

Advanced Metering Infrastructure

HP and Intel's dynamic and modular AMI solution



Smart grids: enabling intelligent energy management

Smart grids combine traditional energy distribution networks with modern digital technology.

By incorporating intelligent monitoring and information management into all aspects of energy production and distribution, smart grids can help to address the following market constraints:

- Need for innovation and competitiveness
- Energy efficiency and capacity management
- Availability of renewable and efficient energy

Migrating energy networks to smart grids involves a substantial modernization program impacting the entire chain of energy generation, transmission, distribution, and consumption.

Currently valued at up to \$24 billion¹, the smart grid market is projected to grow to \$36 billion by 2012, split into approximately equal network infrastructure, hardware/software, and services segments.

Market deregulation has created great challenges for utility companies. The smart grid allows them to respond by offering exciting new services and products to their customers.

Intelligent energy management solutions from HP and Intel enable new revenue streams

Central to the smart grid is Advanced Metering Infrastructure (AMI), a technology that enables utility companies to automate, manage, and control smart meter networks and the data collected from them.

HP and Intel's expertise in the smart grid market

HP Global Utilities Industry division has designed an AMI solution that is scalable, meter-independent, and network equipment agnostic.

The HP Intel AMI solution has the following features:

- Event and alarm management to quickly identify and respond to system disturbances
- Real-time, bi-directional communications to support *net metering*, which enables customers to offset their energy consumption by returning surplus energy to the grid
- Network security to prevent intrusions and unauthorized access

The solution uses HP ProLiant rack-mounted and BladeSystem servers running Intel® Xeon® processors. The industry-leading performance of the Intel Xeon processors allows the large volumes of data in a smart grid to be processed securely and in real time.

The HP AMI solution

The HP AMI solution framework includes the following major components:

- **Meters, concentrators, and access networks** to establish data links between smart meters and management systems

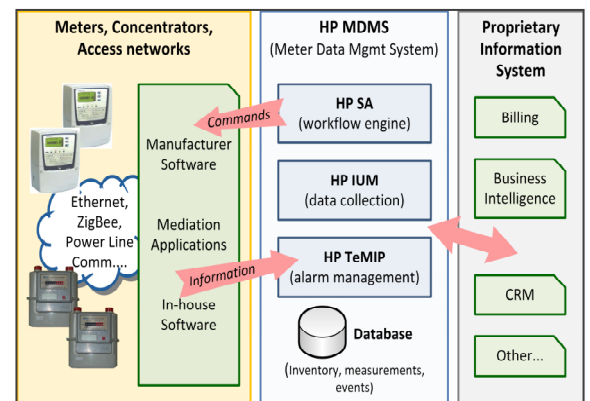


Figure 1: The HP AMI solution architecture

¹References: SBI Reports, June 2009, *Smart Grid Technologies, Markets, Components and Trends Worldwide*; Morgan Stanley, March 2009, *Clean Energy*





- The **Meter Data Management System** (MDMS) to collect and further process measurement data. MDMS is based on the following software components:
 - HP Service Activator (HP SA) for managing smart grid configurations
 - HP Internet Usage Manager (HP IUM) for collecting data from meters in real time
 - HP Telecom Management Information Platform (HP TeMIP) for managing alarms
- The utility company's **proprietary information system** to exploit the data collected for use in billing, business intelligence, customer relationship management, and other internal systems

An implementation of the HP AMI solution is now available at the HP Intel Communications, Media, and Entertainment (CME) Solution Center.

Operating in a genuine production environment, the solution features a custom user interface that displays data collected from electricity and gas meters, as well as providing access to the web interfaces of other applications in the solution.

HP Intel CME Solution Center's team and facilities

The HP AMI solution is now available for demonstrations either online or on our premises.

The solution can also form the basis for additional proofs-of-concept, such as testing and integrating new meters, network components, and proprietary information management systems.

Partners and customers can attend innovation workshops, with teams of dedicated experts available from HP and Intel.

HP and Intel key hardware components

HP BladeSystem c7000 enclosure

Provides all the power, cooling, and I/O infrastructure needed to support modular server, interconnect, and storage components today and throughout the next several years.

Intel® Xeon® Processor 7500 Series

Exceptional scalable performance with advanced reliability for your most data-demanding applications and intelligent performance that automatically adapts to the diverse needs of a virtualized environment.

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