Scheduled Daily Bulk Read from AMI Head-End

Version 3.0

May 14th, 2010

1 Descriptions of Function

All prior work (intellectual property of the company or individual) or proprietary (non-publicly available) work should be so noted.

1.1 Function Name

Scheduled Daily Bulk Read from AMI Head-End

1.2 Function ID

Identification number of the function

1.3 Brief Description

This use case describes how a scheduled daily bulk meter read is accomplished.

1.4 Narrative

The ***AMI Head-End*** is configured to poll meter readings from every meter predefined in the group of meters "bulk read". The configuration of the ***AMI Head-End*** allows to Poll the meter reads every 4 hours. This Use Case describes this schedules 4 hour bulk read.

The scheduled meter read poll is initiated by the ***AMI Head-End*** which was pre-configured to do so on a pre-defined schedule with a pre-determined group of meters (it can perform a bulk read of the whole meter population if configured to do so). The ***AMI Head-End*** uses the AMI network infrastructure based on a mesh radio architecture (please refer to AMI Network Use Case for all details concerning this function) in order to execute this task. Essentially, every ***Smart Meter*** within the bulk read group receives a meter read poll request from the ***AMI Head-End***, passes the readings to the AMI network which delivers the data to its requestor; namely the ***AMI Head-End***. The ***AMI Head-End*** then sends a copy of its data to the ***Operational Data Store (ODS)*** for storage and further analysis.

