

SenML

OMA DM WG

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Agenda

- SenML background / examples
- Q&A
 - Features of latest SenML spec
 - Backward compatibility
 - Current status
 - Overlap with IPSO & CBOR?
- Considerations
- Proposal for PATCH/FETCH format

SenML Example

```
base name  
base unit [ { "bn": "urn:dev:ow:10e2073a01080063",  
             "bu": "Cel", "bt": 1468663235,  
             "v": 23.5},  
             { "t": 1, "v": 23.6},  
             { "t": 5, "v": 24.1},  
             { "t": 9, "v": 25.2} ]  
base time
```

The diagram illustrates a SenML JSON object with annotations:

- A blue arrow points from the label "base unit" to the opening square bracket [.
- A blue arrow points from the label "base name" to the "bn" key.
- A blue arrow points from the label "base time" to the "bt" key.

IPSO/LwM2M Object SenML example

```
[  
  {"bn": "3303/0/",  
   "n": "5700", "v": 42},  
  {"n": "5701", "vs": "Cel"},  
  {"n": "5601", "v": 22},  
  {"n": "5602", "v": 50}  
]
```

Features of latest SenML

- Consistent position for base values
 - More efficient parsing
 - Better compression with multiple base values
- Compression with CBOR
- CoAP content format registrations
- Also
 - Streamable structure
 - Fragment identifiers
 - Actuation/configuration usage
 - Resolved structures
 - Lots of editorial/consistency fixes

Backward compatibility

- Small changes in SenML Pack structure
 - Root element used to be object; now array (no more "e" element)
 - All values start with "v" and base values with "b"
 - Any record can now contain and update base values
 - SenML record structure same as before

draft-jennings-senml-10

```
{  
  "bn": "3303/0/", "e" : [  
    {"n": "5700", "v": 42},  
    {"n": "5701", "sv": "Cel"},  
    {"n": "5601", "v": 22},  
    {"n": "5602", "v": 50}  
  ]}
```

draft-ietf-core-senml-12 (to-be RFC)

```
[  
  {"bn": "3303/0/",  
   "n": "5700", "v": 42},  
  {"n": "5701", "vs": "Cel"},  
  {"n": "5601", "v": 22},  
  {"n": "5602", "v": 50}]
```

Current status

- WGLC finished
- Publication request any day now (final organizational steps ongoing)
- **Feature complete and stable today**
- RFC early 2018

SenML/IPSO/CBOR overlap?

- CBOR one of the serializations of SenML
- SenML one of the representation formats of any IPSO smart object

Considerations

- Globally unique identifiers for SenML names
 - Makes big data processing easier
 - For example, using IPv6 address of the device in base name
- Using unit field instead of unit resource?
 - Slightly more compact
 - Better compatibility with other SenML systems

Proposal for SenML FETCH format

```
FETCH coap://www.example.com  
Content-Format: application/fetch-senml+json  
Accept: application/senml+json
```

```
[  
  {"n": "/3303", "ff": "/*/5700"},  
  {"n": "/3/0/9"},  
  {"n": "/4/0/2"}  
]
```

Proposal for SenML PATCH format

PATCH coap://www.example.com

Content-Format: application/patch-senml+json

Accept: application/senml+json

```
[  
  {"n": "/3303", "ff": "/*/5700", "v": 42},  
  {"n": "/3/0/9", "v": 55},  
  {"n": "/4/0/2", "v": -80}  
]
```

Selector design

- Fixed name selector is simple: "n": "/3303/0/1"
- How to select multiple
 - Wildcards on name segments: "ff": "/*/5700"
 - Statements on names: "name-ends-with": "5700"
 - starts-with, contains, does-not-contain, etc.
 - Type selectors: "type-is": "5700"
 - Needs additional metadata for tagging types
 - Fragment ID method: #rec=3-5,10,19-*
 - ID selectors, Field selectors, value selectors, ...
 - We may want to have a closer look at this part