PMU Issues

- **PMUs not reporting** (extended outages)
- **Phasor data gaps** (PMU or network issues)
- **Phasor data with glitches and spikes** (noise that creates false alarms and makes signal processing and analysis more difficult)

Concentrator Issues (creates “black holes” in wide area visibility)

Server and Communications Issues (generally a small chronic loss of data)
PMUs Not Reporting (A Single Day)

September 23rd 2010

12 Key PMUs that did not report data this day, 6 from one provider.

Bad: 0% – 50% = 34 PMUs
Fair: 50% – 95% = 54 PMUs
Good: 95% – 99% = 21 PMUs
Data with Frequent Gaps

September 19th 2010

Frequency Data Trend (Sub-Second Resolution)
Start Time: 19-Sep-2010 08:32:34 PDT
End Time: 19-Sep-2010 09:09:32 PDT

Data gaps observed on all signals – could be network related issue.
Phasor Data with Glitches and Spikes

- Noise in frequency (40mHz spikes)

Spikes in voltage angle on one PMU observed throughout the day
After a brief gap in data, the angles started off from 100° and gradually settled off at 20° - creates false transient alarms.
Most PMUs Very Good, Some Not

Server/Network Opportunity

Concentrator or Communication Opportunity

PMU or Communication

Data Unavailability (%)
Recommendations

- Analysis Project to find Common and Special Causes of Data Problems
- Develop a Knowledge Base on Issues and Fixes
- Use PMU registry to facilitate analysis and correction
  - PMU and Concentrator Vendor, Communication Path
  - Quality Status Metric
  - Contact for Support
- Notification/Escalation Tool/Process
- Share Data Filtering Methods to Improve Real Time Monitoring and Alarming