

# **The Home Area Network and Electric Service Provider Applications**

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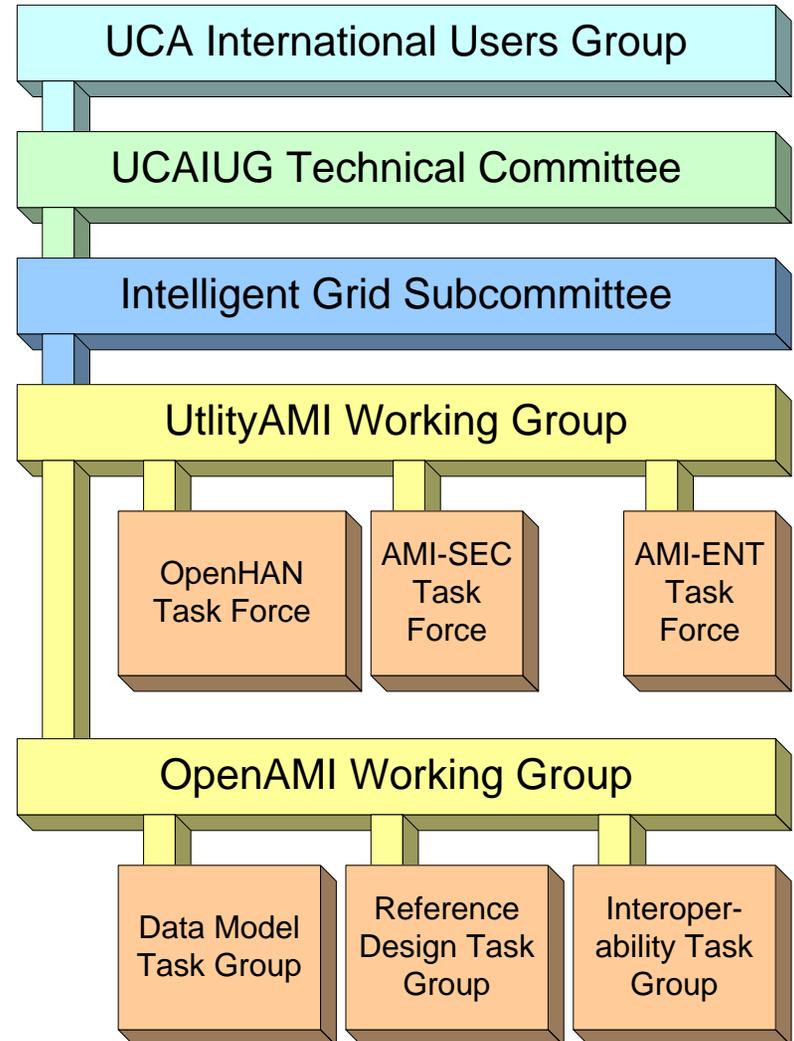
***UCA International Users Group  
UtilityAMI Working Group  
OpenHAN Task Force***

***The UtilityAMI 2008 Home Area Network Systems Requirements  
Specification – (UtilityAMI 2008 HAN SRS)***

***Erich W. Gunther  
Chairman and CTO – EnerNex Corporation  
Chairman, UtilityAMI WG, OpenHAN TF  
Member, DOE GridWise Architecture Council***

# UtilityAMI Overview

- **Formed in November 2005 to develop common requirements for AMI systems**
- **Need for requirements to be driven by entities who will buy AMI systems and their components - utilities**



# OpenHAN Task Force

- **UtilityAMI established the OpenHAN Task Force to develop what is now known as the UtilityAMI 2008 Home Area Network System Requirements Specification (UtilityAMI 2008 HAN SRS).**
- **Collaborative effort of more than nine investor-owned North American utilities serving more than 28 million electric and gas customers in 17 states and provinces**

# UtilityAMI 2008 HAN SRS - Purpose

- **Promotes open standards-based HANs that are interoperable**
- **Provides the vendor community with a common set of principles and requirements around which to build products**
- **Ensures reliable and sustainable HAN platforms**
- **Supports various energy policies in a variety of states, provinces, and countries**
- **Empowers citizens with the information they need to make decisions on their energy use by enabling the vision of a home energy ecosystem**

