



# EnergyAxis®

## *The Smart Grid Now Delivered*

2 p.m. EDT, Tuesday, June 30, 2009



# Introductions

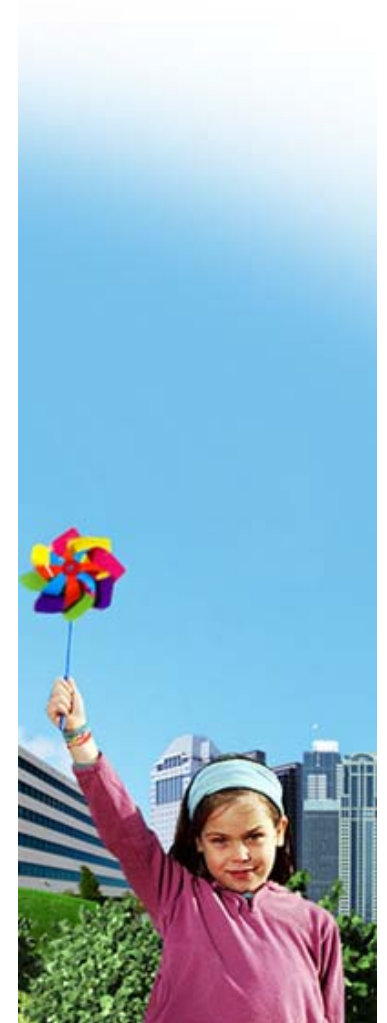
- Mark Munday, CEO Elster Electricity
- Ed Gray, VP, Regulatory Affairs
- Victor Sitton, VP, Product Marketing
- Michael Longrie, Director, Product Management



# Industry in Transition



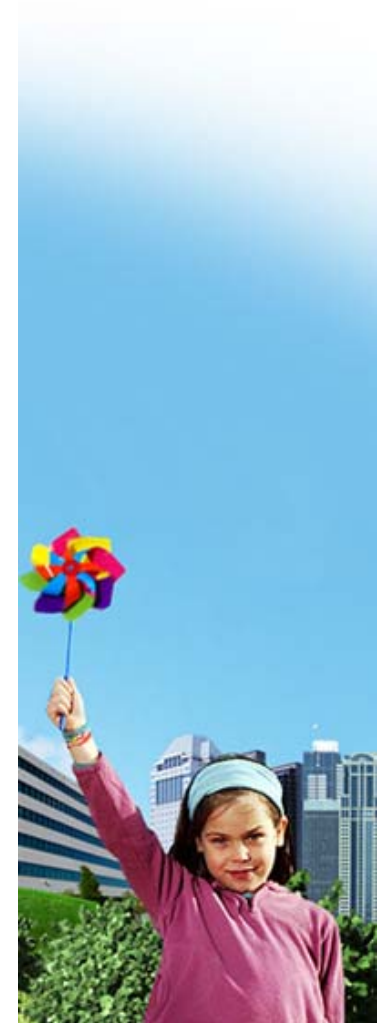
- Smart Grid – Paradigm shift, revolutionizing the way we use energy
- Driven by - technological, environmental, economic, political pressures
- The “Smart Grid” impacts
  - Consumer
  - Energy generation
  - Transmission & distribution
  - Regulatory & economic, policies



# Smart Grid Impact



- Flexibility for resilience & reliability
  - Decentralized, open & secure delivery, information, and control infrastructure
  - Sensing, distributed intelligence and control technologies throughout the transmission and distribution system
  - Integration of key business systems that streamline control and decision making processes
- Knowledge to empower consumers
  - Awareness & understanding
  - Customer actions to reduce energy use and peak load



# Smart Grid Impact



- Economic & environmental sustainability
  - Broad scale energy efficiency programs with predictable and measurable impacts on consumption
  - Demand response technologies that create real time feedback loops between the consumer and utility
  - Renewables and distributed energy resources
  - Climate change



# The American Recovery and Reinvestment Act



- More than \$60 billion in clean energy funds
- Tax incentives for investment
- Distributed generation including renewables
- Promoting energy efficiency
- Deploying 40 million smart meters in American homes

