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Smart Grid Technology Integration

Governor's Energy Summit

December 8, 2009

Today's Discussion

- Smart Grid Defined
- An AUI Approach Achieves a Smarter Grid
- Field Distributed Intelligence
- Allegheny Energy Providing Leadership

Many Terms

- AMR Meter
- AMI Meter
- Smart Meter
- Smart Grid
- Intelligent Grid
- Advanced Utility Infrastructure

A Definition of Smart Grid

- An interconnected system of software and hardware devices that enables communication, control, and management of existing and future power resources making up the electrical grid delivering electric service, which is more affordable, reliable, efficient, clean, safe, secure, and resilient.

Characteristics of a Smart Grid

- Self-Heals
- Motivates and Includes the Consumer
- Resists Attack
- Provides Power Quality for 21st Century Needs
- Accommodates All Generation and Storage Options
- Enables Markets
- Optimizes Assets and Operates Efficiently

Source: <http://www.netl.doe.gov/moderngrid/index.html>

Advanced Utility Infrastructure

An integrated solution achieves
an intelligent delivery system

Demand Side Management

- AMI
- TOU/RTP
- Energy Management

System Efficiency

- Distribution Line Monitoring
- Transformer Health Monitoring
- Substation Monitoring

Electricity Reliability

- Reduced Outage Time
- Preventative Maintenance
- Self-Healing
- Distributed Resources

Security and Supply Chain

- Remote Monitoring
- Asset Tracking
- Physical Security

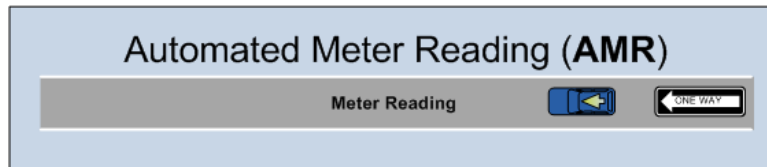
Energy Conservation

- Energy Star Products
- Next Generation Appliances
- New Lighting

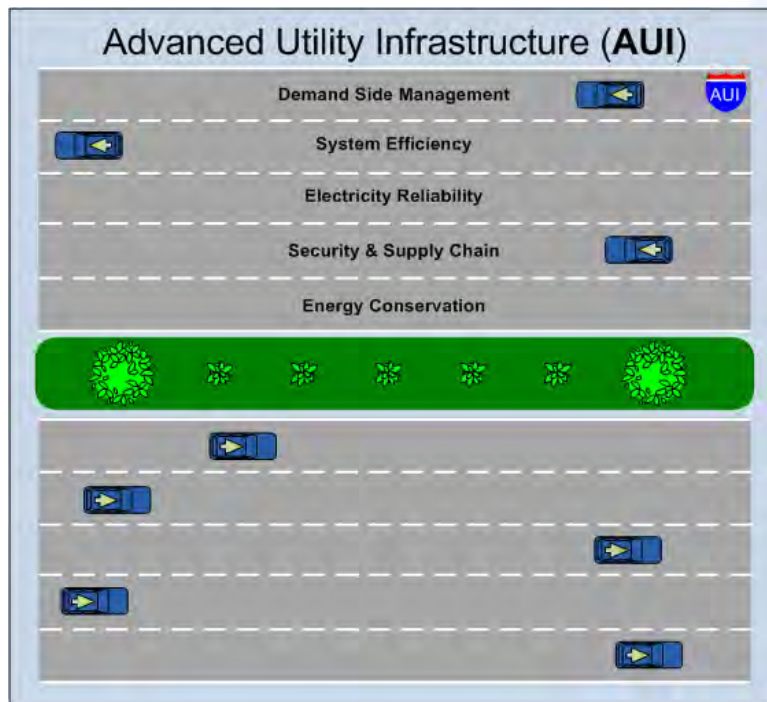
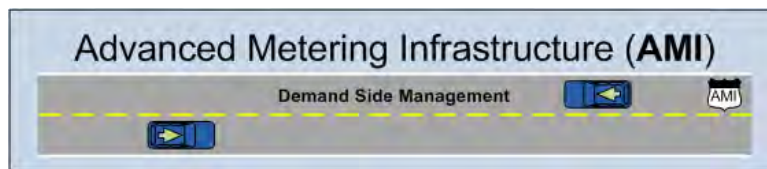
What is the difference?

AMR, AMI, or AUI?

