

**Oracle® Utilities Customer Care and Billing
Integration to Oracle Utilities Meter Data
Management Release 3.1.1 Media Pack**

Implementation Guide

Oracle Utilities Meter Data Management v2.0.1.1
Oracle Utilities Customer Care and Billing v2.3.1.1

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Part 1: Understanding the Integration

This section provides an overview of the participating applications and information regarding the business processes addressed by this integration.

Overview

This document provides configuration and administration information for the integration between Oracle Utilities Customer Care and Billing (CCB) and Oracle Utilities Meter Data Management (MDM).

Additional Resources

The following additional resources are available:

| Resource | Location |
|--|--|
| Oracle Utilities Customer Care and Billing Integration to Oracle Utilities Meter Data Management Release 3.1.1 Media Pack Installation Guide | Same folder as this document, with the distribution for this product. |
| Oracle Utilities Meter Data Management Documentation for Release v2.0.1 | Refer to Oracle Utilities Meter Data Management documentation located on the Oracle Software Delivery Cloud. |
| Oracle Utilities Customer Care and Billing Documentation for Release v2.3.1 | Refer to Oracle Utilities Customer Care and Billing documentation located on the Oracle Software Delivery Cloud. |

About the Integration Product

This section provides general information about the functionality and processing of Oracle Utilities Customer Care and Billing Integration to Oracle Utilities Meter Data Management Release 3.1.1 Media Pack. This is an AIA Direct Integration using SOA Suite and does not require the AIA Foundation Pack to be installed.

About the Products

Oracle Utilities Customer Care and Billing

Oracle Utilities Customer Care and Billing (CCB) is a customer and billing system that manages all aspects of customer service needed by most utilities to operate their business. Basic objects form the core of the system: person, account, premise, service agreement, and service point. These objects hold demographic, geographic, and financial information about a company's customers and properties. Related to these objects are the processes that they manage: bills, payments, meter readings, field activities, etc.

Oracle Utilities Meter Data Management

Oracle Utilities Meter Data Management (MDM) supports the loading, validation, editing, and estimation (VEE) of meter data - from meter configuration, to meter read and usage validation, to bill determinant calculations.

Supported Business Processes

In this integration, Oracle Utilities Customer Care and Billing manages customers (persons), accounts/service agreements (SAs), service points (SPs), meters, meter configurations, and SP/meter history while Oracle Utilities Meter Data Management manages usage information.

Oracle Utilities Customer Care and Billing requests bill determinants from Oracle Utilities Meter Data Management in order to generate bills for customers. Replacement read notifications are sent by Oracle Utilities Meter Data Management whenever corrections are made to read details that were previously included in a usage calculation. This could result in a cancel-rebill scenario in Oracle Utilities Customer Care and Billing that would result in new request(s) for bill determinants as part of the rebill.

During the billing cycle, Oracle Utilities Customer Care and Billing requests usage data from Oracle Utilities Meter Data Management for all service agreements which are part of the billing run that require bill determinants.

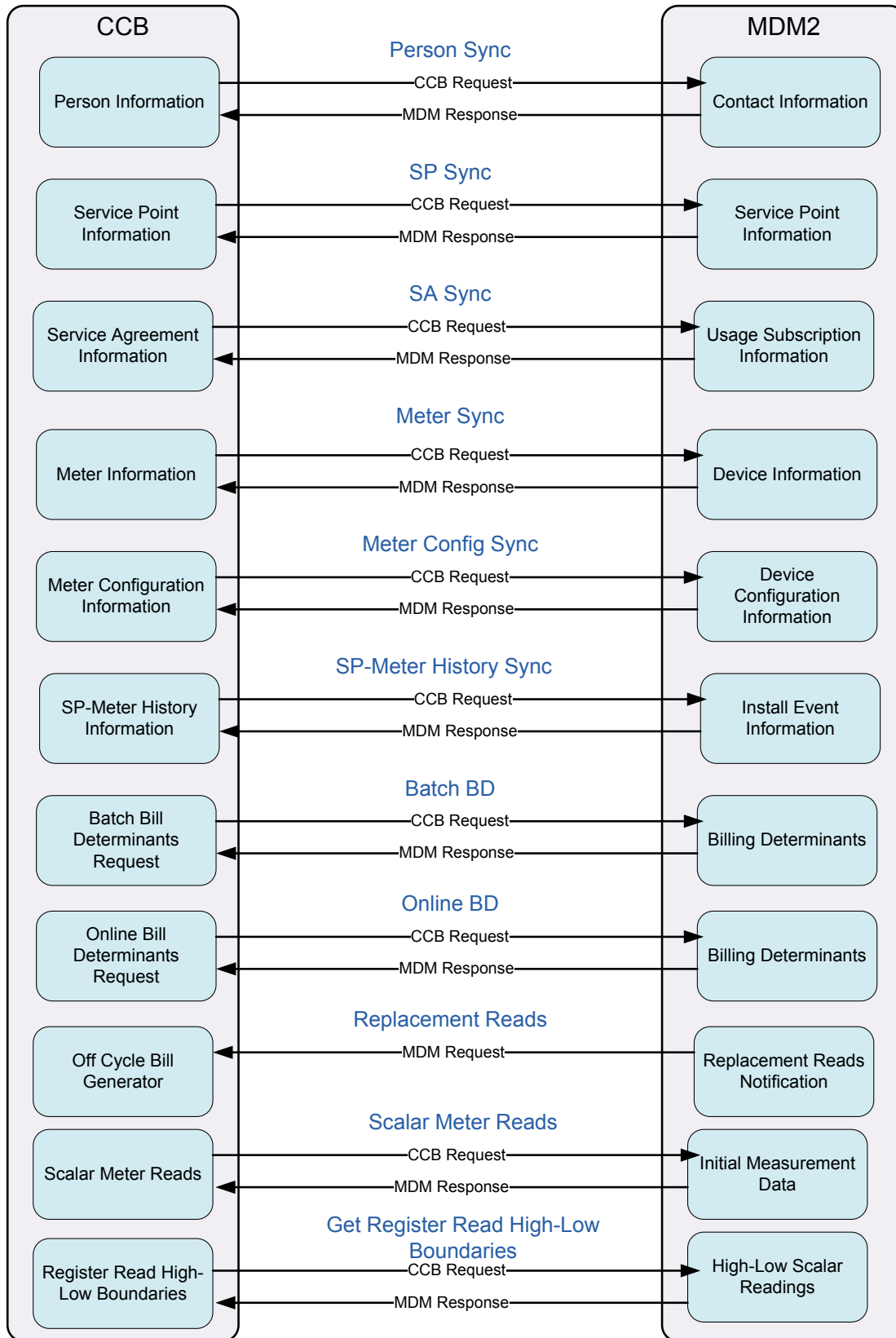
The integration includes links from the Oracle Utilities Customer Care and Billing person, SA, SP, usage request and meter into the Oracle Utilities Meter Data Management contact, US, SP, usage transaction and device. A link also exists from Oracle Utilities Customer Care's SA to Oracle Utilities Meter Data Management's 360 View. In addition a link from Oracle Utilities Meter Data Management SP to the Oracle Utilities Customer Care and Billing Control Central - Account Information is included.

The business processes are as follows:

- Person synchronization
- SP synchronization
- SA synchronization
- Meter synchronization
- Meter Configuration synchronization
- SP – Meter History synchronization
- Batch billing determinants request and response
- Online billing determinants request and response
- Replacement reads notification
- Scalar Meter Read synchronization
- Get Register Read High-Low Boundaries

Except for replacement reads notification, all other flows are Oracle Utilities Customer Care and Billing initiated. Oracle Utilities Customer Care and Billing does not send a response for replacement reads coming from Oracle Utilities Meter Data Management.

The following diagram provides a visual representation of this processing:



CCB MDM2 - Integration Points

1. Oracle Utilities Customer Care and Billing sends person, service point (SP), service agreement (SA), meter, meter configuration, and SP-Meter History data to Oracle Utilities Meter Data Management.
2. Oracle Utilities Customer Care and Billing sends Scalar Meter Reads to Oracle Utilities Meter Data Management.
3. Oracle Utilities Meter Data Management processes the usage measurements coming in from meter devices.
4. Oracle Utilities Customer Care and Billing then sends online or batch billing determinants requests to Oracle Utilities Meter Data Management at the time of billing.
5. Oracle Utilities Meter Data Management responds by sending back the billing determinants as requested from the billing system.
6. If there is any change to the billing determinants in Oracle Utilities Meter Data Management for a meter for which billing determinants have already been sent to Oracle Utilities Customer Care and Billing, then Oracle Utilities Meter Data Management sends a replacement read notification to Oracle Utilities Customer Care and Billing. Oracle Utilities Customer Care and Billing then creates an off cycle bill generation to inform the user.
7. For retrieving the Estimated and High-Low Boundaries for a Register, Oracle Utilities Customer Care and Billing sends a request to Oracle Utilities Meter Data Management.

Understanding the Integration Processes

This section outlines the overall technical overview, business processes, and specific integration points handled by the integration.

Technical Overview

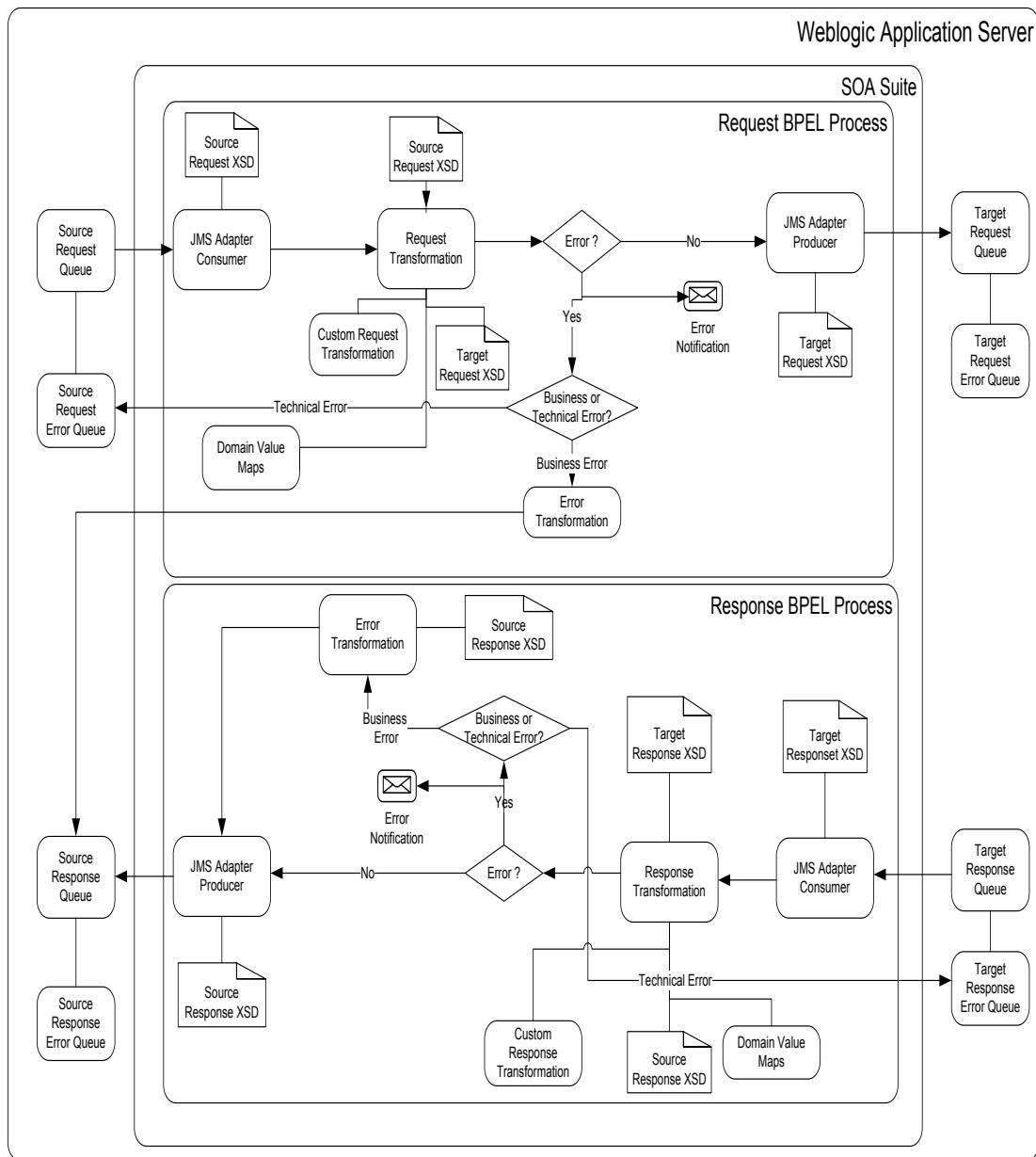
- This is a direct integration between Oracle Utilities Customer Care and Billing and Oracle Utilities Meter Data Management.
- All the end-to-end integration flows are asynchronous.
- The integration receives messages from JMS queues and sends messages to JMS queues. Oracle Utilities Customer Care and Billing and Oracle Utilities Meter Data Management have the ability to read messages from JMS queues, and then write the processed messages to JMS queues.
- WebLogic JMS is used as a queuing mechanism in the integration layer. For each integration flow there are 8 JMS queues with the exception of the replacement reads flow which does not have a response process.
- Get Register Read High-Low Boundaries flow does not involve queues. It uses direct Web service calls.

| | Queue | Description |
|----|---|--|
| 1. | Source application request queue | Source application adds messages to this queue, which is then picked up by the integration layer for transformation. |
| 2. | Source application response queue | Business errors in the integration and success or failure acknowledgements from the target application are transformed by the integration and written to this queue. |
| 3. | Source application request error queue | Technical errors in the integration request flow are written to this queue. |
| 4. | Source application response error queue | Technical errors when the source application reads the messages from the source response queue are written to this queue. |
| 5. | Target application request queue | Integration reads messages from the source application request queue, transforms them, and writes them to this queue. |
| 6. | Target application response queue | Success or failure acknowledgements from the target application are written to this queue and are read by the integration. |
| 7. | Target application request error queue | Technical errors written when the target application tries to read the message from the target request queue are written to this queue. |
| 8. | Target application response error queue | Technical errors in the integration response flow are written to this queue. |

- Two BPEL processes manage each integration flow: one for the request processing and one for the response processing.
- The Request BPEL process includes the following:
 - JMS Consumer to read from source request queue
 - JMS Producer to write to the target request queue
 - Transformations to convert messages from source format to target format. DVMs are used for the transformation.
 - Error handling and error notification
- The Response BPEL process includes the following:
 - JMS Producer to read from the target response queue
 - JMS Producer to write to the source response queue
 - Acknowledgement transformations to convert messages from the target format to the source format. DVMs are used for the transformation.
 - Error handling and error notification

- The JMS consumer and BPEL process is configured to participate in a global transaction, so that BPEL process can issue rollback and commits on the queue. The BPEL process issues rollbacks on the queue in the scenario where it is not able to reach the target queue and the message is moved to the corresponding error queue.
- All technical errors in the integration layer are moved to the error queue of the queue from which the message has been consumed.

The following diagram provides a graphical representation of this processing:



CCB – MDM Integration - Technical Flow Diagram

Integration Points

Master Data Synchronization Flows

The following Integration points are available in Oracle Utilities Customer Care and Billing Integration to Oracle Utilities Meter Data Management Release 3.1.1 Media Pack.

Customer, Service Point, Service Agreement, and Meter related data are synchronized from Oracle Utilities Customer Care and Billing to Oracle Utilities Meter Data Management System.

Oracle Utilities Customer Care and Billing uses the sync request process to capture data changes and communicate or synchronize the data changes to Oracle Utilities Meter Data Management System by sending out a sync request message to the integration layer.

The sync request process is implemented using business object technology, therefore, much of the business rules and processing logic are defined in the algorithms associated to the business objects used by the sync process.

The Audit plug-in spot defined on the entity's MO is used to detect changes in data and to create sync requests.

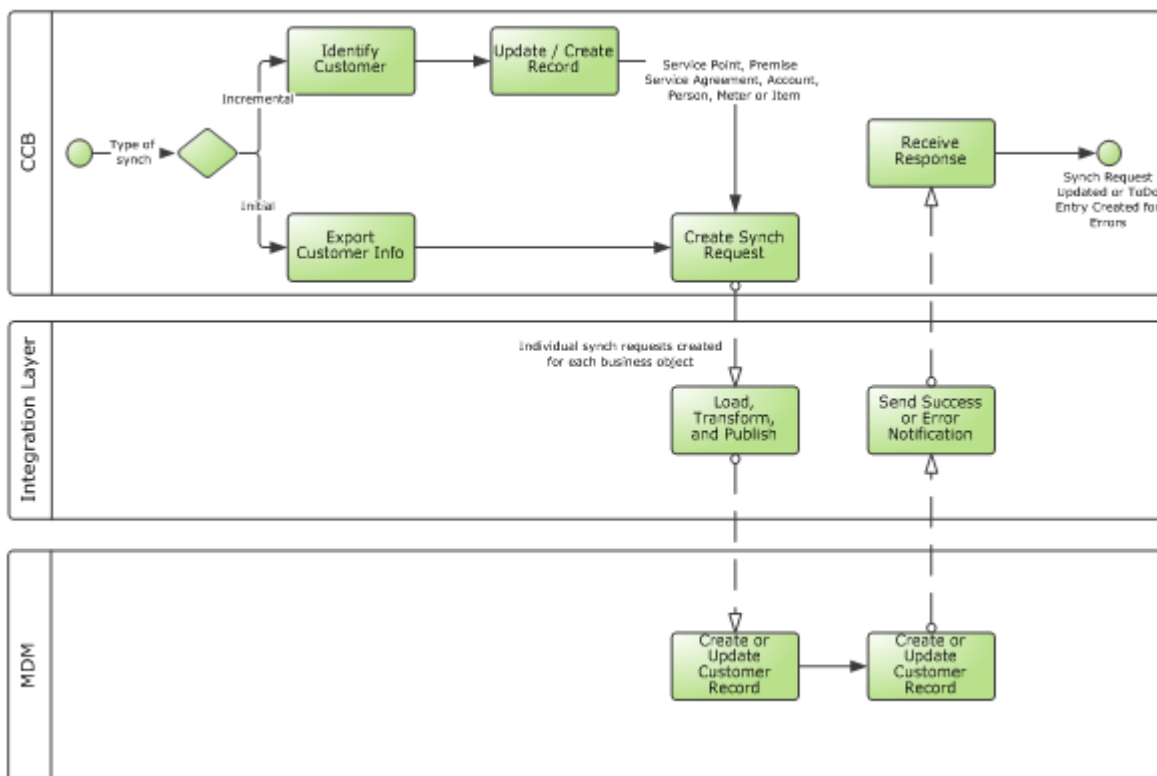
The sync request life cycle captures the change in data, sends sync request message to the integration and awaits an acknowledgement back from the external system – whether positive or negative. Timeouts and negative acknowledgements received from the external system results in the sync request being transitioned to the Error state. As an option, implementation may choose to create a To Do entry in this case.

There is a portal used for searching and viewing sync requests. An alert also appears on the CCB alerts dashboard zone when a sync request exists related to the account or premise in context.

In order to submit the data synchronization batch process in Oracle Utilities Customer Care and Billing, navigate to Batch Job Submission screen and run batch F1-SYNRQ.

For more information on how Oracle Utilities Customer Care and Billing and Oracle Utilities Meter Data Management handle data synchronization, refer to the respective documentation.

The following process diagram shows a graphical representation of the master data synchronization flow:



Business Flow Diagram

For more information, refer to the business flow diagram in 050601 Maintain Customer Information (Reusable Subprocess).pdf included in the documentation package.

Person Information Sync Integration Flow

Business Details

Person Sync synchronizes minimal person details required by Oracle Utilities Meter Data Management from Oracle Utilities Customer Care and Billing.

Technical Details

Oracle Utilities Customer Care and Billing sends the person information in form of XML messages. These messages are transformed by the integration layer, and then sent to Oracle Utilities Meter Data Management. Oracle Utilities Meter Data Management sends an acknowledgement to the integration, so that it can be transformed and sent to Oracle Utilities Customer Care and Billing.

The integration artifacts for Person Sync are as follows:

Composites

| Composite Name | Description |
|-------------------------------|-----------------------------------|
| OUCCB2OUMDM2PersonSyncReqEBF | Person Sync Request BPEL Process |
| OUMDM2OUCCB2PersonSyncRespEBF | Person Sync Response BPEL Process |

JMS Queues

| Queue Name | Description |
|-------------------------------|---|
| OUCCB2PersonSyncRequest | Oracle Utilities Customer Care and Billing Person Sync Request Used by Integration layer to read incoming Person Sync messages from Oracle Utilities Customer Care and Billing. |
| OUCCB2PersonSyncRequestError | Oracle Utilities Customer Care and Billing Person Sync Request Error Error Queue for Oracle Utilities Customer Care and Billing Person Sync Request |
| OUCCB2PersonSyncResponse | Oracle Utilities Customer Care and Billing Person Sync Response Used by Integration layer to add transformed Person Sync response messages from Oracle Utilities Meter Data Management. Integration business errors, if any, are sent to this queue. |
| OUCCB2PersonSyncResponseError | Oracle Utilities Customer Care and Billing Person Sync Response Error Error Queue for Oracle Utilities Customer Care and Billing Person Sync Response |
| OUMDM2PersonSyncRequest | Oracle Utilities Meter Data Management Person Sync Request Used by integration to add transformed Person Sync request messages. |

| Queue Name | Description |
|-------------------------------|--|
| OUMDM2PersonSyncRequestError | Oracle Utilities Meter Data Management Person Sync Request Error Error Queue for Oracle Utilities Meter Data Management Person Sync Request Error |
| OUMDM2PersonSyncResponse | Oracle Utilities Meter Data Management Person Sync Response Used by Integration to read incoming Person Sync response messages from Oracle Utilities Meter Data Management. |
| OUMDM2PersonSyncResponseError | Oracle Utilities Meter Data Management Person Sync Response Error Error Queue for Oracle Utilities Meter Data Management Person Sync Response Error |

SP Information Sync Integration Flow

Business Details

SP Sync synchronizes minimal SP and premise details required by Oracle Utilities Meter Data Management from Oracle Utilities Customer Care and Billing.

Technical Details

Oracle Utilities Customer Care and Billing sends the SP information in the form of XML messages. These messages are transformed by the integration layer, and then sent to Oracle Utilities Meter Data Management. Oracle Utilities Meter Data Management sends an acknowledgement to the integration, so that it can be transformed and sent to Oracle Utilities Customer Care and Billing.

The integration artifacts for SP Sync are as follows:

Composites

| Composite Name | Description |
|---------------------------|-------------------------------|
| OUCCB2OUMDM2SPSyncReqEBF | SP Sync Request BPEL Process |
| OUMDM2OUCCB2SPSyncRespEBF | SP Sync Response BPEL Process |

JMS Queues

| Queue Name | Description |
|--------------------------|--|
| OUCCB2SPSyncRequest | Oracle Utilities Customer Care and Billing SP Sync Request Used by the integration layer to read incoming SP Sync messages from Oracle Utilities Customer Care and Billing. |
| OUCCB2SPSyncRequestError | Oracle Utilities Customer Care and Billing SP Sync Request Error Error Queue for Oracle Utilities Customer Care and Billing SP Sync Request |

| Queue Name | Description |
|---------------------------|---|
| OUCCB2SPSyncResponse | Oracle Utilities Customer Care and Billing SP Sync Response Used by the integration layer to add transformed SP Sync response messages from Oracle Utilities Meter Data Management. Integration business errors, if any, are sent to this queue. |
| OUCCB2SPSyncResponseError | Oracle Utilities Customer Care and Billing SP Sync Response Error Error Queue for Oracle Utilities Customer Care and Billing SP Sync Response |
| OUMDM2SPSyncRequest | Oracle Utilities Meter Data Management SP Sync Request Used by the integration layer to add transformed SP Sync request messages. |
| OUMDM2SPSyncRequestError | Oracle Utilities Meter Data Management SP Sync Request Error Error Queue for Oracle Utilities Meter Data Management SP Sync Request Error |
| OUMDM2SPSyncResponse | Oracle Utilities Meter Data Management SP Sync Response Used by the integration layer to read incoming SP Sync response messages from Oracle Utilities Meter Data Management. |
| OUMDM2SPSyncResponseError | Oracle Utilities Meter Data Management SP Sync Response Error Error Queue for Oracle Utilities Meter Data Management SP Sync Response Error |

SA Information Sync Integration Flow

Business Details

SA Sync synchronizes minimal SA, Account, and SA-SP relationship details required by Oracle Utilities Meter Data Management from Oracle Utilities Customer Care and Billing.

Technical Details

Oracle Utilities Customer Care and Billing sends the SA information in the form of XML messages which are transformed by the integration layer and sent to Oracle Utilities Meter Data Management. Oracle Utilities Meter Data Management sends an acknowledgement which is transformed in the integration layer and sent to Oracle Utilities Customer Care and Billing.

The integration artifacts for SA Sync are as follows:

Composites

| Composite Name | Description |
|--------------------------|------------------------------|
| OUCCB2OUMDM2SASyncReqEBF | SA Sync Request BPEL Process |

| Composite Name | Description |
|---------------------------|-------------------------------|
| OUMDM2OUCCB2SASyncRespEBF | SA Sync Response BPEL Process |

JMS Queues

| Queue Name | Description |
|---------------------------|---|
| OUCCB2SASyncRequest | Oracle Utilities Customer Care and Billing SA Sync Request Used by the integration layer to read incoming SA Sync messages from Oracle Utilities Customer Care and Billing. |
| OUCCB2SASyncRequestError | Oracle Utilities Customer Care and Billing SA Sync Request Error Error Queue for Oracle Utilities Customer Care and Billing SA Sync Request. |
| OUCCB2SASyncResponse | Oracle Utilities Customer Care and Billing SA Sync Response Used by the integration layer to add transformed SA Sync response messages from Oracle Utilities Meter Data Management. Integration business errors, if any, are sent to this queue. |
| OUCCB2SASyncResponseError | Oracle Utilities Customer Care and Billing SA Sync Response Error Error Queue for Oracle Utilities Customer Care and Billing SA Sync Response. |
| OUMDM2SASyncRequest | Oracle Utilities Meter Data Management SA Sync Request Used by the integration layer to add transformed SA Sync request messages. |
| OUMDM2SASyncRequestError | Oracle Utilities Meter Data Management SA Sync Request Error Error Queue for Oracle Utilities Meter Data Management SA Sync Request Error |
| OUMDM2SASyncResponse | Oracle Utilities Meter Data Management SA Sync Response Used by the integration layer to read incoming SA Sync response messages from Oracle Utilities Meter Data Management. |
| OUMDM2SASyncResponseError | Oracle Utilities Meter Data Management SA Sync Response Error Error Queue for Oracle Utilities Meter Data Management SA Sync Response Error |

Meter Information Sync Integration Flow

Business Details

Meter Sync synchronizes minimal meter details required by Oracle Utilities Meter Data Management from Oracle Utilities Customer Care and Billing.

Technical Details

Oracle Utilities Customer Care and Billing sends the meter information in the form of XML messages which are transformed by the integration layer and sent to Oracle Utilities Meter Data Management. Oracle Utilities Meter Data Management sends an acknowledgement which is transformed in the integration layer and sent to Oracle Utilities Customer Care and Billing.

The integration artifacts for Meter Sync are as follows:

Composites

| Composite Name | Description |
|------------------------------|----------------------------------|
| OUCCB2OUMDM2MeterSyncReqEBF | Meter Sync Request BPEL Process |
| OUMDM2OUCCB2MeterSyncRespEBF | Meter Sync Response BPEL Process |

JMS Queues

| Queue Name | Description |
|------------------------------|---|
| OUCCB2MeterSyncRequest | Oracle Utilities Customer Care and Billing Meter Sync Request Used by Integration layer to read incoming Meter Sync messages from Oracle Utilities Customer Care and Billing. |
| OUCCB2MeterSyncRequestError | Oracle Utilities Customer Care and Billing Meter Sync Request Error Error Queue for Oracle Utilities Customer Care and Billing Meter Sync Request |
| OUCCB2MeterSyncResponse | Oracle Utilities Customer Care and Billing Meter Sync Response Used by Integration layer to add transformed Meter Sync response messages from Oracle Utilities Meter Data Management. Integration business errors, if any, will be sent to this queue. |
| OUCCB2MeterSyncResponseError | Oracle Utilities Customer Care and Billing Meter Sync Response Error Error Queue for Oracle Utilities Customer Care and Billing Meter Sync Response |
| OUMDM2MeterSyncRequest | Oracle Utilities Meter Data Management Meter Sync Request Used by integration to add transformed Meter Sync request messages. |
| OUMDM2MeterSyncRequestError | Oracle Utilities Meter Data Management Meter Sync Request Error Error Queue for Oracle Utilities Meter Data Management Meter Sync Request Error |
| OUMDM2MeterSyncResponse | Oracle Utilities Meter Data Management Meter Sync Response Used by Integration to read incoming Meter Sync response messages from Oracle Utilities Meter Data Management. |

| Queue Name | Description |
|------------------------------|--|
| OUMDM2MeterSyncResponseError | Oracle Utilities Meter Data Management Meter Sync Response Error Error Queue for Oracle Utilities Meter Data Management Meter Sync Response Error |

Meter Configuration Information Sync Integration Flow

Business Details

Meter Configuration Sync synchronizes minimal Meter Configuration details required by Oracle Utilities Meter Data Management from Oracle Utilities Customer Care and Billing.

Technical Details

Oracle Utilities Customer Care and Billing sends the Meter Configuration information in the form of XML messages which are transformed by the integration layer and sent to Oracle Utilities Meter Data Management. Oracle Utilities Meter Data Management sends an acknowledgement which is transformed in the integration layer and sent to Oracle Utilities Customer Care and Billing.

The integration artifacts for Meter Configuration Sync are as follows:

Composites

| Composite Name | Description |
|------------------------------------|--|
| OUCCB2OUMDM2MeterConfigSyncReqEBF | Meter Configuration Sync Request BPEL Process |
| OUMDM2OUCCB2MeterConfigSyncRespEBF | Meter Configuration Sync Response BPEL Process |

JMS Queues

| Queue Name | Description |
|-----------------------------------|---|
| OUCCB2MeterConfigSyncRequest | Oracle Utilities Customer Care and Billing Meter Configuration Sync Request Used by Integration layer to read incoming Meter Configuration Sync messages from Oracle Utilities Customer Care and Billing. |
| OUCCB2MeterConfigSyncRequestError | Oracle Utilities Customer Care and Billing Meter Configuration Sync Request Error Error Queue for Oracle Utilities Customer Care and Billing Meter Configuration Sync Request |
| OUCCB2MeterConfigSyncResponse | Oracle Utilities Customer Care and Billing Meter Configuration Sync Response Used by Integration layer to add transformed Meter Configuration Sync response messages from Oracle Utilities Meter Data Management. Integration business errors, if any, will be sent to this queue. |

| Queue Name | Description |
|------------------------------------|--|
| OUCCB2MeterConfigSyncResponseError | Oracle Utilities Customer Care and Billing Meter Configuration Sync Response Error Error Queue for Oracle Utilities Customer Care and Billing Meter Configuration Sync Response |
| OUMDM2MeterConfigSyncRequest | Oracle Utilities Meter Data Management Meter Configuration Sync Request Used by integration to add transformed Meter Configuration Sync request messages. |
| OUMDM2MeterConfigSyncRequestError | Oracle Utilities Meter Data Management Meter Configuration Sync Request Error Error Queue for Oracle Utilities Meter Data Management Meter Configuration Sync Request Error |
| OUMDM2MeterConfigSyncResponse | Oracle Utilities Meter Data Management Meter Configuration Sync Response Used by Integration to read incoming Meter Configuration Sync response messages from Oracle Utilities Meter Data Management. |
| OUMDM2MeterConfigSyncResponseError | Oracle Utilities Meter Data Management Meter Configuration Sync Response Error Error Queue for Oracle Utilities Meter Data Management Meter Configuration Sync Response Error |

SP-Meter History Information Sync Integration Flow

Business Details

SP-Meter History Sync synchronizes the minimum SP-Meter history details required by Oracle Utilities Meter Data Management from Oracle Utilities Customer Care and Billing.

Technical Details

Oracle Utilities Customer Care and Billing sends the SP-Meter information in the form of XML messages which are transformed by the integration layer and sent to Oracle Utilities Meter Data Management. Oracle Utilities Meter Data Management sends an acknowledgement which is transformed in the integration layer and then sent to Oracle Utilities Customer Care and Billing.

The integration artifacts for SP-Meter History Sync are as follows:

Composites

| Composite Name | Description |
|------------------------------------|---|
| OUCCB2OUMDM2SPMeterHistSyncReqEBF | SP Meter History Sync Request BPEL Process |
| OUMDM2OUCCB2SPMeterHistSyncRespEBF | SP Meter History Sync Response BPEL Process |

JMS Queues

| Queue Name | Description |
|------------------------------------|---|
| OUCCB2SPMeterHistSyncRequest | Oracle Utilities Customer Care and Billing SP Meter History Sync Request Used by Integration layer to read incoming SP Meter History Sync messages from Oracle Utilities Customer Care and Billing. |
| OUCCB2SPMeterHistSyncRequestError | Oracle Utilities Customer Care and Billing SP Meter History Sync Request Error Error Queue for Oracle Utilities Customer Care and Billing SP Meter History Sync Request |
| OUCCB2SPMeterHistSyncResponse | Oracle Utilities Customer Care and Billing SP Meter History Sync Response Used by Integration layer to add transformed SP Meter History Sync response messages from Oracle Utilities Meter Data Management. Integration business errors, if any, will be sent to this queue. |
| OUCCB2SPMeterHistSyncResponseError | Oracle Utilities Customer Care and Billing SP Meter History Sync Response Error Error Queue for Oracle Utilities Customer Care and Billing SP Meter History Sync Response |
| OUMDM2SPMeterHistSyncRequest | Oracle Utilities Meter Data Management SP Meter History Sync Request Used by integration to add transformed SP Meter History Sync request messages. |
| OUMDM2SPMeterHistSyncRequestError | Oracle Utilities Meter Data Management SP Meter History Sync Request Error Error Queue for Oracle Utilities Meter Data Management SP Meter History Sync Request Error |
| OUMDM2SPMeterHistSyncResponse | Oracle Utilities Meter Data Management SP Meter History Sync Response Used by Integration to read incoming SP Meter History Sync response messages from Oracle Utilities Meter Data Management. |
| OUMDM2SPMeterHistSyncResponseError | Oracle Utilities Meter Data Management SP Meter History Sync Response Error Error Queue for Oracle Utilities Meter Data Management SP Meter History Sync Response Error |

Scalar Meter Read Sync Integration Flow

Business Details

Scalar Meter Read Sync flow synchronizes the scalar meter reads from Oracle Utilities Customer Care and Billing to Oracle Utilities Meter Data Management.

Technical Details

Oracle Utilities Customer Care and Billing sends the scalar meter reads information in the form of XML messages which are transformed by the integration layer and sent to Oracle Utilities Meter Data Management. Oracle Utilities Meter Data Management sends an acknowledgement which is transformed in the integration layer and then sent to Oracle Utilities Customer Care and Billing.

The integration artifacts for Scalar Meter Read Sync are as follows:

Composites

| Composite Name | Description |
|----------------------------------|--|
| OUCCB2OUMDM2MeterReadSyncReqEBF | Scalar Meter Read Sync Request BPEL Process |
| OUMDM2OUCCB2MeterReadSyncRespEBF | Scalar Meter Read Sync Response BPEL Process |

JMS Queues

| Queue Name | Description |
|------------------------------------|---|
| OUCCB2SPMeterReadSyncRequest | Oracle Utilities Customer Care and Billing Scalar Meter Read Sync Request Used by Integration layer to read incoming Scalar Meter Read messages from Oracle Utilities Customer Care and Billing. |
| OUCCB2SPMeterReadSyncRequestError | Oracle Utilities Customer Care and Billing Scalar Meter Read Sync Request Error Error Queue for Oracle Utilities Customer Care and Billing Scalar Meter Read Sync Request |
| OUCCB2SPMeterReadSyncResponse | Oracle Utilities Customer Care and Billing Scalar Meter Read Sync Response Used by Integration layer to add transformed Scalar Meter Read Sync response messages from Oracle Utilities Meter Data Management. Integration business errors, if any, will be sent to this queue. |
| OUCCB2SPMeterReadSyncResponseError | Oracle Utilities Customer Care and Billing Scalar Meter Read Sync Response Error Error Queue for Oracle Utilities Customer Care and Billing Scalar Meter Read Sync Response |
| OUMDM2SPMeterReadSyncRequest | Oracle Utilities Meter Data Management Scalar Meter Read Sync Request Used by integration to add transformed Scalar Meter Read request messages. |
| OUMDM2SPMeterReadSyncRequestError | Oracle Utilities Meter Data Management Scalar Meter Read Sync Request Error Error Queue for Oracle Utilities Meter Data Management Scalar Meter Read Sync Request Error |

| Queue Name | Description |
|------------------------------------|--|
| OUMDM2SPMeterReadSyncResponse | Oracle Utilities Meter Data Management Scalar Meter Read Response Used by Integration to read incoming Scalar Meter Read response messages from Oracle Utilities Meter Data Management. |
| OUMDM2SPMeterReadSyncResponseError | Oracle Utilities Meter Data Management Scalar Meter Read Response Error Error Queue for Oracle Utilities Meter Data Management Scalar Meter Read Sync Response Error |

Billing Related Flows

Oracle Utilities Customer Care and Billing supports billing for bill determinant oriented service agreements that require usage from Oracle Meter Data Management system.

During billing, bill segments that require usage requests are created in an error state.

These bill segments are generated within the usage request's lifecycle once bill determinants are received from Oracle Meter Data Management.

The create bill segment using a usage request algorithm retrieves the usage period's list that contains an entry for each usage period that Oracle Meter Data Management calculated bill determinants.

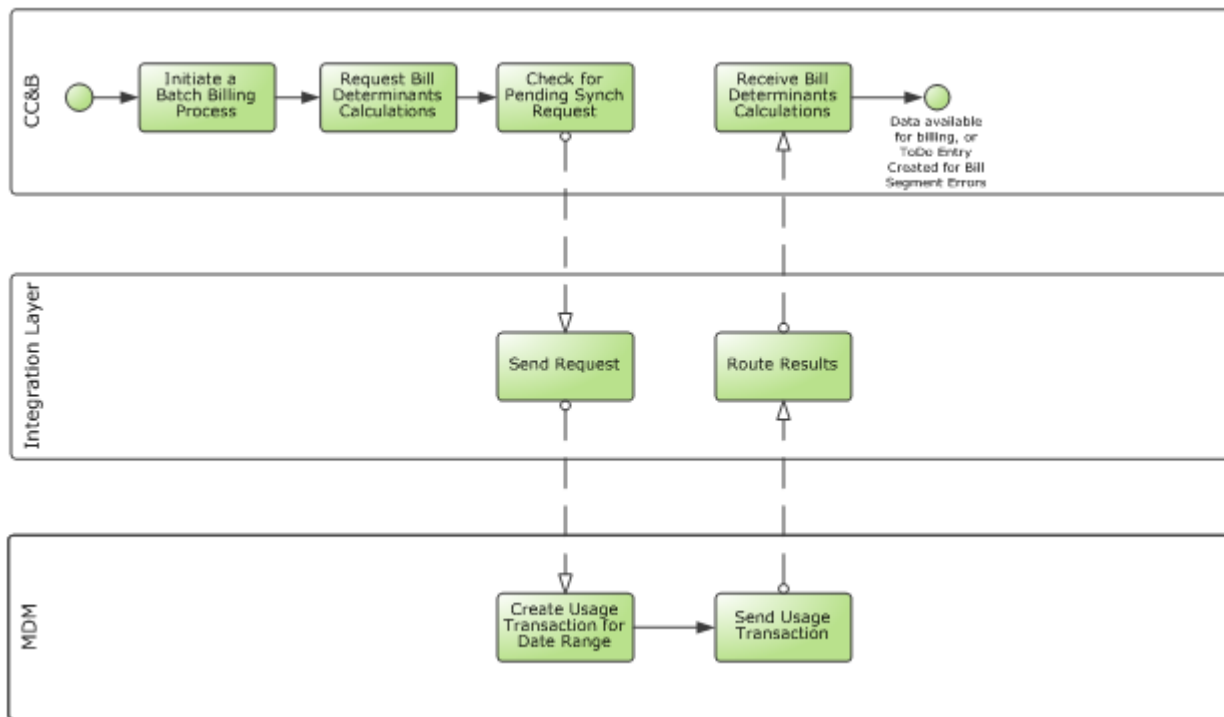
Note. Rate application is called for each entry in the usage period list; the usage period and bill determinants are passed to rate application.

Batch Bill Determinants Integration Flow

Business Details

Batch bill determinant requests sent from Oracle Utilities Customer Care and Billing contain the bill segment period, as well as all applicable rate version and service agreement rate schedule change break periods. Oracle Utilities Meter Data Management calculates bill determinants based on the available read data and usage subscription configuration. These Bill determinants are returned to Oracle Utilities Customer Care and Billing and used for billing. Billing Determinants do not replace billing. Instead they are a result of the determinants calculations (list of service quantities) and provide usage information (audit reads) needed to calculate and generate a bill segment.

The following process diagram shows a graphical representation of this processing:



Business Flow Diagram

For more information refer to the business flow diagram in 100106 Provide Consumption Data to Billing.pdf included in the documentation package.

Technical Details

The batch billing process in Oracle Utilities Customer Care and Billing is running, requesting bill determinant calculations from Oracle Utilities Meter Data Management for multiple bill segments. Oracle Utilities Customer Care and Billing initiates the Batch Billing request and Oracle Utilities Meter Data Management returns Bill determinants to Oracle Utilities Customer Care and Billing per bill segment.

