SenML Data Value Content-Format Indication

draft-ietf-core-senml-data-ct-01

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Examples

```
{"n":"nfc-reader", "vd":"gmNmb28YKg", "ct":"60"}
```

```
{"n":"nfc-reader-42",
 "vd":"H4sIAA+dmFwAAzMx0jEZMAQALnH8Yn0AAAA",
 "ct":"text/csv@gzip"}
```

Feature objective: extensibility

- `ct` is generally ignorable (like any new SenML field)
- But we would like to also have a “must understand” version, `ct_`

- Issue: Interaction between the two (`bct`, `bct_`) and resolved records
- Would prefer to have specific information (in record) override base
- But now, that happens only separately, within the thread for each field name!

RFC 8428: “Must understand” and “_”?

- »Extensions that are **mandatory** to understand to correctly process the Pack MUST have a label name that ends with the "_" character.«
- »Applications MUST ignore any JSON **key-value pairs** that they do not understand unless the key ends with the "_" character, in which case an error MUST be generated.«
  (12.3.1 for senml+json, equivalent text for other representations)
- So a receiver is free to ignore a **key-value combination** if it doesn’t understand the key **or** if it doesn’t understand the combination
- Note that `foo` and `foo_` are different fields from a SenML perspective, except possibly by their semantic definition
  - convention: don’t define a `foo` and a `foo_` that are unrelated

RFC 8428: ct, ct_, bct, bct_

- Resolving algorithm can be performed without understanding field semantics: no inter-field interaction
  - Fields do define how base value and given value for that field mix
  - »A future specification that defines new base fields needs to specify how the field is resolved.«
- Resolving is not influenced by unrelated fields (ct vs. ct_):
  It happens **separately** for ct and for ct_
- The rules applying to a record are applied **after** resolving

- But we need to look at examples having some of these four
  and see whether what we built makes sense

Solution option #1

- Do not apply base value (bct or bct_) if a current value (ct or ct_) exists in the record
- Not supported by RFC 8428
  - Would require using new version/feature for SenML

Solution option #2

- Future specification need to specify semantics of the "safe-to-ignore" and "must understand" versions of the same field in the same record
  - ct_ is the first registration of "must understand" fields
  - Can be handled as DE guidance and clarified in SenML-bis?
- Easy to avoid problem: don't mix the two variants in the Packs
  - but also need to enable combining packs easily
- For ct draft: if both exist in the same Record: ct_ overrides ct (i.e., ignore/remove "safe-to-ignore" version)
- Not perfect, but we don’t know better without new SenML version

What we don’t like about solution #2

- If a pack has a bct_, you can no longer usefully use bct or ct *from that position on*
- That is a limitation, but it doesn’t detract from other useful combinations
- Workaround: Instead of using bct_, use ct_ once to check the must-understand feature; can use bct then

- To do: designated expert to write a wiki page explaining all this

Mixing b and _ fields: what are the resolution rules?

1)

```
[
 {"bfoo_":42, "n":"t1", "v":1},
 {            "n":"t2", "v":2},
 {"foo": 1,   "n":"t3", "v":3}
]
```

2)

```
[
 {"bfoo_":42, "n":"t1", "v":1},
 {            "n":"t2", "v":2},
 {"foo_": 1,  "n":"t3", "v":3}
]
```

3)

```
[
 {"bfoo":42, "n":"t1", "v":1},
 {           "n":"t2", "v":2},
 {"foo_": 1, "n":"t3", "v":3}
]
```

4)

```
[
 {"bfoo":42, "n":"t1", "v":1},
 {           "n":"t2", "v":2},
 {"foo": 1,  "n":"t3", "v":3}
]
```

Mixing b and _ fields: resolved

1)

```
[
 {"bfoo_":42, "n":"t1", "v":1},
 {            "n":"t2", "v":2},
 {"foo": 1,   "n":"t3", "v":3}
]
```

```
[
 {"foo_":42, "n":"t1", "v":1},
 {"foo_":42, "n":"t2", "v":2},
 {"foo": 1, "foo_":42", "n":"t3", "v":3}
]
```

Mixing b and _ fields: resolved

2)

```
[
 {"bfoo_":42, "n":"t1", "v":1},
 {            "n":"t2", "v":2},
 {"foo_": 1,  "n":"t3", "v":3}
]
```

```
[
 {"foo_":42, "n":"t1", "v":1},
 {"foo_":42, "n":"t2", "v":2},
 {"foo_": 1, "n":"t3", "v":3}
]
```

Mixing b and _ fields: resolved

3)

```
[
 {"bfoo":42,  "n":"t1", "v":1},
 {            "n":"t2", "v":2},
 {"foo_": 1,  "n":"t3", "v":3}
]
```

```
[
 {"foo":42,  "n":"t1", "v":1},
 {"foo":42,  "n":"t2", "v":2},
 {"foo_": 1, "foo":42, "n":"t3", "v":3}
]
```

Mixing b and _ fields: resolved

4)

```
[
 {"bfoo":42,  "n":"t1", "v":1},
 {            "n":"t2", "v":2},
 {"foo": 1,   "n":"t3", "v":3}
]
```

```
[
 {"foo":42,  "n":"t1", "v":1},
 {"foo":42,  "n":"t2", "v":2},
 {"foo": 1,  "n":"t3", "v":3}
]
```