

Energy Management UML-Based Information Model

Control and Monitoring

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Agenda

- Collaboration with SCTE
- Use of UML Modeling Tools
- Management Protocols
- Gaps in current Information Model
- UML-Based Information Model

SCTE Collaboration

- Collaboration with SCTE Sustainability Management Subcommittee Adaptive Power System Interface Specification (APSIS™) working group
 - IETF should develop & maintain the master common Energy Management Information Model for the industry
 - SCTE willing to contribute into this model as necessary

UML Modeling Tools

- UML Class Diagrams provide a powerful syntax based modeling/design language for defining Information Models
 - Create a holistic view of the EMAN information framework (static class diagrams, object & deployment diagrams for use cases)
 - Create behavioral diagrams if needed
- Include UML Information Model in RFC Appendix as XMI output text file for tool interchange

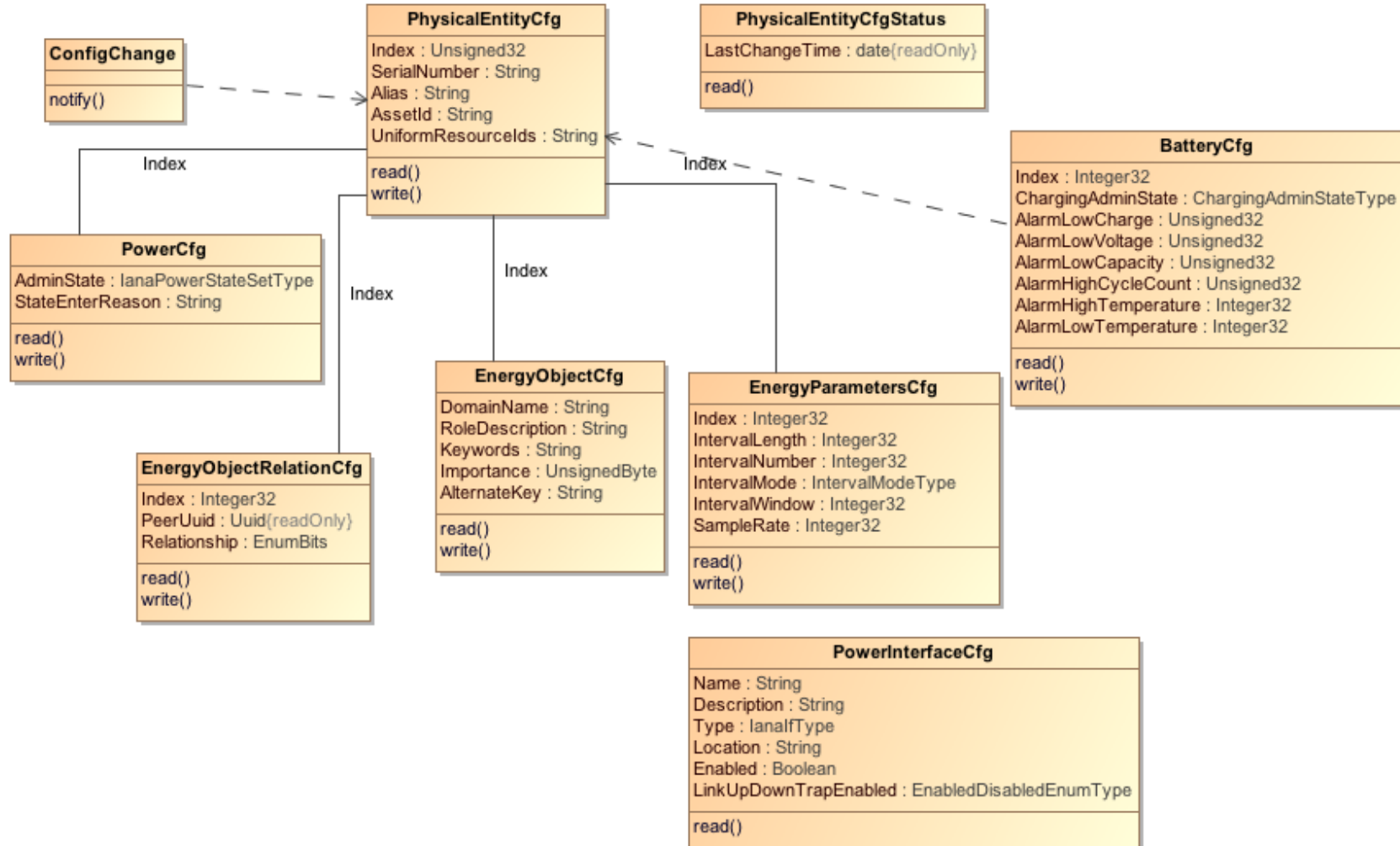
Management Protocols & Data Models

- Information Model is protocol-agnostic
 - Should not be structured/designed to any data modeling language or their constraints
- Data Models are translated/derived from the Information Model and represent the protocol-specific implementation component
 - Industry moving to XML-based provisioning & more efficient and scalable monitoring/collection
 - TR-069, NETCONF for provisioning
 - TR-232, etc for monitoring