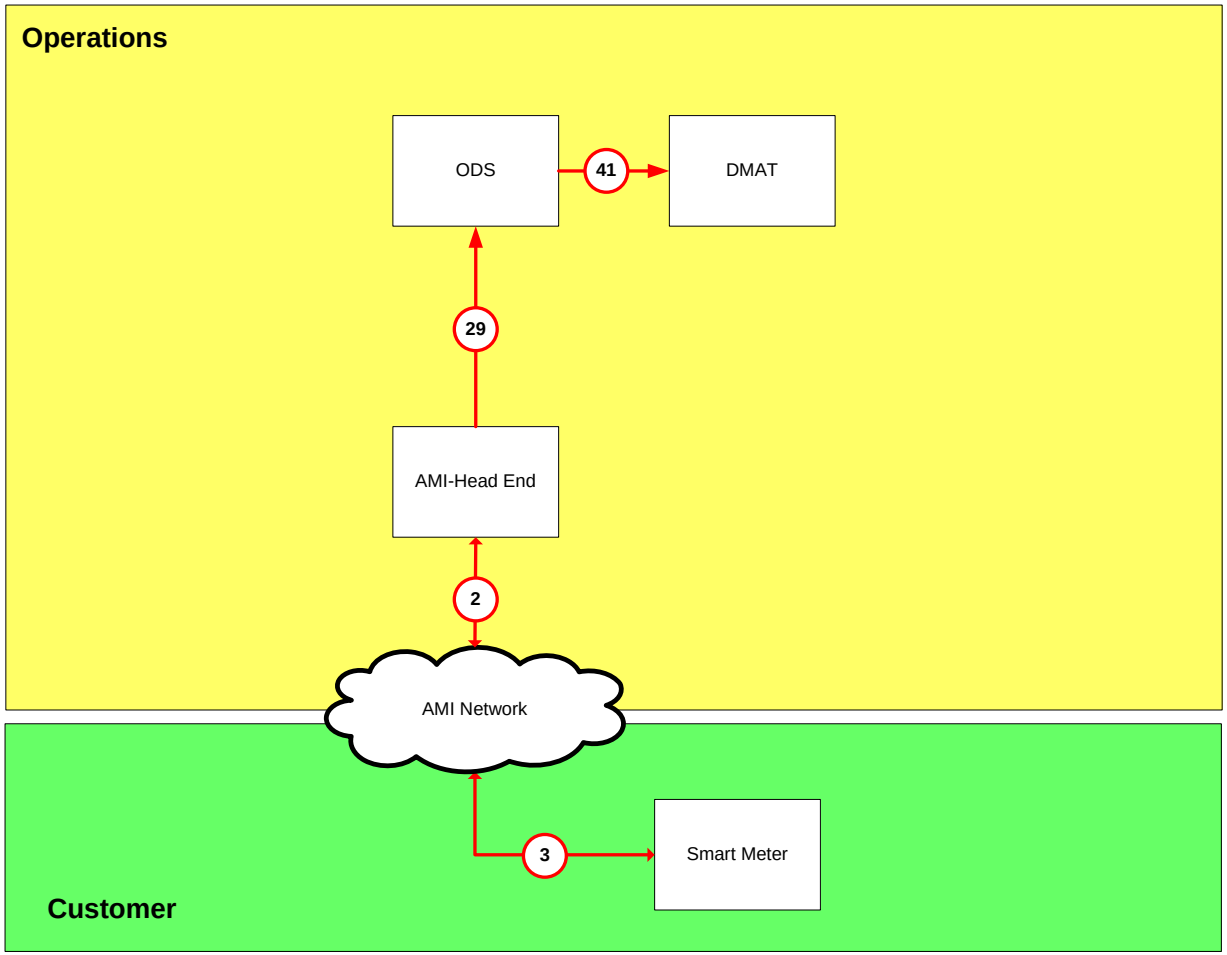


Figure 1-1
Context Diagram for Four Hour Bulk Feed from AMI Head-End

The ***Meter Data Management*** system (***MDM***) is the main actor and it executes those functions on a daily "batch" schedule. First, the ***MDM*** obtains the metering data from the ***AMI Head-End***, then the ***MDM*** processes the data and executes its VEE functions (validation, estimation, editing) on the data, which essentially becomes data ready for billing (billing determinant). The billing

determinants are passed to the ***Customer Information System (CIS)*** and the ***Operational Data Store (ODS).***which services the data to the customer portal.

The scheduled daily push to ***CIS*** is a function that is performed automatically, everyday in the back office. The ***AMI Head-End*** is configured and scheduled to, once a day; push its metering data into a queue. On the same coordinated schedule, the ***MDM*** through the batch processor, pulls the data from the queue and executes its VEE functionality for every meter. Later in the day, once the ***MDM*** has processed the data, the ***MDM*** pushes or exports the result of its processing (essentially billing determinants for this time interval for every meter) to the ***CIS*** and the ***ODS.*** The ***ODS*** then passes the data to the customer portal.

