Data & Network Management Task Team Report Out

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D&NMTT Breakout Agenda

- Three presentations with balance of break out 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 Chakrabortty
- 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!