

Gridmetrics®

Platform Enabling Smart Grid Monitoring & Sensing

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Mission

Gridmetrics will enable the rapid adoption of real-time-all-the-time monitoring and management of the Smart Grid using existing broadband infrastructure

CableLabs®

Existing broadband reaches **90% of households** in the United States



Ideal Wholistic Grid Visibility

Time Synchronized with High Fidelity



Harmonious Dynamic Real-Time Reliable Resilient

Today's Grid Visibility

Can't measure
Can't manage

Blind between the
substation and the meter



600K miles
fiber to 75% substations

6M miles
limited comms

Broadband Infrastructure is Everywhere



Gridmetrics Platform Utilizes Existing Infrastructure



Pole Mounted

Communications networks designed to be resilient to commercial power

Exist in ~90% of U.S. neighborhoods and business parks

Purpose-built uninterruptible power supplies (UPS) for 5G small cells, community WiFi hotspots, broadband fiber nodes

650,000

UPS boxes exist across the United States today



High bandwidth communications

1GB backhaul private, secure

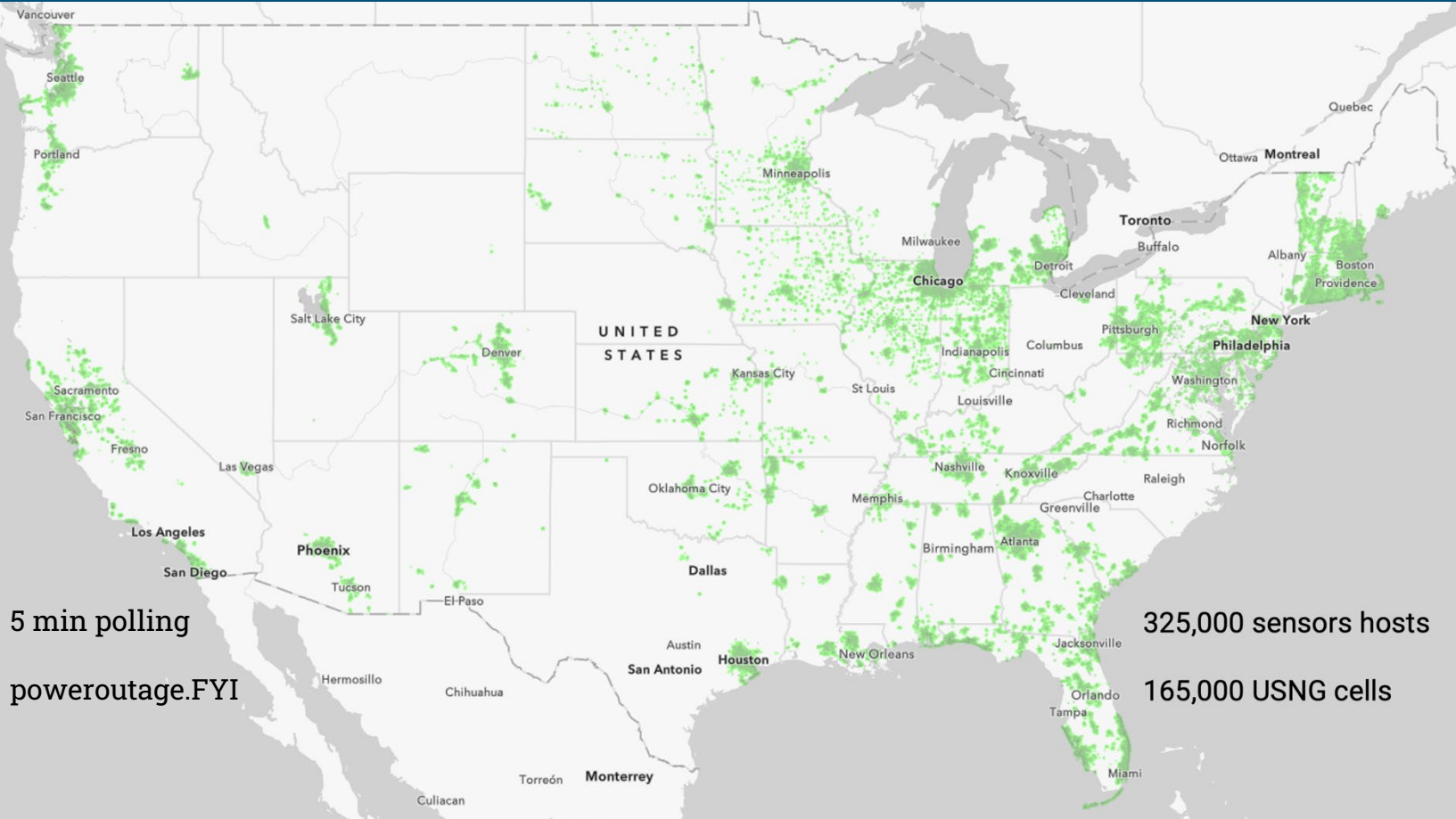


Pedestal



Battery backed 4 - 72 hours

Gridmetrics Coverage Today



5 min polling
poweroutage.FYI

325,000 sensors hosts
165,000 USNG cells

Gridmetrics Today

