



FUTURE POWER GRID INITIATIVE

Scalable Sensor Data Management Middleware

OBJECTIVE

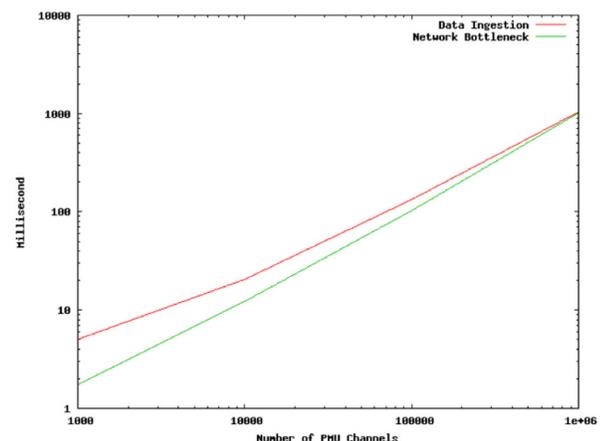
- » Build a scalable and flexible data management middleware to mediate the enormous amount of data from a large number of sensors and a large number of applications in future smart grids
- » Provide a uniformed API to allow applications to access real time power grid data
- » Facilitate the integration of a large number of diverse applications and still provide quality of service (QOS) guarantees

APPROACH

- » Leverage multicast to provide scalable and efficient data delivery and easy integration
- » Specialized design tailoring to the characteristic power grid data and application
- » Distributed over multiple machines for further scalability
- » Dynamic reconfiguration to provide high reliability

IMPACT

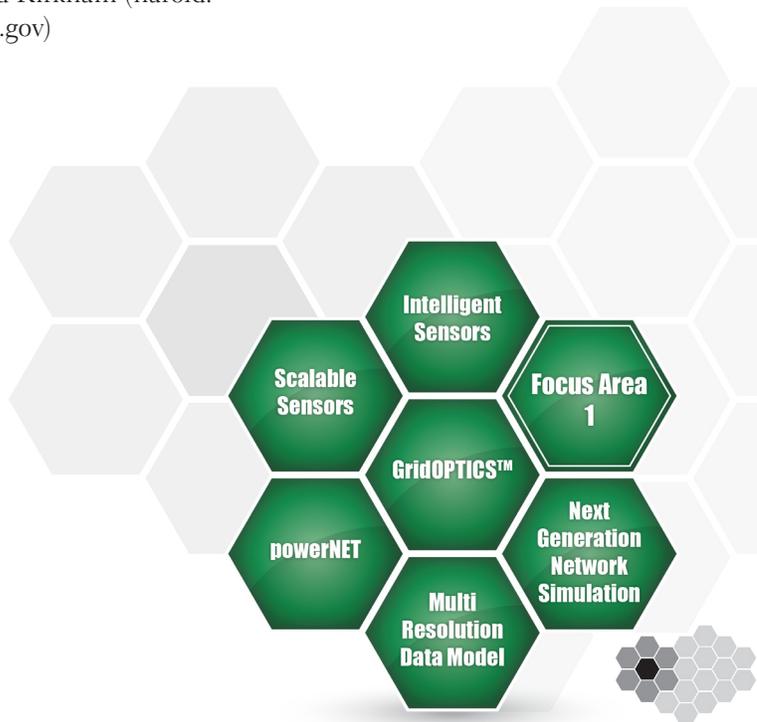
- » Provide essential system building blocks to enable future power grid applications
- » Provide the essential real time data fabric for GridOPTICS™
- » Achieve real-time predictable performance for data access
- » Performance is close to the hardware limits
- » Linearly scalable to multiple nodes
- » Develop fundamental mechanisms to achieve scalability of power data management systems
- » Allow easy integration of a large number of diverse power grid applications that requires reliable, efficient, real-time access of power grid data



GridMW Performance

FOCUS AREA

Focus Area One 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 Harold Kirkham (harold.kirkham@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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