# UtilityAMI 2008 HAN SRS - Audience

- **Utilities considering deploying AMI systems with a HAN**
- **Vendors that make AMI systems for Utilities**
- **Vendors that make consumer products like communicating thermostats, energy management systems, load control switches, in-home displays, smart appliances, plug-in hybrid-electric vehicles, distributed generation resources, etc.**
- **Policy makers looking to understand how Utilities are implementing directives both within and outside of their jurisdictions**

# OpenHAN Ratification Vote Unanimous

- **AEP**
- **SCE**
- **SDG&E**
- **PG&E**
- **Detroit Edison**
- **FPL**
- **BC Hydro**
- **Entergy**
- **Consumers Energy**
- **CenterPoint Energy**
- **Encor**
- **EDF**

**Additional utilities are expected to ratify the document**

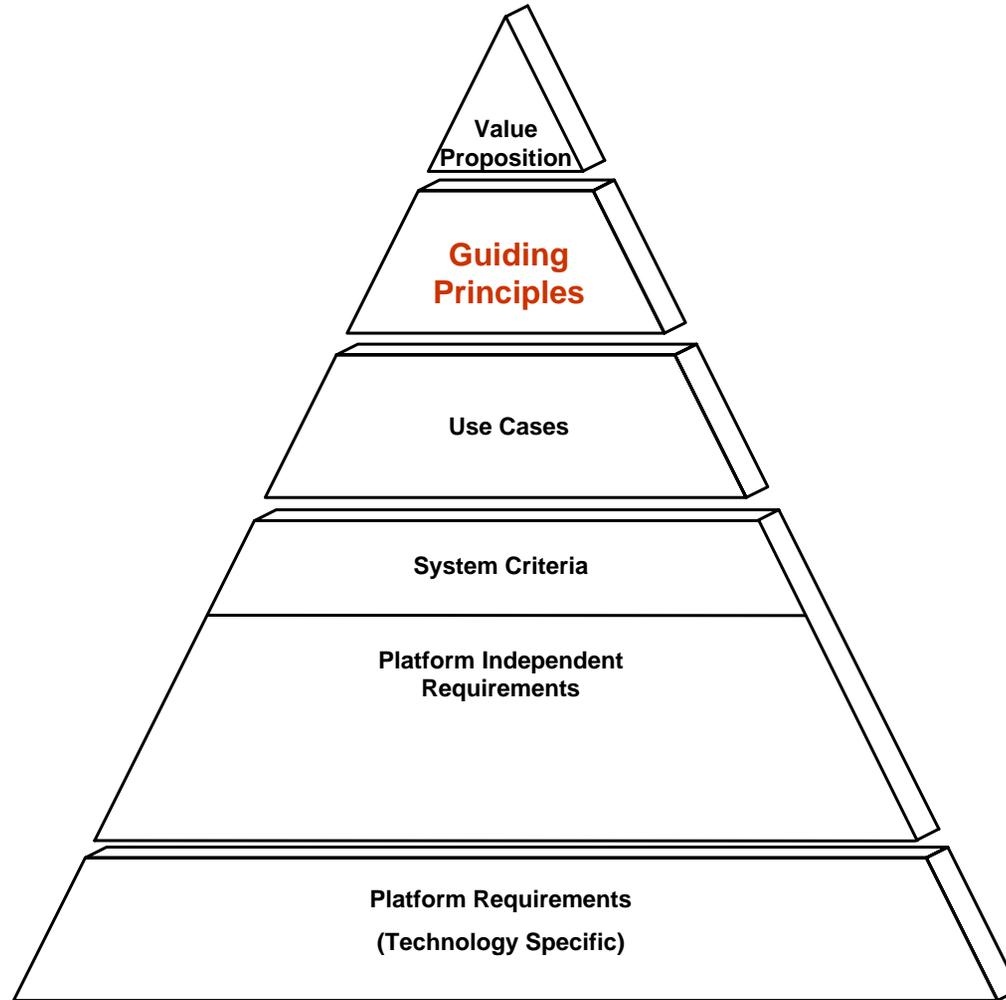
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# HAN Guiding Principles



