Regional Seminar Series
Warsaw, Poland

OSIsoft MDUS EBS Overview

Brandon Lake
Customer Support Engineer

Value now. Value over time.

Agenda

- Introduction
- Partnerships
- The Goals of an Advanced Metering Infrastructure
- The OSIsoft MDUS
- The SAP Roadmap and Offering (SAP's AMI for IS-U)
- Question and Answer

OSIsoft Customers

Company	Generation	Transmission	Distribution	Metering	Energy Trading
RWE	✓		✓		
e·on	✓		✓		
EnBW	✓		✓		
VATTENFALL	✓	✓	✓		✓
essent	✓		✓	✓	
Electrabel GDF SUEZ	✓		✓	✓	
EDF	✓		✓		
endesa	✓		✓		

Value now. Value over time.

OSIsoft Customers (con't)

Company	Generation	Transmission	Distribution	Metering	Energy Trading
IBERDROLA	✓		✓		
edp	✓				
centrica	✓				
FINGRID		✓			
Enel	✓				
Sydkraft	✓				
REN		✓			

Value now. Value over time.

OSIsoft Customers (con't)

Company	Generation	Transmission	Distribution	Metering	Energy Trading
UNION FENOSA	✓				
Scottish and Southern Energy	✓		✓		
ESB	✓				
AES	✓				
RED ELÉCTRICA DE ESPAÑA		✓			
MARK-E	✓				

Value now. Value over time.

Strategic Alliances - Overview

OSIsoft	Microsoft	SAP
Real-Time Data Infrastructure	Productivity & Infrastructure	Line of Business Connectivity

Value now. Value over time.

Strategic Alliances – SAP

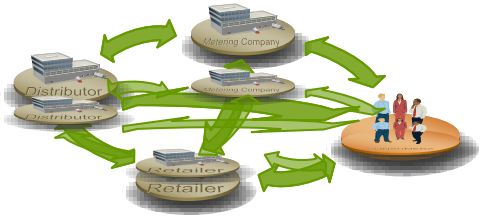
OSIsoft Partner Since 1996:

- SAP Production Planning-Process Industries (SAP PP-PI) module
- SAP Plant Maintenance (SAP-PM) module
- SAP Quality Management (SAP-QM) module
- The OSIsoft Business Package for SAP Portal
- Member of ES Community
- Member of Value Network for Chemicals, Mining, and Utilities
- Enterprise Services for SAP Enterprise Service Repository
- AMI MDUS Solution and participant in SAP Lighthouse Council since 2007
- ***SAP Certified ESOA – AMI Integration***
- ***Endorsed Business Solution (EBS) OSIsoft MDUS***

Smart Grid and Advanced Metering Infrastructure Faces Many Challenges

Outdated Grid Management
VP Operations

Transition to Smart Meters
VP Customer Care



IT Asset Management
CIO

Inefficient maintenance processes
- High maintenance costs
- Large amount of tied up capital

Increasing Demands on Aging infrastructure
- Rising maintenance costs
- Decreasing reliability
- High failure costs
- Need to meet increasing demand with existing resources
- Need to operate as integrated assets

Lack of Visibility
- No access to up-to-date information
- Bad data quality and high error rates
- Need to make decisions across the grid

Volume of Data and Need to collect in Real time
- Need to integrate heterogeneous AMI systems with existing IT landscape
- Necessity to adapt existing business processes

Meters and technology will continue to change
- Limited information on consumed and provided energy
- Incorrect, imprecise and non-timely information

Inefficient Process Handling
- High manual effort for operational processes

Manage mixed vendor landscape
- Integration cost
- Costs to learn and operate systems

Complexity of Interfaces
- Head-end Systems outside of scope of IT
- Metering, telecommunications, standards are evolving

Technology and Skills Maintenance
- High costs for change management
- Short timeframe for implementation

Value now. Value over time.

OSIsoft is an Integrated Solution for Real-time Smart Grid and AMI Infrastructure

Optimized Asset Operations and Maintenance

Integrated enterprise asset management
- Enables enterprise wide access to all asset related data performance data
- Early alert to problems
- Focus of maintenance expenditure on critical equipment
- Historical data guides maintenance programs

Maintenance strategies based on failure effects and reliability
- Gives guidance for asset operation
- Increases reliability
- Lower overall maintenance costs

Visibility across the entire grid
- Access across the grid with same technology
- Provides access to up-to-date information
- Integrates field and back office to ensure low error rates and high data quality

Smart Meter Data Integration

End-to-end coverage of technical and commercial systems
- Interfaces to multiple head-end systems provides flexibility in meter technology
- High volume and real time data collection assures timely, accurate and availability of data on-line

On-time information
- Collects data in real-time and makes available to the enterprise
- On demand request directly to the meter

Streamlined AMI processes
- Self configuring interfaces requires little intervention
- automatic processing of energy data from smart meters
- Automated disconnection and reconnection processing

IT Asset Management

One technology for real-time data collection
- Minimize technologies across company smart grid reduces support, training, maintenance and overall TCO
- Minimize footprint because of technology for data capture and storage

Supportable architecture
- Single source of support SAP Solution Manager
- Availability of on-line systems monitoring
- Minimum data redundancy avoids errors
- OSIsoft handles complexity of Head-end and metering systems