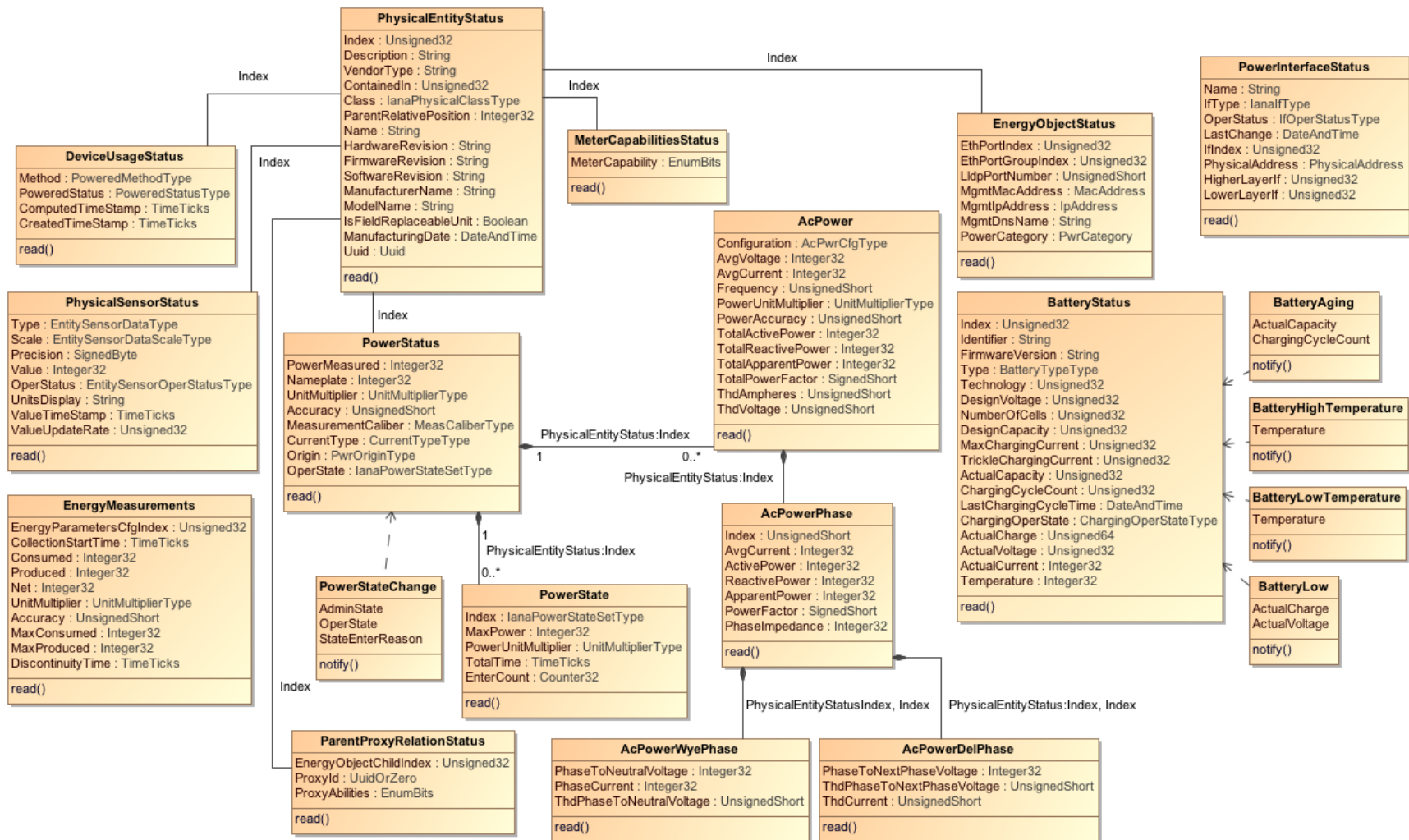
Information Model Gaps

- Power/Energy modeled as interfaces
 - See Class Diagrams in next slides
 - How to best model Physical Device and Physical/Logical interface relationships
 - IF-MIB provides a framework
- Modeling relationships
 - Parent-Child implies UML inheritance (specialization/generalization)
 - No need to have a flat relationship in our model (can be a hierarchical tree)
 - How to best configure relationships
- Battery relationship
 - How do you correlate a battery to a Physical Device?

UML Information Model Control



UML Information Model Monitor



Key Decisions

- draft-ietf-eman-framework-07 consensus on:
 - Information Model will be developed using UML modeling language and included in the draft as XMI interchange format (XML text)
 - Information Model will be architected in a protocol agnostic approach (e.g., data model independent)

Issues

- draft-ietf-eman-framework-07
 - Further work is needed to clarify relationships more generally than Parent-Child
 - Further research into modeling physical interfaces
- draft-ietf-eman-battery-mib-08 consensus on:
 - Further work is needed to clarify the relationship between a battery and it's associated physical device
- draft-ietf-eman-energy-aware-mib-07 consensus on:
 - Further work is needed to better clarify how to best configure relationships
 - Further research into modeling physical interfaces at the implementation level (e.g., in the SNMP MIB data model)