
	American Electric Power	4.5 Advanced Metering Infrastructure	Document ID: Use case # 5.13
	Title: Data Warehouse – Utility’s Smart Grid Clearinghouse		
Subject Matter Expert:	Author:	Reviewed by:	
Michael Tao	John Simmins	Brian D. Green	

Data Warehouse – Utility’s Smart Grid Clearinghouse

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Version History			
Rev.	Date	Author	Change description
2.0	4-11-2010	John J. Simmins	Create Brief Description and Fill in Gaps
3.1	4-26 2010	Brian D. Green	Update revisions and add diagrams

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Summary:


The data warehouse provides a persistent storage mechanism to integrate data from disparate systems for the purpose of reporting and analysis.

Narrative:

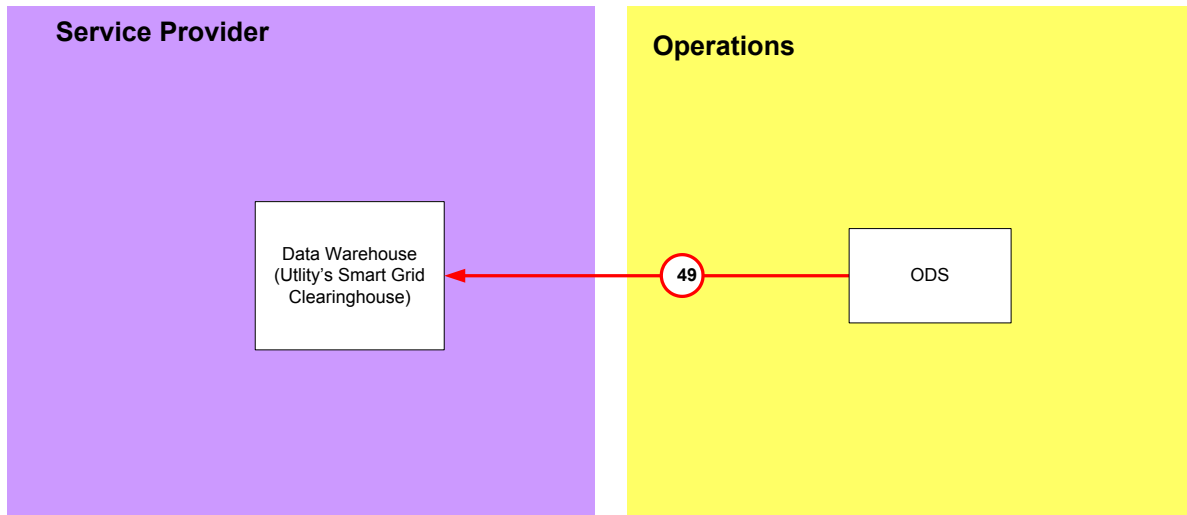
The data warehouse receives a regular feed of information from smart grid systems via the **Operational Data Store (ODS)**. All of these data feeds are processed through an Extract, Transform and Load (ETL) mechanism, which perform the following operations as necessary:

- Extract the data elements of interest
- De-identify the data as needed
- Verify the quality of the data
- Report data problems
- Reduce or aggregate the data if needed
- Load the valid data into the warehouse
- Insure that all data is accounted for and none is duplicated

The design of the database is optimized for analysis and reporting given the metrics required and the data segments identified during requirements gathering. After the warehouse is populated via ETL processes, reporting, analysis and modeling are be conducted through the use of business intelligence tools.

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Interface Diagram:



Note(s):

Actor(s):


The list of the actors and the roles that are participating in this use case described in the table below.

Name	Role description
ODS	Operational Data Store is a sub-system of Utility's data warehouse, which stores operational data i.e. all metering events and messages.
Smart Grid Clearinghouse	Information system that handles data from the ODS (data warehouse) in a reporting format specified by the DOE

Participating Business Functions:

The participating business function, its acronym and what they provide in this use case are detailed in the table below.

