

Multi-Scale Integration of Control Systems (EMS/DMS/BMS Integration)

Project Description

This project aims to create an integrated grid management framework for the end-to-end power delivery system – from central and distributed energy resources at bulk power systems and distribution systems, to local control systems for energy networks, including building management systems.

Expected Outcomes

- Develop an open framework to coordinate EMS, DMS and BMS operations.
- Demonstrate the new framework on a use case at GMLC national lab facilities.
- Deploy and demonstrate new operations applications on that framework.

Significant Milestones	Date
FY16 Mid-year Milestones: Completed the use case report and data exchange requirements/protocols report.	12/2/2016
FY16 Annual Milestones: Complete integration of LANL ED with SNL UC engine; Complete integration of renewable forecasting into UC and ED.	3/30/2017
FY17 Annual Milestones: Demonstrate integration of DMS and BMS information on the use case proposed under task 1; Complete the formulation of new DMS/BMS applications for EMS operations and implementation into UC/ED.	3/30/2018
FY18 Annual Milestones: Successfully demonstrate integrated EMS/DMS/BMS platform; Demonstrate new DMS/BMS applications in UC/ED EMS; Demonstrate the uncertainty modeling and forecasting method in the integrated EMS/DMS/BMS system.	3/30/2019

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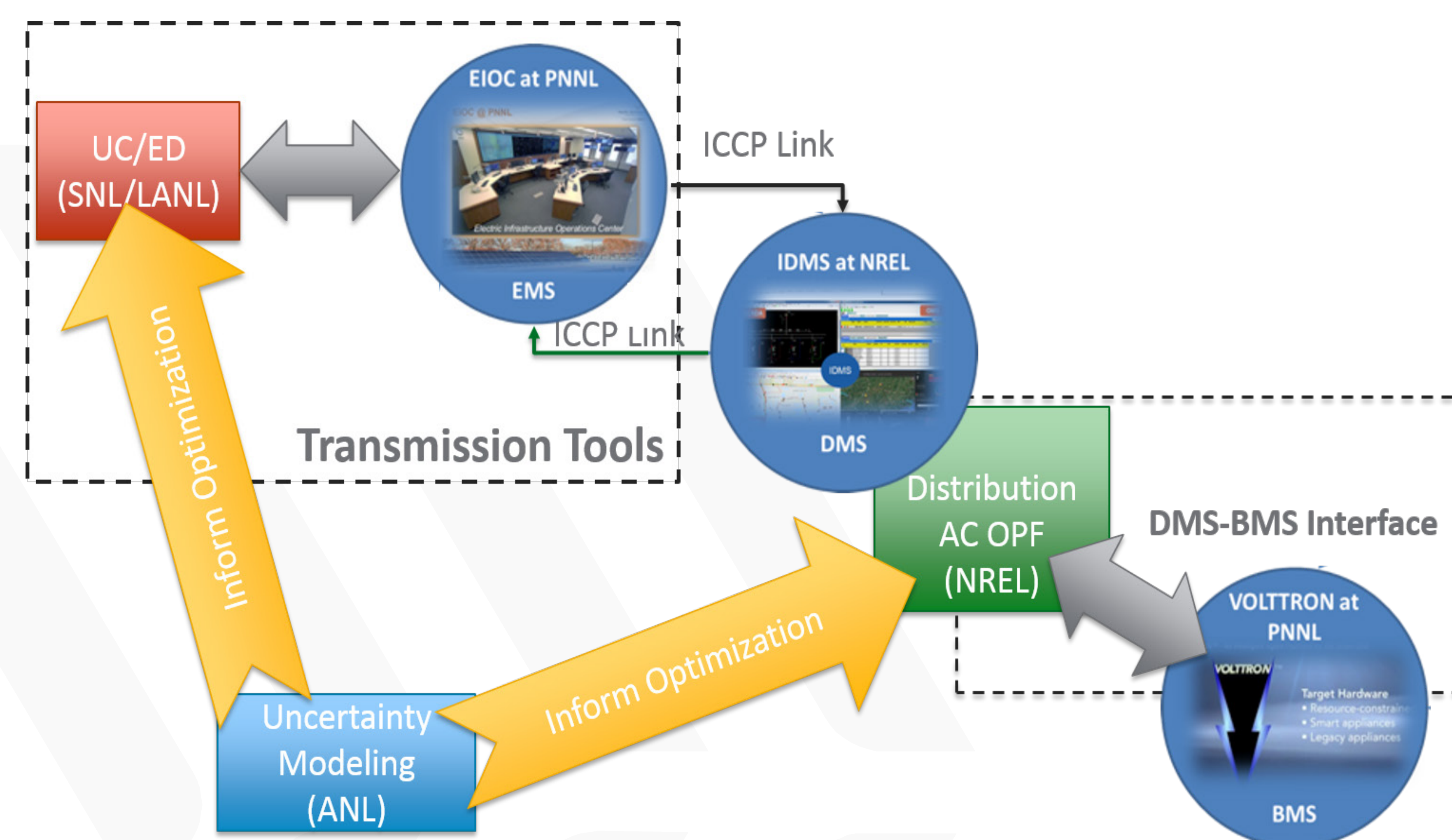