# HAN Guiding Principles

## Capabilities

- Supports a secure two way communication with the meter
- Supports load control integration
- Provides direct access to usage data
- Provides a growth platform for future products which leverage HAN and meter data
- Supports three types of communications: public price signaling, consumer specific signaling and control signaling
- Supports distributed generation and sub-metering

## Assumptions

- ***Consumer owns the HAN\****
- Meter to HAN interface is based on open standards
- Implementation is appropriate given the value and the cost
- Technology obsolescence does not materially impact the overall value

# Requirements Overview

- **Requirements are platform independent**
- **Requirement are to products applied via device mappings (Appendix)**
- **Special class of requirements for an AMI gateway (See Mappings)**
- **Two types of compliance**
  - **Technology/alliance – application and communication compliance (e.g., message structures)**
  - **Vendor/product – compliant with device mapping requirements**

# Requirements Example

## Context:

Applications that respond to control commands from the utility or authorized third parties. Commands typically tell a device to turn ON/OFF at configurable time intervals or thresholds or enter into an energy saving mode.

## Requirements:

- **App.Control.1 HAN Device shall accept control signals from the utility.**
- **App.Control.2 HAN Device shall respond to requests to cease operational state (e.g., open contact).**
- **App.Control.3 HAN Device shall respond to requests to resume operational state (e.g., close contact).**
- **App.Control.4 HAN Device shall acknowledge receipt of control signal.**
- **App.Control.5 HAN Device shall acknowledge execution of control request.**
- **App.Control.6 HAN Device shall acknowledge execution failure of request (i.e., exceptions).**
- **App.Control.7 HAN Device shall signal any consumer-initiated overrides.**

# Device Mappings

- **Tool for applying the specification**
- **Device mappings are logical**
- **Actual Product offerings may include several logical devices**
- **Legend: Basic (B), Enhanced (E), Not Applicable (NA), Optional (O)**
- **Optional Requirements – suggestion to vendor to examine capability**
- **Logical Devices include:**
  - **Energy Services Interface**
  - **PCT**
  - **Display**
  - **EMS**
  - **Load Control**
  - **HAN Electric Meter**
  - **HAN Meter (non-electric)**
  - **Smart Appliance**