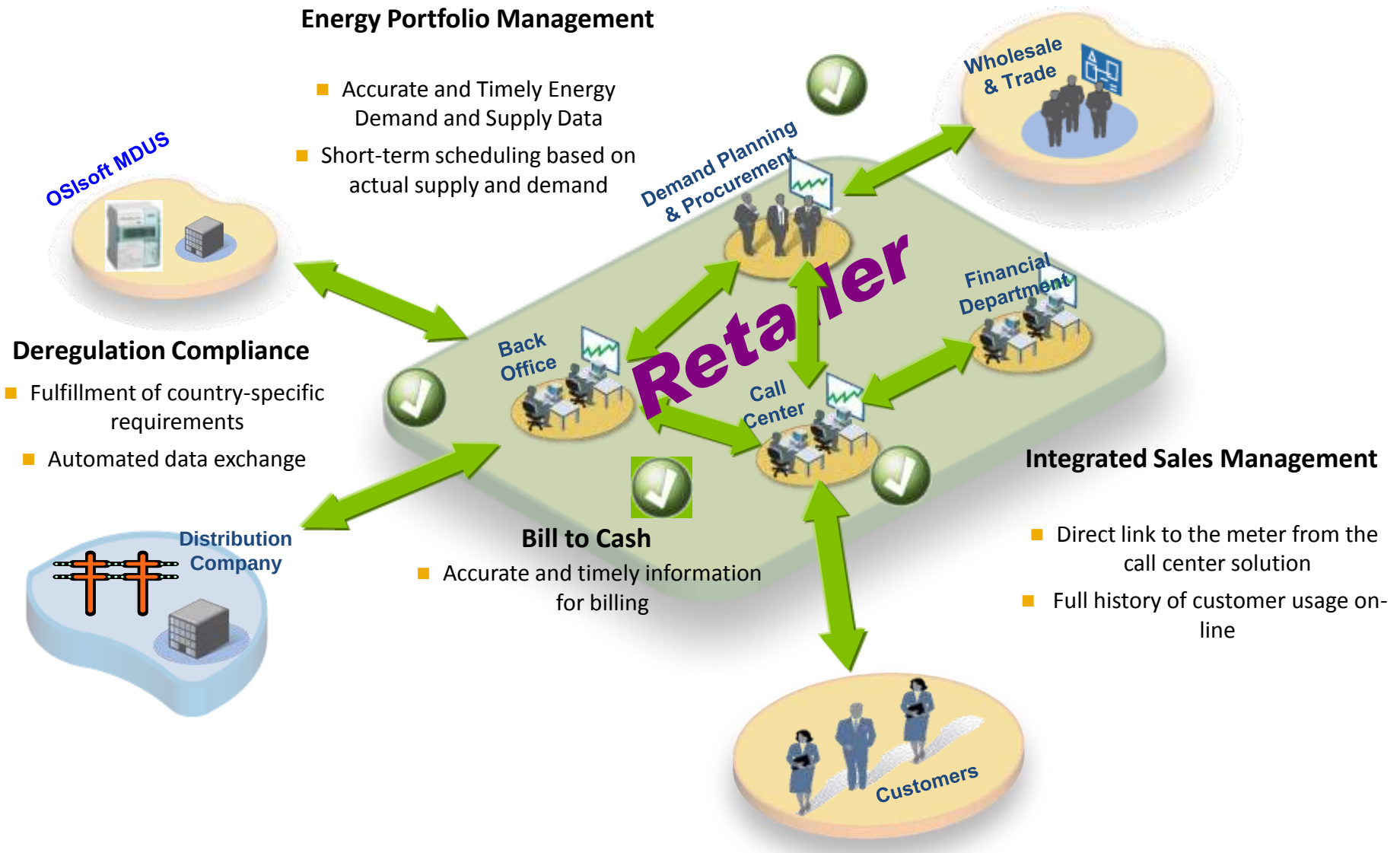
SAP Certification
- Service deployment to SAP PI certified reduce cost of installation and support and allows fast deployment

Value now. Value over time.

AMI Enables new functions

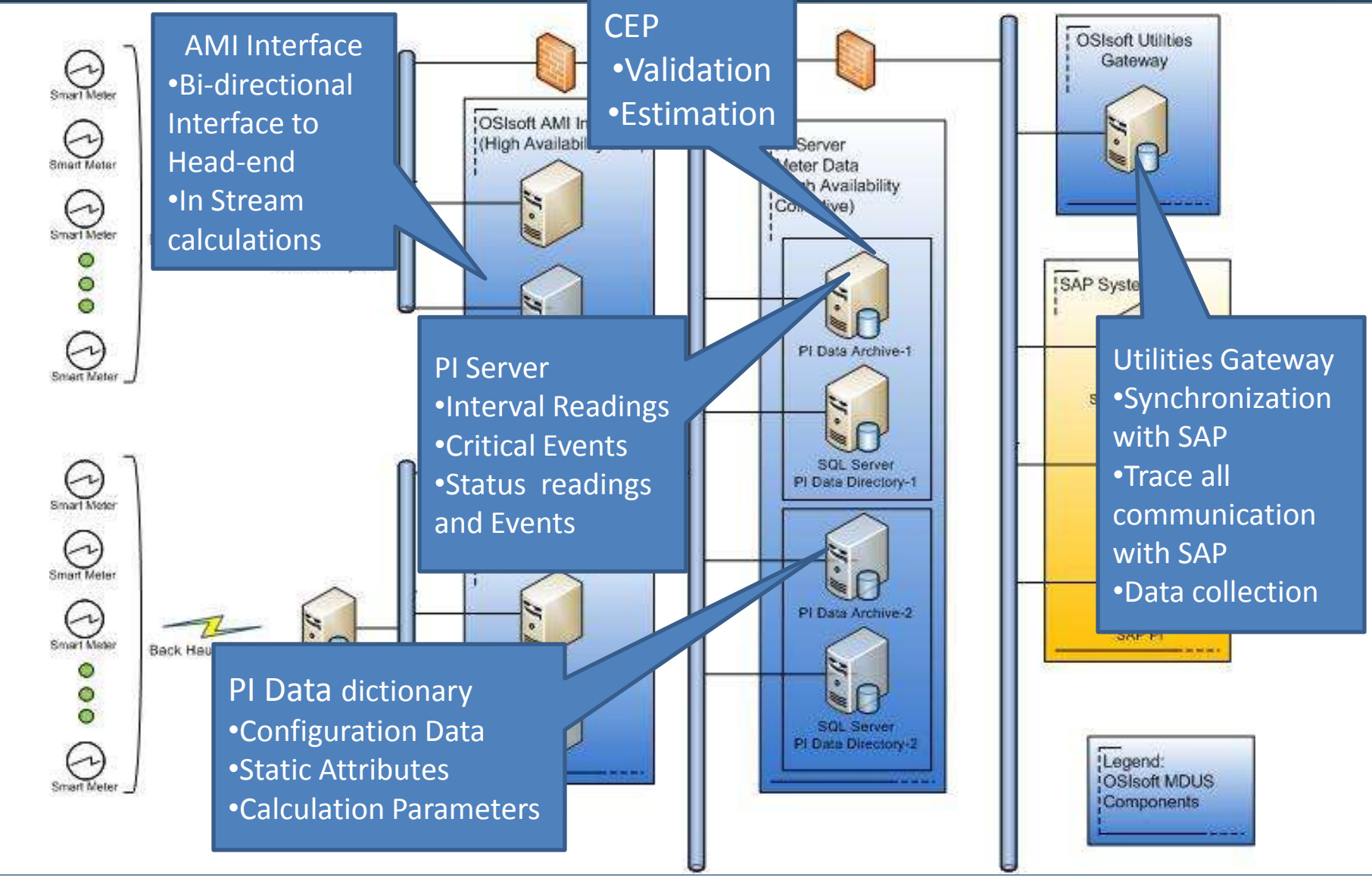
- Meter data from meter to cash
  - Increase accuracy
  - Less estimated bills
  - Reduce time usage and billing
  - Reduce Bill Complaints
  - Better Detection of Fraud
  - Simplified Meter Disconnection
- New Enterprise functions
  - Asset management
  - Load Profile & Forecasting
  - CRM (variable pricing)
- Utility Company Reasons for MDM
  - Mergers and Acquisitions unifying layer for multiple metering systems
  - Implement Demand Response
  - Overall Smart Grid Initiatives
  - Competitive Service
  - Unifying Platform for Market Participants

