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ROHC LLA Implementer's Guide
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Abstract

This document describes common misinterpretations and some ambiguous points of ROHC LLA [3], which defines the Link-Layer Assisted profile for IP/UDP/RTP.

These points have been identified by the members of the ROHC working group during implementation of the profile.

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1. Introduction

ROHC LLA [3] defines a profile for compressing IP/UDP/RTP by using functionality provided by the lower layers to achieve a zero byte compressed header during normal operation.

During implementation of this profile, some errors and unclear areas have been identified. This document tries to correct and clarify those points.

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 [RFC 2119](#) [1].

3. CSP Packet Format

The format of the CSP packet has been identified as non-interoperable when carrying a RHP header with a 3-bit or 7-bit CRC. This problem occurs due to the payload having been dropped by the compressor, while the decompressor is supposed to use the payload length to infer certain fields in the uncompressed header. These fields are the IPv4 total length, the IPv6 payload length, the UDP length and the IPv4 header checksum field (all INFERRED fields in [2]).

To correct this problem, the CSP packet needs to contain information about the payload length carried in the RHP packet. Therefore the length of the RTP payload is carried in the CSP packet. The redefined format for the CSP packet is therefore as follows:


```

0  1  2  3  4  5  6  7
+---+---+---+---+---+---+---+---+
| 1  1  1  1  1  0  1  0 | Packet type identifier
+---+---+---+---+---+---+---+---+
/      RTP Payload Length      / 2 octets
+---+---+---+---+---+---+---+---+
:  ROHC header without padding  :
:    see [ROHC, section 5.7]    :
+---+---+---+---+---+---+---+---+

```

Updating properties: CSP maintains the updating properties of the ROHC header it carries.

RTP Payload Length: This field is the length of the payload carried inside the RTP header, stored in network byte order. I.e. this field will be set by the compressor to (UDP length - size of the RTP header including CSRC identifiers).

When the decompressor receives a CSP packet, it MUST use the RTP payload length field to calculate the value of fields classified as INFERRED in [2] when attempting to verify a 3- or 7-bit CRC carried in the RHP header enclosed in the CSP.

When the encapsulated RHP packet only carries an 8-bit CRC, the RTP payload length MAY be used by the decompressor for verification of the decompressed header.

The packet format defined in this section obsoletes the header format for the CSP defined in [3] [Section 4.1.2](#).

4. CRC Verification of CCP packets

When a CCP packet with the C-bit set is received by the decompressor, the decompressor uses the 7-bit CRC in the packet to verify the context. For this verification to succeed, the decompressor needs to have access to the entire uncompressed header of the latest packet decompressed.

Some implementations of [2] might not save the values of INFERRED fields. An implementation of ROHC LLA MUST save these fields in the decompressor context to be able to successfully verify CCP packets.

Also, [section 4.1.3](#) of [3] states that upon CRC failure, the actions of [2] [section 5.3.2.2.3](#) MUST be taken. That section specifies that detection of SN wraparound and local repair must be performed. Neither of these steps apply when the failing packet is a CCP, and therefore only the action described when both these steps fail should be taken (i.e the steps a-d).

5. Security Consideration

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This document provides some changes and clarifications to [3], but it is not believed that these changes add any extra security considerations than those listed in [3].

6. Acknowledgments

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8. References

8.1. Normative references

- [1] S. Bradner, "Key words for use in RFCs to Indicate Requirement Levels", [RFC 2119](#), March 1997.
- [2] C. Bormann, et. al, "RObust Header Compression (ROHC): Framework and four profiles: RTP, UDP, ESP, and uncompressed", [RFC 3095](#), July 2001.
- [3] L. Jonsson, G. Pelletier, "RObust Header Compression (ROHC): A Link-Layer Assisted Profile for IP/UDP/RTP", [RFC 3242](#), April 2002.

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