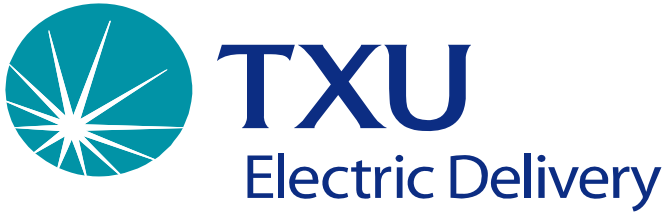
SmartGrid Interoperability Challenges at TXU Electric Delivery



GridWise Interoperability Workshop
April 11-12, 2007

M. Kelly McNair – TXU Electric Delivery

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Prior to Deregulation in ERCOT: Integrated Electric Utility

TXU Electric Delivery

Generation **Transmission & Distribution** **Customers**

Customer

Regulated

Post ERCOT Deregulation: Restructured Electric Industry

TXU Electric Delivery

Competitive Generation

Transmission & Distribution

Prohibited from selling electricity or other competitively available energy services

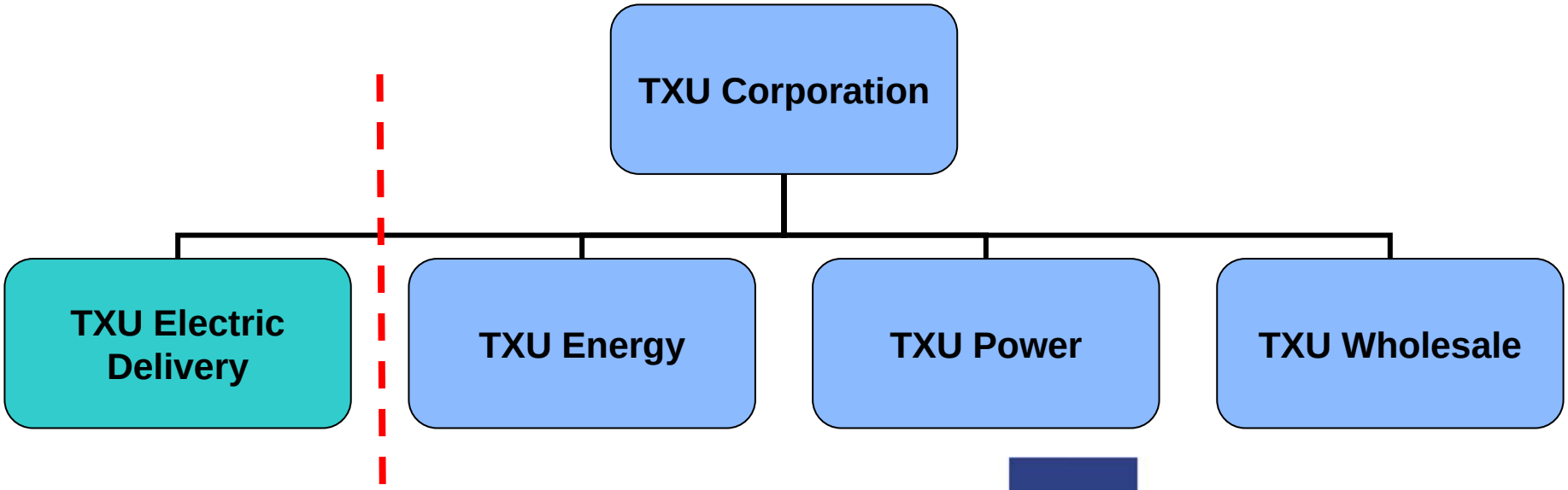
Regulated

Competitive Retail Electric Providers (REPs)