The integration artifacts for Batch Bill Determinants Integration Flow are as follows:

Composites

| Composite Name | Description |
|---------------------------|--------------------------------|
| OUCB2BOUMDM2BatchBDReqEBF | Batch BD Request BPEL Process |
| OUMDM2OUCB2BatchBDRespEBF | Batch BD Response BPEL Process |

JMS Queues

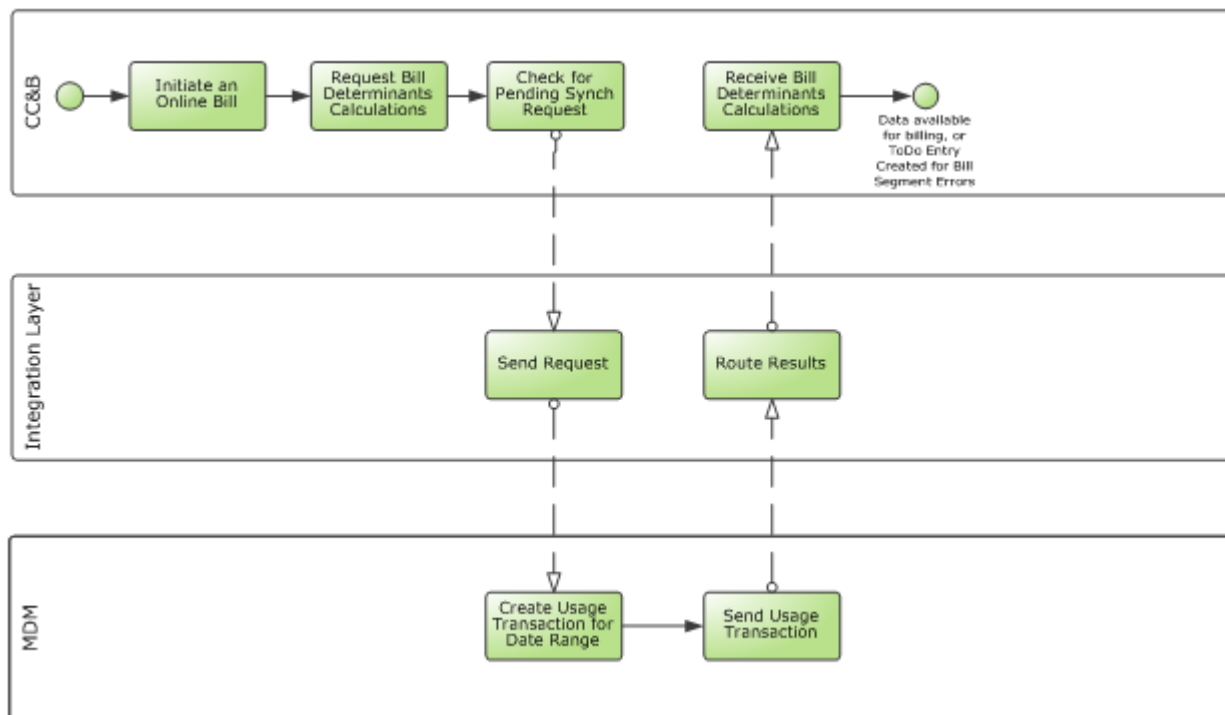
| Queue Name | Description |
|----------------------------|---|
| OUCCB2BatchBDRequest | Oracle Utilities Customer Care and Billing Batch BD Request Used by the integration layer to read incoming Batch BD messages from Oracle Utilities Customer Care and Billing. |
| OUCCB2BatchBDRequestError | Oracle Utilities Customer Care and Billing Batch BD Request Error Error Queue for Oracle Utilities Customer Care and Billing Batch BD Request |
| OUCCB2BatchBDResponse | Oracle Utilities Customer Care and Billing Batch BD Response Used by the integration layer to add transformed Batch BD response messages from Oracle Utilities Meter Data Management. Integration business errors, if any, are sent to this queue. |
| OUCCB2BatchBDResponseError | Oracle Utilities Customer Care and Billing Batch BD Response Error Error Queue for Oracle Utilities Customer Care and Billing Batch BD Response |
| OUMDM2BatchBDRequest | Oracle Utilities Meter Data Management Batch BD Request Used by the integration layer to add transformed Batch BD request messages. |
| OUMDM2BatchBDRequestError | Oracle Utilities Meter Data Management Batch BD Request Error Error Queue for Oracle Utilities Meter Data Management Batch BD Request Error |
| OUMDM2BatchBDResponse | Oracle Utilities Meter Data Management Batch BD Response Used by the integration layer to read incoming Batch BD response messages from Oracle Utilities Meter Data Management. |
| OUMDM2BatchBDResponseError | Oracle Utilities Meter Data Management Batch BD Response Error Error Queue for Oracle Utilities Meter Data Management Batch BD Response Error |

Online Bill Determinants Integration Flow

Business Details

Online bill determinant requests sent from Oracle Utilities Customer Care and Billing contains the bill segment period, as well as all applicable rate version and service agreement rate schedule change break periods. Oracle Utilities Meter Data Management calculates bill determinants based on the available read data and usage subscription configuration. These bill determinants are returned to Oracle Utilities Customer Care and Billing and used for billing. Billing determinants do not replace billing. Instead they calculate the determinants and provide usage information needed to calculate and generate a bill segment.

The following process diagram shows a graphical representation of this processing:



Business Flow Diagram

For more information refer the business flow diagram in 100106 Provide Consumption Data to Billing.pdf included in the documentation package.

Technical Details

If a user requests an ad-hoc bill determinant calculation in Oracle Utilities Customer Care and Billing for a specific account, then Oracle Utilities Customer Care and Billing initiates the Online Bill request for each bill segment that requires bill determinants, and Oracle Utilities Meter Data Management returns bill determinants for each request. Oracle Utilities Meter Data Management sends out success or failure acknowledgement to the integration layer, so that it can be transformed and sent to Oracle Utilities Customer Care and Billing.

The integration artifacts for Online Bill Determinants Integration Flow are as follows:

Composites

| Composite Name | Description |
|----------------------------|---------------------------------|
| OUCB2OUMDM2OnlineBDReqEBF | Online BD Request BPEL Process |
| OUMDM2OUCB2OnlineBDRespEBF | Online BD Response BPEL Process |

JMS Queues

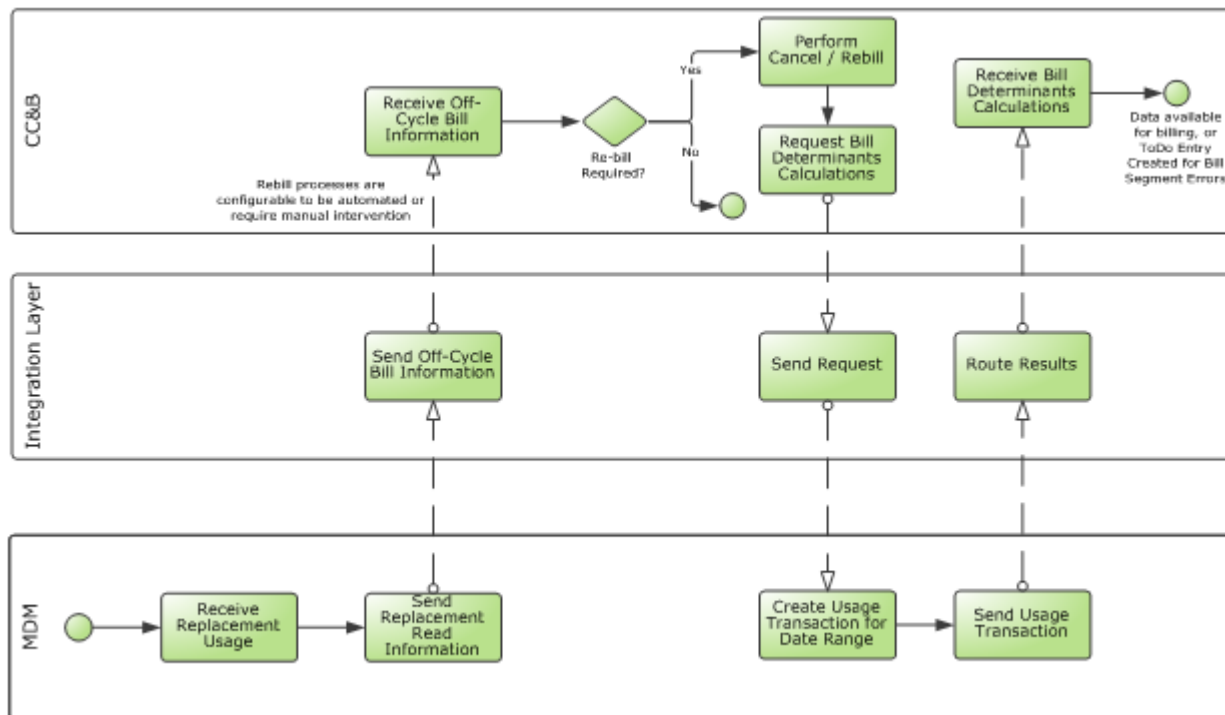
| Queue Name | Description |
|-----------------------------|---|
| OUCCB2OnlineBDRequest | Oracle Utilities Customer Care and Billing Online BD Request Used by the integration layer to read incoming Online BD messages from Oracle Utilities Customer Care and Billing. |
| OUCCB2OnlineBDRequestError | Oracle Utilities Customer Care and Billing Online BD Request Error Error Queue for Oracle Utilities Customer Care and Billing Online BD Request |
| OUCCB2OnlineBDResponse | Oracle Utilities Customer Care and Billing Online BD Response Used by the integration layer to add transformed Online BD response messages from Oracle Utilities Meter Data Management. Integration business errors, if any, are sent to this queue. |
| OUCCB2OnlineBDResponseError | Oracle Utilities Customer Care and Billing Online BD Response Error Error Queue for Oracle Utilities Customer Care and Billing Online BD Response |
| OUMDM2OnlineBDRequest | Oracle Utilities Meter Data Management Online BD Request Used by the integration layer to add transformed Online BD request messages. |
| OUMDM2OnlineBDRequestError | Oracle Utilities Meter Data Management Online BD Request Error Error Queue for Oracle Utilities Meter Data Management Online BD Request Error |
| OUMDM2OnlineBDResponse | Oracle Utilities Meter Data Management Online BD Response Used by the integration layer to read incoming Online BD response messages from Oracle Utilities Meter Data Management. |
| OUMDM2OnlineBDResponseError | Oracle Utilities Meter Data Management Online BD Response Error Error Queue for Oracle Utilities Meter Data Management Online BD Response Error |

Replacement Reads Integration Flow

Business Details

As usage is received into Oracle Utilities Meter Data Management as initial measurements data, it must be validated to determine if the usage constitutes a subsequent correction to usage that was already received and used for bill determinants calculations. If there is a subsequent correction, a replacement reads notification can be sent to Oracle Utilities Customer Care and Billing to indicate that the replacement usage was received. Oracle Utilities Customer Care and Billing creates an off cycle bill generator object and either an automatic rebill or manual rebill (via a To Do entry) can be configured in Oracle Utilities Customer Care and Billing.

The following process diagram shows a graphical representation of this processing:



Business Flow Diagram

For more information on the replacement reads flow, refer to the business flow diagram in 100106 Provide Consumption Data to Billing.pdf included in the documentation package.

Technical Details

Replacement meter reads are created in Oracle Utilities Meter Data Management and notification is sent to Oracle Utilities Customer Care and Billing. Oracle Utilities Customer Care and Billing creates an off cycle bill generator based on the Oracle Utilities Meter Data Management request. Oracle Utilities Customer Care and Billing does not send acknowledgements back to Oracle Utilities Meter Data Management.

The integration artifacts for Replacement Read Notification are as follows:

Composites

| Composite Name | Description |
|----------------------------|---------------------------------------|
| OUMDM2OUCCB2ReplReadReqEBF | Replacement Read Request BPEL Process |

JMS Queues

| Queue Name | Description |
|-----------------------|---|
| OUMDM2ReplReadRequest | Oracle Utilities Customer Care and Billing Replacement Read Request - Used by the integration layer to read incoming Replacement Read messages from Oracle Utilities Meter Data Management. |

| Queue Name | Description |
|-----------------------------|--|
| OUMDM2ReplReadRequestError | Oracle Utilities Meter Data Management Replacement Read Request Error - Error Queue for Oracle Utilities Meter Data Management Replacement Read Request |
| OUMDM2ReplReadResponse | Oracle Utilities Meter Data Management Replacement Read Response - Used by the integration layer to add transformed Replacement Read response messages from Oracle Utilities Meter Data Management. Integration business errors, if any, are sent to this queue. |
| OUMDM2ReplReadResponseError | Oracle Utilities Meter Data Management Replacement Read Response Error - Error Queue for Oracle Utilities Meter Data Management Replacement Read Response |

Get Register Read High-Low Boundaries Integration Flow

Business Details

If the scalar meter reads are stored in Oracle Utilities Meter Data Management, then Oracle Utilities Customer Care and Billing has no way to calculate the High-Low Register Read Boundary values. Oracle Utilities Customer Care and Billing sends a request to Oracle Utilities Meter Data Management for the High-Low Boundary values.

Technical Details

If the Register Read High-Low Boundary values need to be retrieved as part of any flow in Oracle Utilities Customer Care and Billing, the integration is invoked then this sends a request to Oracle Utilities Meter Data Management for the High-Low Boundary values. The response and any errors are returned to Oracle Utilities Customer Care and Billing.

If errors are returned from Oracle Utilities Meter Data Management, the integration starts the Error Handling process. Oracle Utilities Customer Care and Billing reports the error in the logs but the High-Low values are returned as zero and no error is shown in the user interface.

The integration artifacts for this flow are as follows:

Composites

| Composite Name | Description |
|-------------------------------|--|
| OUCCB2OUMDM2HighLowReadReqEBF | Get Register Read High-Low Boundaries BPEL Process |

Prerequisites

All participating applications: Oracle Utilities Customer Care and Billing, Oracle Utilities Meter Data Management, and Oracle SOA Suite must be installed, set up, and working properly.

Part 2: Implementing the Integration Product

This section provides details about how to configure the participating applications and the AIA Direct middle layer for the integration. Information on error handling, monitoring, customization options, and data mapping is also included.

Configuring the Integration

This section provides details about the configuration settings required for the integration, and also discusses details related to:

- [Data Synchronization](#)
- [Setting up Oracle Utilities Customer Care and Billing](#)
- [Setting up Oracle Utilities Meter Data Management](#)
- [Setting up the AIA Direct integration layer](#)

Integration Configuration Checklist

Extensive configuration is required to implement the integration between Oracle Customer Care and Billing and Oracle Meter Data Management. This section provides a list of configuration tasks that may be used as a reference or roadmap.

Oracle Utilities Customer Care and Billing Configuration

| Task | Description |
|--|--|
| Admin Data Setup | |
| Admin Data Setup | There are admin tables that are essential to the integration, for example: SP Type, SA Type, Service Type, UOM, TOU, SQL, Meter Type, etc. These admin tables must be setup in CCB and the corresponding DVMs updated. |
| MDM Navigation Setup | Configure the General System Configuration feature configuration. The MDM URL option value must contain the URL for the MDM |
| System Data Setup | |
| Sync Read Business Objects | Define the read BOs used to build the initial/final sync snapshot |
| Sync Data Area | Define the data area that holds the elements needed in the snapshot |

| Task | Description |
|---|---|
| Sync Pre-processing Algorithm | Configure the pre-processing algorithms that create the initial snapshot for the various entities |
| Timeout Algorithm | Configure the timeout algorithm(s) that are used in sync, usage and corrected read processing |
| To Do Creation Algorithm | Configure the To Do entry algorithm(s) that are used to notify users of anomalies |
| Sync Request Business Object | Setup business objects that define the behavior of the outbound sync requests (link pre-processing, timeout and To Do algorithms, etc.) |
| MO Audit Algorithms | Configure the MO Audit algorithms responsible for sync request creation |
| Maintenance Objects | Update the maintenance objects that your implementation wants to create sync requests for (link audit algorithms and specify option values for sync request BO) |
| Usage Business Objects | This business object defines the behavior of a usage request |
| Replacement Read BO | This business object is used to process a corrected read notification received from Oracle Utilities Meter Data Management |
| Menu Setup | Enable the links from CCB to MDM |
| Batch Scheduling | Note the batch jobs involved in the sync and billing processes and ensure that these are incorporated in your scheduler accordingly |
| JMS Configuration | |
| JMS Setup | Configure the JMS to receive JMS messages from the integration layer |
| XAI Configuration | |
| XAI Setup | Configure JNDI server, JMS connection and queue, XAI sender, outbound message types and external systems for the integration |

Demo Export Bundles: Export bundles are available in the demo environment to assist with the configuration needed. See the following bundles:

- CI_MDMUsageRequest: This bundle contains additional objects that should be configured for MDM usage request processing.
- CI_MasterDataSyncForMDM2: This bundle contains the objects for the Master Data Synchronization with MDM2.

Oracle Utilities Meter Data Management Configuration

| Task | Description |
|--------------------------------------|---|
| Admin Data Setup | |
| Admin Data Setup | There are admin tables that are essential to the integration, for example: SP Type, US Type, Service Type, UOM, TOU, SQI, Device Type, etc. These admin tables must be setup in MDM and the corresponding DVMs updated. |
| MDM Navigation Setup | Configure the General System Configuration feature configuration. The CCB URL option value must contain the URL for the CCB. |
| System Data Setup | |

| Task | Description |
|---------------------------------------|---|
| Sync Business Objects | These are the inbound sync business objects that are used to add or update the data in MDM. Only the ongoing sync business objects need further setup to define the Outbound Message Type to be used for any acknowledgements sent back to CCB. |
| BO Algorithms | These are CCB-specific algorithms that need to be plugged into the sync BOs. A BPA script is provided to for your convenience. |
| Extendable Lookups | Some extendable lookups were created to hold the values as defined in the external system being integrated with. Configure the values for these extendable lookups. |
| Lookup Field | Configure the required values for this lookup field. |
| Menu Setup | Enable the links from MDM to CCB. |
| Batch Scheduling | Note the batch jobs involved in the sync and billing processes and ensure that these are incorporated in your scheduler accordingly. |
| JMS Configuration | |
| JMS Setup | Configure the JMS to receive JMS messages from the integration layer. |
| XAI Configuration | |
| XAI Setup | Configure JNDI server, JMS connection and queue, XAI sender, outbound message types and external systems for the integration. |

Demo Export Bundles: Export bundles are available in the demo environment to assist with the configuration needed. See the following bundles:

- CI_MasterDataSyncFromCCB: This bundle contains the objects for the Master Data Synchronization with CCB.

Integration Product Configuration

| Task | Description |
|--|--|
| Setting Configuration Properties | Update ConfigurationProperties.xml file |
| Setting System Properties | Set Module Configurations properties that are shared by multiple integration flows and Service Configurations properties that are used by a specific BPEL process. |
| Domain Value Maps | Set Domain value maps (DVMs) to map codes and other static values across applications. |
| Error Handling | Setup error notification |

Data Synchronization

Oracle Utilities Meter Data Management serves as the database of record for meter device connections and usage while Oracle Utilities Customer Care and Billing manages customers (persons), accounts (service agreements), and service points. The person, SP, SA, meter, meter configuration, and SP-meter history sync integration points add relevant SP/SA and meter data from Oracle Utilities Customer Care and Billing in Oracle Utilities Meter Data Management.

The data synchronization listed below is not completed by the integration product.

- Rates Setup in Oracle Utilities Meter Data Management and Oracle Utilities Customer Care and Billing

Rates Setup in Oracle Utilities Meter Data Management and Oracle Utilities Customer Care and Billing

Rate setup information is not covered by the synchronization process.

For more information on configuring rates, refer to Oracle Utilities Customer Care and Billing and Oracle Utilities Meter Data Management product documentation.

Setting up Oracle Utilities Customer Care and Billing

To set up Oracle Utilities Customer Care and Billing for the integration, configure the following:

- Admin Data Setup
- System Data Setup
- JMS Configuration
- XAI Configuration

For more information on configuring and working with Oracle Utilities Customer Care and Billing, see the Oracle Utilities Customer Care and Billing user documentation.

The following sections provide details about how to configure these items.

Some configurations described may be required for general functionality and do not necessarily relate directly to the integration; however these are called out as particularly significant configuration items. The inclusion of such items does not mean that other general items that are not mentioned do not need to be configured.

Configure Admin Data Tables

This section describes the unique setup issues specifically related to configuring your system for the integration.

For more information about configuring Oracle Utilities Customer Care and Billing, see the Oracle Utilities Customer Care and Billing User Guide.

Country

Create a country code in Oracle Utilities Customer Care and Billing.

The **Main** page is used to customize the fields and field descriptions that are displayed where addresses are used in the system. This ensures that all addresses conform to the customary address format and conventions of the particular country you have defined.

| Navigation | Guideline | Corresponding DVM |
|----------------------|--------------------------|-----------------------|
| Admin Menu > Country | Create the Country codes | OUCCB2_OUMDM2_Country |

Disconnect Location

Create the required Disconnect Location codes. The codes defined here must exactly match values in the DVM indicated.

| Navigation | Guideline | Corresponding DVM |
|----------------------------------|----------------------------------|----------------------------------|
| Admin Menu > Disconnect Location | Create Disconnect Location codes | OUCCB2_OUMDM2_DisconnectLocation |

SP Type

Create the required SP Types. The codes defined here must exactly match values in the DVM indicated.

| Navigation | Guideline | Corresponding DVM |
|----------------------|-----------------|----------------------|
| Admin Menu > SP Type | Create SP Types | OUCCB2_OUMDM2_SPTYPE |

CIS Division

A CIS division is associated with a jurisdiction. The definition of a jurisdiction is a geographic-oriented entity with unique business rules. For example, if you conduct business in California and Nevada, and each state has different collection rules, you need a separate jurisdiction for each state. Set up a CIS division for each jurisdiction in which you conduct business.

Create the required CIS Division codes. The CIS Division and SA Type combination are concatenated with an exclamation point as a separator of the two values in the DVM indicated.

For example: CIS Division is CA and SA Type is E-RES. The CCB value defined in the OUCCB2_OUMDM2_USType dvm is CA!E-RES.

| Navigation | Guideline | Corresponding DVM |
|---------------------------|---------------------------|----------------------|
| Admin Menu > CIS Division | Create CIS Division codes | OUCCB2_OUMDM2_USType |

SA Type

Create the required SA Types. The CIS Division and SA Type combination are concatenated with an exclamation point as a separator of the two values in the DVM indicated.

For example: CIS Division is CA and SA Type is E-RES. The CCB value defined in the OUCCB2_OUMDM2_USType dvm is CA!E-RES.

| Navigation | Guideline | Corresponding DVM |
|----------------------|-----------------|----------------------|
| Admin Menu > SA Type | Create SA Types | OUCCB2_OUMDM2_USType |

Meter Type

Create the required Meter Types. The codes defined here must exactly match values in the DVM indicated.

| Navigation | Guideline | Corresponding DVM |
|-------------------------|--------------------|--------------------------|
| Admin Menu > Meter Type | Create Meter Types | OUCCB2_OUMDM2_DeviceType |

Manufacturer and Model

Create the required Manufacturer and Model codes. The codes defined here must exactly match values in the DVM indicated.

| Navigation | Guideline | Corresponding DVM |
|---------------------------|---------------------------|----------------------------|
| Admin Menu > Manufacturer | Create Manufacturer codes | OUCCB2_OUMDM2_Manufacturer |
| | Create Model codes | OUCCB2_OUMDM2_Model |

Meter Configuration Type

Create the required Meter Configuration Types. The codes defined here must exactly match values in the DVM indicated.

| Navigation | Guideline | Corresponding DVM |
|---------------------------------------|----------------------------------|--------------------------------|
| Admin Menu > Meter Configuration Type | Create Meter Configuration Types | OUCCB2_OUMDM2_DeviceConfigType |

Read Out Type

Create the required Read Out Types. The codes defined here must exactly match values in the DVM indicated.

| Navigation | Guideline | Corresponding DVM |
|----------------------------|-----------------------|---------------------------|
| Admin Menu > Read Out Type | Create Read Out Types | OUCCB2_OUMDM2_ReadOutType |

Service Type

Create the required Service Types. The codes defined here must exactly match values in the DVM indicated.

| Navigation | Guideline | Corresponding DVM |
|---------------------------|----------------------|-----------------------------|
| Admin Menu > Service Type | Create Service Types | OUCCB2_OUMDM2_MCServiceType |

Unit of Measure

Define the Unit of Measure codes. The codes defined here must exactly match values in the DVM indicated.

| Navigation | Guideline | Corresponding DVM |
|------------------------------|-----------------------------------|-------------------|
| Admin Menu > Unit of Measure | Define unit of measurement codes. | OUMDM2_OUCCB2_UOM |

Time of Use

Define the Time of Use codes. The codes defined here must exactly match values in the DVM indicated.

| Navigation | Guideline | Corresponding DVM |
|--------------------------|--------------------------|-------------------|
| Admin Menu > Time of Use | Define time of use codes | OUMDM2_OUCCB2_TOU |

Service Quantity Identifier

Define the SQL codes. The codes defined here must exactly match values in the DVM indicated.

| Navigation | Guideline | Corresponding DVM |
|--|-------------------------------------|-------------------|
| Admin Menu > Service Quantity Identifier | Define service quantity identifiers | OUMDM2_OUCCB2_SQI |

Feature Configuration

To enable navigation from Oracle Utilities Customer Care and Billing to Oracle Utilities Meter Data Management, setup the Oracle Utilities Meter Data Management URL option type on the General System Configuration feature configuration. The option value must contain the URL for the Oracle Utilities Meter Data Management system (see the demo environment for an example).

Master Configuration

Click on the add button for Oracle Utilities Meter Data Management Integration Master Configuration, configure the External System and Outbound Message Type to be used for Get Register Read High-Low Boundaries flow.

| Navigation | Field | Value |
|---------------------------------------|---|--|
| Admin Menu > M > Master Configuration | External System | MDM |
| Admin Menu > M > Master Configuration | Meter Read High Low Details - Outbound Message Type | Request For Estimated and High-Low Readings Outbound Message |

Installation Options - Framework

Select the algorithm 'C1-MDM2HLB' for the System Event 'Meter Read High Low Limits'.

Configure System Data Tables

BO Algorithms

| Algorithm Type | Description |
|--|--|
| C1-CMDM2PRI, C1-CMDM2SAI, C1-CMDM2SPI, C1-CMDM2MTRI, C1-CMDM2CFGI, C1-CMDM2SMHI, C1-CMDM2MRI | <p>Configure the pre-processing algorithms that create the initial snapshot for the Person, SA, SP, Meter, Meter Configuration, Meter Read and SP/Meter History entities. See the algorithm descriptions for details on how to specify the parameters below.</p> <p>Define the read BOs that each of the algorithms uses to build the initial/final snapshot. The following read BOs are delivered for use by these algorithms: C1-MDM2Person, C1-MDM2Account, C1-MDM2SA, C1-MDM2Premise, C1-MDM2SP, C1-MDM2Meter, C1-MDM2MeterConfiguration, C1-MDM2MR and C1-MDM2SPMeterHistory. If additional elements are needed in the sync request, your implementation may create a child of any of these BOs and add the element under a group called <customElements>. This ensures that they are included in the sync request message at the proper group nodes, so that any custom translation your implementation may decide to do at the integration layer can be done.</p> <p>Define the data area that holds the elements needed in the snapshot. The following data areas are delivered for use by these algorithms: C1-MDM2PersonBasedSnapshot, C1-MDM2SABasedSnapshot, C1-MDM2SPBasedSnapshot, C1-MDM2MeterBasedSnapshot, C1-MDM2MtrConfigBasedSnapshot, C1-MDM2MRBasedSnapshot and C1-MDM2SAMtrHistorySnapshot. Your implementation should not have to create a custom data area as this already provides a <customElements> node in its schema to allow the addition of any elements not included in the base solution.</p> <p>It is possible to filter the qualifying types for each of the syncs. If this is so, define these values in the algorithm, so that only changes to records of these types are communicated across to Oracle Utilities Meter Data Management. (i.e., Person or Business Flag (person type), SA Type, SP Type, Meter Type, Meter Configuration Type – this is used for both Meter Configuration Sync and SP/Meter History Sync.)</p> <p>It is possible to specify custom read BOs and data areas by Type. To do so, simply define your custom BO along with the Type value you wish to use it with. For example: particular SA types for the SA Sync or particular SP types for the SP sync. The algorithm uses these values instead of those defined in points 1 and 2.</p> |
| C1-MDM-TMOT | This monitor algorithm sets a timeout limit on the receipt of a response from the external system. Define the number of hours your implementation wishes to wait for a response from Oracle Utilities Meter Data Management before transitioning the sync request into the Error state. |
| F1-TD-CREATE | This enter algorithm creates a To Do entry. At a minimum, your implementation must define the To Do Type to use in creating the To Do entry and the Characteristic Type For Log Entry used in linking the To Do entry to the sync request via its logs. The base product provides F1-SYNRQ and F1-TODO, respectively, for this purpose. For details on the other parameters used by this algorithm, see the algorithm type description. |
| C1-CHK-DTSY | This monitor algorithm delays the usage request transmission until all related sync requests are in a final state. If your implementation only wishes to delay usage requests for certain external system sync requests, define the external system as an algorithm parameter. |

| Algorithm Type | Description |
|----------------|---|
| C1-USGCY-PRE | If your implementation would like to use the automated retry option for batch billing, add the pre-processing algorithm (C1-USGCY-PRE) on the MDM Cyclical Billing Usage Request BO. See the description on the BO for further detail. |
| C1-TRN-RELSY | If your implementation would prefer online bills to not have to be dependent on sync batch jobs to transition any related sync requests, plug this algorithm in on the MDM Non Cyclical Billing Usage Request BO. Note that the monitor algorithms on the Awaiting Data Sync state of the parent BO need to be moved down to the children BOs (both the Oracle Utilities Meter Data Management Non Cyclical and Cyclical Billing Usage Request BOs). C1-TRN-RELSY needs to be placed before these monitor algorithms. The ongoing sync request BOs in Oracle Utilities Meter Data Management also will need to have the monitor process on their initial states removed (this includes the composite sync request). |

MO Algorithms

Configure the MO Audit algorithms. MO Audit algorithms contain the logic to instantiate a sync request (as long as one does not already exist in the initial state for the MO-Primary Keys combination). A generic algorithm F1-GCHG-CDGP comes with the base product and is plugged in on MOs that need to instantiate sync requests for the same MO. This algorithm instantiates the BOs defined in the Sync Request BO MO Option (see Maintenance Objects below). For MOs that need a sync request instantiated for a different MO, unique algorithms that contain this logic are used. (For example, changes to the Account MO need to be communicated via an SA sync request; or changes to the Premise MO need to be communicated via an SP sync).

| Algorithm Type | Description |
|----------------|--|
| C1-ACCTDCSA | This algorithm instantiates an SA-based sync request whenever a change to the Account MO is detected. Define the sync request BO to be instantiated in the algorithm's parameters. |
| C1-PREMCDSP | This algorithm instantiates an SP-based sync request whenever a change to the Premise MO is detected. Define the sync request BO to be instantiated in the algorithm's parameters. |

Maintenance Object

| Maintenance Object | Description |
|--------------------|--|
| PERSON | Specify the generic MO Audit algorithm F1-GCHG-CDGP. Also specify the C1-MDM2PersonSyncRequest BO in the Sync Request BO MO Option. |
| ACCOUNT | Specify the MO Audit algorithm configured in the previous section. |
| SA | Specify the generic MO Audit algorithm F1-GCHG-CDGP. Also specify the C1-MDM2SASyncRequest BO in the Sync Request BO MO Option. |
| SP | Specify the generic MO Audit algorithm F1-GCHG-CDGP. Also specify the C1-MDM2SPSyncRequest BO in the Sync Request BO MO Option. |
| PREMISE | Specify the MO Audit algorithm configured in the previous section. |
| METER | Specify the generic MO Audit algorithm F1-GCHG-CDGP. Also specify the C1-MDM2MtrSyncRequest BO in the Sync Request BO MO Option. |
| MTR CONFIG | Specify the generic MO Audit algorithm F1-GCHG-CDGP. Also specify the C1-MDM2MtrConfigSyncRequest BO in the Sync Request BO MO Option. |

| Maintenance Object | Description |
|--------------------|--|
| SP/MTR HIST | Specify the generic MO Audit algorithm F1-GCHG-CDCP. Also specify the C1-MDM2SpMtrHistSyncRequest BO in the Sync Request BO MO Option. |
| METER READ | Specify the generic MO Audit algorithm F1-GCHG-CDCP. Also specify the C1-MDM2MRSyncRequest BO in the Sync Request BO MO Option. |

Business Object

| Business Object | Description |
|---|--|
| C1-MDM2PersonSyncRequest, C1-MDM2SASyncRequest, C1-MDM2SPSyncRequest, C1-MDM2MtrSyncRequest, C1-MDM2MtrConfigSyncRequest, C1-MDM2SpMtrHistSyncRequest, C1-MDM2MRSyncRequest | <p>These business objects define the behavior of the outbound sync requests for Oracle Utilities Meter Data Management. It contains the schema elements monitored and synchronized to Oracle Utilities Meter Data Management.</p> <p>The following BO Options must be configured to create the outbound sync request:</p> <ul style="list-style-type: none"> Outbound Message Type: This has a reference to the outbound message BO to use. The base package includes the following BOs for use with each sync request: C1-MDM2PersonSyncReqOutMsg, C1-MDM2SASyncReqOutMsg, C1-MDM2SPSyncReqOutMsg, C1-MDM2MtrSyncReqOutMsg, C1-MDM2MtrConfigSyncReqOutMsg, C1-MDM2MRSyncReqOutMsg and C1-SpMtrHistSyncReqOutMsg. See Defining Outbound Message Types in the user documentation for more information. External System: This has a reference to the outbound message type and its corresponding configuration for communicating with the external system. The base package includes the message XSL C1-CCBJMSQAddNamespace.xsl. See External Systems in the user documentation for more information. <p>Specify the pre-processing algorithm configured in the previous section.</p> <p>Specify the time out algorithm as a monitor algorithm on the Awaiting Acknowledgement state for this BO.</p> <p>Specify the To Do creation algorithm on the Error state for this BO.</p> <p>Depending on the technology used to communicate the sync request to the external system, you may need to create your own enter algorithm and plug it into the Send Request state. The base package comes with an algorithm that creates a message and sends it into a JMS Queue. If your implementation uses this algorithm (C1-CR-OUTMSG), you must define the BO Options for External System and Outbound Message Type.</p> |

| Business Object | Description |
|----------------------------|---|
| C1-UsageRequest | <p>This business object defines the behavior of a usage request.</p> <p>To configure your system for usage requests using this business object:</p> <ul style="list-style-type: none"> • Create a bill segment type for service agreements that require bill determinants. This bill segment type should reference the following base product algorithms: <ul style="list-style-type: none"> ○ Create Algorithm: Create bill segment using a usage request. ○ Get Consumption Algorithm: Get bill segment consumption using a usage request. • Set up SA types for service agreements that require bill determinants. These SA types should have a special role flag of Bill Determinants Required and should reference the bill segment type mentioned above. • A cancellation reason is required when a usage request is cancelled. Your implementation must define valid cancel reasons. Navigate to the lookup page and then define valid values for the lookup field C1_USG_CANCEL_RSN_FLG. • Create a 'Check for Response Timeout' algorithm (see above) and specify your timeout criteria. Update the Awaiting Bill Determinants state on the usage request BO to reference the timeout algorithm. <p>In addition to the standard BO options, the following BO options are relevant to usage request business objects:</p> <ul style="list-style-type: none"> • External System: An external system is required to communicate usage requests to the external system. • Outbound Message Type: An outbound message type is required for the usage request outbound message. |
| C1-UsageRequestNonCyclical | <p>This business object defines the behavior of a usage request created from non-cyclical or online bill generation.</p> <p>In addition to the standard BO options, the following BO options are relevant to usage request business objects:</p> <ul style="list-style-type: none"> • External System: An external system is required to communicate usage requests to the external system. • Outbound Message Type: An outbound message type is required for the non-cyclical billing usage request outbound message. This outbound message type must reference the base MDM Non-Cyclical Billing Usage Request Outbound Message. |

| Business Object | Description |
|--------------------------------|---|
| C1-UsageRequestCyclicalBilling | <p>This business object defines the behavior of a usage request created from the cyclical or batch billing process.</p> <p>In addition to the standard BO options, the following BO options are relevant to usage request business objects:</p> <ul style="list-style-type: none"> • External System: An external system is required to communicate usage requests to the external system. • Outbound Message Type: An outbound message type is required for the cyclical billing usage request outbound message. This outbound message type must reference the base MDM Cyclical Billing Usage Request Outbound Message business object. <p>There are two possible options if MDM is unable to calculate bill determinants within the bill cycle window. The first option is for CCB to create and send a usage request each night of the billing window and for MDM to return an error each night it's unable to calculate usage. The second option is for CCB to send a usage request on the first night of the billing window and for MDM to keep retrying to calculate usage throughout the bill cycle window. If your implementation prefers the latter approach, then specify the Set Automated Retry On Usage Request algorithm on the MDM Cyclical Billing Usage Request BO.</p> |
| C1-CorrectedReadNotification | <p>This business object is used to process a corrected read notification received from Oracle Utilities Meter Data Management. The system attempts to find any frozen bill segments and rebills these segments using one of the following methods:</p> <ul style="list-style-type: none"> • Given a usage ID (MDM2 integration). • Given a service agreement and corrected read period (MDM1 integration). <p>To configure your system for corrected read processing using this business object:</p> <ul style="list-style-type: none"> • Ensure that it's specified as the OCBG Corrected Read BO maintenance object option on the Off Cycle Bill Generator MO (C1-OCBG) • A cancellation reason is required when a corrected read notification is cancelled. Your implementation must define valid cancel reasons. Navigate to the lookup page and define valid values for the lookup field C1_CORRD_CAN_RSN_FLG • Create a 'Check for Response Timeout' algorithm (see above) and specify your timeout criteria. Update the Processing Required state on the corrected read BO to reference the timeout algorithm <p>In addition to the standard BO options, the following BO options are relevant to usage request business objects:</p> <ul style="list-style-type: none"> • System Creation Only: Use this option to identify OCBG BO's that may not be instantiated by a user, for example, corrected reads are only created by the system when notification is received from MDM. This option is used to exclude a BO from the dropdown list of valid BO's on add. It also prevents the SA linked to the corrected read OCBG from being skipped by normal billing. |

Menus

Configure the following context menus to allow navigation from Oracle Utilities Customer Care and Billing to Oracle Utilities Meter Data Management:

| Menu | Navigation Option | Description |
|----------------------------|-------------------|---|
| CI_CONTEXTSERVICEPOINT | c1SPMDM2GoTo | Allows navigation from the CCB SP context menu to MDM service point portal |
| CI_CONTEXTSERVICEAGREEMENT | c1SAMDM2GoTo | Allows navigation from the CCB SA context menu to MDM usage subscription portal |
| CI_CONTEXTSERVICEAGREEMENT | c1SAGoToMDM2-360 | Allows navigation from the CCB SA context menu to MDM 360 View |
| CI_CONTEXTPERSON | c1PerMDM2GoTo | Allows navigation from the CCB person context menu to MDM contact portal |
| CI_CONTEXTMETER | c1MtrMDM2GoTo | Allows navigation from the CCB meter context menu to MDM device portal |
| CI_CONTEXTUSAGE | c1UsgMDM2GoTo | Allows navigation from the CCB usage request context menu to MDM usage transaction portal |

Once configured, users should be able to launch the Oracle Utilities Meter Data Management system from these context menus. Also note that these context menus have been configured in the demo environment; use the demo data as a reference.

Batch Scheduling

This is the batch process to run the sync request. It is a generic batch process that is used for different sync processes. It has a couple of parameters that can be used to control which sync request BOs to process.

| Batch Code | Description |
|------------|--|
| F1-SYNRQ | Sync Request Monitor Process. This is the batch process to run the sync request. It is a generic batch process that is used for different sync processes. It has a couple of parameters that can be used to control which sync request BOs to process. |

| Batch Parameters | Parameter Description | Value |
|--------------------------|---|---|
| maintenanceObject | Sync Request maintenance object. | F1-SYNC REQ (This is the default value.) |
| isRestrictedByBatchCode | The value of true restricts processing to sync requests whose current state is linked to this batch code. | |
| restrictToBusinessObject | Enter a business object code here to limit the process to sync requests linked to this business object. | |

| Batch Parameters | Parameter Description | Value |
|--------------------|---|---|
| restrictToBOStatus | Enter a status code here to limit the process to sync requests in this state. | PENDING Populate this value to only process sync request, in Pending status. |

| Batch Code | Description |
|------------|---|
| C1-SYNIL | Generic Sync Request Initial Load - This process creates an initial sync request BO for a particular MO. A script parameter is provided, so implementations can further restrict the creation of initial sync requests to certain records within the MO. |
| C1-USGDF | Usage Scheduled Monitor Process (Deferred) - This batch process invokes monitoring rules associated with the current state of usage records. This batch needs to be executed twice for the Business Object "C1-UsageRequestCyclicalBilling", once for Pending state and then for Billing Determinants Received state. |
| BILLING | Create bills using the bill cycle - The bill cycle process creates bills for accounts with an "open" bill cycle. |

To generate initial sync requests, submit the C1-SYNIL batch job. (See previous section for the parameters necessary to set it up.)

To transition Sync Requests out of the Pending state, run the F1-SYNRQ batch job.

To create Usage Requests from batch billing, submit the BILLING batch job.

To transition Usage Requests out of the Pending state or the Billing Determinants Received state, run the C1-USGDF batch job.

For more information about the sync request process, the business objects, maintenance objects, and other components used for this process, see the Oracle Utilities Framework User Guide section titled "Data Synchronization".

For more information about the usage request process, see the Oracle Utilities Customer Care and Billing User Guide chapter titled "Defining Meter, Item & Equipment Options".

JMS Configuration

This section describes the JMS configuration to be done in the Oracle Utilities Customer Care and Billing WebLogic server and in the Oracle Utilities Customer Care and Billing deployment XML files. Configure the JMS to receive JMS messages from the integration layer.

WebLogic Server JMS Configuration

To configure JMS the Oracle Utilities Customer Care and Billing WebLogic server, log in to the console using the URL `http://<server_name>:<port_number>/console`.

For example: `http://ccbserver:7001/console`

JMS Module

Create a new JMS module in the WebLogic console.

To create a JMS module used for remote queue configuration:

1. Open the WebLogic console and create a new JMS module.
2. Enter a meaningful name for the JMS module. This JMS module is used to create configurations which consume messages from remote WebLogic queues.

For example: MDMInegrationModule.

Foreign Server

Create a new Foreign server under the JMS module in the WebLogic console.