Real-time data from OSIsoft enables Retailer



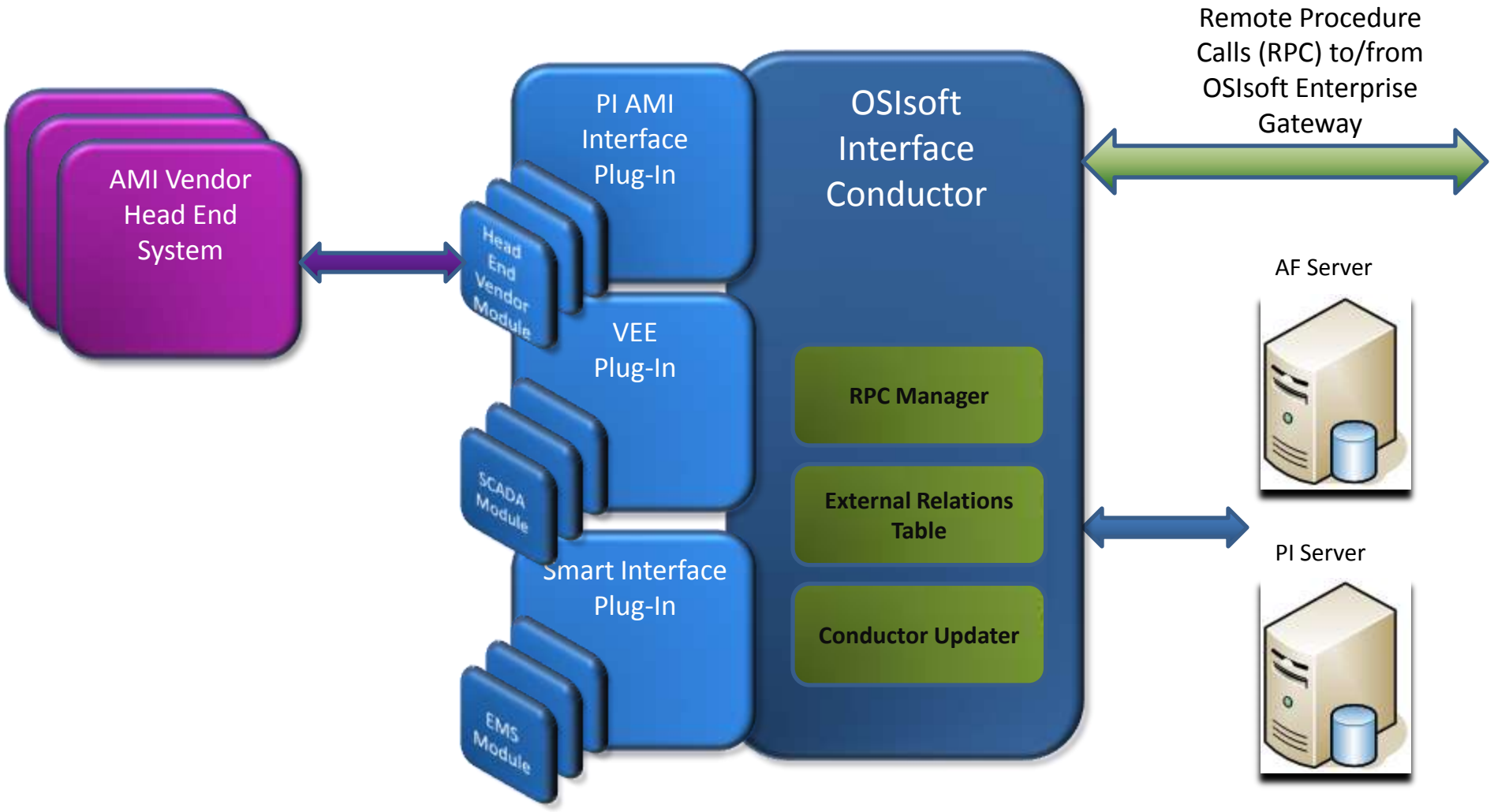
Value now. Value over time.

OSIsoft MDUS – SAP Endorsed Business Solution



Value now. Value over time.

OSIsoft Interfaces

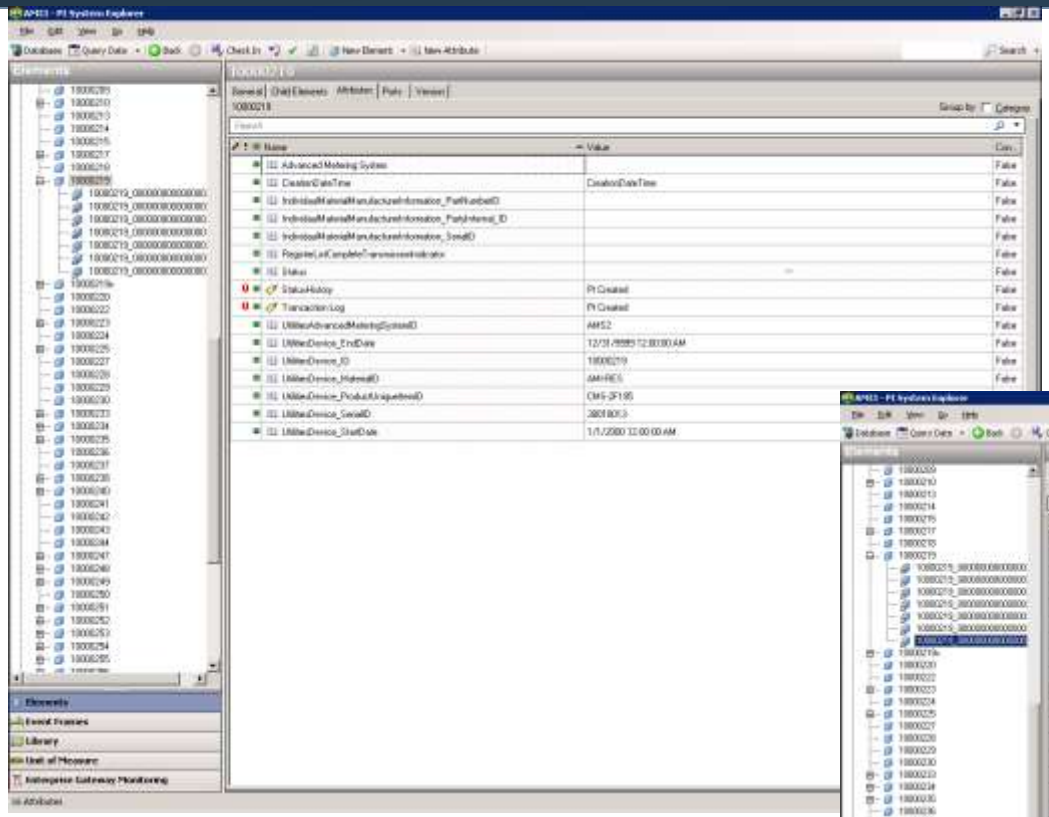


Value now. Value over time.