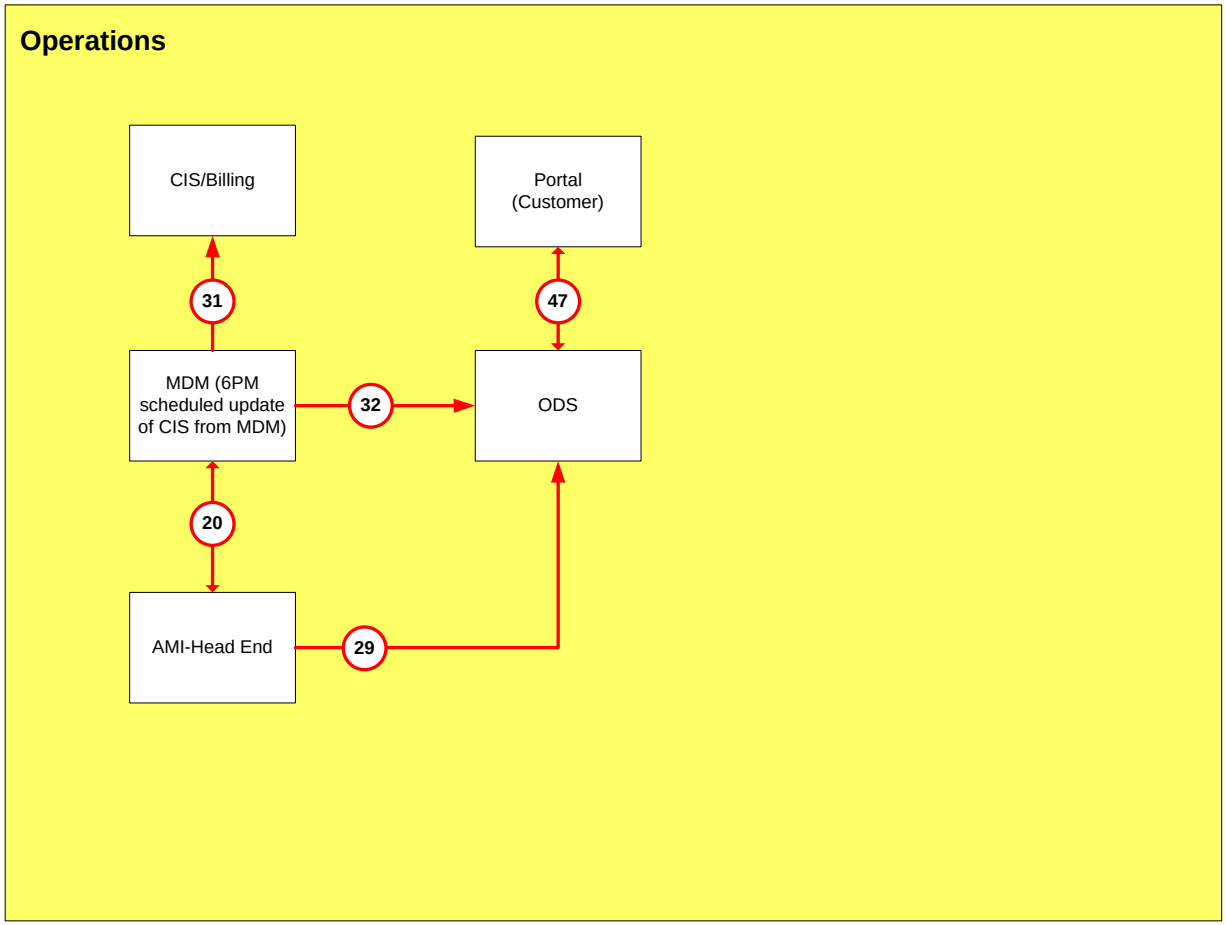


Figure 1-2
Context Diagram for Scheduled Bulk Feed from AMI Head-End

1.5 Actor (Stakeholder) Roles

Describe all the people (their job), systems, databases, organizations, and devices involved in or affected by the Function (e.g. operators, system administrators, technicians, end users, service personnel, executives, SCADA system, real-time database, RTO, RTU, IED, power system). Typically, these actors are logically grouped by organization or functional boundaries or just for collaboration purpose of this use case. We need to identify these groupings and their relevant roles and understand the constituency. The same actor could play different roles in different Functions, but only one role in one Function. If the same actor (e.g. the same person) does play multiple roles in one Function, list these different actor-roles as separate rows.

Grouping (Community)		***Group Description***
Actor Name	***Actor Type (person, organization, device, system, or subsystem)***	***Actor Description***
MDM	System	Meter Data Management that performs VEE (validation, estimation, (please complete)
DMAT	Subsystem	Data Mining Analysis Tool is a sub-system of the Utility's data warehouse that will extract data from the ODS and mine the data upon request and pass it along to requestors.
AMI Head-End	System	The AMI Head-End is the back office system than controls the Advanced Metering Infrastructure.
NIC - ESP	Device	AMI side of the network interface card within the smart meter.
ODS	Sub-System	Operational Data Store is a sub-system of the Utility's data warehouse, which stores operational data i.e. all metering events and messages.
CIS (MACSS)	System	Customer Information System internally called MACSS that is the system of record for customer data and billing.
Customer Portal	System	

Grouping (Community)		*Group Description*
Actor Name	*Actor Type (person, organization, device, system, or subsystem)*	*Actor Description*
Meter Metrology Board	Device	The board, internal to the smart meter, on which the functions of the smart meter are configured and performed.

