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CLUE Protocol Data Channel
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Abstract

This document specifies how to use the Stream Control Transmission Protocol (SCTP) on top of the Datagram Transport Layer Security (DTLS) protocol (SCTPoDTLS) for transporting CLUE protocol messages between CLUE entities.

The document describes the SCTP considerations for CLUE, and the SDP Offer/Answer procedures for negotiating a SCTPoDTLS connection for CLUE.

Details and procedures associated with the CLUE protocol are outside the scope of this document.

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1. Introduction

This document specifies how to use the Stream Control Transmission Protocol (SCTP) on top of the Datagram Transport Layer Security (DTLS) protocol (SCTPoDTLS) for transporting CLUE protocol messages between CLUE entities.

The document describes the SCTP considerations for CLUE, and the SDP Offer/Answer procedures for negotiating a SCTPoDTLS connection for CLUE.

Details and procedures associated with the CLUE protocol are outside the scope of this document.

2. Conventions

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 BCP 14, RFC 2119 [RFC2119].

CLUE data channel refers to the SCTPoDTLS association that is used between two CLUE entities in order to transport CLUE messages.

CLUE message refers to a CLUE protocol message that is sent over the CLUE data channel.

CLUE entity refers to a SIP User Agent (UA) device that supports the CLUE mechanism (including the CLUE protocol).

[RFC4960] defines a SCTP stream as a unidirectional logical channel established from one to another associated SCTP endpoint, within which all user messages are delivered in sequence except for those submitted to the unordered delivery service.

[RFC4960] defines a SCTP identifier as a unsigned integer, which identifies an SCTP stream.

3. Usage of SCTPoDTLS in the CLUE Context

3.1. General

This section defines the CLUE data channel, and describes the SCTP features and extensions used to realize it.

The CLUE data channel realization, and set of SCTP features, are based on the the RTCWEB data channel defined in [I-D.ietf-rtcweb-data-channel]. This will allow CLUE entities to be interoperable with entities implementing [I-D.ietf-rtcweb-data-channel].

3.2. CLUE Data Channel Definition

The CLUE data channel is realized by using the Stream Control Transmission Protocol (SCTP) on top of the Datagram Transport Layer Security (DTLS) protocol [I-D.ietf-tsvwg-sctp-dtls-encaps].

The realization of a bidirectional CLUE Data Channel is a pair of one incoming SCTP stream and one outgoing SCTP stream. These streams are then used to transport CLUE messages in both directions.

The SCTP streams MUST belong to the same SCTP association.

Within a given CLUE session, CLUE entities MUST use a single CLUE data channel for all CLUE messages associated with the CLUE session.

The SCTP streams MUST have identical SCTP stream identifier values, unless a specific value is already used for some other purpose.

OPEN ISSUE #1: The requirement to use identical STCP stream identifier values might be modified depending on what mechanism will be used to negotiate the identifier values.

3.3. RTCWEB Data Channel Protocol Usage

OPEN ISSUE #2: It is FFS whether the RTCWEB Data Channel Protocol [I-D.ietf-rtcweb-data-protocol] will be used with the CLUE data channel.

NOTE: If [I-D.ietf-rtcweb-data-protocol] will be used with the CLUE data channel, a new associated 'protocol' value needs to be registered with IANA in the 'Protocol Registry' defined by [I-D.ietf-rtcweb-data-protocol].

3.4. SCTP Considerations

3.4.1. SCTP Payload Protocol Identifier (PPID)

CLUE entities MUST use the PPID value XX, according to the procedures in [I-D.ietf-rtcweb-data-channel].

NOTE: As described in [I-D.ietf-rtcweb-data-channel], the PPID value XX indicates that the SCTP message contains data encoded in a UTF-8 format [reference-needed]. The PPID value XX does not indicate what protocol the SCTP message contains.

NOTE: If the RTCWEB Data Channel Protocol [I-D.ietf-rtcweb-data-protocol] will be used for the CLUE data channel, the PPID value 50 will be used for Data Channel Protocol messages.

3.4.2. Reliability

The usage of SCTP for the data channel ensures reliable transport of CLUE messages.

NOTE: [I-D.ietf-rtcweb-data-channel] requires the support of the partial reliability extension defined in [RFC3758]. This is not needed for CLUE, as messages are required to always be sent reliably. [I-D.ietf-rtcweb-data-channel] also mandates support of the limited retransmission policy defined in [I-D.tuexen-tsvwg-sctp-prpolicies].

3.4.3. Order

CLUE entities MUST use the ordered delivery SCTP service, as described in section 6.6 of [RFC2960].

3.4.4. Stream Reset

CLUE entities MUST support the stream reset extension defined in [RFC6525]

The dynamic address reconfiguration extension defined in [RFC5061] MUST be used to signal the support of the stream reset extension defined in [RFC6525]. Other features of [RFC5061] MUST NOT be used.

3.4.5. Interleaving

CLUE entities MUST support the message interleaving mechanism defined in [I-D.stewart-tsvwg-sctp-ndata].

3.4.6. SCTP Multihoming

CLUE entities MUST NOT use SCTP multihoming.

NOTE: The SCTPoDTLS mechanism does not support SCTP multihoming.

4. SDP Offer/Answer Procedures

4.1. SDP-based WebRTC Data Channel Negotiation Usage

OPEN ISSUE #3: It is FFS whether the SDP-based WebRTC Data Channel Negotiation mechanism [I-D.ejzak-dispatch-webrtc-data-channel-sdpneg] will be used with the CLUE data channel.

NOTE: If [I-D.ejzak-dispatch-webrtc-data-channel-sdpneg] will be used with the CLUE data channel, a new associated 'sub-protocol' value needs to be registered with IANA.

5. Security Considerations

TBD

6. IANA Considerations

[RFC EDITOR NOTE: Please replace RFC-XXXX with the RFC number of this document.]

7. Acknowledgments

Thanks to Paul Kyzivat and Christian Groves for comments on the document.

8. Change Log

[RFC EDITOR NOTE: Please remove this section when publishing]

Changes from draft-holmberg-clue-datachannel-01

o More text added

Changes from draft-holmberg-clue-datachannel-00

o Editorial corrections based on comments from Paul K

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9.1. Normative References

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