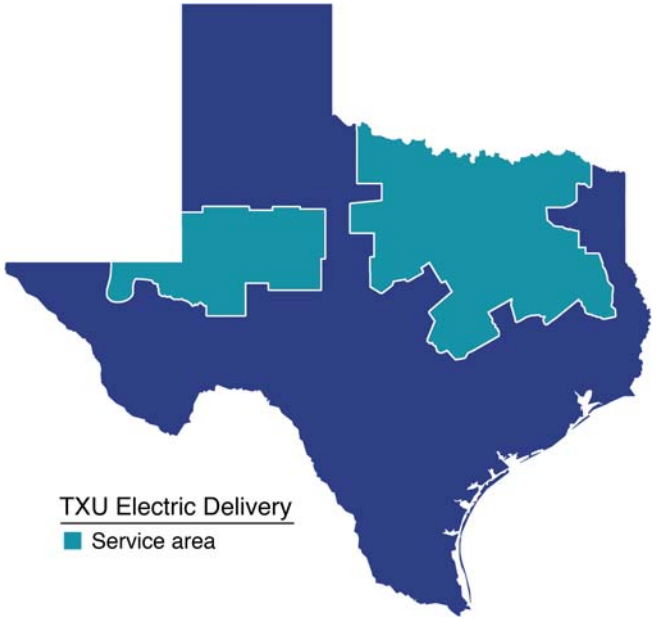
Customer

TXU Electric Delivery: Who We Are

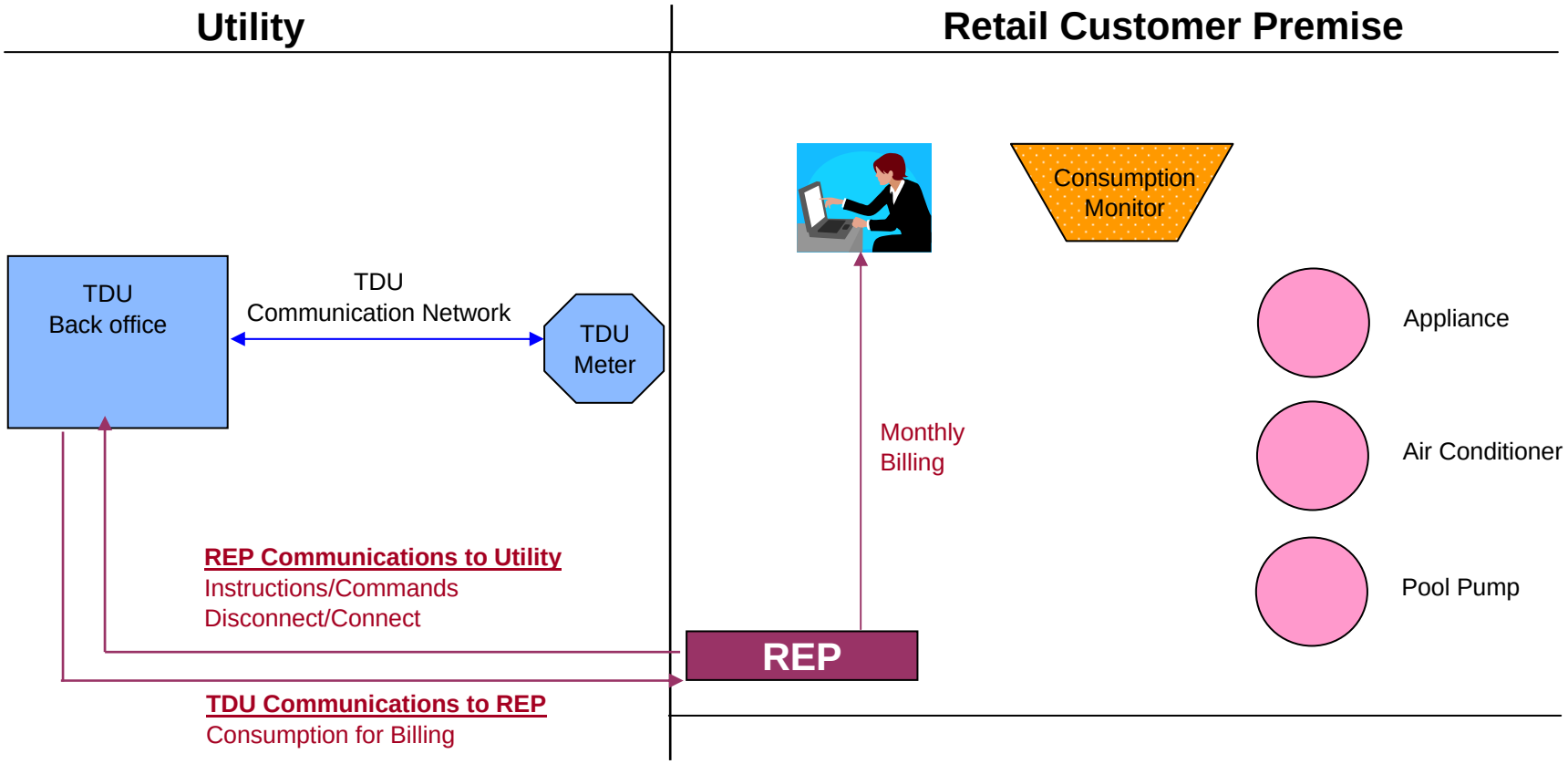
TXU Electric Delivery



- "Wires" company in Texas electric market
- 3 million electric meters
- ~115k miles of T&D lines
- 6th largest T&D company in US
- Serve ~65 Competitive Retailers
- Regulated by Texas PUC