To create the Foreign Server used for remote queue configuration:

1. Enter the WebLogic console and select the JMS module created for the integration.
2. Create a Foreign server under the JMS module.
3. Enter the following for the Foreign server:
 - **Name** – Name for the Foreign server. For example: CCBMDMForeignServer
 - **JNDI Initial Context Factory** – *weblogic.jndi.WLInitialContextFactory*
 - **JNDI Connection URL** – Add the URL for the Integration SOA server.
For example: **t3://soaserver.com:8002**
 - **JNDI Properties Credential** – Password for the SOA server user
 - **JNDI Properties** - *java.naming.security.principal=<SOA Server user>*
For example: weblogic
4. Under the Foreign server, create a foreign destination for each remote queue.
 - **Name** – Name of the foreign destination.
 - **Local JNDI Name** – Add a local JNDI name for the Integration Queue. Local JNDI name is later added manually as part of configuration in weblogic-ejb-jar.xml → <weblogic-enterprise-bean> → <message-driven-descriptor> → <destination-jndi-name>.
 - **Remote JNDI Name** – JNDI name of the queue on the Integration SOA server. Few examples are as follows: For each integration point, one destination is created.

Person Sync

| Destination Name | Local JNDI Name | Remote JNDI Name |
|--------------------------|-----------------------------------|------------------------------|
| OUCCB2PersonSyncResponse | jms/LocalOUCCB2PersonSyncResponse | jms/OUCCB2PersonSyncResponse |

SP Sync

| Destination Name | Local JNDI Name | Remote JNDI Name |
|----------------------|-------------------------------|--------------------------|
| OUCCB2SPSyncResponse | jms/LocalOUCCB2SPSyncResponse | jms/OUCCB2SPSyncResponse |

SA Sync

| Destination Name | Local JNDI Name | Remote JNDI Name |
|----------------------|-------------------------------|--------------------------|
| OUCCB2SASyncResponse | jms/LocalOUCCB2SASyncResponse | jms/OUCCB2SASyncResponse |

Meter Sync

| Destination Name | Local JNDI Name | Remote JNDI Name |
|-------------------------|----------------------------------|-----------------------------|
| OUCCB2MeterSyncResponse | jms/LocalOUCCB2MeterSyncResponse | jms/OUCCB2MeterSyncResponse |

Meter Configuration Sync

| Destination Name | Local JNDI Name | Remote JNDI Name |
|-------------------------------|--|-----------------------------------|
| OUCCB2MeterConfigSyncResponse | jms/LocalOUCCB2MeterConfigSyncResponse | jms/OUCCB2MeterConfigSyncResponse |

SP-Meter History Sync

| Destination Name | Local JNDI Name | Remote JNDI Name |
|-------------------------------|--|-----------------------------------|
| OUCCB2SPMeterHistSyncResponse | jms/LocalOUCCB2SPMeterHistSyncResponse | jms/OUCCB2SPMeterHistSyncResponse |

Batch BD

| Destination Name | Local JNDI Name | Remote JNDI Name |
|-----------------------|--------------------------------|---------------------------|
| OUCCB2BatchBDResponse | jms/LocalOUCCB2BatchBDResponse | jms/OUCCB2BatchBDResponse |

Online BD

| Destination Name | Local JNDI Name | Remote JNDI Name |
|------------------------|---------------------------------|----------------------------|
| OUCCB2OnlineBDResponse | jms/LocalOUCCB2OnlineBDResponse | jms/OUCCB2OnlineBDResponse |

Replacement Reads

| Destination Name | Local JNDI Name | Remote JNDI Name |
|-----------------------|--------------------------------|---------------------------|
| OUCCB2ReplReadRequest | jms/LocalOUCCB2ReplReadRequest | jms/OUCCB2ReplReadRequest |

Scalar Meter Reads

| Destination Name | Local JNDI Name | Remote JNDI Name |
|-----------------------------|--------------------------------------|---------------------------------|
| OUCCB2MeterReadSyncResponse | jms/LocalOUCCB2MeterReadSyncResponse | jms/OUCCB2MeterReadSyncResponse |

5. Under the Foreign server, create a Remote Connection Factory.

- **Name** – Name of the remote connection factory.
- **Local JNDI Name** – Add a local JNDI name to the Integration Connection Factory. This JNDI name is added manually later as part of configuration in WebLogic-ejb-jar.xml → <weblogic-enterprise-bean> → <message-driven-descriptor> → <connection-factory-jndi-name>.
- **Remote JNDI Name** – JNDI name of the JMS Connection factory on the Integration SOA server.

For example:

| Connection Factory Name | Local JNDI Name | Remote JNDI Name |
|-------------------------------|--|-----------------------------------|
| OUCCB2OUMDM2ConnectionFactory | jms/LocalOUCCB2OUMDM2ConnectionFactory | jms/OUCCB2OUMDM2ConnectionFactory |

Configuration File Changes

Configure Message Driven Beans (MDB)

It is recommended that you use the Oracle Utilities Customer Care and Billing template and CM (Customer Modification) feature to make changes to these configuration files. This ensures that your modifications cannot be overwritten by future application patches.

Modify files: ejb-jar.xml and ejb-weblogic-jar.xml

Location: Oracle Utilities Customer Care and Billing Enterprise Archive (EAR) file

- The Oracle Utilities Customer Care and Billing configuration files, ejb-jar.xml and ejb-weblogic-jar.xml, must be modified to configure Message Driven Beans (MDB). MDBs receive messages from the integration queues. These files are part of the Oracle Utilities Customer Care and Billing Enterprise Archive (EAR) file.
- The Oracle Utilities Customer Care and Billing application needs to be redeployed after these changes are made.
- **Managing configuration files:** Configuration files such as config.xml, ejb-jar.xml, and ejb-weblogic-jar.xml are managed through template configuration files which reside in the environment directory. When the initialSetup.sh script is executed, environment specific information is combined with the template to create the target file which is then deployed to the correct location. When the environment is started (spl.sh start), changes are automatically deployed to WebLogic.
- **Overriding the existing template:** It is possible to override the existing template by providing another template file in the same location, with the same name, but prefixed with ".cm". For example, if etc/cm.ejb-jar.xml.template is found when initialSetup is run, the cm.ejb-jar.xml.template is used to generate the target ejb-jar.xml file.

- **Enabling changes for integration:** To enable your changes for integration with Oracle Utilities Meter Data Management it is recommended that you first make a "CM" copy of the existing template and then make your changes to the CM version. If there are any problems with starting the application, delete the CM versions of the files and rerun initialSetup to regenerate and redeploy the original versions.

If you make CM versions of the template files and later install a patch which updates the base template, the CM version will not be updated.

Note: Working examples of the configuration files are available for download from My Oracle Support in patch number 11793506 - CCB - MDMV2 INTEGRATION CONFIGURATION EXAMPLES. Before installing the examples, read the Product Fix design document included in the patch for more information.

Create a new MDB to receive messages from each integration inbound queue. For simplicity, we refer to the names of the target configuration files in the following examples, however you should make your changes in the etc/cm.<target file>.template version of the file, and then execute initialSetup.sh (Unix) or initialSetup.cmd (Windows) to deploy the generated file.

1. Create an MDB for each Oracle Utilities Customer Care and Billing inbound queue to receive messages and invoke CCB service.
2. Modify the ejb-jar.xml and weblogic-ejb-jar.xml files to configure the MDBs.
3. Add the <message-driven> and <container-transaction> tag for each inbound queue in ejb-jar.xml. Add a security role with role cisusers in ejb-jar.xml. Following is an example:

```
<?xml version="1.0" encoding="UTF-8"?>
<ejb-jar
  version="2.1"
  xmlns="http://java.sun.com/xml/ns/j2ee"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://java.sun.com/xml/ns/j2ee
http://java.sun.com/xml/ns/j2ee/ejb-jar_2_1.xsd">
  <display-name>ServiceBean</display-name>
  <enterprise-beans>
    <session>
      <description>Deployment descriptor for the Service
Bean</description>
      <display-name>Service Bean</display-name>
      <ejb-name>SPLServiceBean</ejb-name>
      <home>com.splwg.ejb.service.ServiceHome</home>
      <remote>com.splwg.ejb.service.Service</remote>
      <ejb-class>com.splwg.ejb.service.impl.ServiceBean</ejb-class>
      <session-type>Stateless</session-type>
      <transaction-type>Bean</transaction-type>
      <env-entry>
        <description>XAI HTTP Caller URL</description>
        <env-entry-name>XAIServerURL</env-entry-name>
        <env-entry-type>java.lang.String</env-entry-type>
        <env-entry-
value>http://localhost:7151/spl/XAIApp/xaiserver</env-entry-value>
      </env-entry>
      <env-entry>
        <description>XAI HTTP Caller User</description>
        <env-entry-name>HTTPBasicAuthUser</env-entry-name>
        <env-entry-type>java.lang.String</env-entry-type>
        <env-entry-value>SPLXAI</env-entry-value>
      </env-entry>
    </session>
  </enterprise-beans>
</ejb-jar>
```



```
<env-entry>
  <description>XAI HTTP Caller User password</description>
  <env-entry-name>HTTPBasicAuthPasswordEnc</env-entry-name>
  <env-entry-type>java.lang.String</env-entry-type>
  <env-entry-value>splxai00</env-entry-value>
</env-entry>
</session>

<!-- Batch BD Integration Point -->
<message-driven>
  <description>MDB for OUCCB2BatchBDResponse</description>
  <display-name>OUCCB2BatchBDResponse</display-name>
  <ejb-name>OUCCB2BatchBDResponse</ejb-name>
  <ejb-class>com.splwg.ejb.mdb.MessageProcessor</ejb-class>
  <messaging-type>javax.jms.MessageListener</messaging-type>
  <transaction-type>Bean</transaction-type>
  <message-destination-type>javax.jms.Queue</message-destination-
type>
</message-driven>

<!-- Meter Configuration Sync Integration Point -->
<message-driven>
  <description>MDB for OUCCB2MeterConfigSyncResponse</description>
  <display-name>OUCCB2MeterConfigSyncResponse</display-name>
  <ejb-name>OUCCB2MeterConfigSyncResponse</ejb-name>
  <ejb-class>com.splwg.ejb.mdb.MessageProcessor</ejb-class>
  <messaging-type>javax.jms.MessageListener</messaging-type>
  <transaction-type>Bean</transaction-type>
  <message-destination-type>javax.jms.Queue</message-destination-
type>
</message-driven>

<!-- Meter Sync Integration Point -->
<message-driven>
  <description>MDB for OUCCB2MeterSyncResponse</description>
  <display-name>OUCCB2MeterSyncResponse</display-name>
  <ejb-name>OUCCB2MeterSyncResponse</ejb-name>
  <ejb-class>com.splwg.ejb.mdb.MessageProcessor</ejb-class>
  <messaging-type>javax.jms.MessageListener</messaging-type>
  <transaction-type>Bean</transaction-type>
  <message-destination-type>javax.jms.Queue</message-destination-
type>
</message-driven>

<!-- Online BD Integration Point -->
<message-driven>
  <description>MDB for OUCCB2OnlineBDResponse</description>
  <display-name>OUCCB2OnlineBDResponse</display-name>
  <ejb-name>OUCCB2OnlineBDResponse</ejb-name>
  <ejb-class>com.splwg.ejb.mdb.MessageProcessor</ejb-class>
  <messaging-type>javax.jms.MessageListener</messaging-type>
  <transaction-type>Bean</transaction-type>
  <message-destination-type>javax.jms.Queue</message-destination-
type>
</message-driven>

<!-- Person Sync Integration Point -->
<message-driven>
  <description>MDB for OUCCB2PersonSyncResponse</description>
  <display-name>OUCCB2PersonSyncResponse</display-name>
  <ejb-name>OUCCB2PersonSyncResponse</ejb-name>
  <ejb-class>com.splwg.ejb.mdb.MessageProcessor</ejb-class>
  <messaging-type>javax.jms.MessageListener</messaging-type>
  <transaction-type>Bean</transaction-type>
  <message-destination-type>javax.jms.Queue</message-destination-
type>
```

```

</message-driven>
<!-- Replacement Reads Integration Point -->
<message-driven>
  <description>MDB for OUCCB2ReplReadRequest</description>
  <display-name>OUCCB2ReplReadRequest</display-name>
  <ejb-name>OUCCB2ReplReadRequest</ejb-name>
  <ejb-class>com.splwg.ejb.mdb.MessageProcessor</ejb-class>
  <messaging-type>javax.jms.MessageListener</messaging-type>
  <transaction-type>Bean</transaction-type>
  <message-destination-type>javax.jms.Queue</message-destination-
type>
</message-driven>
<!-- SA Sync Integration Point -->
<message-driven>
  <description>MDB for OUCCB2SASyncResponse</description>
  <display-name>OUCCB2SASyncResponse</display-name>
  <ejb-name>OUCCB2SASyncResponse</ejb-name>
  <ejb-class>com.splwg.ejb.mdb.MessageProcessor</ejb-class>
  <messaging-type>javax.jms.MessageListener</messaging-type>
  <transaction-type>Bean</transaction-type>
  <message-destination-type>javax.jms.Queue</message-destination-
type>
</message-driven>
<!-- SP Meter History Sync Integration Point -->
<message-driven>
  <description>MDB for OUCCB2SPMeterHistSyncResponse</description>
  <display-name>OUCCB2SPMeterHistSyncResponse</display-name>
  <ejb-name>OUCCB2SPMeterHistSyncResponse</ejb-name>
  <ejb-class>com.splwg.ejb.mdb.MessageProcessor</ejb-class>
  <messaging-type>javax.jms.MessageListener</messaging-type>
  <transaction-type>Bean</transaction-type>
  <message-destination-type>javax.jms.Queue</message-destination-
type>
</message-driven>
<!-- SP Sync Integration Point -->
<message-driven>
  <description>MDB for OUCCB2SPSyncResponse</description>
  <display-name>OUCCB2SPSyncResponse</display-name>
  <ejb-name>OUCCB2SPSyncResponse</ejb-name>
  <ejb-class>com.splwg.ejb.mdb.MessageProcessor</ejb-class>
  <messaging-type>javax.jms.MessageListener</messaging-type>
  <transaction-type>Bean</transaction-type>
  <message-destination-type>javax.jms.Queue</message-destination-
type>
</message-driven>
<!--Scalar Meter Read Sync Integration Point -->
<message-driven>
  <description>MDB for OUCCB2MeterReadSyncResponse</description>
  <display-name>OUCCB2MeterReadSyncResponse</display-name>
  <ejb-name>OUCCB2MeterReadSyncResponse</ejb-name>
  <ejb-class>com.splwg.ejb.mdb.MessageProcessor</ejb-class>
  <messaging-type>javax.jms.MessageListener</messaging-type>
  <transaction-type>Bean</transaction-type>
  <message-destination-type>javax.jms.Queue</message-destination-
type>
</message-driven>

</enterprise-beans>

<assembly-descriptor>

```

```
<security-role>
  <role-name>cisusers</role-name>
</security-role>
<!-- Batch BD Integration Point -->
<container-transaction>
  <method>
    <ejb-name>OUCCB2BatchBDResponse</ejb-name>
    <method-name>onMessage</method-name>
  </method>
  <trans-attribute>NotSupported</trans-attribute>
</container-transaction>
<!-- Meter Configuration Sync Integration Point -->
<container-transaction>
  <method>
    <ejb-name>OUCCB2MeterConfigSyncResponse</ejb-name>
    <method-name>onMessage</method-name>
  </method>
  <trans-attribute>NotSupported</trans-attribute>
</container-transaction>
<!-- Meter Sync Integration Point -->
<container-transaction>
  <method>
    <ejb-name>OUCCB2MeterSyncResponse</ejb-name>
    <method-name>onMessage</method-name>
  </method>
  <trans-attribute>NotSupported</trans-attribute>
</container-transaction>
<!-- Online BD Integration Point -->
<container-transaction>
  <method>
    <ejb-name>OUCCB2OnlineBDResponse</ejb-name>
    <method-name>onMessage</method-name>
  </method>
  <trans-attribute>NotSupported</trans-attribute>
</container-transaction>
<!-- Person Sync Integration Point -->
<container-transaction>
  <method>
    <ejb-name>OUCCB2PersonSyncResponse</ejb-name>
    <method-name>onMessage</method-name>
  </method>
  <trans-attribute>NotSupported</trans-attribute>
</container-transaction>
<!-- Replacement Reads Integration Point -->
<container-transaction>
  <method>
    <ejb-name>OUCCB2ReplReadRequest</ejb-name>
    <method-name>onMessage</method-name>
  </method>
  <trans-attribute>NotSupported</trans-attribute>
</container-transaction>
<!-- SA Sync Integration Point -->
<container-transaction>
  <method>
    <ejb-name>OUCCB2SASyncResponse</ejb-name>
    <method-name>onMessage</method-name>
  </method>
  <trans-attribute>NotSupported</trans-attribute>
</container-transaction>
<!-- SP Meter History Sync Integration Point -->
<container-transaction>
  <method>
```

```

        <ejb-name>OUCCB2SPMeterHistSyncResponse</ejb-name>
        <method-name>onMessage</method-name>
    </method>
    <trans-attribute>NotSupported</trans-attribute>
</container-transaction>
    <!-- SP Sync Integration Point -->
<container-transaction>
    <method>
        <ejb-name>OUCCB2SPSyncResponse</ejb-name>
        <method-name>onMessage</method-name>
    </method>
    <trans-attribute>NotSupported</trans-attribute>
</container-transaction>
    <!--Scalar Meter Read Sync Integration Point -->
<container-transaction>
    <method>
        <ejb-name>OUCCB2MeterReadSyncResponse</ejb-name>
        <method-name>onMessage</method-name>
    </method>
    <trans-attribute>NotSupported</trans-attribute>
</container-transaction>

</assembly-descriptor>

</ejb-jar>

```

4. Modify weblogic-ejb-jar.xml. Add the <weblogic-enterprise-bean> tag for each inbound queue. Add a security role with the role "cisusers".
5. References in the <weblogic-enterprise-bean> tag are as follows:
 - <ejb-name> - MDB name given in the ejb-jar.xml file.
 - <destination-jndi-name> - JNDI name provided in JMS module → Foreign server → Foreign destination → Local JNDI name.
 - <connection-factory-jndi-name> - JNDI name provided in JMS module → Foreign server → Remote Connection Factory → Local JNDI name. Following is an example:

```

<?xml version="1.0" encoding="UTF-8"?>
<!--
    ** This file was automatically generated by
    ** EJBGen WebLogic Server 10.0 SP0   Wed May 9 18:10:27 EDT 2007 933139
-->
<weblogic-ejb-jar
    xmlns="http://www.bea.com/ns/weblogic/90"
    xmlns:j2ee="http://java.sun.com/xml/ns/j2ee"
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
    xsi:schemaLocation="http://www.bea.com/ns/weblogic/90
http://www.bea.com/ns/weblogic/90/weblogic-ejb-jar.xsd">
    <weblogic-enterprise-bean>
        <ejb-name>SPLServiceBean</ejb-name>
        <jndi-name>spl/servicebean</jndi-name>
    </weblogic-enterprise-bean>
    <!--Batch BD Integration Point -->
    <weblogic-enterprise-bean>
        <ejb-name>OUCCB2BatchBDResponse</ejb-name>
        <message-driven-descriptor>
            <pool>
                <max-beans-in-free-pool>5</max-beans-in-free-pool>
            </pool>
        </message-driven-descriptor>
    </weblogic-enterprise-bean>

```

```
        <initial-beans-in-free-pool>1</initial-beans-in-free-pool>
    </pool>
    <destination-jndi-
name>jms/LocalOUCCB2BatchBDResponse</destination-jndi-name>
    <connection-factory-jndi-
name>jms/LocalOUCCB2OUMDM2ConnectionFactory</connection-factory-jndi-name>
    </message-driven-descriptor>
</weblogic-enterprise-bean>
<!--Meter Configuration Sync Integration Point -->
<weblogic-enterprise-bean>
    <ejb-name>OUCCB2MeterConfigSyncResponse</ejb-name>
    <message-driven-descriptor>
        <pool>
            <max-beans-in-free-pool>5</max-beans-in-free-pool>
            <initial-beans-in-free-pool>1</initial-beans-in-free-pool>
        </pool>
        <destination-jndi-
name>jms/LocalOUCCB2MeterConfigSyncResponse</destination-jndi-name>
        <connection-factory-jndi-
name>jms/LocalOUCCB2OUMDM2ConnectionFactory</connection-factory-jndi-name>
        </message-driven-descriptor>
    </weblogic-enterprise-bean>
<!--Meter Sync Integration Point -->
<weblogic-enterprise-bean>
    <ejb-name>OUCCB2MeterSyncResponse</ejb-name>
    <message-driven-descriptor>
        <pool>
            <max-beans-in-free-pool>5</max-beans-in-free-pool>
            <initial-beans-in-free-pool>1</initial-beans-in-free-pool>
        </pool>
        <destination-jndi-
name>jms/LocalOUCCB2MeterSyncResponse</destination-jndi-name>
        <connection-factory-jndi-
name>jms/LocalOUCCB2OUMDM2ConnectionFactory</connection-factory-jndi-name>
        </message-driven-descriptor>
    </weblogic-enterprise-bean>
<!--Online BD Integration Point -->
<weblogic-enterprise-bean>
    <ejb-name>OUCCB2OnlineBDResponse</ejb-name>
    <message-driven-descriptor>
        <pool>
            <max-beans-in-free-pool>5</max-beans-in-free-pool>
            <initial-beans-in-free-pool>1</initial-beans-in-free-pool>
        </pool>
        <destination-jndi-
name>jms/LocalOUCCB2OnlineBDResponse</destination-jndi-name>
        <connection-factory-jndi-
name>jms/LocalOUCCB2OUMDM2ConnectionFactory</connection-factory-jndi-name>
        </message-driven-descriptor>
    </weblogic-enterprise-bean>
<!--Person Sync Integration Point -->
<weblogic-enterprise-bean>
    <ejb-name>OUCCB2PersonSyncResponse</ejb-name>
    <message-driven-descriptor>
        <pool>
            <max-beans-in-free-pool>5</max-beans-in-free-pool>
            <initial-beans-in-free-pool>1</initial-beans-in-free-pool>
        </pool>
        <destination-jndi-
name>jms/LocalOUCCB2PersonSyncResponse</destination-jndi-name>
        <connection-factory-jndi-
name>jms/LocalOUCCB2OUMDM2ConnectionFactory</connection-factory-jndi-name>
        </message-driven-descriptor>
```

```
</weblogic-enterprise-bean>
  <!--Replacement Reads Integration Point -->
<weblogic-enterprise-bean>
  <ejb-name>OUCCB2ReplReadRequest</ejb-name>
  <message-driven-descriptor>
    <pool>
      <max-beans-in-free-pool>5</max-beans-in-free-pool>
      <initial-beans-in-free-pool>1</initial-beans-in-free-pool>
    </pool>
    <destination-jndi-
name>jms/LocalOUCCB2ReplReadRequest</destination-jndi-name>
    <connection-factory-jndi-
name>jms/LocalOUCCB2OUMDM2ConnectionFactory</connection-factory-jndi-name>
  </message-driven-descriptor>
</weblogic-enterprise-bean>
  <!--SA Sync Integration Point -->
<weblogic-enterprise-bean>
  <ejb-name>OUCCB2SASyncResponse</ejb-name>
  <message-driven-descriptor>
    <pool>
      <max-beans-in-free-pool>5</max-beans-in-free-pool>
      <initial-beans-in-free-pool>1</initial-beans-in-free-pool>
    </pool>
    <destination-jndi-name>jms/LocalOUCCB2SASyncResponse</destination-
jndi-name>
    <connection-factory-jndi-
name>jms/LocalOUCCB2OUMDM2ConnectionFactory</connection-factory-jndi-name>
  </message-driven-descriptor>
</weblogic-enterprise-bean>
  <!--SP Meter History Sync Integration Point -->
<weblogic-enterprise-bean>
  <ejb-name>OUCCB2SPMeterHistSyncResponse</ejb-name>
  <message-driven-descriptor>
    <pool>
      <max-beans-in-free-pool>5</max-beans-in-free-pool>
      <initial-beans-in-free-pool>1</initial-beans-in-free-pool>
    </pool>
    <destination-jndi-
name>jms/LocalOUCCB2SPMeterHistSyncResponse</destination-jndi-name>
    <connection-factory-jndi-
name>jms/LocalOUCCB2OUMDM2ConnectionFactory</connection-factory-jndi-name>
  </message-driven-descriptor>
</weblogic-enterprise-bean>
  <!--SP Sync Integration Point -->
<weblogic-enterprise-bean>
  <ejb-name>OUCCB2SPSyncResponse</ejb-name>
  <message-driven-descriptor>
    <pool>
      <max-beans-in-free-pool>5</max-beans-in-free-pool>
      <initial-beans-in-free-pool>1</initial-beans-in-free-pool>
    </pool>
    <destination-jndi-name>jms/LocalOUCCB2SPSyncResponse</destination-
jndi-name>
    <connection-factory-jndi-
name>jms/LocalOUCCB2OUMDM2ConnectionFactory</connection-factory-jndi-name>
  </message-driven-descriptor>
</weblogic-enterprise-bean>
  <!--Scalar Meter Read Sync Integration Point -->
<weblogic-enterprise-bean>
  <ejb-name>OUCCB2MeterReadSyncResponse</ejb-name>

    <max-beans-in-free-pool>5</max-beans-in-free-pool>
```

```
        <initial-beans-in-free-pool>1</initial-beans-in-free-pool>
    </pool>
    <destination-jndi-
name>jms/LocalOUCCB2MeterReadSyncResponse</destination-jndi-name>
    <connection-factory-jndi-
name>jms/LocalOUCCB2OUMDM2ConnectionFactory</connection-factory-jndi-name>
    </message-driven-descriptor>
</weblogic-enterprise-bean>

    <security-role-assignment>
        <role-name>cisusers</role-name>
        <principal-name>cisusers</principal-name>
    </security-role-assignment>

</weblogic-ejb-jar>
```

XAI Configuration

XAI JNDI Server

Create a new XAI JNDI server pointing to the Integration SOA server.

To create XAI JNDI server configured to communicate with integration layer:

1. In the Admin menu, navigate to XAI JNDI server.
2. Enter the XAI JNDI server name. For example: **CI_MDM_JNDI**
3. Enter the XAI JNDI server description For example: **CCB-MDM Integration server**
4. Enter the Provider URL in the format **t3://<SOA Server>: <SOA Port>**. For example:
t3://soaserver.us.oracle.com:8002

XAI JMS Queue

Create a new XAI JMS queue for each integration queue where Oracle Utilities Customer Care and Billing sends messages.

To create XAI JMS queue:

1. In the Admin menu, navigate to XAI JMS queue.
2. Enter the following:
 - **XAI JMS Queue** – Queue name in Oracle Utilities Customer Care and Billing.
 - **Description** – Queue description
 - **Queue Name** – JNDI name of the queue on the Integration server. For example:
jms/OUCCB2PersonSyncRequest.
 - **Target Client Flag** – **JMS**
 - **XAI JNDI Server** – Select the XAI JNDI server created for integration.

Note: Only define the queues that Oracle Utilities Customer Care and Billing will be publishing or writing messages to.

Examples of the JMS queue that need to be setup for the different integration points are as follows:

Person Sync Integration Point

| XAI JMS Queue | Description | Queue Name | Target Client Flag | XAI JNDI Server |
|---------------|---------------------|-----------------------------|--------------------|-----------------|
| CI_MDM2PSyn | Person Sync Request | jms/OUCCB2PersonSyncRequest | JMS | CI_MDM_JNDI |

SP Sync Integration Point

| XAI JMS Queue | Description | Queue Name | Target Client Flag | XAI JNDI Server |
|---------------|-----------------|-------------------------|--------------------|-----------------|
| CI_MDM2SPSyn | SP Sync Request | jms/OUCCB2SPSyncRequest | JMS | CI_MDM_JNDI |

SA Sync Integration Point

| XAI JMS Queue | Description | Queue Name | Target Client Flag | XAI JNDI Server |
|---------------|-----------------|-------------------------|--------------------|-----------------|
| CI_MDM2SASyn | SA Sync Request | jms/OUCCB2SASyncRequest | JMS | CI_MDM_JNDI |

Meter Sync Integration Point

| XAI JMS Queue | Description | Queue Name | Target Client Flag | XAI JNDI Server |
|---------------|--------------------|----------------------------|--------------------|-----------------|
| CI_MDM2MSyn | Meter Sync Request | jms/OUCCB2MeterSyncRequest | JMS | CI_MDM_JNDI |

Meter Configuration Sync Integration Point

| XAI JMS Queue | Description | Queue Name | Target Client Flag | XAI JNDI Server |
|---------------|----------------------------------|----------------------------------|--------------------|-----------------|
| CI_MDM2MCSyn | Meter Configuration Sync Request | jms/OUCCB2MeterConfigSyncRequest | JMS | CI_MDM_JNDI |

SP-Meter History Sync Integration Point

| XAI JMS Queue | Description | Queue Name | Target Client Flag | XAI JNDI Server |
|---------------|-------------------------------|----------------------------------|--------------------|-----------------|
| CI_MDM2SHSyn | SP-Meter History Sync Request | jms/OUCCB2SPMeterHistSyncRequest | JMS | CI_MDM_JNDI |

Batch BD Integration Point

| XAI JMS Queue | Description | Queue Name | Target Client Flag | XAI JNDI Server |
|---------------|--------------------------------|--------------------------|--------------------|-----------------|
| BatchBDReq2 | Batch Bill Determinant Request | jms/OUCCB2BatchBDRequest | JMS | CI_MDM_JNDI |

Online BD Integration Point

| XAI JMS Queue | Description | Queue Name | Target Client Flag | XAI JNDI Server |
|---------------|---------------------------------|---------------------------|--------------------|-----------------|
| OnlineBDReq2 | Online Bill Determinant Request | jms/OUCCB2OnlineBDRequest | JMS | CI_MDM_JNDI |

Scalar Meter Read Sync Integration Point

| XAI JMS Queue | Description | Queue Name | Target Client Flag | XAI JNDI Server |
|---------------|--------------------------------|--------------------------------|--------------------|-----------------|
| CI_MDM2MRSyn | Scalar Meter Read Sync Request | jms/OUCCB2MeterReadSyncRequest | JMS | CI_MDM_JNDI |

XAI JMS Connection

Create a new XAI JMS connection used to connect to the integration queues.

To create XAI JMS Connection:

1. In the Admin menu, navigate to XAI JMS connection.
2. Enter the following:
 - **XAI JMS Connection** – Connection name in Oracle Utilities Customer Care and Billing.
 - **Description** – Connection description
 - **XAI JNDI Server** – Select the XAI JNDI server created for this integration (as described in the XAI JNDI Server section).
 - **JNDI ConnectionFactory** – JNDI name of the connection factory on the Integration server. For example: `jms/OUCCOUMDMConnectionFactory`

| XAI JMS Connection | Description | XAI JNDI Server | JNDI Connection Factory |
|--------------------|--------------------------------|-----------------|-----------------------------------|
| CI_MDM2_CF | CCB MDM Integration Connection | CI_MDM_JNDI | jms/OUCCB2OUMDM2ConnectionFactory |

XAI Sender

Create a new XAI Sender for each Oracle Utilities Customer Care and Billing Outbound integration queue.

To create a realtime XAI sender configured to communicate with integration layer:

1. In the Admin menu, navigate to XAI Sender.
2. Enter a unique XAI sender and its description.
3. Populate the following values:
 - **XAI Sender** – Sender name in Oracle Utilities Customer Care and Billing.
 - **Description** – Sender description
 - **Invocation Type** – *Real-time*
 - **XAI Class** – *RTJMSQSND*R (Realtime JMS Queue Sender)
 - **Active** - Select the checkbox.
 - **MSG Encoding** – *UTF-8 message encoding*
 - **XAI JMS Connection** – XAI JMS connection created for the integration.
 - **XAI JMS Queue** – XAI JMS queue created for the Oracle Utilities Customer Care and Billing outbound queue.
4. Select the Context tab and set values for the following context types:
 - **JMS Message Type (Bytes(Y)/Text(N))** – *N*
 - **JMS User Name** – user for the SOA server to be accessed.
 - **JMS User Password** – Password for the SOA server to be accessed.

Examples of the XAI sender that need to be setup for the different integration points are as follows:

Person Sync Integration Point

| XAI Sender | Description | XAI JMS Connection | XAI JMS Queue |
|-------------|--------------------------------|--------------------|---------------|
| CI_MDM2PSyn | MDM Person Sync Request Sender | CI_MDM2_CF | CI_MDM2PSyn |

SP Sync Integration Point

| XAI Sender | Description | XAI JMS Connection | XAI JMS Queue |
|--------------|----------------------------|--------------------|---------------|
| CI_MDM2SPSyn | MDM SP Sync Request Sender | CI_MDM2_CF | CI_MDM2SPSyn |

SA Sync Integration Point

| XAI Sender | Description | XAI JMS Connection | XAI JMS Queue |
|--------------|----------------------------|--------------------|---------------|
| CI_MDM2SASyn | MDM SA Sync Request Sender | CI_MDM2_CF | CI_MDM2SASyn |

Meter Sync Integration Point

| XAI Sender | Description | XAI JMS Connection | XAI JMS Queue |
|-------------|-------------------------------|--------------------|---------------|
| CI_MDM2MSyn | MDM Meter Sync Request Sender | CI_MDM2_CF | CI_MDM2MSyn |

Meter Configuration Sync Integration Point

| XAI Sender | Description | XAI JMS Connection | XAI JMS Queue |
|--------------|---|--------------------|---------------|
| CI_MDM2MCSyn | MDM Meter Configuration Sync Request Sender | CI_MDM2_CF | CI_MDM2MCSyn |

SP-Meter History Sync Integration Point

| XAI Sender | Description | XAI JMS Connection | XAI JMS Queue |
|--------------|--|--------------------|---------------|
| CI_MDM2SHSyn | MDM SP-Meter History Sync Request Sender | CI_MDM2_CF | CI_MDM2SHSyn |

Batch BD Integration Point

| XAI Sender | Description | XAI JMS Connection | XAI JMS Queue |
|-------------|---|--------------------|---------------|
| BatchBDReq2 | MDM Batch Bill Determinant JMS Queue Sender | CI_MDM2_CF | BatchBDReq2 |

Online BD Integration Point

| XAI Sender | Description | XAI JMS Connection | XAI JMS Queue |
|--------------|--|--------------------|---------------|
| OnlineBDReq2 | MDM Online Bill Determinant JMS Queue Sender | CI_MDM2_CF | OnlineBDReq2 |

Scalar Meter Read Integration Point

| XAI Sender | Description | XAI JMS Connection | XAI JMS Queue |
|--------------|--|--------------------|---------------|
| CI_MDM2MRSyn | MDM Scalar Meter Read JMS Queue Sender | CI_MDM2_CF | CI_MDM2MRSyn |

Create a new XAI Sender to invoke integration for the 'Get Register Read High-Low Boundaries Flow'.

To create a realtime XAI sender configured to invoke the integration BPEL process:

1. In the Admin menu, navigate to XAI Sender.
2. Enter a unique XAI sender and its description.
3. Populate the following values:
 - **XAI Sender** – Sender name in Oracle Utilities Customer Care and Billing (Ex:

REGHILOW).

- **Description** – Sender description
- **Invocation Type** – *Real-time*
- **XAI Class** – *RTHTTPSNDR* (Real Time Sender to route messages via HTTP)
- **Active** - Select the checkbox.
- **MSG Encoding** – *UTF-8 message encoding*

4. Select the Context tab and set values for the following context types:

- **HTTP Header** – **SOAPAction:"process"**
- **HTTP Login User** – User ID to access Integration BPEL process
- **HTTP Password** - Password to access Integration BPEL process
- **HTTP Method (POST/GET)** – **POST**
- **HTTP Timeout** - **60**
- **HTTP Transport Method** - **SendReceive**
- **HTTP URL 1** - Set the URL to be accessed. If the URL value does not fit, use the additional HTTP URL types to set the complete URL.

Ex: http://demo1:8072/soa-infra/services/CCB2-MDM2/OUCCB2OUMDM2HighLowReadReqEBF/ouccb2oumdm2highlowreadreqebf_client_ep

Outbound Message Type

To create a new outbound message type for each Oracle Utilities Customer Care and Billing outbound integration queue:

1. In the Admin menu, navigate to Outbound Message Type.
2. Enter an outbound message type, description, and detailed description.
3. Select the outbound message business object created for a specific outbound queue.

Examples of the Outbound Message Type that need to be setup for the different integration points are as follows:

Person Sync Integration Point

| Outbound Message Type | Description | Business Object |
|-----------------------|--|----------------------------|
| CI_MDM2PSYN | MDM Person Sync Request Outbound Message | C1-MDM2PersonSyncReqOutMsg |

SP Sync Integration Point

| Outbound Message Type | Description | Business Object |
|-----------------------|--------------------------------------|------------------------|
| CI_MDM2SPSYN | MDM SP Sync Request Outbound Message | C1-MDM2SPSyncReqOutMsg |

SA Sync Integration Point

| Outbound Message Type | Description | Business Object |
|-----------------------|--------------------------------------|------------------------|
| CI_MDM2SASYN | MDM SA Sync Request Outbound Message | C1-MDM2SASyncReqOutMsg |

Meter Sync Integration Point

| Outbound Message Type | Description | Business Object |
|-----------------------|---|-------------------------|
| CI_MDM2MSYN | MDM Meter Sync Request Outbound Message | C1-MDM2MtrSyncReqOutMsg |

Meter Configuration Sync Integration Point

| Outbound Message Type | Description | Business Object |
|-----------------------|---|-------------------------------|
| CI_MDM2MCSYN | MDM Meter Configuration Sync Request Outbound Message | C1-MDM2MtrConfigSyncReqOutMsg |

SP-Meter History Sync Integration Point

| Outbound Message Type | Description | Business Object |
|-----------------------|--|-------------------------------|
| CI_MDM2SHSYN | MDM SP-Meter History Sync Request Outbound Message | C1-MDM2SpMtrHistSyncReqOutMsg |

Batch BD Integration Point

| Outbound Message Type | Description | Business Object |
|-----------------------|--|-------------------------|
| CI_MDM_BBD | MDM Batch Bill Determinants Outbound Message | C1-CyclicalUsgReqOutMsg |

Online BD Integration Point

| Outbound Message Type | Description | Business Object |
|-----------------------|---|----------------------------|
| CI_MDM_OBD | MDM Online Bill Determinants Outbound Message | C1-NonCyclicalUsgReqOutMsg |

Scalar Meter Read Sync Integration Point

| Outbound Message Type | Description | Business Object |
|-----------------------|--|------------------------|
| CI_MDM2MRSYN | MDM Meter Read Sync Request Outbound Message | C1-MDM2MRSyncReqOutMsg |

Get Register Read High-Low Boundaries Integration Flow

| Outbound Message Type | Description | Business Object |
|-----------------------|--|-------------------------------|
| CI_MDM2RHILO | Request For Estimated and High-Low Readings Outbound Message | C1-MDM2EstAndHighLowReqOutMsg |

External System

To create a new external system for Oracle Utilities Customer Care and Billing integration to Oracle Utilities Meter Data:

1. In the Admin menu, navigate to External System.
2. Enter a unique external system and description. For example: Name = CI_MDM1, Description = Oracle Utilities Meter Data Management
3. Set the Our Name in Their System field to Customer Care and Billing.
4. Associate the outbound message types created to the external system. For each outbound message type, set the following:
 - **Outbound Message Type** – Set the outbound message type created for Oracle Utilities Customer Care and Billing outbound queue.
 - **Processing Method** – *Real-time*
 - **XAI Sender** – Set the XAI sender created for the queue.
 - **Message XSL** - *C1-CCBJMSQAddNamespace.xsl*

For example: External System – **CI_MDM1**

| Outbound Message Type | Processing Method | XAI Sender | Message XSL |
|-----------------------|-------------------|--------------|--|
| CI_MDM2PSYN | Real-time | CI_MDM2PSyn | C1-CCB2JMSQAddNamespace.xsl |
| CI_MDM2SPSYN | Real-time | CI_MDM2SPSyn | C1-CCB2JMSQAddNamespace.xsl |
| CI_MDM2SASYN | Real-time | CI_MDM2SASyn | C1-CCB2JMSQAddNamespace.xsl |
| CI_MDM2MSYN | Real-time | CI_MDM2MSyn | C1-CCB2JMSQAddNamespace.xsl |
| CI_MDM2MCSYN | Real-time | CI_MDM2MCSyn | C1-CCB2JMSQAddNamespace.xsl |
| CI_MDM2SHSYN | Real-time | CI_MDM2SHSyn | C1-CCB2JMSQAddNamespace.xsl |
| CI_MDM_BBD | Real-time | BatchBDReq2 | C1-CCB2JMSQAddNamespace.xsl |
| CI_MDM_OBD | Real-time | OnlineBDReq2 | C1-CCB2JMSQAddNamespace.xsl |
| CI_MDM2RHILO | Real-time | REGHILOW | CDxAddEnvelope-SOAP1-2.xsl Response XSL: C1-CCBRemoveEnvEnvelopeAndNamespace.xsl |
| CI_MDM2MRSYN | Real-time | CI_MDM2MRSyn | C1-CCB2JMSQAddNamespace.xsl |

For more information about configuration guidelines, see the Oracle Utilities Customer Care and Billing documentation.

Setting Up Oracle Utilities Meter Data Management

Two BPA scripts are provided to aid in the setup of Oracle Utilities Meter Data Management in sync processing. Consequently, the amount of setup work to be done by an implementation is greatly reduced. These scripts are intended to be executed only once prior to any customizations being made to any of the sync objects:

- Insert Oracle Utilities Customer Care and Billing-specific algorithms to Sync Request BOs (MDM)
 - D2-AddCCBAIg - This script inserts transformation algorithms specific to the Oracle Utilities Customer Care and Billing integration into the sync request BOs. If your implementation needs to introduce additional transformation algorithms, they need to be inserted after this script is run.
 - D2-PopMstCfg- This script sets up data in the following master configurations:
 - Master Data Synchronization Configuration – contains the foreign key reference information used by framework to validate and/or resolve foreign keys in the master data sync requests.
 - Seeder Sync Request Master Configuration – contains information needed by the sync request seeder BO to determine the actual BO to instantiate. The information is keyed to external system, MO, and initial load indicator in the sync request.

The rest of the setup tasks in Oracle Utilities Meter Data Management include:

- Admin Data Setup
- System Data Setup
- JMS Configuration
- XAI Configuration

The following sections provide a general overview of these steps. However, you should refer to the Oracle Utilities Meter Data Management Installation and Configuration Guide for detailed steps.

For more information on configuring and working with Oracle Utilities Meter Data Management, refer to Oracle Utilities Meter Data Management Installation and Configuration Guide for Release 2.0.1.0.