**Years of working with
broadband companies**

6+

Gridmetrics
innovation
developed and
incubated at
CableLabs

**Years of aggregated
data points**

4

Gridmetrics
unique data
provides an
independent,
observational
view of power

**Total number of
sensor hosts**

325,000

Gridmetrics
partners with
broadband
communications
providers

**US population that
live or work within
1km of a sensor host**

160M

Gridmetrics
power sensors are
tightly aligned
with population
density

The Gridmetrics Visibility Platform



Features

High fidelity 12 bit sampled at 10,000/sec

Time synchronized to 0.5 microseconds

Resilient, continuous streaming data

Rapid time to data

Footprint of available broadband infrastructure

Data is secure and free of personal identifiable info

Cheaper, better, faster

Benefits

Insights derived from raw, lossless, aggregated data

Wholistic grid visibility across transmission & distribution

Constant, consistent signals for *state of the grid*

Installation independent of utility

Density and distribution tightly coupled with population and power

Security by design ensures support from broadband operators

Pick any three



Gridmetrics Visibility Data from ORNL Sponsored Pilot

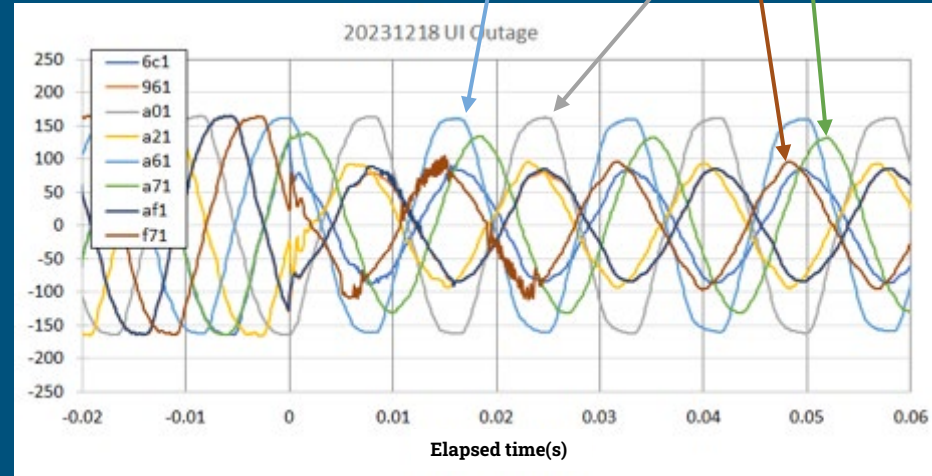
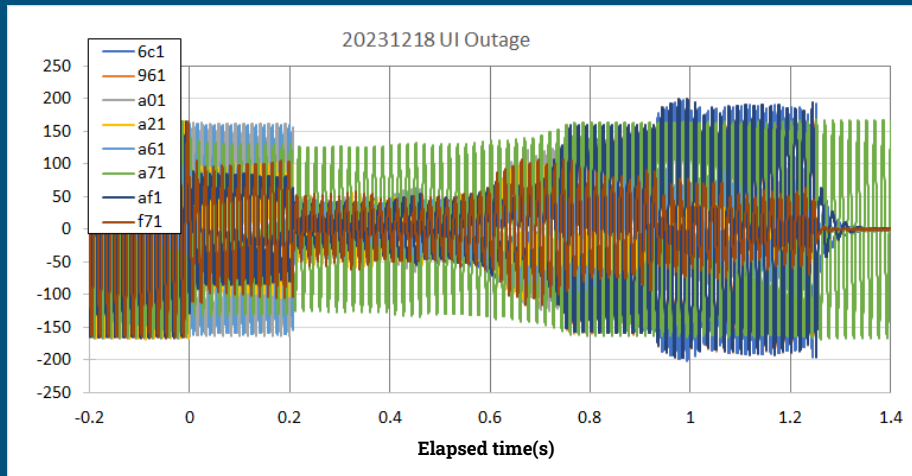
Distribution Grid visibility is typically captured via disparate devices

