Energy Management Framework
draft-ietf-eman-framework-02

John Parello, Benoit Claise, Brad Schoening, J Quittek

New in this version

- Aligned with the latest version of the terminology draft
- Remove the Manufacturer Power State
- Context:
  - Previous open issue: "Role received feedback on establishing guidance on how to set this value (D Prantl et al)"
  - Updated section 5.2.5 with some examples for the role context
- Mentions the RMON event and alarm as the generic way for tresholding

New in this version
ODVA Compliance

- Compliance with the 3 ODVA Energy counters

```
+------------------+---------------------------+
|          EnergyMeasurement                   |
|----------------------------------------------|
| consumed : long                              |
| generated : long                             |
| net : long                                   |
| accuracy : enum { 0..10000}                  |
+----------------------------------------------+
```

- [EMAN-MON] is already aligned:
  - eoEnergyIntervalEnergyConsumed
  - eoEnergyIntervalEnergyProduced
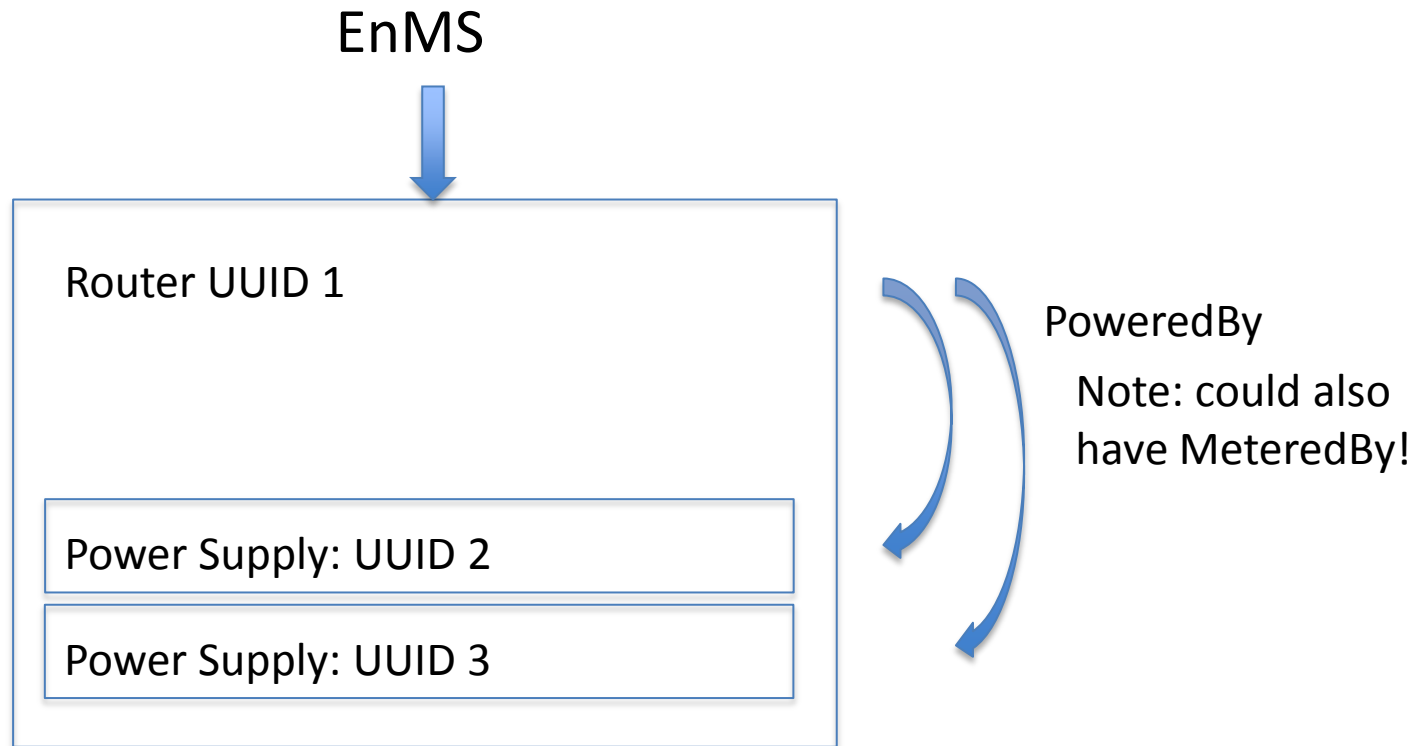 - eoEnergyIntervalEnergyNet

New in this version
Push Mechanism

- [EMAN-REQ]: "Means should be provided to either push such values from the place they are available to the management system or to have them stored at the powered entity for a sufficiently long period of time such that a management system can retrieve a stored time series of values."