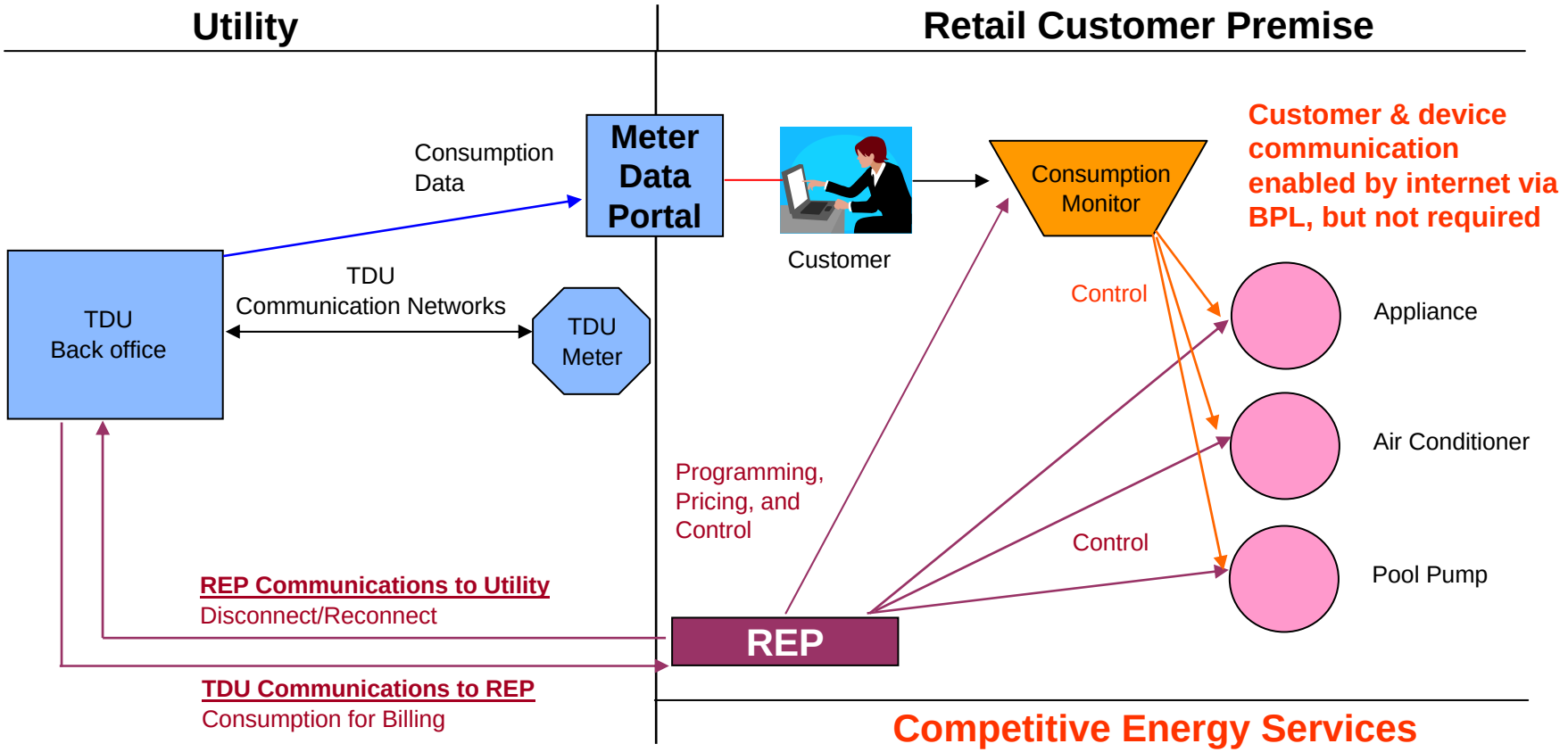
Today



- Consumption data provided by TDU, via ERCOT, to REP
- REP utilizes data for billing

