

**Oracle® Utilities Meter Data Management Integration  
to SAP for Meter Data Unification and  
Synchronization**

Release 11.1 Media Pack

Implementation Guide

Oracle Utilities Meter Data Management v2.0.1.6

SAP for Meter Data Unification and Synchronization v 6.0 EHP5

E28257-02

February 2012



---

Copyright © 2012, Oracle and/or its affiliates. All rights reserved.

This software and related documentation are provided under a license agreement containing restrictions on use and disclosure and are protected by intellectual property laws. Except as expressly permitted in your license agreement or allowed by law, you may not use, copy, reproduce, translate, broadcast, modify, license, transmit, distribute, exhibit, perform, publish, or display any part, in any form, or by any means. Reverse engineering, disassembly, or decompilation of this software, unless required by law for interoperability, is prohibited.

The information contained herein is subject to change without notice and is not warranted to be error-free. If you find any errors, please report them to us in writing.

If this software or related documentation is delivered to the U.S. Government or anyone licensing it on behalf of the U.S. Government, the following notice is applicable:

#### U.S. GOVERNMENT RIGHTS

Programs, software, databases, and related documentation and technical data delivered to U.S. Government customers are “commercial computer software” or “commercial technical data” pursuant to the applicable Federal Acquisition Regulation and agency-specific supplemental regulations. As such, the use, duplication, disclosure, modification, and adaptation shall be subject to the restrictions and license terms set forth in the applicable Government contract, and, to the extent applicable by the terms of the Government contract, the additional rights set forth in FAR 52.227-19, Commercial Computer Software License (December 2007). Oracle America, Inc., 500Oracle Parkway, Redwood City, CA 94065.

This software or hardware is developed for general use in a variety of information management applications. It is not developed or intended for use in any inherently dangerous applications, including applications which may create a risk of personal injury. If you use this software or hardware in dangerous applications, then you shall be responsible to take all appropriate fail-safe, backup, redundancy and other measures to ensure its safe use. Oracle Corporation and its affiliates disclaim any liability for any damages caused by use of this software or hardware in dangerous applications.

Oracle and Java are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

This software or hardware and documentation may provide access to or information on content, products and services from third parties. Oracle Corporation and its affiliates are not responsible for and expressly disclaim all warranties of any kind with respect to third party content, products and services. Oracle Corporation and its affiliates will not be responsible for any lost, costs, or damages incurred due to your access to or use of third party content, products or services.

# Table of Contents

---

Part 1: Understanding the Integration .....	5
Overview.....	6
Additional Resources .....	6
About the Integration Product.....	7
About the Products .....	7
Supported Business Processes.....	7
Understanding the Integration Processes .....	11
Technical Overview.....	11
Integration Points .....	11
Prerequisites .....	22
Part 2: Implementing the Integration Product.....	23
Configuring the Integration .....	24
Integration Configuration Checklist.....	24
Setting Up SAP for Meter Data Unification and Synchronization .....	25
Setting Up Oracle Utilities Meter Data Management Adapter for SAP Meter Data Unification and Synchronization .....	26
Setting Up Process Integration .....	50
Monitoring and Troubleshooting.....	74
Monitoring from SAP Customer Relations and Billing .....	74
Monitoring from Oracle Utilities Meter Data Management.....	74
Monitoring from the Integration.....	76
Troubleshooting .....	77
Customization Options .....	79
Extension Points .....	79
Custom Transformations.....	81
Appendix A: Data Mapping.....	85
Device Create .....	85
Device Change .....	90
Device Configuration Create.....	95
Device Configuration Change.....	102
Service Point Sync.....	108
Meter Registered Notification Sync .....	112

---

Profile Allocation Sync .....	113
Equipment Relationship Sync.....	117
Usage.....	120
Device Status Check.....	127
Device Remote Connect.....	133
Device Remote Disconnect .....	137
Appendix B: Cross References .....	142

# 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](#)

[About the Integration Product](#)

[Understanding the Integration Processes](#)

## Overview

This document provides configuration and administration information for the integration between Oracle Utilities Meter Data Management (MDM) and SAP for Meter Data Unification and Synchronization.

---

## Additional Resources

The following additional resources are available:

Resource	Location
Oracle Utilities Meter Data Management Integration to SAP for Meter Data Unification and Synchronization Release 11.1 Implementation Guide	Same folder as this document, with the distribution for this product.
Oracle Utilities Meter Data Management Installation Guide for Release v2.0.1.6	Refer to Oracle Utilities Meter Data Management installation documentation located on Oracle Software Delivery Cloud.
SAP for Utilities v6.0 EHP5	Refer to <a href="http://help.sap.com">http://help.sap.com</a> for additional information.

## About the Integration Product

This section provides general information about the functionality and processing of Oracle Utilities Meter Data Management Integration to SAP for Meter Data Unification and Synchronization Release 11.1 Media Pack. This is an Oracle AIA Direct Integration using Oracle SOA Suite and does not require the Oracle AIA Foundation Pack to be installed.

