Engineering Analysis Task Team

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NASPI Workgroup Meeting Break-Out

April 4-5, 2023

EATT Break Out Agenda

- 3:00-3:15 Introduction to the EATT and Round table introductions
- 3:15-3:45 **Special Guest Presentation:** The Grid Event Signature Library: A Centralized Repository of Power System Waveform Data
  - Aaron Wilson (Oak Ridge National Laboratory) and Jhi-Young Joo (Lawrence Livermore National Laboratory)
- 3:45-4:15 **Special Guest Presentation:** The Use of High-Speed Synchronized Measurements to Create Dynamic Indicators of Grid Resilience
  - David A. Schoenwald (Sandia National Laboratory)
- 4:15-4:25 Edge Computing Survey Results
- 4:25-4:35 Model Validation Paper update?
- 4:35-5:00 What do you want to see for the future of EATT

EATT Mission Statement

1. Proliferate the development, testing, and validation of engineering applications and data analytical methods that use synchronized measurements systems.

2. Assist in the deployment and utilization of synchronized wide-area measurement applications.

3. Formulate and guide recommended R&D activities related to the advancement of wide-area synchronized measurement systems and their applications.

EATT Edge Computing Survey

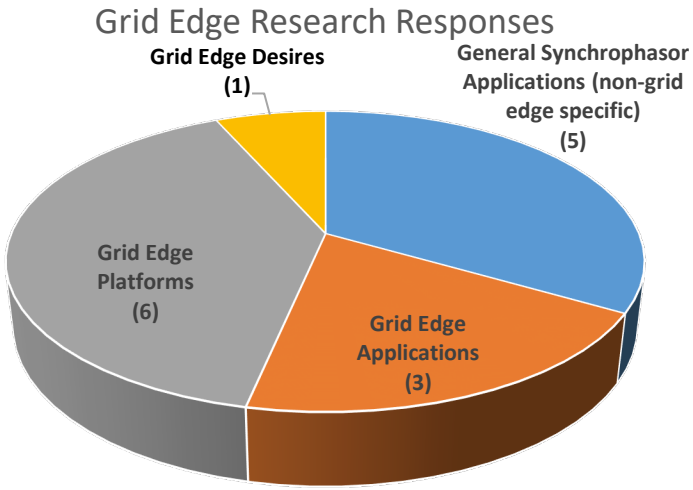
The EATT has released a survey to develop a beginning understanding of edge computing techniques and how synchrophasor data can contribute to such technologies.

Edge computing definition: Data collected, algorithms calculated, and decisions made at grid edge devices WITHOUT the translation of large amounts of system synchrophasor data to a central location. Local synchrophasor data transfer (say between substations) is considered an edge computing application.

The survey included one question seeking expertise and knowledge on existing or in-development synchrophasor edge computing applications.

Main results demonstrate an underlying challenge to understand the true definition of "grid edge" and the lack of a well-defined category of applications.

EATT Edge Computing Survey Results - Research



3 out of the 19 total response were generic synchrophasor responses

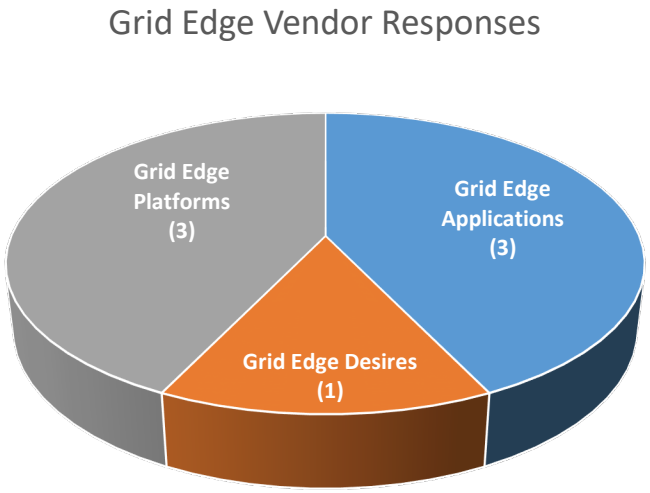
Grid Edge Apps

Utilize local frequency measurement data to voluntarily reduce power usage by sending signals to air conditioners.

Currently we are trying to monitor disturbances and their control using edge computing by using PMU data of adjacent substations.

A Machine Learning (ML) solution deployed in an Internet-of-Things (IoT) edge device for detecting forced oscillations in power grids.

EATT Edge Computing Survey Results - Vendor



7 out of the 14 total response were either no response or were general synchrophasor applications (non-grid edge)

Grid Edge Apps

GE Phasor Controller hardware and a substation PDC used for intelligent islanding, frequency control and transient instability protection.

I believe you could classify the application in Mexico (by SEL and CFE) which used the phase angle to determine if there was power flow out of Merida and based on that measurement, modify the relay settings.

Distribution synchrophasors to control usage of a simulated battery to match 15 minute and real time actual renewable PV production in a residential setting.

EATT Edge Computing Survey Results - Utility

No Grid Edge Apps reported in use

5 out of the 12 total response were no response

Applications reported (in –service or discussed)

- Area Separation
- Data Quality
- Fast Voltage Control for Large Sensitive Customers
- Substation PDC local WAMPAC
- Automatic Voltage Control
- Linear State Estimation for Distribution
- Oscillation and Island Detection
- Power Flow Monitoring and Disturbance Detection

Advanced Model Validation & Calibration

- EATT White Paper
- Lead: Honggang Wang (previously with GE)

Objective: Document industry advancements in model validation and calibration

Drafting has been completed

What do you want to see from EATT?

- **Synchrophasor Edge Computing White paper – Is this of value to the NASPI community?**
- **IBR Performance Monitoring Analytics and Tools – Data, ML analytics and BES impact identifications – Can synchrophasors help and what type of application is needed?**
- Other Ideas for EATT products?