Meter readings provided to retail electric providers (REPs) for billing

Being Enabled at TXU ED Today

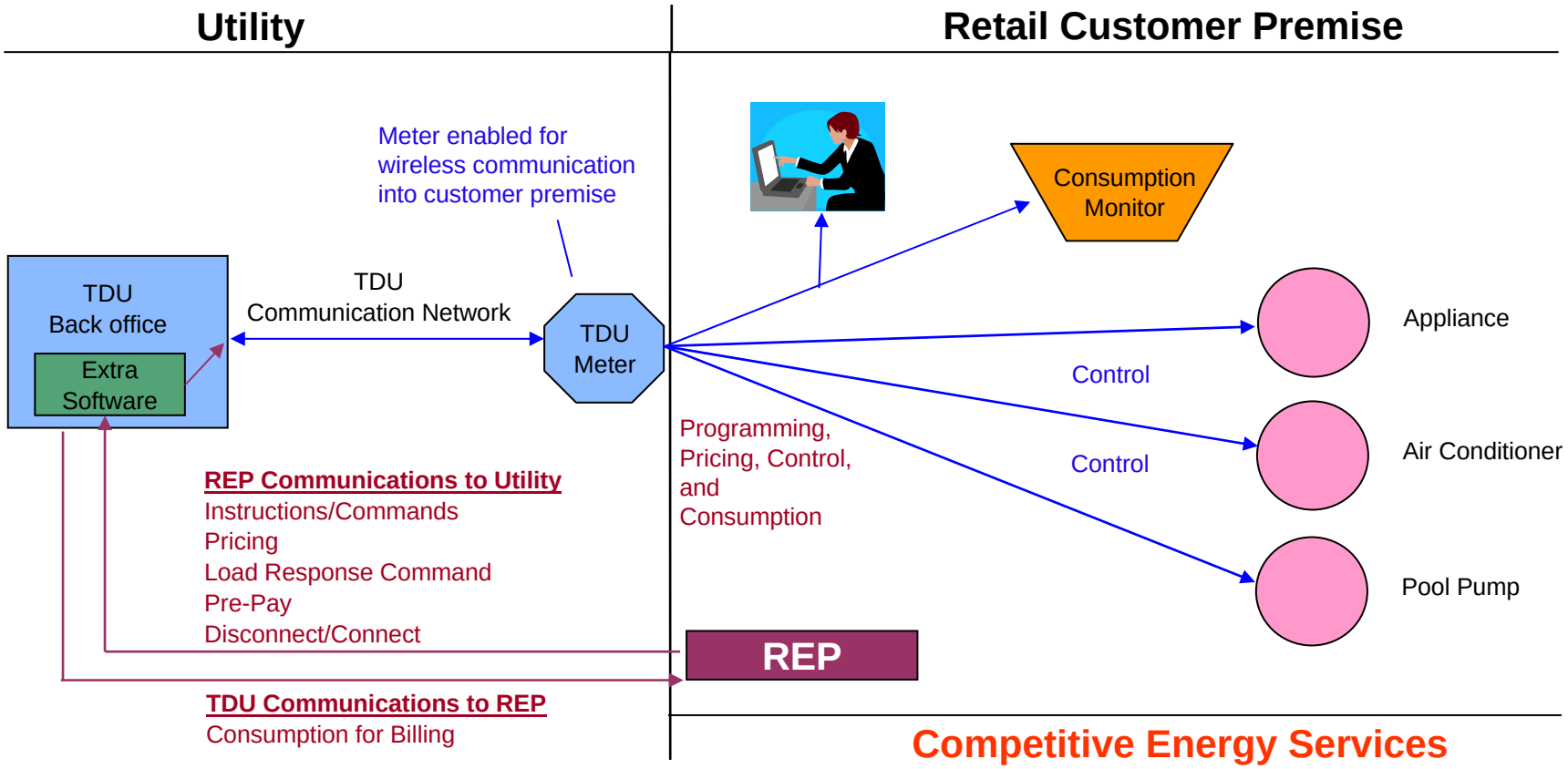


- Consumption data provided to customer and REP via web **Meter Data Portal**
- REP program parameters communicated to home through internet or other means
- In-home device control by REP or by in-home monitor

Meter and network are being installed by TXUED. Portal in development to provide readings the next day via internet. Retailers may implement pricing, load control, other automation services. Consumer may implement their own choices.

All Customer Communications via TDU's Communications Infrastructure

TXU Electric Delivery



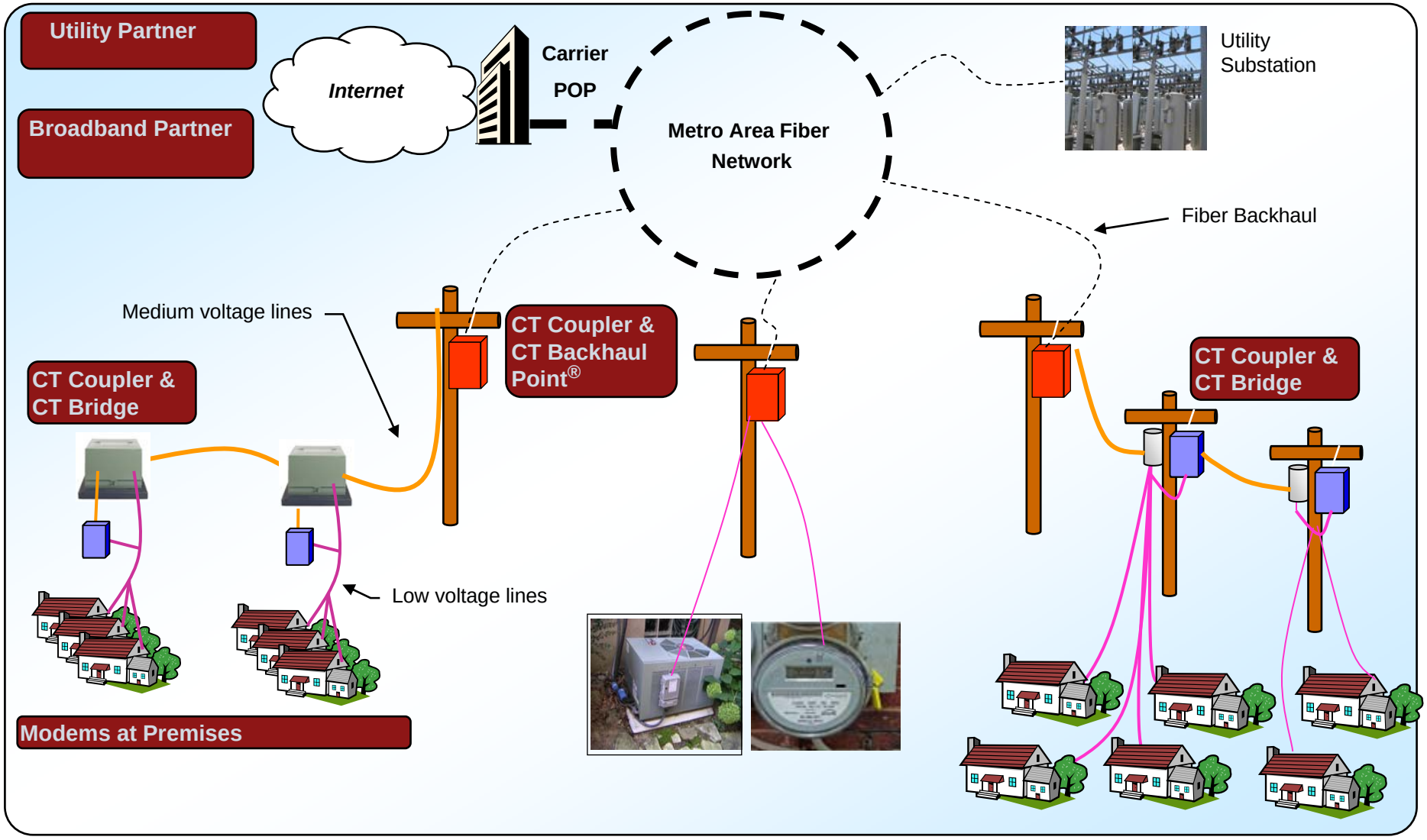
- Consumption data provided by TDU to customer in home and to REP
- REP program parameters communicated to home through TDU network and meter
- In-home device control provided by TDU at request of REP