Standard Oracle Utilities Meter Data Management configuration, such as setting up usage validation rules and setting up services to poll for usage data, is covered in the standard Oracle Utilities Meter Data Management configuration guides.

The following sections provide details about the most significant configuration items.

Configure Admin Data Tables

This section describes the unique setup issues specifically related to configuring your system for the integration.

For more information about configuring Oracle Utilities Meter Data Management, see the Oracle Utilities Meter Data Management User Guide.

Country

Create a country code in Oracle Utilities Meter Data Management.

The **Main** page is used to customize the fields and field descriptions that are displayed where addresses are used in the system. This ensures that all addresses conform to the customary address format and conventions of the particular country you have defined.

| Navigation | Guideline | Corresponding DVM |
|----------------------|--------------------------|-----------------------|
| Admin Menu > Country | Create the Country codes | OUCCB2_OUMDM2_Country |

Service Point Type

Create the required SP Types. The codes defined here must exactly match values in the DVM indicated.

| Navigation | Guideline | Corresponding DVM |
|---------------------------------|-----------------|-----------------------|
| Admin Menu > Service Point Type | Create SP Types | OUCCB2_OUMDM2_SPTType |

Usage Subscription Type

Create the required US Types. The codes defined here must exactly match values in the DVM indicated.

| Navigation | Guideline | Corresponding DVM |
|--------------------------------------|-----------------|----------------------|
| Admin Menu > Usage Subscription Type | Create US Types | OUCCB2_OUMDM2_USType |

Device Type

Create the required Device Types. The codes defined here must exactly match values in the DVM indicated.

| Navigation | Guideline | Corresponding DVM |
|--------------------------|---------------------|--------------------------|
| Admin Menu > Device Type | Create Device Types | OUCCB2_OUMDM2_DeviceType |

Manufacturer and Model

Create the required Manufacturer and Model codes. The codes defined here must exactly match values in the DVM indicated.

| Navigation | Guideline | Corresponding DVM |
|---------------------------|---------------------------|----------------------------|
| Admin Menu > Manufacturer | Create Manufacturer codes | OUCCB2_OUMDM2_Manufacturer |
| | Create Model codes | OUCCB2_OUMDM2_Model |

Device Configuration Type

Create the required Device Configuration Types. The codes defined here must exactly match values in the DVM indicated.

| Navigation | Guideline | Corresponding DVM |
|--|-----------------------------------|--------------------------------|
| Admin Menu > Device Configuration Type | Create Device Configuration Types | OUCCB2_OUMDM2_DeviceConfigType |

Service Type

Create the required Service Types. The codes defined here must exactly match values in the DVM indicated.

| Navigation | Guideline | Corresponding DVM |
|---------------------------|----------------------|-----------------------------|
| Admin Menu > Service Type | Create Service Types | OUCCB2_OUMDM2_MCServiceType |

Unit of Measure

Define the Unit of Measure codes. The codes defined here must exactly match values in the DVM indicated.

| Navigation | Guideline | Corresponding DVM |
|------------------------------|-----------------------------------|-------------------|
| Admin Menu > Unit of Measure | Define unit of measurement codes. | OUMDM2_OUCCB2_UOM |

Time of Use

Define the Time of Use codes. The codes defined here must exactly match values in the DVM indicated.

| Navigation | Guideline | Corresponding DVM |
|--------------------------|--------------------------|-------------------|
| Admin Menu > Time of Use | Define time of use codes | OUMDM2_OUCCB2_TOU |

Service Quantity Identifier

Define the SQL codes. The codes defined here must exactly match values in the DVM indicated.

| Navigation | Guideline | Corresponding DVM |
|--|-------------------------------------|-------------------|
| Admin Menu > Service Quantity Identifier | Define service quantity identifiers | OUMDM2_OUCCB2_SQL |

Service Provider (Usage Recipient)

Create a service provider that references the external system for Oracle Utilities Customer Care and Billing.

To create usage transactions (and calculate bill determinants) based on usage requests from CCB, add this processing method:

- Processing Role: Usage Transaction Creation, Business Object: How To Create US Related Information, Default Processing Method Business Object: D2-UsageTransaction

To send usage (bill determinants) related information back to CCB, add the following processing method(s):

- Processing Role: Usage Transaction Notification - Online, Business Object: How To Send US Related Information, Default Processing Method Outbound Message Type: <outbound message type for usage transaction response for an online usage request>
- Processing Role: Usage Transaction Notification - Batch, Business Object: How To Send US Related Information, Default Processing Method Outbound Message Type: <outbound message type for usage transaction response for a batch usage request>
- Processing Role: Usage Transaction Error Notification - Online, Business Object: How To Send US Related Information, Default Processing Method Outbound Message Type: <outbound message type for usage transaction error response for an online usage request>
- Processing Role: Usage Transaction Error Notification - Batch, Business Object: How To Send US Related Information, Default Processing Method Outbound Message Type: <outbound message type for usage transaction error response for a batch usage request>
- Processing Role: Usage Transaction Subsequent Correction Notification - Batch, Business Object: How To Send US Related Information, Default Processing Method Outbound Message Type: <outbound message type for usage transaction subsequent correction notification>

To sync CCB meter reads, add this processing method:

- Processing Role: Initial Measurement Creation, Business Object: How To Create MC Related Information, Default Processing Method Business Object: D1-SyncIMDScalar

Note. This service provider (usage recipient) can then be referenced in the usage subscription or the usage subscription type.

Master Configuration

Two master configurations (Master Data Synchronization Configuration and Seeder Sync Request Master Configuration) need to be completed. A BPA script is provided to prepopulate these with the information necessary to support the base objects included in the sync. Run D2-PopMstCfg to accomplish this.

MDM Master Configuration needs to be completed. For Hi/Lo limits, value takes precedence over factor if both sets are specified.

Feature Configuration

To enable navigation from Oracle Utilities Meter Data Management to Oracle Utilities Customer Care and Billing, setup the Oracle Utilities Customer Care and Billing URL option type on the General System Configuration feature configuration. The option value must contain the URL for the Oracle Utilities Customer Care and Billing system (see the demo environment for an example).

Configure System Data Tables

Business Objects

This section describes unique setup issues specifically related to configuring your system for integration.

| Business Object | Description |
|-------------------------------|--|
| D1-OngoingSyncRequestContact, | These business objects define the behavior of the ongoing sync requests. The |

| Business Object | Description |
|---|--|
| D1-OngoingSyncRequestDC, D1-OngoingSyncRequestDevice, D1-OngoingSyncRequestIE, D1-OngoingSyncRequestMC, D1-OngoingSyncRequestSP, D2-OngoingSyncRequestUS, D1-CompositeSyncRequestDC | <p>schema elements define information required to maintain the master data in Oracle Utilities Meter Data Management.</p> <p>As part of sync request processing, an acknowledgement message is sent to the external system (either positive or negative). The "Outbound Message Type" BO option contains a reference to the outbound message BO to use for this purpose. The base package includes BO D1-OngoingSyncReqAckMsg to be used on the outbound message type configuration. Refer to Outbound Configuration in this section for more information. (Note that this option does not need to be configured on the ongoing sync requests for Device Configuration and Measuring Component, but does have to be configured on the Composite Sync Request for Device Configuration.)</p> <p>The error states in the ongoing sync requests contain automatic To Do creation and automatic retry. The parameters relevant to these processes (To Do Retry Frequency and To Do Maximum Retries) are captured as BO status options. If your implementation needs to introduce your own values, simply add a higher sequenced row for the option you intend to modify. The algorithms will automatically use these values.</p> <p>The Create To Do algorithm (D1-TDCREATE) has been delivered to use the base package supplied To Do Type D1-SYNIN for this process. If your implementation needs to use a different To Do Type, you will need to configure your own algorithm and supply the value in its parameters.</p> <p>The monitor process on the initial states of these BOs may be removed by the implementation if immediate processing of they sync requests is desired as they are received (as in the case where implementations have opted to use the C1-TRN-RELSY algorithm in their online CCB bill generation process – the previous section for more information).</p> |

| Business Object | Description |
|---------------------|--|
| D2-UsageTransaction | <p>This business object defines the behavior of a usage transaction.</p> <p>To configure your system to create usage transactions based on usage requests from external system using this business object:</p> <ul style="list-style-type: none"> • Create a service provider that references the usage subscriber's external system (e.g. CCB - Customer Care and Billing). • Add a processing method for the service provider created earlier. Use a processing role of Usage Transaction Creation and a business object of How To Create US Related Information. Define business object D2-UsageTransaction as the default processing method. <p>To configure your system to send usage back to the external system, add the following processing methods (using the same provider created earlier).</p> <ul style="list-style-type: none"> • Processing Role: Usage Transaction Notification - Online, Business Object: How To Send US Related Information, Default Processing Method Outbound Message Type: <outbound message for usage transaction response for an online usage request> • Processing Role: Usage Transaction Notification - Batch, Business Object: How To Send US Related Information, Default Processing Method Outbound Message Type: <outbound message for usage transaction response for a batch usage request> • Processing Role: Usage Transaction Error Notification - Online, Business Object: How To Send US Related Information, Default Processing Method Outbound Message Type: <outbound message for usage transaction error response for an online usage request> • Processing Role: Usage Transaction Error Notification - Batch, Business Object: How To Send US Related Information, Default Processing Method Outbound Message Type: <outbound message for usage transaction error response for a batch usage request> • Processing Role: Usage Transaction Subsequent Correction Notification - Batch, Business Object: How To Send US Related Information, Default Processing Method Outbound Message Type: <outbound message for usage transaction subsequent correction notification> |

| Business Object | Description |
|--------------------------------|--|
| D1-OngoingSyncReqScalarMtrRead | <p>This business object defines the behavior of the Scalar Meter Read ongoing sync requests. The schema elements define information required to sync a Scalar Meter Read as IMD in Oracle Utilities Meter Data Management.</p> <p>Notable system data delivered for sync Scalar Meter Read -</p> <ul style="list-style-type: none"> - Transform algorithm (D1-FRMTRANDT) transforms the sync request's register reads into IMD Seeder BO data. - IMD Creation algorithm (D1-CRESYNIMD) instantiates IMD Seeder BOs. - Sync Request IMD BO (D1-SyncIMDScalar) transformed from IMD Seeder BO. - Sync Request IMD Scalar Other Info DA (D1-SyncIMDScalarOtherInfo) is an empty DA, that implementation may extend to capture other CCB meter/register read elements and custom elements, in the MDM Sync Request IMD BO. <p>Similar to Master Data Sync, Scalar Meter Read Sync supports</p> <ul style="list-style-type: none"> - Sending acknowledgements - Automatic to do creation and retry in error states. <p>The monitor process on the initial states of these BOs may be removed by the implementation if immediate processing of they sync requests is desired as they are received (as in the case where implementations have opted to use the C1-TRN-RELSY algorithm in their online CCB bill generation process – the previous section for more information).</p> |

For more information about the sync request process, the business objects, maintenance objects, and other components used for this process, see the “Data Synchronization” section in Oracle Utilities Framework User Guide.

BO Algorithms

Oracle Utilities Customer Care and Billing-specific algorithms need to be plugged in on the sync request business objects. A BPA script is provided to plug-in these algorithms on to the sync BOs. This BPA script should be executed prior to any further customizations done on the sync BOs. It should only be executed once. Run D2-AddCCBAIg (Insert CCB-specific algorithms to Sync Request BOs (MDM)) to accomplish this.

Extendable Lookups

Configure the following extendable lookups in Oracle Utilities Meter Data Management:

- D1-DeviceLocationLookup – Configure the corresponding values from the Oracle Utilities Customer Care and Billing Meter Location admin table.
- D1-SPInstructionLookup – Configure the corresponding values from the Oracle Utilities Customer Care and Billing Meter Read Instruction admin table.
- D1-SPWarningLookup – Configure the corresponding values from the Oracle Utilities Customer Care and Billing Meter Read Warning admin table.

- D1-OkToEnterLookup – Configure the corresponding values from Oracle Utilities Customer Care and Billing (values are true or false).
- D1-KeyLookup – Configure the corresponding values from Oracle Utilities Customer Care and Billing (values are true or false).
- D2-CCBRateScheduleLookup – Configure the Oracle Utilities Customer Care and Billing rate schedule and its corresponding Oracle Utilities Meter Data Management usage group.

Read Out Type

Create the required Read Out Types. The codes defined here must exactly match values in the DVM indicated.

| Navigation | Guideline | Corresponding DVM |
|----------------------|---|---------------------------|
| Admin Menu > Look Up | Create Read Out Types for READ_OUT_TYPE_FLG field | OUCCB2_OUMDM2_ReadOutType |

Menus

Configure the following context menus to allow navigation from Oracle Utilities Meter Data Management to Oracle Utilities Customer Care and Billing:

| Menu | Navigation Option | Description |
|---------------|-------------------|---|
| D1_CONTEXT_SP | d1SPGotoCCB | Allows navigation from the MDM SP context menu to CCB Control Central - Account Information |

Batch Scheduling

The delivered batch codes need no further setup in Oracle Utilities Meter Data Management. The following batch processes can be run from the Batch Submission page.

The following batch processes are used for Initial Sync requests:

All sync requests for all objects being synchronized are expected to be present in the Pending state. The general process flow of the batches for the initial sync request is described below.

| Batch Code | Description |
|--|--|
| D1-CMSYN | This batch process split the composite sync request for device configuration into its constituent MO-based sync requests for device configuration and measuring component. |
| F1-SYSRQ | This batch process transitions all the sync requests out of the PENDING state. |
| F1-SAKRQ | This batch process pre-allocates the production key to each record and transitions all the sync requests out of the Transformed/Schema Validated state into the Key Allocated state. |
| D1-SIKCN, D1-SIKSP, D1-SIKDV, D1-SIKDC | These batch processes resolves any foreign keys within the schema as well as executes the validation algorithms on the target BOs. These batch codes are for processing Contact, SP, Device and Device Configuration initial sync requests. These batch processes can be run in parallel. |

| Batch Code | Description |
|-----------------------|---|
| D1-SILCN and D1-SILDV | These batch processes loads the records for Contact and Device into the production tables. They are loaded first into the system because the other sync request records are dependent on these records before they can be loaded successfully into the system. These batch processes can be run in parallel. |
| D1-SILSP and D1-SILDC | These batch processes loads the records for SP and Device Configuration into the production tables. These batch processes can be run in parallel. |
| D1-SIKIE and D1-SIKMC | These batch processes resolves any foreign keys within the schema as well as executes the validation algorithms on the target BOs for Install Event and Measuring Component. These batch processes can be run in parallel. |
| D1-SILIE and D1-SILMC | These batch processes loads the records for Install Event and Measuring Component. These batch processes can be run in parallel. |
| D1-SIKUS | This batch process resolves any foreign keys within the schema and executes the validation algorithms on the US target BO. |
| D1-SILUS | This batch process loads the US records into the production tables. |
| D1-SIIER | This is the batch process to transition sync request out of the ERROR state. |

If any sync requests exist in the Validation Error state, run D1-SIIER to retry the data transformation/schema validation process (after, of course, the error have been investigated and resolved).

If any sync requests exist in the Resolution/BO Validation Error state, run its respective D1-SIK* batch job (see above for the proper suffix to use for each master data record being synchronized).

The following batch process are used for Ongoing Sync requests

| Batch Code | Description |
|------------|---|
| D1-SIOPE | This is the batch process to transition ongoing sync request out of the PENDING state. It is a generic batch process that is used for different sync processes. It has a couple of parameters that can be used to control which sync request BOs to process. |
| D1-SIOER | This is the batch process to transition ongoing sync request out of the ERROR state. |

Depending on how sync requests are sent from CCB, it is possible that interdependent sync requests might be received out of order. If you wish to control the order of processing the ongoing sync requests within, you can either introduce your own batch controls to replace D1-SIOPE (each batch control will have the specific ongoing sync BO defaulted in the input parameter); or you can submit D1-SIOPE several times, each time specifying a different ongoing sync BO in the input parameter. Otherwise, you can let the built-in retry processing within the ongoing sync request life cycle resolve the error by running D1-SIOER.

The above also applies to processing of the meter configuration sync request from CCB. Since the latter is split into several sync requests in MDM, it is possible that the MC syncs are processed before the DC sync. Any of the options already mentioned can be used to handle this scenario.

The following batch processes are used for usage transaction processing

| Batch Code | Description |
|------------|---|
| D2-UTCD | This is the batch process to transition usage transactions out of the Calculation Deferred state. Usage transactions created as a result of batch billing initiated usage requests stop on the Calculation Deferred state. Run this batch process to proceed with the calculation. |
| D2-UTID | This is the batch process to transition usage transactions out of the Issue Detected state. Usage transactions that encounter issues during calculation stop on the Issue Detected state. Run this batch process to retry calculation. |

JMS Configuration

This section describes the JMS configuration to be done in the Oracle Utilities Meter Data Management WebLogic server and in the Oracle Utilities Meter Data Management deployment XML files. The configuration described in this section is used for receiving JMS messages from the integration layer.

Weblogic Server JMS Configuration

To configure JMS in the Oracle Utilities Meter Data Management WebLogic server log in to the console using the URL `http://<server_name>:<port_number>/console`.

For example: `http://mdmserver:7001/console`

JMS Module

Create a new JMS module in the WebLogic console.

To create a JMS module used for remote queue configuration:

1. Open the WebLogic console and create a new JMS module.
2. Enter a meaningful name for the JMS module. This JMS module is used to create configurations which consume messages from remote WebLogic queues. For example: `MDMInegrationModule`

Foreign Server

Create a new Foreign server under the JMS module in the WebLogic console.

To create the Foreign server used for remote queue configuration:

1. Open the WebLogic console and select the JMS module created for integration.
2. Create a Foreign server under the JMS module.
3. Add the following:
 - **Name** – Name of the Foreign server. For example: `MDMCCBForeignServer`

- **JNDI Initial Context Factory** – *weblogic.jndi.WLInitialContextFactory*
 - **JNDI Connection URL** – Add the URL of Integration SOA server. For example:
t3://soaserver.com:8002
 - **JNDI Properties Credential** – Password for the SOA server user.
 - **JNDI Properties** - *java.naming.security.principal=<SOA Server user>*. For example:
weblogic
4. Under the Foreign server, create a Foreign destination for each remote queue.
- **Name** – Name of foreign destination.
 - **Local JNDI Name** – Add a local JNDI name for the Integration queue. Local JNDI name is later added manually as part of configuration in the WebLogic-ejb-jar.xml →
<weblogic-enterprise-bean> → <message-driven-descriptor> → <destination-jndi-name>.
 - **Remote JNDI Name** – JNDI name of the queue on the Integration SOA server. Few examples are as follows. For each Integration point, one destination is created.

Person Sync

| Destination Name | Local JNDI Name | Remote JNDI Name |
|-------------------------|----------------------------------|-----------------------------|
| OUMDM2PersonSyncRequest | jms/LocalOUMDM2PersonSyncRequest | jms/OUMDM2PersonSyncRequest |

SP Sync

| Destination Name | Local JNDI Name | Remote JNDI Name |
|---------------------|------------------------------|-------------------------|
| OUMDM2SPSyncRequest | jms/LocalOUMDM2SPSyncRequest | jms/OUMDM2SPSyncRequest |

SA Sync

| Destination Name | Local JNDI Name | Remote JNDI Name |
|---------------------|------------------------------|-------------------------|
| OUMDM2SASyncRequest | jms/LocalOUMDM2SASyncRequest | jms/OUMDM2SASyncRequest |

Meter Sync

| Destination Name | Local JNDI Name | Remote JNDI Name |
|------------------------|---------------------------------|----------------------------|
| OUMDM2MeterSyncRequest | jms/LocalOUMDM2MeterSyncRequest | jms/OUMDM2MeterSyncRequest |

Meter Configuration Sync

| Destination Name | Local JNDI Name | Remote JNDI Name |
|------------------------------|---------------------------------------|----------------------------------|
| OUMDM2MeterConfigSyncRequest | jms/LocalOUMDM2MeterConfigSyncRequest | jms/OUMDM2MeterConfigSyncRequest |

SP-Meter History Sync

| Destination Name | Local JNDI Name | Remote JNDI Name |
|------------------------------|---------------------------------------|----------------------------------|
| OUMDM2SPMeterHistSyncRequest | jms/LocalOUMDM2SPMeterHistSyncRequest | jms/OUMDM2SPMeterHistSyncRequest |

Batch BD

| Destination Name | Local JNDI Name | Remote JNDI Name |
|----------------------|-------------------------------|--------------------------|
| OUMDM2BatchBDRequest | jms/LocalOUMDM2BatchBDRequest | jms/OUMDM2BatchBDRequest |

Online BD

| Destination Name | Local JNDI Name | Remote JNDI Name |
|-----------------------|--------------------------------|---------------------------|
| OUMDM2OnlineBDRequest | jms/LocalOUMDM2OnlineBDRequest | jms/OUMDM2OnlineBDRequest |

Meter Read Sync

| Destination Name | Local JNDI Name | Remote JNDI Name |
|----------------------------|-------------------------------------|--------------------------------|
| OUMDM2MeterReadSyncRequest | jms/LocalOUMDM2MeterReadSyncRequest | jms/OUMDM2MeterReadSyncRequest |

5. Under the Foreign server, create a Remote Connection Factory.

- **Name** – Name of remote connection factory.
- **Local JNDI Name** – Add a local JNDI name for the Integration Connection Factory. This JNDI name is added manually later as part of configuration in the WebLogic-ejb-jar.xml → <weblogic-enterprise-bean> → <message-driven-descriptor> → <connection-factory-jndi-name>.
- **Remote JNDI Name** – JNDI name of the JMS Connection Factory on the Integration SOA server. For example:

| Connection Factory Name | Local JNDI Name | Remote JNDI Name |
|------------------------------|---------------------------------------|----------------------------------|
| OUCB2OUMDM2ConnectionFactory | jms/LocalOUCB2OUMDM2ConnectionFactory | jms/OUCB2OUMDM2ConnectionFactory |

Configuration File Changes

Configure Message Driven Beans (MDB)

It is recommended that you use the Oracle Utilities Meter Data Management template and CM (Customer Modification) feature to make changes to these configuration files. This ensures that your modifications cannot be overwritten by future application patches.

Modify files: ejb-jar.xml and ejb-weblogic-jar.xml

Location: Oracle Utilities Meter Data Management Enterprise Archive (EAR) file

- The Oracle Utilities Meter Data Management configuration files, `ejb-jar.xml` and `ejb-weblogic-jar.xml`, must be modified to configure Message Driven Beans (MDB). MDBs which receive messages from the integration queues. These files are part of the Oracle Utilities Meter Data Management Enterprise Archive (EAR) file.
- The Oracle Meter Data Management application needs to be redeployed after these changes are made.
- **Managing Configuration Files:** Configuration files such as `config.xml`, `ejb-jar.xml` and `ejb-weblogic-jar.xml` are managed through template configuration files which reside in the environment's templates directory. When the `initialSetup.sh` script is executed, environment specific information is combined with the template to create the target file which is then deployed to the correct location. When the environment is started up (`spl.sh start`) the changes are automatically deployed to WebLogic.
- **Extending existing templates:** It is possible to extend existing templates with the use of Include template file(s) in the same location as the existing template. Using `#ouaf_user_exit` within the target template that will be extended, additional configuration from the include template will be processed and appended to the target template where the `#ouaf_user_exit` is present.
- **Enabling changes for the integration:** To enable your changes for integration with Oracle Utilities Meter Data Management it is recommended that you first make a "CM" copy of the existing template and make your changes to the CM version. If there are any problems with starting the application it is a simple process to delete the CM versions of the files and rerun `initialSetup` to regenerate and redeploy the original versions.

If you make CM versions of the template files and later install a patch which updates the base template, the CM version will not be updated.

Note: Working example include configuration files are available for download from My Oracle Support in Patch number 11796091 - MDMV2 - CCB INTEGRATION CONFIGURATION EXAMPLES. Before installing the examples please read the Product Fix Design document included in the patch for more information.

To create MDB to receive messages from the Oracle Utilities Meter Data Management inbound queue:

1. Create a new MDB to receive messages from each integration inbound queue. For simplicity, we refer to the names of the target configuration files in the following examples. However, you should make your changes in the `templates/cm_<target file>.include` version of the file and then execute `initalSetup.sh` (Unix) or `initalSetup.cmd` (Windows) to deploy the generated file.
2. Create an MDB for each Oracle Utilities Meter Data Management inbound queue to receive messages and invoke the MDM service.
3. Create or modify `cm_ejb-jar.xml.wls.jms_1.include`, `cm_ejb-jar.xml.wls.mdb.include`, `cm_weblogic-ejb-jar.xml.jms.include`, `cm_config.xml.jms.include` or `cm_config.xml.win.jms.include` (for Windows systems only) files to configure the MDBs.
 - a. Add the `<message-driven>` and `<container-transaction>` tag for each inbound queue in the `ejb-jar.xml`.
 - b. `cm_ejb-jar.xml.wls.jms_1.include` example:

```
<!--Batch BD Integration Point -->
<message-driven>
  <description>MDB for OUMDM2BatchBDRequest</description>
  <display-name>OUMDM2BatchBDRequest</display-name>
  <ejb-name>OUMDM2BatchBDRequest</ejb-name>
  <ejb-class>com.splwg.ejb.mdb.MessageProcessor</ejb-class>
  <messaging-type>javax.jms.MessageListener</messaging-type>
  <transaction-type>Bean</transaction-type>
  <message-destination-type>javax.jms.Queue</message-
destination-type>
</message-driven>
<!--Meter Config Sync Integration Point -->
<message-driven>
  <description>MDB for
OUMDM2MeterConfigSyncRequest</description>
  <display-name>OUMDM2MeterConfigSyncRequest</display-name>
  <ejb-name>OUMDM2MeterConfigSyncRequest</ejb-name>
  <ejb-class>com.splwg.ejb.mdb.MessageProcessor</ejb-class>
  <messaging-type>javax.jms.MessageListener</messaging-type>
  <transaction-type>Bean</transaction-type>
  <message-destination-type>javax.jms.Queue</message-
destination-type>
</message-driven>
<!--Meter Sync Integration Point -->
<message-driven>
  <description>MDB for OUMDM2MeterSyncRequest</description>
  <display-name>OUMDM2MeterSyncRequest</display-name>
  <ejb-name>OUMDM2MeterSyncRequest</ejb-name>
  <ejb-class>com.splwg.ejb.mdb.MessageProcessor</ejb-class>
  <messaging-type>javax.jms.MessageListener</messaging-type>
  <transaction-type>Bean</transaction-type>
  <message-destination-type>javax.jms.Queue</message-
destination-type>
</message-driven>
<!--Online BD Integration Point -->
<message-driven>
  <description>MDB for OUMDM2OnlineBDRequest</description>
  <display-name>OUMDM2OnlineBDRequest</display-name>
  <ejb-name>OUMDM2OnlineBDRequest</ejb-name>
  <ejb-class>com.splwg.ejb.mdb.MessageProcessor</ejb-class>
  <messaging-type>javax.jms.MessageListener</messaging-type>
  <transaction-type>Bean</transaction-type>
  <message-destination-type>javax.jms.Queue</message-
destination-type>
</message-driven>
<!--Person Sync Integration Point -->
<message-driven>
  <description>MDB for OUMDM2PersonSyncRequest</description>
  <display-name>OUMDM2PersonSyncRequest</display-name>
  <ejb-name>OUMDM2PersonSyncRequest</ejb-name>
  <ejb-class>com.splwg.ejb.mdb.MessageProcessor</ejb-class>
  <messaging-type>javax.jms.MessageListener</messaging-type>
  <transaction-type>Bean</transaction-type>
  <message-destination-type>javax.jms.Queue</message-
destination-type>
</message-driven>
<!--SA Sync Integration Point -->
<message-driven>
  <description>MDB for OUMDM2SASyncRequest</description>
  <display-name>OUMDM2SASyncRequest</display-name>
  <ejb-name>OUMDM2SASyncRequest</ejb-name>
  <ejb-class>com.splwg.ejb.mdb.MessageProcessor</ejb-class>
```

```

        <messaging-type>javax.jms.MessageListener</messaging-type>
        <transaction-type>Bean</transaction-type>
        <message-destination-type>javax.jms.Queue</message-
destination-type>
    </message-driven>
    <!--SP-Meter History Integration Point -->
    <message-driven>
        <description>MDB for
OUMDM2SPMeterHistSyncRequest</description>
        <display-name>OUMDM2SPMeterHistSyncRequest</display-name>
        <ejb-name>OUMDM2SPMeterHistSyncRequest</ejb-name>
        <ejb-class>com.splwg.ejb.mdb.MessageProcessor</ejb-class>
        <messaging-type>javax.jms.MessageListener</messaging-type>
        <transaction-type>Bean</transaction-type>
        <message-destination-type>javax.jms.Queue</message-
destination-type>
    </message-driven>
    <!-- SP Sync Integration Point -->
    <message-driven>
        <description>MDB for OUMDM2SPSyncRequest</description>
        <display-name>OUMDM2SPSyncRequest</display-name>
        <ejb-name>OUMDM2SPSyncRequest</ejb-name>
        <ejb-class>com.splwg.ejb.mdb.MessageProcessor</ejb-class>
        <messaging-type>javax.jms.MessageListener</messaging-type>
        <transaction-type>Bean</transaction-type>
        <message-destination-type>javax.jms.Queue</message-
destination-type>
    </message-driven>
    <!--Meter Read Sync Integration Point -->
    <message-driven>
        <description>MDB for
OUMDM2MeterReadSyncRequest</description>
        <display-name>OUMDM2MeterReadSyncRequest</display-name>
        <ejb-name>OUMDM2MeterReadSyncRequest</ejb-name>
        <ejb-class>com.splwg.ejb.mdb.MessageProcessor</ejb-class>
        <messaging-type>javax.jms.MessageListener</messaging-type>
        <transaction-type>Bean</transaction-type>
        <message-destination-type>javax.jms.Queue</message-
destination-type>
    </message-driven>

```

c. cm_ejb-jar.xml.wls.mdb.include example:

```

<!--Batch BD Integration Point -->
<container-transaction>
    <method>
        <ejb-name>OUMDM2BatchBDRequest</ejb-name>
        <method-name>onMessage</method-name>
    </method>
    <trans-attribute>NotSupported</trans-attribute>
</container-transaction>
<!--Meter Config Sync Integration Point -->
<container-transaction>
    <method>
        <ejb-name>OUMDM2MeterConfigSyncRequest</ejb-name>
        <method-name>onMessage</method-name>
    </method>
    <trans-attribute>NotSupported</trans-attribute>
</container-transaction>
<!--Meter Sync Integration Point -->

```

```

<container-transaction>
  <method>
    <ejb-name>OUMDM2MeterSyncRequest</ejb-name>
    <method-name>onMessage</method-name>
  </method>
  <trans-attribute>NotSupported</trans-attribute>
</container-transaction>
<!--Online BD Integration Point -->
<container-transaction>
  <method>
    <ejb-name>OUMDM2OnlineBDRequest</ejb-name>
    <method-name>onMessage</method-name>
  </method>
  <trans-attribute>NotSupported</trans-attribute>
</container-transaction>
<!--Person Sync Integration Point -->
<container-transaction>
  <method>
    <ejb-name>OUMDM2PersonSyncRequest</ejb-name>
    <method-name>onMessage</method-name>
  </method>
  <trans-attribute>NotSupported</trans-attribute>
</container-transaction>
<!--SA Sync Integration Point -->
<container-transaction>
  <method>
    <ejb-name>OUMDM2SASyncRequest</ejb-name>
    <method-name>onMessage</method-name>
  </method>
  <trans-attribute>NotSupported</trans-attribute>
</container-transaction>
<!--SP-Meter History Integration Point -->
<container-transaction>
  <method>
    <ejb-name>OUMDM2SPMeterHistSyncRequest</ejb-name>
    <method-name>onMessage</method-name>
  </method>
  <trans-attribute>NotSupported</trans-attribute>
</container-transaction>
<!-- SP Sync Integration Point -->
<container-transaction>
  <method>
    <ejb-name>OUMDM2SPSyncRequest</ejb-name>
    <method-name>onMessage</method-name>
  </method>
  <trans-attribute>NotSupported</trans-attribute>
</container-transaction>
<!--Meter Read Sync Integration Point -->
<container-transaction>
  <method>
    <ejb-name>OUMDM2MeterReadSyncRequest</ejb-name>
    <method-name>onMessage</method-name>
  </method>
  <trans-attribute>NotSupported</trans-attribute>
</container-transaction>

```

- d. Modify the cm_weblogic-ejb-jar.xml.jms.include file. Add the <weblogic-enterprise-bean> tag for each inbound queue.
- e. Add a security role with role cisusers.

The references in <weblogic-enterprise-bean> tag are as follows:

- <ejb-name> - MDB name given in ejb-jar.xml.
- <destination-jndi-name> - JNDI name provided in JMS module → Foreign server → Foreign destination → Local JNDI name.
- <connection-factory-jndi-name> - JNDI name provided in JMS module → Foreign server → Remote Connection Factory → Local JNDI name.
- cm_weblogic-ejb-jar.xml.jms.include example:

```
<!--Batch BD Integration Point -->
<weblogic-enterprise-bean>
  <ejb-name>OUMDM2BatchBDRequest</ejb-name>
  <message-driven-descriptor>
    <pool>
      <max-beans-in-free-pool>5</max-beans-in-free-pool>
      <initial-beans-in-free-pool>1</initial-beans-in-free-pool>
    </pool>
    <destination-jndi-
name>jms/LocalOUMDM2BatchBDRequest</destination-jndi-name>
    <connection-factory-jndi-
name>jms/LocalOUCCB2OUMDM2ConnectionFactory</connection-factory-
jndi-name>
  </message-driven-descriptor>
</weblogic-enterprise-bean>
<!--Meter Config Sync Integration Point -->
<weblogic-enterprise-bean>
  <ejb-name>OUMDM2MeterConfigSyncRequest</ejb-name>
  <message-driven-descriptor>
    <pool>
      <max-beans-in-free-pool>5</max-beans-in-free-pool>
      <initial-beans-in-free-pool>1</initial-beans-in-free-pool>
    </pool>
    <destination-jndi-
name>jms/LocalOUMDM2MeterConfigSyncRequest</destination-jndi-name>
    <connection-factory-jndi-
name>jms/LocalOUCCB2OUMDM2ConnectionFactory</connection-factory-
jndi-name>
  </message-driven-descriptor>
</weblogic-enterprise-bean>
<!--Meter Sync Integration Point -->
<weblogic-enterprise-bean>
  <ejb-name>OUMDM2MeterSyncRequest</ejb-name>
  <message-driven-descriptor>
    <pool>
      <max-beans-in-free-pool>5</max-beans-in-free-pool>
      <initial-beans-in-free-pool>1</initial-beans-in-free-pool>
    </pool>
    <destination-jndi-
name>jms/LocalOUMDM2MeterSyncRequest</destination-jndi-name>
    <connection-factory-jndi-
name>jms/LocalOUCCB2OUMDM2ConnectionFactory</connection-factory-
jndi-name>
  </message-driven-descriptor>
</weblogic-enterprise-bean>
<!--Online BD Integration Point -->
<weblogic-enterprise-bean>
  <ejb-name>OUMDM2OnlineBDRequest</ejb-name>
  <message-driven-descriptor>
    <pool>
```

```
        <max-beans-in-free-pool>5</max-beans-in-free-pool>
        <initial-beans-in-free-pool>1</initial-beans-in-free-pool>
    </pool>
    <destination-jndi-
name>jms/LocalOUMDM2OnlineBDRequest</destination-jndi-name>
    <connection-factory-jndi-
name>jms/LocalOUCCB2OUMDM2ConnectionFactory</connection-factory-
jndi-name>
    </message-driven-descriptor>
</weblogic-enterprise-bean>
<!--Person Sync Integration Point -->
<weblogic-enterprise-bean>
    <ejb-name>OUMDM2PersonSyncRequest</ejb-name>
    <message-driven-descriptor>
        <pool>
            <max-beans-in-free-pool>5</max-beans-in-free-pool>
            <initial-beans-in-free-pool>1</initial-beans-in-free-pool>
        </pool>
        <destination-jndi-
name>jms/LocalOUMDM2PersonSyncRequest</destination-jndi-name>
        <connection-factory-jndi-
name>jms/LocalOUCCB2OUMDM2ConnectionFactory</connection-factory-
jndi-name>
        </message-driven-descriptor>
</weblogic-enterprise-bean>
<!--SA Sync Integration Point -->
<weblogic-enterprise-bean>
    <ejb-name>OUMDM2SASyncRequest</ejb-name>
    <message-driven-descriptor>
        <pool>
            <max-beans-in-free-pool>5</max-beans-in-free-pool>
            <initial-beans-in-free-pool>1</initial-beans-in-free-pool>
        </pool>
        <destination-jndi-
name>jms/LocalOUMDM2SASyncRequest</destination-jndi-name>
        <connection-factory-jndi-
name>jms/LocalOUCCB2OUMDM2ConnectionFactory</connection-factory-
jndi-name>
        </message-driven-descriptor>
</weblogic-enterprise-bean>
<!--SP-Meter History Integration Point -->
<weblogic-enterprise-bean>
    <ejb-name>OUMDM2SPMeterHistSyncRequest</ejb-name>
    <message-driven-descriptor>
        <pool>
            <max-beans-in-free-pool>5</max-beans-in-free-pool>
            <initial-beans-in-free-pool>1</initial-beans-in-free-pool>
        </pool>
        <destination-jndi-
name>jms/LocalOUMDM2SPMeterHistSyncRequest</destination-jndi-name>
        <connection-factory-jndi-
name>jms/LocalOUCCB2OUMDM2ConnectionFactory</connection-factory-
jndi-name>
        </message-driven-descriptor>
</weblogic-enterprise-bean>
<!-- SP Sync Integration Point -->
<weblogic-enterprise-bean>
    <ejb-name>OUMDM2SPSyncRequest</ejb-name>
    <message-driven-descriptor>
        <pool>
            <max-beans-in-free-pool>5</max-beans-in-free-pool>
            <initial-beans-in-free-pool>1</initial-beans-in-free-pool>
        </pool>
```



```
<destination-jndi-  
name>jms/LocalOUMDM2SPSyncRequest</destination-jndi-name>  
<connection-factory-jndi-  
name>jms/LocalOUCCB2OUMDM2ConnectionFactory</connection-factory-  
jndi-name>  
</message-driven-descriptor>  
</weblogic-enterprise-bean>  
<!--Meter Read Sync Integration Point -->  
<weblogic-enterprise-bean>  
<ejb-name>OUMDM2MeterReadSyncRequest</ejb-name>  
<message-driven-descriptor>  
<pool>  
<max-beans-in-free-pool>5</max-beans-in-free-pool>  
<initial-beans-in-free-pool>1</initial-beans-in-free-pool>  
</pool>  
<destination-jndi-  
name>jms/LocalOUMDM2MeterReadSyncRequest</destination-jndi-name>  
<connection-factory-jndi-  
name>jms/LocalOUCCB2OUMDM2ConnectionFactory</connection-factory-  
jndi-name>  
</message-driven-descriptor>  
</weblogic-enterprise-bean>
```

- cm_config.xml.jms.include/ cm_config.xml.win.jms.include example:

```
<jms-system-resource>  
<name>CCB2IntegrationExampleModule</name>  
<target>myserver</target>  
<sub-deployment>  
<name>CCB2IntegrationExample</name>  
<target>myserver</target>  
</sub-deployment>  
<descriptor-file-name>jms/Module-for-CCB-integration-example-  
1-jms.xml</descriptor-file-name>  
</jms-system-resource>
```

XAI Configuration

XAI JNDI Server

Create a new XAI JNDI server which points to the Integration SOA server.

To create a XAI JNDI server to communicate with the integration layer:

1. In the Admin menu, navigate to the XAI JNDI server.
2. Enter the XAI JNDI server name. For example: **CCB_JNDI**
3. Enter the XAI JNDI server description. For example: MDM-CCB Integration server
4. Enter the Provider URL in the format **t3//<SOA Server>: <SOA Port>**.
For example: **t3://soaserver.us.oracle.com:8002**

XAI JMS Queue

Create a new XAI JMS queue for each integration queue where Oracle Utilities Meter Data Management sends messages.

To create a XAI JMS queue:

1. In the Admin menu, navigate to XAI JMS queue.
2. Enter the following:
 - **XAI JMS Queue** – Queue name in Oracle Utilities Meter Data Management.
 - **Description** – Queue description
 - **Queue Name** – JNDI name of the queue on the Integration server. For example: jms/OUMDM2SPSyncResponse
 - **Target Client Flag** – **JMS**
 - **XAI JNDI Server** – Select the XAI JNDI server created for integration.

Note: Only define the queues that Oracle Utilities Meter Data Management will be publishing or writing messages to.

The following are few examples to create a XAI JMS queue:

Contact Sync Integration Point

| XAI JMS Queue | Description | Queue Name | Target Client Flag | XAI JNDI Server |
|---------------|-----------------------|------------------------------|--------------------|-----------------|
| ConSyncRes | Contact Sync Response | jms/OUMDM2PersonSyncResponse | JMS | CCB_JNDI |

Device Configuration Sync Integration Point

| XAI JMS Queue | Description | Queue Name | Target Client Flag | XAI JNDI Server |
|---------------|------------------------------------|-----------------------------------|--------------------|-----------------|
| DCSyncRes | Device Configuration Sync Response | jms/OUMDM2MeterConfigSyncResponse | JMS | CCB_JNDI |

Device Sync Integration Point

| XAI JMS Queue | Description | Queue Name | Target Client Flag | XAI JNDI Server |
|---------------|----------------------|-----------------------------|--------------------|-----------------|
| DevSyncRes | Device Sync Response | jms/OUMDM2MeterSyncResponse | JMS | CCB_JNDI |

Install Event Sync Integration Point

| XAI JMS Queue | Description | Queue Name | Target Client Flag | XAI JNDI Server |
|---------------|-----------------------------|-----------------------------------|--------------------|-----------------|
| IESyncRes | Install Event Sync Response | jms/OUMDM2SPMeterHistSyncResponse | JMS | CCB_JNDI |

SP Sync Integration Point

| XAI JMS Queue | Description | Queue Name | Target Client Flag | XAI JNDI Server |
|---------------|-----------------------------|--------------------------|--------------------|-----------------|
| SPSyncRes | Service Point Sync Response | jms/OUMDM2SPSyncResponse | JMS | CCB_JNDI |

US History Sync Integration Point

| XAI JMS Queue | Description | Queue Name | Target Client Flag | XAI JNDI Server |
|---------------|----------------------------------|--------------------------|--------------------|-----------------|
| USSyncRes | Usage Subscription Sync Response | jms/OUMDM2SASyncResponse | JMS | CCB_JNDI |

BD Response (Batch BD Request) Integration Point

| XAI JMS Queue | Description | Queue Name | Target Client Flag | XAI JNDI Server |
|---------------|---------------------------------|---------------------------|--------------------|-----------------|
| BatchBDRes | Batch Bill Determinant Response | jms/OUMDM2BatchBDResponse | JMS | CCB_JNDI |

BD Response (Online BD Request) Integration Point

| XAI JMS Queue | Description | Queue Name | Target Client Flag | XAI JNDI Server |
|---------------|----------------------------------|----------------------------|--------------------|-----------------|
| OnlineBDRes | Online Bill Determinant Response | jms/OUMDM2OnlineBDResponse | JMS | CCB_JNDI |

Replacement Read / Subsequent Correction Integration Point

| XAI JMS Queue | Description | Queue Name | Target Client Flag | XAI JNDI Server |
|---------------|--------------------------|---------------------------|--------------------|-----------------|
| ReplReadReq | Replacement Read Request | jms/OUMDM2ReplReadRequest | JMS | CCB_JNDI |

Meter Read Sync Integration Point

| XAI JMS Queue | Description | Queue Name | Target Client Flag | XAI JNDI Server |
|---------------|--|---------------------------------|--------------------|-----------------|
| MtrRdSyncRes | Initial Measurement Data Sync Response | jms/OUMDM2MeterReadSyncResponse | JMS | CCB_JNDI |

XAI JMS Connection

Create a new XAI JMS connection used to connect to the integration queues.

