The IP host does not change the transport address A2 during the lifetime of the IP transport connection. The host transport address A2 will be thus static and also not change during the lifetime of the H.248 stream/termination.

NOTE 1 – IP host equipment with autonomous source port changes (e.g., due to security reasons) for the same transport connection (i.e., same application data stream) are therefore not considered here. In this context "autonomous" means that changes will not lead to any correspondent session control protocol (e.g., SIP) activity.

[Assumption 4] MGC awareness concerning address changes

An MGC using the *ipnapt* package is "aware" that there is a need for NAPT traversal support for the H.248 stream/termination. For this package, the MGC may not be aware of a) the translated transport address A2' by the NAPT device (Note 2), or b) the transport address changes by the IP endpoint after connection establishment. A consequence of this assumption is the fact that possible source address/port filtering by the MG is related to a static transport address A2, e.g., such a filter may not be autonomously adapted by the MG.

NOTE 2 – This function is in the particular scope of the *adr* package (see clause 7).

[Assumption 5] Validity of source endpoint address

The MG is not aware of whether the source transport address (before or after latching) of the incoming stream represents a "valid" address (in the scope of that session).

NOTE 3 – The MGC could check, based on the *adr* package, whether the latched source transport address is valid or unknown.

The latch/re-latch process could be extended, e.g., by additional consideration of given destination transport address information (in the case that the MGC is unsure about a valid endpoint). Such a capability is for further study.

NOTE 4 – There is a possible security problem. The use case of intentionally injected IP packets by an attacker with "his" source transport address may not be detected by the MG (in the scope of this Recommendation).

[Assumption 6] MG awareness concerning transport protocol type

The MG may be aware of or be agnostic of the *transport-protocol type* of the H.248 stream. This may depend, e.g., in case of IP-to-IP MGs on the configured interworking mode (see, e.g., clause 3.2.6 of [b-ITU-T Q.3303.2]). Nevertheless, the *ipnapt* package may be used for any type of transport protocol (e.g., UDP, TCP, SCTP, DCCP).

[Assumption 7] IP connection establishment

This may be relevant for *connection-oriented* IP transport protocols (such as TCP, SCTP, DCCP). The IP connection may be either "internally initiated" (the IP host in the internal network domain, i.e., relates to an "outgoing call") or "externally initiated" ("incoming call").

[Assumption 8] MGC/MG awareness concerning UNSAF processes

This Recommendation is not related to unilateral self-address fixing (UNSAF; see [b-IETF RFC 3424] mechanisms like, e.g., STUN [b-IETF RFC 3489] or Teredo [b-IETF RFC 4380]). Support of UNSAF is FFS, e.g., in the future