

FUTURE POWER GRID INITIATIVE

GridOPTICS™ powerNET Testbed

THE CHALLENGE

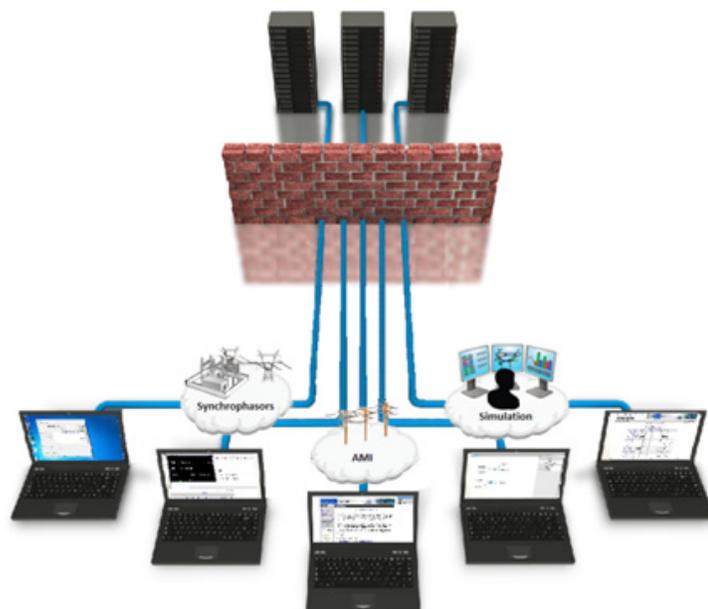
To successfully plan and evaluate various configurations of future power grid deployment, grid operators and policy planners will need advanced simulation and modeling capabilities. Without a testbed allowing experimentation and various systems configurations of construction, commissioning, and operations, successful deployment of future power grid infrastructure becomes more costly.

OUR APPROACH

This testbed will connect to a real-time data management system using model-driven data reduction, aggregation and replication algorithms to improve the reliability and scalability of information networks in the power grid. Power system equipment, a simulation cluster, and VMW are integrated into DETER software to enable the testbed to accommodate a wide range of experiments. Common real world system configurations will be provided to enable quick and user friendly experiment setup. Future work will include federation with other testbed environments, such as DETERlab.

IMPACT

- ▶ Access to real power system equipment
- ▶ Sandbox environment where new ideas can be tested
- ▶ Collaborative scientific environment for sharing data and experimental configurations
- ▶ Scalable with support for simulated, virtual, and bare metal equipment
- ▶ Experiment-based with data storage facilities.



powerNET testbed is a remotely accessible, multi-user, experimental testbed focused on enabling cutting edge power system and Smart Grid research.

FOCUS AREA

This project is part of **Focus Area One**, which addresses data networking and management issues, and enables the digital infrastructure for the future grid. This focus area will address the

gaps in networking and real-time data management by developing advanced algorithms and software tools and techniques. **Focus Area Leads:** Bora Akyol (bora@pnnl.gov) and Phil Craig (philip.craig@pnnl.gov).

ABOUT FPGI

The Future Power Grid Initiative (FPGI) will deliver next-generation concepts and tools for grid operation and planning and ensure a more secure, efficient and reliable future grid. Building on the Electricity Infrastructure Operations Center (EIOC), the Pacific Northwest National Laboratory's (PNNL) national electric grid research facility, the FPGI will advance the science and develop the technologies necessary for meeting the nation's expectations for a highly reliable and efficient electric grid, reducing carbon emissions and our dependence on foreign oil.

ABOUT PNNL

Pacific Northwest National Laboratory is a Department of Energy Office of Science national laboratory where interdisciplinary teams advance science and technology and deliver solutions to America's most intractable problems in energy, the environment and national security. PNNL employs 4,900 staff, has an annual budget of nearly \$1.1 billion, and has been managed by Ohio-based Battelle since the lab's inception in 1965.

For more information, please visit the FPGI website or contact:

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