



LOCALGRID™

INTELLIGENCE AT THE EDGE

APRIL 2015

# UTILITY CHALLENGE



## ***Pilot Projects***

Transformer monitoring

- Outage detection
- Fault detection
- Loss detection

MicroGrid, operated by utility for customers

- EV charging
- Storage
- PV solar
- V2G
- Flexible asset

## ***Infrastructure Challenge***

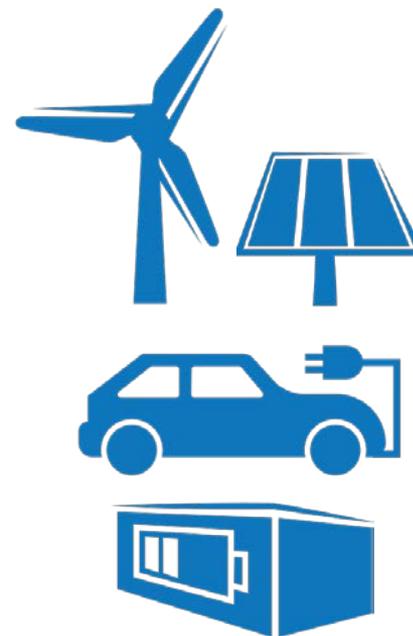
New technology introduction

- High cost of integration
- Lack of exiting infrastructure

New network requirements

- Analytics does not fit OT network model
- Operations does not fit IT network model

How does a MicroGrid integrate with operational systems and how does it evolve?



# INTELLIGENT INFRASTRUCTURE

Existing IT infrastructure is not suited to meet these challenges.

A new network architecture is required with

- ✓ Mission critical reliability
- ✓ Complex security
- ✓ High interoperability
- ✓ Embedded software
- ✓ Operational network
- ✓ IT/OT integration



Distributed Networks, or Fog Computing, is the next generation operations network

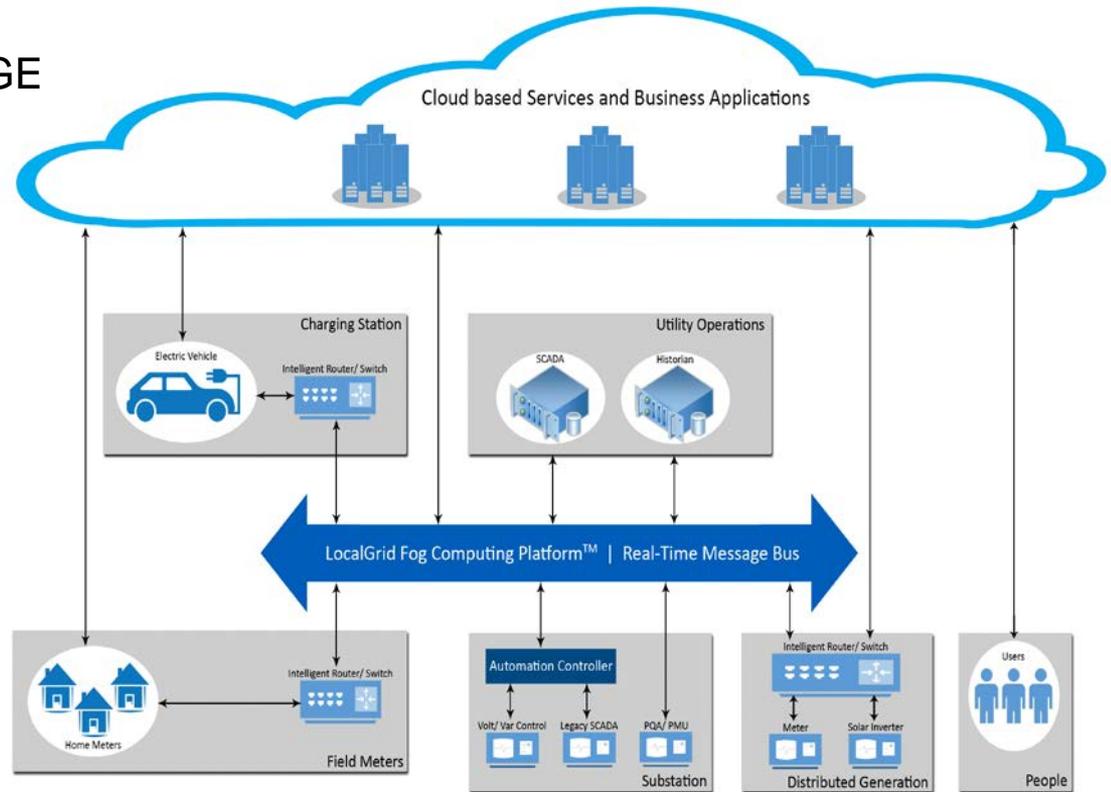
- ✓ Decentralized
- ✓ Network as platform (\$\$)
- ✓ Data-in-motion
- ✓ Services at the edge
- ✓ Low latency
- ✓ Closed operations network