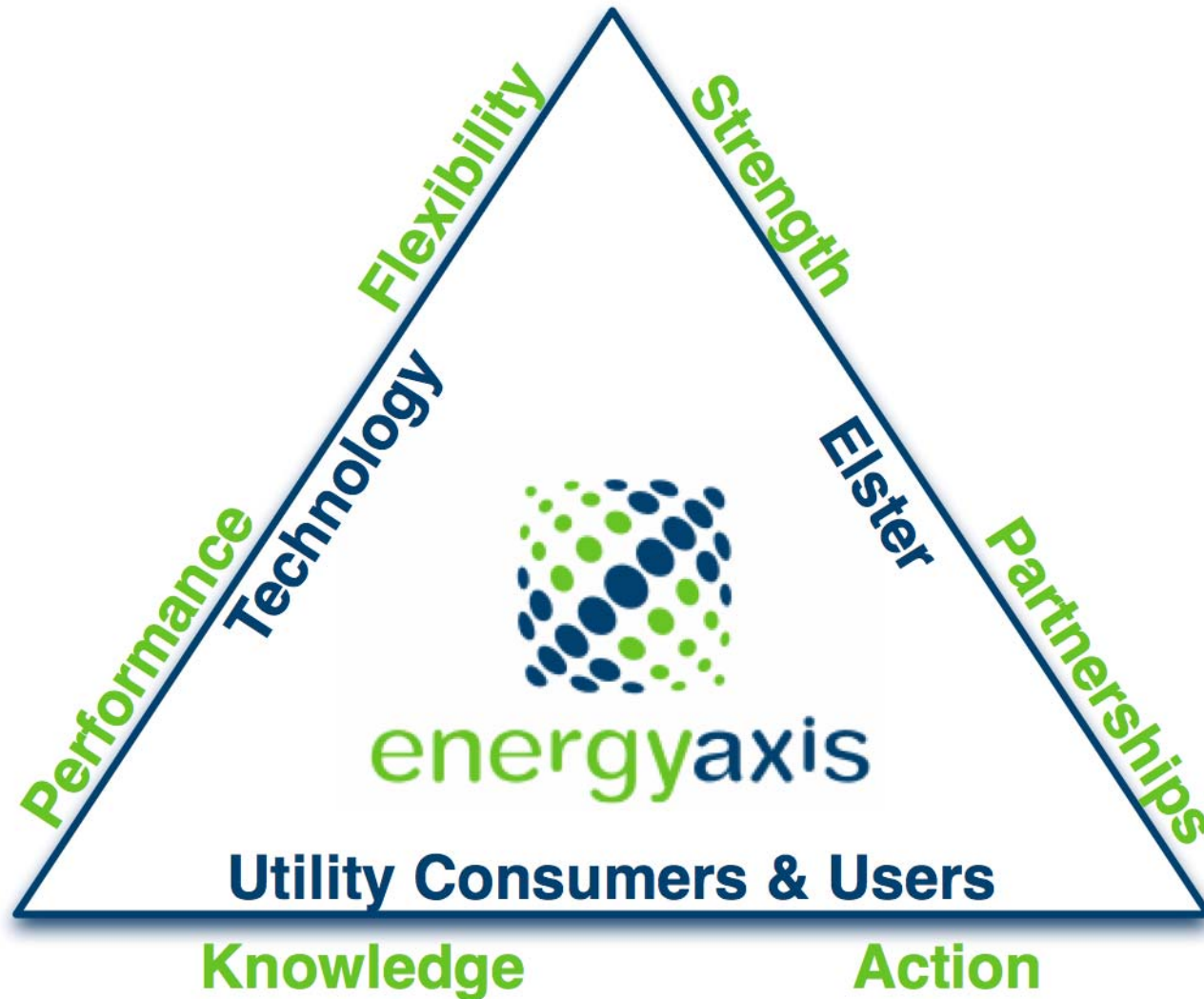


# Smart Grid Delivered

- Proven smart metering and smart grid solutions
  - Industry knowledge: 120 years supporting electric utilities
  - Global: Customer base and expertise spans the world
  - Proven applications: 3M Smart Grid meters shipped
  - Proven flexibility: Installed Smart Grid demand response and distribution monitoring & control products
  - Unmatched quality and reliability
- Engineering versus Marketing
  - “It works!”
  - Flexible architecture
  - Distributed Intelligence
  - Standards that lead to interoperability



# Six Principles



# Elster's Vision of the Smart Grid



# Real-World Tested

- Market leading
  - 60+ systems deployed
  - 3M EnergyAxis endpoints shipped
  - 2.5M smart devices on-line and delivering data
  - Multi-utilities – electric, water, gas
- Proven utility-grade
  - 170+ years of products, systems and solutions



# Unified Systems Management



Elster Electricity GIS

Analysis

- Hop Level
- Comm Rate

Collectors List

- Collector\_One
- cell\_0774
- cell\_2004
- cell\_2000

Meters legend

Hop Level Legend

- Hop Level 1
- Hop Level 2
- Hop Level 3
- Hop Level 4
- Hop Level 5
- Hop Level 6
- Hop Level 7
- Hop Level 8

Map | Satellite | Hybrid | Terrain

Map data ©2009 Tele Atlas - Terms of Use

Lat: 35.783617 Long: -78.549081

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SYSTEM ACTIVITIES | USER ACTIVITIES | EXECUTIVE VIEW

Schedule Metrics

Show Details

| Name               | Meter Read Status |        |    |
|--------------------|-------------------|--------|----|
|                    | State             | Errors |    |
| Daily_Reg_Region_1 | 2                 | 0      | 17 |
| Daily_Reg_Region_2 | 1                 | 0      | 6  |
| Daily_Reg_Region_3 | 0                 | 1      | 11 |
| Daily_Reg_Region_4 | 2                 | 2      | 33 |
| Daily_Load_Profile | 0                 | 0      | 1  |
| Daily_Download     | 0                 | 1      | 0  |
| Monthly_LAN_Reset  | 0                 | 0      | 1  |