1.6 Information exchanged

Information Object Name	*Information Object Description*
Request for Meter read from AMI Head-End	Request for meter read data from the AMI Head-End
Meter Data	Meter Data from a smart meter or group of smart meters
Web Service Request - 24 Hour Bulk Meter Read Data	
Web Service Request - Acknowledgement and job number	
meterReadings	61968 formatted data package with meter read data

1.7 Activities/Services

Activity/Service Name	*Activities/Services Provided*

1.8 Contracts/Regulations

Contract/Regulation	*Impact of Contract/Regulation on Function*

Policy	*From Actor*	*May*	*Shall Not*	*Shall*	*Description (verb)*	*To Actor*

Constraint	*Type*	*Description*	*Applies to*

2 Step by Step Analysis of Function

Describe steps that implement the function. If there is more than one set of steps that are relevant, make a copy of the following section grouping (Steps to implement function, Preconditions and Assumptions, Steps normal sequence, Post-conditions) and provide each copy with its own sequence name.

2.1 Steps to implement function – Name of Sequence

Name of this sequence.

2.1.1 Preconditions and Assumptions

Actor/System/Information/Contract	*Preconditions or Assumptions*
AMI Head-End	Batch Processes addressed in this use case are functions of the AMI Head-End
MDM	ETL Engine actions addressed in this use case are functions of the MDM

2.1.2 Steps – Name of Sequence

Describe the normal sequence of events, focusing on steps that identify new types of information or new information exchanges or new interface issues to address. Should the sequence require detailed steps that are also used by other functions, consider creating a new "sub" function, then referring to that "subroutine" in this function. Remember that the focus should be less on the algorithms of the applications and more on the interactions and information flows between "entities", e.g. people, systems, applications, data bases, etc. There should be a direct link between the narrative and these steps.

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environment
#	*Triggering event? Identify the name of the event.*[1]	*What other actors are primarily responsible for the Process/Activity? Actors are defined in section0.*	*Label that would appear in a process diagram. Use action verbs when naming activity.*	*Describe the actions that take place in active and present tense. The step should be a descriptive noun/verb phrase that portrays an outline summary of the step. "If …Then…Else" scenarios can be captured as multiple Actions or as separate steps.*	*What other actors are primarily responsible for Producing the information? Actors are defined in section0.*	*What other actors are primarily responsible for Receiving the information? Actors are defined in section0.* *(Note – May leave blank if same as Primary Actor)*	*Name of the information object. Information objects are defined in section 1.6*	*Elaborate architectural issues using attached spreadsheet. Use this column to elaborate details that aren't captured in the spreadsheet.*	*Reference the applicable IECSA Environment containing this data exchange. Only one environment per step.*
1.1	AMI Head-End Scheduler in the AMI Head-End determines it is time for a 4 Hour Bulk read	AMI Head-End	AMI Head-End sends 4 Hour Bulk request	AMI Head-End sends 4 Hour Bulk request to AMI Network	AMI Head-End	AMI Network	Request for Meter read from AMI Head-End	proprietary	Use AMI Network Use Case

[1] Note – A triggering event is not necessary if the completion of the prior step – leads to the transition of the following step.

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environment
1.2		AMI Network	AMI Network sends 4 Hour Bulk request to selected	AMI Network sends 4 Hour Bulk request to selected NIC - ESP	AMI Network	NIC - ESP	Request for Meter read from AMI Head-End	proprietary	
1.3		NIC - ESP	NIC - ESP send read request to Meter Metrology Board	NIC - ESP send read request to Meter Metrology Board	NIC - ESP	Meter Metrology Board	Request for Meter read from AMI Head-End	C12.18, C12.19	
1.4		Meter Metrology Board	Meter Metrology Board collects meter reading	Meter Metrology Board collects meter reading	Meter Metrology Board	Meter Metrology Board	Meter Data		
1.5		Meter Metrology Board	Meter Metrology Board sends Meter Data	Meter Metrology Board sends Meter Data of requested information to NIC - ESP	Meter Metrology	NIC - ESP	Meter Data	C12.18, C12.19	
1.6		NIC - ESP	NIC - ESP sends Meter Data of requested information	NIC - ESP sends Meter Data of requested information to AMI Network	NIC - ESP	AMI Network	Meter Data	proprietary	