---

## About the Products

### 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 and other forms of usage calculations. This product has next generation packaged functionality, configurability for custom business rules, and high performance with large volumes of data from smart meters.

### SAP for Meter Data Unification and Synchronization

SAP for Utilities contains open, documented enterprise services for integration with Oracle Utilities Meter Data Management software vendors. The published interface for Meter Data Unification and Synchronization (MDUS) enables SAP systems to access usage data and Advanced Metering Infrastructure (AMI) capabilities from a unified Oracle Utilities Meter Data Management system that can interact with multiple different metering systems across the utility network. The initial release of this integration covers the primary data exchanges that are required for meter operations, billing, customer relations, and demand management.

---

## Supported Business Processes

Oracle Utilities Meter Data Management communicates with meter devices and processes the usage measurements collected from all meter devices. The SAP system notifies Oracle Utilities Meter Data Management of the device asset records and installation, removal, or exchange of smart meter devices.

Oracle Utilities Meter Data Management has advanced functionality to process usage information from smart meter devices and can respond to billing order requests from systems, such as SAP.

This integration consists of the following business processes:

**Create or Change Meter:** Once a meter, which is considered to be a smart-meter, is created or modified in the SAP system, this action will initiate the request for a smart meter to be created or modified in Oracle Utilities Meter Data Management. This creates or updates a record for the device itself, but does not include any configuration or measurement details. Once the record is processed successfully in Oracle Utilities Meter Data Management, the system sends a confirmation message back to SAP.

**Install Meter:** After a physical meter installation, the smart meter register configuration and location details are sent to Oracle Utilities Meter Data Management. The smart meter register creation results in a composite synchronization of the device configuration, measuring components and installation event. Meanwhile, the location details are used to synchronize the service point and initiate an activity to enable service through the device at the service point. Oracle Utilities Meter Data Management takes all steps to enable service by issuing AMI commands to get the status of the device connected, and once all of this processing is complete, the system initiates a smart meter registration activity, and this notification is sent to SAP.

**Smart Meter Equipment Relationship:** Other types of devices, such as breakers, transformers, or AMI communication modules, can be tracked and related to the meter device installation in SAP. The devices can be allocated to a meter or register in SAP. The integration to Oracle Utilities Meter Data Management updates the device installation event constant so that any factors that need to be applied to raw usage from the meter are known in order to calculate proper billing determinants.

**Remove Meter:** After a physical meter removal, the smart meter register changes are sent to Oracle Utilities Meter Data Management. When the change indicates a removal, the installation event for the meter is updated to process the removal and Oracle Utilities Meter Data Management sends a confirmation message back to SAP.

**Meter Exchange:** After a physical meter exchange, the smart meter changes are sent to Oracle Utilities Meter Data Management for both the old and new meter. The processing of these messages results in a combination of the removal of the old meter and updating of the installation event with the removal date, and then a configuration and installation of the new meter. If the prior meter installation involved a relationship to equipment, the same relationship is maintained with the same installation constant on the new meter installation event.

Oracle Utilities Meter Data Management also manages all steps to enable service for the new meter by issuing AMI commands to get the status of the device connected, and once all of this processing is complete, the system initiates a smart meter registration activity, and this notification is sent to SAP.

**Data Synchronization for Profile Allocation:** In SAP, smart meter registers that measure time series interval data are assigned to a profile. The profile to which a register is assigned in SAP is synchronized to Oracle Utilities Meter Data Management and the SAP profile id is captured as an identifier on the measuring component. Once this update is processed, a confirmation message is sent back to SAP.

**Billing (Time Series Calculations):** When a billing process runs in SAP, the system creates requests for time series calculations from the Oracle Utilities Meter Data Management system. These requests are sent in a bulk message from SAP and the calculations are done in the Oracle Utilities Meter Data Management system. The integration layer creates individual usage requests for each individual billing order in the bulk message, as well as a response activity that will later on collate the bulk response to SAP. Each of these usage transactions and the response activity captures the bulk message ID so that everything is linked together. There is a new usage transaction business object to capture additional input parameters that are supplied by SAP, and also to allow for an override usage group, which is dynamically determined. A new calculation algorithm looks for the override usage group on the requests from SAP rather than the usage group from the usage subscription. This is because the SAP system does not synchronize the type of bill determinants that is required for a given billing contract.

As part of the implementation of the Oracle Utilities Meter Data Management system to operate with SAP billing, a time of use (TOU) map template is configured to correspond with each TOU interface that is defined in the SAP system. To aid the user in configuration, the new TOU map template in Oracle Utilities Meter Data Management is designed to be set up in a similar way as the TOU interface in SAP. Each time slice in the SAP TOU interface requires a distinct TOU code in Oracle Utilities Meter Data Management. A formula in SAP can only be used by one TOU interface (to aid Oracle Utilities Meter Data Management in identifying the proper TOU map template to use). Finally, the activity response business object builds the bulk response from Oracle Utilities Meter Data Management to send back to complete the interface.