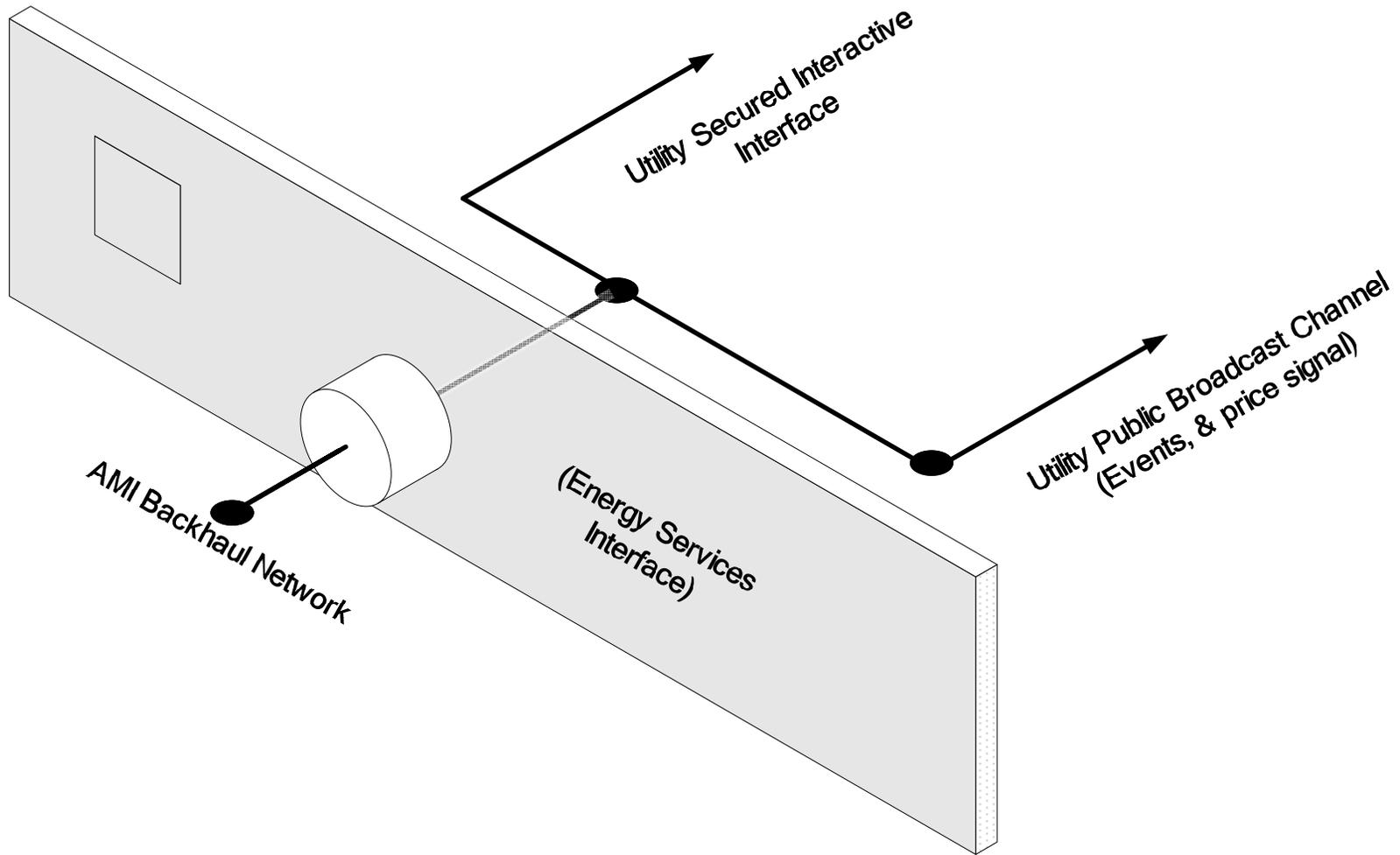
# Device Mapping Example

Requ. ID	OpenHAN System Requirements	Energy Services Interface	PCT	Display	EMS	Load Control	HAN Electric Meter	HAN Meter (non-electric)	Smart Appliance
App.Control.1	HAN Device shall accept control signals from the Utility.	NA	B	B	B	B	B	B	B
App.Control.2	HAN Device shall respond to requests to cease operational state (e.g., open contact).	NA	B	NA	B	B	NA	NA	E
App.Control.3	HAN Device shall respond to requests to resume operational state (e.g., close contact).	NA	B	NA	B	B	NA	NA	E
App.Control.4	HAN Device shall acknowledge receipt of control signal.	NA	B	NA	B	B	NA	NA	E
App.Control.5	HAN Device shall acknowledge execution of control request.	NA	B	NA	B	E	NA	NA	O
App.Control.6	HAN Device shall acknowledge execution failure of request (i.e., exceptions).	NA	E	NA	E	E	NA	NA	O
App.Control.7	HAN Device shall signal any consumer-initiated overrides.	NA	B	NA	B	E	NA	NA	O
App.Control.8	HAN Device shall respond to request to cease operation state at a specific time.	NA	B	NA	B	E	NA	NA	O