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environment
1.7		AMI Network	AMI Network delivers Meter Data of requested information	AMI Network delivers Meter Data of requested information to AMI Head-End	AMI Network	AMI Head-End	Meter Data	proprietary	Use AMI Network Use Case
1.8	8AM Daily Push	AMI Head-End	Request from the AMI Head-End for 24 Hour Bulk Meter Read Data	Batch Processor makes a Web Service Request from the AMI Head-End for 24 Hour Bulk Meter Read Data	AMI Head-End	AMI Head-End	Web Service Request - 24 Hour Bulk Meter Read Data		
1.9		AMI Head-End	Acknowledgement and job number created	Acknowledgement and job number created by the AMI Head-End	AMI Head-End	AMI Head-End	Web Service Request - Acknowledgement and job number		
1.10		AMI Head-End	24 Hour Meter Data is placed in the AMI Head-End Queue	24 Hour Meter Data is placed in the AMI Head-End Queue	AMI Head-End	AMI Head-End	meterReadings		
1.11		AMI Head-End	Batch Processor pulls the 24 Hour AMI Meter data	Batch Processor pulls the 24 Hour AMI Meter data from the AMI Head-End Queue	AMI Head-End	AMI Head-End	meterReadings		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environment
1.12		AMI Head-End	Batch Processor converts the 24 Hour Meter Data	Batch Processor converts the 24 Hour Meter Data to CIM	AMI Head-End	AMI Head-End	meterReadings		
1.13		AMI Head-End	Batch processor places 24 Hour Meter Data	Batch processor places 24 Hour Meter Data in the queue of the MDM	AMI Head-End	MDM	meterReadings		
1.14		MDM	ETL Engine extracts the Meter Read Data at 8 PM	ETL Engine extracts the Meter Read Data at 8 PM and sends it to the ODS	MDM	ODS	meterReadings		
1.15		MDM	ETL Engine extracts the 24 Hour Bulk Meter Data	ETL Engine extracts the 24 Hour Bulk Meter Data and sends it to the ODS	MDM	ODS	meterReadings		
1.16		MDM	ETL Engine extracts the Meter Read Data at 8 PM	ETL Engine extracts the Meter Read Data at 8 PM and sends it to the CIS	MDM	CIS	meterReadings		
1.17		ODS	The ODS sends 24 Hour Bulk Meter Data	The ODS sends 24 Hour Bulk Meter Data to the Customer Portal	ODS	Customer Portal	meterReadings	61968	
1.18		AMI Head-End	AMI Head-End to ODS	AMI Head-End delivers Bulk Meter Data to ODS	AMI Head-End	ODS	meterReadings	61968	