To create a XAI JMS connection:

1. In the Admin menu, navigate to XAI JMS Connection.
2. Enter the following:
 - **XAI JMS Connection** – Connection name in Oracle Utilities Meter Data Management.
 - **Description** – Connection description
 - **XAI JNDI Server** – Select the XAI JNDI server created for this integration (as described in the XAI JNDI Server section).
 - **JNDI ConnectionFactory** – JNDI name of the connection factory on the integration server.

For example:

| XAI JMS Connection | Description | XAI JNDI Server | JNDI Connection Factory |
|--------------------|--------------------------------|-----------------|-----------------------------------|
| CCB2_CF | MDM CCB Integration Connection | CCB_JNDI | jms/OUCCB2OUMDM2ConnectionFactory |

XAI Sender

To create a new realtime XAI sender (to communicate with the integration layer) for each Oracle Utilities Meter Data Management Outbound Integration Queue:

1. In the Admin menu, navigate to XAI Sender.
2. Enter a unique XAI sender and its description.
3. Populate the following values:
 - **XAI Sender** – Sender name in Oracle Utilities Meter Data Management.
 - **Description** – Sender description

- **Invocation Type** – *Real-time*
- **XAI Class** – *RTJMSQSNDP* (Realtime JMS Queue Sender)
- **Active** - Select the checkbox.
- **MSG Encoding** – *UTF-8 message encoding*
- **XAI JMS Connection** – XAI JMS connection created for integration.
- **XAI JMS Queue** – XAI JMS Queue created for the Oracle Meter Data Management outbound queue.

4. Select the Context tab and set values for the following context types:

- **JMS Message Type (Bytes(Y)/Text(N))** – *N*
- **JMS User Name** – User for the SOA server to be accessed.
- **JMS User Password** – Password for the SOA server to be accessed.

For example:

Contact Sync Integration Point

| XAI Sender | Description | XAI JMS Connection | XAI JMS Queue |
|-------------|-------------------------------------|--------------------|---------------|
| DM-CCBCSACK | Contact Sync Response Sender to CCB | CCB2_CF | ConSyncRes |

Device Configuraton Integration Point

| XAI Sender | Description | XAI JMS Connection | XAI JMS Queue |
|--------------|--|--------------------|---------------|
| DM-CCBDCSACK | Device Configuration Sync Response Sender to CCB | CCB2_CF | DCSyncRes |

Device Sync Integration Point

| XAI Sender | Description | XAI JMS Connection | XAI JMS Queue |
|-------------|------------------------------------|--------------------|---------------|
| DM-CCBDSACK | Device Sync Response Sender to CCB | CCB2_CF | DevSyncRes |

Install Event Sync Integration Point

| XAI Sender | Description | XAI JMS Connection | XAI JMS Queue |
|--------------|---|--------------------|---------------|
| DM-CCBIESACK | Install Event Sync Response Sender to CCB | CCB2_CF | IESyncRes |

Service Point Sync Integration Point

| XAI Sender | Description | XAI JMS Connection | XAI JMS Queue |
|--------------|---|--------------------|---------------|
| DM-CCBSPSACK | Service Point Sync Response Sender to CCB | CCB2_CF | SPSyncRes |

Usage Subscription Sync Integration Point

| XAI Sender | Description | XAI JMS Connection | XAI JMS Queue |
|--------------|--|--------------------|---------------|
| DM-CCBUSSACK | Usage Subscription Sync Response Sender to CCB | CCB2_CF | USSyncRes |

BD Response (Batch BD Request) Integration Point

| XAI Sender | Description | XAI JMS Connection | XAI JMS Queue |
|------------|---|--------------------|---------------|
| DM-CCB-BBD | Bill Determinants for Batch Request JMS Queue Sender to CCB | CCB2_CF | BatchBDRes |

BD Response (Online BD Request) Integration Point

| XAI Sender | Description | XAI JMS Connection | XAI JMS Queue |
|-------------|--|--------------------|---------------|
| DM-CCB-OBDD | Bill Determinants for Online Request JMS Queue Sender to CCB | CCB2_CF | OnlineBDRes |

BD Error Response (Batch BD Request) Integration Point

| XAI Sender | Description | XAI JMS Connection | XAI JMS Queue |
|-------------|--|--------------------|---------------|
| DM-CCB-EBBD | Bill Determinants Error Notification for Batch Request JMS Queue Sender to CCB | CCB2_CF | BatchBDRes |

BD Error Response (Online BD Request) Integration Point

| XAI Sender | Description | XAI JMS Connection | XAI JMS Queue |
|-------------|---|--------------------|---------------|
| DM-CCB-EOBD | Bill Determinants Error Notification for Online Request JMS Queue Sender to CCB | CCB2_CF | OnlineBDRes |

Replacement Reads / Subsequent Correction Integration Point

| XAI Sender | Description | XAI JMS Connection | XAI JMS Queue |
|------------|--|--------------------|---------------|
| DM-CCB-SC | Bill Determinants Subsequent Correction Notification JMS Queue Sender to CCB | CCB2_CF | ReplReadReq |

Meter Read Sync Integration Point

| XAI Sender | Description | XAI JMS Connection | XAI JMS Queue |
|--------------|--|--------------------|---------------|
| DM-CCBMRSACK | Meter Read Sync Response Sender to CCB | CCB2_CF | MtrRdSyncRes |

Outbound Message Type

To create new Outbound Message Type for each Oracle Utilities Meter Data Management Outbound integration queue:

1. In the Admin menu, navigate to Outbound Message Type.
2. Enter an outbound message type, its description, and then the detailed description.
3. Select the Outbound Message Business object created for the specific outbound queue.

For example:

Contact Sync

| Outbound Message Type | Description | Business Object |
|-----------------------|--|-------------------------|
| DM-CCBCSACK | CCB Contact Sync Acknowledgement Message | D1-OngoingSyncReqAckMsg |

Device Configuration Sync

| Outbound Message Type | Description | Business Object |
|-----------------------|---|-------------------------|
| DM-CCBDCSACK | CCB Device Configuration Sync Acknowledgement Message | D1-OngoingSyncReqAckMsg |

Device Sync

| Outbound Message Type | Description | Business Object |
|-----------------------|---|-------------------------|
| DM-CCBDSACK | CCB Device Sync Acknowledgement Message | D1-OngoingSyncReqAckMsg |

Install Event Sync

| Outbound Message Type | Description | Business Object |
|-----------------------|--|-------------------------|
| DM-CCBIESACK | CCB Install Event Sync Acknowledgement Message | D1-OngoingSyncReqAckMsg |

SP Sync

| Outbound Message Type | Description | Business Object |
|-----------------------|-------------------------------------|-------------------------|
| DM-CCBSPSACK | CCB SP Sync Acknowledgement Message | D1-OngoingSyncReqAckMsg |

US Sync

| Outbound Message Type | Description | Business Object |
|-----------------------|-------------------------------------|-------------------------|
| DM-CCBUSSACK | CCB US Sync Acknowledgement Message | D1-OngoingSyncReqAckMsg |

BD Response (Batch BD Request) Integration Point

| Outbound Message Type | Description | Business Object |
|-----------------------|--|--------------------------|
| DM-CCB-BBD | Usage Transaction Response For A Batch Usage Request | D2-UsageTranOutboundMesg |

BD Response (Online BD Request) Integration Point

| Outbound Message Type | Description | Business Object |
|-----------------------|--|--------------------------|
| DM-CCB-OB | Usage Transaction Response For An Online Usage Request | D2-UsageTranOutboundMesg |

BD Error Response (Batch BD Request) Integration Point

| Outbound Message Type | Description | Business Object |
|-----------------------|--|--------------------------------|
| DM-CCB-EBBD | Usage Transaction Error Response For A Batch Usage Request | D2-UsageTranErrDtlOutboundMesg |

BD Error Response (Online BD Request) Integration Point

| Outbound Message Type | Description | Business Object |
|-----------------------|--|--------------------------------|
| DM-CCB-EOBD | Usage Transaction Error Response For An Online Usage Request | D2-UsageTranErrDtlOutboundMesg |

Replacement Read / Subsequent Correction Notification Integration Point

| Outbound Message Type | Description | Business Object |
|-----------------------|--|--------------------------------|
| DM-CCB-SC | Usage Transaction Subsequent Correction Notification | D2-UsageTranSubCorrectOutbound |

Meter Read Sync

| Outbound Message Type | Description | Business Object |
|-----------------------|---|-------------------------|
| DM-CCBMRSACK | CCB Meter Read Sync Acknowledgement Message | D1-OngoingSyncReqAckMsg |

External System

To create a new external system for Oracle Utilities Meter Data Management Integration to Oracle Utilities Customer Care and Billing:

1. In the Admin menu, define an external system.
2. Enter a unique name for the external system and its description. For example: Name = CI_CCB, Description = Oracle Utilities Customer Care and Billing
3. Set the Our Name in Their System field to Meter Data Management.
4. Associate the outbound message types created to the external system. For each outbound message type, set the following:
 - **Outbound Message Type** – Set the outbound message type created for Oracle Utilities Meter Data Management outbound queue.
 - **Processing Method** – *Real-time*
 - **XAI Sender** – Set the XAI sender created for the queue.
 - **Message XSL** - *D1-MDMJMSQAddNamespace.xsl*

For example: **External System – OUCCB**

| Outbound Message Type | Processing Method | XAI Sender | Message XSL |
|-----------------------|-------------------|--------------|----------------------------|
| DM-CCBCSACK | Real-time | DM-CCBCSACK | D1-MDMJMSQAddNamespace.xsl |
| DM-CCBDCSACK | Real-time | DM-CCBDCSACK | D1-MDMJMSQAddNamespace.xsl |
| DM-CCBDSACK | Real-time | DM-CCBDSACK | D1-MDMJMSQAddNamespace.xsl |
| DM-CCBIESACK | Real-time | DM-CCBIESACK | D1-MDMJMSQAddNamespace.xsl |
| DM-CCBSPSACK | Real-time | DM-CCBSPSACK | D1-MDMJMSQAddNamespace.xsl |
| DM-CCBUSSACK | Real-time | DM-CCBUSSACK | D1-MDMJMSQAddNamespace.xsl |
| DM-CCB-BBD | Real-time | DM-CCB-BBD | D1-MDMJMSQAddNamespace.xsl |
| DM-CCB-OB | Real-time | DM-CCB-OB | D1-MDMJMSQAddNamespace.xsl |
| DM-CCB-EBBD | Real-time | DM-CCB-EBBD | D1-MDMJMSQAddNamespace.xsl |
| DM-CCB-EOBD | Real-time | DM-CCB-EOBD | D1-MDMJMSQAddNamespace.xsl |
| DM-CCB-SC | Real-time | DM-CCB-SC | D1-MDMJMSQAddNamespace.xsl |
| DM-CCBMRSACK | Real-time | DM-CCBMRSACK | D1-MDMJMSQAddNamespace.xsl |

For more information about configuration guidelines, see the Oracle Utilities Meter Data Management user documentation.

Setting up the Process Integration

The following sections describe how to configure integration pack to meet the requirements for 2-way integration. Configuration steps include setting the following:

- Configuration properties
- System properties
- Domain value maps
- Error handling

Setting Configuration Properties

The ConfigurationProperties.XML file contains properties which can be defaulted in the integration. Also, it contains flags to enable extension points within the integration.

ConfigurationProperties.XML is located in MDS under the directory apps/CCB-MDM/AIAMetaData/config.

Note: Whenever the ConfigurationProperties.XML file is updated, it must be reloaded to MDS for updates to be reflected in the applications or services that use the updated properties. You can perform the reload by rebooting the SOA server.

Setting System Properties

There are two sets of configuration properties described in this section:

- Module Configurations are the properties that are shared by multiple integration flows within this Oracle Utilities Customer Care and Billing Integration to Oracle Utilities Meter Data Management Release 3.1.1 Media Pack.
- Service Configurations are the properties that are used by a specific BPEL process.

Module Configurations

When the DVM lookup value is not found for a DVM, DVM flags signal if an error is triggered. If the value is set to “true”, the integration layer triggers a DVM exception to the initiating application. If the value is set to “false”, the integration does not trigger any exception and it passes the source application value as the default value to the target application.

| Module Name | Default / Shipped Value | Description |
|--|-------------------------|---|
| CCB.Generic.MessageCategory | 11114 | This is the message category that the integration layer uses for Oracle Utilities Customer Care and Billing (CCB) error messages. |
| CCB.GenericBusinessException.MessageNumber | 11001 | This is the message number that the integration layer uses for generic CCB errors. |

| Module Name | Default / Shipped Value | Description |
|---|-------------------------|--|
| CCB.GenericDVMException.MessageNumber | 11401 | This is the message number that the integration layer uses for DVM errors. |
| SOA-INFRA.AuditLevel | ON | This property needs to be set to OFF if the Audit Level is set to OFF for the BPEL processes. If the setting is OFF, then error handling does not use the composite and component instance IDs to log the error message. |
| ErrorHandling.GenericEmailID | | This property is used to set the administrator email ID for the errorhandling process to send out an email in case of a critical failure where even the Errorhandling process fails. |
| DVM.OUCCB2_OUMDM2_MO.ThrowException | false | This is the flag for OUCCB2_OUMDM2_MO DVM. |
| DVM.OUCCB2_OUMDM2_ContactType.ThrowException | false | This is the flag for OUCCB2_OUMDM2_ContactType DVM. |
| DVM.OUCCB2_OUMDM2_Country.ThrowException | false | This is the flag for OUCCB2_OUMDM2_Country DVM. |
| DVM.OUCCB2_OUMDM2_DisconnectLocation.ThrowException | false | This is the flag for OUCCB2_OUMDM2_DisconnectLocation DVM. |
| DVM.OUCCB2_OUMDM2_MeasurementCycle.ThrowException | false | This is the flag for OUCCB2_OUMDM2_MeasurementCycle DVM. |
| DVM.OUCCB2_OUMDM2_MeasurementCycleRoute.ThrowException | false | This is the flag for OUCCB2_OUMDM2_MeasurementCycleRoute DVM. |
| DVM.OUCCB2_OUMDM2_SPSourceStatus.ThrowException | false | This is the flag for OUCCB2_OUMDM2_SPSourceStatus DVM. |
| DVM.OUCCB2_OUMDM2_SPStatus.ThrowException | false | This is the flag for OUCCB2_OUMDM2_SPStatus DVM. |
| DVM.OUCCB2_OUMDM2_SPTType.ThrowException | false | This is the flag for OUCCB2_OUMDM2_SPTType DVM. |
| DVM.OUCCB2_OUMDM2_LifeSupportSensitiveLoad.ThrowException | false | This is the flag for OUCCB2_OUMDM2_LifeSupportSensitiveLoad DVM. |
| DVM.OUCCB2_OUMDM2_USType.ThrowException | false | This is the flag for OUCCB2_OUMDM2_USType DVM. |
| DVM.OUCCB2_OUMDM2_SASStatus.ThrowException | false | This is the flag for OUCCB2_OUMDM2_SASStatus DVM. |
| DVM.OUCCB2_OUMDM2_DeviceType.ThrowException | false | This is the flag for OUCCB2_OUMDM2_DeviceType DVM. |
| DVM.OUCCB2_OUMDM2_MeterStatus.ThrowException | false | This is the flag for OUCCB2_OUMDM2_MeterStatus DVM. |
| DVM.OUCCB2_OUMDM2_Manufacturer.ThrowException | false | This is the flag for OUCCB2_OUMDM2_Manufacturer DVM. |

| Module Name | Default / Shipped Value | Description |
|---|-------------------------|--|
| DVM.OUCCB2_OUMDM2_Model.ThrowException | false | This is the flag for OUCCB2_OUMDM2_Model DVM. |
| DVM.OUCCB2_OUMDM2_DeviceConfigType.ThrowException | false | This is the flag for OUCCB2_OUMDM2_DeviceConfigType DVM. |
| DVM.OUCCB2_OUMDM2_HowToUse.ThrowException | false | This is the flag for OUCCB2_OUMDM2_HowToUse DVM. |
| DVM.OUCCB2_OUMDM2_ReadOutType.ThrowException | false | This is the flag for OUCCB2_OUMDM2_ReadOutType DVM. |
| DVM.OUCCB2_OUMDM2_ConsumptiveSubtractive.ThrowException | false | This is the flag for OUCCB2_OUMDM2_ConsumptiveSubtractive DVM. |
| DVM.OUCCB2_OUMDM2_MCSERVICEType.ThrowException | false | This is the flag for OUCCB2_OUMDM2_MCSERVICEType DVM. |
| DVM.OUCCB2_OUMDM2_NegativeConsumption.ThrowException | false | This is the flag for OUCCB2_OUMDM2_NegativeConsumption DVM. |
| DVM.OUCCB2_OUMDM2_BillCondition.ThrowException | false | This is the flag for OUCCB2_OUMDM2_BillCondition DVM. |
| DVM.OUCCB2_OUMDM2_AllowEstimate.ThrowException | false | This is the flag for OUCCB2_OUMDM2_AllowEstimate DVM. |
| DVM.OUCCB2_OUMDM2_BillingOption.ThrowException | false | This is the flag for OUCCB2_OUMDM2_BillingOption DVM. |
| DVM.OUCCB2_OUMDM2_BillMode.ThrowException | false | This is the flag for OUCCB2_OUMDM2_BillMode DVM. |
| DVM.OUCCB2_OUMDM2_AutomatedRetry.ThrowException | false | This is the flag for OUCCB2_OUMDM2_AutomatedRetry DVM. |
| DVM.OUMDM2_OUCCB2_IsEstimate.ThrowException | false | This is the flag for OUMDM2_OUCCB2_IsEstimate DVM. |
| DVM.OUMDM2_OUCCB2_UOM.ThrowException | false | This is the flag for OUMDM2_OUCCB2_UOM DVM. |
| DVM.OUMDM2_OUCCB2_TOU.ThrowException | false | This is the flag for OUMDM2_OUCCB2_TOU DVM. |
| DVM.OUMDM2_OUCCB2_SQL.ThrowException | false | This is the flag for OUMDM2_OUCCB2_SQL DVM. |
| DVM.OUMDM2_OUCCB2_UsageType.ThrowException | false | This is the flag for OUMDM2_OUCCB2_UsageType DVM. |
| DVM.OUMDM2_OUCCB2_MeasuresPeakQuantity.ThrowException | false | This is the flag for OUMDM2_OUCCB2_MeasuresPeakQuantity DVM. |
| DVM.OUMDM2_OUCCB2_SPHowToUse.ThrowException | false | This is the flag for OUMDM2_OUCCB2_SPHowToUse DVM. |

| Module Name | Default / Shipped Value | Description |
|---|-------------------------|--|
| DVM.OUMDM2_OUCCB2_SkipSA.ThrowException | false | This is the flag for OUMDM2_OUCCB2_SkipSA DVM. |
| DVM.OUMDM2_OUCCB2_SkipReason.ThrowException | false | This is the flag for OUMDM2_OUCCB2_SkipReason DVM. |
| DVM.OUCCB2_OUMDM2_ReadType.ThrowException | false | This is the flag for OUCCB2_OUMDM2_ReadType DVM. |

Service Configurations

| Service Name | Property Name | Default / Shipped Value | Description |
|-------------------------------|---------------------------------|-------------------------|---|
| OUCCB2OUMDM2PersonSyncReqEBF | Default.SystemID | OU_CCB2_01 | Initiating system ID. |
| | Extension.PreXformCCB2toMDM2 | false | If set to true, the pre transformation extension service is invoked. |
| | Extension.PostXformToMDM2 | false | If set to true, the post transformation extension service is invoked. |
| | BusinessError.NotificationFlag | false | If set to true, business error notification is sent via Email. |
| | TechnicalError.NotificationFlag | false | If set to true, technical error notification is sent via Email. |
| OUMDM2OUCCB2PersonSyncRespEBF | Default.SystemID | OU_MDM2_01 | Initiating system ID. |
| | Extension.PreXformMDM2toCCB2 | false | If set to true, the pre transformation extension service is invoked. |
| | Extension.PostXformtoCCB2 | false | If set to true, the post transformation extension service is invoked. |
| | BusinessError.NotificationFlag | false | If set to true, business error notification is sent via Email. |
| | TechnicalError.NotificationFlag | false | If set to true, technical error notification is sent via Email. |
| OUCCB2OUMDM2SPSyncReqEBF | Default.SystemID | OU_CCB2_01 | Initiating system ID. |
| | Extension.PreXformCCB2toMDM2 | false | If set to true, the pre transformation extension service is invoked. |
| | Extension.PostXformToMDM2 | false | If set to true, the post transformation extension service is invoked. |
| | BusinessError.NotificationFlag | false | If set to true, business error notification is sent via Email. |

| Service Name | Property Name | Default / Shipped Value | Description |
|---------------------------------|----------------------------------|-------------------------|---|
| | TechnicalError.NotificationFlag | false | If set to true, technical error notification is sent via Email. |
| OUMDM2OUCCB2SPS yncRespEBF | Default.SystemID | OU_MDM2_01 | Initiating system ID. |
| | Extension.PreXformMD M2toCCB2 | false | If set to true, the pre transformation extension service is invoked. |
| | Extension.PostXformtoC CB2 | false | If set to true, the post transformation extension service is invoked. |
| | BusinessError.NotificationFlag | false | If set to true, business error notification is sent via Email. |
| | TechnicalError.NotificationFlag | false | If set to true, technical error notification is sent via Email. |
| OUCCB2OUMDM2SAS yncReqEBF | Default.SystemID | OU_CCB2_01 | Initiating system ID. |
| | Extension.PreXformCCB 2toMDM2 | false | If set to true, the pre transformation extension service is invoked. |
| | Extension.PostXformTo MDM2 | false | If set to true, the post transformation extension service is invoked. |
| | BusinessError.NotificationFlag | false | If set to true, business error notification is sent via Email. |
| | TechnicalError.NotificationFlag | false | If set to true, technical error notification is sent via Email. |
| OUMDM2OUCCB2SAS yncRespEBF | Default.SystemID | OU_MDM2_01 | Initiating system ID. |
| | Extension.PreXformMD M2toCCB2 | false | If set to true, the pre transformation extension service is invoked. |
| | Extension.PostXformtoC CB2 | false | If set to true, the post transformation extension service is invoked. |
| | BusinessError.NotificationFlag | false | If set to true, business error notification is sent via Email. |
| | TechnicalError.NotificationFlag | false | If set to true, technical error notification is sent via Email. |
| OUCCB2OUMDM2Mete rSyncReqEBF | Default.SystemID | OU_CCB2_01 | Initiating system ID. |
| | Extension.PreXformCCB 2toMDM2 | false | If set to true, the pre transformation extension service is invoked. |
| | Extension.PostXformTo MDM2 | false | If set to true, the post transformation extension service is invoked. |

| Service Name | Property Name | Default / Shipped Value | Description |
|------------------------------------|---------------------------------|-------------------------|---|
| | BusinessError.NotificationFlag | false | If set to true, business error notification is sent via Email. |
| | TechnicalError.NotificationFlag | false | If set to true, technical error notification is sent via Email. |
| OUMDM2OUCCB2MeterSyncRespEBF | Default.SystemID | OU_MDM2_01 | Initiating system ID. |
| | Extension.PreXformMDM2toCCB2 | false | If set to true, the pre transformation extension service is invoked. |
| | Extension.PostXformtoCCB2 | false | If set to true, the post transformation extension service is invoked. |
| | BusinessError.NotificationFlag | false | If set to true, business error notification is sent via Email. |
| | TechnicalError.NotificationFlag | false | If set to true, technical error notification is sent via Email. |
| OUCCB2OUMDM2SPMeterHistSyncReqEBF | Default.SystemID | OU_CCB2_01 | Initiating system ID. |
| | Extension.PreXformCCB2toMDM2 | false | If set to true, the pre transformation extension service is invoked. |
| | Extension.PostXformToMDM2 | false | If set to true, the post transformation extension service is invoked. |
| | BusinessError.NotificationFlag | false | If set to true, business error notification is sent via Email. |
| | TechnicalError.NotificationFlag | false | If set to true, technical error notification is sent via Email. |
| OUMDM2OUCCB2SPMeterHistSyncRespEBF | Default.SystemID | OU_MDM2_01 | Initiating system ID. |
| | Extension.PreXformMDM2toCCB2 | false | If set to true, the pre transformation extension service is invoked. |
| | Extension.PostXformtoCCB2 | false | If set to true, the post transformation extension service is invoked. |
| | BusinessError.NotificationFlag | false | If set to true, business error notification is sent via Email. |
| | TechnicalError.NotificationFlag | false | If set to true, technical error notification is sent via Email. |
| OUCCB2OUMDM2MeterConfigSyncReqEBF | Default.SystemID | OU_CCB2_01 | Initiating system ID. |
| | Extension.PreXformCCB2toMDM2 | false | If set to true, the pre transformation extension service is invoked. |

| Service Name | Property Name | Default / Shipped Value | Description |
|------------------------------------|---------------------------------|-------------------------|---|
| | Extension.PostXformToMDM2 | false | If set to true, the post transformation extension service is invoked. |
| | BusinessError.NotificationFlag | false | If set to true, business error notification is sent via Email. |
| | TechnicalError.NotificationFlag | false | If set to true, technical error notification is sent via Email. |
| | MDM2.Interval.Flag | D1IN | Flag for Interval meter |
| | MDM2.Scalar.Flag | D1SC | Flag for Scalar meter |
| OUMDM2OUCCB2MeterConfigSyncRespEBF | Default.SystemID | OU_MDM2_01 | Initiating system ID. |
| | Extension.PreXformMDM2toCCB2 | false | If set to true, the pre transformation extension service is invoked. |
| | Extension.PostXformtoCCB2 | false | If set to true, the post transformation extension service is invoked. |
| | BusinessError.NotificationFlag | false | If set to true, business error notification is sent via Email. |
| | TechnicalError.NotificationFlag | false | If set to true, technical error notification is sent via Email. |
| OUCCB2OUMDM2BatchBDRReqEBF | Default.SystemID | OU_CCB2_01 | Initiating system ID. |
| | Extension.PreXformCCB2toMDM2 | false | If set to true, the pre transformation extension service is invoked. |
| | Extension.PostXformToMDM2 | false | If set to true, the post transformation extension service is invoked. |
| | BusinessError.NotificationFlag | false | If set to true, business error notification is sent via Email. |
| | TechnicalError.NotificationFlag | false | If set to true, technical error notification is sent via Email. |
| OUMDM2OUCCB2BatchBDRRespEBF | Default.SystemID | OU_MDM2_01 | Initiating system ID. |
| | Extension.PreXformMDM2toCCB2 | false | If set to true, the pre transformation extension service is invoked. |
| | Extension.PostXformtoCCB2 | false | If set to true, the post transformation extension service is invoked. |
| | BusinessError.NotificationFlag | false | If set to true, business error notification is sent via Email. |
| | TechnicalError.NotificationFlag | false | If set to true, technical error notification is sent via Email. |

| Service Name | Property Name | Default / Shipped Value | Description |
|---------------------------------|---------------------------------|-------------------------|---|
| OUCCB2OUMDM2OnlineBDReqEBF | Default.SystemID | OU_CCB2_01 | Initiating system ID. |
| | Extension.PreXformCCB2toMDM2 | false | If set to true, the pre transformation extension service is invoked. |
| | Extension.PostXformToMDM2 | false | If set to true, the post transformation extension service is invoked. |
| | BusinessError.NotificationFlag | false | If set to true, business error notification is sent via Email. |
| | TechnicalError.NotificationFlag | false | If set to true, technical error notification is sent via Email. |
| OUMDM2OUCCB2OnlineBDRespEBF | Default.SystemID | OU_MDM2_01 | Initiating system ID. |
| | Extension.PreXformMDM2toCCB2 | false | If set to true, the pre transformation extension service is invoked. |
| | Extension.PostXformtoCCB2 | false | If set to true, the post transformation extension service is invoked. |
| | BusinessError.NotificationFlag | false | If set to true, business error notification is sent via Email. |
| | TechnicalError.NotificationFlag | false | If set to true, technical error notification is sent via Email. |
| OUMDM2OUCCB2ReplReadReqEBF | Default.SystemID | OU_MDM2_01 | Initiating system ID. |
| | Extension.PreXformMDM2toCCB2 | false | If set to true, the pre transformation extension service is invoked. |
| | Extension.PostXformtoCCB2 | false | If set to true, the post transformation extension service is invoked. |
| | BusinessError.NotificationFlag | false | If set to true, business error notification is sent via Email. |
| | TechnicalError.NotificationFlag | false | If set to true, technical error notification is sent via Email. |
| OUCCB2OUMDM2MeterReadSyncReqEBF | Default.SystemID | OU_CCB2_01 | Initiating system ID. |
| | Extension.PreXformCCB2toMDM2 | false | If set to true, the pre transformation extension service is invoked. |
| | Extension.PostXformToMDM2 | false | If set to true, the post transformation extension service is invoked. |
| | BusinessError.NotificationFlag | false | If set to true, business error notification is sent via Email. |

| Service Name | Property Name | Default / Shipped Value | Description |
|----------------------------------|---------------------------------|-------------------------|---|
| | TechnicalError.NotificationFlag | false | If set to true, technical error notification is sent via Email. |
| OUMDM2OUCCB2MeterReadSyncRespEBF | Default.SystemID | OU_MDM2_01 | Initiating system ID. |
| | Extension.PreXformMDM2toCCB2 | false | If set to true, the pre transformation extension service is invoked. |
| | Extension.PostXformtoCCB2 | false | If set to true, the post transformation extension service is invoked. |
| | BusinessError.NotificationFlag | false | If set to true, business error notification is sent via Email. |
| | TechnicalError.NotificationFlag | false | If set to true, technical error notification is sent via Email. |
| OUCCB2OUMDM2HighLowReadReqEBF | Default.SystemID | OU_CCB2_01 | Initiating system ID. |
| | Extension.PreXformCCB2toMDM2 | false | If set to true, the pre transformation extension service is invoked. |
| | Extension.PostXformCCB2toMDM2 | false | If set to true, the post transformation extension service is invoked before invoking MDM. |
| | Extension.PreXformMDM2toCCB2 | false | If set to true, the pre transformation extension service for Response is invoked. |
| | Extension.PostXformMDM2toCCB2 | false | If set to true, the post transformation extension service for Response is invoked. |

Domain Value Maps

Domain value maps (DVMs) are a standard feature of the Oracle SOA Suite which maps codes and other static values across applications. For example: "US" and "USA"

DVMs are static in nature, though Administrators can add additional maps as needed. Transactional business processes never update DVMs - they only read from them. They are stored in XML files and cached in memory at runtime.

To maintain information within the domain value maps:

2. Open a browser and access the SOA Composer application (<http://host:port/soa/composer/>)
3. On the SOA Composer, click the "Open" dropdown and select "Open DVM". This displays a list of all DVM files in MDS.
4. Select the relevant DVM you wish to maintain.
5. Edit the selected DVM. The Edit button in the top navigation bar enables editing the DVM.
6. Once the DVM has been edited, click Save in the navigation bar. This saves the DVM data for that session.

7. Click Commit after updating each DVM. This saves the DVM data in MDS.

The DVMs for Oracle Utilities Customer Care and Billing Integration to Oracle Utilities Meter Data Management Release 3.1.1 Media Pack are listed as follows:

| DVM | Integration Points | Description |
|--|--------------------|---|
| OUCCB2_OUMDM2_ErrorCode | All | Mapping between Oracle Utilities Customer Care and Billing (CCB) message category and message number and Oracle Utilities Meter Data Management (MDM) message category and message number. The Message Category and message number are stored in the same DVM column but separated by “!” symbol. |
| OUCCB2_OUMDM2_MO | All | Transform the CCB Maintenance Object name to MDM Maintenance Object name. |
| OUCCB2_OUMDM2_ContactType | Person Sync | Transform the CCB Contact type to MDM Contact Type. |
| OUCCB2_OUMDM2_Country | SP Sync | Transform the Country code from CCB to MDM format and vice versa. |
| OUCCB2_OUMDM2_DisconnectLocation | SP Sync | Transform Disconnect location code from CCB to MDM format and vice versa. |
| OUCCB2_OUMDM2_MeasurementCycle | SP Sync | Transform measurement cycle code from CCB to MDM format and vice versa. |
| OUCCB2_OUMDM2_MeasurementCycleRoute | SP Sync | Transform measurement cycle route code from CCB to MDM format and vice versa. |
| OUCCB2_OUMDM2_SPSourceStatus | SP Sync | Transform SP Source status from CCB to MDM format and vice versa. |
| OUCCB2_OUMDM2_SPStatus | SP Sync | Transform SP status from CCB to MDM format and vice versa. |
| OUCCB2_OUMDM2_SPTType | SP Sync | Transform SP Type from CCB to MDM format and vice versa. |
| OUCCB2_OUMDM2_LifeSupportSensitiveLoad | SP Sync | Transform life support sensitive load to enter code from CCB to MDM format and vice versa. |
| OUCCB2_OUMDM2_USType | SA Sync | Transform CCB SA type and CIS Division combination to MDM US type and vice versa. In the CCB column, the SA Type and CIS Division are both entered with “!” symbol as the separator. |
| OUCCB2_OUMDM2_SASStatus | SA Sync | Transform CCB SA status to MDM Usage subscription status and vice versa. |
| OUCCB2_OUMDM2_DeviceType | Meter Sync | Transform CCB Meter type to MDM Device type and vice versa. |
| OUCCB2_OUMDM2_MeterStatus | Meter Sync | Transform CCB Meter status to MDM Device status and vice versa. |

| DVM | Integration Points | Description |
|--------------------------------------|--|--|
| OUCCB2_OUMDM2_Manufacturer | Meter Sync | Transform CCB Manufacturer to MDM Manufacturer and vice versa. |
| OUCCB2_OUMDM2_Model | Meter Sync | Transform CCB Model to MDM Model and vice versa. |
| OUCCB2_OUMDM2_DeviceConfigType | Meter Configuration Sync | Transform CCB Meter Config type to MDM Device Config type and vice versa. |
| OUCCB2_OUMDM2_HowToUse | Meter Configuration Sync | Transform CCB How to use flag to MDM How to use flag and vice versa. |
| OUCCB2_OUMDM2_ReadOutType | Meter Configuration Sync | Transform CCB Read out type to MDM Read out type and vice versa. |
| OUCCB2_OUMDM2_ConsumptiveSubtractive | Meter Configuration Sync | Transform CCB Consumptive Subtractive flag to MDM Consumptive Subtractive flag and vice versa. |
| OUCCB2_OUMDM2_MCSERVICEType | Meter Configuration Sync | Transform CCB Measuring component service type to MDM Measuring component service type and vice versa. |
| OUCCB2_OUMDM2_NegativeConsumption | Meter Configuration Sync | Transform CCB negative consumption flag to MDM negative consumption flag and vice versa. |
| OUCCB2_OUMDM2_BillCondition | Batch BD and Online BD | Transform CCB Bill Condition to MDM Bill Condition and vice versa. |
| OUCCB2_OUMDM2_AllowEstimate | Batch BD and Online BD | Transform CCB Allow Estimate to MDM Allow Estimate and vice versa. |
| OUCCB2_OUMDM2_BillingOption | Batch BD and Online BD | Transform CCB Billing Option to MDM Billing Option and vice versa. |
| OUCCB2_OUMDM2_BillMode | Batch BD and Online BD | Transform CCB Bill Mode to MDM Bill Mode and vice versa. |
| OUCCB2_OUMDM2_AutomatedRetry | Batch BD | Transform CCB Automated Retry to MDM Automated Retry and vice versa. |
| OUMDM2_OUCCB2_IsEstimate | Batch BD and Online BD | Transform MDM Is Estimate flag to CCB Is Estimate flag and vice versa. |
| OUMDM2_OUCCB2_UOM | Meter Configuration Sync, Batch BD and Online BD | Transform CCB UOM to MDM UOM and vice versa. |
| OUMDM2_OUCCB2_TOU | Meter Configuration Sync, Batch BD and Online BD | Transform CCB TOU to MDM TOU and vice versa. |
| OUMDM2_OUCCB2_SQI | Meter Configuration Sync, Batch BD and Online BD | Transform CCB SQI to MDM SQI and vice versa. |
| OUMDM2_OUCCB2_UsageType | Batch BD and Online BD | Transform the MDM usage type to CCB usage type. For example: Interval, Scalar, etc. |

| DVM | Integration Points | Description |
|------------------------------------|------------------------|---|
| OUMDM2_OUCCB2_SPHowToUse | Batch BD and Online BD | Transform MDM SP How to Use flag to CCB SP How to Use Flag and vice versa |
| OUMDM2_OUCCB2_MeasuresPeakQuantity | Batch BD and Online BD | Transform MDM Measures Peak Quantity flag to CCB Measures Peak Quantity flag and vice versa |
| OUMDM2_OUCCB2_SkipSA | Batch BD | Transform MDM Skip flag to CCB Skip SA flag |
| OUMDM2_OUCCB2_Skipreason | Batch BD | Transform MDM Skip Reason flag to CCB Skip Reason flag. |
| OUCCB2_OUMDM2_ReadType | Scalar Meter Read | Transform CCB Read Type flag to MDM Measurement Condition. |

For more information about Domain Value Maps, refer the chapters [Working with Domain Value Maps](#) and [Using SOA Composer with Domain Value Maps](#) in Oracle Fusion Middleware Developer's Guide for Oracle SOA Suite.