Digital Fault Recorders (DFR), Remote Terminal Units (RTU), Phasor Measurement Units (PMU)

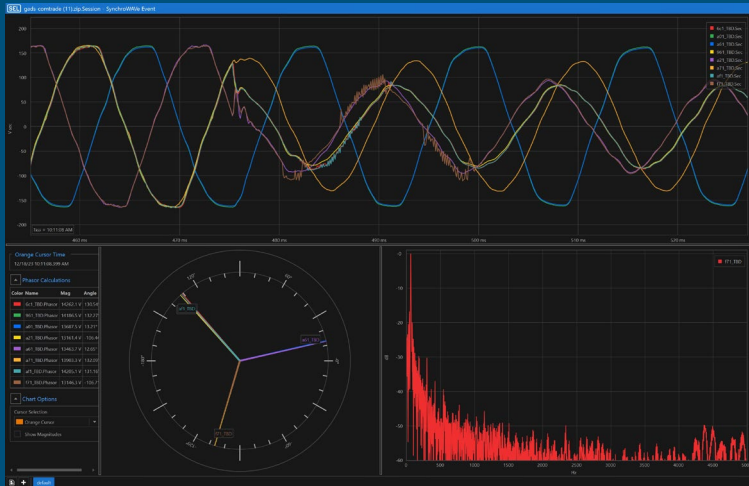
Gridmetrics enables high-fidelity, time synchronized visibility

