ORACLE UTILITIES SMART GRID GATEWAY

KEY FEATURES

- Provides a single point of connection between all existing and future Smart Grid devices and applications
- Handles common AMI processes, including remote connect/disconnect and meter status
- Creates a solid foundation on which to build Smart Grid business processes
- Ensures efficient and timely flow of data to appropriate applications
- Works with productized adapters for specific AMI systems
- Near real-time outage and restoration updates
- Supports proactive outage response and accurate problem identification

KEY BENEFITS

- Reduces long-term costs to implement and operate Smart Grid processes and programs
- Minimizes data duplication
- Provides a common set of commands that foster application interoperability
- Bolsters the security and auditability of Smart Grid processes
- Increases responsiveness and customer satisfaction

As the Smart Grid evolves, utilities will gather an ever-increasing volume of data from an ever-expanding list of devices. Oracle Utilities Smart Grid Gateway (SGG) provides a single point of connection that links devices to all the applications that use their data. SGG dramatically reduces the cost and complexity of enhancing Smart Grids with new devices, data streams, and business processes.

Smart Grid Evolution

Many Smart Grid projects begin with smart metering and a focus on customer consumption data. Frequently, those projects route meter data from metering head ends directly to a meter data management (MDM) system.

Smart metering, however, is just a first step. As the Smart Grid evolves, utilities will need communication channels that permit many different applications to send commands to meters. Additionally, data and commands will increasingly flow between applications and non-metering devices like grid sensors and load control devices. Attempting to route such communications via MDM would be, at a minimum, inefficient. It could also drain MDM resources, resulting in processing slow-downs that could hamper bill production.

Yesterday: Limited Communications Choices

In the past, Smart Grid architects envisioned two possible solutions to moving expanding volumes and types of Smart Grid data and commands between devices and applications:

- **Expanding MDM capacity**. The result, however, is a clearly inefficient data flow as commands and data irrelevant to MDM increase. Additionally, requiring MDM vendors to accommodate all these new types of commands and data would force them to dedicate scarce development resources to an ever-expanding task that is peripheral or irrelevant to their central focus.
- **Constructing individual application communication interfaces**. These would connect a specific application to all appropriate metering head ends and device networks. It takes little imagination, however, to realize that, as the number of devices expands, the cost to develop, operate, and upgrade such links would be extraordinarily high. And the resulting tangled nest of complicated links would almost certainly lead to dropped, conflicting, and untraceable communications.

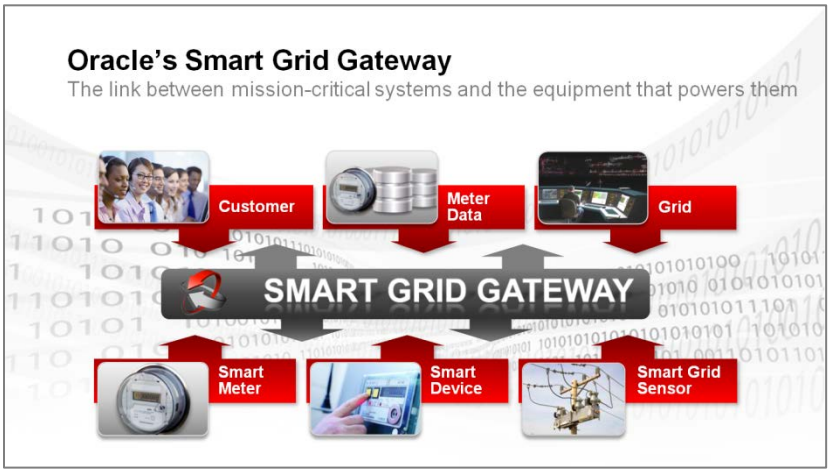
Today: A New Way to Structure the Smart Grid

Oracle Utilities Smart Grid Gateway (SGG) is a new and better structure for handling Smart Grid data. It is a single point of connection between applications and devices. It handles data-gathering and command delivery between all current and future devices and applications that will attach to the Smart Grid. With it, utilities can increase or decrease the amount of data and the types of data and commands flowing from devices to applications without having to change either the MDM or the communications modules on separate applications.