OUCCB2_OUMDM2_ErrorCode

This DVM is used by the integration code to transform Oracle Utilities Meter Data Management Message Category and Message number to Oracle Utilities Customer Care and Billing Message Category and message number. This helps the implementation layer to map specific message numbers to specific error codes, and thus provide more user-friendly error messages in Oracle Utilities Customer Care and Billing.

| OUCCB2_ErrorCode | OUMDM2_ErrorCode |
|--|--|
| This is a combination of CCB Message Category and Message Number separated by "!". | This is a combination of MDM Message Category and Message Number separated by "!". |

OUCCB2_OUMDM2_MO

This DVM is used by the integration layer to map Oracle Utilities Customer Care and Billing Maintenance Object value to corresponding Oracle Utilities Meter Data Management Maintenance Object value.

| OUCCB2_MO | OUMDM2_MO |
|------------------------------------|------------------------------------|
| This is a valid MO defined in CCB. | This is a valid MO defined in MDM. |

OUCCB2_OUMDM2_ContactType

This DVM is used by the integration layer to map Oracle Utilities Customer Care and Billing Contact Type value to corresponding Oracle Utilities Meter Data Management Contact type value.

| OUCCB2_ContactType | OUMDM2_ContactType |
|--|--|
| This is a valid Contact Type defined in CCB. | This is a valid Contact Type defined in MDM. |

OUCCB2_OUMDM2_Country

This DVM is used by the integration layer to map Oracle Utilities Customer Care and Billing country code to corresponding Oracle Utilities Meter Data Management Country code.

| OUCCB2_CountryCode | OUMDM2_Country Code |
|--|--|
| This is a valid country code defined in CCB. | This is a valid country code defined in MDM. |

OUCCB2_OUMDM2_DisconnectLocation

This DVM is used by the integration layer to map Oracle Utilities Customer Care and Billing Disconnect Location to corresponding Oracle Utilities Meter Data Management Disconnect Location.

| OUCCB2_DisconnectLocation | OUMDM2_DisconnectLocation |
|---|---|
| This is a valid Disconnect Location defined in CCB. | This is a valid Disconnect Location defined in MDM. |

OUCCB2_OUMDM2_MeasurementCycle

This DVM is used by the integration layer to map Oracle Utilities Customer Care and Billing Measurement Cycle to corresponding Oracle Utilities Meter Data Management Measurement Cycle.

| OUCCB2_MeasurementCycle | OUMDM2_MeasurementCycle |
|---|---|
| This is a valid Measurement Cycle defined in CCB. | This is a valid Measurement Cycle defined in MDM. |

OUCCB2_OUMDM2_MeasurementCycleRoute

This DVM is used by the integration layer to map Oracle Utilities Customer Care and Billing Measurement Cycle Route to corresponding Oracle Utilities Meter Data Management Measurement Cycle Route.

| OUCCB2_MeasurementCycleRoute | OUMDM2_MeasurementCycleRoute |
|---|---|
| This is a valid Measurement Cycle Route defined in CCB. | This is a valid Measurement Cycle Route defined in MDM. |

OUCCB2_OUMDM2_SPSourceStatus

This DVM is used by the integration layer to map Oracle Utilities Customer Care and Billing SP Source Status to corresponding Oracle Utilities Meter Data Management SP Source Status.

| OUCCB2_SPSourceStatus | OUMDM2_SPSourceStatus |
|--|--|
| This is a valid SP Source Status defined in CCB. | This is a valid SP Source Status defined in MDM. |

OUCCB2_OUMDM2_SPStatus

This DVM is used by the integration layer to map Oracle Utilities Customer Care and Billing SP Status to corresponding Oracle Utilities Meter Data Management SP Status.

| OUCCB2_SPStatus | OUMDM2_SPStatus |
|---|---|
| This is a valid SP Status defined in CCB. | This is a valid SP Status defined in MDM. |

OUCCB2_OUMDM2_SPTYPE

This DVM is used by the integration layer to map Oracle Utilities Customer Care and Billing SP Type to corresponding Oracle Utilities Meter Data Management SP Type.

| OUCCB2_SPTYPE | OUMDM2_SPTYPE |
|---|---|
| This is a valid SP Type defined in CCB. | This is a valid SP Type defined in MDM. |

OUCCB2_OUMDM2_LifeSupportSensitiveLoad

This DVM is used by the integration layer to map Oracle Utilities Customer Care and Billing LifeSupportSensitiveLoad flag to corresponding Oracle Utilities Meter Data Management LifeSupportSensitiveLoad flag.

| OUCCB2_LifeSupportSensitiveLoad | OUMDM2_LifeSupportSensitiveLoad |
|---|---|
| This is a valid LifeSupportSensitiveLoad flag defined in CCB. | This is a valid LifeSupportSensitiveLoad flag defined in MDM. |

OUCCB2_OUMDM2_USType

This DVM is used by the integration layer to map Oracle Utilities Customer Care and Billing CIS Division and SA Type to corresponding Oracle Utilities Meter Data Management Usage Subscription type.

| OUCCB2_CISDivision_SAType | OUMDM2_USType |
|---|---|
| This is a valid CIS Division and SA Type combination defined in CCB separated by "!". | This is a valid Usage Subscription type defined in MDM. |

OUCCB2_OUMDM2_SASStatus

This DVM is used by the integration layer to map Oracle Utilities Customer Care and Billing SA Status to corresponding Oracle Utilities Meter Data Management US Status.

| OUCCB2_SASStatus | OUMDM2_USStatus |
|---|---|
| This is a valid SA Status defined in CCB. | This is a valid US Status defined in MDM. |

OUCCB2_OUMDM2_DeviceType

This DVM is used by the integration layer to map Oracle Utilities Customer Care and Billing Device Type to corresponding Oracle Utilities Meter Data Management Device Type.

| OUCCB2_DeviceType | OUMDM2_DeviceType |
|---|---|
| This is a valid Device Type defined in CCB. | This is a valid Device Type defined in MDM. |

OUCCB2_OUMDM2_MeterStatus

This DVM is used by the integration layer to map Oracle Utilities Customer Care and Billing Meter Status to corresponding Oracle Utilities Meter Data Management Device Status.

| OUCCB2_MeterStatus | OUMDM2_DeviceStatus |
|--|---|
| This is a valid Meter Status defined in CCB. | This is a valid Device status defined in MDM. |

OUCCB2_OUMDM2_Manufacturer

This DVM is used by the integration layer to map Oracle Utilities Customer Care and Billing Manufacturer code to corresponding Oracle Utilities Meter Data Management Manufacturer code.

| OUCCB2_Manufacturer | OUMDM2_Manufacturer |
|---|---|
| This is a valid Manufacturer code defined in CCB. | This is a valid Manufacturer code defined in MDM. |

OUCCB2_OUMDM2_Model

This DVM is used by the integration layer to map the Oracle Utilities Customer Care and Billing Model code to corresponding Oracle Utilities Meter Data Management Model code.

| OUCCB2_Model | OUMDM2_Model |
|--|--|
| This is a valid Model code defined in CCB. | This is a valid Model code defined in MDM. |

OUCCB2_OUMDM2_DeviceConfigType

This DVM is used by the integration layer to map the Oracle Utilities Customer Care and Billing Device Config Type code to corresponding Oracle Utilities Meter Data Management Device Config Type code.

| OUCCB2_DeviceConfigType | OUMDM2_DeviceConfigType |
|---|---|
| This is a valid Device Config Type code defined in CCB. | This is a valid Device Config Type code defined in MDM. |

OUCCB2_OUMDM2_HowToUse

This DVM is used by the integration layer to map the Oracle Utilities Customer Care and Billing HowToUse flag to corresponding Oracle Utilities Meter Data Management HowToUse flag.

| OUCCB2_HowToUse | OUMDM2_HowToUse |
|---|---|
| This is a valid HowToUse flag defined in CCB. | This is a valid HowToUse flag defined in MDM. |

OUCCB2_OUMDM2_ReadOutType

This DVM is used by the integration layer to map the Oracle Utilities Customer Care and Billing Read Out Type code to corresponding Oracle Utilities Meter Data Management Read Out Type code.

| OUCCB2_ReadOutType | OUMDM2_ReadOutType |
|--|--|
| This is a valid Read Out Type code defined in CCB. | This is a valid Read Out Type code defined in MDM. |

OUCCB2_OUMDM2_ConsumptiveSubtractive

This DVM is used by the integration layer to map the Oracle Utilities Customer Care and Billing ConsumptiveSubtractive flag to corresponding Oracle Utilities Meter Data Management ConsumptiveSubtractive flag.

| OUCCB2_ConsumptiveSubtractive | OUMDM2_ConsumptiveSubtractive |
|---|---|
| This is a valid ConsumptiveSubtractive flag defined in CCB. | This is a valid ConsumptiveSubtractive flag defined in MDM. |

OUCCB2_OUMDM2_MCSERVICEType

This DVM is used by the integration layer to map the Oracle Utilities Customer Care and Billing Measuring Component Service Type code to corresponding Oracle Utilities Meter Data Management Measuring Component Service Type code.

| OUCCB2_MCSERVICEType | OUMDM2_MCSERVICEType |
|---|---|
| This is a valid Measuring Component Service Type code defined in CCB. | This is a valid Measuring Component Service Type code defined in MDM. |

OUCCB2_OUMDM2_NegativeConsumption

This DVM is used by the integration layer to map the Oracle Utilities Customer Care and Billing NegativeConsumption flag to corresponding Oracle Utilities Meter Data Management NegativeConsumption flag.

| OUCCB2_NegativeConsumption | OUMDM2_NegativeConsumption |
|--|--|
| This is a valid NegativeConsumption flag defined in CCB. | This is a valid NegativeConsumption flag defined in MDM. |

OUCCB2_OUMDM2_BillCondition

This DVM is used by the integration layer to map the Oracle Utilities Customer Care and Billing BillCondition flag to corresponding Oracle Utilities Meter Data Management BillCondition flag.

| OUCCB2_BillCondition | OUMDM2_BillCondition |
|--|--|
| This is a valid BillCondition flag defined in CCB. | This is a valid BillCondition flag defined in MDM. |

OUCCB2_OUMDM2_AllowEstimate

This DVM is used by the integration layer to map the Oracle Utilities Customer Care and Billing AllowEstimate flag to corresponding Oracle Utilities Meter Data Management AllowEstimate flag.

| OUCCB2_AllowEstimate | OUMDM2_AllowEstimate |
|--|--|
| This is a valid AllowEstimate flag defined in CCB. | This is a valid AllowEstimate flag defined in MDM. |

OUCCB2_OUMDM2_BillingOption

This DVM is used by the integration layer to map the Oracle Utilities Customer Care and Billing BillingOption flag to corresponding Oracle Utilities Meter Data Management BillingOption flag.

| OUCCB2_BillingOption | OUMDM2_BillingOption |
|--|--|
| This is a valid BillingOption flag defined in CCB. | This is a valid BillingOption flag defined in MDM. |

OUCCB2_OUMDM2_BillMode

This DVM is used by the integration layer to map the Oracle Utilities Customer Care and Billing BillMode flag to corresponding Oracle Utilities Meter Data Management BillMode flag.

| OUCCB2_BillMode | OUMDM2_BillMode |
|---|---|
| This is a valid BillMode flag defined in CCB. | This is a valid BillMode flag defined in MDM. |

OUCCB2_OUMDM2_AutomatedRetry

This DVM is used by the integration layer to map the Oracle Utilities Customer Care and Billing AutomatedRetry flag to corresponding Oracle Utilities Meter Data Management AutomatedRetry flag.

| OUCCB2_AutomatedRetry | OUMDM2_AutomatedRetry |
|---|---|
| This is a valid AutomatedRetry flag defined in CCB. | This is a valid AutomatedRetry flag defined in MDM. |

OUCCB2_OUMDM2_ReadType

This DVM is used by the integration layer to map the Oracle Utilities Customer Care and Billing ReadType flag to corresponding Oracle Utilities Meter Data Management MeasurementCondition flag.

| OUCCB2_ReadType | OUMDM2_ReadType |
|---|---|
| This is a valid Read Type defined in CCB. | This is a valid Measurement Condition defined in MDM. |

OUMDM2_OUCCB2_IsEstimate

This DVM is used by the integration layer to map the Oracle Utilities Meter Data Management Is Estimate flag to corresponding Oracle Utilities Customer Care and Billing Is Estimate flag.

| OUMDM2_IsEstimate | OUCCB2_IsEstimate |
|--|--|
| This is a valid Is Estimate flag defined in MDM. | This is a valid Is Estimate flag defined in CCB. |

OUMDM2_OUCCB2_UOM

This DVM is used by the integration layer to map the Oracle Utilities Meter Data Management UOM to corresponding Oracle Utilities Customer Care and Billing UOM.

| OUMDM2_UOM | OUCCB2_UOM |
|-------------------------------------|-------------------------------------|
| This is a valid UOM defined in MDM. | This is a valid UOM defined in CCB. |

OUMDM2_OUCCB2_TOU

This DVM is used by the integration layer to map the Oracle Utilities Meter Data Management TOU to corresponding Oracle Utilities Customer Care and Billing TOU.

| OUMDM2_TOU | OUCCB2_TOU |
|-------------------------------------|-------------------------------------|
| This is a valid TOU defined in MDM. | This is a valid TOU defined in CCB. |

OUMDM2_OUCCB2_SQI

This DVM is used by the integration layer to map the Oracle Utilities Meter Data Management SQI to corresponding Oracle Utilities Customer Care and Billing SQI.

| OUMDM2_SQI | OUCCB2_SQI |
|-------------------------------------|-------------------------------------|
| This is a valid SQI defined in MDM. | This is a valid SQI defined in CCB. |

OUMDM2_OUCCB2_UsageType

This DVM is used by the integration layer to map the Oracle Utilities Meter Data Management usage type to corresponding Oracle Utilities Customer Care and Billing usage type.

| OUMDM2_UsageType | OUCCB2_UsageType |
|--|--|
| This is a valid Usage type defined in MDM. | This is a valid Usage type defined in CCB. |

OUMDM2_OUCCB2_SPHowToUse

This DVM is used by the integration layer to map the Oracle Utilities Meter Data Management SP How To Use to corresponding Oracle Utilities Customer Care and Billing SP How To Use.

| OUMDM2_SPHowToUse | OUCCB2_SPHowToUse |
|-------------------------------------|-------------------------------------|
| This is a valid TOU defined in MDM. | This is a valid TOU defined in CCB. |

OUMDM2_OUCCB2_MeasuresPeakQuantity

This DVM is used by the integration layer to map the Oracle Utilities Meter Data Management Measures Peak Quantity to corresponding Oracle Utilities Customer Care and Billing Measures Peak Quantity.

| OUMDM2_MeasuresPeakQuantity | OUCCB2_MeasuresPeakQuantity |
|-------------------------------------|-------------------------------------|
| This is a valid SQI defined in MDM. | This is a valid SQI defined in CCB. |

OUMDM2_OUCCB2_SkipSA

This DVM is used by the integration layer to map the Oracle Utilities Meter Data Management Skip element to the corresponding Oracle Utilities Customer Care and Billing Skip SA element.

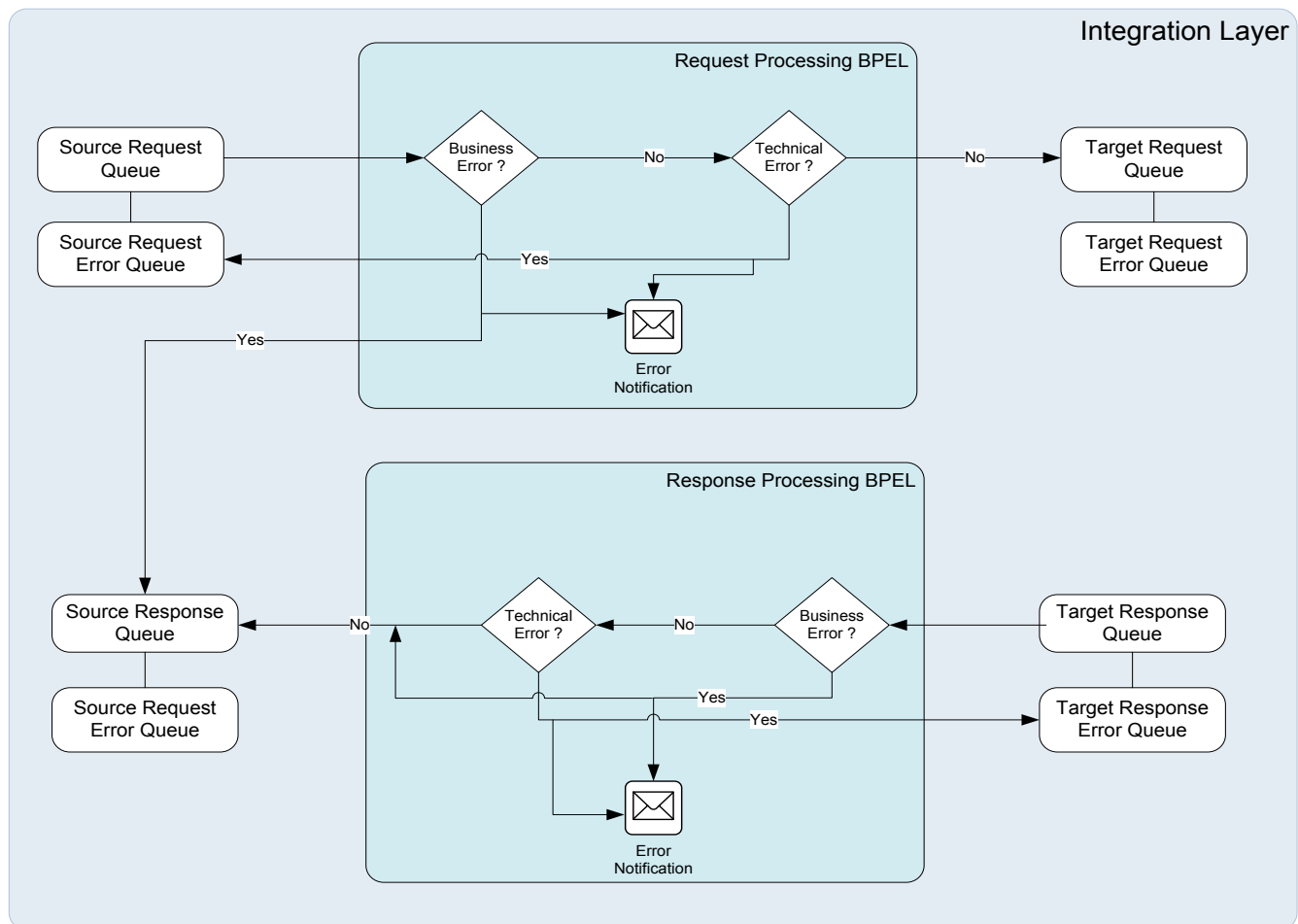
| OUMDM2_Skip | OUCCB2_Skip |
|---|---|
| This is a valid Skip flag defined in MDM. | This is a valid Skip SA value defined in CCB. The values are true or false. |

OUMDM2_OUCCB2_SkipReason

This DVM is used by the integration layer to map the Oracle Utilities Meter Data Management Skip Reason element to the corresponding Oracle Utilities Customer Care and Billing Skip Reason element.

| OUMDM2_SkipReason | OUCCB2_SkipReason |
|---|---|
| This is a valid Skip Reason defined in MDM. | This is a valid Skip Reason defined in CCB. |

Error Handling



CCB – MDM Integration – Error Handling

The integration includes two types of errors:

- **Business Errors** – Triggered when the DVM lookup values are not found or there is a transformation error in the integration layer. Business errors are sent back to the source application and can be re-tried from there.
- **Technical Errors** – Triggered when there are connectivity issues between queues. Technical errors are sent to the error queue and can be re-tried from integration layer.

| S. No | Integration Flow | Type of error | Action | Notification Type | Retry |
|-------|---|-----------------|---|-------------------------------|--|
| A1 | Master Data Sync – CCB originated request processing (i.e. SP Information Sync flow) | Business error | Message is sent to CCB Response Queue. (i.e CCB SP Response Queue) | Email (optional) and CCB ToDo | Data correction in CCB |
| A2 | | Technical error | Message is rolled back to CCB Request Error Queue. (i.e CCB SP Request Error Queue) | Email (optional) | Administrator has to move the messages to CCB Request Queue from WebLogic Admin console. (i.e CCB SP Request Queue) |
| A3 | Master Data Sync – MDM originated response processing (i.e. SP Information Sync flow) | Business error | Message is sent to CCB Response Queue. (i.e CCB SP Response queue) | Email (optional) and CCB ToDo | Data correction in CCB |
| A4 | | Technical error | Message is rolled back to MDM Response Error Queue. (i.e MDM SP Response Error Queue) | Email (optional) | Administrator has to move the messages to MDM Response Queue from WebLogic Admin console. (i.e MDM SP Response Queue) |

This is applicable to the Person, SP, SA, Meter, Meter Configuration, and SP-Meter History Information Sync Integration flows.

| S. No | Integration Flow | Type of error | Action | Notification Type | Retry |
|-------|---|-----------------|---|-------------------------------|---|
| C1 | Batch BD – CCB originated request processing | Business error | Message is sent to CCB Batch BD Response Queue. | Email (optional) and CCB ToDo | Data correction in CCB |
| C2 | | Technical error | Message is rolled back to CCB Batch BD Request Error Queue. | Email (optional) | Administrator has to move the messages to CCB Batch BD Request Queue from WebLogic Admin console. |
| C3 | Batch BD – MDM originated response processing | Business error | Message is sent to CCB Batch BD Response Queue. | Email (optional) and CCB ToDo | Data correction in CCB |

| S. No | Integration Flow | Type of error | Action | Notification Type | Retry |
|-------|---|-----------------|--|-------------------------------|--|
| C4 | | Technical error | Message is rolled back to MDM Batch BD Response Error Queue. | Email (optional) | Administrator has to move the messages to MDM Batch BD Response Queue from WebLogic Admin console. |
| D1 | Online BD – CCB originated request processing | Business error | Message is sent to CCB Online BD Response Queue. | Email (optional) and CCB ToDo | Data correction in CCB |
| D2 | | Technical error | Message is rolled back to CCB Online BD Request Error Queue. | Email (optional) | Administrator has to move the messages to CCB Online BD Request Queue from WebLogic Admin console. |
| D3 | Online BD – MDM originated response processing | Business error | Message is sent to CCB Online BD Response Queue. | Email (optional) and CCB ToDo | Data correction in CCB |
| D4 | | Technical error | Message is rolled back to MDM Online BD Response Error Queue. | Email (optional) | Administrator has to move the messages to MDM Online BD Response Queue from WebLogic Admin console. |
| E1 | Replacement Read – MDM originated request processing | Business error | Message is sent to MDM Replacement Read Response Queue. | Email (optional) | Data correction in MDM |
| E2 | | Technical error | Message is rolled back to MDM Replacement Read Request Error Queue. | Email (optional) | Administrator has to move the messages to MDM Replacement Read Request Queue from WebLogic Admin console. |
| E3 | Replacement Read – CCB originated response processing | Business error | Message is sent to MDM Replacement Read Response Queue. | Email (optional) and CCB ToDo | Data correction in CCB |
| E4 | | Technical error | Message is rolled back to CCB Replacement Read Response Error Queue. | Email (optional) | Administrator has to move the messages to CCB Replacement Read Response Queue from WebLogic Admin console. |

To retry the technical error failure messages:

1. In the WebLogic console, navigate to Services → Messaging → JMS Modules.
2. Select CCB-MDM Integration JMS Module to display all queues related to this integration.
3. Select the appropriate error queue and click the Monitoring tab. This tab displays the details about messages in the queue in a table.
4. Select the checkbox in the details table and click Show Messages. This displays all the messages in the error queue.
5. Click Move and select Move All.
6. Select the CCB-MDM JMS server to move messages and then click Next.
7. Select the correct parent queue for the error queue from the dropdown and click Finish.

This action moves all messages to the source queue, so that the integration layer processes all messages again.

Error Notification Setup

Steps to enable EMAIL notification for CCB-MDM Error Handling module.

1. Log in to the Enterprise Manager console.
2. Expand SOA and then right-click SOA Infra. From the menu, click SOA Administration and then click Workflow Notification Properties.
3. From the drop-down list, select EMAIL.
4. Enter the Email IDs in the From address field.

INTEGRATION_ERR_STORE

The INTEGRATION_ERR_STORE table is used to store all the error details for each message failure. The table is populated for each integration point based on the BusinessError.NotificationFlag and TechnicalError.NotificationFlag properties for each service in the ConfigurationProperties.xml file.

INTEGRATION_ERR_LOOKUP

The error handling module configuration is governed by the Integration_err_lookup table. This table contains processing instructions for each composite. The Error_Processing_Parent composite picks data for one composite and calls error_Processing_Detail for processing. The configuration in this table is used to process the error records stored in the INTEGRATION_ERR_STORE table.

| S. No. | Column Name | Description | Default/ Suggested values |
|--------|-------------|---|---------------------------|
| 1 | LookUp_ID | Sequence ID of entry in this table. This is auto generated. | Auto generated |

| S. No. | Column Name | Description | Default/ Suggested values |
|--------|-------------------|--|--|
| 2 | IP_Name | Name of the composite processed. Example: OUMDMOUCCBReplReadReqEBF | This column is prepopulated with the individual enterprise business flow name. Do not modify. Modifying this value will break the code. |
| 3 | Processing_Status | Current status of processing it has to be one of the following: <ul style="list-style-type: none"> • HALTED (waiting for manual intervention), • NOT REQUIRED • ALIVE | NOT REQUIRED |
| 4 | Run_Flag | Processing flag status, Y or N. Unread value = N, read value =Y | N |
| 5 | Next_Runtime | Next runtime when the error record should be processed for this composite. | SYSDATE+200 |
| 6 | Halt_For_Error | Allowed values Y or N. When set to Y, manual intervention is required after one successful error record processing. When set to N, processing continues without halting. | N |
| 7 | RunTime_Interval | Runtime in minutes after which the next error processing should be done. Example : P10Y0M0DT0H0M0S Next processing is done after 10 years 0 months 0 days 0 hours 0 minutes and 0 seconds This value must be updated based on the business requirement. Setting fewer intervals may have impact on performance. | Default : P10Y0M0DT0H0M0S |
| 8 | Email_ID | Email ID where error notifications are sent. This value can be different or same for all the composites. | Default : email@email.com |

| S. No. | Column Name | Description | Default/ Suggested values |
|--------|----------------------------|---|--|
| 9 | Email_Content_Type | <p>GENERIC – One Email is sent for all errors. No detail information is included.</p> <p>SINGLE – One Email is sent for all errors with details included in the attachment.</p> <p>MULTIPLE – Multiple Emails are sent and each email has information equal to the value specified in Error_Count_Per_Notification column.</p> <p>Values are case sensitive and must always be given in upper case.</p> | Default : GENERIC |
| 10 | Email_XSL | <p>XSL to be applied for creating Email Content which includes subject/body and attachment. Look and feel can be modified here.</p> | <p>Default file is provided for all the composites and present under the xsl folder of composite.</p> <p>Example: xsl/Transformation_Create_Email.xsl</p> <p>Copy this to the mds folder and enter the mds path in this column for additional configuration.</p> |
| 11 | Error_Count_Per_Processing | <p>A notification is sent after the number of records set here is processed.</p> <p>For example: If this is set to 50, then an email notification containing 50 records is sent after 50 records are created in the error store.</p> | Default : 100 |
| 12 | Email_Attachment_Location | <p>Location where the Email attachment is created on the server.</p> <p>This value should point to the location/folder where the attachment should be stored.</p> <p>This is used to create the attachment file in the following format.</p> <p>INTEGRATION_ERR_LOOKUP.Email_Attachment_Location + IP_Name + Date (in YYYYMMDDHH24MMSS)</p> | |

| S. No. | Column Name | Description | Default/ Suggested values |
|--------|-------------------------|--|---------------------------|
| 13 | Email_Attachment_Flag | <p>Y – Send Email with attachment. In this case, it is not mandatory to have Email_Attachment_Location specified.</p> <p>N – Send Email without attachment, but send the attachment location. In this case, Email_Attachment_Location has to be specified.</p> <p>ServerName</p> <p>+INTEGRATION_ERR_LOOKUP.Email_Attachment_Location + IntegrationPoint_Name + Date in YYYYMMDDHH24MMSS</p> | N |
| 14 | Publish_Human_Task_Flag | <p>Y – Publish human task</p> <p>N – Don't publish human task</p> <p>If Halt_For_Error value is set to Y and Publish_Human_Task_Flag is also Y, then human task is published and the user can take action from worklist application.</p> | N |
| 15 | ID_Human_Task | <p>User/ Group ID to which human task should be published in case Halt_For_Error is set to Y.</p> <p>This ID must be present in the WebLogic realm pointed by fusion middleware.</p> | weblogic |
| 16 | Last_Updated_Date | Last updated date time | SYSDATE |
| 17 | Purge_Error_Store_Flag | <p>Y – Purge data</p> <p>N – No purge require</p> <p>The process PurgeIntegrationErrorStore is deployed when the flag, purge.process.deploy=true (in the deploy.properties file) is set to true during installation.</p> <p>If flag.purge.process = false, then value of this column Purge_Error_Store_Flag will always be N.</p> | Default : N |

| S. No. | Column Name | Description | Default/ Suggested values |
|--------|------------------------------|--|---------------------------|
| 18 | Purge_Processing_Status_Flag | <p>Y – Purge Processing in process N – Purge processing not happening</p> <p>The process PurgeIntegrationErrorStore is only deployed when the flag, purge.process.deploy=true (in the deploy.properties file) is set to true during installation.</p> <p>If flag.purge.process = false then value of this column Purge_Error_Store_Flag will always be N.</p> | Default : N |
| 19 | Purge_Frequency | <p>No of days after which data should be purged. This will be in picture format</p> <p>Example : P10Y0M0DT0H0M0S</p> <p>Next processing will be done after 10 years 0 months 0 days 0 hours 0 minutes and 0 seconds.</p> <p>This value has to be updated based on the business requirement. Setting fewer intervals may have impact on performance.</p> <p>Need to set this value appropriately.</p> <p>Applicable only when flag.purge.process = true in deploy.properties file during installation and the process PurgeIntegrationErrorStore ID deployed.</p> | Default : P10Y0M0DT0H0M0S |
| 20 | Next_Purge_Date | <p>Next purge date. Format: Next_Purge_date + Purge_Frequency</p> <p>Applicable only when flag.purge.process = true in deploy.properties file during installation and the process PurgeIntegrationErrorStore ID deployed.</p> | SYSDATE+100 |

| S. No. | Column Name | Description | Default/ Suggested values |
|--------|-----------------|--|--|
| 21 | Purge_File_Name | Directory name where the purge file should be stored. Applicable only when flag.purge.process = true in deploy.properties file during installation and the process PurgeIntegrationErrorStore ID deployed. | 'location on server where purge record should be persisted' |

To customize error email notifications for individual integration points:

1. Use the composite: UpdateIntegrationErrorLookupTable.
2. Open the following URL in a browser to get the screen that provides options to update the contents of table.
http://<hostname>:<soa server port>/soa-infra/services/CCB-MDM/
UpdateIntegrationErrorLookupTable/updateintegrationerrorlookuptablebpel_client_ep?
3. Expand WS-Security and provide authentication information.
This username and password are going to be same as that used to log in to WebLogic Enterprise Manager console.
4. Expand the payload section. This displays several editable text fields.
Only the ipName field is mandatory and should be entered as one of the values from
INTEGRATION_ERR_LOOKUP.IP_NAME field.

By default all the checkboxes appearing next to the text fields are checked.

5. Provide values in the text field. If you do not want to have a particular value updated, then uncheck the box.

Monitoring and Troubleshooting

This section discusses how to:

- Monitor from Oracle Utilities Customer Care and Billing
- Monitor from Oracle Utilities Meter Data Management
- Monitor from the Integration Layer
- Troubleshoot

Monitoring from Oracle Utilities Customer Care and Billing

Oracle Utilities Customer Care and Billing Error Logs

- Errors related to the online integration invocation from Oracle Utilities Customer Care and Billing (CCB) are stored in the CCB_ENVIRONMENT_NAME/logs/system folder.

For example: V231_CCB_PERF_BLD10_LIN_ORA_WLS/logs/system

- Errors related to batch integration invocation from CCB are stored in the \$SPLOUTPUT/CCB_ENVIRONMENT_NAME folder.

For example: /spl/sploutput/V231_CCB_PERF_BLD10_LIN_ORA_WLS

For more information about errors and notifications, see the Oracle Utilities Customer Care and Billing documentation.

Notifications

When Oracle Utilities Customer Care and Billing sends a request message out to Oracle Meter Data Management (MDM), it expects a response back. It can get a positive response when the message is processed successfully or can get an error response when a business error is encountered in the integration or from the target application (MDM).

When Oracle Utilities Customer Care and Billing receives the response message from the inbound Oracle Utilities Customer Care and Billing response queue, the message is parsed and converted to an XML document, checked that the XML is valid and that the XML has a valid XAI inbound service.

- If there is an error encountered which processing the message, EJBException will be thrown causing the message to be rolled back to the corresponding Oracle Utilities Customer Care and Billing response error queue and a To Do entry is created, if configured.

For example: If Oracle Utilities Customer Care and Billing receives a person sync response message from the Oracle Utilities Customer Care and Billing person sync response queue and an error is encountered, the message will be moved to the CCB person sync response error queue.

- If the message was processed successfully, the Business Object or Business Service or Service Script (BO/BS/SS) defined on XAI Inbound Service is invoked. If an application error is encountered inside the BO/BS/SS processing, the message will not be rolled back to the error queue. Only a To Do entry is created, if configured. Otherwise, the error will only be seen in the spl-service.log file.

The XAI inbound service is invoked to process the response message.

Regardless of whether To-Do was set up or not, the errors are logged in spl-service.log file.

Setup To Do Entry for JMS message error

XAI Options

Define To Do Type for Inbound JMS Message Errors XAI Option. Use To Do Type F1-INJMS (Inbound JMS Message In Error). This To Do Type is delivered with the application. Implementation can define a custom To Do Type if needed.

XAI Inbound Service

For every XAI Inbound Service used to process the different Sync Response, Billing Determinant Response and Replacement Reads Request, the **Post Error** checkbox must be set to Yes.

Connection Errors

Information about errors can be found in log files. For information about error logs and their respective folders, see the section Oracle Utilities Customer Care and Billing Error Logs.

Monitoring from Oracle Utilities Meter Data Management

Oracle Meter Data Management Error Logs

- Errors related to the online integration invocation from Oracle Utilities Meter Data Management are stored in the MDM_ENVIRONMENT_NAME/system/logs folder.

For example: V201_MDM_BLD10_LIN_ORA_WLS/logs/system

- Errors related to batch integration invocation from Oracle Utilities Meter Data Management are stored in the \$SPOUTPUT/ MDM_ENVIRONMENT_NAME folder.

For example: /spl/sploutput/V201_MDM_BLD10_LIN_ORA_WLS

For more information about errors and notifications, see the Oracle Utilities Meter Data Management documentation.

Notifications

When Oracle Utilities Meter Data Management receives a request message from Oracle Utilities Customer Care and Billing, it will send a response back to Oracle Utilities Customer Care and Billing. It can send a positive response when the message is processed successfully or can send an error response when a business error is encountered.

When Oracle Utilities Meter Data Management receives the request message from the inbound Oracle Utilities Meter Data Management request queue, the message is parsed and converted to an XML document, checked that the XML is valid and check that the XML has a valid XAI inbound service.

- If there is an error encountered which processing the message, EJBException will be thrown causing the message to be rolled back to the corresponding Oracle Utilities Meter Data Management request error queue and a To Do entry is created, if configured.

For example: If Oracle Utilities Meter Data Management receives a person sync request message from the Oracle Utilities Meter Data Management person sync request queue and an error is encountered, the message will be moved to the Oracle Utilities Meter Data Management person sync request error queue.)

- If the message was processed successfully, the Business Object or Business Service or Service Script (BO/BS/SS) defined on XAI Inbound Service is invoked. If an application error is encountered inside the BO/BS/SS processing, the message will not be rolled back to the error queue. Only a To Do entry is created, if configured. Otherwise, the error will only be seen in the spl-service.log file.

The XAI inbound service is invoked to process the request message.

Regardless of whether To-Do was set up or not, the errors are logged in spl-service.log file.

Setup To Do Entry for JMS message error

XAI Options

Define To Do Type for Inbound JMS Message Errors XAI Option. Use To Do Type F1-INJMS (Inbound JMS Message In Error). This To Do Type is delivered with the application. Implementation can define a custom To Do Type if needed.

XAI Inbound Service

For every XAI Inbound Service used to process the different Sync Request and Billing Determinant Request, the **Post Error** checkbox must be set to Yes.

Connection Errors

Information about errors can be found in log files. For information about error logs and their respective folders, see the section Oracle Utilities Meter Data Management Error Logs.

Monitoring from the Integration

To monitor the integration flow using the Integration, use any of the following:

- Monitoring the composite instances using WebLogic SOA Enterprise Manager
- Monitoring the WebLogic logs
- Monitoring the queues using WebLogic Console

Monitoring using WebLogic SOA Enterprise Manager

1. Log in to the WebLogic SOA Server Enterprise Manager, and then navigate to SOA → SOA-Infra → CCB-MDM.

All composite processes deployed for integration are available under the partition CCB-MDM.

2. Select the appropriate process to list all the instances for the processes sorted by time of execution.

The instances also have the request ID as part of the display name.

3. Click the appropriate process instance and it will display the flow for the process.

The composite flow lists all activities in the process instance.

Monitoring using WebLogic logs

Log in to the machine where SOA server is installed. The SOA logs are stored in: <WebLogic installation folder>/user_projects/domains/<SOA Domain name>/servers/<SOA Server name>/logs

For example:

/slot/ems1234/oracle/Middleware/user_projects/domains/soa_domain/servers/soa_server1/logs

Monitoring the Queues using WebLogic Console

1. Log in to the WebLogic Console, and then go to the Services → Messaging → JMS Modules.

All queues used for the integration are available in the JMS Module **CCB2MDM2FJM**.

2. Select the appropriate queue on the list and go to the Monitoring tab. In the Monitor tab, the user can check if the message is stuck in the queue because there are no consumers listening to the queue and check how many consumers are listening to the queue. If the Consumers Current column is 0, it means no consumers are listening to the queue.

3. To check the message rolled back to the error queue, select the appropriate error queue on the list and go to the Monitoring tab. In the Monitor tab, the user can see the message.

Data Purge

To maintain maximum system integrity, the Oracle Fusion Middleware database should be purged periodically. For information about how to complete this task, refer to the note 815896.1 on <https://support.oracle.com>.

Troubleshooting

At times, Oracle Utilities Customer Care and Billing Integration to Oracle Utilities Meter Data Management might experience errors or issues with connection, processing, or sending or receiving messages. Following are the common scenarios which help you to troubleshoot error, if any, and find possible solutions.

The source application is the one sending out the message and the target application is the one receiving the message.

Example: CCB is sending a SP sync request message to MDM, CCB is the source application and MDM is the target application. The source queue is OUCCB2PersonSyncRequest and the target queue is OUMDM2PersonSyncRequest. The source error queue is OUCCB2PersonSyncRequestError and the target queue is OUMDM2PersonSyncRequestError.

MDM is sending a SP sync response message to CCB, MDM is the source application and CCB is the target application. The source queue is OUMDM2PersonSyncResponse and the target queue is OUCCB2PersonSyncResponse. The source error queue is OUMDM2PersonSyncResponseError and the target queue is OUCCB2PersonSyncResponseError.

Error 1: Source application sends out a message but the message does not reach the source queue.

Go to WebLogic Console to check if the message reached the source queue. Refer to [Monitoring the Queues using WebLogic Console](#) section for more information

To resolve this error, do the following:

1. Check the source application logs to see if any errors are encountered while trying to send the message out. Refer to [Oracle Utilities Customer Care and Billing Error Logs](#) or [Oracle Utilities Meter Data Management Error Logs](#) sections for more information on where to find the logs
2. Check the source application's XAI Configuration to ensure they are configured correctly. Refer to the [Setting Up Oracle Utilities Customer Care and Billing – XAI Configuration](#) or [Setting Up Oracle Utilities Meter Data Management – XAI Configuration](#) sections for more information.

Error 2: Source application sends out a message but the message does not reach the target queue.

To resolve this error, do the following:

1. Check if the BPEL processes are running. Refer to the [Monitoring using WebLogic SOA Enterprise Manager](#) section for more information.

- If WebLogic SOA Enterprise Manager is not accessible or the BPEL processes cannot be seen found in the Weblogic SOA Enterprise Manger, restart the SOA managed server. Refer to the Oracle Utilities Customer Care and Billing Integration to Oracle Utilities Meter Data Management Release 3.1.1 Media Pack Installation Guide, under Restarting SOA Managed Server or it can also be started from the WebLogic console.
 - If WebLogic SOA Enterprise Manager is accessible but the BPEL process is not active, activate or start up the process from the WebLogic SOA Enterprise Manager.
2. If the BPEL processes are running, check if the message has faulted or encountered an error. Refer to the [Monitoring using WebLogic SOA Enterprise Manager](#) section for more information.
 - If a technical error is encountered, the message is rolled back to the corresponding source error queue. Fix the error and move the message back to the source queue to retry.
 - From WebLogic SOA Enterprise Manager, check the appropriate process instance flow trace to see the error details.
 - Check the logs. Refer to [Monitoring using WebLogic logs](#) section for more information.

Error 3: Source application sends out a message, message successfully processed by the integration, but the message does not reach the target application.

To resolve this error, do the following:

1. In Weblogic SOA Enterprise Manager, check the process to see if the message was successfully processed by the integration layer. Refer to the [Monitoring using WebLogic SOA Enterprise Manager](#) section for more information.
2. If a successful instance of the message was found in the WebLogic SOA Enterprise Manager, check the target queue to see if the message exists in the queue.
 - Check the corresponding target queue of the process to see if there is a current or pending message stuck in the queue. The possible cause is that no consumers are listening to the target queue. Refer to the [Monitoring the Queues using WebLogic Console](#) section for more information. To fix this, restart the target application.
 - If there are still no consumers listening to the target queue after bouncing the application, check the target application's JMS Configuration to make sure they are configured correctly. Refer to [Setting Up Oracle Utilities Customer Care and Billing – JMS Configuration](#) or [Setting Up Oracle Utilities Meter Data Management – JMS Configuration](#) for more information. After changing the JMS configuration of the target application, restart the target application.
 - Check the source application logs to see if any errors are encountered while trying to send the message out. Refer to the [Oracle Utilities Customer Care and Billing Error Logs](#) or [Oracle Utilities Meter Data Management Error Logs](#) section for more information on where to find the logs.
3. If no message is stuck in the target queue, check the target application logs to see if any errors are encountered while trying to processe the message received. Refer to the [Oracle Utilities Customer Care and Billing Error Logs](#) or [Oracle Utilities Meter Data Management Error Logs](#) section for more information on where to find the logs.

Customization Options

Extension Methods

The integration process allows extensibility of transaction messages using the following methods:

- Pretransformation Extension Point
- Posttransformation Extension Point
- Custom Transformations

Pretransformation Extension Point

The pretransformation extension point is invoked before the main transformation is executed. This transformation aids in transforming the source XML coming as an input to the integration process.

The integration layer defines an external call from the pretransformation extension point. This extension point accepts source XML as input and gives the source XML as output. The implementation can choose to plug in a concrete WSDL instead of the abstract WSDL. This can assist the implementation in invoking any external Web service and transform the input XML.

Post Transformation Extension Point

The post transformation extension point is invoked after the main transformation is executed. This transformation aids in transforming the target XML going as an input to the target queue.

The integration layer defines an external call from the post transformation extension point. This extension point accepts the target XML as input and gives the target XML as output. The implementation can choose to plug in a concrete WSDL instead of the abstract WSDL. This can assist the implementation in invoking any external Web service and transform the output XML.

Custom Transformations

The custom transformations are used to add data to custom elements in the incoming and outgoing messages. The incoming and outgoing messages have custom elements defined in the message. These custom elements refer to a custom XML schema. The main transformation invokes custom transformation.

Empty custom transformation and custom schemas are shipped with the product. The implementation team can add additional fields in the custom schema and map them using the custom transformations.

Using custom transformations allows the implementation to define and pass additional data from the source system to the target system.

Steps to implement extension points

1. Each process in the integration has a pre- and post-transformation extension point which can be used to invoke Web services and transform the payload.
2. The desired extension point can be triggered from the process by enabling it using the ConfigurationProperties.xml pre- and post-transformation extension flags as described in section [Setting Configuration Properties](#).
3. Each process has its own concrete wsdl which is used to read the endpoint location for the extension service.

These concrete wsdl files are located in MDS under the following directories:

- /apps/CCB2-MDM2/AIAMetaData/AIAComponents/ExtensionServiceLibrary/OUCCB2
- /apps/CCB2-MDM2/AIAMetaData/AIAComponents/ExtensionServiceLibrary/OUMDM2

Update the concrete wsdl file to define the binding and service details for the extension service to be called and move the concrete wsdl file to MDS.

4. To move the concrete wsdl to MDS, update the appropriate wsdl in the product install home. The directories to put the concrete wsdl in product install home are the following:

- \$PRODUCT_HOME/MDS-Artifacts/CCB2-MDM2/AIAMetaData/AIAComponents/ExtensionServiceLibrary/OUCCB
- \$PRODUCT_HOME/MDS-Artifacts/CCB2-MDM2/AIAMetaData/AIAComponents/ExtensionServiceLibrary/OUMDM2

Then deploy the concrete wsdl to MDS by running the ant deploy command for Deploying MDS folder.

For more information about the command to use to deploying to MDS, see the Oracle Utilities Customer Care and Billing Integration to Oracle Utilities Meter Data Management Release 3.1.1 Media Pack Installation Guide, under Deploying MDS Folder section.

5. After deploying the files to MDS, restart the SOA server.
6. After restarting the SOA server, the extension point invokes the Web service in the concrete WSDL.