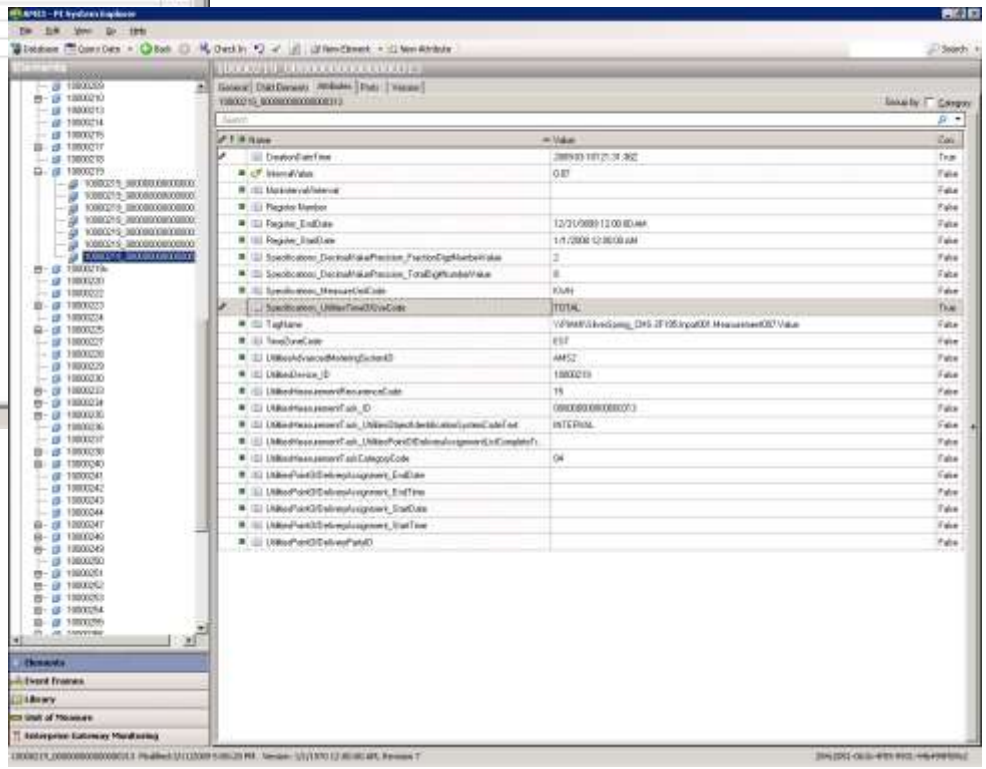
PI AMI Interface

- Interface Plug-in
  - Bi-directional Communication (WSDL/SOAP)
    - Interval Meter Reading
    - On Demand Reads
    - Remote Connect/Disconnect
    - Demand Management / Load Limiting
    - Meter Events, Alarms and Reports
  - Asset hierarchy
    - Meter
      - Channel1
      - Channel n
      - Register1
      - Register n
- Interface Conductor
  - New PI Subsystem
  - VEE Interprocess communication <future>