49 / 1

39 / 0

11/26/08 11/27/08 11/28/08

Date

WAN Metrics

WAN Metrics - Communication Costs

| Schedule Name      | Cost  |
|--------------------|-------|
| Daily_Load_Profile | ~2.97 |
| Daily_Download     | ~2.97 |
| Daily_Reg_Region_1 | ~3.99 |
| Daily_Reg_Region_2 | ~3.99 |
| Daily_Reg_Region_3 | ~3.99 |
| Daily_Reg_Region_4 | ~3.99 |
| Monthly_LAN_Reset  | ~2.97 |

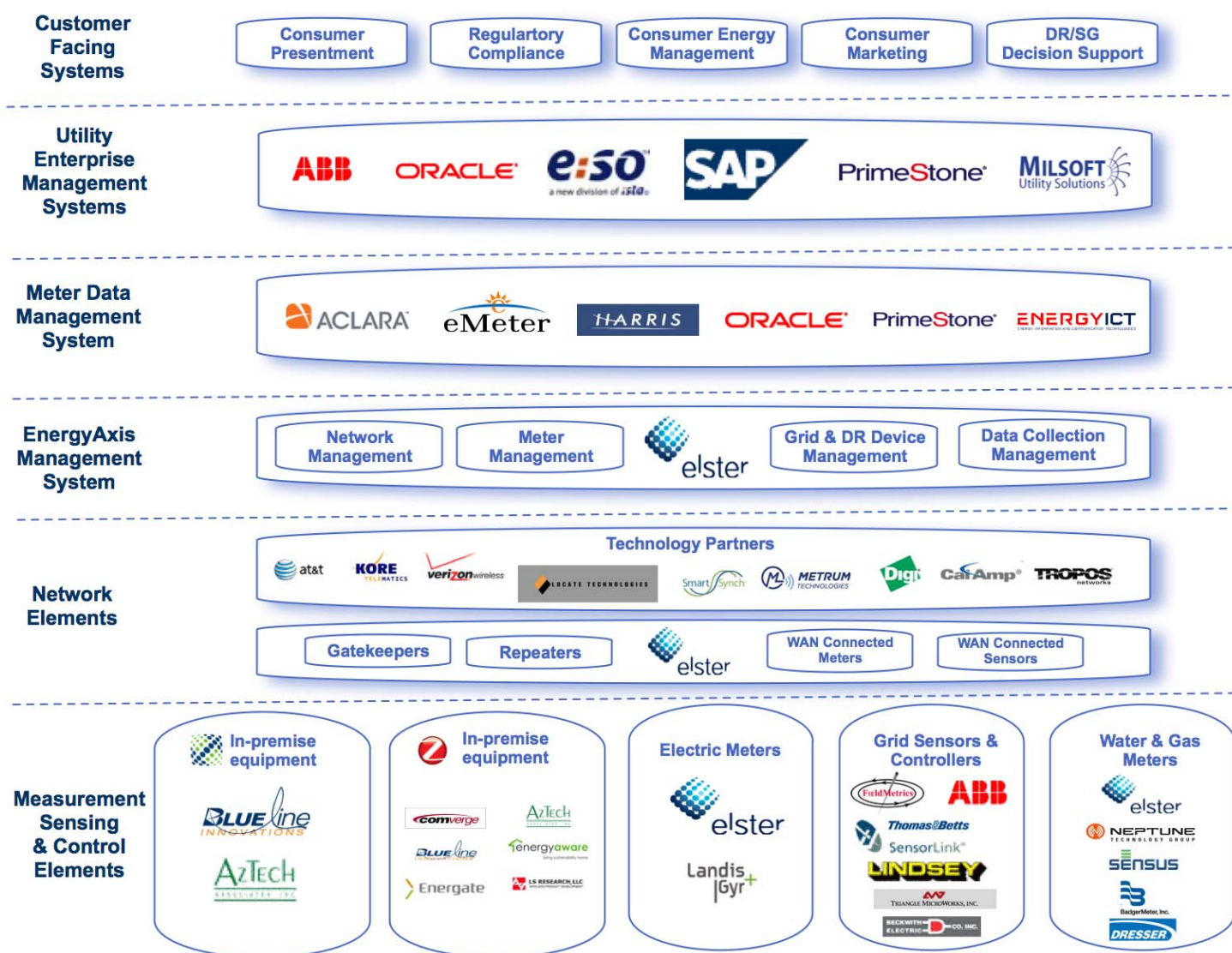
System LAN Metrics

System LAN Metrics

| Node Level   | Meter Count |
|--------------|-------------|
| Node Level 1 | 672         |
| Node Level 2 | 882         |
| Node Level 3 | 1008        |
| Node Level 4 | 756         |
| Node Level 5 | 714         |
| Node Level 6 | 168         |