- [EMAN-FMWK]: "the EMAN requirement document [EMAN-REQ] also require the push of time series of power values. Therefore, IPFIX [RFC5101] is also mentioned as the appropriate solution in the following figures, even if there are no documents describing the IPFIX solution at the time of writing these lines. Note that this framework doesn't exclude another solution than IPFIX.

Relationships between EOs

- Two Energy Objects MAY establish an EO Relationship. Within a relationship one EO becomes an EO Parent while the other becomes an EO Child.
- The Energy Object Child MUST keep track of its Energy Object Parent(s) along with the Energy Object Relationships type. The Energy Object Parent MUST keep track of its Energy Object Child(ren).

- To be stressed in the next version of the document: an EO can be a device or a component (a line card, a battery, etc...)
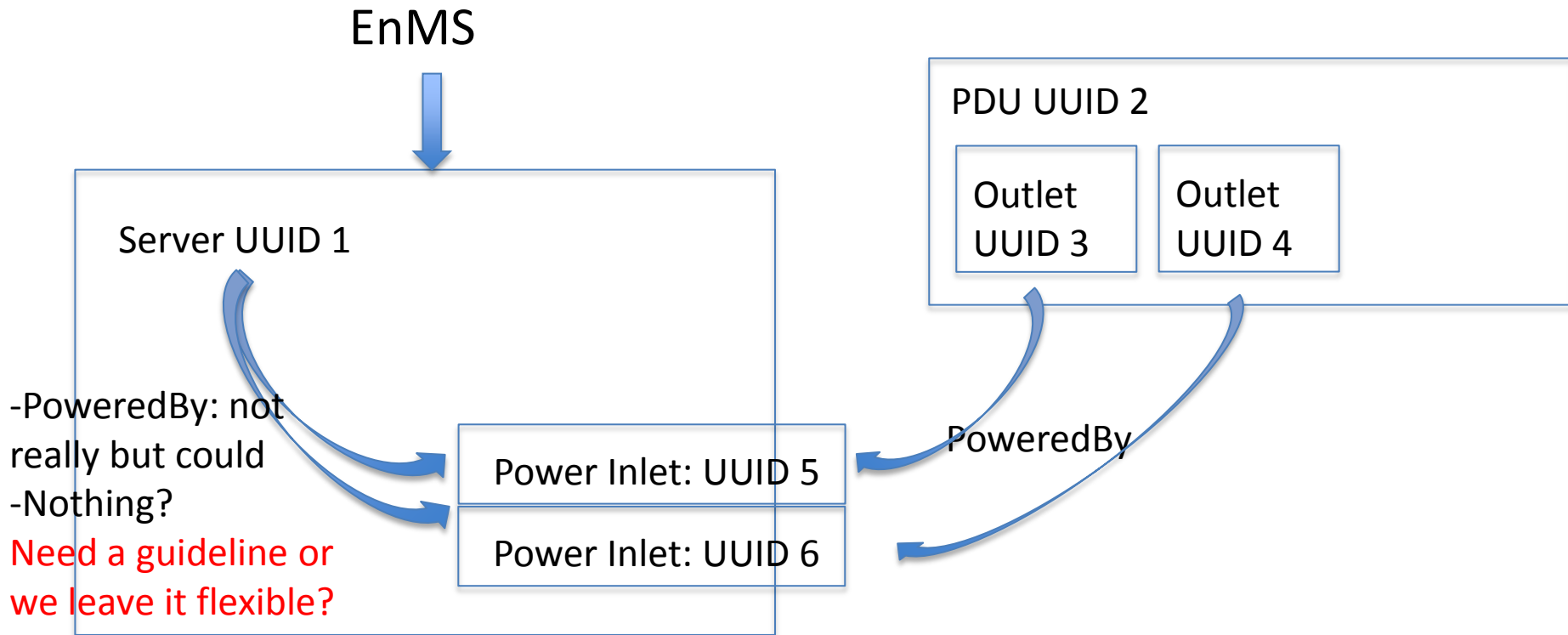
Example 1: a Router with 2 Power Supplies

EnMS

Router UUID 1

Power Supply: UUID 2

Power Supply: UUID 3

PoweredBy

Note: could also have MeteredBy!

