A Cloud Data Sharing Platform
for Real-time PMU Data

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Description: We present the results of a study conducted by WSU, Cornell and ISO-NE aimed at understanding the practical challenges associated with using cloud computing infrastructures to monitor PMU devices in a deployment intended to be similar in scope and scale to the Northeastern regional power pool. The study was built on a cloud data sharing and computation platform originally created in the GridCloud project sponsored by the U.S. Dept. of Energy ARPA-E GENI program. In the studied system recorded PMU data from the ISO-NE system are used to create emulated PMU data streams that are sent over secured communication links to the cloud where a real-time state estimator runs. We will discuss security requirements, options, and their degree of match, as well as several latencies: from the time when PMU data are captured to when the corresponding state estimate becomes available; from when the data are captured to when they are available for computation in the cloud; and from capture to the time that raw data can be used by applications not running in the cloud. We will also describe performance of the system when two identical systems are deployed with one instance running on an Amazon data center on the US Northeast and the second running remotely in the Pacific Northwest to provide spatial redundancy.

Biography: Carl Hauser is a Clinical Associate Professor of Computer Science in the School of Electrical Engineering and Computer Science at Washington State University. After receiving his Ph.D. in Computer Science at Cornell University, he spent 20+ years with IBM Research and Xerox Palo Alto Research Center working on problems in programming languages, operating systems, networks, and distributed systems. Since joining WSU in 2001, Dr. Hauser has focused primarily on computer science research related to power grid operations: distributed systems, networking, cyber security, modeling and simulation.