Consistent and constant across feeders and phases

Mount Carmel, CT



Gridmetrics Visibility Data Visualized



Gridmetrics waveform data
exportable to COMTRADE and CSV

Viewed in Schweitzer Engineering
Lab's (SEL) SynchroWAVE tool

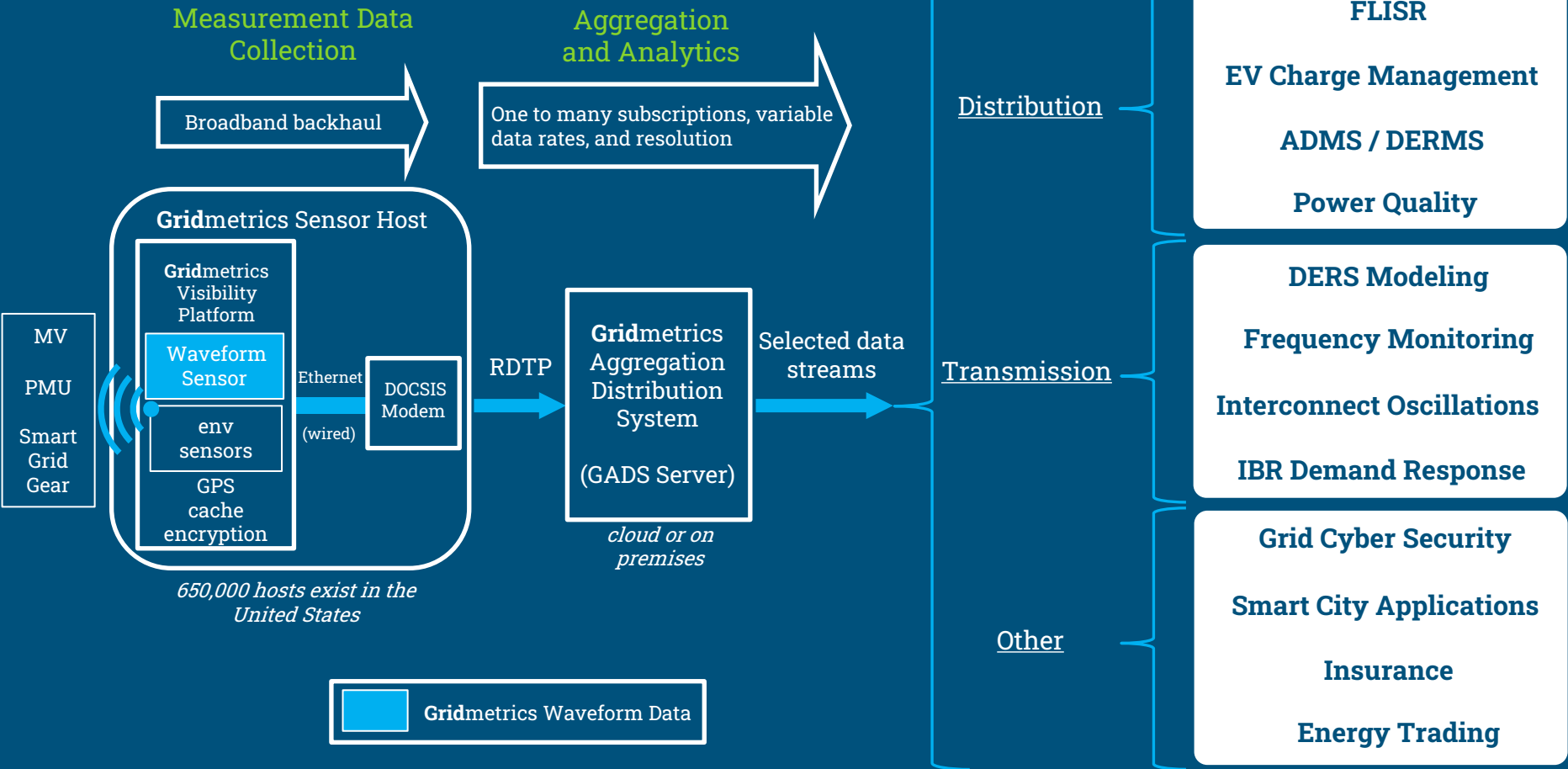
Gridmetrics waveform data (17 sensors)
visualizing frequency

15 min, 50ms windows, time synchronized



The Gridmetrics Platform

Markets and Applications



Gridmetrics Visibility Platform Overview

- Essentials Signals-as-a-Service
 - Provide Frequency, ROCOF, Voltage and ROCOV based on 20 packets/sec (500 data points, 3 cycles, 50ms)
 - Latency of event notification targeted < 5 sec
 - Aggregated sensor data to create real-time profile of *state of the grid*
- Deployment Configuration
 - 6 sensors per feeder = 2 sensors per phase per feeder
 - Provides measurement confirmation, redundancy and basic segmentation (north, between, south)
- Notables
 - No Personally Identifiable Information (PII)
 - Pilot with VELCO in South Hero, VT - including data from eclipse



THANK YOU!