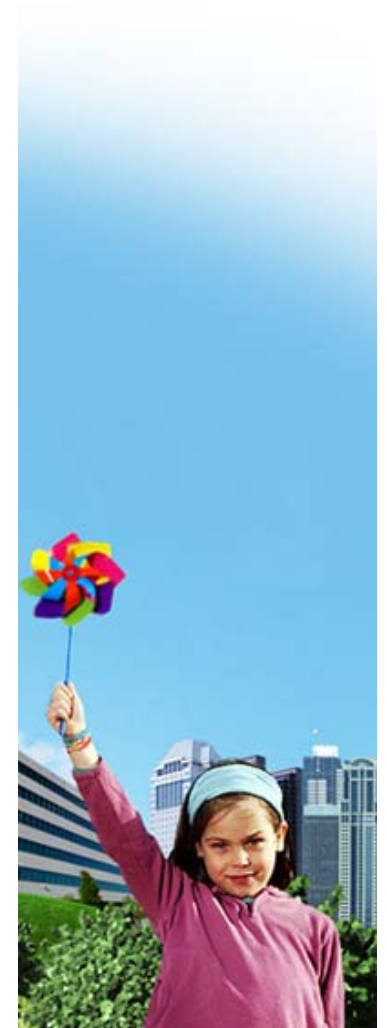
# The Right Partners



# Unifying Solutions for the Smart Grid



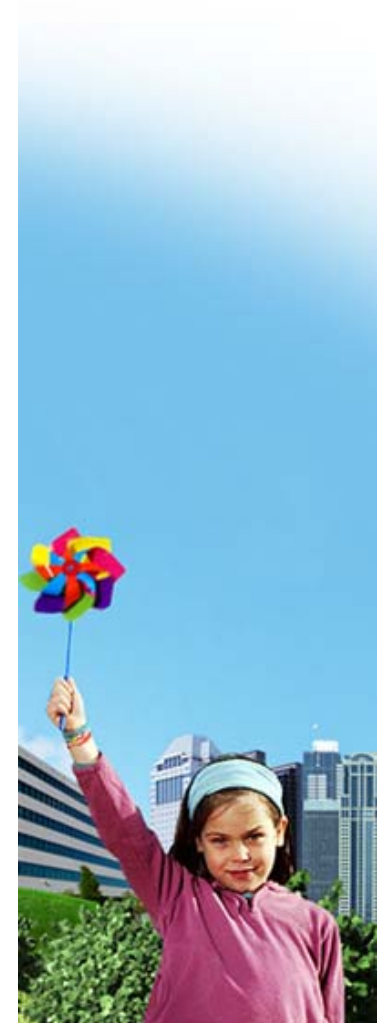
- **EnergyAxis Unifies**
  - Communications technologies
  - Network Management
  - End-to-End Security
  - Standards & Interoperability
  - Enterprise Applications
- **EnergyAxis Smart Grid Solutions**
  - Real and deployable today
  - Flexible to meet the needs of the future



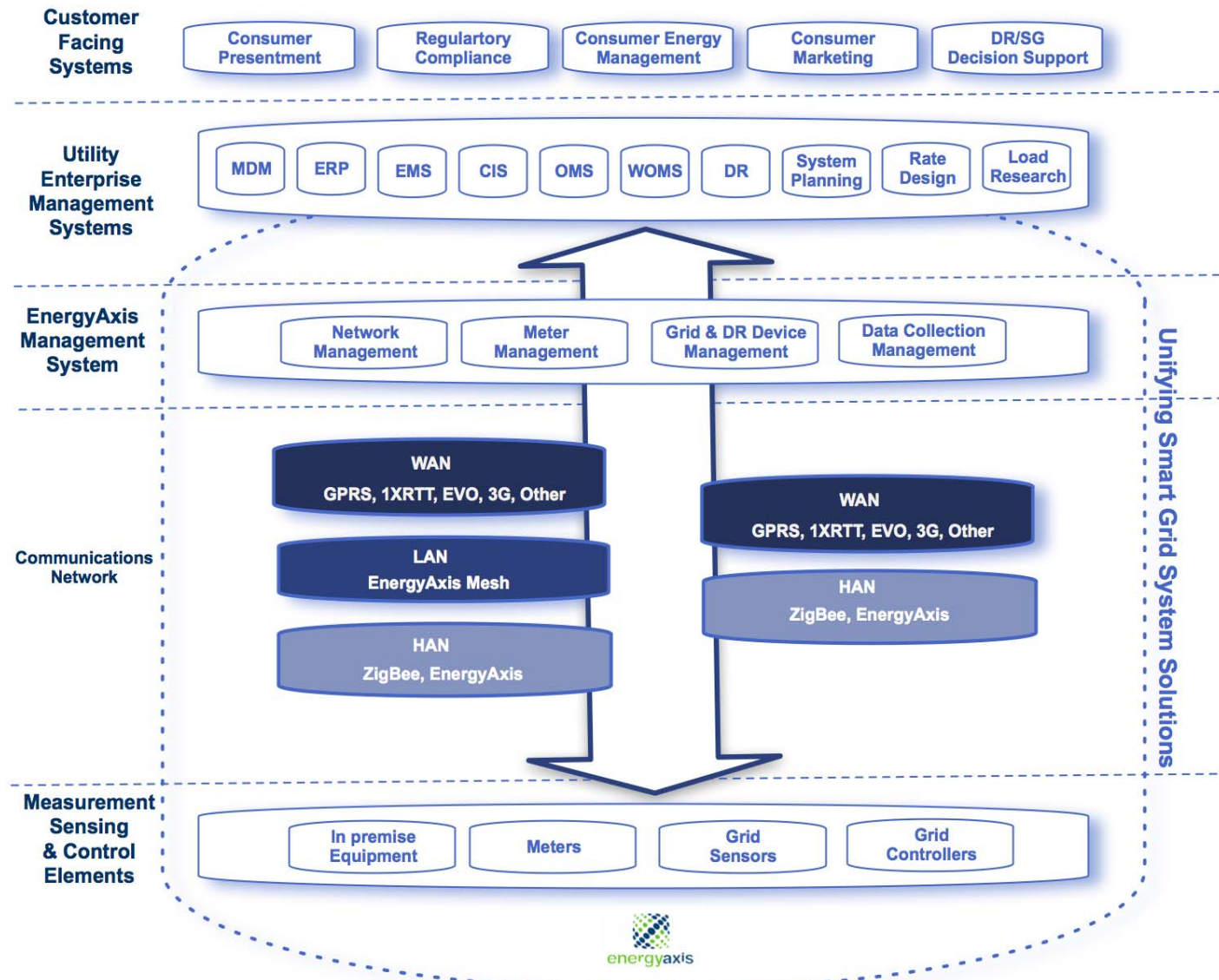
# EnergyAxis – Architected for Today and Tomorrow



