SERIES H: AUDIOVISUAL AND MULTIMEDIA SYSTEMS

Infrastructure of audiovisual services – Supplementary services for multimedia

Using ITU-T H.225.0 call signalling connection as transport for media

Recommendation ITU-T H.460.26

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

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Using ITU-T H.225.0 call signalling connection as transport for media

Summary

Recommendation ITU-T H.460.26 enables ITU-T H.323 devices under the condition where UDP transport is unavailable, to transport media and control that otherwise would be transported over UDP to be tunnelled through the ITU H.225.0 signalling channel over TCP. This extension may be used in conjunction with Recommendation ITU-T H.460.17 "Using H.225.0 call signalling connection as transport for H.323 RAS messages" to facilitate the transportation of RAS, signalling (Recommendation ITU-T H.225.0), control (Recommendation ITU-T H.245) and media packets (RTP/RTCP/SRTP/SRTCP) over a signal TCP channel.

History

Edition	Recommendation	Approval	Study Group
1.0	ITU-T H.460.26	2012-06-29	16

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/.

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Recommendation ITU-T H.460.26

Using ITU-T H.225.0 call signalling connection as transport for media

1   Scope

This Recommendation describes the procedures for the transportation of RTP/SRTP and RTCP/SRTCP messages over an existing ITU-T H.225.0 call signalling connection.

Used in conjunction with [ITU-T H.460.17] and utilizing ITU-T H.225.0 as transport for ITU-T H.245 messages, this proposed Recommendation allows call related messaging (signalling and media) to be transported over ITU-T H.225.0 signalling within a single TCP connection.

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.235]	Recommendation ITU-T H.235 (2003), *Security and encryption for H-Series (H.323 and other H.245-based) multimedia terminals*.
[ITU-T H.245]	Recommendation ITU-T H.245 (2006), *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*.
[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

None.

3.2 Terms defined in this Recommendation

This Recommendation defines the following term:

3.2.1 media over ITU-T H.225.0: The mechanism allowing the transportation of media (RTP/SRTP/RTCP/SRTCP) over ITU-T H.225.0 signalling.

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

ACF   Admission Confirm

ARQ   Admission Request

ASN.1   Abstract Syntax Notation No. 1

GEF   Generic Extensible Framework

LCF   Location Confirm

LRQ   Location Request

PER   Packed Encoding Rules

RAS   Registration, Admission and Status

RCF   Registration Confirm

RRQ   Registration Request

RTCP   Real Time Control Protocol

RTP   Real Time Protocol

SRTCP   Secure Real Time Control Protocol

SRTP   Secure Real Time Protocol

TCP   Transmission Control Protocol

UDP   User Datagram Protocol

5 Feature description

This Recommendation defines a procedure wherein media and media control may be transported over ITU-T H.225.0 signalling.

This Recommendation is designed for use in secure and/or restricted networks where other ITU-T H.323 messaging may not be suitable, for instance in a network that restricts the number of available ports for either internal or external communication.

6 Informative description

This Recommendation outlines the mechanism for using the ITU-T H.225.0 call signalling connection as a transport for media. This Recommendation may be used in conjunction with [ITU-T H.460.17] to allow the transportation of RAS, call signalling and media over a single TCP connection.

This Recommendation should only be considered for the condition wherein the transport of media over UDP is unavailable. The detection/decision on whether transport over UDP is available is beyond the scope of this Recommendation.

7 Capability advertisement

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

When initiating a call and the endpoint is registered to a gatekeeper, the endpoint shall indicate its support of this Recommendation via the featureSet.supportedFeatures field in the ARQ message to the gatekeeper, and the gatekeeper shall acknowledge the requirement of this feature via the featureSet.neededFeatures field of the responding ACF message.

The advertisement of this Recommendation may indicate to the gatekeeper that transport over UDP may not be available to the endpoint.

