

Integrated Multi Scale Data Analytics and Machine Learning

Project Description

Develop and demonstrate distributed analytics solutions to building-grid challenges, leveraging multi-scale data sets, from both sides of the meter. Evaluate and demonstrate the application of machine learning techniques to create actionable information for grid and building operators, and derive customer benefits from disparate data

Enabling the transition from data to actionable information at the building to grid interface

Outcomes

- ▶ Enable local nodal information exchange and high-performance, distributed algorithmic analysis
- ▶ Deploy local analytics integration at the grid edge, with a bridge to supervisory grid layers
- ▶ State-of-the-art distributed analytics strategies to thrive in an evolving distribution system

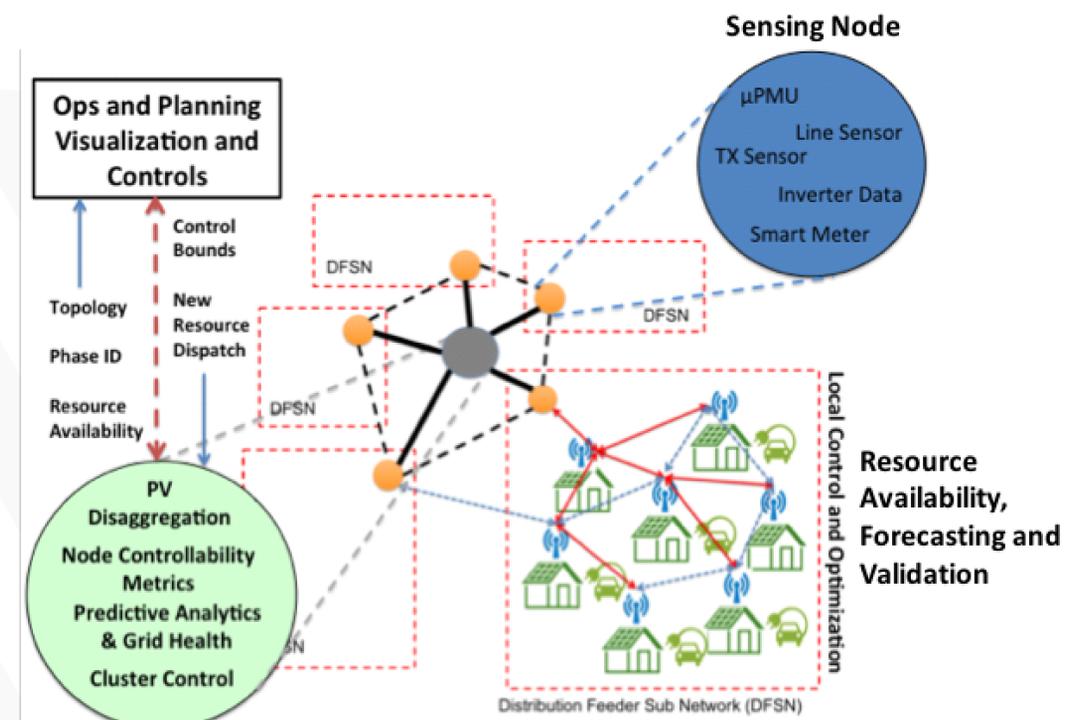
Benefits

- ▶ Consumers will have increased revenue streams for utilization of resources
- ▶ Grid operators and planners can proactively and efficiently manage assets
- ▶ Improved grid health and data utilization

Significant Milestones	Date
Task 1: White paper delivery and review	9/1/16
Task 2: Workshop & Use Case Review	2/1/17
Task 4: Benchtop application demo	7/1/17
Task 6: Framework Presentation	6/1/18

Team

- ▶ LLNL, LBNL, LANL, ANL, NREL, SNL
- ▶ Industrial Partners: RPU, Pecan St, PG&E, PSL, Sentient, Duke Energy, SGIP, OSISoft



Distributed Analytics Node

Use Case	DR & DER Local Availability & Verification	Incipient Failure Detection in Distribution	Topology & Parameter Estimation
Present State of Art	Estimated forecast and manual communication	Local sensing, smoke signals, outage management	Successful applications in highly sensed environments,
Present Granularity	Sub or Individual Customer, Day+	Limited prior to outaged component	Sub or Individual Customer, Day+
Future Requirement	Cust & Dist XFRMR Real time and Hrs Ahead	Dist XFRMR/ component level Real time, Months and Hrs Ahead	Switch, Distribution Component Planning and Event Driven
Useful Data	AMI, Irradiance, Green/Orange Button, PMU, model	AMI, Model, PMU, GIS	AMI, Model PMU, GIS, Model

Stakeholders

Consumers, DERMS and PV Vendors, Operators

Consumers, Asset Managers, Operators

Planners, vendors, PV integrators, Operators

Progress

- ▶ Use case review at stakeholder workshop
- ▶ Evaluated state of the art in ML, and selected platform
- ▶ Two white papers delivered, and being published
- ▶ Coordinated with synergistic activities across programmatic boundaries