- Multi-Technology Architecture
- New High Performance Mesh Network
- Distributed Intelligence
- Expanded Interoperability
- New Grid Monitoring Solutions
- Enhance Security



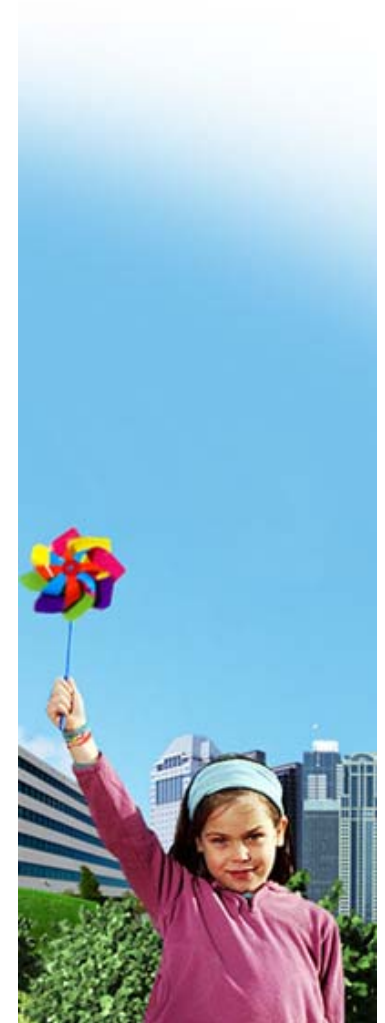
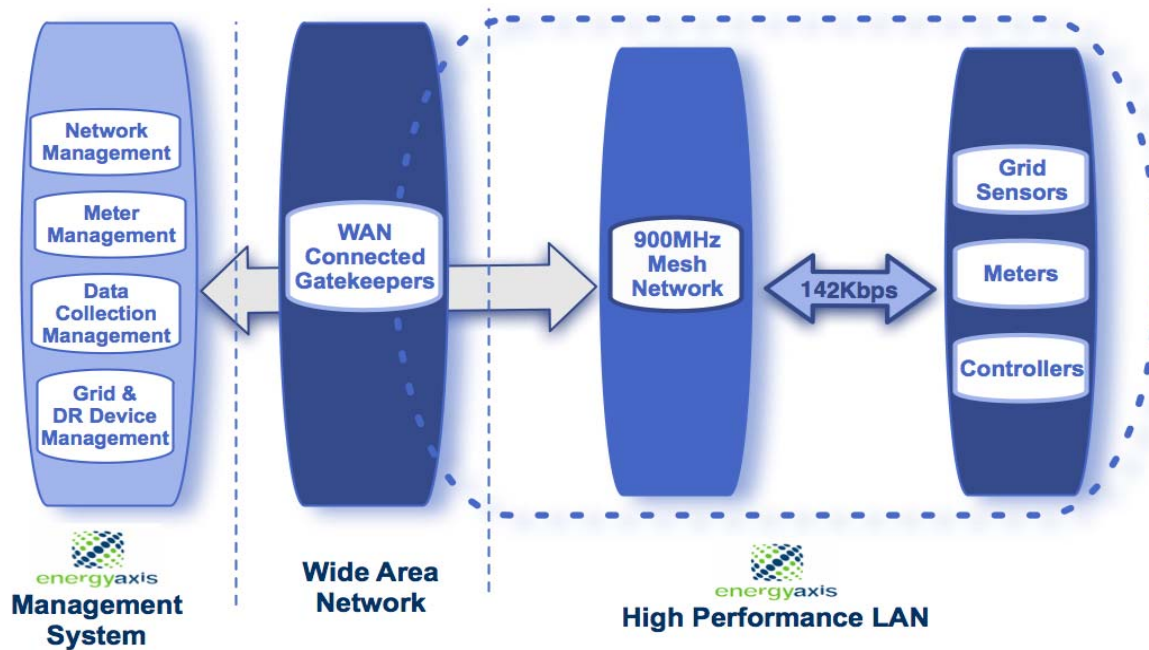
# Multi-Technology Architecture