Figure 1 EMS/DMS/BMS System Architecture

Progress to Date

- Completed Version 1 of use case document and communication/control requirements document.
- Implemented the BMS in VOLTTRON™, which allows for control actions based on communication from the DMS.
- Collected Duke Energy's distribution data and PJM's transmission data for the Y2 and Y3 demo.
- Completed the benchmarking of stochastic unit commitment and economic dispatch.
- Completed integration of stochastic Unit Commitment (UC) and stochastic Economic Dispatch (ED); Completed integration of renewable forecasting into UC and ED.

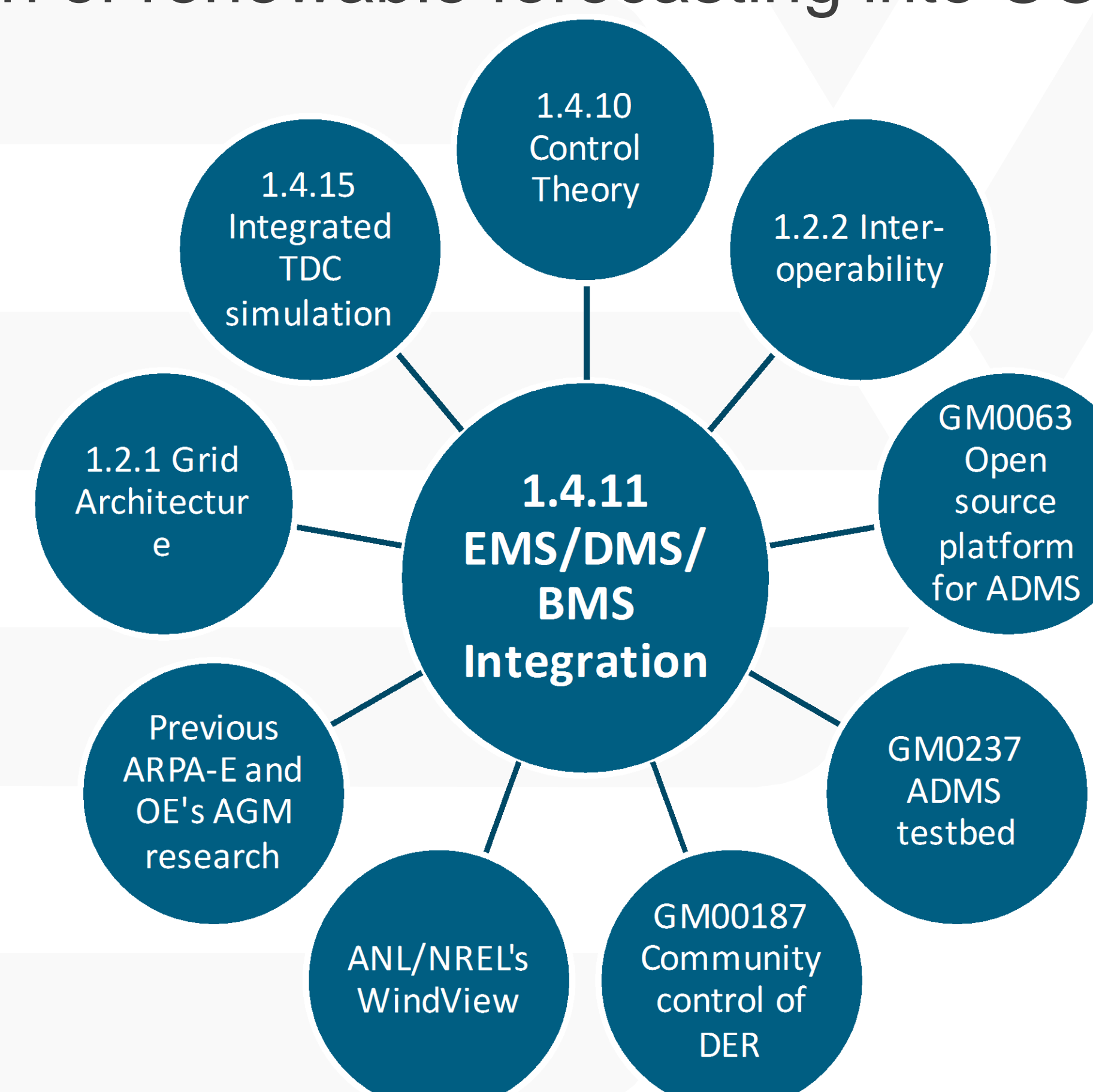


Figure 2 Project Integration and Collaboration