AF Model Built and Linked Automatically

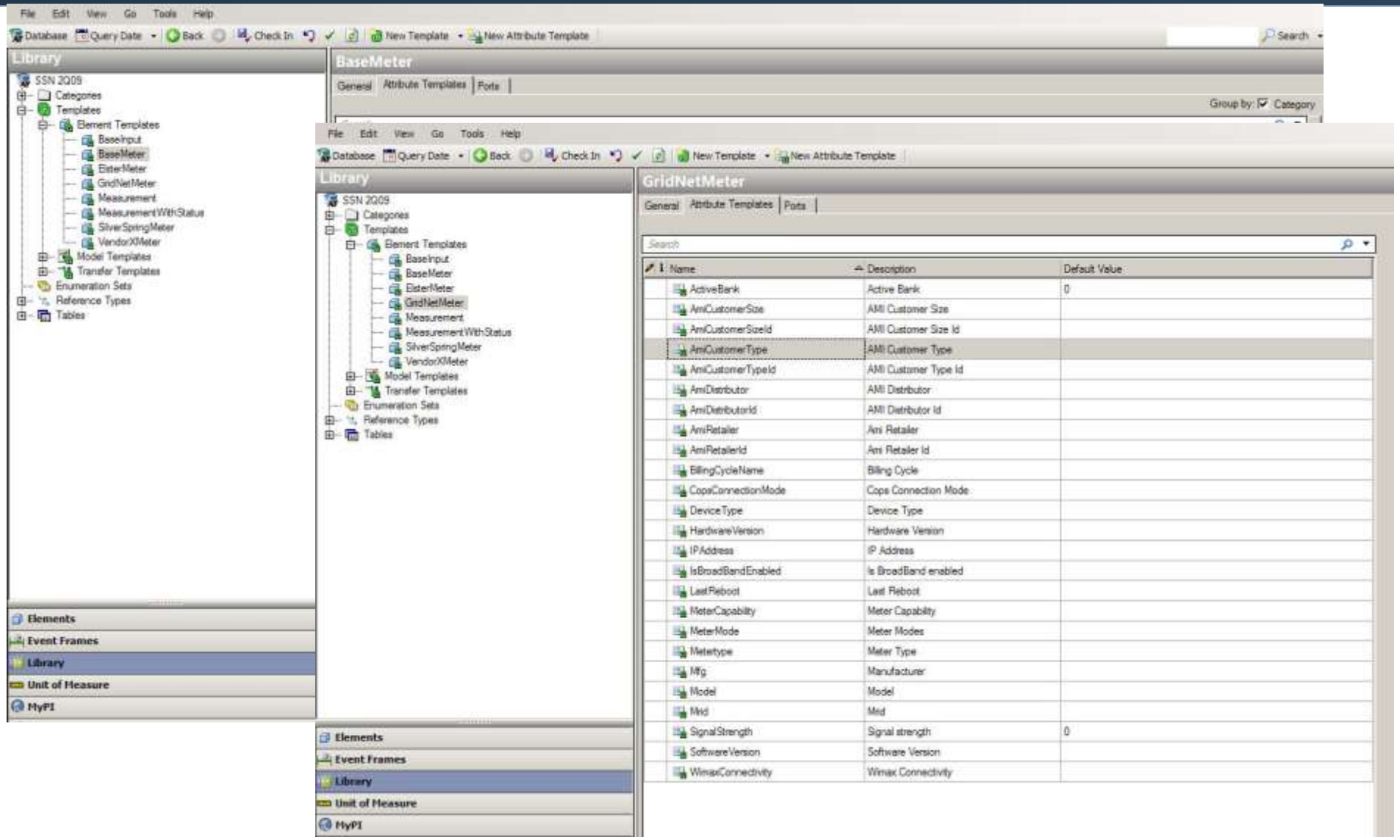


SAP sends Device Creation and Measurement documents request



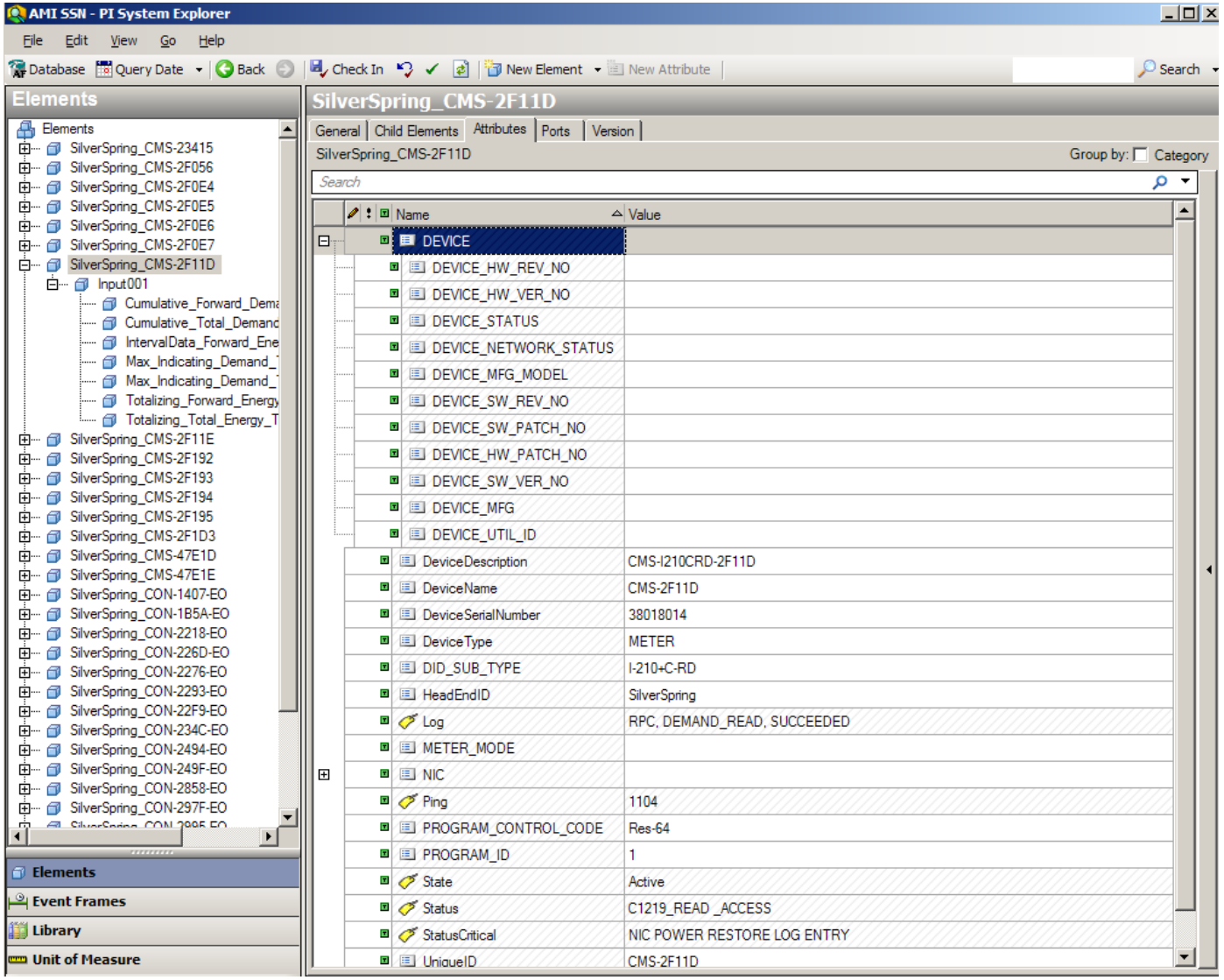
Device and Measurement data is Synchronized with AMI Interface database and SAP automatically.

AMI Meter Template



Value now. Value over time.

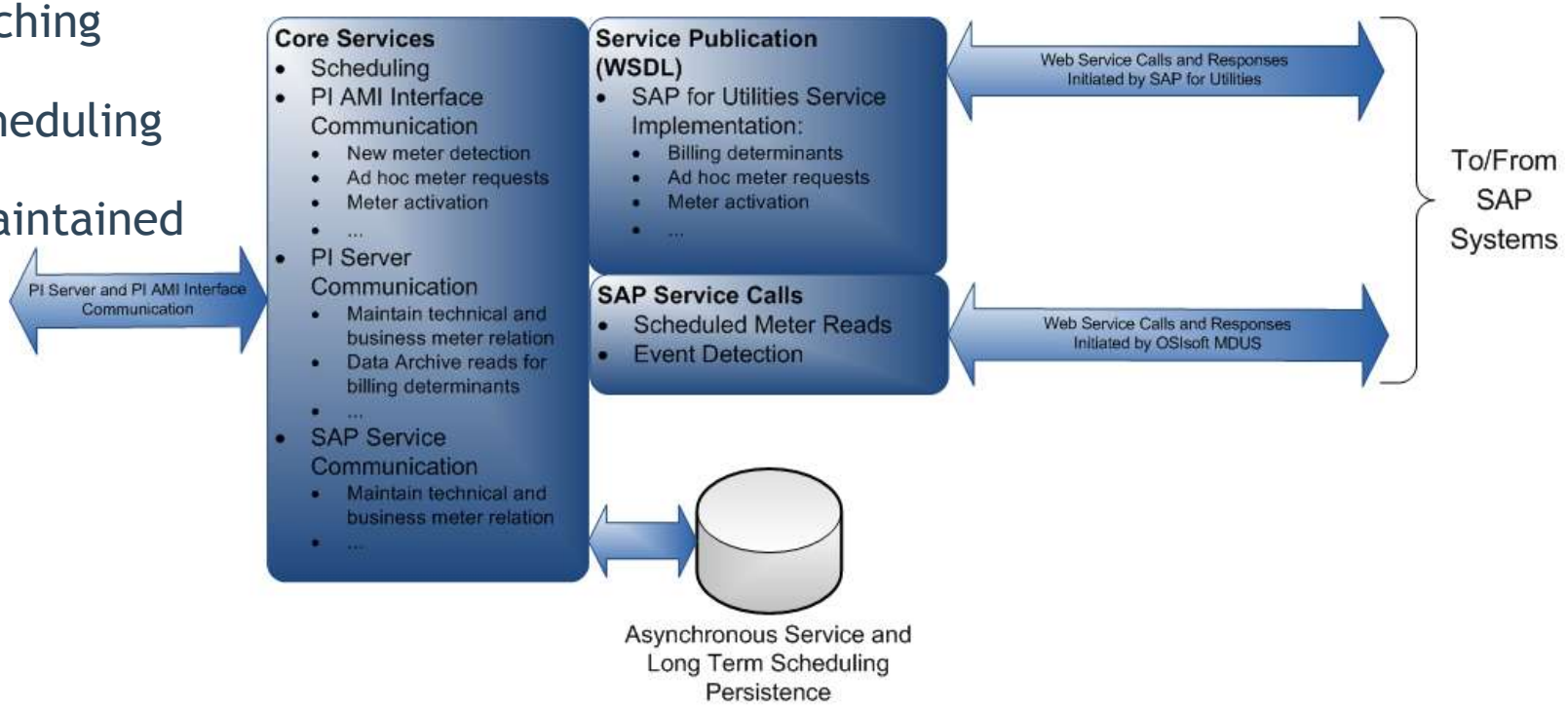
AMI Meter Elements (inherited from templates)