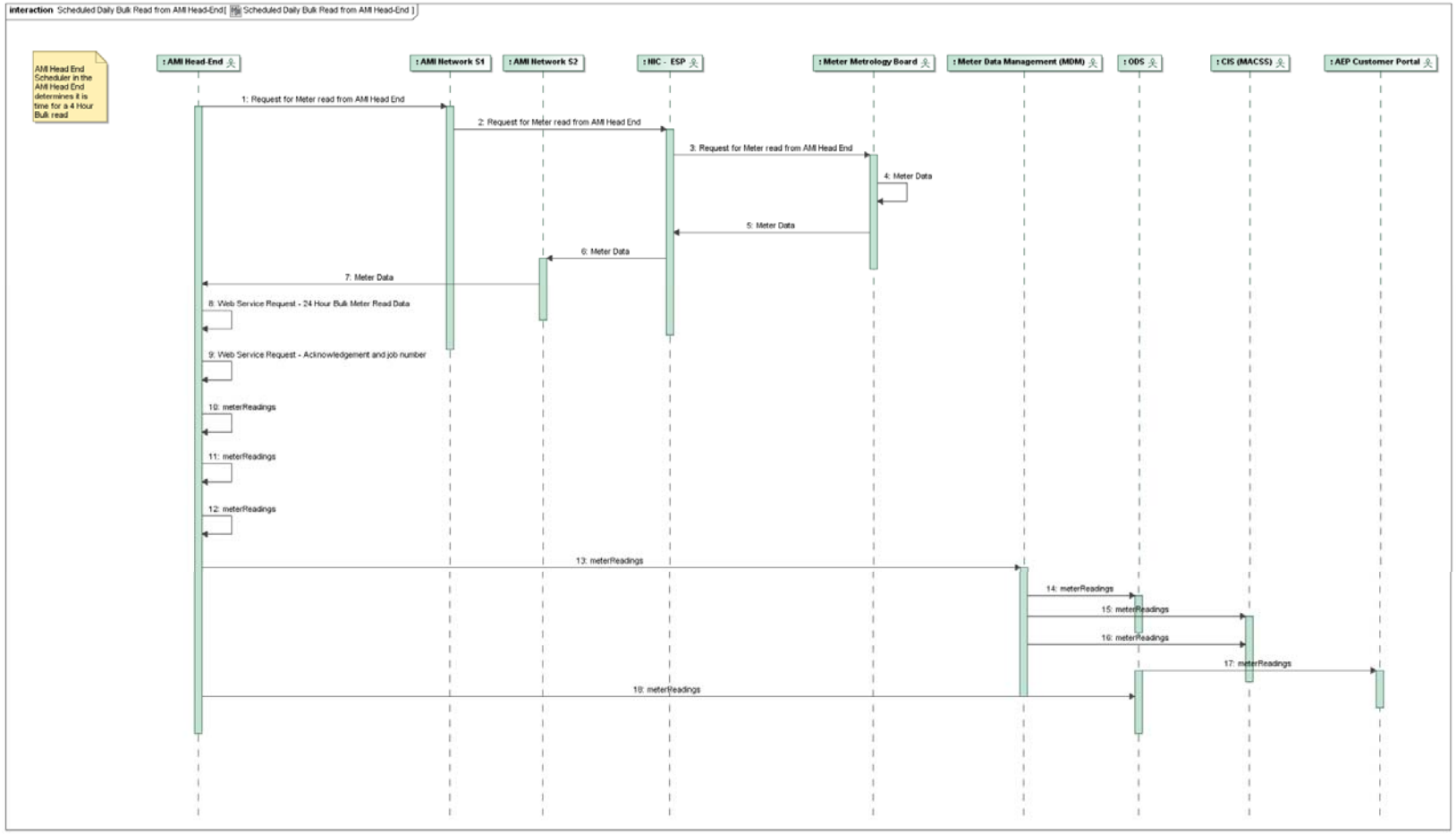
2.1.3 Post-conditions and Significant Results