Vision: Unitary utility network for meter and in-home communication

Retail providers ride on top of that communications network

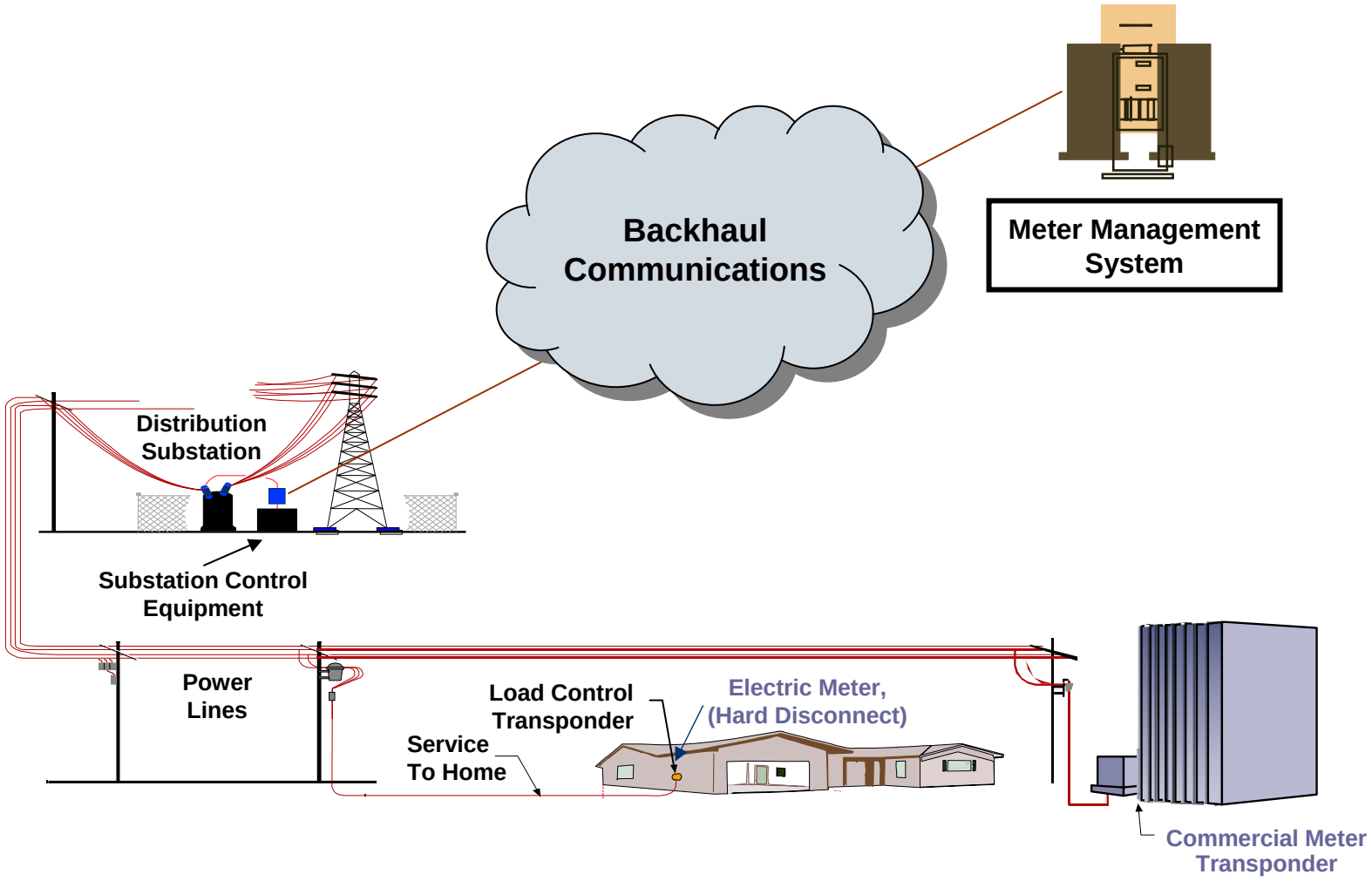
Broadband over Power Line (BPL) Network Architecture

