



# Power Systems Engineering Research Center

## Requirements and Mechanisms for Flexible and Robust Inter-Utility Data Sharing

**Dave Bakken**

Associate Professor of Computer Science  
School of Electrical Engineering and Computer Science  
Washington State University  
Pullman, Washington, USA

Research Tele-seminar  
November 6, 2007  
2:00-3:00 p.m. Eastern Time (11:00-12:00 Pacific)

### Description

With the increase in the monitoring of status data at very high rates in high voltage substations and the ability to time synchronize these data with GPS signals, there is a growing need for transmitting this data for monitoring, operation, protection and control needs. The sets of data that need to be transferred and the speed at which they need to be transferred depend on the application – for example, slow for post-event analysis, near real-time for monitoring and as close to real-time as possible for control or protection. In this tele-seminar, we overview the requirements for the next-generation power grid's communication infrastructure in the areas of flexibility and quality of service. We also overview technologies in the computer science field of distributed computing that can be brought to bear to help meet these requirements, yet to date have not been discussed in the context of grid modernization. Additionally, we argue against the industry trend of using either TCP/IP or web services for real-time data exchange for fast controls. Finally, describe GridStat, a novel middleware framework we have developed that is suitable for the power grid and its application programs. Test results demonstrate that such a flexible framework can also guarantee latency that is suitable for fast wide-area protection and control.

### Biography

**David E. Bakken** is an associate professor of computer science in the School of Electrical Engineering and Computer Science (EECS) at Washington State University (WSU). His research interests include middleware, distributed computing systems, fault tolerance, and quality of service frameworks. Prior to joining WSU, he was a scientist at BBN Technologies where he was an original co-inventor of the Quality Objects (QuO) framework. He has consulted for Amazon.com, Network Associates Labs, and others, and he has also worked as a software developer for Boeing.

**Participation:** Live audio will be provided via teleconference phone bridge. The presentation slides can be downloaded from the [PSERC website](#) on November 6. The audio-slide production of the tele-seminar will be available by web streaming a day after the tele-seminar.

**Registration:** To indicate that your organization would like to have an access line, send an email to [Theresa.Herr@asu.edu](mailto:Theresa.Herr@asu.edu) with the subject "Bakken Seminar". To use our limited phone bridge capacity efficiently, we ask that people in an organization meet together to participate rather than calling in separately, if at all possible. Connection information will be sent before the seminar. There is no charge for participating!

**Professional Development Hour Certification:** PDH certification is available for PSERC members (only). Send an email requesting PDH certification to [Theresa.Herr@asu.edu](mailto:Theresa.Herr@asu.edu) with the subject "PDH" after the seminar. *Include the name and title of each participant.*

**Seminar Logistics and Assistance**

Connection information will be emailed to you after you submit your request. If you have any questions, please contact Theresa Herr, PSERC's administrative assistant, at 480-965-1643 or [Theresa.Herr@asu.edu](mailto:Theresa.Herr@asu.edu). You can also contact Dennis Ray, PSERC Executive Director, at 608-265-3808 or [djay@engr.wisc.edu](mailto:djay@engr.wisc.edu).

**Speaker Contact Information**

Dave Bakken  
Email: [bakken@eecs.wsu.edu](mailto:bakken@eecs.wsu.edu)  
Phone: 509-335-2399

**PSERC's Seminar Coordinator**

Shmuel Oren, University of California at Berkeley  
Email: [oren@ieor.berkeley.edu](mailto:oren@ieor.berkeley.edu)

Shmuel welcomes feedback on the tele-seminars and suggestions for future ones.