RELATED PRODUCTS AND SERVICES

Oracle Utilities Smart Grid Gateway requires:

- Oracle RDBMS Enterprise Edition
- Oracle WebLogic Server Standard Edition
- Java JDK



Oracle Utilities Smart Grid Gateway Functions

- Accepts commands and routes them to any device—not just meters.
- Routes data streams from all types and brands of devices to one or more applications.
- Governs and filters data to prevent unnecessary data and functional duplication.[1]
- Handles standard AMI processes such as:
  - Incoming meter usage and events.
  - Remote connect/disconnect.
  - Meter ping/meter status check.
  - On-demand read.
  - Meter commissioning and de-commissioning.
- Handles exceptions. For instance, SGG retries failed deliveries and reports on results using options (on number of retries, for instance) chosen by the utility.
- Tracks the history of each transaction and provides overall transaction audit reports.
- Integrates with Oracle Utilities Network Management System (NMS) or third party outage management systems to assist in outage detection and verification as well as restoration confirmation, including:
  - Provides meter status information to NMS such as "last gasp" power off messages and restoration power-up messages
  - Supports "meter pings" to request a power-on status from the meter
  - Supports "turning off" the message flows from SGG to NMS for one or more meters in order to accommodate testing or false meter statuses

Additional Oracle Utilities Smart Grid Gateway Features

- Device and head-end system management. SGG routes commands without requiring an application to know how to communicate with a specific device. Similarly, SGG routes data received from devices that do not need to know the location of the application that will use the data. Device and head-end system management means that changes in devices do not affect the operation of business processes. Therefore, utilities can set up entire business processes just once and leave them unchanged throughout numerous changes in the devices that supply data to the process.

[1] Utilities can, for instance, configure SGG so that it does not send outage alerts immediately to an outage management system. Instead, SGG might retain the alert pending receipt of a reconnection signal within a few seconds—an occurrence that would signal a blink-out, not an outage.

Standard templates or hooks for attaching any application and any device. This means:

- It is easier, faster, and cheaper to add applications and devices to the Smart Grid. Each requires only one interface—to SGG.
- Utilities can add interfaces (adapters) and commands as needed to accommodate any uniqueness in their smart environment.
- Utilities can attach SGG to any vendor's applications or devices.

- A common set of commands that can be used from any application. This means:
  - Less development time to add Smart Grid commands to existing applications.
  - Less training time for users of multiple applications.
- Command orchestration and transaction management. SGG sends commands according to sets of rules chosen by the utility. It also tracks and logs those commands, which are available for audit.
- Configuration templates utilities can use to tailor SGG to specific needs. These choices and any customizations are preserved intact during upgrades to SGG and to the attached applications and devices. In other words, once completed, they remain undisturbed through multiple upgrades.
- Security based on Oracle Fusion middleware.

The Oracle Utilities Smart Grid Gateway Evolution

SGG is designed to evolve at the pace of change required by utility Smart Grid plans.

- Direct integration between SGG and Oracle Utilities Meter Data Management v2.0.1 or higher.
- Pre-built vendor adapters that link AMI head-end systems with other utility applications such as meter data management, customer care and billing, and network management systems. These adapters support the loading of meter data and meter events, publish data to downstream applications, and enable certain smart meter commands. They can also be extended, in concert with SGG, to support additional devices or commands.

  Using SGG with the adapters allows utilities to quickly connect multi-vendor solutions without requiring complex integration efforts. As a result, utilities can reduce total cost of ownership and more efficiently implement their Smart Grid initiatives.

  The following adapters provide utilities with a simplified link between Smart Grid devices and the applications that use their data:

  - **Oracle Utilities Smart Grid Gateway Adapter for Echelon**
    Integrates with Echelon's Networked Energy Services (NES) System
  - **Oracle Utilities Smart Grid Gateway MV-90 Adapter for Itron**
    Loads MV-90 binary formatted usage data and interval status codes
  - **Oracle Utilities Smart Grid Gateway Adapter for Itron OpenWay**
    Provides integration with Itron OpenWay head-end system including execution of smart meter commands and the requesting and processing of scheduled usage and event data
  - **Oracle Utilities Smart Grid Gateway Adapter for Landis+Gyr**
    Integrates with Landis+Gyr Gridstream Command Center
  - **Oracle Utilities Smart Grid Gateway Adapter for Sensus RNI**
    Integrates with Sensus Regional Network Interface (RNI)
  - **Oracle Utilities Smart Grid Gateway Adapter for Silver Spring Networks**
    Integrates with Silver Spring Networks' UtilityIQ

SGG Adapter Developer Kit (ADK)

If a productized adapter is needed beyond those listed above, Oracle Utilities offers an Adapter Development Kit (ADK) that can be purchased to integrate with additional head-end systems. The ADK is built on the same technology platform as the productized adapters offering similar features and benefits:

The ADK can also be extended, with SGG, to support additional devices or commands.

SGG plays an important role in the evolution of Smart Grid business processes. SGG is a tool that makes it easier to design and improve processes that incorporate smart devices—that is, devices that are able to receive and provide data and whose operation can be controlled through received signals. By increasing the efficiency with which applications can send commands and devices can receive and act on them, SGG can power an increasingly complex and pervasive set of business processes and customer programs that bring utilities closer to achieving their operational, customer, resource, and environmental goals.

Contact Us

For more information about Oracle Utilities Smart Grid Gateway, visit oracle.com or call +1.800.275.4775 to speak to an Oracle representative.

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Hardware and Software, Engineered to Work Together

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