Midwest Power Company

Overview

Oracle SOA Suite is a comprehensive, hot-pluggable software suite to build, deploy and manage Service-Oriented Architectures (SOA). The components of the suite include consistent tooling, a single deployment and management tool, end-to-end security and unified metadata management. Oracle SOA Suite's hot-pluggable architecture helps businesses lower upfront costs by allowing maximum re-use of existing IT investments and assets, regardless of the environment they run in, or the technology they were built upon.

The energy industry today is faced with the challenge to keep up with rising customer demand in areas such as natural gas and renewable energy. Environmental uncertainties in power have increased utility costs, causing customers to take an interest in their usage data. To handle this demand, the power industry started implementing the Smart Grid plan on a national scale. The Smart Grid program involves a device, the Smart Meter, being installed directly in customers' homes to provide real-time usage, problems and data to interested parties. Information such as outages can be sent to repair crews to better evaluate the problem. The customer can access usage information in order to understand the breakdown of their utility costs. The storage and flow of this information requires coordination of IT personnel and the correct software configuration.

This Midwest Power Company has collaborated with Zirous, primarily focused on SOA solutions aimed at simplifying integration implementations. This particular SOA integration was needed because the Company now required a way to monitor and organize data from the Company's Smart Grid program. Zirous designed and implemented a solution that controlled the flow of this new information, allowing the Company to use the data to better understand and serve their customers.

Challenges:

Handling and allowing access to data from the brand new Smart Grid program posed many challenges within the Company, including:

- Allowing customers quick access to the Smart Meter data through their portal
- No way to send vital system outage information, real-time, to maintenance crews
- Lack of organization in place to manage the flow of this new data
- Existing technology did not allow end-user customer support to test the smart meters if customer loses power

Solution Details:

Zirous architected a solution leveraging the key features of Oracle products including SOA Suite 11g, BPEL/Mediator and Weblogic 11g to address the Company's need to exchange and monitor the new Smart Meter data. Key features of this implementation included the following, which resulted in the process flow depicted in Diagram 1.
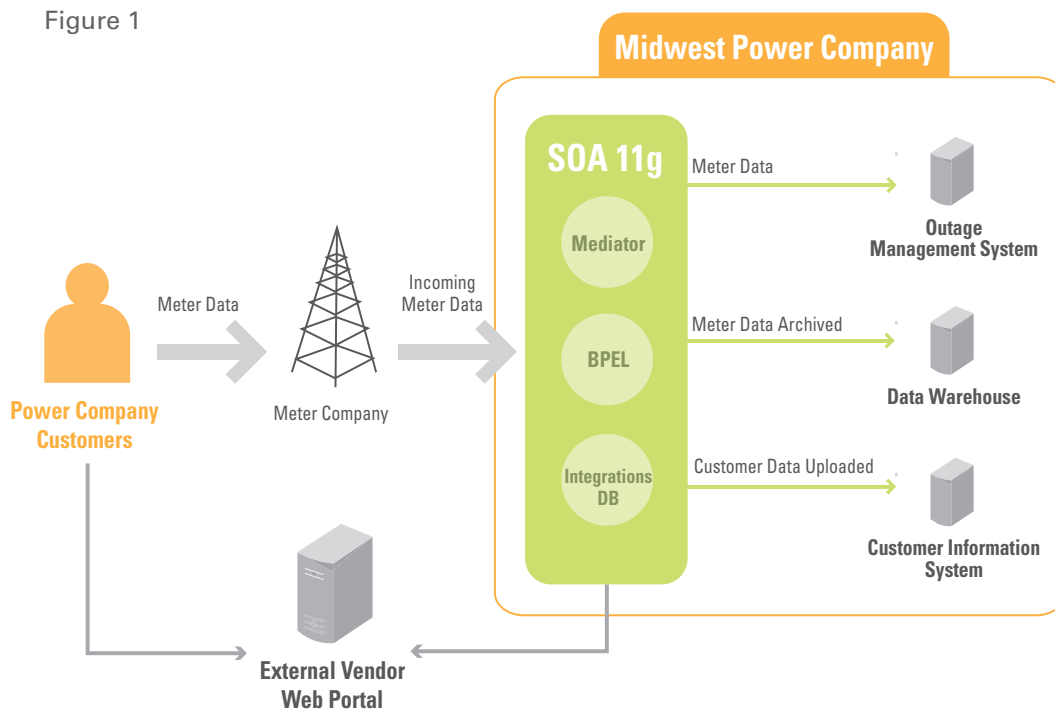
Technology
Stack:
Oracle SOA Suite 11g
Oracle Weblogic 11g
Oracle ADF 11g

- Designed, built, and deployed 25 separate integrations to connect five different systems within the Company including the Sensus meter system, GE OMS (outage management system), Accelerated Innovations Web Portal (AI), eDNA (data historian) and CIS (customer information system).
- Implemented integrations using Oracle's AIA methodology and created canonical data models using the power industry standard, Multispeak.
- Implemented integration layer for the Company's custom CIS, allowing for future integration and reporting.
- Along with BPEL and Mediator, Oracle SOA Suite 11g components such as Domain Value Maps (DVMs) were utilized to make integrations more flexible and allow non-technical resources to update integrations if their data or business requirements change.
- Integrated and leveraged existing error handling framework used within client's infrastructure so that the Company didn't need to implement another balkanized service to further complicate their processes.
- Designed and built a test bench application utilizing ADF and SOA 11g that allowed the Company to build and run different testing scenarios on the integration layer and endpoint systems.

With the above technology implementation, Oracle's SOA Suite enabled the solution by providing a foundation based on industry standards. With this foundation, Zirous consultants were able to develop a real-time system that integrated the disparate systems. This integration allows customers to view real-time usage on their portal and customer service specialists to test meters in real-time, without having to send someone into the field.

Figure 1

Midwest Power Company

SOA 11g
Mediator
BPEL
Integrations DB

Meter Data → Outage Management System
Meter Data Archived → Data Warehouse
Customer Data Uploaded → Customer Information System

Power Company Customers
Meter Data → Meter Company → Incoming Meter Data →

External Vendor Web Portal