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H.460.24

Amendment 2
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SERIES H: AUDIOVISUAL AND MULTIMEDIA SYSTEMS

Infrastructure of audiovisual services – Supplementary
services for multimedia

Point-to-point media through network address
translators and firewalls within ITU-T H.323 systems

**Amendment 2: Support for ITU-T H.460.19
multiplex media mode for point-to-point media**

Recommendation ITU-T H.460.24 (2009) –
Amendment 2

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Recommendation ITU-T H.460.24

Point-to-point media through network address translators and firewalls within ITU-T H.323 systems

Amendment 2

Support for ITU-T H.460.19 multiplex media mode for point-to-point media

Summary

Recommendation ITU-T H.460.24 enables an ITU-T H.323 gatekeeper to formulate a decision to enable direct media flows between ITU-T H.323 endpoints that reside behind network address translator (NAT)/firewall (FW) devices. This extension is used in conjunction with Recommendation ITU-T H.460.18 to facilitate the traversal of media across NAT/FW devices and Recommendation ITU-T H.460.23 to discover the characteristics of NAT/FW devices sitting in front of ITU-T H.323 endpoints, reducing the frequency with which media proxy devices (as described in Recommendation ITU-T H.460.19) are needed by allowing direct media connectivity between the endpoints. Connectivity is achieved via the formulation of an intelligent media transmission decision and call signalling that instructs endpoints to initiate media flows in such a manner that a reliable direct media pathway is established, even if one or both endpoints reside behind a NAT/FW device.

Amendment 1 to Recommendation ITU-T H.460.24 further improves conditions where media pathways do not require the services of an intermediary to achieve NAT traversal. New Annex B allows endpoints under certain conditions, after first establishing media flows through an intermediary entity, to probe for a direct route and, if detected, change the media pathway to flow directly between the endpoints freeing up the resources of the intermediary entity.

Amendment 2 to Recommendation ITU-T H.460.24 adds support for ITU-T H.460.19 multiplex media mode for point-to-point media flows.

History

Edition	Recommendation	Approval	Study Group
1.0	ITU-T H.460.24	2009-12-14	16
1.1	ITU-T H.460.24 (2009) Amd. 1	2011-05-14	16
1.2	ITU-T H.460.24 (2009) Amd. 2	2013-03-16	16

FOREWORD

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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.

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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/>.

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Recommendation ITU-T H.460.24

Point-to-point media through network address translators and firewalls within ITU-T H.323 systems

Amendment 2

Support for ITU-T H.460.19 multiplex media mode for point-to-point media

1 Scope

This Recommendation defines the capability and procedures for enabling the direct point-to-point media flow between endpoints even if at least one device is behind a network address translator (NAT) or firewall (FW) device. If used in conjunction with [ITU-T H.460.23], this feature can be used to extend the scalability of [ITU-T H.460.19] to allow media, where determined, to flow directly between endpoints and avoid the requirement to proxy media.

2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published. The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

- [ITU-T H.225.0] Recommendation ITU-T H.225.0 (2009), *Call signalling protocols and media stream packetization for packet-based multimedia communication systems*.
- [ITU-T H.245] Recommendation ITU-T H.245 (2009), *Control protocol for multimedia communication*.
- [ITU-T H.323] Recommendation ITU-T H.323 (2009), *Packet-based multimedia communications systems*.
- [ITU-T H.460.1] Recommendation ITU-T H.460.1 (2002), *Guidelines for the use of the generic extensible framework*.
- [ITU-T H.460.17] Recommendation ITU-T H.460.17 (2005), *Using H.225.0 call signalling connection as transport for H.323 RAS messages*.
- [ITU-T H.460.18] Recommendation ITU-T H.460.18 (2005), *Traversal of H.323 signalling across network address translators and firewalls*.
- [ITU-T H.460.19] Recommendation ITU-T H.460.19 (2005), *Traversal of H.323 media across network address translators and firewalls*.
- [ITU-T H.460.23] Recommendation ITU-T H.460.23 (2009), *Network address translator and firewall device determination in H.323 systems*.
- [IETF RFC 3174] IETF RFC 3174 (2001), *US Secure Hash Algorithm 1 (SHA1)*.

[IETF RFC 3489] IETF RFC 3489 (2003), *STUN – Simple Traversal of User Datagram Protocol (UDP) Through Network Address Translators (NATs)*.

