

## Title: Using CIM For Distribution Applications

CIM is a core component of GridOS® – a software platform enabling three-phase unbalanced analysis and optimization of distribution networks. This presentation will focus on the benefits, challenges, and overall experience in using CIM for software development of distribution network applications. More specifically, the presentation will focus on the following topics:

- Using CIM classes for modelling distribution networks such that they are ready for various planning and real-time distribution analysis including time-series power-flow, loss minimization, and hosting capacity. CIM modelling for each type of network asset, feeder containment, and topology representation will be discussed. Challenges and solutions in dealing with various modelling formats will also be discussed.
- Extending CIM to model energy storage systems for optimal dispatch, as well as using existing CIM classes to model other distributed energy resources (ex. solar photovoltaics).
- Using CIM *StateVariable* objects for representing results for snap-shot and time-series analysis.
- Incorporating CIM difference models to enable distribution planners to modify network models by creating / deleting network assets, and by editing existing asset properties and ratings.
- Using CIM IEC61968 classes for building the GridOS Equipment Library.
- Using CIM classes for visualizing distribution networks on the GIS view.
- Software challenges encountered with serialization of CIM in RDF/XML format, and the benefits of representing CIM in JSON.

## Presenters/Authors

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Bio: Emily Ma is a software development team lead for Opus One's Advanced Analytics team. At Opus One, she is responsible for research and development of advanced distribution system modeling and optimization. She also has a lot of experience in the software realization of the CIM modeling and data integration. In her free time, Emily contributes to the Python community – last year, she was a presenter at PyCon Canada demonstrating power-flow running in Jupyter Notebook. Emily holds a Bachelor's degree in Engineering Science from the University of Toronto, and is a licensed Professional Engineer in Ontario.

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Bio: Evert Timberg is a Principal Architect at Opus One. At Opus One, he focuses on developing GridOS. He has extensive experience with simulation and analysis of electrical networks from both an electronics and power systems perspective along with experience in developing highly scalable software solutions using open source technologies. Outside of work he maintains a popular open source charting library. He has a Bachelor's degree in Electrical Engineering from the University of Toronto.