



Green Data Models Modelling Questions

Green WG Chairs (Diego & Rob)

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Modelling Questions (from Interims):

- 1. What level of dependence do/should models have on Framework?**
- 2. What layers of models do we need, device, network, service, inventory, topology?**
- 3. How much granularity in power control? (e.g., power states vs on/off)**
- 4. Should control relate to intent or actual power usage?**
- 5. How generic should the model be for components? (e.g., linecards vs optics, vs forwarding planes)**
- 6. How to model power reported for other devices?**
- 7. How does the data get aggregated together?**
- 8. Accuracy of the data?**
- 9. Time intervals for data reporting?**

Discussion results/conclusions for interims

Q3. How much granularity in power control?

Q8: How to control or report accuracy of the information?

Q9: What time intervals is the data being reported over?

Chairs would like to try and further discuss/confirm conclusions

Q3. How much granularity in power control?

- Should this be generic states (e.g. reusing EMAN work), or a range (e.g., 1-100)?
- Or should this be very simple (e.g., a simple boolean on/off)?
- Or should this vary by the component being modelled?
- How does a client know what states a device/component supports and what they actually mean?
- Does the configuration align with the operational state or are they different?

Q3. How much granularity in power control?

Virtual Interim 3 - Conclusions

1. Want to support both central controllers and distributed control on the device (i.e., distributed behaviour)
2. Want to be able to have a simple model, that can be extended
3. Bandwidth requirements for interface
4. Can split between simpler config and more complex state
5. Should consider capabilities
6. Can augment, but would want guidance, and this was difficult for ANIMA

Q8. How to control or report accuracy of the information?

- Is the granularity/accuracy statically defined in the data model?
 - What do devices do if they cannot report at this level of accuracy?
 - Probably require a target accuracy that is sufficient to meet requirements.
 - Note accuracy for power consumption on a large router (i.e. KW), differs from says optics (W, or mW)
 - Floats/Doubles might have been helpful here, but YANG doesn't support those.
- Or does a device need to report what accuracy it is able to report at?
 - Note – this adds flexibility for the devices, but greatly increases the complexity of consumers of the data, particularly if they are trying to aggregate data from multiple sources.
 - At what level of granularity would the accuracy be reported at? E.g., could it differ for different linecards.

Q8. How to control or report accuracy of the information?

Virtual Interim 3 - Conclusions

- Perhaps report average over a longer time interval (e.g., quantized over the last 30 seconds)
- Need an ability to report accuracy of the information (e.g., perhaps +/- 5% or classes of accuracy)
- Some existing models use Watts not milliWatts. May not be accurate enough. Could use 2 counters

Q9. What time intervals is the data being reported over?

- It is aggregated power over time, or instantaneous power usage (or both)?
- Can each component use its own time interval, or is this pre-defined and fixed?
- Or are there a standard set of time intervals that the data can be reported at?

Q9. What time intervals is the data being reported over?

Virtual Interim 3 - Conclusions

- Report instantaneous power
- Perhaps also report total power consumed since device was last cleared
- Perhaps report average over a longer time interval (e.g., quantized over the last 30 seconds)
- Some existing modules

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Q1. What level of dependence do/should models have on Framework?

- Does the framework affect the structure of the models?
- Or is it beneficial for the models to be aligned to the framework?
- Or does it not matter (e.g., commonality in groupings)?

Q2. What layer/relationship between the models do we need?

- Device/Component & Network level models are obvious
- What about inventory, hardware, topology (or are these just network models)?
- What about reporting the data to customers or end users (or is that outside YANG)

Q3. How much granularity in power control?

- Should this be generic states (e.g. reusing EMAN work), or a range (e.g., 1-100)?
- Or should this be very simple (e.g., a simple boolean on/off)?
- Or should this vary by the component being modelled?
- How does a client know what states a device/component supports and what they actually mean?
- Does the configuration align with the operational state or are they different?

Q4. Should control relate to intent or control actual power usage?

- I.e., does the configuration put the device/component into low power sleep mode, or hybrid sleep or cold sleep?
- Or does the configuration put the device/component into sleep capable mode, leaving it to the device to decide what state it should be in?
- Or do we need to be able to model both?

- Related: Do you set the forwarding ASIC to act in a particular way or tell it to optimize for performance or to minimize power usage.

Q5. How generic should the model be for components?

Does it treat each component generically, with a generic power mode, or is it more concrete (e.g., different modellings properties for interfaces vs optics vs fabric vs forwarding planes, etc)?

- What does it mean to put a linecard into 70 out of 100? How would vendors implement consistently?

Could using identities and augmentations can be cover both? I.e., both generic identities with more concrete refinements?

Q6. How to model reporting power for other devices?

- Whilst not introducing any additional complexity in the main case where a device is reporting its power usage?
- Does this differ at the device vs network level?
- How to attribute power and avoid double counting?

Q7. How/where does the data get aggregated?

Does any aggregation happen on the devices, or only at the network level?

Does power get reported both in aggregate and also in a fine-grained way?

How to avoid double accounting?

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Thank you for your contributions and participating