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SenML: Features and Versions
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Abstract

The Sensor Measurement Lists (SenML) specification provides a version number that is set to the number 10 in RFC 8428, without further specification on the way to make use of different version numbers. This short document specifies the use of "SenML Features" and maps them to SenML version numbers, updating RFC 8428.

Status of This Memo

This Internet-Draft is submitted in full conformance with the provisions of BCP 78 and BCP 79.

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This Internet-Draft will expire on August 13, 2020.

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1. Introduction

The Sensor Measurement Lists (SenML) specification [RFC8428] provides a version number that is set to 10, without further specification on the way to make use of different version numbers.

The traditional idea of using a version number for evolving an interchange format presupposes a linear progression of that format. A more likely form of evolution of SenML is the addition of "features" that can be added to the base version (version 10) in a fashion that is mostly independent of each other. A recipient of a SenML pack can check the features it implements against those required by the pack, processing the pack only if all required features are provided in the implementation.

This short document specifies the use of SenML Features and maps them to SenML version number space, updating [RFC8428].

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.

Where bit arithmetic is explained, this document uses the notation familiar from the programming language C, except that "**" denotes exponentiation.

2. Feature Codes and the Version number

The present specification defines "SenML Features", identified by a "feature name" (a text string) and a "feature code", an unsigned integer less than 53.

The specific version of a SenML pack is composed of a set of features. The SenML version number ("bver" field) is then the sum of, for each feature present, two taken to the power of the feature code of that feature.

$$\text{version} = \sum_{fc=0}^{52} \text{present}(fc) \times 2^{fc}$$

where present(fc) is 1 if the feature with the feature code "fc" is present, 0 otherwise.

3. Features: Reserved0, Reserved1, Reserved2, Reserved3

For SenML Version 10 as described in [RFC8428], the feature codes 0 to 3 are already in use. Reserved1 (1) and Reserved3 (3) are always present and the features Reserved0 (0) and Reserved2 (2) are always absent, yielding a version number of 10 if no other feature is in use. These four reserved feature codes are not to be used with any more specific semantics except in a specification that updates the present specification.

4. Feature: Secondary Units

The feature "Secondary Units" (code number 4) indicates that secondary unit names [I-D.ietf-core-senml-more-units] MAY be be used in the "u" field, in addition to the primary unit names already allowed by [RFC8428].

Note that the most basic use of this feature simply sets the SenML version number to 26 (10 + 2**4).

5. Security Considerations

The security considerations of [RFC8428] apply. This specification provides structure to the interpretation of the SenML version number, which poses no additional security considerations except for some potential for surprise that version numbers do not simply increase linearly.

6. IANA Considerations

IANA is requested to create a new subregistry "SenML features" within the SenML registry [IANA.senml], with the registration policy "specification required" [RFC8126] and the columns:

- Feature code (an unsigned integer less than 53)

- Feature name (text)

- Specification

The initial content of this registry is as follows:

Feature code	Feature name	Specification
0	Reserved0	RFCthis
1	Reserved1	RFCthis
2	Reserved2	RFCthis
3	Reserved3	RFCthis
4	Secondary Units	RFCthis

Table 1: Features defined for SenML at the time of writing

Acknowledgements

Ari Keranen proposed to use the version number as a bitset.

8. Normative References

[I-D.ietf-core-senml-more-units]
Bormann, C., "Additional Units for SenML", draft-ietf-core-senml-more-units-03 (work in progress), November 2019.

[IANA.senml]
IANA, "Sensor Measurement Lists (SenML)", <http://www.iana.org/assignments/senml>.

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, DOI 10.17487/RFC2119, March 1997, <https://www.rfc-editor.org/info/rfc2119>.

[RFC8126] Cotton, M., Leiba, B., and T. Narten, "Guidelines for Writing an IANA Considerations Section in RFCs", BCP 26, RFC 8126, DOI 10.17487/RFC8126, June 2017, <https://www.rfc-editor.org/info/rfc8126>.

[RFC8174] Leiba, B., "Ambiguity of Uppercase vs Lowercase in RFC 2119 Key Words", BCP 14, RFC 8174, DOI 10.17487/RFC8174, May 2017, <https://www.rfc-editor.org/info/rfc8174>.

[RFC8428] Jennings, C., Shelby, Z., Arkko, J., Keranen, A., and C. Bormann, "Sensor Measurement Lists (SenML)", RFC 8428, DOI 10.17487/RFC8428, August 2018, <https://www.rfc-editor.org/info/rfc8428>.

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