Value now. Value over time.

OSIsoft Utilities Gateway

- Direct communication between SAP Utilities EhP 4 (EhP 5) and the head end systems
- Highly scalable
  - 64 bit
  - Caching
  - Scheduling
- Self maintained



Value now. Value over time.

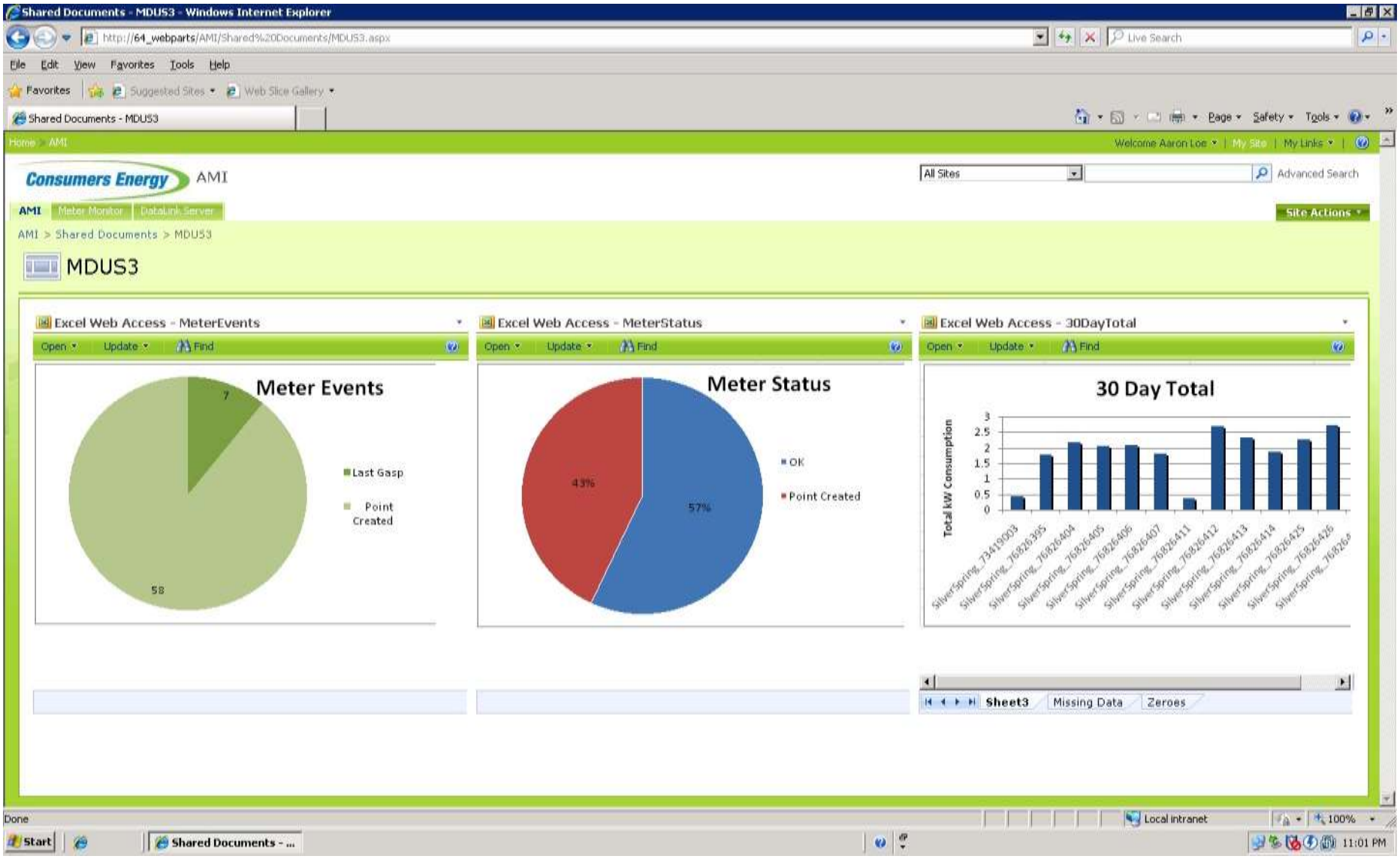
AMI Differentiators for OSIsoft MDUS

- Ability to make data available and useful as soon as the head end system provides the data
  - MDMs are designed to process data daily
- Feature Highlights
  - SAP Certified Content
  - PI Server performance
  - CEP analytics
  - Self configuring interfaces
- No overlap with SAP functionality
- Meter and Network neutral – support of multi-vendor environment
- OSIsoft has huge presence in utilities across the smart grid
  - Generation
  - Renewable generation
  - Transmission
  - Distribution
- End to end visibility of the data