Acronym	Business Function/Abstract Component	Services or Information Provided

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Assumptions / Design Considerations:

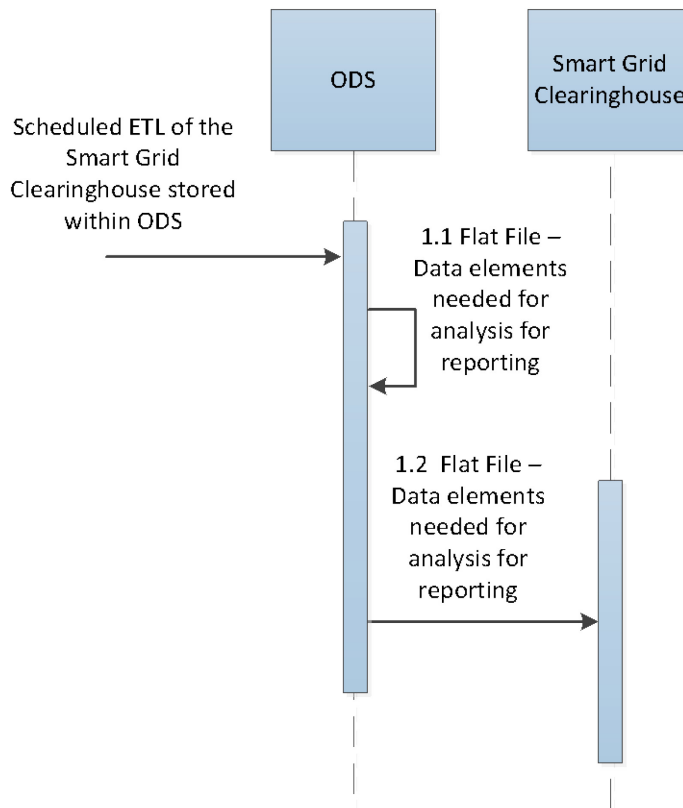
- Standard International Electrotechnical Commission (IEC) 61968 Message Definition format will be followed to provide the Header, Request, Reply, and payload used when defining the messages for the design specifications. For the purpose of the use cases identified in this document these have been omitted as they are to be provided in the design specification for the Data Warehouse – Utility’s Smart Grid Clearinghouse use case.

Normal Sequence:

The sequences of events, showing the order in which they occur during the typical progression of this use case are provided in the table below. The Sequence Diagram that graphically depicts the events is presented immediately following the table.

Use Case Step	Triggering Event	Description Of Process	Information To Be Exchanged	Producer	Receiver	Message Type and Additional Notes
1.1	Scheduled ETL of the Smart Grid Clearinghouse use stored within ODS	On a predetermined frequency a batch process (ETL) will run, extracting data from ODS and creating a Flat File for the Smart Grid Clearinghouse	Flat File - Data elements needed for analysis or reporting	ODS	Internal	
1.2		FTP flat file to the Smart Grid Clearinghouse	Flat File - Data elements needed for analysis or reporting	ODS	Smart Grid Clearinghouse	

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Data Warehouse Sequence Diagram

Integration Scenarios

Adapters will use the Common Information Model (CIM) in Extensible Markup Language (XML) to send and receive messages and events.

The following are the points of integration that must be tested for this use case. Other non-CIM message interfaces may be testable in this use case.

Actor	Interface Points
	•
	•

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Pre-conditions:

The following conditions that MUST be met before this use case can occur.

- ODS is populated with data required by the Utility’s Smart Grid

Post-conditions:

The following events or actions that may happen after or be caused by the completion of the normal use case events, as well as the exceptions or alternative sequences are:

- Integration to be defined (based on DOE requirements) between the Utility’s Smart Grid Clearinghouse to the DOE’s Smart Grid Clearinghouse.

Exceptions / Alternate Sequences:

There are no exceptions, unusual events or alternate sequences defined for this use case.


Use Case Step	Triggering Event	Description Of Process	Information To Be Exchanged	Producer	Receiver	Message Type

Message Type(s) Diagram:None

An XML Schema Definition (XSD) diagram shows the normative and informative parts of the message. Not all of the International Electrotechnical Commission’s (IEC) – CIM message optional elements must or will be used in the use of IEC – CIM for this specific use case.

References:

Use Cases or other documentation referenced by this use case include:.

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Issues: None

ID	Description	Status

Miscellaneous Notes: None