For example: To enable the extension points for OUCCB2OUMDM2SPSyncReqExtension, add the binding and service elements to the OUCCB2OUMDM2SPSyncReqExtensionConcrete.wsdl.

```
<binding name="OUCCB2OUMDM2SPSyncReqV1ExtensionServiceSOAP11Binding"
        type="ccbext:OUCCB2OUMDM2SPSyncReqV1ExtensionService">
  <soap:binding style="document"
    transport="http://schemas.xmlsoap.org/soap/http"/>
  <operation name="PreXformCCB2toMDM2">
    <soap:operation style="document"
      soapAction="http://xmlns.oracle.com/OUCCB2OUMDM2SPSyncReqEBF/OUCCB2OUMDM2SPSyncReqExtension/V1/PreXformCCB2toMDM2"/>
    <input>
      <soap:body use="literal" parts="CCB2ToMDM2"/>
    </input>
```

```
<output>
  <soap:body use="literal" parts="CCB2toMDM2"/>
</output>
<fault name="fault">
  <soap:fault name="fault" use="literal"/>
</fault>
</operation>
<operation name="PostXformCCB2toMDM2">
  <soap:operation style="document"
soapAction="http://xmlns.oracle.com/OUCCB2OUMDM2SPSyncReqEBF/OUCCB2OUMDM
S2PSyncReqExtension/V1/ PostXformCCB2toMDM2"/>
  <input>
    <soap:body use="literal" parts="MDM2Enqueue"/>
  </input>
  <output>
    <soap:body use="literal" parts="MDM2Enqueue"/>
  </output>
  <fault name="fault">
    <soap:fault name="fault" use="literal"/>
  </fault>
</operation>
</binding>
<service name="OUCCB2OUMDM2SPSyncReqV1ExtensionService">
<!-- Port name must match the port name used for the Extension service
in the composite.xml for the process - ->
  <port name="OUCCB2OUMDM2SPSyncReqV1ExtensionService"

binding="ccbext:OUCCB2OUMDM2SPSyncReqV1ExtensionServiceSOAP11Binding">
  <soap:address location="<endpoint url of the Extension
server"/>
  </port>
</service>
```

Note: The binding and service can be added easily using the Oracle Jdeveloper 11g.

Steps to implement custom transformations

1. Each process in the integration has its own XSD file. The messages have custom elements which can be used to pass additional data. Refer to message mappings to see the location of customElements in each message.
2. Each XSD has a corresponding CustomType xsd file in which the complexType elements for each customElements tag are defined.
3. Each process uses two XSD files, one for the Oracle Utilities Customer Care and Billing message and one for the Oracle Utilities Meter Data Management message.
4. To pass additional elements in the customElements tag, the corresponding complexType needs to be modified. Add the additional elements required in both complexType elements i.e. xsd for both edge applications.
5. Each process has a main transformation which invokes custom templates. Each main transformation file has a corresponding custom XSL and custom templates are defined in the custom XSL.
6. These custom templates are invoked at the location where each customElements tag is present.

7. The custom XSL can be modified to add transformation for the newly added elements in custom XSD files.
8. The custom XSD files are located in product install home under the following directories:

CCB2MDM2/MDS-Artifacts/CCB2-MDM2/AIAMetaData/AIAComponents/
ApplicationObjectLibrary/OUCCB/V1/schemas

CCB2MDM2/MDS-Artifacts/ CCB2-MDM2/AIAMetaData/AIAComponents/
ApplicationObjectLibrary/OUMDM2/V1/schemas

The custom XSL files are located in product install home under the directory

CCB2-MDM2/services/industry/Utilities/EBF/<Process Name>/xsl

9. After updating the XSD and XSL files in the product install home, update MDS using the ant deploy command for Deploying MDS folder.

For more information about the command to use to deploying to MDS, see the Oracle Utilities Customer Care and Billing Integration to Oracle Utilities Meter Data Management Release 3.1.1 Media Pack Installation Guide, under Deploying MDS Folder section.

1. After deploying the files to MDS, restart the SOA server.
2. After restarting the SOA server, the changes to the custom xsd and xsl will be reflected in the integration.

For example: In the SA synchronization process, to pass sendDetails → finalSnapshot → customElements → distMethod element in Oracle Utilities Customer Care and Billing to SyncRequestDetails → finalSnapshot → customElements → distributionMethod element in MDM, the following changes need to be done:

- a. In OUCCB2SASyncRequestCustomType.xsd, add the distMethod element to the schema. This xsd file is located in CCB2-MDM2/MDS-Artifacts/CCB2-MDM2/AIAMetaData/AIAComponents/ ApplicationObjectLibrary/OUCCB/V1/schemas folder.

```
<xsd:complexType name="FinalSnapshotCustomType">
  <xsd:sequence>
    <xsd:element name="distMethod" type="xsd:string"/>
  </xsd:sequence>
</xsd:complexType>
```

- b. In OUMDMSASyncRequestCustomType.xsd, add the distributionMethod element in the schema. This xsd file is located in CCB2-MDM2/MDS-Artifacts/CCB2-MDM2/AIAMetaData/AIAComponents/ ApplicationObjectLibrary/OUMDM2/V1/schemas folder.

```
<xsd:complexType name="FinalSnapshotCustomType">
  <xsd:sequence>
    <xsd:element name="distributionMethod"
type="xsd:string"/>
  </xsd:sequence>
</xsd:complexType>
```

- c. Transformation XformOUCCB2SASyncReq_to_OUMDM2SASyncReq_Custom.xsl

```
<xsl:template name="finalSnapshot-customElements">
  <!-- This template is use for Xformation of
    //finalSnapshot/customElements in Request Message-->
  <distributionMethod
xmlns="http://xmlns.oracle.com/OUMDM2/RequestMessage">
    <xsl:value-of
select="/ns0:sendDetails/ns0:syncRequestDetails/ns0:finalSnapshot/ns0:cu
stomElements/ns0:distMethod"/>
    </distributionMethod>
</xsl:template>
```

Appendix A: Data Mapping

This section provides mapping details for each integration point.

Person Synchronization

Person Sync Request Mapping

| CCB Person Request Message | | | MDM Contact Request Message | | | DVM Mapping |
|----------------------------|----------------|---------------|-----------------------------|-----------------------|---------------|------------------|
| Element Name | Parent Element | Type | Element Name | Parent Element | Type | DVM |
| sendDetails | | Outermost Tag | D1-SyncRequestInbound | | Outermost Tag | |
| | | | syncRequestId | D1-SyncRequestInbound | Field | |
| | | | bo | D1-SyncRequestInbound | Field | |
| | | | boStatus | D1-SyncRequestInbound | Field | |
| | | | createDateTime | D1-SyncRequestInbound | Field | |
| | | | statusDateTime | D1-SyncRequestInbound | Field | |
| syncRequestId | sendDetails | Field | externalReferenceId | D1-SyncRequestInbound | Field | |
| bo | sendDetails | Field | | | | |
| boStatus | sendDetails | Field | | | | |
| createDateTime | sendDetails | Field | | | | |
| statusDateTime | sendDetails | Field | | | | |
| version | sendDetails | Field | | | | |
| sourceSystem | sendDetails | Field | externalSystem | D1-SyncRequestInbound | Field | |
| syncRequired | sendDetails | Field | | | | |
| forceSync | sendDetails | Field | | | | |
| initialLoad | sendDetails | Field | initialLoad | D1-SyncRequestInbound | Field | |
| discardReason | sendDetails | Field | | | | |
| cancelReason | sendDetails | Field | | | | |
| mo | sendDetails | Field | targetMo | D1-SyncRequestInbound | Field | OUCCB2_OUMDM2_MO |
| pkValue1 | sendDetails | Field | externalPkValue1 | D1-SyncRequestInbound | Field | |
| pkValue2 | sendDetails | Field | externalPkValue2 | D1-SyncRequestInbound | Field | |
| pkValue3 | sendDetails | Field | externalPkValue3 | D1-SyncRequestInbound | Field | |
| pkValue4 | sendDetails | Field | externalPkValue4 | D1-SyncRequestInbound | Field | |
| pkValue5 | sendDetails | Field | externalPkValue5 | D1-SyncRequestInbound | Field | |
| | | | productionPkValue | D1-SyncRequestInbound | Field | |
| | | | version | D1-SyncRequestInbound | Field | |
| | | | relatedCompositeSyncId | D1-SyncRequestInbound | Field | |
| | | | clearExceptions | D1-SyncRequestInbound | Field | |
| | | | targetBo | D1-SyncRequestInbound | Field | |
| personBO | sendDetails | Field | | | | |

| CCB Person Request Message | | | MDM Contact Request Message | | | DVM Mapping |
|----------------------------|--------------------|-------|-----------------------------|-----------------------|-------|---------------------------|
| snapshotDA | sendDetails | Field | | | | |
| postScript | sendDetails | Field | | | | |
| syncRequestDetails | sendDetails | Group | syncRequestDetails | D1-SyncRequestInbound | Group | |
| | | | original | syncRequestDetails | Group | |
| initialSnapshot | syncRequestDetails | Group | initialSnapshot | original | Group | |
| contactType | initialSnapshot | Field | contactType | initialSnapshot | Field | OUCCB2_OUMDM2_ContactType |
| customElements | initialSnapshot | Group | customElements | initialSnapshot | Group | |
| formattedElements | initialSnapshot | Group | formattedElements | initialSnapshot | Group | |
| finalSnapshot | syncRequestDetails | Group | finalSnapshot | original | Group | |
| contactType | finalSnapshot | Field | contactType | finalSnapshot | Field | OUCCB2_OUMDM2_ContactType |
| customElements | finalSnapshot | Group | customElements | finalSnapshot | Group | |
| formattedElements | finalSnapshot | Group | formattedElements | finalSnapshot | Group | |
| | | | transformed | syncRequestDetails | Field | |

Person Sync Response Mapping

| MDM Contact Sync Response Message | | | CCB Person Sync Response Message | | | DVM Mapping |
|-----------------------------------|--------------------------|---------------|-----------------------------------|-----------------------------------|---------------|-------------------------|
| Element Name | Parent Element | Type | Element Name | Parent Element | Type | DVM |
| sendDetails | | Outermost Tag | F1-UpdateAndTransitionSyncRequest | | Outermost Tag | |
| syncRequestId | sendDetails | Field | | | | |
| externalReferenceId | sendDetails | Field | syncRequestId | F1-UpdateAndTransitionSyncRequest | Field | |
| exceptionInformation | sendDetails | Group | | | | |
| exceptionInformationList | exceptionInformation | List | exceptionInfo | F1-UpdateAndTransitionSyncRequest | List | |
| messageCategory | exceptionInformationList | Field | messageCategory | F1-UpdateAndTransitionSyncRequest | Field | |
| messageNumber | exceptionInformationList | Field | messageNumber | F1-UpdateAndTransitionSyncRequest | Field | OUCCB2_OUMDM2_ErrorCode |
| sequence | exceptionInformationList | Field | sequence | F1-UpdateAndTransitionSyncRequest | Field | |
| comments | exceptionInformationList | Field | comments | F1-UpdateAndTransitionSyncRequest | Field | |
| messageParameters | exceptionInformationList | List | messageParameters | exceptionInfo | List | |
| parameterSequence | messageParameters | Field | parameterSequence | messageParameters | Field | |
| messageParameterType | messageParameters | Field | | | | |
| messageParameterValue | messageParameters | Field | messageParameterValue | messageParameters | Field | |
| customElements | sendDetails | Group | customElements | F1- | Group | |

| MDM Contact Sync Response Message | | | CCB Person Sync Response Message | | | DVM Mapping |
|-----------------------------------|--|--|----------------------------------|--------------------------------|--|-------------|
| | | | | UpdateAndTransitionSyncRequest | | |

SP Information Synchronization

SP Sync Request Mapping

| CCB SP Request Message | | | MDM SP Request Message | | | DVM Mapping |
|------------------------|----------------|---------------|------------------------|-----------------------|---------------|----------------------|
| Element Name | Parent Element | Type | Element Name | Parent Element | Type | DVM |
| sendDetails | | Outermost Tag | D1-SyncRequestInbound | | Outermost Tag | |
| | | | syncRequestId | D1-SyncRequestInbound | Field | |
| | | | bo | D1-SyncRequestInbound | Field | |
| | | | boStatus | D1-SyncRequestInbound | Field | |
| | | | createDateTime | D1-SyncRequestInbound | Field | |
| | | | statusDateTime | D1-SyncRequestInbound | Field | |
| syncRequestId | sendDetails | Field | externalReferenceId | D1-SyncRequestInbound | Field | |
| bo | sendDetails | Field | | | | |
| boStatus | sendDetails | Field | | | | |
| createDateTime | sendDetails | Field | | | | |
| statusDateTime | sendDetails | Field | | | | |
| version | sendDetails | Field | | | | |
| sourceSystem | sendDetails | Field | externalSystem | D1-SyncRequestInbound | Field | |
| syncRequired | sendDetails | Field | | | | |
| forceSync | sendDetails | Field | | | | |
| initialLoad | sendDetails | Field | initialLoad | D1-SyncRequestInbound | Field | |
| discardReason | sendDetails | Field | | | | |
| cancelReason | sendDetails | Field | | | | |
| mo | sendDetails | Field | targetMo | D1-SyncRequestInbound | Field | OUCCB2_OUMDM2_M O |
| pkValue1 | sendDetails | Field | externalPkValue1 | D1-SyncRequestInbound | Field | |
| pkValue2 | sendDetails | Field | externalPkValue2 | D1-SyncRequestInbound | Field | |
| pkValue3 | sendDetails | Field | externalPkValue3 | D1-SyncRequestInbound | Field | |
| pkValue4 | sendDetails | Field | externalPkValue4 | D1-SyncRequestInbound | Field | |
| pkValue5 | sendDetails | Field | externalPkValue5 | D1-SyncRequestInbound | Field | |
| | | | productionPkValue | D1-SyncRequestInbound | Field | |
| | | | version | D1-SyncRequestInbound | Field | |
| | | | relatedCompositeSyncId | D1-SyncRequestInbound | Field | |
| | | | clearExceptions | D1-SyncRequestInbound | Field | |
| | | | targetBo | D1-SyncRequestInbound | Field | |
| spBO | sendDetails | Field | | | | |
| premiseBO | sendDetails | Field | | | | |
| snapshotDA | sendDetails | Field | | | | |
| postScript | sendDetails | Field | | | | |
| syncRequestDetails | sendDetails | Group | syncRequestDetails | D1-SyncRequestInbound | Group | |
| | | | original | syncRequestDetails | Group | |

| CCB SP Request Message | | | MDM SP Request Message | | | DVM Mapping |
|--------------------------|--------------------|-------|--------------------------|--------------------|-------|--|
| initialSnapshot | syncRequestDetails | Group | initialSnapshot | original | Group | |
| spType | initialSnapshot | Field | spType | initialSnapshot | Field | OUCCB2_OUMDM2_S PType |
| spStatus | initialSnapshot | Field | boStatus | initialSnapshot | Field | OUCCB2_OUMDM2_S PStatus |
| spSourceStatus | initialSnapshot | Field | spSourceStatus | initialSnapshot | Field | OUCCB2_OUMDM2_S PSourceStatus |
| disconnectLocation | initialSnapshot | Field | disconnectLocation | initialSnapshot | Field | OUCCB2_OUMDM2_Di sconnectLocation |
| measurementCycle | initialSnapshot | Field | measurementCycle | initialSnapshot | Field | OUCCB2_OUMDM2_M easurementCycle |
| measurementCycleRoute | initialSnapshot | Field | measurementCycleRoute | initialSnapshot | Field | OUCCB2_OUMDM2_M easurementCycleRoute |
| country | initialSnapshot | Field | country | initialSnapshot | Field | OUCCB2_OUMDM2_C ountry |
| lifeSupportSensitiveLoad | initialSnapshot | Field | lifeSupportSensitiveLoad | initialSnapshot | Field | OUCCB2_OUMDM2_Li feSupportSensitiveLoad |
| customElements | initialSnapshot | Group | customElements | initialSnapshot | Group | |
| formattedElements | initialSnapshot | Group | formattedElements | initialSnapshot | Group | |
| finalSnapshot | syncRequestDetails | Group | finalSnapshot | original | Group | |
| spType | finalSnapshot | Field | spType | finalSnapshot | Field | OUCCB2_OUMDM2_S PType |
| spStatus | finalSnapshot | Field | boStatus | finalSnapshot | Field | OUCCB2_OUMDM2_S PStatus |
| spSourceStatus | finalSnapshot | Field | spSourceStatus | finalSnapshot | Field | OUCCB2_OUMDM2_S PSourceStatus |
| disconnectLocation | finalSnapshot | Field | disconnectLocation | finalSnapshot | Field | OUCCB2_OUMDM2_Di sconnectLocation |
| measurementCycle | finalSnapshot | Field | measurementCycle | finalSnapshot | Field | OUCCB2_OUMDM2_M easurementCycle |
| measurementCycleRoute | finalSnapshot | Field | measurementCycleRoute | finalSnapshot | Field | OUCCB2_OUMDM2_M easurementCycleRoute |
| country | finalSnapshot | Field | country | finalSnapshot | Field | OUCCB2_OUMDM2_C ountry |
| lifeSupportSensitiveLoad | finalSnapshot | Field | lifeSupportSensitiveLoad | finalSnapshot | Field | OUCCB2_OUMDM2_Li feSupportSensitiveLoad |
| customElements | finalSnapshot | Group | customElements | finalSnapshot | Group | |
| formattedElements | finalSnapshot | Group | formattedElements | finalSnapshot | Group | |
| | | | transformed | syncRequestDetails | Field | |

SP Sync Response Mapping

| MDM SP Sync Response Message | | | CCB SP Sync Response Message | | | DVM Mapping |
|------------------------------|----------------|------------------|---|---|------------------|-------------|
| Element Name | Parent Element | Type | Element Name | Parent Element | Type | DVM |
| sendDetails | | Outermost Tag | F1- UpdateAndTransitionSync Request | | Outermost Tag | |
| syncRequestId | sendDetails | Field | | | | |
| externalReferenceId | sendDetails | Field | syncRequestId | F1- UpdateAndTransitionSync Request | Field | |
| exceptionInformation | sendDetails | Group | | | | |

| MDM SP Sync Response Message | | | CCB SP Sync Response Message | | | DVM Mapping |
|------------------------------|--------------------------|-------|------------------------------|-----------------------------------|-------|-------------------------|
| exceptionInformationList | exceptionInformation | List | exceptionInfo | F1-UpdateAndTransitionSyncRequest | List | |
| messageCategory | exceptionInformationList | Field | messageCategory | F1-UpdateAndTransitionSyncRequest | Field | |
| messageNumber | exceptionInformationList | Field | messageNumber | F1-UpdateAndTransitionSyncRequest | Field | OUCCB2_OUMDM2_ErrorCode |
| sequence | exceptionInformationList | Field | sequence | F1-UpdateAndTransitionSyncRequest | Field | |
| comments | exceptionInformationList | Field | comments | F1-UpdateAndTransitionSyncRequest | Field | |
| messageParameters | exceptionInformationList | List | messageParameters | exceptionInfo | List | |
| parameterSequence | messageParameters | Field | parameterSequence | messageParameters | Field | |
| messageParameterType | messageParameters | Field | | | | |
| messageParameterValue | messageParameters | Field | messageParameterValue | messageParameters | Field | |
| customElements | sendDetails | Group | customElements | F1-UpdateAndTransitionSyncRequest | Group | |

SA Information Synchronization

SA Sync Request Mapping

| CCB SP Request Message | | | MDM SP Request Message | | | DVM Mapping |
|------------------------|----------------|---------------|------------------------|-----------------------|---------------|-------------|
| Element Name | Parent Element | Type | Element Name | Parent Element | Type | DVM |
| sendDetails | | Outermost Tag | D1-SyncRequestInbound | | Outermost Tag | |
| | | | syncRequestId | D1-SyncRequestInbound | Field | |
| | | | bo | D1-SyncRequestInbound | Field | |
| | | | boStatus | D1-SyncRequestInbound | Field | |
| | | | createDateTime | D1-SyncRequestInbound | Field | |
| | | | statusDateTime | D1-SyncRequestInbound | Field | |
| syncRequestId | sendDetails | Field | externalReferenceId | D1-SyncRequestInbound | Field | |
| bo | sendDetails | Field | | | | |
| boStatus | sendDetails | Field | | | | |
| createDateTime | sendDetails | Field | | | | |
| statusDateTime | sendDetails | Field | | | | |
| version | sendDetails | Field | | | | |
| sourceSystem | sendDetails | Field | externalSystem | D1-SyncRequestInbound | Field | |
| syncRequired | sendDetails | Field | | | | |
| forceSync | sendDetails | Field | | | | |

| CCB SP Request Message | | | MDM SP Request Message | | | DVM Mapping |
|------------------------|--------------------|-------|------------------------|-----------------------|-------|----------------------------|
| initialLoad | sendDetails | Field | initialLoad | D1-SyncRequestInbound | Field | |
| discardReason | sendDetails | Field | | | | |
| cancelReason | sendDetails | Field | | | | |
| mo | sendDetails | Field | targetMo | D1-SyncRequestInbound | Field | OUCCB2_OUMDM2_M O |
| pkValue1 | sendDetails | Field | externalPkValue1 | D1-SyncRequestInbound | Field | |
| pkValue2 | sendDetails | Field | externalPkValue2 | D1-SyncRequestInbound | Field | |
| pkValue3 | sendDetails | Field | externalPkValue3 | D1-SyncRequestInbound | Field | |
| pkValue4 | sendDetails | Field | externalPkValue4 | D1-SyncRequestInbound | Field | |
| pkValue5 | sendDetails | Field | externalPkValue5 | D1-SyncRequestInbound | Field | |
| | | | productionPkValue | D1-SyncRequestInbound | Field | |
| | | | version | D1-SyncRequestInbound | Field | |
| | | | relatedCompositeSyncId | D1-SyncRequestInbound | Field | |
| | | | clearExceptions | D1-SyncRequestInbound | Field | |
| | | | targetBo | D1-SyncRequestInbound | Field | |
| saBO | sendDetails | Field | | | | |
| accountBO | sendDetails | Field | | | | |
| snapshotDA | sendDetails | Field | | | | |
| postScript | sendDetails | Field | | | | |
| syncRequestDetails | sendDetails | Group | syncRequestDetails | D1-SyncRequestInbound | Group | |
| | | | original | syncRequestDetails | Group | |
| initialSnapshot | syncRequestDetails | Group | initialSnapshot | original | Group | |
| cisDivision | initialSnapshot | Field | usType | initialSnapshot | Field | OUCCB2_OUMDM2_U SType |
| saType | initialSnapshot | Field | | initialSnapshot | Field | |
| saStatus | initialSnapshot | Field | boStatus | initialSnapshot | Field | OUCCB2_OUMDM2_S AStatus |
| customElements | initialSnapshot | Group | customElements | initialSnapshot | Group | |
| formattedElements | initialSnapshot | Group | formattedElements | initialSnapshot | Group | |
| finalSnapshot | syncRequestDetails | Group | finalSnapshot | original | Group | |
| cisDivision | finalSnapshot | Field | usType | finalSnapshot | Field | OUCCB2_OUMDM2_U SType |
| saType | finalSnapshot | Field | | finalSnapshot | Field | |
| saStatus | finalSnapshot | Field | boStatus | finalSnapshot | Field | OUCCB2_OUMDM2_S AStatus |
| customElements | finalSnapshot | Group | customElements | finalSnapshot | Group | |
| formattedElements | finalSnapshot | Field | formattedElements | finalSnapshot | Field | |
| | | | transformed | syncRequestDetails | Field | |

SA Sync Response Mapping

| MDM US Sync Response Message | | | CCB SA Sync Response Message | | | DVM Mapping |
|------------------------------|--------------------------|---------------|-----------------------------------|-----------------------------------|---------------|-------------------------|
| Element Name | Parent Element | Type | Element Name | Parent Element | Type | DVM |
| sendDetails | | Outermost Tag | F1-UpdateAndTransitionSyncRequest | | Outermost Tag | |
| syncRequestId | sendDetails | Field | | | | |
| externalReferenceId | sendDetails | Field | syncRequestId | F1-UpdateAndTransitionSyncRequest | Field | |
| exceptionInformation | sendDetails | Group | | | | |
| exceptionInformationList | exceptionInformation | List | exceptionInfo | F1-UpdateAndTransitionSyncRequest | List | |
| messageCategory | exceptionInformationList | Field | messageCategory | F1-UpdateAndTransitionSyncRequest | Field | |
| messageNumber | exceptionInformationList | Field | messageNumber | F1-UpdateAndTransitionSyncRequest | Field | OUCCB2_OUMDM2_ErrorCode |
| sequence | exceptionInformationList | Field | sequence | F1-UpdateAndTransitionSyncRequest | Field | |
| comments | exceptionInformationList | Field | comments | F1-UpdateAndTransitionSyncRequest | Field | |
| messageParameters | exceptionInformationList | List | messageParameters | exceptionInfo | List | |
| parameterSequence | messageParameters | Field | parameterSequence | messageParameters | Field | |
| messageParameterType | messageParameters | Field | | | | |
| messageParameterValue | messageParameters | Field | messageParameterValue | messageParameters | Field | |
| customElements | sendDetails | Group | customElements | F1-UpdateAndTransitionSyncRequest | Group | |

Meter Information Synchronization

Meter Sync Request Mapping

| CCB Meter Request Message | | | MDM Device Request Message | | | DVM Mapping |
|---------------------------|----------------|---------------|----------------------------|-----------------------|---------------|-------------|
| Element Name | Parent Element | Type | Element Name | Parent Element | Type | DVM |
| sendDetails | | Outermost Tag | D1-SyncRequestInbound | | Outermost Tag | |
| | | | syncRequestId | D1-SyncRequestInbound | Field | |
| | | | bo | D1-SyncRequestInbound | Field | |
| | | | boStatus | D1-SyncRequestInbound | Field | |

| CCB Meter Request Message | | | MDM Device Request Message | | | DVM Mapping |
|---------------------------|--------------------|-------|----------------------------|-----------------------|-------|--------------------------------|
| | | | createDateTime | D1-SyncRequestInbound | Field | |
| | | | statusDateTime | D1-SyncRequestInbound | Field | |
| syncRequestId | sendDetails | Field | externalReferenceId | D1-SyncRequestInbound | Field | |
| bo | sendDetails | Field | | | | |
| boStatus | sendDetails | Field | | | | |
| createDateTime | sendDetails | Field | | | | |
| statusDateTime | sendDetails | Field | | | | |
| version | sendDetails | Field | | | | |
| sourceSystem | sendDetails | Field | externalSystem | D1-SyncRequestInbound | Field | |
| syncRequired | sendDetails | Field | | | | |
| forceSync | sendDetails | Field | | | | |
| initialLoad | sendDetails | Field | initialLoad | D1-SyncRequestInbound | Field | |
| discardReason | sendDetails | Field | | | | |
| cancelReason | sendDetails | Field | | | | |
| mo | sendDetails | Field | targetMo | D1-SyncRequestInbound | Field | OUCCB2_OUMDM2_M O |
| pkValue1 | sendDetails | Field | externalPkValue1 | D1-SyncRequestInbound | Field | |
| pkValue2 | sendDetails | Field | externalPkValue2 | D1-SyncRequestInbound | Field | |
| pkValue3 | sendDetails | Field | externalPkValue3 | D1-SyncRequestInbound | Field | |
| pkValue4 | sendDetails | Field | externalPkValue4 | D1-SyncRequestInbound | Field | |
| pkValue5 | sendDetails | Field | externalPkValue5 | D1-SyncRequestInbound | Field | |
| | | | productionPkValue | D1-SyncRequestInbound | Field | |
| | | | version | D1-SyncRequestInbound | Field | |
| | | | relatedCompositeSyncId | D1-SyncRequestInbound | Field | |
| | | | clearExceptions | D1-SyncRequestInbound | Field | |
| | | | targetBo | D1-SyncRequestInbound | Field | |
| meterBO | sendDetails | Field | | | | |
| snapshotDA | sendDetails | Field | | | | |
| postScript | sendDetails | Field | | | | |
| syncRequestDetails | sendDetails | Group | syncRequestDetails | D1-SyncRequestInbound | Group | |
| | | | original | syncRequestDetails | Group | |
| initialSnapshot | syncRequestDetails | Group | initialSnapshot | original | Group | |
| deviceType | initialSnapshot | Field | deviceType | initialSnapshot | Field | OUCCB2_OUMDM2_D eviceType |
| meterStatus | initialSnapshot | Field | boStatus | initialSnapshot | Field | OUCCB2_OUMDM2_M eterStatus |
| manufacturer | initialSnapshot | Field | manufacturer | initialSnapshot | Field | OUCCB2_OUMDM2_M anufacturer |
| model | initialSnapshot | Field | model | initialSnapshot | Field | OUCCB2_OUMDM2_M odel |
| customElements | initialSnapshot | Group | customElements | initialSnapshot | Group | |
| formattedElements | initialSnapshot | Group | formattedElements | initialSnapshot | Group | |
| finalSnapshot | syncRequestDetails | Group | finalSnapshot | original | Group | |
| deviceType | finalSnapshot | Field | deviceType | finalSnapshot | Field | OUCCB2_OUMDM2_D eviceType |
| meterStatus | finalSnapshot | Field | meterStatus | finalSnapshot | Field | OUCCB2_OUMDM2_M eterStatus |
| manufacturer | finalSnapshot | Field | manufacturer | finalSnapshot | Field | OUCCB2_OUMDM2_M anufacturer |

| CCB Meter Request Message | | | MDM Device Request Message | | | DVM Mapping |
|---------------------------|---------------|-------|----------------------------|--------------------|-------|-------------------------|
| model | finalSnapshot | Field | model | finalSnapshot | Field | OUCCB2_OUMDM2_M odel |
| customElements | finalSnapshot | Group | customElements | finalSnapshot | Group | |
| formattedElements | finalSnapshot | Group | formattedElements | finalSnapshot | Group | |
| | | | transformed | syncRequestDetails | Field | |

Meter Sync Response Mapping

| MDM Device Sync Response Message | | | CCB Meter Sync Response Message | | | DVM Mapping |
|----------------------------------|--------------------------|------------------|---|---|------------------|-----------------------------|
| Element Name | Parent Element | Type | Element Name | Parent Element | Type | DVM |
| sendDetails | | Outermost Tag | F1- UpdateAndTransitionSync Request | | Outermost Tag | |
| syncRequestId | sendDetails | Field | | | | |
| externalReferenceId | sendDetails | Field | syncRequestId | F1- UpdateAndTransitionSync Request | Field | |
| exceptionInformation | sendDetails | Group | | | | |
| exceptionInformationList | exceptionInformation | List | exceptionInfo | F1- UpdateAndTransitionSync Request | List | |
| messageCategory | exceptionInformationList | Field | messageCategory | F1- UpdateAndTransitionSync Request | Field | |
| messageNumber | exceptionInformationList | Field | messageNumber | F1- UpdateAndTransitionSync Request | Field | OUCCB2_OUMDM2_ ErrorCode |
| sequence | exceptionInformationList | Field | sequence | F1- UpdateAndTransitionSync Request | Field | |
| comments | exceptionInformationList | Field | comments | F1- UpdateAndTransitionSync Request | Field | |
| messageParameters | exceptionInformationList | List | messageParameters | exceptionInfo | List | |
| parameterSequence | messageParameters | Field | parameterSequence | messageParameters | Field | |
| messageParameterType | messageParameters | Field | | | | |
| messageParameterValue | messageParameters | Field | messageParameterValue | messageParameters | Field | |
| customElements | sendDetails | Group | customElements | F1- UpdateAndTransitionSync Request | Group | |

Meter Configuration Information Synchronization

Meter Configuration Sync Request Mapping

| CCB Meter Config Request Message | | | MDM Device Config Request Message | | | DVM Mapping |
|----------------------------------|--------------------|---------------|-----------------------------------|-------------------------|---------------|----------------------|
| Element Name | Parent Element | Type | Element Name | Parent Element | Type | DVM |
| sendDetails | | Outermost Tag | D1-SyncRequestInbound | | Outermost Tag | |
| | | | syncRequestId | D1-SyncRequestInbound | Field | |
| | | | bo | D1-SyncRequestInbound | Field | |
| | | | boStatus | D1-SyncRequestInbound | Field | |
| | | | createDateTime | D1-SyncRequestInbound | Field | |
| | | | statusDateTime | D1-SyncRequestInbound | Field | |
| syncRequestId | sendDetails | Field | externalReferenceId | D1-SyncRequestInbound | Field | |
| bo | sendDetails | Field | | | | |
| boStatus | sendDetails | Field | | | | |
| createDateTime | sendDetails | Field | | | | |
| statusDateTime | sendDetails | Field | | | | |
| version | sendDetails | Field | | | | |
| sourceSystem | sendDetails | Field | externalSystem | D1-SyncRequestInbound | Field | |
| syncRequired | sendDetails | Field | | | | |
| forceSync | sendDetails | Field | | | | |
| initialLoad | sendDetails | Field | initialLoad | D1-SyncRequestInbound | Field | |
| discardReason | sendDetails | Field | | | | |
| cancelReason | sendDetails | Field | | | | |
| Mo | sendDetails | Field | targetMo | D1-SyncRequestInbound | Field | OUCCB2_OUMDM2_M O |
| pkValue1 | sendDetails | Field | externalPkValue1 | D1-SyncRequestInbound | Field | |
| pkValue2 | sendDetails | Field | externalPkValue2 | D1-SyncRequestInbound | Field | |
| pkValue3 | sendDetails | Field | externalPkValue3 | D1-SyncRequestInbound | Field | |
| pkValue4 | sendDetails | Field | externalPkValue4 | D1-SyncRequestInbound | Field | |
| pkValue5 | sendDetails | Field | externalPkValue5 | D1-SyncRequestInbound | Field | |
| | | | productionPkValue | D1-SyncRequestInbound | Field | |
| | | | version | D1-SyncRequestInbound | Field | |
| | | | relatedCompositeSyncId | D1-SyncRequestInbound | Field | |
| | | | clearExceptions | D1-SyncRequestInbound | Field | |
| | | | targetBo | D1-SyncRequestInbound | Field | |
| meterConfigurationBO | sendDetails | Field | | | | |
| snapshotDA | sendDetails | Field | | | | |
| Postscript | sendDetails | Field | | | | |
| syncRequestDetails | sendDetails | Group | syncRequestDetails | D1-SyncRequestInbound | Group | |
| | | | original | syncRequestDetails | Group | |
| initialSnapshot | syncRequestDetails | Group | initialSnapshot | original | Group | |
| deviceConfigurationInfo | initialSnapshot | Group | deviceConfigurationInfo | initialSnapshot | Group | |
| deviceConfigurationType | deviceConfig | Field | deviceConfigurationType | deviceConfigurationInfo | Field | OUCCB2_OUMDM2_D |

| CCB Meter Config Request Message | | | MDM Device Config Request Message | | | DVM Mapping |
|----------------------------------|-------------------------|-------|-----------------------------------|-------------------------|-------|--------------------------------|
| deviceConfigType | deviceConfigType | Field | deviceConfigType | deviceConfigType | Field | deviceConfigType |
| deviceConfigurationInfo | deviceConfigurationInfo | Field | deviceConfigurationInfo | deviceConfigurationInfo | Field | |
| customElements | deviceConfigurationInfo | Group | customElements | deviceConfigurationInfo | Group | |
| formattedElements | deviceConfigurationInfo | Group | formattedElements | deviceConfigurationInfo | Group | |
| measuringComponentInfo | initialSnapshot | Group | measuringComponentInfo | initialSnapshot | Group | |
| measuringComponentList | measuringComponentInfo | List | measuringComponentList | measuringComponentInfo | List | |
| registerId | measuringComponentInfo | Field | registerId | measuringComponentInfo | Field | |
| howToUse | measuringComponentInfo | Field | howToUse | measuringComponentInfo | Field | OUMDM2_HowToUse |
| readOutType | measuringComponentInfo | Field | readOutType | measuringComponentInfo | Field | OUMDM2_ReadOutType |
| consumptiveSubtractive | measuringComponentInfo | Field | consumptiveSubtractive | measuringComponentInfo | Field | OUMDM2_ConsumptiveSubtractive |
| serviceType | measuringComponentInfo | Field | serviceType | measuringComponentInfo | Field | OUMDM2_MCSERVICEType |
| allowNegativeConsumption | measuringComponentInfo | Field | allowNegativeConsumption | measuringComponentInfo | Field | OUMDM2_NegativeConsumption |
| uom | measuringComponentInfo | Field | uom | measuringComponentInfo | Field | OUMDM2_UOM |
| toU | measuringComponentInfo | Field | toU | measuringComponentInfo | Field | OUMDM2_TOU |
| sqi | measuringComponentInfo | Field | sqi | measuringComponentInfo | Field | OUMDM2_SQI |
| intervalRegisterType | measuringComponentInfo | Field | intervalScalar | measuringComponentInfo | Field | |
| customElements | measuringComponentInfo | Group | customElements | measuringComponentInfo | Group | |
| formattedElements | measuringComponentInfo | Group | formattedElements | measuringComponentInfo | Group | |
| finalSnapshot | syncRequestDetails | Group | finalSnapshot | original | Group | |
| deviceConfigurationInfo | finalSnapshot | Field | deviceConfigurationInfo | finalSnapshot | Field | |
| deviceConfigurationType | deviceConfigurationInfo | Field | deviceConfigurationType | deviceConfigurationInfo | Field | OUCCB2_OUMDM2_DeviceConfigType |
| deviceConfigurationInfo | deviceConfigurationInfo | Field | deviceConfigurationInfo | deviceConfigurationInfo | Field | |
| customElements | deviceConfigurationInfo | Group | customElements | deviceConfigurationInfo | Group | |
| formattedElements | deviceConfigurationInfo | Group | formattedElements | deviceConfigurationInfo | Group | |
| measuringComponentInfo | initialSnapshot | Group | measuringComponentInfo | initialSnapshot | Group | |
| measuringComponentList | measuringComponentInfo | List | measuringComponentList | measuringComponentInfo | List | |
| registerId | measuringComponentInfo | Field | registerId | measuringComponentInfo | Field | |
| howToUse | measuringComponentInfo | Field | howToUse | measuringComponentInfo | Field | OUMDM2_HowToUse |
| readOutType | measuringComponentInfo | Field | readOutType | measuringComponentInfo | Field | OUMDM2_ReadOutType |
| consumptiveSubtractive | measuringComponentInfo | Field | consumptiveSubtractive | measuringComponentInfo | Field | OUMDM2_ConsumptiveSubtractive |

| CCB Meter Config Request Message | | | MDM Device Config Request Message | | | DVM Mapping |
|----------------------------------|------------------------|-------|-----------------------------------|------------------------|-------|----------------------------|
| serviceType | measuringComponentInfo | Field | serviceType | measuringComponentInfo | Field | OUMDM2_MCServicetype |
| allowNegativeConsumption | measuringComponentInfo | Field | allowNegativeConsumption | measuringComponentInfo | Field | OUMDM2_NegativeConsumption |
| uom | measuringComponentInfo | Field | uom | measuringComponentInfo | Field | OUMDM2_UOM |
| tou | measuringComponentInfo | Field | tou | measuringComponentInfo | Field | OUMDM2_TOU |
| sqi | measuringComponentInfo | Field | sqi | measuringComponentInfo | Field | OUMDM2_SQI |
| intervalRegisterType | measuringComponentInfo | Field | intervalScalar | measuringComponentInfo | Field | |
| customElements | measuringComponentInfo | Group | customElements | measuringComponentInfo | Group | |
| formattedElements | measuringComponentInfo | Group | formattedElements | measuringComponentInfo | Group | |
| | | | transformed | syncRequestDetails | Field | |

Meter Configuration Sync Response Mapping

| MDM Device Config Sync Response Message | | | CCB Meter Config Sync Response Message | | | DVM Mapping |
|---|--------------------------|---------------|--|-----------------------------------|---------------|-------------------------|
| Element Name | Parent Element | Type | Element Name | Parent Element | Type | DVM |
| sendDetails | | Outermost Tag | F1-UpdateAndTransitionSyncRequest | | Outermost Tag | |
| syncRequestId | sendDetails | Field | | | | |
| externalReferenceId | sendDetails | Field | syncRequestId | F1-UpdateAndTransitionSyncRequest | Field | |
| exceptionInformation | sendDetails | Group | | | | |
| exceptionInformationList | exceptionInformation | List | exceptionInfo | F1-UpdateAndTransitionSyncRequest | List | |
| messageCategory | exceptionInformationList | Field | messageCategory | F1-UpdateAndTransitionSyncRequest | Field | |
| messageNumber | exceptionInformationList | Field | messageNumber | F1-UpdateAndTransitionSyncRequest | Field | OUCCB2_OUMDM2_ErrorCode |
| sequence | exceptionInformationList | Field | sequence | F1-UpdateAndTransitionSyncRequest | Field | |
| comments | exceptionInformationList | Field | comments | F1-UpdateAndTransitionSyncRequest | Field | |
| messageParameters | exceptionInformationList | List | messageParameters | exceptionInfo | List | |
| parameterSequence | messageParameters | Field | parameterSequence | messageParameters | Field | |
| messageParameterType | messageParameters | Field | | | | |
| messageParameterValue | messageParameters | Field | messageParameterValue | messageParameters | Field | |
| customElements | sendDetails | Group | customElements | F1- | Group | |

| MDM Device Config Sync Response Message | | | CCB Meter COnfig Sync Response Message | | | DVM Mapping |
|---|--|--|--|---------------------------------|--|-------------|
| | | | | UpdateAndTransitionSync Request | | |

