



Next Generation EMS

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Next Generation EMS

- Current architecture limits competition for efficient applications from smaller vendors
- Future Power System requires different look at reliability and control
 - Centralized vs. decentralized control
 - Corrective vs. preventive
 - System survivability and resilience vs. reliability: early detection + fast recovery
 - New definition of contingency
- Wide area situational awareness
- Decision support system
- New Applications



Architecture

- Integration friendly
- Platform Independence
- Decentralized, distributed processing
- Commercial DBMS vs. proprietary products
- Seamless integration of PMU data
- Common components
- Vendor independent presentation layer
- High performance computing (HPC) and cloud technology
- Standards
- Open competition for computationally superior applications



Situational Awareness

- Intelligent alarm system
- Complex event processing based on standard event repository
- Automatic vulnerability assessment and detection
- EMS/DMS integration
- Standards for visualization: color, naming conventions, “look and feel”
- Image exchange vs. data exchange
- National location registry
- Interregional cloud-based SCADA?
- Weather, Gas, Communication, IT infrastructure monitoring
- Self performance and compliance monitoring

Decision Support System

- Enhanced forecast tools and look ahead capability
- Stochastic and robust optimization methods
- Risk based OPF
- Cascading failure analysis
- Corrective actions calculation
- Online stability analysis
- Adaptive external network model management and validation
- Online system restoration



Roadmap

- Establish a **small** team of experts to develop high level functional specs and requirements:
 - Major functions
 - Components
 - Performance and capacity requirements
 - Standard interfaces
- Review by wider industrial group
- Map to modern IT architecture (add IT Experts)
- Evaluate by out-of-industry IT experts
- Develop transition plan
- Determine R&D needs and fund R&D
- New application development
- Pilots