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Introducing the Local Base Name in SenML  
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## Abstract

The Sensor Measurement Lists (SenML) specification defines a format for representing simple sensor measurements and device parameters. This specification defines a new label to relax the requirement for global identification of every measurement.

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[1.](#) Introduction

The Sensor Measurement Lists (SenML) specification, see [RFC 8428](#) [[RFC8428](#)], defines a format for representing simple sensor measurements and device parameters.

Ideally, sensor readings used in the Internet of Things environment should be as small as possible. For this reason the specification also defines an encoding of these sensor measurements and device parameters in CBOR (on top of other serialization formats).

A design decision in SenML was, however, that each measurement transmitted over the network is self-contained and contains information that uniquely identifies and differentiates the sensor from all others - not only locally on the device but globally.

This is accomplished by the combination of two fields, namely the 'Name' and the 'Base Name' values. The specification requires the concatenation of the Name and the Base Name values to yield the name of the sensor and recommends that the concatenated names be represented as URIs or URNs.

Figure 1 is an example taken from [RFC 8428](#).

```
[
  {"bn":"urn:dev:ow:10e2073a01080063:", "n":"temp", "u":"Cel", "v":23.1},
  {"n":"label", "vs":"Machine Room"},
  {"n":"open", "vb":false},
  {"n":"nfc-reader", "vd":"aGkgCg"}
```

]

Figure 1: SenML Example Measurement with Base Name value

The global identification of every measurement as it is traveling through the network and through different systems has its use case and allows easy identification of the source and enables correlation.

Unfortunately, it also has drawbacks:

- o The unique identification of the sensor adds a substantial overhead, particularly when the sensor identification is verbose. Deployed systems, for example, make use of [RFC 4122](#) [[RFC4122](#)] Type 5 Universally Unique Identifier (UUIDs).
- o The global identification of every measurements is often unnecessary when the SenML is used as a mechanism to represent data for device-to-cloud communication or cloud-to-gateway communication where data is subsequently processed, aggregated or otherwise modified. In such systems, the identification of the sensor and the device has its origin in the security context rather than in the SenML contained measurement. LwM2M [[LWM2M](#)] is an example of such an architecture.
- o Finally, there are privacy implications of globally identifying each measurements and some deployments may prefer better privacy protection over ease of correlation.

This specification therefore updates [RFC 8428](#) and defines a new Local Base Name value (lbn) that can be used instead of the Base Name value defined in [RFC 8428](#).

Figure 2 shows an example based on LwM2M use of SenML.

```
[
  {"lbn":"/3303/", "n":"/0/5700/", "v":25.2},
  {"n":"/1/5700/", "v":5}
]
```

Figure 2: SenML Example Measurement with Local Base Name value

Note: In the LwM2M data model objects, object instances, and resources are encoded as numerical values. The value of '3303' refers to the Temperature object, '0' and '1' to the two instances of the resource '5700' (Sensor Value). Hence, this measurement indicates that the two temperator sensors expose their sensor readings.

## 2. 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 [BCP 14](#) [[RFC2119](#)] [[RFC8174](#)] when, and only when, they appear in all capitals, as shown here.

## 3. Local Base Name SenML Structure and Semantics

This specification defines one new label, the Local Base Name value, which is used instead of the Base Name value. For practical purposes the Local Base Name / Name concatenation does not need to be a URN or a URI because existing data models used in the IoT space do not all make use of URIs/URNs.

Name	Label	CBOR Label	JSON Type	XML Type
Local Base Name	lbn	8	String	string

Figure 3: Local Base Name SenML Label

## 4. CDDL

This document defines a new value to be added to the CDDL defined in [Section 11 of RFC 8428](#).

The new key-value-pair is

lbn => tstr ; Local Base Name

## 5. Security Considerations

This document inherits the security properties of [RFC 8428](#) but improves its privacy features by removing the unique identification of the sensor when the Local Base Name value is used instead of the Name / Base Name combination.

## 6. IANA Considerations

IANA is asked to register the following new entry in the SenML Labels Registry.

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Name	Label	CL	JSON Type	XML Type	EI	Reference
Local Base Name	lbn	8	String	string	a	[[This RFC]]

Note that CL = CBOR Label and EI = EXI ID.

## 7. Acknowledgements

The author would like to thank the OMA Device Management and Service Enablement working group for their discussion and their input. In particular, I would to thank Ari Keranen, David Navarro, Mojan Mohajer and Alan Soloway.

## 8. References

### 8.1. Normative References

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