TXU Electric Delivery



Power Line Carrier (PLC) Network Architecture

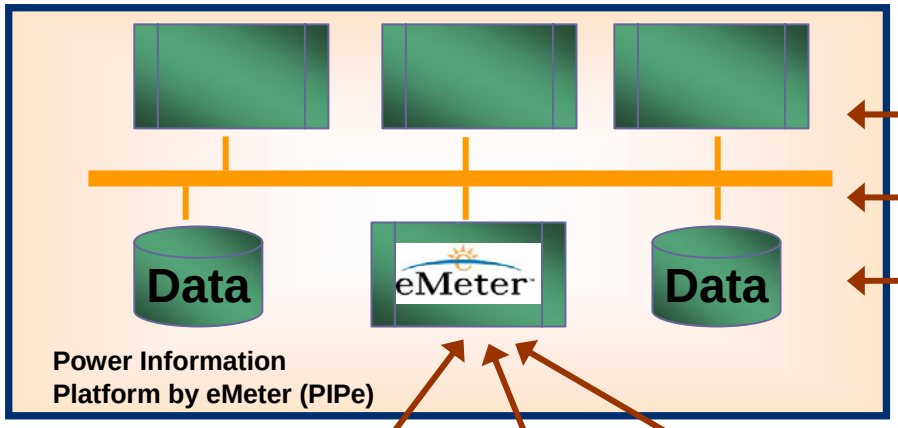
TXU Electric Delivery



Present IT Systems

TXU Electric Delivery

Meter Data Management System



Existing Legacy Systems

AMR System 1

AMR System 2

Existing AMR and Other Systems

Cellular IDR, POTS IDR, Hunt, MV90, Manually Read Meters

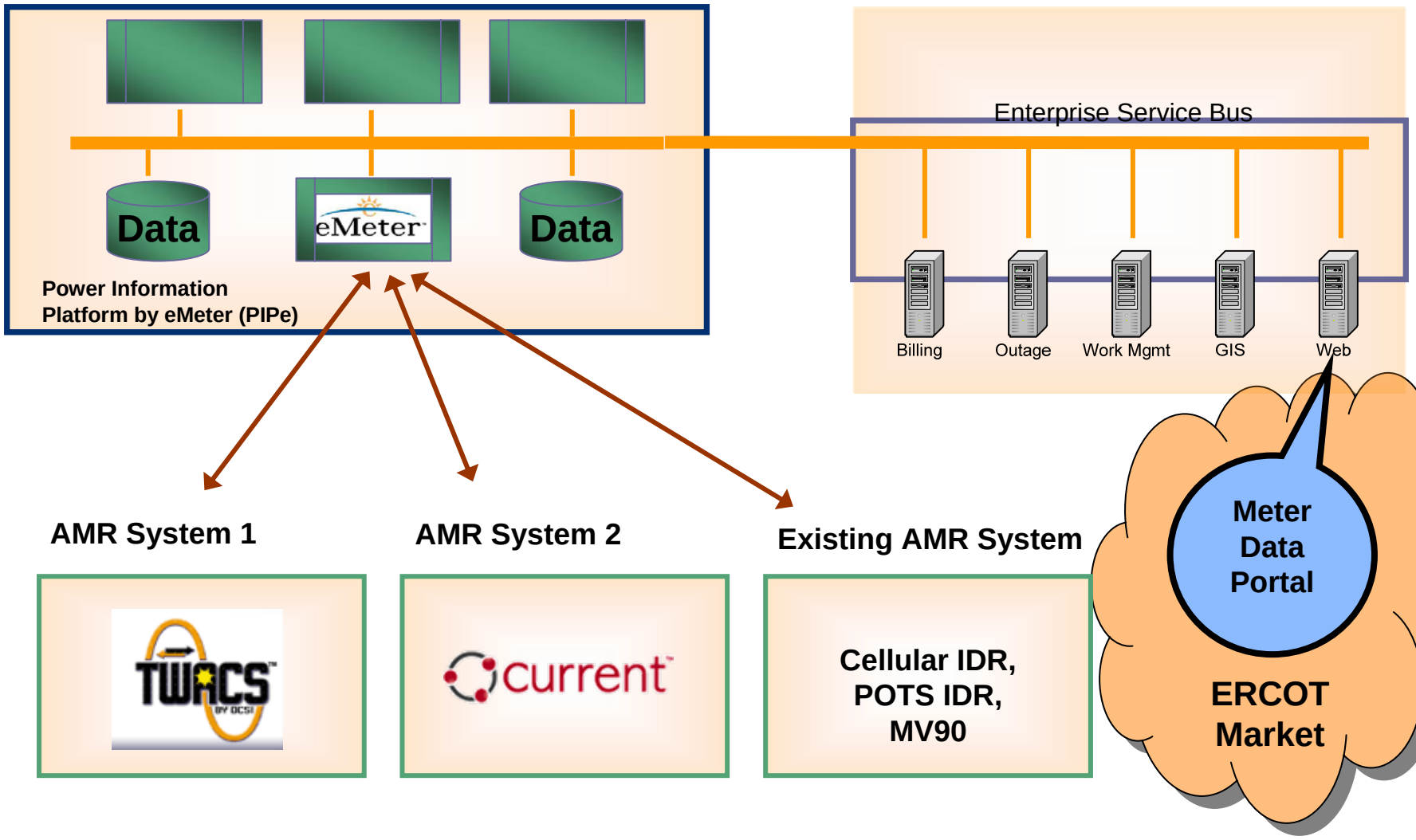
ERCOT Market

Future IT Systems

TXU Electric Delivery

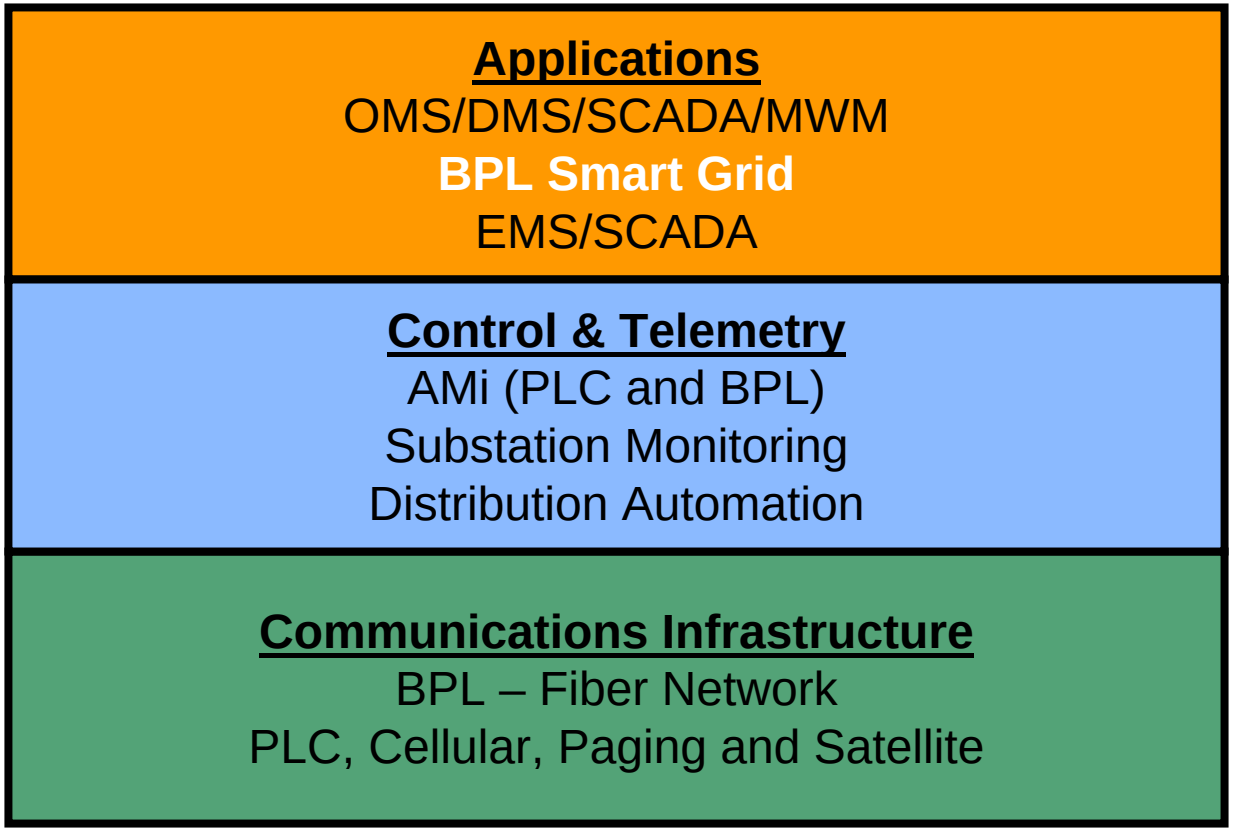
Meter Data Management System

Future Systems



SmartGrid Vision

TXU Electric Delivery



SmartGrid Functional Objectives

TXU Electric Delivery

1. **Replace aging mobile workforce management (MWM) system that is no longer supported by vendors**

2. **Implement a fully integrated OMS/DMS/MWM system suite replacing a "legacy" home-grown Outage Management System (OMS) and several unrelated distribution control systems**