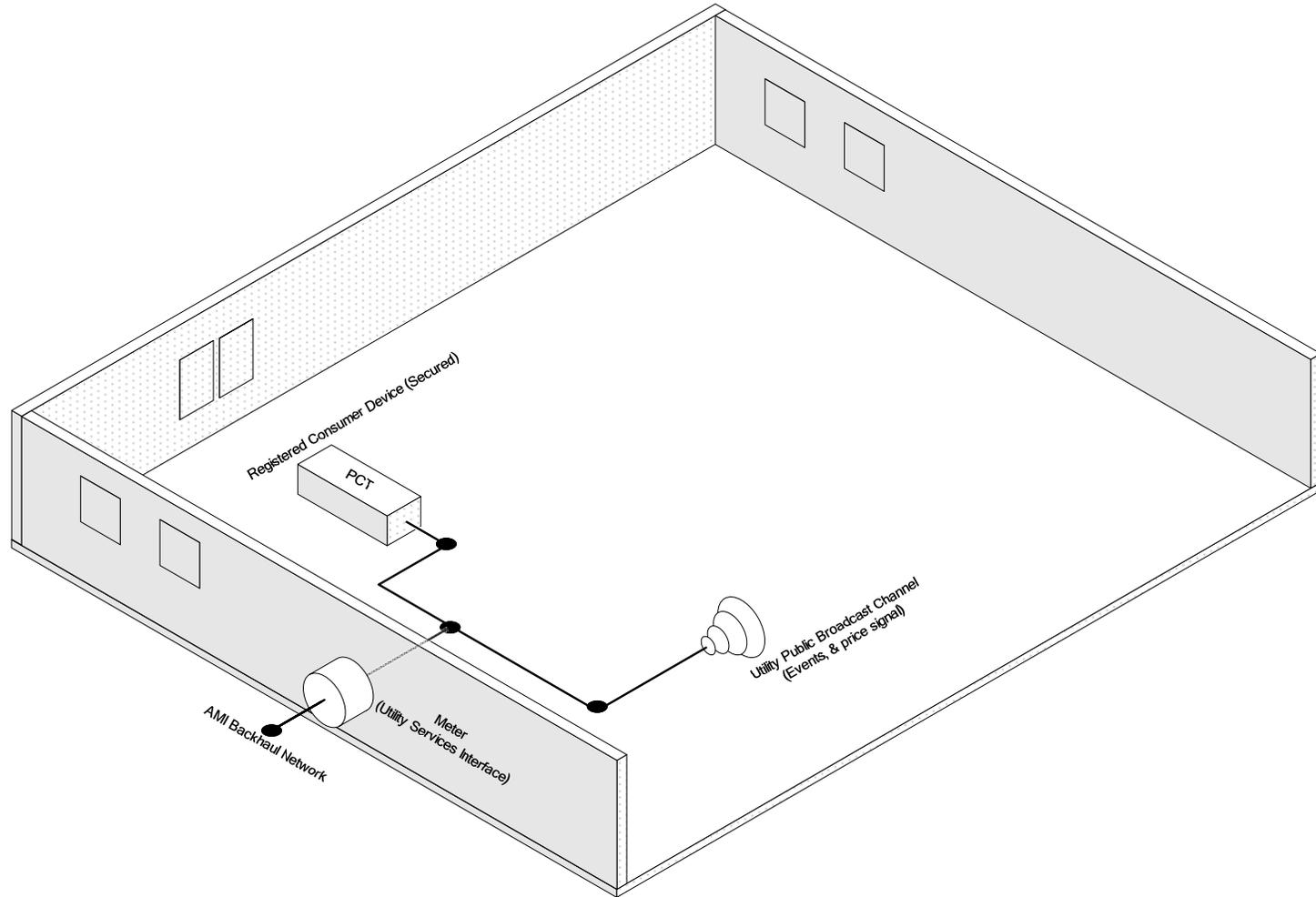
# Architecture Considerations

- The architectural consideration section is not binding
- Provided for context
- **Sections include:**
  - **Utility Interface**
  - **Device Ownership**
  - **Public Broadcast Interface**
    - Broadcast ID (e.g., Utility ID, SSID)
    - Current Price (e.g., \$0.XX/kWhr)
    - Relative Price (e.g., high, medium, low)
    - Message Expiration Time (e.g., 1 – 1440 minutes)
    - Rate Descriptor (e.g., residential, commercial, etc.)
    - Severity of Event Description (e.g., Stage 1, 2, 3)
    - Integrity check (e.g., CRC)
  - **Utility Secured Interface**
  - **Consumer Devices**
  - **Utility Devices**
  - **Cohabitation**
  - **Deregulated Utilities**
- **Four Scenarios given as examples**

