WG13 Issues - CIM Issues #6924

Add subclasses of SubSchedulingArea

09/16/2024 04:16 PM - Alex Anderson

Status:	New		
Priority:	Normal		
Target version:			
Author/Contact Info:		**Standard(s):**	
Base Release:		**Version:**	
Solution to be Applied To:		**Clause:**	
Solution Version:		**Sub-Clause:**	
Solution Applied By:		**Paragraph:**	
Completion Date:	09/30/2024	**Table:**	
CIM Keywords:	61970-ControlArea	**Originally Closed in Version:**	
Breaking Change:	No	**Origination Date:**	
Breaking Change Description:		**Origination ID:**	
CIM Impacted Groups:	WG13	**Originally Assigned To:**	
Requestor:			

Description

Add SchedulingArea, SubSchedulingArea, and five new subclasses of SubSchedulingArea to the main Grid >> ControlArea package.
Add association from SubSchedulingArea to Equipment / ConductingEquipment and to Terminal for specifying containment of equipment inside a persistent area for distributed control.
New classes are DistributionArea, FeederArea, SwitchArea, and Microgrid.

Proposed Solution

Add SchedulingArea, SubSchedulingArea, and five new subclasses of SubSchedulingArea to the main Grid >> ControlArea package.

Update description of **SubSchedulingArea** to "An area that is a part of another scheduling area. Typically part of a Transmission System Operator (TSO) scheduling area operated by a Distributed System Operator (DSO) or a Close Distributed System Operator (CDSO). ~~This includes microgrid concept. A sub-scheduling area can contain other sub-areas. A sub-scheduling area leaf will form the smallest entity of any given energy area.~~ The SubSchedulingArea is a persistent connectivity-based containment defined by a set of boundary Terminal objects. The BoundaryTerminal association is to the near-side terminal of clearly-defined electrical boundaries forming a local power system with one or more points of common coupling. Each piece of Equipment can be associated with one SubSchedulingArea in which it is contained. The boundaries of the SubSchedulingArea are specified through the Terminals of equipment forming the boundary (such as a Recloser or PowerTransformer) and do not change through topology changes via switching actions."

Add new child class of SubSchedulingArea, named **DistributionArea** with description "A persistent connectivity-based containment of medium-voltage and high-voltage distribution Equipment with clearly defined electrical boundaries based on terminals of boundary equipment in a distribution substation or multiple substations. The DistributionArea provides the highest-level description of the equipment controlled by the Distribution System Operator (DSO)"

Add new child class of SubSchedulingArea, named **FeederArea** with description "A persistent connectivity-based containment of medium-voltage distribution Equipment with clearly defined electrical boundaries based on electrical connectivity of a distribution feeder. The FeederArea contains all medium voltage equipment not contained in a SwitchArea or Substation / Bay. It also includes all Sectionalisers, Reclosers, and all other poletop and pad-mounted switchgear that form the boundary of a SwitchArea. It also includes all equipment between the feeder head terminal and the first switching device if the substation breaker is not included in Feeder EquipmentContainer."

Add new child class of SubSchedulingArea, named **SwitchArea** with description "A persistent connectivity-based containment of medium-voltage distribution Equipment with clearly defined electrical boundaries formed by one or more Switch objects. The SwitchArea contains all conductors, fuses, poletop equipment, and vault equipment. It also contains all secondary service

transformers not contained in a SecondarySubstation."

Add new child class of SwitchArea, named **Microgrid** with description "A persistent connectivity-based containment of distribution equipment that 1) has clearly-defined electrical boundaries formed by one or more point of common coupling Switch objects and 2) that acts as a single controllable entity which can be operated in grid-connected or islanded mode. This covers both utility-owned distribution microgrids and customer-owned facility microgrids as defined in IEV 617-04-22."

Add new child class of SubSchedulingArea, named **SecondaryArea** with description "A persistent connectivity-based containment of low-voltage distribution Equipment and customer-owned Equipment with clearly defined electrical boundaries formed by one or more PowerTransformer objects."

Decision

It was agreed to keep SchedulingArea and SubSchedulingArea as the concrete classes. Specializations of FeederArea, etc. will not be added to the model in favor of an enumeration that describes the kind of SubSchedulingArea. The two classes will be added to the ControlArea package It has associations to Terminal and ConductingEquipment. The self-assc nesting and assc to Feeder to remain same as in NC package. Svein to review and edit descriptions.

The SubSchedulingArea definition will be updated as:
"An area that is a part of another scheduling area. Typically part of a Transmission System Operator (TSO) scheduling area operated by a Distributed System Operator (DSO) or a Closed Distributed System Operator (CDSO). This includes microgrid concept. A sub scheduling area can contain other sub areas. A sub scheduling area leaf will form the smallest entity of any given energy area.

The SubSchedulingArea is a persistent connectivity-based containment defined by a set of boundary Terminal objects. Each piece of ConductingEquipment can be associated with one SubSchedulingArea. The boundaries of the SubSchedulingArea are specified through the Terminals of conducting equipment forming the boundary (such as a Recloser or PowerTransformer)."

Terminal assc description: "The BoundaryTerminals association is to the near-side terminal of clearly-defined electrical boundaries forming a local power system with one or more points of common coupling. Each terminal can form the boundary of only a single SubSchedulingArea"

Cond EQ assc description: "Each piece of ConductingEquipment can be associated with one SubSchedulingArea to provide a persistent containment for connectivity and control modeling"

Descriptions for the SubSchedulingAreaKind enum same as for the original concrete specializations proposed

Related issues:

Related to WG13 Issues - CIM Issues #5044: Review circuit class in CIM18	**Closed**
Related to WG13 Issues - CIM Issues #4989: Feeder:How to modelize a feeder as...	**Closed**

History

#1 - 09/19/2024 11:46 AM - Todd Viegut

- Related to CIM Issues #5044: Review circuit class in CIM18 added

#2 - 09/19/2024 11:50 AM - Todd Viegut

- Related to CIM Issues #4989: Feeder:How to modelize a feeder as a collection of equipme added

#3 - 11/08/2024 02:13 PM - Alex Anderson

- File Feeder and Substation Containment Proposal PNNL-204041.pdf added

#4 - 03/26/2025 11:10 AM - Alex Anderson

- Decision updated

Files

Feeder and Substation Containment Proposal PNNL-204041.pdf	3.31 MB	11/08/2024	Alex Anderson