



U.S. DEPARTMENT OF
ENERGY

OFFICE OF
**CYBERSECURITY, ENERGY SECURITY,
AND EMERGENCY RESPONSE**



Universal Utility Data Exchange (UUDEX) Pacific Northwest National Laboratory (PNNL)

Mark Rice, PM / Scott R. Mix, CISSP, PI
Cybersecurity for Energy Delivery Systems Peer Review

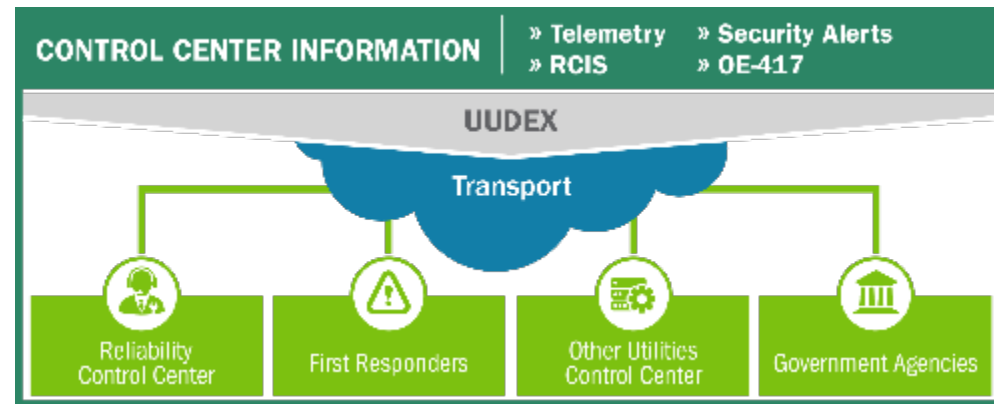
November 6-8, 2018

Summary: UUDEx

UUDEx

Objective

- Develop a modern, secure, model driven, dynamic, and flexible data exchange approach for utility communications, that is secure by default, and transport agnostic.



Schedule

- October 2018 – September 2020
- Phase 1 - Define Requirements of UUDEx
- Phase 2 - Develop design of UUDEx
- Phase 3 - Development of UUDEx

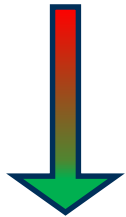
Total Value of Award: \$ 2,500,000

Funds Expended to Date: 15.57%

Performer: Pacific Northwest National Laboratory

Partners: OATI, MITRE
IAB: ConEd, PJM,
WAPA

State of the Art



UUDEX

- ❑ Current inter-utility data sharing connections are difficult and time consuming to set up
- ❑ Most operational data exchanges are not secure (even though secure options are often available)
- ❑ Existing operational data sharing mechanisms assume communications and computing infrastructures from the 1990's
- ❑ UUDEX will provide a modern, model-based, secure-by-design communications infrastructure
- ❑ Support exchange of cybersecurity information to facilitate situational awareness, attack prevention and mitigation
- ❑ Reduce new link setup time to 1 hour and minimize time & human resources to create or modify communication link

Industry reluctance for change

- Engaged Utilities on IAB
- Partner participation on standards committees including IEC TC57
- Working tech transfer plan from Day 1, and working with OATI to market the product
- Plan to have open source reference model

Existing method of using certificates slow down/decrease adoption of security data exchange

- Alternative to certificates for machine to machine
- Understand ramification of using PKI for external/ad-hoc connections

Secure by design

- Understand how to set up/force the client server to configuration to be doing encrypted traffic by default
- Understand regulation impacts of encrypted traffic by application
- Interoperability of security solutions

Major Accomplishments

- Gathered information from industry about current uses and needs for inter-utility communications
 - Deliverable submitted in June 2018 – *Universal Utility Data Exchange (UUDEX) - Initial Interview Results* by Scott Mix, Mark Rice and Siddharth Sridhar
- Established and met with an Industry Advisory Board
- Developed a Functional Specification for the new approach
 - Deliverable to be submitted in November 2018 – *Universal Utility Data Exchange (UUDEX) Functional Specifications* by Scott Mix, Mark Rice, Scott Neumann, Charles Schmidt, *et al.*

Plans to transfer technology/knowledge to end user

- Intellectual Property Management Plan developed and approved by partners
- Technology Transfer Plan work to this next year
- End goal is to develop a functional requirements, design specification, and reference implementation, that can be submitted to an international standards organization as an initial draft international standard to augment and replace existing standards
- One partner (OATI) is engaged in IEC activities and could champion the effort there

Approach for the end of project

- Develop Detailed Design Specification based on Functional Requirements document
- Build a reference implementation of UUDEX
- Demonstrate the reference implementation with two nodes exchanging information
 - dynamically add or modify data communicating between the two nodes without disrupting existing communications
 - establish a link to a third node without disrupting existing communications