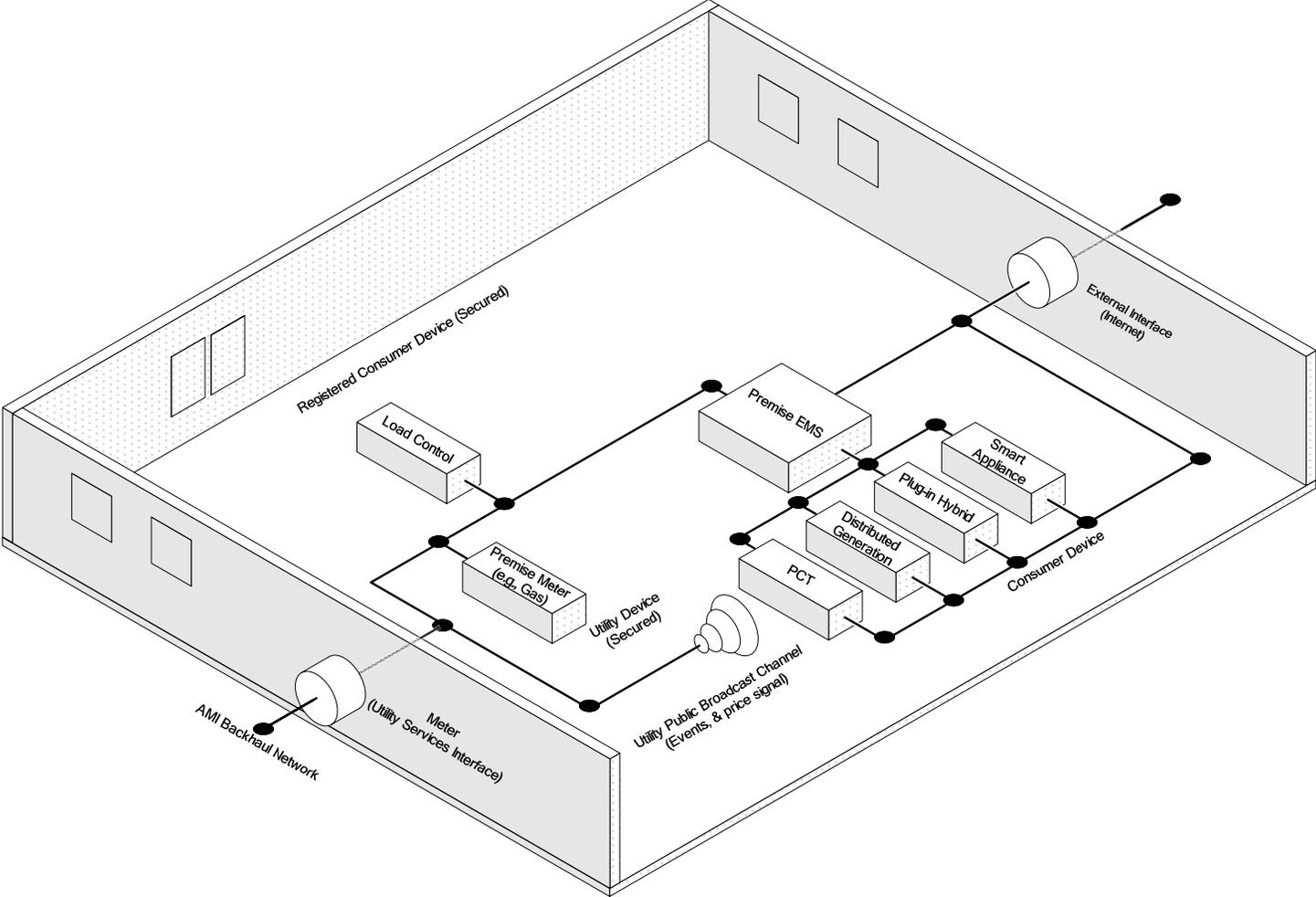
# Interface



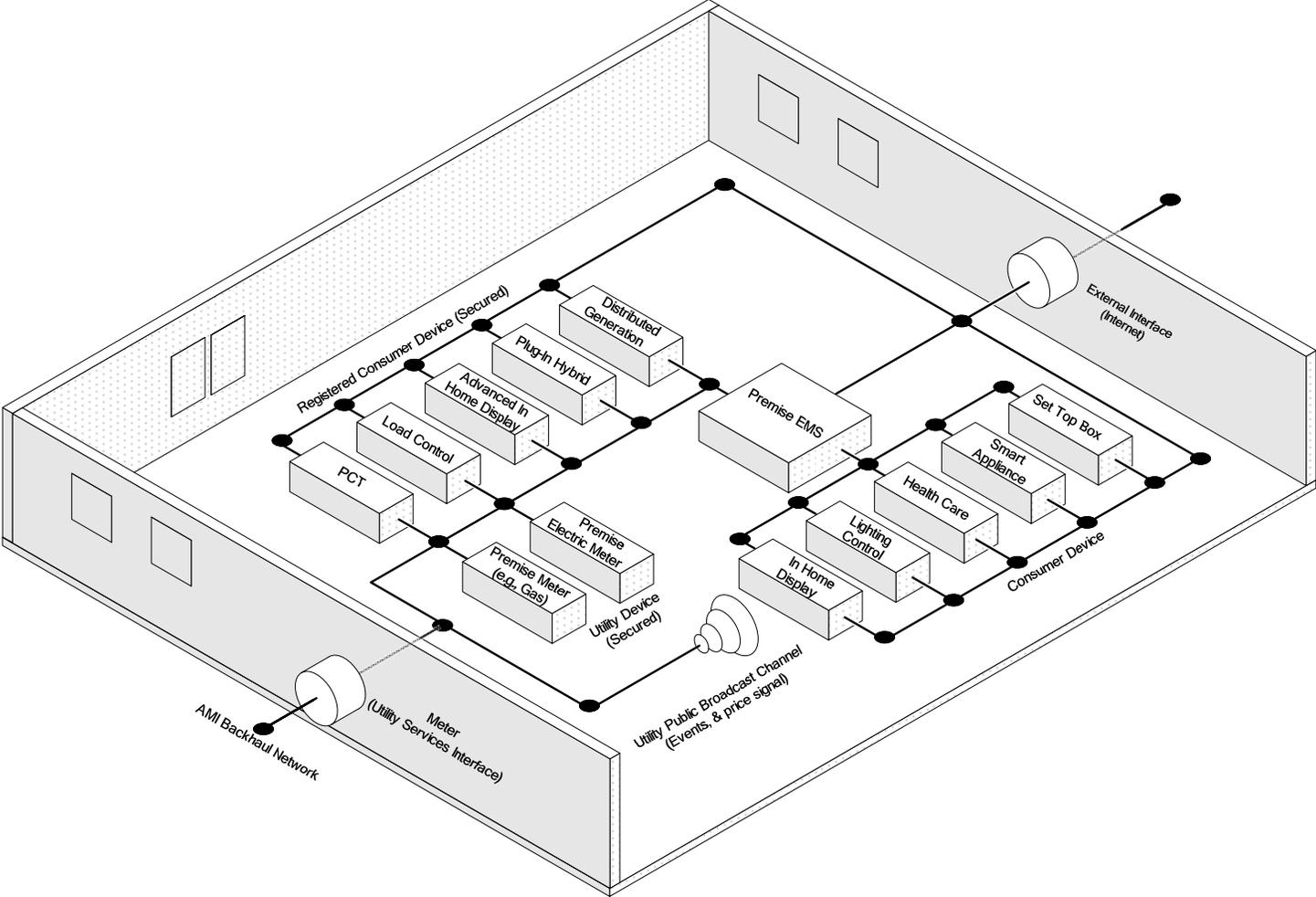
# Early Implementation Scenario



# Coexistence with Home Automation Systems



# Mature System Scenario



# Summary

- **A significant body of work has been created by the energy service provider utility community that suggests requirements and best practices for**
  - **AMI systems in general**
  - **Systems involving a HAN specifically**
- **The specification will evolve as will activities related to its application**
  - **Conformance**
  - **Information models**
  - **Technology specific implementation guidelines**
- **The next meeting of UtilityAMI and it's task forces are this week in San Diego**