3. **Leverage the "new" data available through AMIS into system operations activities**

4. **Utilize "intelligent" field mounted equipment in true "smart grid" activities**

5. **Provide near real-time data and control to distribution operations control centers**

6. **Improve reliability to customers while controlling costs**

SmartGrid Interoperability Objectives

TXU Electric Delivery

1. **Utilize “completely off the shelf” (COTS) applications wherever possible and work with vendors to update/improve applications**

2. **Implement utility standards for common information models (CIM) to allow improved interoperability between various applications**

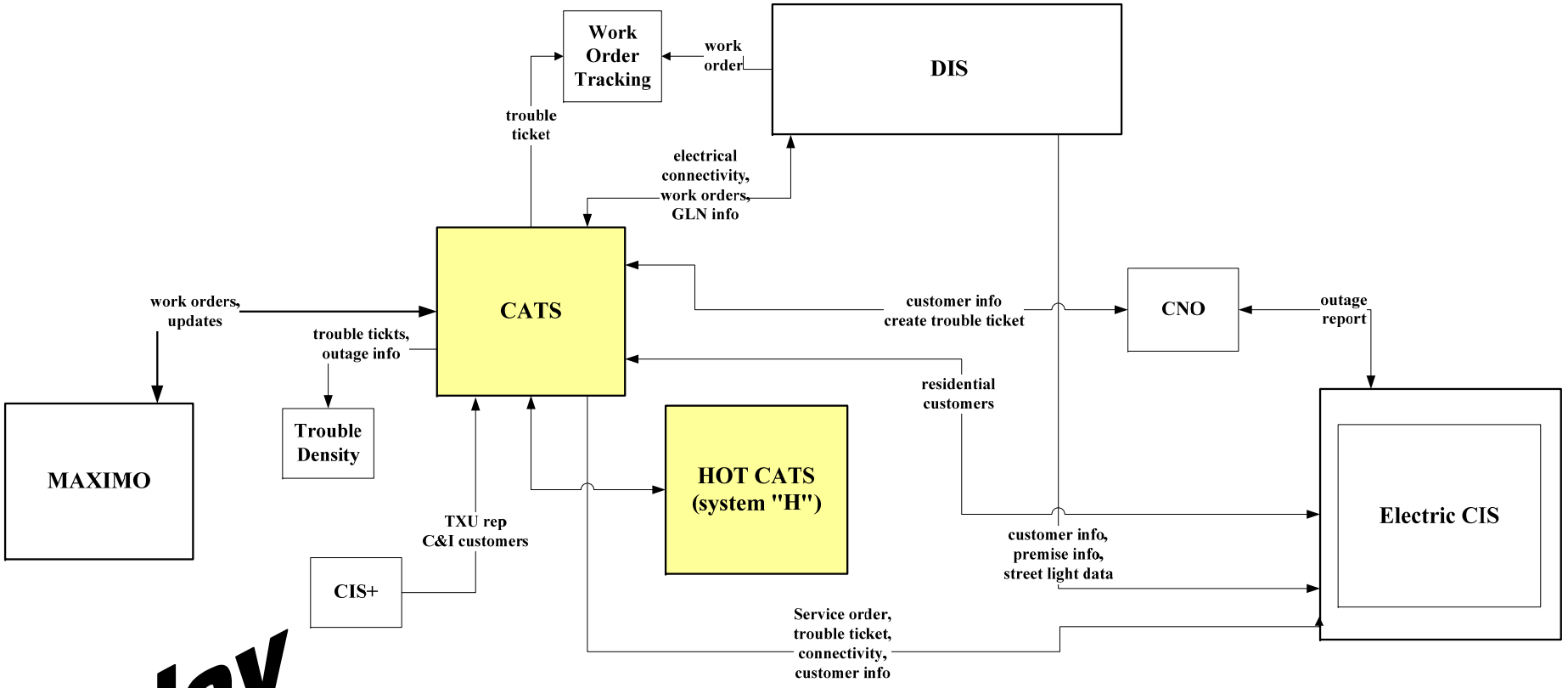
3. **Leverage the “new” technologies available for enterprise application integration (EAI) by using a state-of-the-art middleware suite for new application implementations**