NOTE – The IETF published a new RFC that obsoletes [IETF RFC 3489], changing the name of the standard and the procedures defined therein. This Recommendation relies on the protocol and procedures specified in [IETF RFC 3489], and the protocol and procedures defined in the new RFC are neither suitable nor compatible. As such, this Recommendation does not reference the new RFC and deliberately makes reference to the original specification, which is now referred to as "classical STUN".

[IETF RFC 3550] IETF RFC 3550 (2003), *RTP: A Transport Protocol for Real-Time Applications*.

[IETF RFC 3711] IETF RFC 3711 (2004), *The Secure Real-time Transport Protocol (SRTP)*.

3 Definitions

3.1 Terms defined elsewhere

This Recommendation uses the following terms defined elsewhere:

3.1.1 transport address [ITU-T H.323]: The transport layer address of an addressable ITU-T H.323 entity as defined by the (inter)network protocol suite in use. The Transport Address of an ITU-T H.323 entity is composed of the Network Address plus the transport layer service access point identifier of the addressable ITU-T H.323 entity.

3.2 Terms defined in this Recommendation

This Recommendation defines the following terms:

3.2.1 P2Pnat media: Indicates that media flows directly (peer-to-peer) between two communicating endpoints through NAT devices without the assistance of a media proxy.

3.2.2 pinhole: A temporary binding of an internal and an external transport address in the network address translator/firewall, which allows the bidirectional passage of packets between those addresses.

3.2.3 STUN server: A server to assist in network address translator type detection.

3.2.4 well-behaved NAT: A network address translator (NAT) that exhibits consistent behaviour over time of a given NAT type as categorized in clause 5 of [IETF RFC 3489].

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

ACF	Admission Confirm
ARJ	Admission Reject
ARQ	Admission Request
CUI	Channel Unique Identifier
EP	Endpoint
FW	Firewall
GEF	Generic Extensibility Framework
LAN	Local Area Network
LCF	Location Confirm

LRQ	Location Request
NAT	Network Address Translator
OID	Object Identifier
OLC	Open Logical Channel message
OLCAck	Open Logical Channel Acknowledge message
PER	Packed Encoding Rules
RTCP	Real-time Transport Control Protocol
RTP	Real-time Transport Protocol
SR	Sender Report
SRTCP	Secure Real-Time Transport Control Protocol
SRTP	Secure Real-time Transport Protocol
STUN	Simple Traversal of User datagram protocol through Network address translators
TCP	Transmission Control Protocol
TSAP	Transport layer Service Access Point
UDP	User Datagram Protocol

5 Feature description

This Recommendation defines a procedure wherein gatekeepers may negotiate between each other to determine a method to traverse media between endpoints where at least one of these endpoints is located behind a NAT/FW device, without requiring the use of an ITU-T H.460.19 server to proxy media.

This Recommendation is designed for use in networks that employ NAT/FW devices with well-behaved NAT characteristics. Networks that do not employ well-behaved NAT devices should continue to utilize [ITU-T H.460.18] and [ITU-T H.460.19] to ensure proper end-to-end media flows.

6 Capability advertisement

Endpoints capable of supporting P2Pnat media shall advertise this capability via the generic extensibility framework (GEF) defined in [ITU-T H.323] and [ITU-T H.460.1].

This feature shall be used in conjunction with ITU-T H.460.23 NAT/FW determination and [ITU-T H.460.18] (or optionally [ITU-T H.460.17]) as an alternative to [ITU-T H.460.19]. Endpoints seeking to support this feature shall also support [ITU-T H.460.23] and [ITU-T H.460.18]/[ITU-T H.460.19] or optionally [ITU-T H.460.17]/[ITU-T H.460.19].

If ITU-T H.460.18 or optionally ITU-T H.460.17 and ITU-T H.460.23 features are unsupported or unavailable, then this feature shall be disabled and shall not advertised.

Endpoints shall advertise the P2Pnat media feature when sending an ARQ to a gatekeeper. The feature indicator shall be included in the **supportedFeatures** field of the **featureSet** field and, if or when instructed by the gatekeeper via the replying ACF message, the feature indicator shall also be to include as a **supportedFeatures** field in the Setup message when placing calls to remote endpoints. The gatekeeper shall also advertise this capability to other gatekeepers via the generic data field contained in the LRQ and responding LCF messages.

NOTE – The advertisement and use of [ITU-T H.460.19] shall be determined by the media strategy of this feature (refer to clause 9).