MDUS Dashboard

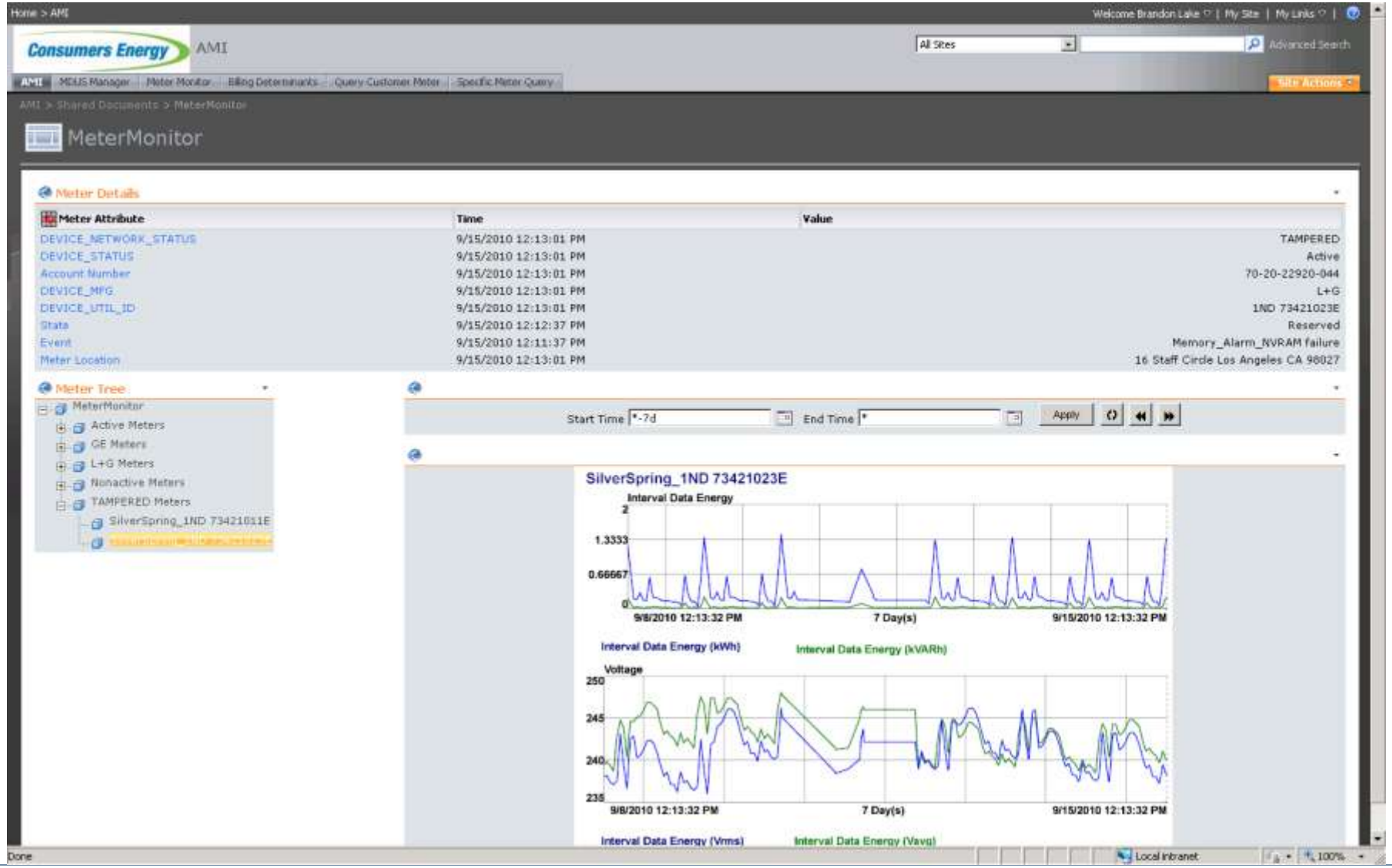
Value now. Value over time.

MDUS Events Drilldown



Value now. Value over time.

MDUS Dynamic/Element Relative Views



Value now. Value over time.

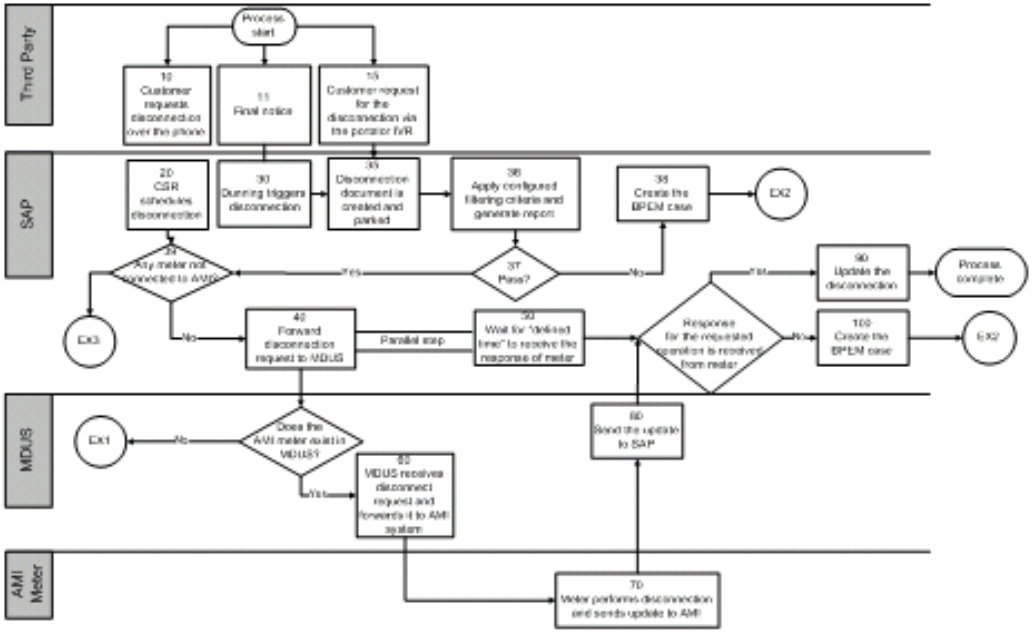
Co-Development benefits the end customer

Process Flow Visio Diagram [example]
Stags in the architecture:

- **Third Party:** customer, other market participant, supplier, etc and the channel he is using like Internet, Call Center, IVR, Market Flow, etc
- **SAP :** SAP for Utilities and in particular the new *SAP AMI Enabling for Utilities* component
- **MDUS:** the Meter Data Unification and Synchronization System
- AMI-Head End: only if it is important to differentiate the AMI Head End function from the MDUS function
- **AMI ("Smart") Meter**
- Home Automation Network (HAN): only if it is important for the description of the use case to explain activities at appliances (controlled through a HAN) connected to the smart meter via a gateway.

