CoAP Payload-Length Option Extension
draft-li-core-coap-payload-length-option-03

Abstract

   This document defines an extension to the Constrained Application
   Protocol (CoAP) to add one new option: Payload-Length, which is used
   to indicate the length of the payload of the message.

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1. Introduction

   This specification adds one new option to the Constrained Application
   Protocol (CoAP): Payload-Length.

1.1. Motivation

   If a CoAP message is transported through UDP, the message length can
   be obtained from the UDP header. But not all transport mechanisms
   provide an unambiguous length of the CoAP message. For example, in
   industry field, there are some data tranport protocols, like RS232,
   RS422, RS485, which don't provide message length indication. For
   these cases, an indication of the payload length of the message is
   needed in CoAP message level.

   TBD: how about CAN bus protocol, USB 2.0?

   With this option, it will be easier for the receiver to extract the
   payload part from the whole message.

   Another benefit to have this option is to check the integrity of the
   message length.

1.2. Justification

   To indicate the payload length, another alternative is to use
   encoding method as specified in section 3.2 of [RFC7252], but it is
   better to use an Option for this.

   Reason is that, payload length is an optional feature, and in most of
   the cases, it is not necessary to be indicated. If we use encoding
   method, every implementation needs to support this encoding for the

payload, not only for the options. If we use an Option for this, it
is optional, and it can be optionally implemented where necessary.

1.3. Terminology

The terms CoAP Server and CoAP Client are used synonymously to Server
and Client as specified in the terminology section of [RFC7252].

1.4. Requirements Language

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].

2. Option Definition

```
+------+---+---+---+---+---------------+--------+--------+---------+
| Type | C | U | N | R |     Name      | Format | Length | Default |
+------+---+---+---+---+---------------+--------+--------+---------+
| TBD  | - | - | - | - | Payload-Length| uint   | 0-2 B  | (none)  |
+------+---+---+---+---+---------------+--------+--------+---------+
```

If this option is present, the value of this option is an unsigned
integer giving the length of the payload of the message. Note that
this integer can be zero for a zero-length payload, which can in turn
be represented by a zero-length option value.

The Payload-Length option does not have a default value, so in case
of its absence the receiver MUST determine the payload length through
other means. This is to keep backward compatibility. If the option
is absent, the payload can have any size, and the payload length
needs to be determined as it is currently done for UDP.

The minimum payload length is 0, and the maximum payload length is
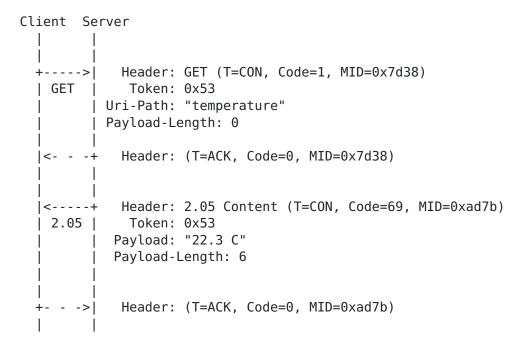$2^{16}-1 = 65535$.

In case that the transport layer does not provide message length
indication, the Payload-Length option SHOULD be included in the CoAP
message. Otherwise, it MAY be included.

This options can be used both in the request and response.

This option MUST NOT occur more than once.

3. Example

In the example below, in the GET request, the payload is empty, so
the Payload-Length option has a zero-length option payload. In the
response, the payload is "22.3 C", and the Payload-Length is 6.

```
    Client  Server
       |      |
       |      |
     +----->|    Header: GET (T=CON, Code=1, MID=0x7d38)
     | GET  |     Token: 0x53
     |      | Uri-Path: "temperature"
     |      | Payload-Length: 0
     |      |
     |<- - -+   Header: (T=ACK, Code=0, MID=0x7d38)
     |      |
     |      |
     |<-----+    Header: 2.05 Content (T=CON, Code=69, MID=0xad7b)
     | 2.05 |     Token: 0x53
     |      |   Payload: "22.3 C"
     |      |   Payload-Length: 6
     |      |
     |      |
     +- - ->|    Header: (T=ACK, Code=0, MID=0xad7b)
     |      |
```

4. IANA Considerations

The IANA is requested to add the following option number entries:

```
     +--------+----------------+----------------------------+
     | Number |      Name      | Reference                  |
     +--------+----------------+----------------------------+
     |  TBD   | Payload-Length | Section 2 of this document |
     +--------+----------------+----------------------------+
```

5. Security Considerations

The Payload-Length option defined in this document presents no
security considerations beyond those in Section 10 of the base CoAP
specification [RFC7252].

6. Acknowledgements

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7. Normative References

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

[RFC7252] Shelby, Z., Hartke, K., and C. Bormann, "The Constrained
           Application Protocol (CoAP)", RFC 7252, June 2014.

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