- The ENTITY-MIB containment tree: the power supplies are part of the router

Example 2: a Server Connected to two different PDU ports

EnMS

Server UUID 1

PDU UUID 2

Outlet UUID 3

Outlet UUID 4
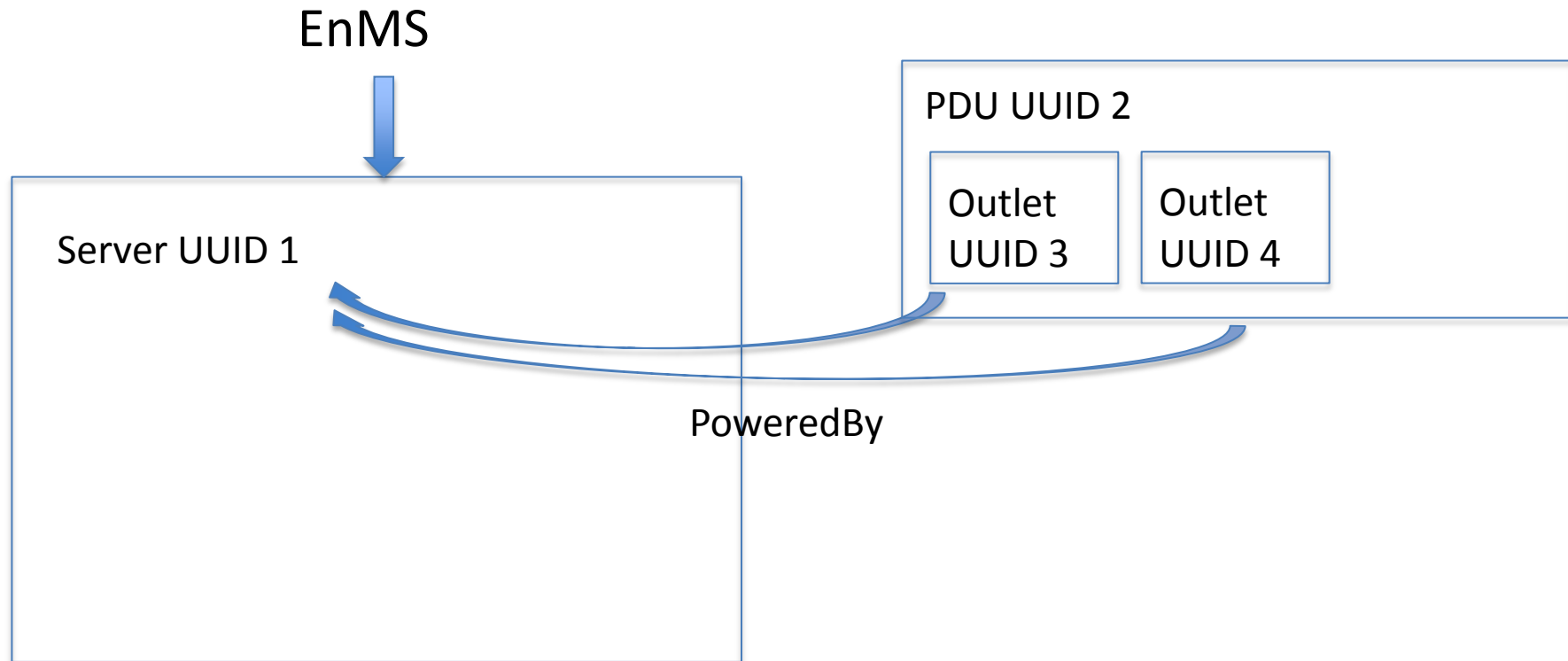
PoweredBy

- The ENTITY-MIB containment tree: the power outlets are part of the PDU

Example 3: a Server Connected to two different PDU ports

EnMS

Server UUID 1

PDU UUID 2

Outlet UUID 3

Outlet UUID 4

-PoweredBy: not really but could
-Nothing?
Need a guideline or we leave it flexible?

PoweredBy

Power Inlet: UUID 5

Power Inlet: UUID 6

- If the Server knows about his power inlets…

Example 4: a Server Connected to two different PDU ports

EnMS

PC UUID 1   PoweredBy?