4. **Utilize service oriented architecture (SOA) concepts to keep access to vital information open and easily accessed by any application**

5. **Provide near real-time data and value-added information to all market participants (customers, retail electric providers, ERCOT, and other participants) via Web Portals and specialized information transfers**

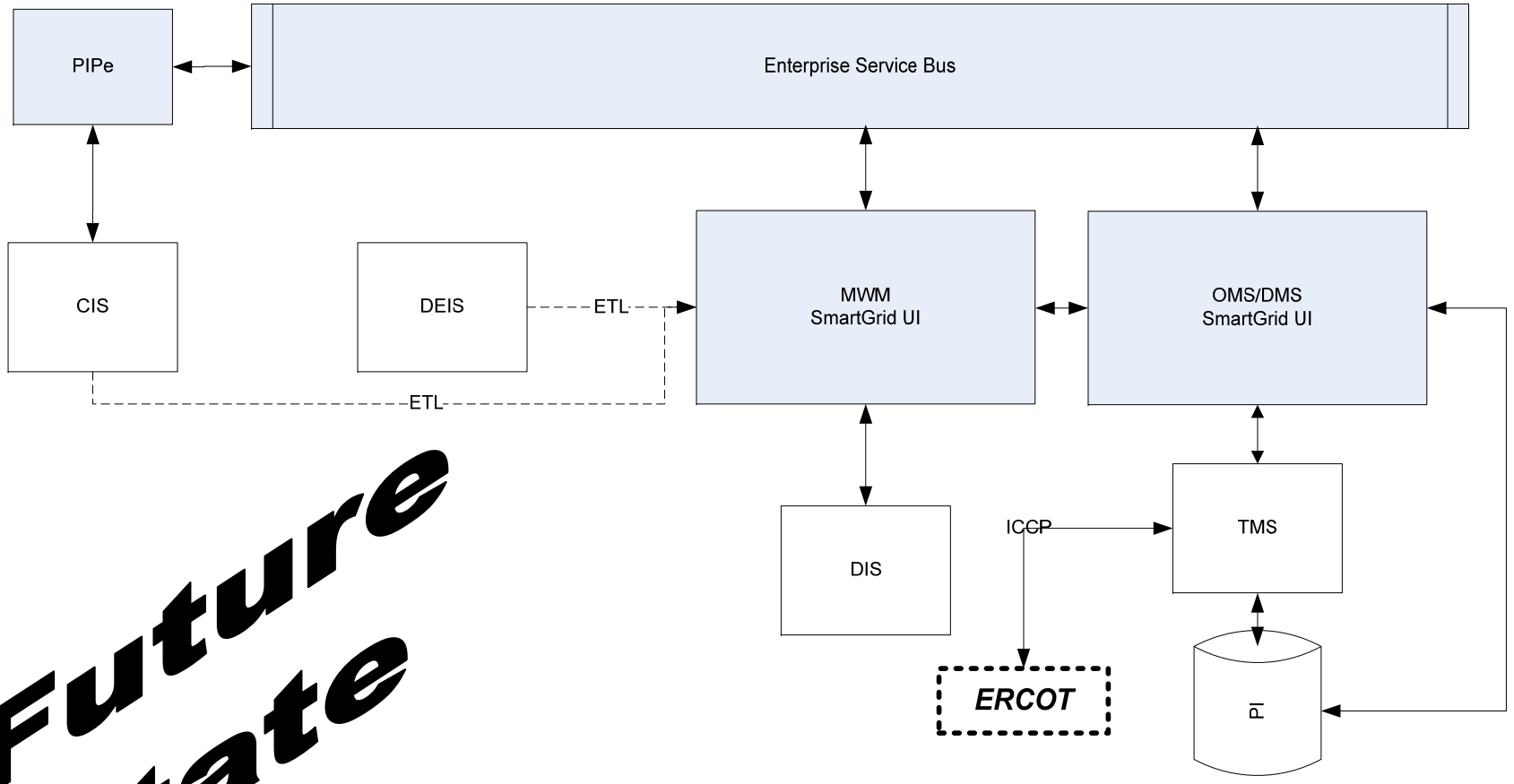
Outage Management System Landscape

TXU Electric Delivery



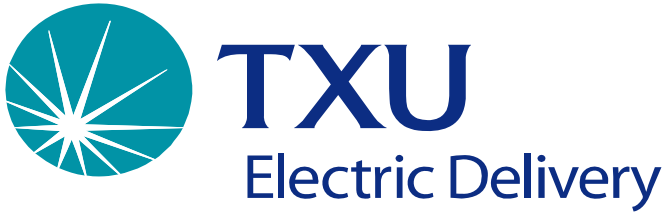
Today

SmartGrid Interoperability Challenges



Future State

TXU
Electric Delivery



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