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R. Even
A. Lochbaum
Polycom

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MIME Type Registration for RTP Payload Format for H.224

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Abstract

In conversational video applications, far-end camera control protocol is used by participants to control the remote camera. The protocol that is commonly used is ITU H.281 over H.224. The document registers the H224 media type. It defines the syntax and the semantics of the Session Description Protocol (SDP) parameters needed to support far-end camera control protocol using H.224.

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1. Introduction

The document registers the H224 media type, which may be used by systems that use SDP [RFC4566].

This media type is used for supporting the simple far-end camera control protocol on SDP-based systems. The media type helps signaling gateways between H.323 [ITU.H323] and SDP-based systems to use far-end camera control, end to end, without any protocol translation in the middle.

The document defines the H224 media type since the RTP packets in H.323 annex Q [ITU.H323] carry H.224 frames [ITU.H224]. The far-end camera control protocol (FECC) is internal to the H.224 frame and is identified by the client ID field of the H.224 packet.

The document will define the SDP [RFC4566] parameters needed to support the above far-end camera control protocol in systems that use SDP.

2. Terminology

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in RFC2119 [RFC2119] and indicate requirement levels for compliant RTP implementations.

3. Far-End Camera Control Protocol

This simple protocol is based on ITU-T H.281[ITU.281] frames carried in ITU-T H.224 packets in an RTP/UDP channel. H.323 annex Q specifies how to build the RTP packets from the H.224 packets.

Using far end camera control protocol in point-to-point calls and multipoint calls for packet-switch networks is described in H.323, annex Q.

4. IANA Considerations

4.1. Media Type Registration

This section describes the media types and names associated with this payload format. The registration uses the templates defined in RFC 4288 [RFC4288]. It follows RFC 3555 [RFC3555].

4.1.1. Registration of MIME Media Type application/h224

MIME media type name: application

MIME subtype name: H224

Required parameters: None

Optional parameters: None

Encoding considerations:

This media type is framed (see H.323, Annex Q [ITU.H323]) and contains binary data; see Section 4.8 of [RFC4288]

Security considerations: See Section 6 of RFC 4573.

Interoperability considerations:

Terminals sending simple far-end camera control commands should use this MIME type. Receivers who cannot support the protocol will reject the channel.

Published specification: RFC 4573

Applications that use this media type:

Video conferencing applications.

Additional information: None

Person and email address to contact for further information:

Roni Even: roni.even@polycom.co.il

Intended usage: COMMON

Restrictions on usage:

This media type depends on RTP framing and thus is only defined for transfer via RTP [RFC3550]. Transport within other framing protocols is not defined at this time.

Author: Roni Even

Change controller:

IETF Audio/Video Transport working group, delegated from the IESG.

5. SDP Parameters

The media type application/h224 string is mapped to fields in the Session Description Protocol (SDP) as follows:

- The media name in the "m=" line of SDP MUST be application. The transport SHALL be any applicable RTP profile (for example RFC 3551 [RFC3551]), and the payload type is dynamic.

- The encoding name in the "a=rtpmap" line of SDP MUST be h224 (the MIME subtype).

- The default clock rate in the "a=rtpmap" line MUST be 4800.

The recommended maximum bandwidth for this protocol is 6.4 kbit/sec.

5.1. Usage with the SDP Offer Answer Model

When offering FECC using SDP in an Offer/Answer model [RFC3264], the following considerations are necessary.

Far-end camera control communication is uni-directional. H.224 is bi-directional and can be used to learn the capabilities of the remote video end point, e.g., how many cameras it has. The offer answer exchange is dependent on the functionality of both sides.

The offerer offers a sendonly channel if its camera cannot be remotely controlled and if the offerer does not intend to use H.224 to learn the capabilities of the remote video endpoints.

In all other cases, when the offerer’s camera can be remotely controlled and/or it intends to use H.224 capabilities negotiation, the offerer offers a sendrecv channel.

The answerer behavior is as follows:

If it receives an offer with sendonly, it answers with a recvonly if it supports far-end camera control; otherwise, it ignores/rejects the offer.

If it receives an offer with sendrecv and its camera can be remotely controlled, or it intends to use H.224 capabilities negotiation, it answers with a sendrecv option. If its camera cannot be remotely controlled, it can answer with a sendonly attribute. The answerer may also reject the offer if he does not support FECC or does not intend to use FECC at the moment.

6. Security Considerations

H.224 payload format, defined in H.323, annex Q defines packet structure based on RTP using the RTP header structure from RFC 3550. Those packets are subject to the security considerations discussed in the RTP specification [RFC3550]. This implies that confidentiality of the media streams is achieved by encryption. Secure Realtime Transport Protocol (SRTP) [RFC3711] may be used to provide both encryption and integrity protection of RTP flow.

A potential denial-of-service threat exists for data that causes application behavior like camera movement. The attacker can inject pathological datagrams into the stream that cause the receiver to change the camera position. Therefore, the usage of data origin authentication and data integrity protection of at least the H.323 annex Q packet is RECOMMENDED; for example, with SRTP.

Note that the appropriate mechanism to ensure confidentiality and integrity of H.323 annex Q packets and their payloads is very dependent on the application and on the transport and signaling protocols employed. Thus, although SRTP is given as an example above, other possible choices exist.

7. References

7.1. Normative References

[ITU.281] International Telecommunications Union, "A far end camera control protocol for videoconferences using H.224", ITU- T Recommendation H.281, November 1994.

[ITU.H224] International Telecommunications Union, "A real time control protocol for simplex applications using the H.221 LSD/HSD/HLP channels.", ITU-T Recommendation H.224, February 2000.

[ITU.H323] International Telecommunications Union, "Visual telephone systems and equipment for local area networks which provide a non-guaranteed quality of service", ITU-T Recommendation H.323, July 2003.

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, March 1997.

[RFC3264] Rosenberg, J. and H. Schulzrinne, "An Offer/Answer Model with Session Description Protocol (SDP)", RFC 3264, June 2002.

[RFC3550] Schulzrinne, H., Casner, S., Frederick, R., and V. Jacobson, "RTP: A Transport Protocol for Real-Time Applications", STD 64, RFC 3550, July 2003.

[RFC4566] Handley, M., Jacobson, V., and C. Perkins, "SDP: Session Description Protocol", RFC 4566, July 2006.

7.2. Informative References

[RFC3551] Schulzrinne, H. and S. Casner, "RTP Profile for Audio and Video Conferences with Minimal Control", STD 65, RFC 3551, July 2003.

[RFC3555] Casner, S. and P. Hoschka, "MIME Type Registration of RTP Payload Formats", RFC 3555, July 2003.

[RFC3711] Baugher, M., McGrew, D., Naslund, M., Carrara, E., and K. Norrman, "The Secure Real-time Transport Protocol (SRTP)", RFC 3711, March 2004.

[RFC4288] Freed, N. and J. Klensin, "Media Type Specifications and Registration Procedures", BCP 13, RFC 4288, December 2005.

Authors' Addresses

Roni Even
Polycom
94 Derech Em Hamoshavot
Petach Tikva 49130
Israel

EMail: roni.even@polycom.co.il

Andrew Lochbaum
Polycom
6500 River Place Blvd, Building 6
Austin, TX 78730
USA

EMail: alochbaum@polycom.com

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