AMI is a two-lane road with data flowing in both directions



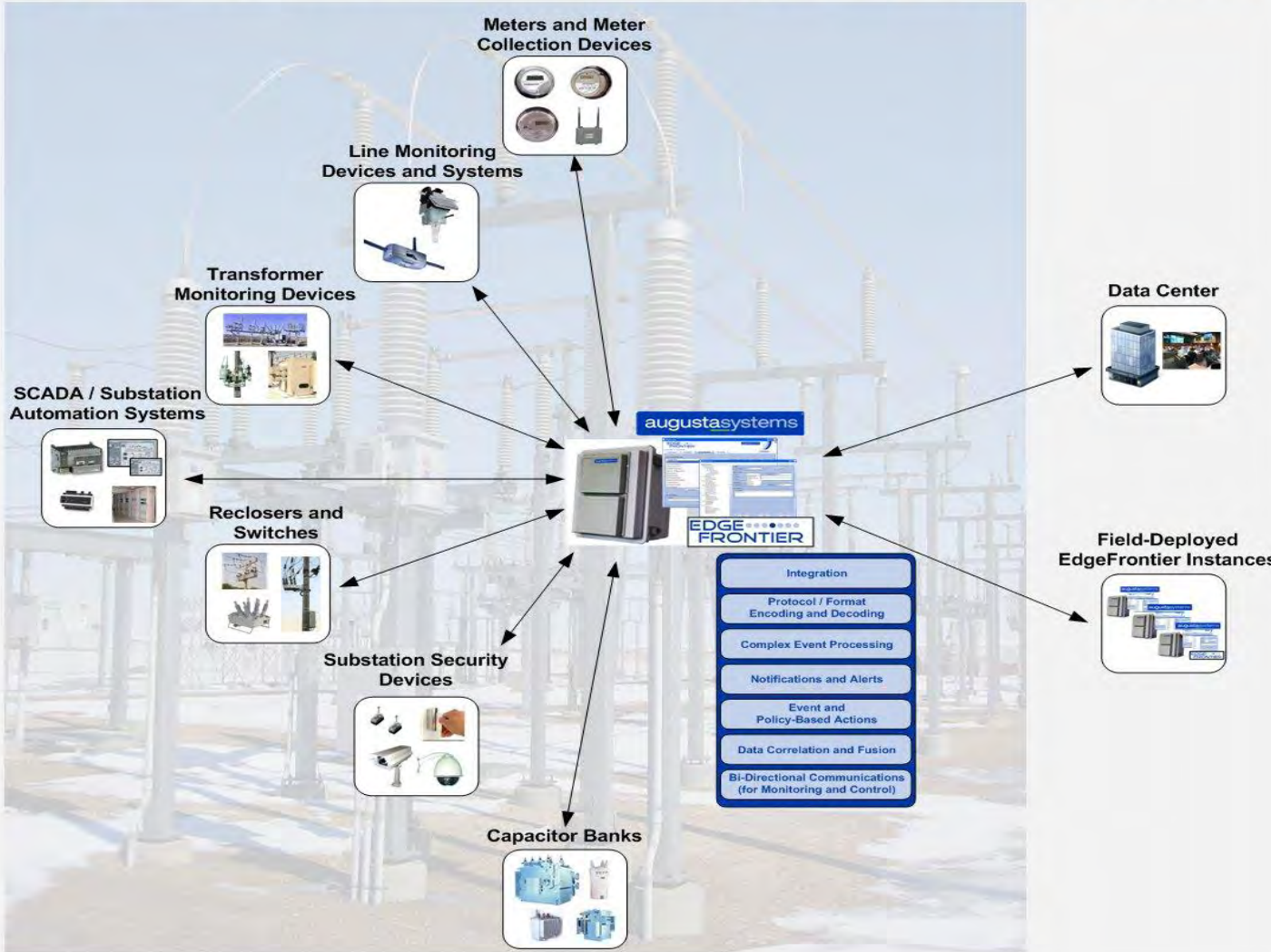
AMR is a one-way street with data flowing in one direction



AUI is a multi-lane expressway, with different types of information flowing in both directions

Field and Substation Connectivity and Intelligence

EdgeFrontier Field and Substation Integration and Interoperability



Allegheny Applications

Using technology integration and evaluation, Allegheny is working to implement this approach in West Virginia...



Applications:

- Developmental Field Test
- WV Super Circuit
- Research Ridge Test Facility
- Distribution Network Modernization

...through a series of innovative projects featuring distributed intelligence and new and legacy device and systems integration.

The logo for Augusta Systems is displayed within a blue rounded rectangle. The word "augustasystems" is written in a white, lowercase, sans-serif font. A thin green horizontal line is positioned under the letter 'a' in "systems". A registered trademark symbol (®) is located in the top right corner of the blue rectangle.

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