SP-Meter History Information Synchronization

SP-Meter History Sync Request Mapping

| CCB SP-Meter History Request Message | | | MDM Install Event Request Message | | | DVM Mapping |
|--------------------------------------|----------------|---------------|-----------------------------------|-----------------------|---------------|----------------------|
| Element Name | Parent Element | Type | Element Name | Parent Element | Type | DVM |
| sendDetails | | Outermost Tag | D1-SyncRequestInbound | | Outermost Tag | |
| | | | syncRequestId | D1-SyncRequestInbound | Field | |
| | | | bo | D1-SyncRequestInbound | Field | |
| | | | boStatus | D1-SyncRequestInbound | Field | |
| | | | createDateTime | D1-SyncRequestInbound | Field | |
| | | | statusDateTime | D1-SyncRequestInbound | Field | |
| syncRequestId | sendDetails | Field | externalReferenceId | D1-SyncRequestInbound | Field | |
| bo | sendDetails | Field | | | | |
| boStatus | sendDetails | Field | | | | |
| createDateTime | sendDetails | Field | | | | |
| statusDateTime | sendDetails | Field | | | | |
| version | sendDetails | Field | | | | |
| sourceSystem | sendDetails | Field | externalSystem | D1-SyncRequestInbound | Field | |
| syncRequired | sendDetails | Field | | | | |
| forceSync | sendDetails | Field | | | | |
| initialLoad | sendDetails | Field | initialLoad | D1-SyncRequestInbound | Field | |
| discardReason | sendDetails | Field | | | | |
| cancelReason | sendDetails | Field | | | | |
| mo | sendDetails | Field | targetMo | D1-SyncRequestInbound | Field | OUCCB2_OUMDM2_M O |
| pkValue1 | sendDetails | Field | externalPkValue1 | D1-SyncRequestInbound | Field | |
| pkValue2 | sendDetails | Field | externalPkValue2 | D1-SyncRequestInbound | Field | |
| pkValue3 | sendDetails | Field | externalPkValue3 | D1-SyncRequestInbound | Field | |
| pkValue4 | sendDetails | Field | externalPkValue4 | D1-SyncRequestInbound | Field | |
| pkValue5 | sendDetails | Field | externalPkValue5 | D1-SyncRequestInbound | Field | |
| | | | productionPkValue | D1-SyncRequestInbound | Field | |
| | | | version | D1-SyncRequestInbound | Field | |
| | | | relatedCompositeSyncId | D1-SyncRequestInbound | Field | |
| | | | clearExceptions | D1-SyncRequestInbound | Field | |
| | | | targetBo | D1-SyncRequestInbound | Field | |
| soMeterHistoryBO | sendDetails | Field | | | | |
| snapshotDA | sendDetails | Field | | | | |
| postScript | sendDetails | Field | | | | |
| syncRequestDetails | sendDetails | Group | syncRequestDetails | D1-SyncRequestInbound | Group | |

| CCB SP-Meter History Request Message | | | MDM Install Event Request Message | | | DVM Mapping |
|--------------------------------------|--------------------|-------|-----------------------------------|--------------------|-------|-------------|
| | | | original | syncRequestDetails | Group | |
| initialSnapshot | syncRequestDetails | Group | initialSnapshot | original | Group | |
| deviceConfigurationId | initialSnapshot | Field | deviceConfigurationId | initialSnapshot | Field | |
| customElements | initialSnapshot | Group | customElements | initialSnapshot | Group | |
| formattedElements | initialSnapshot | Group | formattedElements | initialSnapshot | Group | |
| finalSnapshot | syncRequestDetails | Group | finalSnapshot | original | Group | |
| deviceConfigurationId | finalSnapshot | Field | deviceConfigurationId | finalSnapshot | Field | |
| customElements | finalSnapshot | Group | customElements | finalSnapshot | Group | |
| formattedElements | finalSnapshot | Group | formattedElements | finalSnapshot | Group | |
| | | | transformed | syncRequestDetails | Field | |

SP-Meter History Sync Response Mapping

| MDM Install Event Sync Response Message | | | CCB SP-Meter History Sync Response Message | | | DVM Mapping |
|---|--------------------------|---------------|--|-----------------------------------|---------------|-------------------------|
| Element Name | Parent Element | Type | Element Name | Parent Element | Type | DVM |
| sendDetails | | Outermost Tag | F1-UpdateAndTransitionSyncRequest | | Outermost Tag | |
| syncRequestId | sendDetails | Field | | | | |
| externalReferenceId | sendDetails | Field | syncRequestId | F1-UpdateAndTransitionSyncRequest | Field | |
| exceptionInformation | sendDetails | Group | | | | |
| exceptionInformationList | exceptionInformation | List | exceptionInfo | F1-UpdateAndTransitionSyncRequest | List | |
| messageCategory | exceptionInformationList | Field | messageCategory | F1-UpdateAndTransitionSyncRequest | Field | |
| messageNumber | exceptionInformationList | Field | messageNumber | F1-UpdateAndTransitionSyncRequest | Field | OUCCB2_OUMDM2_ErrorCode |
| sequence | exceptionInformationList | Field | sequence | F1-UpdateAndTransitionSyncRequest | Field | |
| comments | exceptionInformationList | Field | comments | F1-UpdateAndTransitionSyncRequest | Field | |
| messageParameters | exceptionInformationList | List | messageParameters | exceptionInfo | List | |
| parameterSequence | messageParameters | Field | parameterSequence | messageParameters | Field | |
| messageParameterType | messageParameters | Field | | | | |
| messageParameterValue | messageParameters | Field | messageParameterValue | messageParameters | Field | |
| customElements | sendDetails | Group | customElements | F1-UpdateAndTransitionSyncRequest | Group | |

Batch Bill Determinants Mapping

Batch Bill Determinants Request Mapping

| CCB Batch BD Request Message | | | MDM Batch BD Request Message | | | DVM Mapping |
|------------------------------|--------------------|---------------|-----------------------------------|-----------------------------------|---------------|-----------------------------|
| Element Name | Parent Element | Type | Element Name | Parent Element | Type | DVM |
| sendDetails | | Outermost Tag | D2-UsageTransactionRequestInbound | | Outermost Tag | |
| | | | usageld | D2-UsageTransactionRequestInbound | Field | |
| | | | bo | D2-UsageTransactionRequestInbound | Field | |
| | | | boStatus | D2-UsageTransactionRequestInbound | Field | |
| | | | statusReason | D2-UsageTransactionRequestInbound | | |
| | | | createDateTime | D2-UsageTransactionRequestInbound | Field | |
| | | | updateStatusDateTime | D2-UsageTransactionRequestInbound | Field | |
| | | | usld | D2-UsageTransactionRequestInbound | Field | |
| | | | usageGroup | D2-UsageTransactionRequestInbound | Field | |
| usageld | sendDetails | Field | externalId | D2-UsageTransactionRequestInbound | Field | |
| bo | sendDetails | Field | | | | |
| boStatus | sendDetails | Field | | | | |
| createDateTime | sendDetails | Field | | | | |
| statusDateTime | sendDetails | Field | | | | |
| | | | comments | D2-UsageTransactionRequestInbound | Field | |
| | | | measurementCycle | D2-UsageTransactionRequestInbound | Field | |
| | | | measurementCycleRoute | D2-UsageTransactionRequestInbound | Field | |
| | | | scheduledSelectionDate | D2-UsageTransactionRequestInbound | Field | |
| | | | isTraceOn | D2-UsageTransactionRequestInbound | Field | |
| intervalProcessing | sendDetails | Group | intervalMC | D2-UsageTransactionRequestInbound | Group | |
| startDateTime | intervalProcessing | Field | startDateTime | intervalMC | Field | |
| endDateTimeFrom | intervalProcessing | Field | endDateTimeFrom | intervalMC | Field | |
| endDateTimeTo | intervalProcessing | Field | endDateTimeTo | intervalMC | Field | |
| scalarProcessing | sendDetails | Group | scalarMC | D2-UsageTransactionRequestInbound | Group | |
| startDateTime | scalarProcessing | Field | startDateTime | scalarMC | Field | |
| endDateTime | scalarProcessing | Field | endDateTimeFrom | scalarMC | Field | |
| | | | endDateTimeTo | scalarMC | Field | |
| billingOption | scalarProcessing | Field | endRangeOption | scalarMC | Field | OUCCB2_OUMDM2_BillingOption |

| CCB Batch BD Request Message | | | MDM Batch BD Request Message | | | DVM Mapping |
|------------------------------|------------------|-------|------------------------------|---------------------------------------|-------|------------------------------|
| minDaysOffset | scalarProcessing | Field | minDaysOffset | scalarMC | Field | |
| maxDaysOffset | scalarProcessing | Field | maxDaysOffset | scalarMC | Field | |
| allowEstimate | scalarProcessing | Field | allowEstimate | scalarMC | Field | OUCCB2_OUMDM2_AllowEstimat |
| estimateDate | scalarProcessing | Field | estimateDate | scalarMC | Field | |
| Said | sendDetails | Field | usExternalId | D2-UsageTransactionRequest Inbound | Field | |
| billSegmentId | sendDetails | Field | | | | |
| Version | sendDetails | Field | | | | |
| | | | version | D2-UsageTransactionRequest Inbound | | |
| | | | dateBreaks | D2-UsageTransactionRequest Inbound | Group | |
| dateBreaks | sendDetails | List | dateBreaksList | dateBreaks | List | |
| breakDateTime | dateBreaks | Field | dateBreak | dateBreaksList | Field | |
| billCondition | sendDetails | Field | billCondition | D2-UsageTransactionRequest Inbound | Field | OUCCB2_OUMDM2_BillConditio |
| retryInfo | sendDetails | Group | | | | |
| automatedretry | retryInfo | Field | automatedretry | D2-UsageTransactionRequest Inbound | Field | OUCCB2_OUMDM2_AutomatedRetry |
| retryUntilDateTime | retryInfo | Field | retryUntilDateTime | D2-UsageTransactionRequest Inbound | Field | |
| customElements | sendDetails | Group | customElements | D2-UsageTransactionRequest Inbound | Group | |
| billCycle | sendDetails | Field | | | | |
| windowStartDate | sendDetails | Field | | | | |
| billModelInfo | sendDetails | Group | | | | |
| billMode | billModelInfo | Field | requestMode | D2-UsageTransactionRequest Inbound | Field | OUCCB2_OUMDM2_BillMode |
| | | | deferCalculation | D2-UsageTransactionRequest Inbound | Field | OUCCB2_OUMDM2_BillMode |

Batch Bill Determinants Response Mapping

| MDM Batch BD Response Message | | | CCB Batch BD Response Message | | | DVM Mapping |
|-------------------------------|---------------------|------------------|-------------------------------|----------------------|------------------|------------------------------|
| Element Name | Parent Element | Type | Element Name | Parent Element | Type | DVM |
| sendDetails | | Outermost Tag | C1UpdateUsageRequest | | Outermost Tag | |
| externalId | sendDetails | Field | usageId | C1UpdateUsageRequest | Field | |
| usageId | sendDetails | Field | externalReferenceId | C1UpdateUsageRequest | Field | |
| | | | usageperiod | C1UpdateUsageRequest | Group | |
| startDateTime | sendDetails | Field | startDateTime | usageperiod | Field | |
| endDateTime | sendDetails | Field | endDateTime | usageperiod | Field | |
| | | | scalarProcessing | C1UpdateUsageRequest | Group | |
| isEstimate | sendDetails | Field | isEstimate | scalarProcessing | Field | OUMDM2_OUCCB2_I sEstimate |
| summaryUsagePeriods | sendDetails | Group | | | | |
| summaryUsagePeriodsList | summaryUsagePeriods | List | spUsagePeriod | C1UpdateUsageRequest | List | |

| MDM Batch BD Response Message | | | CCB Batch BD Response Message | | | DVM Mapping |
|-------------------------------|-------------------------|-------|-------------------------------|----------------------|-------|-------------------------|
| startDateTime | summaryUsagePeriodsList | Field | startDateTime | spUsagePeriod | Field | |
| endDateTime | summaryUsagePeriodsList | Field | endDateTime | spUsagePeriod | Field | |
| spSQs | summaryUsagePeriodsList | Group | | | | |
| spSQsList | spSQs | List | serviceQty | spUsagePeriod | List | |
| spSQsequence | spSQsList | Field | seq | serviceQty | Field | |
| spld | spSQsList | Field | spld | serviceQty | Field | |
| uom | spSQsList | Field | uom | serviceQty | Field | OUMDM2_OUCCB2_UOM |
| tou | spSQsList | Field | tou | serviceQty | Field | OUMDM2_OUCCB2_TOU |
| sqi | spSQsList | Field | sqi | serviceQty | Field | OUMDM2_OUCCB2_SQI |
| quantity | spSQsList | Field | qty | serviceQty | Field | |
| | | | usagePeriods | C1UpdateUsageRequest | List | |
| startDateTime | summaryUsagePeriodsList | | startDateTime | usagePeriods | Field | |
| endDateTime | summaryUsagePeriodsList | | endDateTime | usagePeriods | Field | |
| usageType | summaryUsagePeriodsList | | usageRequestType | usagePeriods | Field | OUMDM2_OUCCB2_UsageType |
| SQs | summaryUsagePeriodsList | | | | | |
| SQsList | SQs | | serviceQty | usagePeriods | List | |
| sqSequence | SQsList | | seq | serviceQty | Field | |
| uom | SQsList | | uom | serviceQty | Field | OUMDM2_OUCCB2_UOM |
| tou | SQsList | | tou | serviceQty | Field | OUMDM2_OUCCB2_TOU |
| sqi | SQsList | | sqi | serviceQty | Field | OUMDM2_OUCCB2_SQI |
| quantity | SQsList | | qty | serviceQty | Field | |
| usagePeriods | sendDetails | Group | | | | |
| usagePeriodsList | usagePeriods | List | | | | |
| sequence | usagePeriodsList | Field | | | | |
| startDateTime | usagePeriodsList | Field | | | | |
| endDateTime | usagePeriodsList | Field | | | | |
| usageType | usagePeriodsList | Field | | | | |
| SQs | usagePeriodsList | List | | | | |
| SQsList | SQs | Field | | | | |
| sqSequence | SQsList | Field | | | | |
| sqType | SQsList | Field | | | | |
| Uom | SQsList | Field | | | | |
| Tou | SQsList | Field | | | | |
| Sqi | SQsList | Field | | | | |
| Quantity | SQsList | Field | | | | |
| spld | SQsList | Field | | | | |

| MDM Batch BD Response Message | | | CCB Batch BD Response Message | | | DVM Mapping |
|-------------------------------|-------------------|-------|-------------------------------|----------------------|-------|-------------------|
| measuringComponentId | SQsList | Field | | | | |
| touMapId | SQsList | Field | | | | |
| Factor | SQsList | Field | | | | |
| characteristicType | SQsList | Field | | | | |
| characteristicValue | SQsList | Field | | | | |
| usageGroup | SQsList | Field | | | | |
| usageRule | SQsList | Field | | | | |
| intervalData | SQsList | Field | | | | |
| secondPerInterval | SQsList | Field | | | | |
| Intervals | SQsList | Group | | | | |
| mL | intervals | List | | | | |
| S | mL | Field | | | | |
| Dt | mL | Field | | | | |
| Q | mL | Field | | | | |
| scalarDetails | sendDetails | Group | | | | |
| scalarDetailsList | scalarDetails | List | reads | | List | |
| sequence | scalarDetailsList | Field | readSeq | reads | Field | |
| spld | scalarDetailsList | Field | spld | reads | Field | |
| uom | scalarDetailsList | Field | uom | reads | Field | OUMDM2_OUCCB2_UOM |
| tou | scalarDetailsList | Field | tou | reads | Field | OUMDM2_OUCCB2_TOU |
| sqi | scalarDetailsList | Field | sqi | reads | Field | OUMDM2_OUCCB2_SQI |
| measuringComponentId | scalarDetailsList | Field | | | | |
| startDateTime | scalarDetailsList | Field | startDateTime | reads | Field | |
| startMeasurement | scalarDetailsList | Field | startReading | reads | Field | |
| endDateTime | scalarDetailsList | Field | endDateTime | reads | Field | |
| endMeasurement | scalarDetailsList | Field | endReading | reads | Field | |
| quantity | scalarDetailsList | Field | measuredQty | reads | Field | |
| finalUom | scalarDetailsList | Field | finalUom | reads | Field | OUMDM2_OUCCB2_UOM |
| finalTou | scalarDetailsList | Field | finalTou | reads | Field | OUMDM2_OUCCB2_TOU |
| finalSqi | scalarDetailsList | Field | finalSqi | reads | Field | OUMDM2_OUCCB2_SQI |
| finalQuantity | scalarDetailsList | Field | finalQty | reads | Field | |
| spHowToUse | scalarDetailsList | Field | spHowToUse | reads | Field | |
| mcHowToUse | scalarDetailsList | Field | regHowToUse | reads | Field | |
| measuresPeakQuantity | scalarDetailsList | Field | measuresPeakQuantity | reads | Field | |
| appliedMultiplier | scalarDetailsList | Field | constant | reads | Field | |
| usePercent | scalarDetailsList | Field | usePercent | reads | Field | |
| usageGroup | scalarDetailsList | Field | | | | |
| usageRule | scalarDetailsList | Field | | | | |
| customElements | scalarDetailsList | Group | customElements | reads | Group | |
| exceptions | sendDetails | Group | | | | |
| exceptionsList | exceptions | List | exceptionInfo | C1UpdateUsageRequest | List | |

| MDM Batch BD Response Message | | | CCB Batch BD Response Message | | | DVM Mapping |
|-------------------------------|-----------------------|-------|-------------------------------|-----------------------|-------|--------------------------|
| sequence | exceptionsList | Field | sequence | exceptionInfo | Field | |
| usageGroup | exceptionsList | Field | | | | |
| usageRule | exceptionsList | Field | | | | |
| exceptionType | exceptionsList | Field | | | | |
| exceptionSeverity | exceptionsList | Field | | | | |
| toDoType | exceptionsList | Field | | | | |
| toDoRole | exceptionsList | Field | | | | |
| messageCategory | exceptionsList | Field | messageCategory | exceptionInfo | Field | |
| messageNumber | exceptionsList | Field | messageNumber | exceptionInfo | Field | |
| comments | exceptionsList | Field | comments | exceptionInfo | Field | |
| messageParameters | exceptionsList | Group | | | | |
| messageParametersList | messageParameters | List | messageParameters | exceptionInfo | List | |
| sequence | messageParametersList | Field | parameterSequence | messageParametersList | Field | |
| parameter | messageParametersList | Field | messageParameterValue | messageParametersList | Field | |
| parameterType | messageParametersList | Field | | | | |
| skipDetails | sendDetails | Group | saSkipInfo | C1UpdateUsageRequest | Group | |
| skip | skipDetails | Field | skipSA | saSkipInfo | Field | OUMDM2_OUCCB2_SkipSA |
| skipReason | skipDetails | Field | skipReason | saSkipInfo | Field | OUMDM2_OUCCB2_SkipReason |
| nextScheduledReadDate | skipDetails | Field | nextScheduledReadDate | saSkipInfo | Field | |
| customElements | sendDetails | Group | customElements | C1UpdateUsageRequest | Group | |

Online Bill Determinants Mapping

Online Bill Determinants Request Mapping

| CCB Online BD Request Message | | | MDM Online BD Request Message | | | DVM Mapping |
|-------------------------------|----------------|---------------|-----------------------------------|-----------------------------------|---------------|-------------|
| Element Name | Parent Element | Type | Element Name | Parent Element | Type | DVM |
| sendDetails | | Outermost Tag | D2-UsageTransactionRequestInbound | | Outermost Tag | |
| | | | usageId | D2-UsageTransactionRequestInbound | Field | |
| | | | bo | D2-UsageTransactionRequestInbound | Field | |
| | | | boStatus | D2-UsageTransactionRequestInbound | Field | |
| | | | statusReason | D2-UsageTransactionRequestInbound | | |
| | | | createDateTime | D2-UsageTransactionRequestInbound | Field | |
| | | | updateStatusDateTime | D2-UsageTransactionRequestInbound | Field | |

| CCB Online BD Request Message | | | MDM Online BD Request Message | | | DVM Mapping |
|-------------------------------|--------------------|-------|-------------------------------|---------------------------------------|-------|----------------------------------|
| | | | usId | D2-UsageTransactionRequest Inbound | Field | |
| | | | usageGroup | D2-UsageTransactionRequest Inbound | Field | |
| usageld | sendDetails | Field | externalId | D2-UsageTransactionRequest Inbound | Field | |
| bo | sendDetails | Field | | | | |
| boStatus | sendDetails | Field | | | | |
| createDateTime | sendDetails | Field | | | | |
| statusDateTime | sendDetails | Field | | | | |
| | | | comments | D2-UsageTransactionRequest Inbound | Field | |
| | | | measurementCycle | D2-UsageTransactionRequest Inbound | Field | |
| | | | measurementCycleRoute | D2-UsageTransactionRequest Inbound | Field | |
| | | | scheduledSelectionDate | D2-UsageTransactionRequest Inbound | Field | |
| | | | isTraceOn | D2-UsageTransactionRequest Inbound | Field | |
| intervalProcessing | sendDetails | Group | intervalMC | D2-UsageTransactionRequest Inbound | Group | |
| startDateTime | intervalProcessing | Field | startDateTime | intervalMC | Field | |
| endDateTimeFrom | intervalProcessing | Field | endDateTimeFrom | intervalMC | Field | |
| endDateTimeTo | intervalProcessing | Field | endDateTimeTo | intervalMC | Field | |
| scalarProcessing | sendDetails | Group | scalarMC | D2-UsageTransactionRequest Inbound | Group | |
| startDateTime | scalarProcessing | Field | startDateTime | scalarMC | Field | |
| endDateTime | scalarProcessing | Field | endDateTimeFrom | scalarMC | Field | |
| | | | endDateTimeTo | scalarMC | Field | |
| billingOption | scalarProcessing | Field | endRangeOption | scalarMC | Field | OUCCB2_OUMDM2_ BillingOption |
| minDaysOffset | scalarProcessing | Field | minDaysOffset | scalarMC | Field | |
| maxDaysOffset | scalarProcessing | Field | maxDaysOffset | scalarMC | Field | |
| allowEstimate | scalarProcessing | Field | allowEstimate | scalarMC | Field | OUCCB2_OUMDM2_ AllowEstimat |
| estimateDate | scalarProcessing | Field | estimateDate | scalarMC | Field | |
| Said | sendDetails | Field | usExternalId | D2-UsageTransactionRequest Inbound | Field | |
| billSegmentId | sendDetails | Field | | | | |
| Version | sendDetails | Field | | | | |
| | | | version | D2-UsageTransactionRequest Inbound | | |
| | | | dateBreaks | D2-UsageTransactionRequest Inbound | Group | |
| dateBreaks | sendDetails | List | dateBreaksList | dateBreaks | List | |
| breakDateTime | dateBreaks | Field | dateBreak | dateBreaksList | Field | |
| billCondition | sendDetails | Field | billCondition | D2-UsageTransactionRequest Inbound | Field | OUCCB2_OUMDM2_ BillConditio |
| retryInfo | sendDetails | Group | | | | |
| automatedretry | retryInfo | Field | automatedretry | D2-UsageTransactionRequest Inbound | Field | OUCCB2_OUMDM2_ AutomatedRetry |
| retryUntilDateTime | retryInfo | Field | retryUntilDateTime | D2-UsageTransactionRequest | Field | |

| CCB Online BD Request Message | | | MDM Online BD Request Message | | | DVM Mapping |
|-------------------------------|---------------|-------|-------------------------------|---------------------------------------|-------|----------------------------|
| | | | | Inbound | | |
| customElements | sendDetails | Group | customElements | D2-UsageTransactionRequest Inbound | Group | |
| billModelInfo | sendDetails | Group | | | | |
| billMode | billModelInfo | Field | requestMode | D2-UsageTransactionRequest Inbound | Field | OUCCB2_OUMDM2_ BillMode |

Online Bill Determinants Response Mapping

| MDM Online BD Response Message | | | CCB Online BD Response Message | | | DVM Mapping |
|--------------------------------|-------------------------|------------------|--------------------------------|----------------------|------------------|------------------------------|
| Element Name | Parent Element | Type | Element Name | Parent Element | Type | DVM |
| sendDetails | | Outermost Tag | C1UpdateUsageRequest | | Outermost Tag | |
| externalId | sendDetails | Field | usageId | C1UpdateUsageRequest | Field | |
| usageId | sendDetails | Field | externalReferenceId | C1UpdateUsageRequest | Field | |
| | | | usagePeriod | C1UpdateUsageRequest | Group | |
| startDateTime | sendDetails | Field | startDateTime | usagePeriod | Field | |
| endDateTime | sendDetails | Field | endDateTime | usagePeriod | Field | |
| | | | scalarProcessing | C1UpdateUsageRequest | Group | |
| isEstimate | sendDetails | Field | isEstimate | scalarProcessing | Field | OUMDM2_OUCCB2_I sEstimate |
| summaryUsagePeriods | sendDetails | Group | | | | |
| summaryUsagePeriodsList | summaryUsagePeriods | List | spUsagePeriod | C1UpdateUsageRequest | List | |
| startDateTime | summaryUsagePeriodsList | Field | startDateTime | spUsagePeriod | Field | |
| endDateTime | summaryUsagePeriodsList | Field | endDateTime | spUsagePeriod | Field | |
| spSQs | summaryUsagePeriodsList | Group | | | | |
| spSQsList | spSQs | List | serviceQty | spUsagePeriod | List | |
| spSQsequence | spSQsList | Field | seq | serviceQty | Field | |
| spId | spSQsList | Field | spId | serviceQty | Field | |
| uom | spSQsList | Field | uom | serviceQty | Field | OUMDM2_OUCCB2_ UOM |
| tou | spSQsList | Field | tou | serviceQty | Field | OUMDM2_OUCCB2_ TOU |
| sqi | spSQsList | Field | sqi | serviceQty | Field | OUMDM2_OUCCB2_ SQI |
| quantity | spSQsList | Field | qty | serviceQty | Field | |
| | | | usagePeriods | C1UpdateUsageRequest | List | |
| startDateTime | summaryUsagePeriodsList | | startDateTime | usagePeriods | Field | |
| endDateTime | summaryUsagePeriodsList | | endDateTime | usagePeriods | Field | |
| usageType | summaryUsagePeriodsList | | usageRequestType | usagePeriods | Field | OUMDM2_OUCCB2_ UsageType |
| SQs | summaryUsagePeriodsList | | | | | |
| SQsList | SQs | | serviceQty | usagePeriods | List | |

| MDM Online BD Response Message | | | CCB Online BD Response Message | | | DVM Mapping |
|--------------------------------|-------------------|-------|--------------------------------|------------|-------|-------------------|
| sqSequence | SQsList | | seq | serviceQty | Field | |
| uom | SQsList | | uom | serviceQty | Field | OUMDM2_OUCCB2_UOM |
| tou | SQsList | | tou | serviceQty | Field | OUMDM2_OUCCB2_TOU |
| sqi | SQsList | | sqi | serviceQty | Field | OUMDM2_OUCCB2_SQI |
| quantity | SQsList | | qty | serviceQty | Field | |
| usagePeriods | sendDetails | Group | | | | |
| usagePeriodsList | usagePeriods | List | | | | |
| sequence | usagePeriodsList | Field | | | | |
| startDateTime | usagePeriodsList | Field | | | | |
| endDateTime | usagePeriodsList | Field | | | | |
| usageType | usagePeriodsList | Field | | | | |
| SQs | usagePeriodsList | List | | | | |
| SQsList | SQs | Field | | | | |
| sqSequence | SQsList | Field | | | | |
| sqType | SQsList | Field | | | | |
| Uom | SQsList | Field | | | | |
| Tou | SQsList | Field | | | | |
| Sqi | SQsList | Field | | | | |
| Quantity | SQsList | Field | | | | |
| spId | SQsList | Field | | | | |
| measuringComponentId | SQsList | Field | | | | |
| touMapId | SQsList | Field | | | | |
| Factor | SQsList | Field | | | | |
| characteristicType | SQsList | Field | | | | |
| characteristicValue | SQsList | Field | | | | |
| usageGroup | SQsList | Field | | | | |
| usageRule | SQsList | Field | | | | |
| intervalData | SQsList | Field | | | | |
| secondPerInterval | SQsList | Field | | | | |
| Intervals | SQsList | Group | | | | |
| mL | intervals | List | | | | |
| S | mL | Field | | | | |
| Dt | mL | Field | | | | |
| Q | mL | Field | | | | |
| scalarDetails | sendDetails | Group | | | | |
| scalarDetailsList | scalarDetails | List | reads | | List | |
| sequence | scalarDetailsList | Field | readSeq | reads | Field | |
| spId | scalarDetailsList | Field | spId | reads | Field | |
| uom | scalarDetailsList | Field | uom | reads | Field | OUMDM2_OUCCB2_UOM |
| tou | scalarDetailsList | Field | tou | reads | Field | OUMDM2_OUCCB2_TOU |

| MDM Online BD Response Message | | | CCB Online BD Response Message | | | DVM Mapping |
|--------------------------------|-----------------------|-------|--------------------------------|-----------------------|-------|-------------------|
| sqi | scalarDetailsList | Field | sqi | reads | Field | OUMDM2_OUCCB2_SQI |
| measuringComponentId | scalarDetailsList | Field | | | | |
| startDateTime | scalarDetailsList | Field | startDateTime | reads | Field | |
| startMeasurement | scalarDetailsList | Field | startReading | reads | Field | |
| endDateTime | scalarDetailsList | Field | endDateTime | reads | Field | |
| endMeasurement | scalarDetailsList | Field | endReading | reads | Field | |
| quantity | scalarDetailsList | Field | measuredQty | reads | Field | |
| finalUom | scalarDetailsList | Field | finalUom | reads | Field | OUMDM2_OUCCB2_UOM |
| finalTou | scalarDetailsList | Field | finalTou | reads | Field | OUMDM2_OUCCB2_TOU |
| finalSqi | scalarDetailsList | Field | finalSqi | reads | Field | OUMDM2_OUCCB2_SQI |
| finalQuantity | scalarDetailsList | Field | finalQty | reads | Field | |
| spHowToUse | scalarDetailsList | Field | spHowToUse | reads | Field | |
| mcHowToUse | scalarDetailsList | Field | regHowToUse | reads | Field | |
| measuresPeakQuantity | scalarDetailsList | Field | measuresPeakQuantity | reads | Field | |
| appliedMultiplier | scalarDetailsList | Field | constant | reads | Field | |
| usePercent | scalarDetailsList | Field | usePercent | reads | Field | |
| usageGroup | scalarDetailsList | Field | | | | |
| usageRule | scalarDetailsList | Field | | | | |
| customElements | scalarDetailsList | Group | customElements | reads | Group | |
| exceptions | sendDetails | Group | | | | |
| exceptionsList | exceptions | List | exceptionInfo | C1UpdateUsageRequest | List | |
| sequence | exceptionsList | Field | sequence | exceptionInfo | Field | |
| usageGroup | exceptionsList | Field | | | | |
| usageRule | exceptionsList | Field | | | | |
| exceptionType | exceptionsList | Field | | | | |
| exceptionSeverity | exceptionsList | Field | | | | |
| toDoType | exceptionsList | Field | | | | |
| toDoRole | exceptionsList | Field | | | | |
| messageCategory | exceptionsList | Field | messageCategory | exceptionInfo | Field | |
| messageNumber | exceptionsList | Field | messageNumber | exceptionInfo | Field | |
| comments | exceptionsList | Field | comments | exceptionInfo | Field | |
| messageParameters | exceptionsList | Group | | | | |
| messageParametersList | messageParameters | List | messageParameters | exceptionInfo | List | |
| sequence | messageParametersList | Field | parameterSequence | messageParametersList | Field | |
| parameter | messageParametersList | Field | messageParameterValue | messageParametersList | Field | |
| parameterType | messageParametersList | Field | | | | |
| customElements | sendDetails | Group | customElements | C1UpdateUsageRequest | Group | |

Replacement Reads Mapping

Replacement Reads Request Mapping

| MDM Replacement Read Request Message | | | CCB Replacement Read Request Message | | |
|--------------------------------------|----------------|--------------|--------------------------------------|-----------------------------------|--------------|
| Element Name | Parent Element | Type | Element Name | Parent Element | Type |
| sendDetails | | OutermostTag | C1-DetAcctCreateCorrectedReadOCBG | | OutermostTag |
| | | | replacementRead | C1-DetAcctCreateCorrectedReadOCBG | Group |
| usageld | | | usageld | replacementRead | Field |
| externalId | sendDetails | Field | externalReferenceId | replacementRead | Field |
| customElements | sendDetails | Group | customElements | replacementRead | Group |

Scalar Meter Reads Synchronization

Scalar Meter Reads Request Mapping

| CCB Online BD Request Message | | | MDM Online BD Request Message | | | DVM Mapping |
|-------------------------------|----------------|--------------|-------------------------------|-----------------------|--------------|------------------|
| Element Name | Parent Element | Type | Element Name | Parent Element | Type | DVM |
| sendDetails | | OutermostTag | D1-SyncRequestInbound | | OutermostTag | |
| | | | syncRequestId | D1-SyncRequestInbound | Field | |
| | | | bo | D1-SyncRequestInbound | Field | |
| | | | boStatus | D1-SyncRequestInbound | Field | |
| | | | createDateTime | D1-SyncRequestInbound | Field | |
| | | | statusDateTime | D1-SyncRequestInbound | Field | |
| syncRequestId | sendDetails | Field | externalReferenceId | D1-SyncRequestInbound | Field | |
| bo | sendDetails | Field | | | | |
| boStatus | sendDetails | Field | | | | |
| createDateTime | sendDetails | Field | | | | |
| statusDateTime | sendDetails | Field | | | | |
| version | sendDetails | Field | | | | |
| sourceSystem | sendDetails | Field | externalSystem | D1-SyncRequestInbound | Field | |
| syncRequired | sendDetails | Field | | | | |
| forceSync | sendDetails | Field | | | | |
| initialLoad | sendDetails | Field | initialLoad | D1-SyncRequestInbound | Field | |
| discardReason | sendDetails | Field | | | | |
| cancelReason | sendDetails | Field | | | | |
| mo | sendDetails | Field | targetMo | D1-SyncRequestInbound | Field | OUCCB2_OUMDM2_MO |

| CCB Online BD Request Message | | | MDM Online BD Request Message | | | DVM Mapping |
|-----------------------------------|------------------------|-------|-----------------------------------|-----------------------|-------|----------------------------|
| pkValue1 | sendDetails | Field | externalPkValue1 | D1-SyncRequestInbound | Field | |
| pkValue2 | sendDetails | Field | externalPkValue2 | D1-SyncRequestInbound | Field | |
| pkValue3 | sendDetails | Field | externalPkValue3 | D1-SyncRequestInbound | Field | |
| pkValue4 | sendDetails | Field | externalPkValue4 | D1-SyncRequestInbound | Field | |
| pkValue5 | sendDetails | Field | externalPkValue5 | D1-SyncRequestInbound | Field | |
| | | | productionPkValue | D1-SyncRequestInbound | Field | |
| | | | version | D1-SyncRequestInbound | Field | |
| | | | relatedCompositeSyn cld | D1-SyncRequestInbound | Field | |
| | | | clearExceptions | D1-SyncRequestInbound | Field | |
| | | | targetBo | D1-SyncRequestInbound | Field | |
| meterReadBO | sendDetails | Field | | | | |
| snapshotDA | sendDetails | Field | | | | |
| postScript | sendDetails | Field | | | | |
| syncRequestDetails | sendDetails | Group | syncRequestDetails | D1-SyncRequestInbound | Group | |
| | | | original | syncRequestDetails | Group | |
| initialSnapshot | syncRequestDe tails | Group | initialSnapshot | original | Group | |
| meterReadInfo | initialSnapshot | Group | scalarReadInfo | initialSnapshot | Group | |
| meterReadId | meterReadInfo | Field | scalarReadExternalId | scalarReadInfo | Field | |
| deviceConfigurationEx ternalId | meterReadInfo | Field | deviceConfigurationEx ternalId | scalarReadInfo | Field | |
| readDateTime | meterReadInfo | Field | measurementDateTim e | scalarReadInfo | Field | |
| useOnBill | meterReadInfo | Field | doNotUse | scalarReadInfo | Field | |
| customElements | meterReadInfo | Field | customElements | scalarReadInfo | Field | |
| formattedElements | meterReadInfo | Field | formattedElements | scalarReadInfo | Field | |
| registerReadInfo | initialSnapshot | Group | measurements | initialSnapshot | Group | |
| registerReadList | registerReadInf o | Group | measurementList | measurements | Group | |
| registerReadId | registerReadLis t | Field | measurementExternal Id | measurementList | Field | |
| measuringComponent ExternalId | registerReadLis t | Field | measuringComponent ExternalId | measurementList | Field | |
| reading | registerReadLis t | Field | measurement | measurementList | Field | |
| readType | registerReadLis t | Field | measurementConditio n | measurementList | Field | OUCCB2_OUMDM 2_ReadType |
| customElements | registerReadLis t | Field | customElements | measurementList | Field | |
| formattedElements | registerReadLis t | Field | formattedElements | measurementList | Field | |
| finalSnapshot | syncRequestDe tails | Group | finalSnapshot | original | Group | |
| meterReadInfo | finalSnapshot | Group | scalarReadInfo | finalSnapshot | Group | |
| meterReadId | meterReadInfo | Field | scalarReadExternalId | scalarReadInfo | Field | |
| deviceConfigurationEx ternalId | meterReadInfo | Field | deviceConfigurationEx ternalId | scalarReadInfo | Field | |
| readDateTime | meterReadInfo | Field | measurementDateTim e | scalarReadInfo | Field | |
| useOnBill | meterReadInfo | Field | doNotUse | scalarReadInfo | Field | |
| customElements | meterReadInfo | Field | customElements | scalarReadInfo | Field | |
| formattedElements | meterReadInfo | Field | formattedElements | scalarReadInfo | Field | |
| registerReadInfo | finalSnapshot | Group | measurements | finalSnapshot | Group | |

| CCB Online BD Request Message | | | MDM Online BD Request Message | | | DVM Mapping |
|-------------------------------|------------------|-------|-------------------------------|-----------------|-------|------------------------|
| registerReadList | registerReadInfo | Group | measurementList | measurements | Group | |
| registerReadId | registerReadList | Field | measurementExternalId | measurementList | Field | |
| measuringComponentExternalId | registerReadList | Field | measuringComponentExternalId | measurementList | Field | |
| reading | registerReadList | Field | measurement | measurementList | Field | |
| readType | registerReadList | Field | measurementCondition | measurementList | Field | OUCCB2_OUMDM2_ReadType |
| customElements | registerReadList | Field | customElements | measurementList | Field | |
| formattedElements | registerReadList | Field | formattedElements | measurementList | Field | |

Scalar Meter Reads Sync Response Mapping

| MDM Meter Reads Sync Response Message | | | CCB Meter Reads Sync Response Message | | | DVM Mapping |
|---------------------------------------|--------------------------|---------------|---------------------------------------|-----------------------------------|---------------|-------------------------|
| Element Name | Parent Element | Type | Element Name | Parent Element | Type | DVM |
| sendDetails | | Outermost Tag | F1-UpdateAndTransitionSyncRequest | | Outermost Tag | |
| syncRequestId | sendDetails | Field | | | | |
| externalReferenceId | sendDetails | Field | syncRequestId | F1-UpdateAndTransitionSyncRequest | Field | |
| exceptionInformation | sendDetails | Group | | | | |
| exceptionInformationList | exceptionInformation | List | exceptionInfo | F1-UpdateAndTransitionSyncRequest | List | |
| messageCategory | exceptionInformationList | Field | messageCategory | F1-UpdateAndTransitionSyncRequest | Field | |
| messageNumber | exceptionInformationList | Field | messageNumber | F1-UpdateAndTransitionSyncRequest | Field | OUCCB2_OUMDM2_ErrorCode |
| sequence | exceptionInformationList | Field | sequence | F1-UpdateAndTransitionSyncRequest | Field | |
| comments | exceptionInformationList | Field | comments | F1-UpdateAndTransitionSyncRequest | Field | |
| messageParameters | exceptionInformationList | List | messageParameters | exceptionInfo | List | |
| parameterSequence | messageParameters | Field | parameterSequence | messageParameters | Field | |
| messageParameterType | messageParameters | Field | | | | |
| messageParameterValue | messageParameters | Field | messageParameterValue | messageParameters | Field | |
| customElements | sendDetails | Group | customElements | F1-UpdateAndTransitionSyncRequest | Group | |

Get Register Read High-Low Boundary

Message Mapping

| CCB Message | | | MDM Message | | |
|--------------|----------------|---------------|---|---|--------------|
| Element Name | Parent Element | Type | Element Name | Parent Element | Type |
| | | Outermost Tag | D2-DetermineEstimatedAndHighLowScalarReadings | | OutermostTag |
| sendDetails | | Group | input | D2-DetermineEstimatedAndHighLowScalarReadings | Group |

| CCB Message | | | MDM Message | | |
|-----------------------------|-------------------|-------|------------------------------|---|-------|
| registerId | sendDetails | Field | externalMeasuringComponentId | input | Field |
| | | | measuringComponentId | input | Field |
| readDateTime | sendDetails | Field | msrmtDateTime | input | Field |
| responseDetails | | Group | output | D2-DetermineEstimatedAndHighLowScalarReadings | Group |
| estimatedRegisterReading | responseDetails | Field | estimatedReading | output | Field |
| lowBoundaryRegisterReading | responseDetails | Field | lowBoundaryReading | output | Field |
| highBoundaryRegisterReading | responseDetails | Field | highBoundaryReading | output | Field |
| | | | previousReadingDttm | output | Field |
| | | | previousReading | output | Field |
| | | | estimatedConsumption | output | Field |
| | | | lowBoundaryConsumption | output | Field |
| | | | highBoundaryConsumption | output | Field |
| | | | exceptions | output | |
| exceptionInfo | responseDetails | Group | exceptionsList | exceptions | Group |
| sequence | exceptions | Field | sequence | exceptionsList | Field |
| messageCategory | exceptions | Field | messageCategory | exceptionsList | Field |
| messageNumber | exceptions | Field | messageNumber | exceptionsList | Field |
| comments | exceptions | Field | messageInfo | exceptionsList | Field |
| | | | messageParameters | exceptionsList | Group |
| messageParameters | exceptions | Group | messageParametersList | messageParameters | Group |
| parameterSequence | messageParameters | Field | sequence | messageParametersList | Field |
| messageParameterValue | messageParameters | Field | parameter | messageParametersList | Field |
| | | | parameterType | messageParametersList | Field |

Appendix B: Cross References

The following sections provide references for where you can find more information on some of the terms and entities related to this integration.

Domain Value Maps

Please refer to the chapters titled [Working with Domain Value Maps](#) and [Using SOA Composer with Domain Value Maps](#) in Oracle® Fusion Middleware Developer's Guide for Oracle SOA Suite.

JMS Adapter

Please refer to [Oracle Fusion Middleware User's Guide for Technology Adapters](#) for more information.

Process Flow Diagrams

The following supplemental process flow diagrams are included with the documentation package.

- 050000 Customer Service.pdf
- 050600 Deliver Customer Care.pdf
- 050601 Maintain Customer Information CCB-MDM (Reusable Subprocess).pdf
- 050603 Fulfill Simple Request.pdf
- 100000 Billing and Revenue Management.pdf
- 100100 Manage Meter Data.pdf
- 100106 Provide Consumption Data to Billing.pdf

For known issues and their workaround, refer to the Oracle Support Knowledge article **Document 1304120.1 Known Issues and Workaround of CCB-MDM Integration**.