# New High Performance Mesh Network

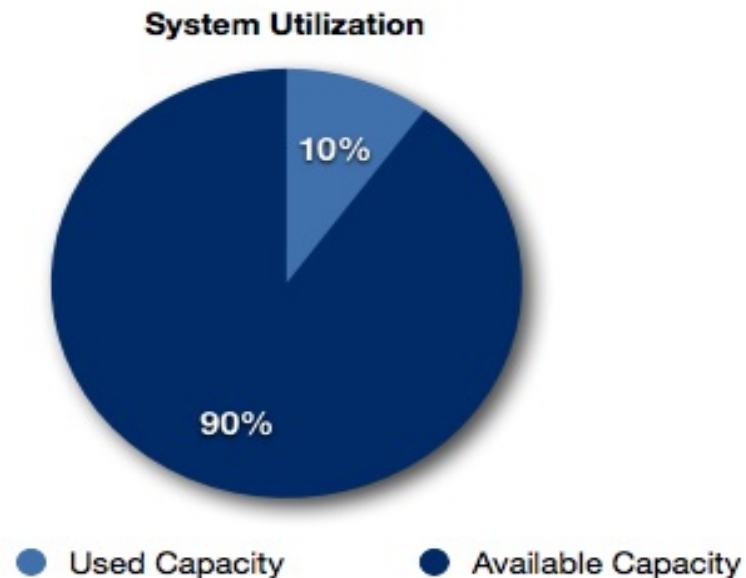


- Class Leading 142kbps at 900Mhz
- 16 Hops
- Proactively Managed
- Redundant Qualified Paths

