

Reference Model for Energy Management Version 2

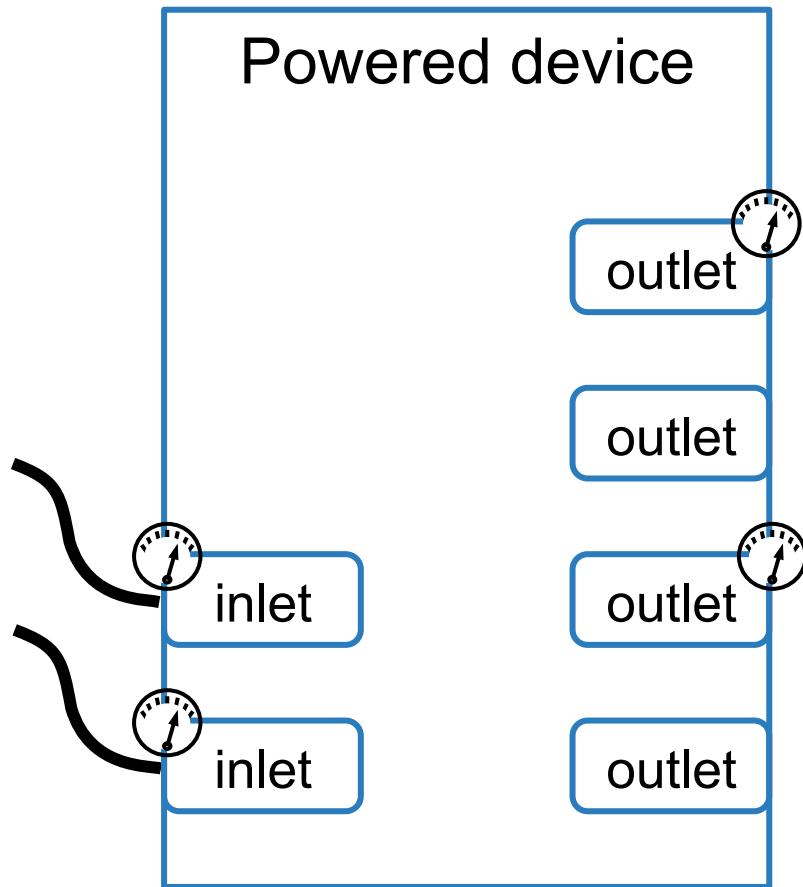
draft-quittek-eman-reference-model-02

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Motivation

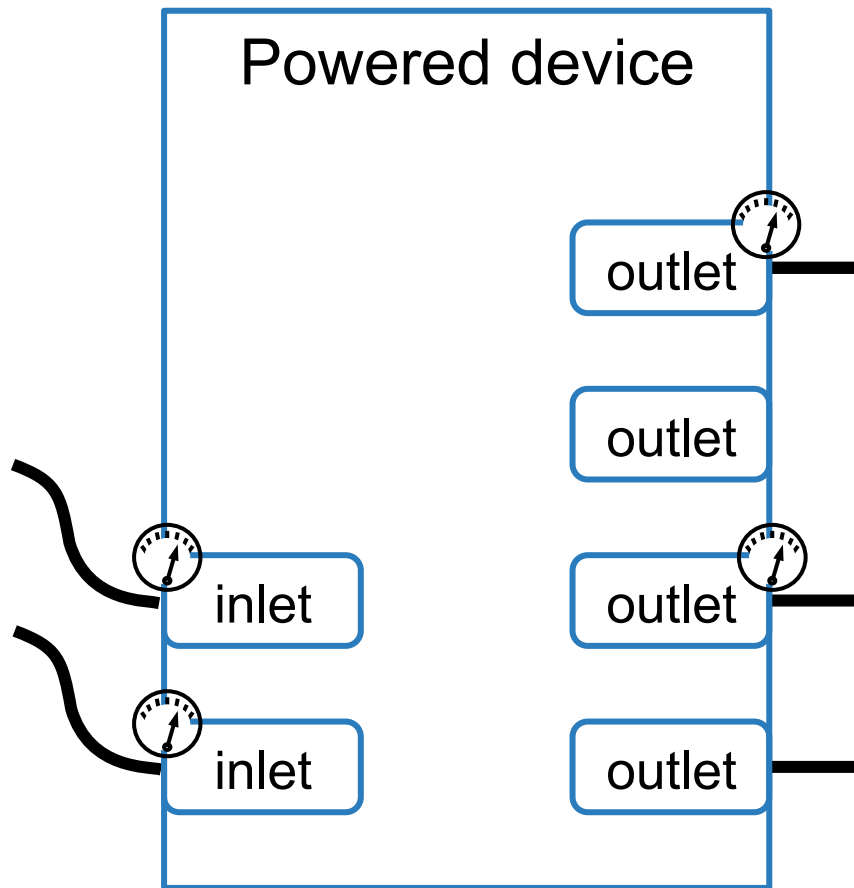
- Energy Management is still a new thing to the IETF
- We are heavily discussing concepts and models
- This is not an easy search
 - ◆ all drafts with models changed substantially since Prague
- So far our main problem has been modeling **devices reporting on other devices**
 - ◆ this is not very common in network management
 - ◆ we tried to model this in the eman framework draft and in previous versions of this draft