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# LOCALGRID FOG COMPUTING PLATFORM™

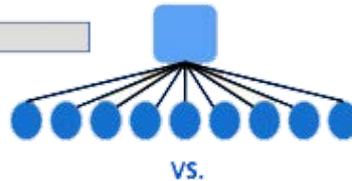
- ✓ Analytics and control at the EDGE
- ✓ Tiered & variable data rates
  - Waveforms: 60+ S/cycle
  - Local analytics: 1-60 S/sec
  - SCADA: 1-15 minute interval
- ✓ Secure & filter data at source
- ✓ Virtualize applications
  - MicroGrid Modeling
  - Event detection
  - State estimation



# SOLUTION – DISTRIBUTED NETWORK

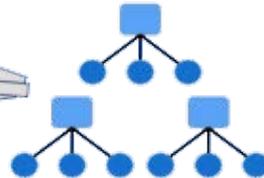


**20<sup>th</sup> Century: Central Assets**  
-> Central IT Structure



vs.

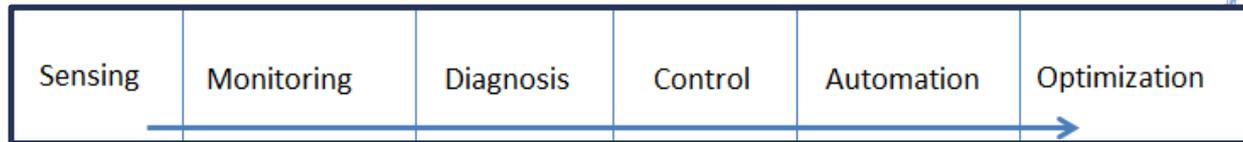
**21<sup>st</sup> Century: Distributed Assets**  
-> Distributed IT



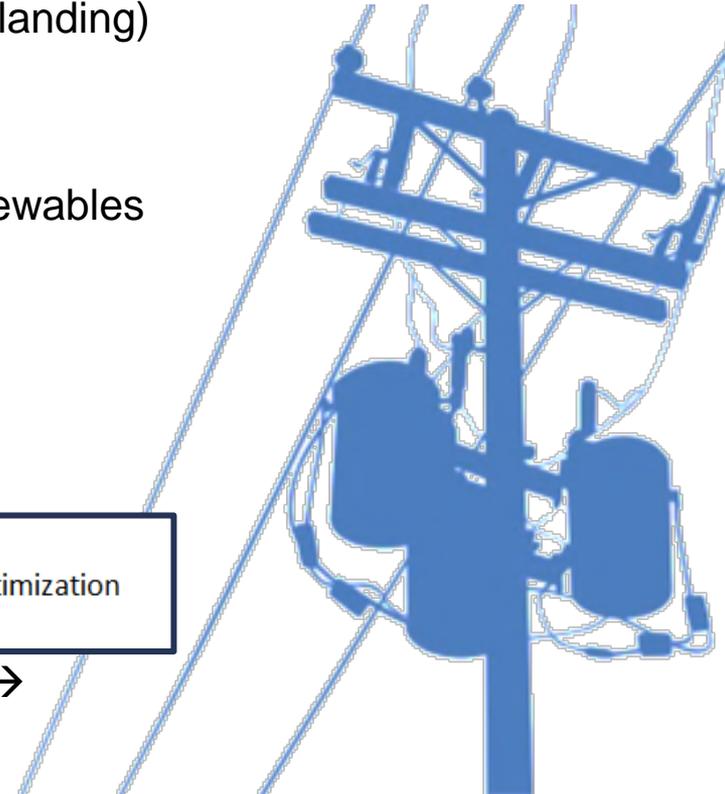
- ✓ Lower cost of deployment
- ✓ Reduce bandwidth costs
- ✓ Scalable
- ✓ Surety & security of supply
- ✓ Network domain for intelligent assets
- ✓ Flexible asset with flexible application platform
- ✓ Assets available for market participation

# GRID APPLICATIONS DESIGNED TO EVOLVE

- ✓ Modular MicroGrids (Continued Operation & Auto-Islanding)
- ✓ Distributed State Estimation & Optimization
- ✓ NERC CIP v5 Security
- ✓ Grid Integration of Electric Vehicles, Storage & Renewables
- ✓ Flow Optimization & Grid Balancing
- ✓ Distributed Networks
- ✓ Situational Awareness & Response
- ✓ Distributed Application Platform



→ Increasing Complexity, Evolving Applications →





WORK WITH US TO DEVELOP THE NEXT  
GENERATION OF GRID APPLICATIONS

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