Diagram:
Utility disconnects or load-limits customer

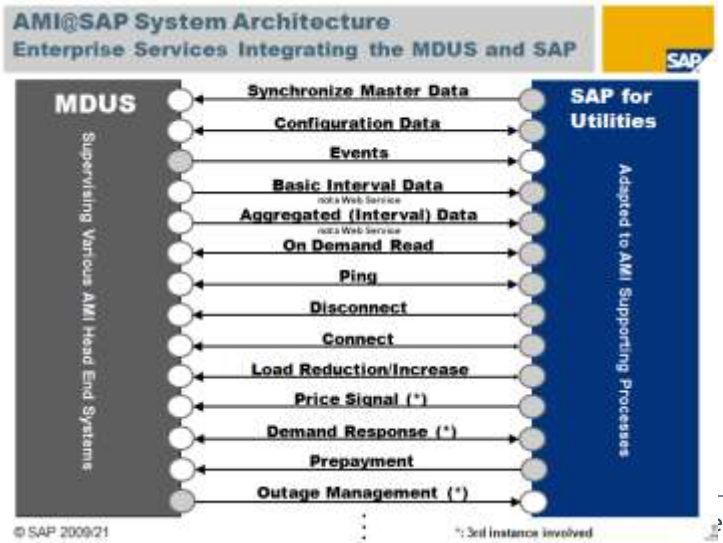
Billing & Customer Service	Customer Interface	Delivery	Energy Procurement	Field Services & System Recovery	Installation & Maintenance
B1 Multiple clients read demand and energy data	**C1** Customer reduces demand in response to pricing and/or grid event	**D1** Distribution operator curtails/limits customer load for grid management	**E1** Real-time operations curtails/limits load for economic dispatch	**S1** AMI system recovers after power outage, communications or equipment failure	**I1** Utility installs, provisions and configures AMI system
B2 Utility remotely limits or connects / disconnects customer	**C2** Customer has access to and reads recent energy usage and cost at his or her site	**D2** Distribution operators optimize network based on data collected by the AMI system	**E2** Utility procures energy and settles wholesale transactions using AMI system data		**I2** Utility manages end-to-end life-cycle of the meter system
B3 Utility detects tampering or theft at customer site	**C3** Customer uses prepayment services	**D3** Customer provides distributed generation			**I3** Utility upgrades AMI system to address future requirements
B4 Contract meter reading for other utilities	**C4** External clients use the AMI system to interact with customer devices	**D4** Distribution operator locates outage using AMI data and restores service			



Value now. Value over time.

End to End Connectivity

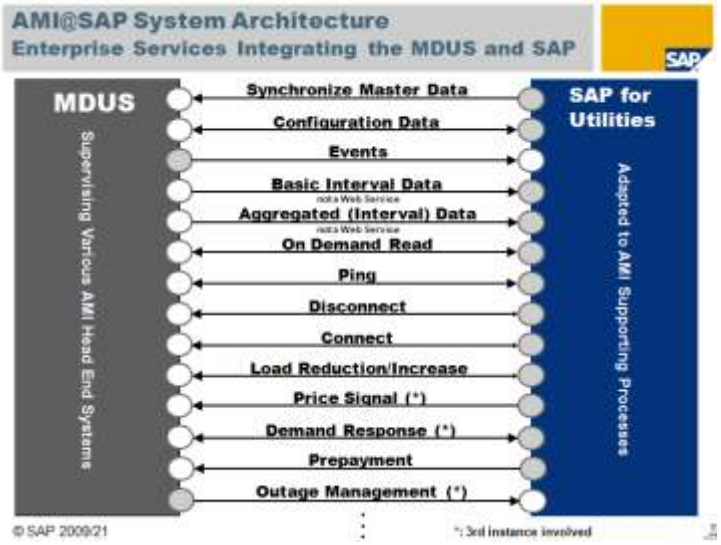
- AMI@SAP EhP4 (combined of 31 web services)
  - Synchronization of Master Data (14 web services to support business process)
    - Device and Registers (Measurement Tasks)
  - Basic Interval Data (3 services)
    - Scheduled Time series Data
  - Meter Reading/Meter Reading C
    - On demand and requested reads



Value now. Value over time.

End to End Connectivity

- AMI@SAP EhP5 and beyond
  - Configuration Data (9 web services to support business process)
  - Synchronization of Master Data (4 services)
  - Aggregated Interval Data (4 services)
  - Disconnection/Reconnection (2 services)
  - Events (2 services)
  - Text Notification (1 service)
  - Ping (2 services)
  - Basic Interval Data (1 service)
  - Load limitation (4 services)



Value now. Value over time.

Strategic Alliances – SAP

OSIsoft Partner Since 1996:

- SAP Production Planning-Process Industries (SAP PP-PI) module
- SAP Plant Maintenance (SAP-PM) module
- SAP Quality Management (SAP-QM) module
- The OSIsoft Business Package for SAP Portal
- Member of ES Community
- Member of Value Network for Chemicals, Mining, and Utilities
- Enterprise Services for SAP Enterprise Service Repository
- AMI MDUS Solution and participant in SAP Lighthouse Council since 2007
- ***SAP Certified ESOA – AMI Integration***
- ***Endorsed Business Solution (EBS) OSIsoft MDUS***

Value now. Value over time.

SAP Certification of OSIsoft MDUS

CERTIFICATE

SAP INTEGRATION CERTIFICATION

SAP® Certified
Integration via Enterprise Services

SAP AG

hereby confirms that the interface software **Enterprise Gateway AMI Service Connector 1.0.0** for the product **OSIsoft Meter Data Unification System 1.0.0** of the company **OSIsoft, LLC** has been certified for integration with **SAP Utility 6.0** via **SAP PI 7.1** with the SAP integration scenario **ESOA-BUNDLE 1.0 – Utility -Advanced Meter Infrastructure.**

This certificate confirms the existence of product features in accordance with SAP certification procedures. It does not guarantee that the product is error-free.

The certification test is documented in report no. 9023360 and expires on November 17, 2012.

Vendor Hardware: **EBSBASE32**
Vendor Operating System: **Windows 2003**
SAP Test System: **SAP Utility 6.0**
SAP PI 7.1

This configuration meets the requirements for connecting **Enterprise Gateway AMI Service Connector 1.0.0** to SAP applications.

Certified Functions:

Use Case 1: Device Initialization Process
Use Case 2: Change Technical Master Data
Use Case 3: Reading a Group of Meters: Discrete Meter Reading Process
Use Case 4: Reading One Customer's Meter: On Demand Read

SAP Partner

SAP® Certified
Integration via Enterprise Services

Value now. Value over time.

OSIsoft Selected As SAP EBS Partner for AMI

Endorsed Business Solutions (EBS)

Trusted solutions relevant for your industry

SAP

Endorsed Business Solutions

- Application level integration with solution qualification to ensure end-to-end business process
- Complementary solutions selected by SAP Product and Industry groups
- Product roadmap guided by SAP based on Cooperative Development Agreement
- Endorsed by SAP and sold by partners

THE BEST-RUN BUSINESSES RUN SAP

Value now. Value over time.

Thank you

777 Davis St., Suite 250 San Leandro, CA 94577