 - ◆ we needed new concepts (parent/child; power monitor/power controller, etc.)
- Is this **really** what we need? No easier way?
- Here is a proposal

What are we managing?



- Powered devices are boxes
- They receive power at a **power interface (PI)***
 - ♦ derived from IEEE PoE 802.af/at
- The power interface connects the device to a power transmission medium
 - ♦ often called 'wire' or 'cord'
- A power interface can be an **inlet** or an **outlet**
 - ♦ on the left it is obviously an inlet
- May **measure** power at PIs
- Devices may be able to **switch** power at PIs

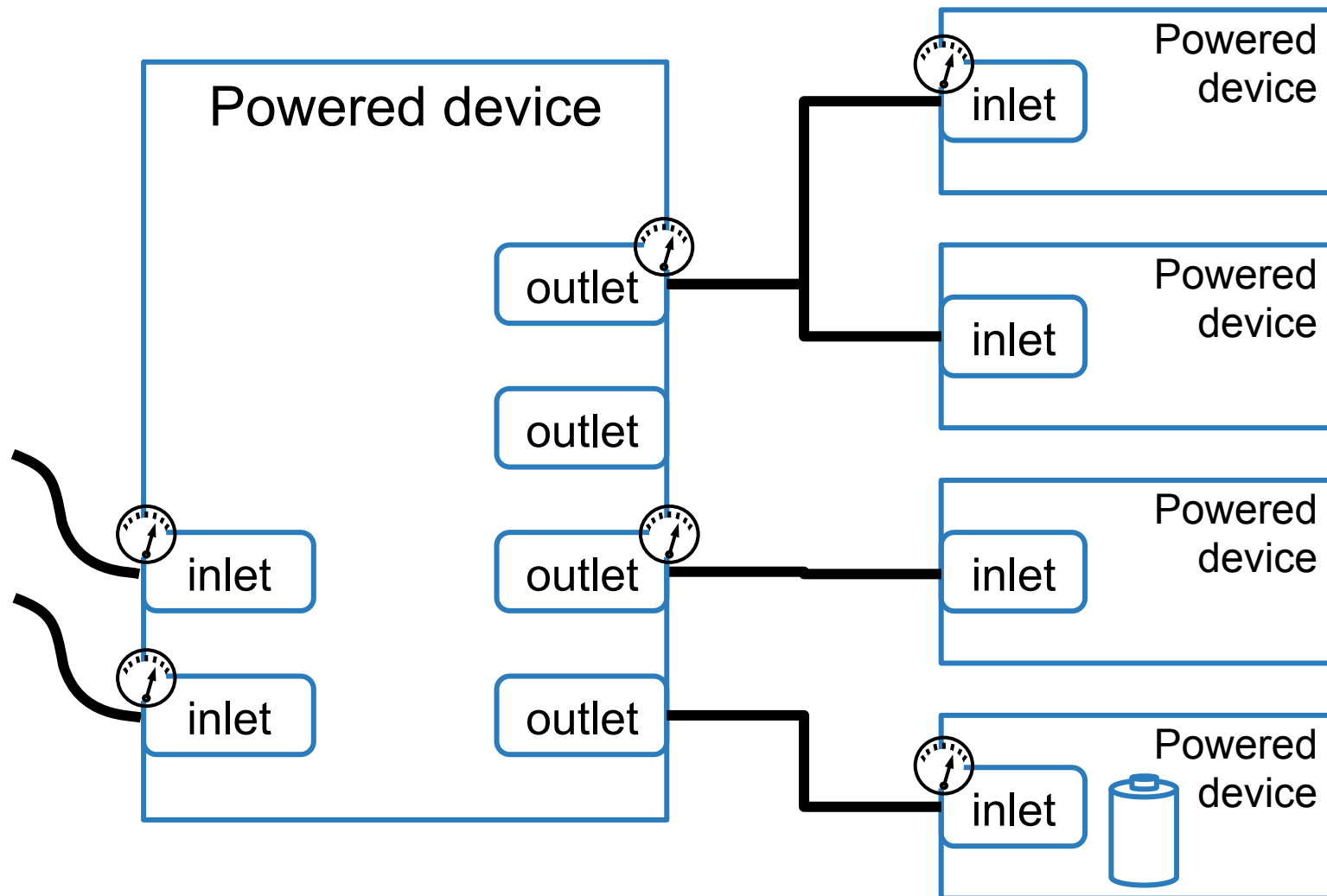
What does a device report about itself?



