

6Lo  
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Constrained Application Protocol (CoAP) over IEEE 802.15.4 Information  
Element for IETF  
draft-bormann-6lo-coap-802-15-ie-00.txt

## Abstract

IEEE Std. 802.15.4-2015 defines Information Elements (IE), and [draft-kivinen-802-15-ie](#) defines a framework for using these IEs in IETF protocols.

The present specification defines a way to transport CoAP messages in IEs. This can be used to perform CoAP exchanges with neighboring IEEE 802.15.4 nodes before there is IP connectivity, e.g., to configure that IP connectivity.

[draft-wang-6tisch-6top-coapie](#) demonstrates example applications of this for 6TiSCH. Other areas of application are conceivable even in classic 6LoWPAN networks.

## Status of This Memo

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## [1.](#) Introduction

(See abstract for now.)

### [1.1.](#) Terminology

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 [RFC 2119](#) [[RFC2119](#)].

In this specification, the term "byte" is used in its now customary sense as a synonym for "octet".

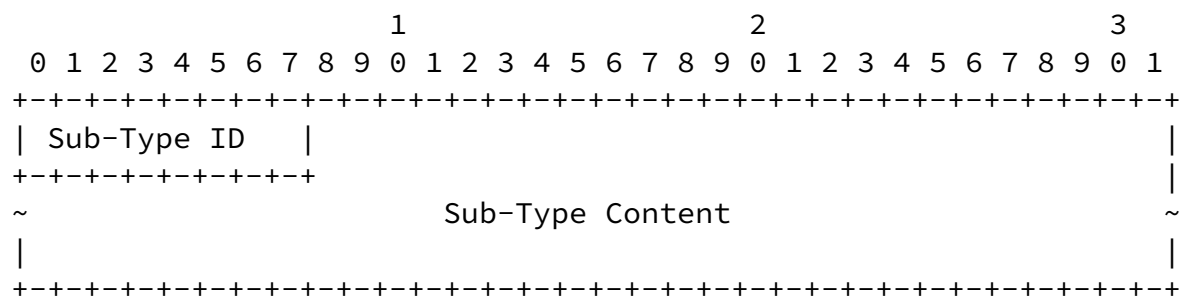
## [2.](#) CoAP over IETF IE

The format of the IETF IE is defined in [[I-D.kivinen-802-15-ie](#)] as follows:

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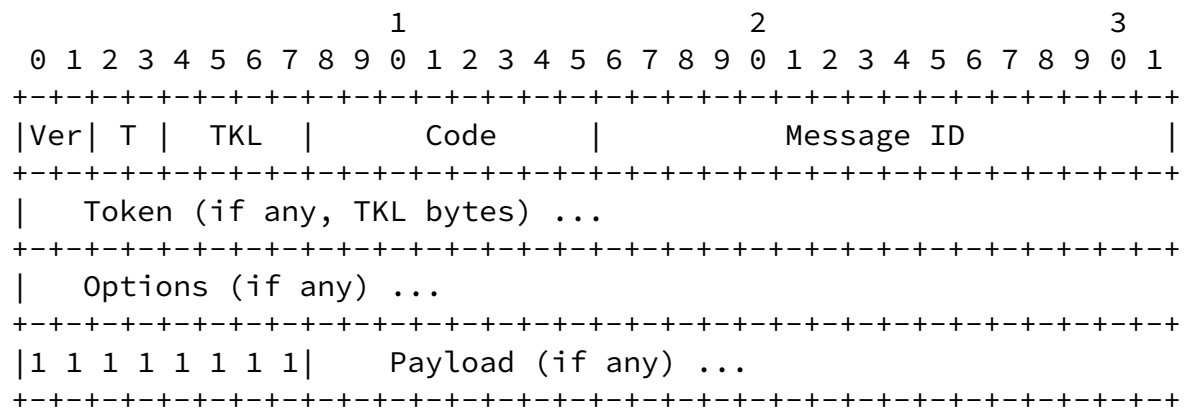
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### IETF IE Subtype Format

Here, Sub-Type ID is the IANA allocated number specifying the sub-type of the IETF IE. The CoAP message is embedded in the IETF IE as follows:



### IETF IE Subtype Format for CoAP

This means that the combinations of Ver, T, TKL used by CoAP need to be allocated as Sub-Type IDs. Ver is always 1; T can be 0, 1, 2, 3, and TKL can be between 0 and 8 for T in 0..2 and 0 only for T = 3. This means that  $3 \times 9 + 1 = 28$  Sub-Type IDs are needed.

## 3. Benefits

Allocating 11 % of the code points (28 out of the 256) available for IETF IEs may seem like a large chunk. However, it enables the embedding of CoAP messages into IEs in an efficient way; any smaller allocation would need additional complexity for variable length encoding or would even always need an additional byte of overhead.

#### [4.](#) IANA Considerations

This specification requests IANA to assign the following 28 code points in the registry for IETF IE Sub-type IDs to this specification:

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+-----+-----+	
Value	Sub-type ID
+-----+-----+	
64-72	CoAP
80-88	CoAP
96-104	CoAP
112	CoAP
+-----+-----+	

#### [5.](#) Security Considerations

The security considerations of [[I-D.kivinen-802-15-ie](#)] apply. Specifically, this means that object security (intrinsic in the resources accessed or explicit on the CoAP level) may be required.

#### [6.](#) Acknowledgments

Much of the text here is taken from [[I-D.kivinen-802-15-ie](#)].

#### [7.](#) References

##### [7.1.](#) Normative References

- [I-D.kivinen-802-15-ie]  
Kivinen, T. and P. Kinney, "IEEE 802.15.4 Information Element for IETF", [draft-kivinen-802-15-ie-00](#) (work in progress), March 2016.
- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate

Requirement Levels", [BCP 14](#), [RFC 2119](#),  
DOI 10.17487/RFC2119, March 1997,  
<<http://www.rfc-editor.org/info/rfc2119>>.

## [7.2](#). Informative References

[I-D.wang-6tisch-6top-coapie]

Wang, Q., Vilajosana, X., Watteyne, T., Sudhaakar, R., and  
P. Zand, "Transporting CoAP Messages over IEEE802.15.4e  
Information Elements", [draft-wang-6tisch-6top-coapie-01](#)  
(work in progress), July 2015.

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