MeteredBy

Battery: UUID 2
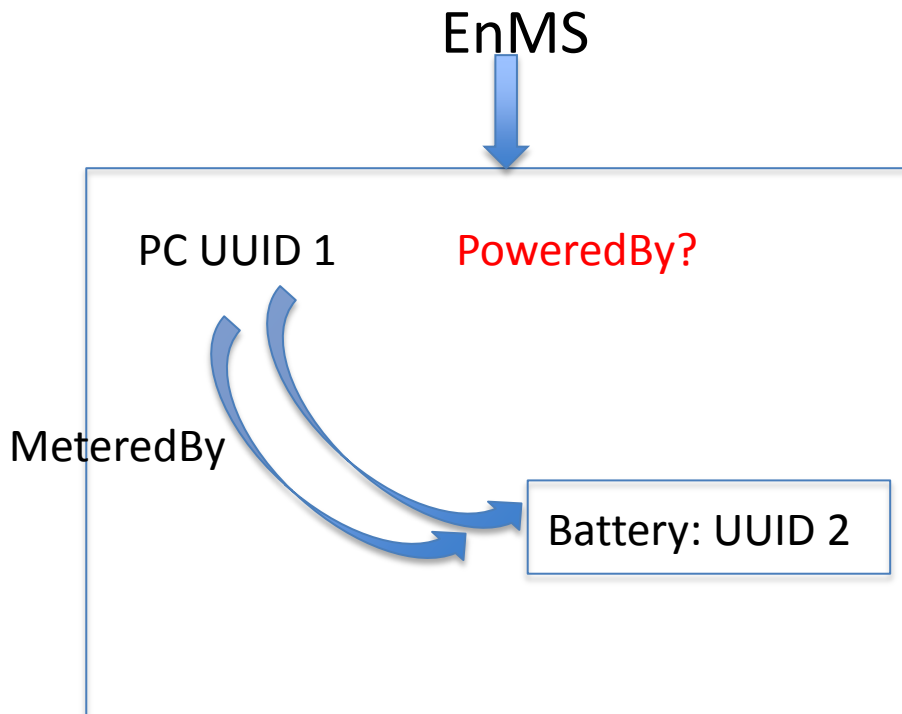
PoweredBy?
1. No because it's part of the same containment tree and there is no interaction with an external UUID (like the power supply example)
2. Yes we leave it flexible?

In line with the [EMAN-REF] power interface? To be confirmed

Conclusion from the Examples

- An EO can be a device or a component (a line card, a battery, etc…)
- At this point, the framework doesn't preclude any type of relationships between EO's
  - The model has to be flexible because we don't know all the complex use cases
  - Relationships are optional: EO parent/child might or not be aware of their relationships
- The ENTITY-MIB provides the containment tree

What's next?

- Correct the UML based on the ENERGY-AWARE new design
- Clarification: add some examples for clarification
- Explain better the proxy relationship (the EO Children are monitored on the proxy)

Open Issue: A single list of children or one list per topology

```
|
|   +-------------------------------------------+
|--|    EO Child Relationships (optional)       |
|   | ----------------------------------------- |
|   |  eoMeteredBy (Parent(s) UUID list)         |
|   |  eoPoweredBy (Parent(s) UUID list          |
|   |  eoDependentOf (Parent(s) UUID list)       |
|   |  eoAggregatedBy (Parent(s) UUID list       |
|   |  eoProxyBy (Parent(s) UUID list)           |
|   |  eoParentProxyAbilities (Parent abilities)|
|   +-------------------------------------------+
|
|
|   +-------------------------------------------+
|--|    EO Parent Relationships (optional)      |
|   | ----------------------------------------- |
|   |  eoChildrenList (Child(ren) UUID list)    |
|   +-------------------------------------------+
```

- Do we need the ability for parent to know the list of EO children per relationship type?

    - Right now, it's not the case! Ask each EO child

- In other words, do we need EO Children UUID list for: eoMeteringChildrenList,, eoPoweringChildrenList, eoDependentChildrenList, eoAggregatingChildrenList, eoProxyingChildrenList

Open Issues

- Do we want to add some examples such as http://www.ietf.org/proceedings/81/slides/eman-4.pdf slide [14-17], or should it be for the [EMAN-AS]
- "An Energy Object is part of a single Energy Management Domain. The Energy Management Domain should be configured on an Energy Object.". Wrong assumption according to Bill.
- Receive feedback (D Prantl et al) on possibly having a variable range of states (i.e. dimmer)
  - Bill: "need to consider how to support a wider range of options. Percentage style and cap style would seem to be two such alternatives."
- If the aggregation disappear from [EMAN-REQ], then we don't need the "Aggregation Relationship", and this is even simpler!
  - Unless this is only the function that disappears, not the aggregation?
- Open issues from Bill on the mailing list
- Open issues from Bruce on the mailing list.
  - Replied on the mailing list.

Thank You

John Parello, Benoit Claise, Brad Schoening, J Quittek