SCHC over PPP
draft-thubert-lpwan-schc-over-ppp-00

Abstract

This document extends RFC 5172 to signal the use of SCHC as the compression method between a pair of nodes over PPP. Combined with RFC 2516, this enables the use of SCHC over Ethernet and Wi-Fi.

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1. Introduction

The Point-to-Point Protocol (PPP) [RFC5172] provides a standard method of encapsulating network-layer protocol information over point-to-point links. "A Method for Transmitting PPP Over Ethernet (PPPoE)" [RFC2516] transports PPP over Ethernet between a pair of nodes. It is compatible with a translating bridge to Wi-Fi, and therefore enables PPP over Wi-Fi as well.

PPP also defines an extensible Link Control Protocol, and proposes a family of Network Control Protocols (NCPs) for establishing and configuring different network-layer protocols. "IP Version 6 over PPP" [RFC5072] defines the IPv6 Control Protocol (IPv6CP), which is an NCP for a PPP link, and allows for the negotiation of desirable parameters for an IPv6 interface over PPP.

"Negotiation for IPv6 Datagram Compression Using IPv6 Control Protocol" [RFC5172] defines the IPv6 datagram compression option that can be negotiated by a node on the link through the IPv6CP. The "Static Context Header Compression (SCHC) and fragmentation for LPWAN, application to UDP/IPv6" [SCHC] is a compression and fragmentation technique that was defined after the publication of [RFC5172]. In order to enable SCHC over PPP and therefore Ethernet and Wi-Fi, [RFC5172] must be extended to signal SCHC as an additional compression method for use over PPP.

2. BCP 14

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in BCP 14 [RFC2119] [RFC8174] when, and only when, they appear in all capitals, as shown here.
3. Extending RFC 5172

[RFC5172] defines an IPV6CP option called the IPv6-Compression-Protocol Configuration option with a type of 2. The option contains an IPv6-Compression-Protocol field value that indicates a compression protocol and an optional data field as shown in Figure 1:

```
+---------------+---------------+---------------+
|       Type    |    Length     | IPv6-Compression-Protocol |
|---------------+---------------+---------------------------|
| Data ...      |---------------+---------------------------|
+---------------+---------------+---------------------------|
```

Figure 1: The IPv6-Compression-Protocol Configuration Option

This specification indicates a new IPv6-Compression-Protocol field value for [SCHC] (see Section 5, and enables to transport a Uniform Resource Identifier (URI) [RFC3986] of the set of rules in the optional data. The default format for the set of rules is YANG using the "Data Model for SCHC" [SCHC_DATA_MODEL] encoded in JSON as specified in [RFC7951]. If the encoding is asymetrical, the initiator of the session is considered downstream, playing the role of the device in an LPWAN network.

4. Security Considerations

This draft enables to use the SCHC compression and fragmentation over PPP and therefore Ethernet and Wi-Fi with PPPoE. It inherits the possible threats against SCHC listed in the "Security considerations" section of [SCHC].

5. IANA Considerations

This document requests the allocation of a new value in the registry "IPv6-Compression-Protocol Types" for "SCHC". A suggested value is proposed in Table 1:

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Static Context Header Compression (SCHC)</td>
<td>This document</td>
</tr>
</tbody>
</table>

Table 1: IP Header Compression Configuration Option Suboption Types
6. Acknowledgments

7. Normative References


8. Informative References


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