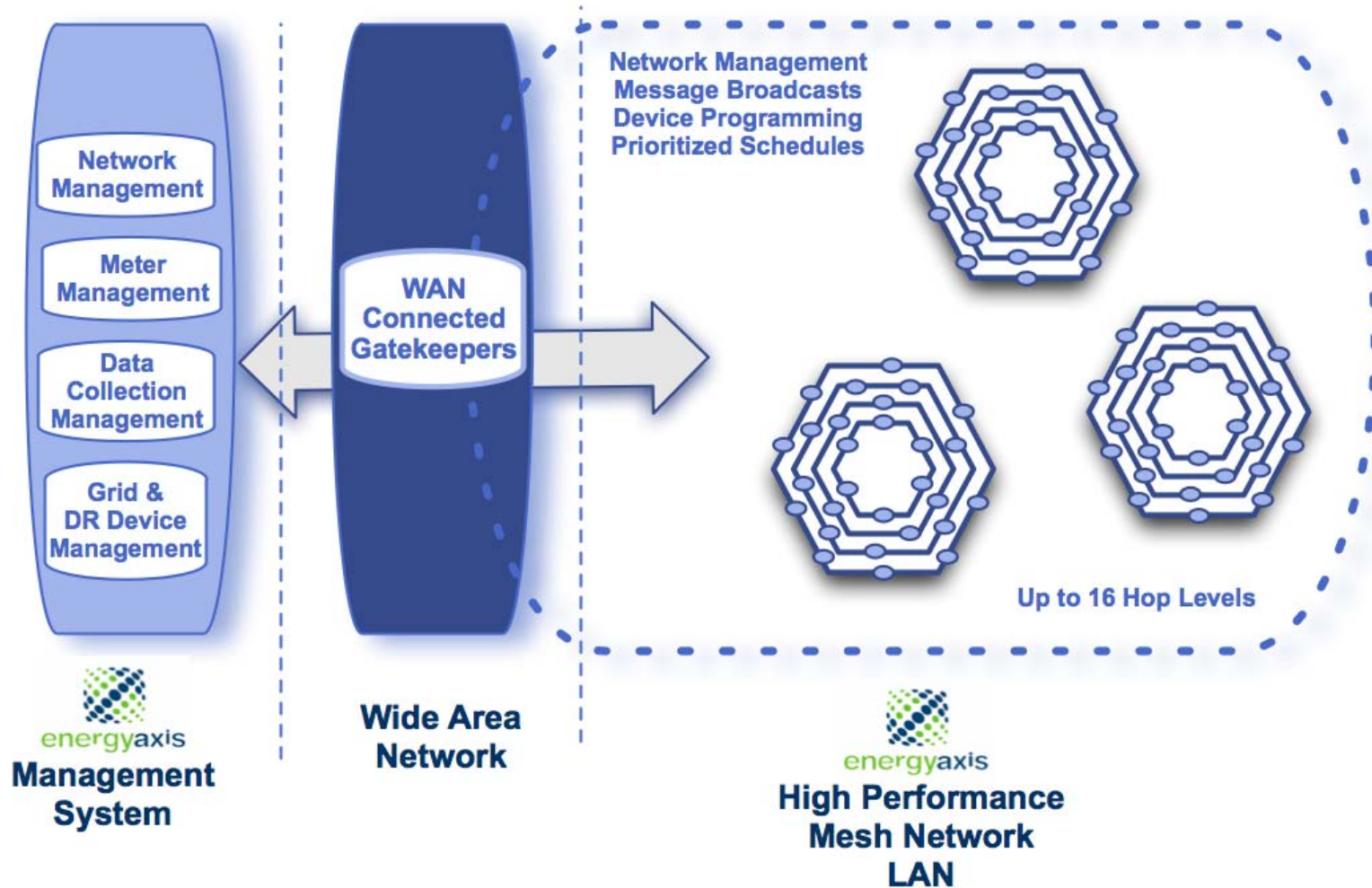


# High Performance Network

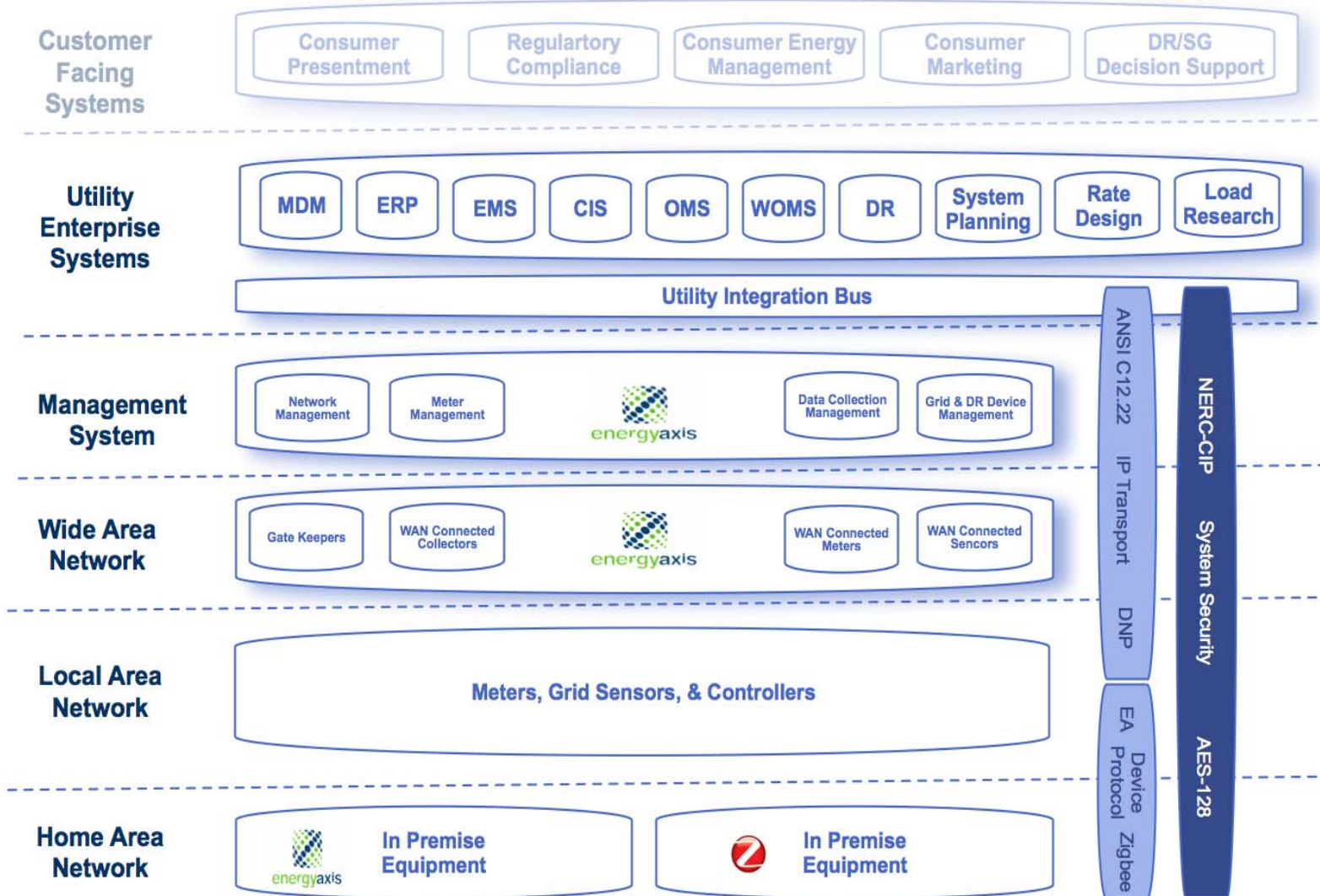
- Superior data transport capacity
  - 10% or less of network capacity used today
  - 1-2 seconds per on-demand read