When placing the call, this Recommendation shall advertise this feature in the featureSet.neededFeatures field of the ITU-T H.225.0 SETUP message and it shall be acknowledged in the ITU-T H.225.0 CALLPROCEEDING or ALERT or CONNECT message.

Table 1 defines the media over ITU-T H.225.0 feature of this Recommendation.

Table 1 – Indication of media over ITU-T H.225.0 feature

Feature name:	Media over ITU-T H.225.0
Feature description:	This feature allows ITU-T H.225.0 to be used as a transport for media
Feature identifier type:	Standard
Feature identifier value:	26

8 ITU-T H.245 considerations

Transport addresses in the OpenLogicalChannel and OpenLogicalChannelAck have no meaning when tunnelling media. All optional mediaChannel and MediaControlChannel elements contained in the H2250LogicalChannelParameters shall be omitted. The transportCapability element shall be present with an optional mediaChannelCapabilities field containing a SEQUENCE OF containing 1 element of MediaTransportType ip_TCP.

9 Packaging of media

All media/control shall be packed as regular RTP/SRTP/RTCP/SRTP frames and shall be transmitted unaltered, and unpacked and processed as if they were regular media/control frames.

Media shall be packed and transmitted over ITU-T H.225.0 via the Media Payload parameter contained within the genericData field of an ITU-T H.225.0 INFORMATION message.

Table 2 – Media Payload parameter

Parameter name:	Media Payload
Parameter description:	Indicates the encoded payload
Parameter identifier type:	Standard
Parameter identifier value:	1
Parameter type:	Raw
Parameter cardinality:	One and only one

The Media Payload parameter defined in Table 2 shall contain an encoded UDP_Frame element (refer to Annex A).

The UDP frame element shall contain:

– **sessionId**: the unique session id of the RTP/SRTP/RTCP/SRTCP.

– **dataframe**: whether the frame field is RTP/SRTP (true) or RTCP/SRTCP (false).

– **frame**: sequence of complete RTP/SRTP/RTCP/SRTCP frames.

The ITU-T H.225.0 INFORMATION message in this Recommendation is the designated transport media from the encoder device to the decoder device. If the call is then forwarded to another party, the ITU-T H.225.0 INFORMATION message shall be removed and not passed on.

9.1 Audio considerations

To reduce message handling, it is recommended to bundle a small number of audio RTP/SRTP frames into one media payload element.

9.2 Video considerations

To enable the efficient management of media, it is recommended to bundle video RTP/SRTP frames according to the RTP/SRTP timestamp within the media payload element. In other words, all the elements of the media payload contain the same timestamp.

10 ITU-T H.225.0 message management

To efficiently manage the ITU-T H.225.0 call signalling channel, it is recommended to prioritize the messages sent over the channel via a priority buffer. Preference shall be given to time-critical messages such as audio, delivery-critical messages such as call/media signalling, and discretionary/recoverable messages such as video. How the priority buffer is implemented is beyond the scope of this Recommendation.

Furthermore, call signalling is transmitted over a reliable transport and may on occasion add long delays or block message transmission. It is recommended that the priority buffer times (time held in the buffer) be monitored and, once a limit is reached or the underlying transport is blocked, that the buffer be purged of video messages and that local bandwidth management policies be employed to reduce such delays or blockages. When purging video messages from the buffer, a fresh I frame shall be sent.

Annex A

ASN.1 code for ITU-T H.460.26

(This annex forms an integral part of this Recommendation.)

```
MEDIA-OVER-H2250 {itu-t(0) recommendation(0) h(8) 460 26 version(0) 1 media-
over-h2250(0)} DEFINITIONS AUTOMATIC TAGS ::=
BEGIN
FrameData ::= CHOICE
{
    rtp             OCTET STRING (SIZE(12..1500)),
    rtcp            OCTET STRING (SIZE(1..1500))
}
UDPFrame ::= SEQUENCE
{
    sessionId       INTEGER (0..255),
    dataFrame       BOOLEAN,
    frame           SEQUENCE OF FrameData
}
END
```

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