



Data & Network Management Task Team Report Out

Co-Chairs:

Dan Brancaccio, BRIDGE Energy Group

James McNierney, NYISO

March 24, 2015

San Mateo, CA



D&NMTT Breakout Agenda

- Three presentations with balance of breakout to be working session
 - Information Centric communication infrastructure for real-time communications of data
 - A Demonstration of cloud communications network for wide-area monitoring and control of power systems
 - GPS-spoofed synchrophasor data correction for state estimation



RT Communications Proof of Concept

- Research from Various Universities
 - Presenter – Herman Bontius – (Alliander)
 - Use a publish / subscribe paradigm
 - Operates at the retail / distribution level/s
 - Proof of Concept for applying this use case to simulate providing the latency requirements of RT applications
 - Use 4G LTE communications to transfer data (for proof of concept – Not preferred)
 - SE, fault location and resiliency are part of the Proof of Concept



Cloud Communications for WAMS and control

- Research from NC State and UNC
 - Presenter Aranya Chakraborty
- Develop theoretical distributed cloud computing demonstration with optimization algorithms for WAMS over a secure communications network
 - Test stability, convergence and robustness
 - Wide Area Oscillation Monitoring
 - Decentralized SE



Cloud Communications for WAMS and control

- Formulated oscillation modes estimation problem arising from swing dynamic models of large power systems
- Demonstrating end-to-end delay on ExoGENI demonstrating Infrastructure as a Service (IaaS) clouds in a decentralized way.
- Implement attack-resiliency mechanisms
- Demonstrated this in a distributed architecture



GPS-spoofed phasor data correction for SE

- Research from University of Wyoming
 - Presenter - Dongliang Duan
- Implementing data checks to correlate data
- Only civilian GPS signal available
 - Publicly known, easy to predict
 - All PMUs are Subject to GPS Spoofing Attack (GSA)
 - PMU device can't sense it
 - Makes PMU data, invalid

GPS-spoofed phasor data correction using SE

- Mathematically, all measurements coming from the affected PMU will be affected.
- GSA can be denoted by location, spoofed phase shift)
- Using SE, to determine an algorithm in two use cases to provide a mathematical solution to correct faulty signals.
- Simulation setup has been done on 14, 30, 57 bus benchmark systems.
- Evaluate ability to locate and correct



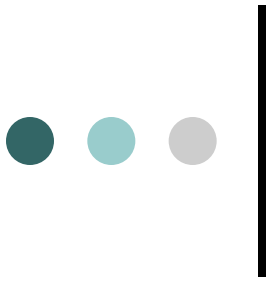
PMU Data Classification

- Need more information on this
 - Understanding the errors and how they affect the applications that are in use today.
 - Give guidance on what data rates they need
 - Give an idea of what kind of tolerance the applications can sustain



DNMTT Business

- Working with CRSTT
- Data Storage Architectures
 - RT Tools – for Control Room
 - Engineering tools use historical data
- Network Architectures
- Network Management Tools and Strategies
- Process and people problems (Governance)



Thank you for participating!