# Distributed Intelligence



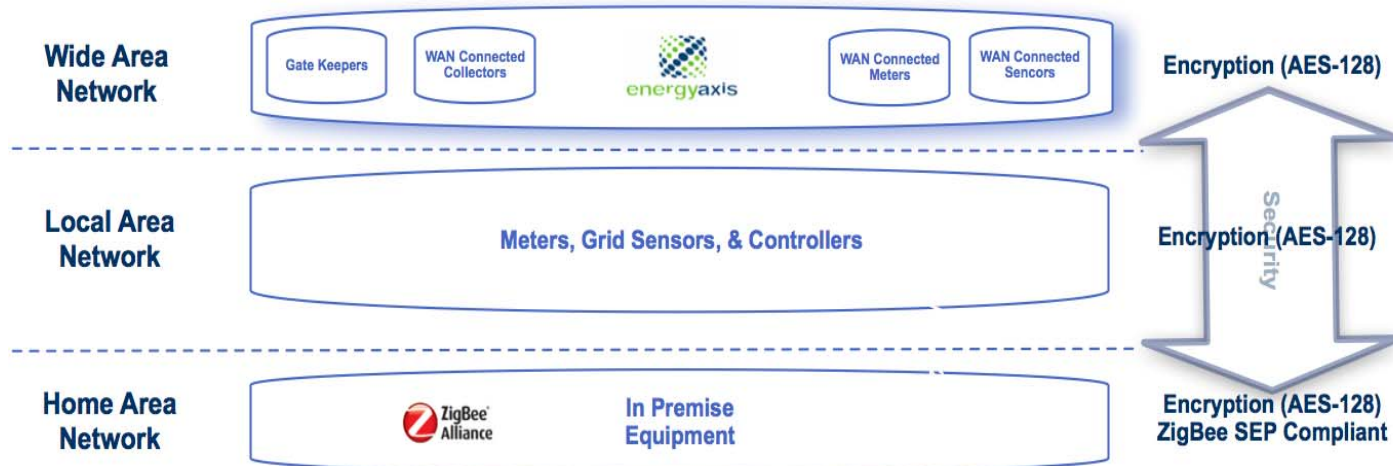
# Expanded Interoperability



# Grid Modernization – Elster and its Technology Partners



# EnergyAxis Secure Communications



- Secure Communication Summary
- AES-128 Encryption Algorithm over WAN, LAN and HAN (NIST SP 800-38, FIPS-197)
  - 128-bit block cipher (strong authentication)
- Each message has a unique authentication token
- LAN to WAN isolation
- Each node has a unique encryption key
- No keys are transferred across the network
- Key management provided (NIST 800-57)
- Customer changeable/managed encryption keys (NIST 800-57)
- Unique re-keying keys used for seed updates (NIST 800-57)
- Developed utilizing AMI Sec Cryptographic Services requirements

***Security must serve its intended function while not forgetting ease of use!***



# EnergyAxis – Unifying Solutions for the Smart Grid



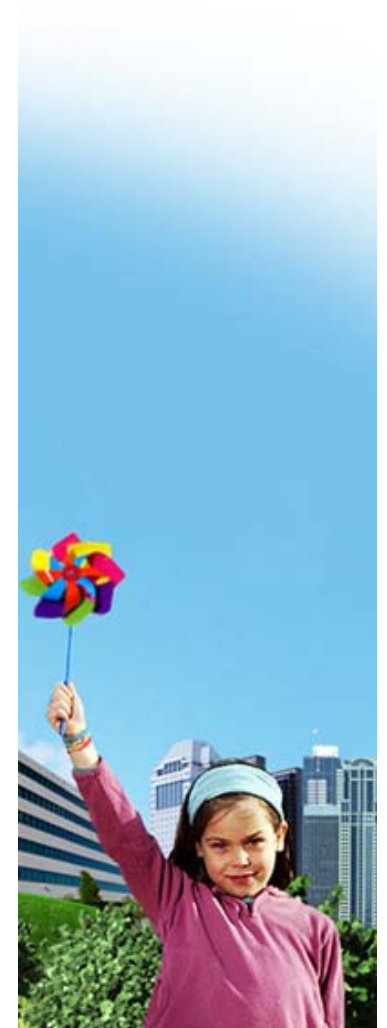
- More than a communications pipe
- A network of intelligent devices
- Class leading performance
- A solution that brings technologies together
- A focus on proven utility grade solutions





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# Thank you!



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