



# Improve Wide Area Monitoring

Cisco powers synchrophasor communication for smart grid.

## Case Study

**Industry:** Power Utilities

**Location:** United States

**Business Impact:**

Benefits delivered by the Cisco solution include:

- Measurements generated at higher frequency
- Observeability for grid stability, monitoring, and control
- Isolation and prioritization of various applications
- Flexibility to deploy future technology



### Business Challenge

Modern interconnected power delivery networks require close monitoring and control of grid operations and equipment behavior. Utilities have used Supervisory Control and Data Acquisition (SCADA) measurements typically once every two seconds to feed command, control, and monitoring systems. Several power system disturbances and extended outages have shown that the SCADA measurement data is no longer sufficient to provide adequate observeability or 'Situational Awareness' of complex interconnected power delivery networks. Small disturbances in these power delivery systems, if they are not detected early enough, can lead to widespread cascading failures in the grid.

Phasor Measurement Units (PMUs) allow more granular collection of important operational data to provide a high-quality view and control of the power system as it responds to supply and demand fluctuations. However, the PMU data, to be useful for early detection of disturbances, need to be collected at significantly higher frequency (typically 200 times a second) and require a high degree of performance collection, aggregation, dissemination, and management. Hence, a very robust, low-latency, and highly scalable communication network is essential.

Most utility communication networks are not designed or positioned to deal with the explosion of data that PMUs generate. Nor are they resilient enough to support synchrophasors for wide-area control. Therefore, smart grid applications that process PMU data will be constrained by the communications system, and will be limited to performing after-the-fact fault analysis, as opposed to a powerful tool for proactive and preventive stability control. The result is the marginalization of PMU programs and investments.

### Solution and Results

Cisco products and solutions facilitate quick deployment of PMUs in the utility network to provide:

- Necessary communication network capacity for the increased traffic load
- Stringent performance for critical operational needs
- Critical data/control/protection path delay monitoring and visualization
- Virtualization through Multi-Protocol Label Switching for isolating and prioritizing various applications on a converged IP network
- Proper cyber security for synchrophasors that support control and protection applications
- Higher reliability and resiliency for next-generation smart grid applications
- Flexibility to deploy future PMUs without having to redesign the communications network

### Cisco Connected Grid Services

Cisco® end-to-end Connected Grid solutions support the most extensive range of smart grid applications. Smart grid networks based on Cisco solutions help ensure the highest reliability, controllability, security, and performance. Also, with well-established Cisco IOS® software, network support personnel can have the highest confidence in managing smart grid infrastructure.

Cisco Connected Grid Services include comprehensive network planning, design, testing, implementation, and operation. With Cisco Connected Grid Services, utilities can successfully support smart grid implementation with confidence.