Nothing more needed!

- On the device
 - ♦ ID, type, context, etc.
 - ♦ power state
 - ♦ total net power
- On Power interfaces
 - ♦ power at inlets
 - ♦ power at outlets (if present)
- Topology
 - ♦ connected other devices per power interface (as far as known)

Power Topology: Connected Interfaces



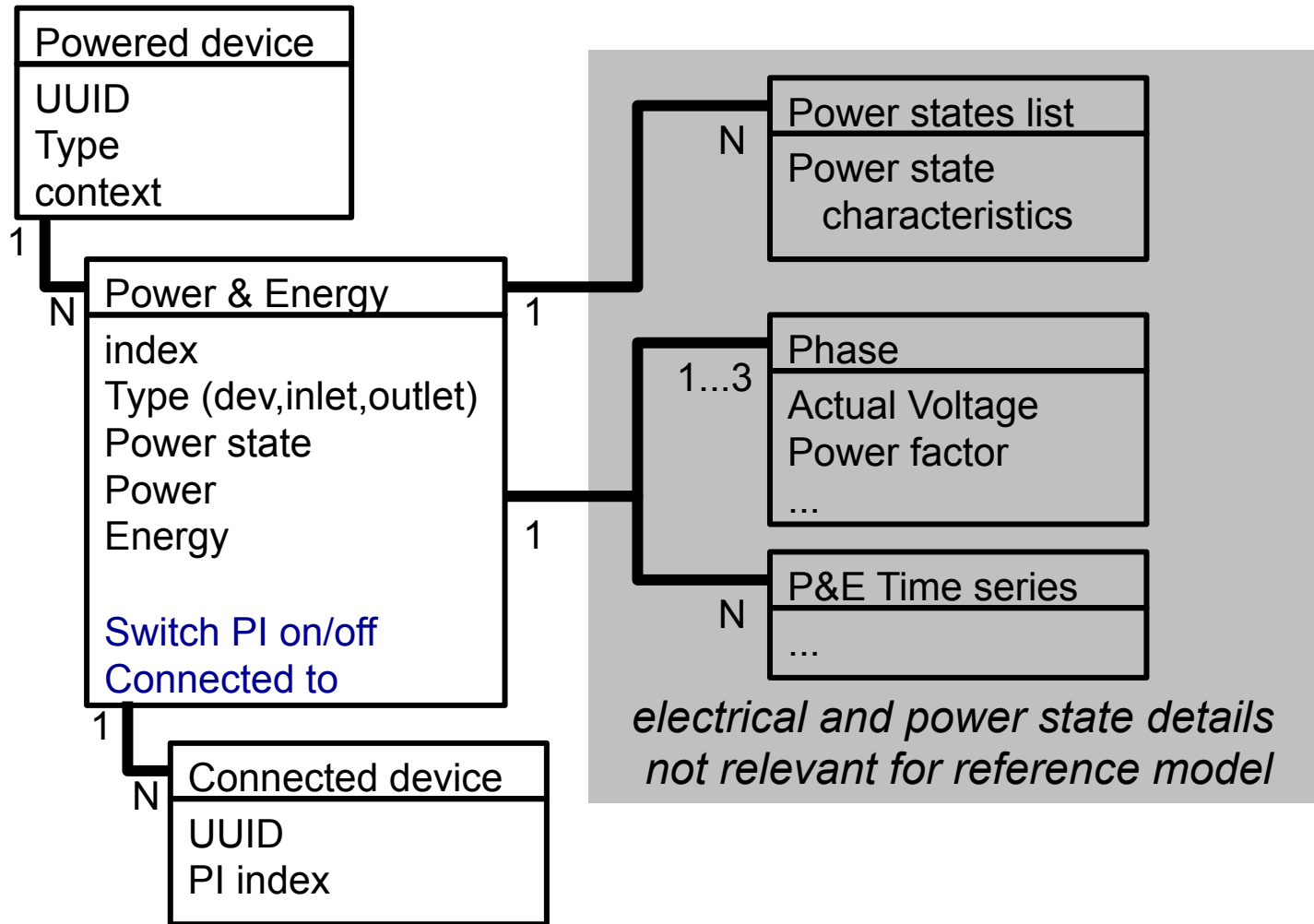
Power Topology: Connected Interfaces

- Power outlets can be connected to power inlets
- PIs may provide a list of PIs of other devices connected to it
- If we meter power at an PI we may derive information on connected devices
 - ◆ this works in both directions
- Metering at one interface may not necessarily give precise information on other connected interfaces.
 - ◆ there may be more than one other PI connected
- You can switch on and off PIs
 - ◆ but the effect is not always predictable
 - ◆ it is not always clear which other device is affected
 - ◆ when power is switched off, connected devices may run on battery

How to report on other devices?

- There may be need to represent non-IP devices (connectivity)
- There may be need to represent other IP devices (scalability)
- ...
- The result is that
 - ◆ one device (parent) reports for one or more other devices (children)
 - ◆ one device (parent) accepts control commands for other devices (children)
- This is independent of electric connectivity
 - ◆ who provides power to whom is a different story
- This is on top of the model shown on previous slides
- And this is **independent of energy management**
 - ◆ You can do this for any MIB module
- If a device reports on another one it uses the same structure as for reporting for itself
 - ◆ simplicity & re-use
- In such a case it acts as proxy and/or concentrator

Result: Simple Information Model



Conclusion

- The reference model based on the concept of **power interfaces** seems to be a better choice than the ones discussed so far
- It is simpler
 - ◆ easy to understand and work with
 - ◆ it is closer to concepts we have a lot of experience with
 - Network interface <---> Power interface
 - ◆ the resulting MIB module will be simpler
 - ◆ it is in line with IEEE PoE 802.3af/at
 - ◆ it does not make any assumption about topology
 - ◆ it avoids creating unnecessary relationships between devices
- It is more flexible
 - ◆ you can build the parent/child model on top of it
 - ◆ you can build others on top, such as reference-model-01