

**Signalling of CLUE and SDP offer/answer
draft-even-clue-sdp-clue-relation-01.txt**

Abstract

This document describes the relation between the different CLUE attributes as specified in the CLUE framework and the SDP attributes. The document will discuss the issues with the CLUE call signalling in order to keep the consistency between the Offer/answer state and the CLUE state.

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1. Introduction

The CLUE framework[I-D.ietf-clue-framework] is used to specify the information needed for creating a Telepresence call. The model includes the Media capture information providing information about content of the streams and can provide information about the spatial information between streams based on the capture point and area of capture. A capture scene includes media captures that are part of a same scene e.g. room capture or presentation.

The other information defined in the framework is the Encoding information providing information about the abilities of the providers to send streams allowing a consumer to configure a capture to a specific encoding.

The next sections will look at the capture attributes and the encoding parameter and describe the relation to SDP [[RFC4566](#)].

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. Capture attributes

The media capture attributes provide static information about the captures. This includes the content of information and can provide spatial information in order to allow the "being there" experience. The media capture attributes include the content describing the role of the media capture, if the content is composed or switched and spatial information providing the three dimensional position of the streams.

The media capture content attribute is based on SDP content attribute [[RFC4796](#)] The other attribute do not have similar SDP attributes.

When starting a call the initial offer may include more than one media stream of a media type with a content attribute (e.g. offer main and slide SDP content). In this case the advertisement will also include media captures for main and slides. If the initial offer did not provide content attribute there is no need to provide it later assuming that if the answerer do not support CLUE protocol it is not sure that he will support the content attribute [[RFC4796](#)]

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As for the other attributes, there are no similar SDP attributes and they provide information which can be used by TelePresence systems. The media capture switched and composed attributes provide information about the creation of the content. Using RTP/RTCP SRR and CSRC [RFC3550] can provide information about the content of the media captures.

The CLUE framework [I-D.ietf-clue-framework] recommends using one transport connection for each media type multiplexing using one RTP session. This also makes it simple to add and remove media capture by the consumer without a need for an [RFC3264] offer answer.

The exception is if the consumer prefers using a separate RTP non multiplex session. In this case when adding or removing a media capture there will be a need to have also an offer answer session to specify the UDP port for the new RTP session or to close it. (note that ICE exchange may be required too). The open question is what should be done first, CLUE configuration or SDP offer/answer.

As can be seen there is minimal duplication between SDP and these media capture attributes. There is a need to correlate between the RTP streams and media captures; this is discussed in CLUE RTP mapping [I-D.even-clue-rtp-mapping]

When multiplexing RTP streams in a single RTP session there is probably no need for offer answer exchange when the consumer send a new configuration.

4. Encoding parameters

A media capture can specify an encoding group that maps a media capture to encoding parameters. The encoding parameters are used to provide information about the ability of a CLUE endpoint to send streams. An encoding group is composed of individual encodes that may be used by a media capture to encode a stream as long as the total values of the attributes used by the individual encodes in the group do not exceed the group encode values.

The individual encode parameters include: maxBandwidth, maxH264Mbps, maxWidth, maxHeight and maxFrameRate. The encoding group parameters include MaxGroupBandwidth, MaxGroupH264Mbps, and for video MaxBandWidth. Note that the use case is to provide information about the send capabilities of the provider.

The max H264Mbps is H.264 specific and there is a similar parameters in RFC6184 [RFC6184] but in RFC6184 signals the receiver capability.

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The maxFrameRate is similar to SDP framerate attribute, for maxWidth and MaxHeight there are similar parameters in [\[RFC6236\]](#). All these parameters carried in SDP signal the receiver capability or requested mode.

The maxBandwidth is similar to the SDP b=attribute and specifying group and individual values can be partially done using the session level and media level attributes. The major different again is that the b= attribute is used to describe receiver capability, maximum bandwidth it can receive.

The Media capture encoding information and SDP attribute are similar but they indicate different types of limitations. While the Media capture attributes are sender encoding capabilities the SDP ones specify receiver capabilities. This is because of the different usage. The SDP attributes are used by the receiver to indicate what it can receive and decode. Still in H.264 the parameter sets are used to convey some of the above parameters (like width and height) and can be conveyed in SDP using sprop-parameter-sets or sprop-level-parameter-sets. In general the "sprop" attributes are used to convey sender capabilities.

The [RFC3264](#) [\[RFC3264\]](#) offer/answer is used by the receiver to limit or ask for a specific mode. Since the encoding parameters specify limits on the sending side it may look like there is no correlation problem. The next sections will look at the specific parameters and see if this assumption is correct.

The CLUE maxBandWidth is limiting the maximum bandwidth that a sender will use. The receiver can ask for higher or lower bandwidth based on H.264 level or using the SDP "b" attribute. If asking for higher than the CLUE value will limit and is asking for lower value the SDP value will be the limiting factor. A change mid-call may happen for example because of congestion. The endpoint must be aware of both values. Note that bandwidth change using RTCP TMMBR [\[RFC5104\]](#) can occur. If the previous bandwidth was higher than the CLUE maxBandwidth and the new band width is lower the EP must use the lowest bandwidth. Since the bandwidth in the offer and answer provide information about receiver capabilities it means that if the value is changed by an intermediary like an SBC the sender will know that the receiver now have different value and act accordingly.

The maxH264Mbps and maxFrameRate show similar behavior to maxBandwidth.

The CLUE maxWidth and maxHeight as sender capability and the image attribute in SDP are both send and receive capability. The recommendation is for using [RFC6236](#) to negotiate these values and not

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CLUE encoding. The maxH264Mbps and maxFrameRate can be sufficient to provide compute limitations on the encoder side.

Conclusion - except for the maxWidth and maxHeight there is no problem between the SDP and CLUE encoding values as long as SDP attributes are used as receiver capabilities and the relation between the two protocols is defined. Changing SDP values will not require a change in CLUE advertisement or configuration and vice versa since these parameters signal maximum values and not exact values.

5. Acknowledgements

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6. IANA Considerations

TBD

7. Security Considerations

TBD.

8. References

8.1. Normative References

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

8.2. Informative References

- [I-D.even-clue-rtp-mapping]
Even, R. and J. Lennox, "Mapping RTP streams to CLUE media captures", [draft-even-clue-rtp-mapping-04](#) (work in progress), September 2012.
- [I-D.ietf-clue-framework]

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Romanow, A., Duckworth, M., Pepperell, A., and B. Baldino, "Framework for Telepresence Multi-Streams", [draft-ietf-clue-framework-06](#) (work in progress), July 2012.

- [RFC3550] Schulzrinne, H., Casner, S., Frederick, R., and V. Jacobson, "RTP: A Transport Protocol for Real-Time Applications", STD 64, [RFC 3550](#), July 2003.
- [RFC4796] Hautakorpi, J. and G. Camarillo, "The Session Description Protocol (SDP) Content Attribute", [RFC 4796](#), February 2007.
- [RFC5104] Wenger, S., Chandra, U., Westerlund, M., and B. Burman, "Codec Control Messages in the RTP Audio-Visual Profile with Feedback (AVPF)", [RFC 5104](#), February 2008.
- [RFC6184] Wang, Y., Even, R., Kristensen, T., and R. Jesup, "RTP Payload Format for H.264 Video", [RFC 6184](#), May 2011.
- [RFC6236] Johansson, I. and K. Jung, "Negotiation of Generic Image Attributes in the Session Description Protocol (SDP)", [RFC 6236](#), May 2011.

Author's Address

Roni Even
Huawei
Tel Aviv,
Israel

Email: roni.even@mail01.huawei.com

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