Actor/Activity	*Post-conditions Description and Results*

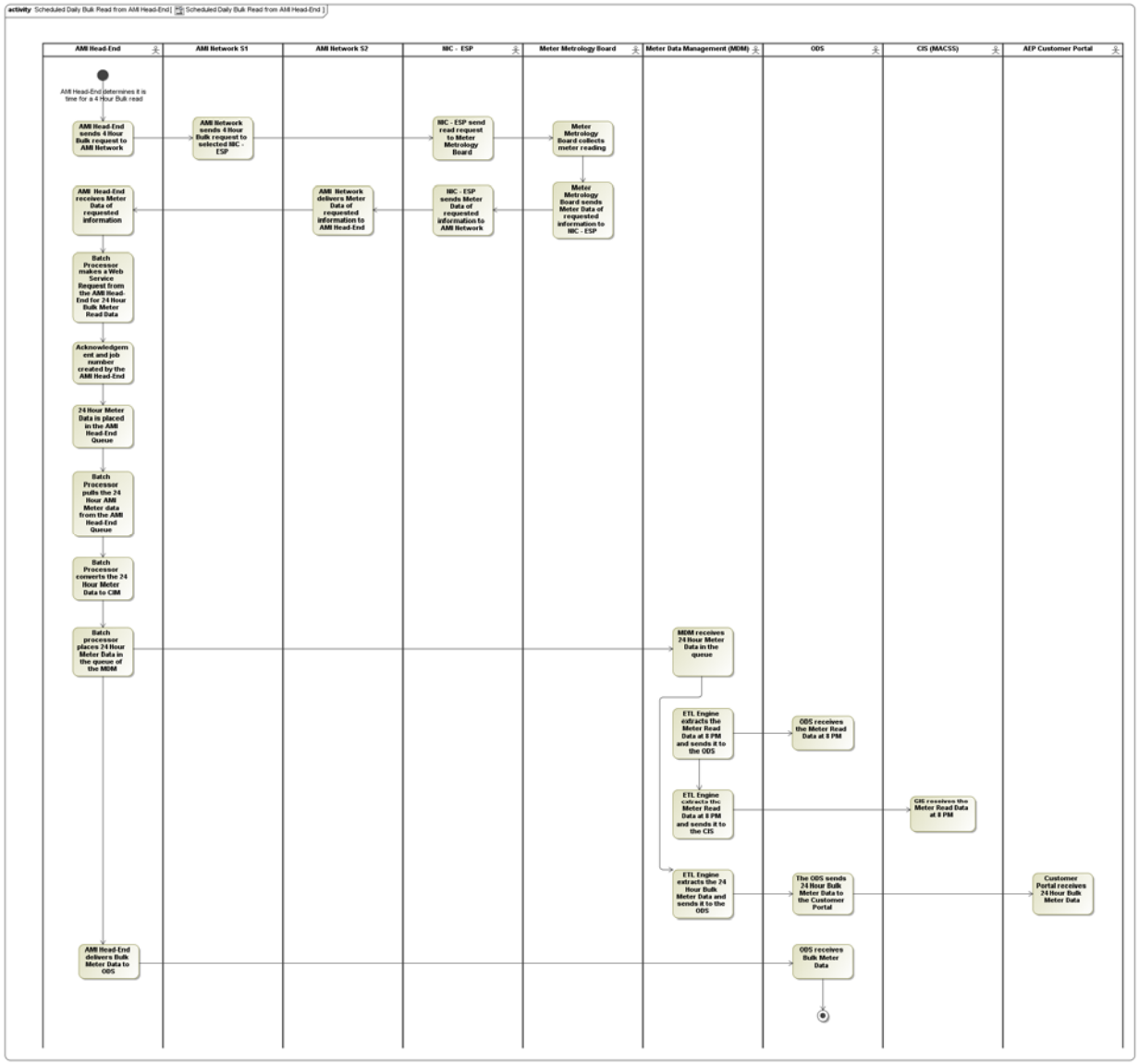
2.2 Architectural Issues in Interactions

Elaborate on all architectural issues in each of the steps outlined in each of the sequences above. Reference the Step by number.

2.3 Diagrams



Scheduled Bulk Read from AMI Head-End Sequence Diagram



Scheduled Bulk Read from AMI Head-End Activity Diagram

3 Auxiliary Issues

3.1 References and contacts

ID	Title or contact	Reference or contact information
[1]		

3.2 Action Item List

ID	Description	Status
[1]		

3.3 Revision History

No	Date	Author	Description
2.0	April 10 2010	John Simmins	Filling in blanks. Noticed that this UC covers both the 4 hour reads and the daily reads to CIS and the Portal. Waiting for clarification.
3.0	May 14th, 2010	Brian D. Green	Revision and add diagrams