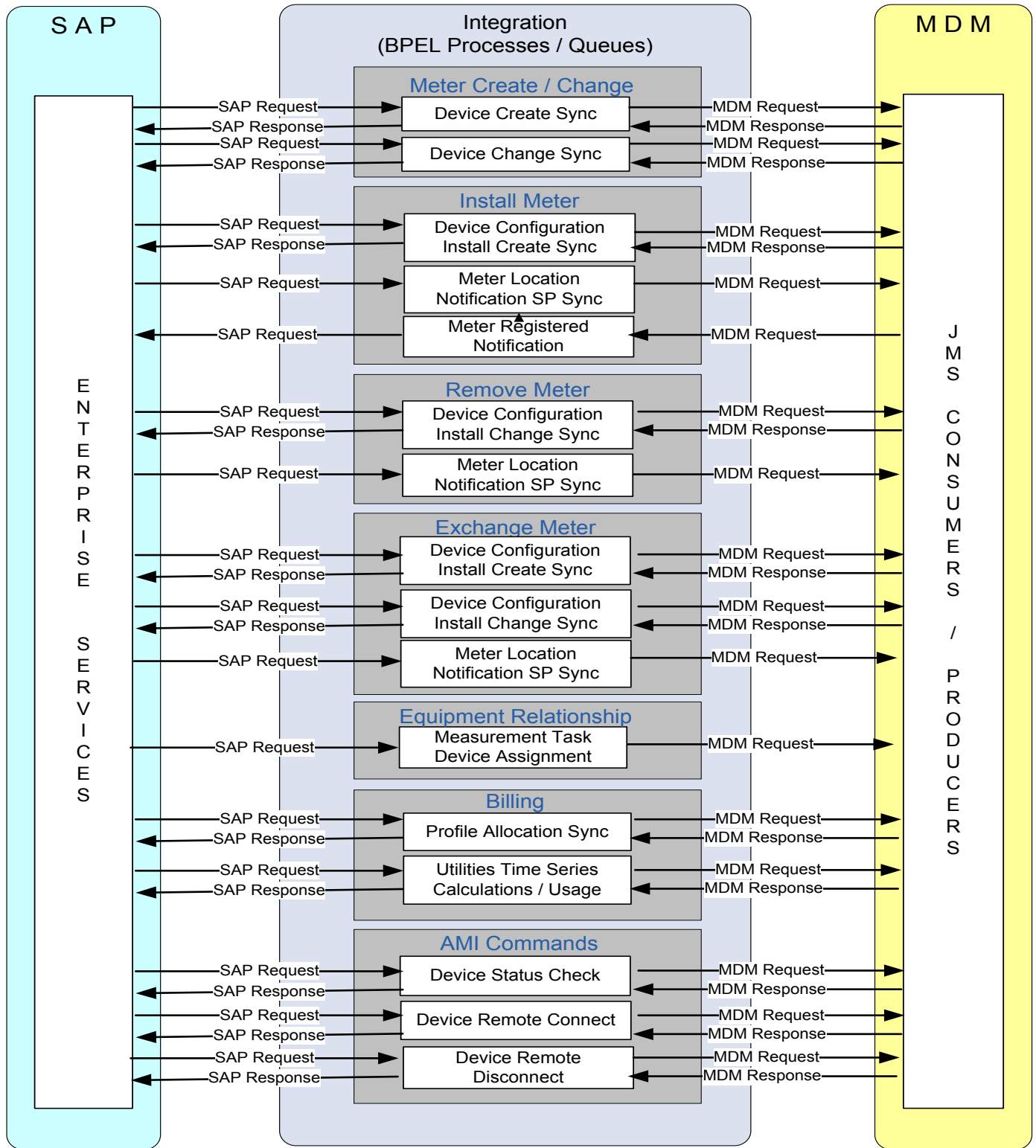


**Device Status Query:** The Oracle Utilities Meter Data Management system has a Smart Grid Gateway that provides standard interfaces to AMI vendor's software to operate with smart AMI meters. For meters that support electronic commands to check the current status of the device, a Smart Grid Gateway activity is available. This integration with SAP allows for a new inbound service to map to this standard type of activity.

**Remote Meter Connect Command:** The Oracle Utilities Smart Grid Gateway also provides standard activities to enable or disable service. The gateway can receive remote connect requests to enable service through standard interfaces and then manages the process to issue the appropriate commands to the AMI vendor's software and update the connection status of the device. Once this activity is complete, a confirmation message is sent back to SAP.

**Remote Meter Disconnect Command:** The Oracle Utilities Smart Grid Gateway also provides standard activities to enable or disable service. The gateway can receive remote disconnect requests to disable service through standard interfaces and then manages the process to issue the appropriate commands to the AMI vendor's software and update the connection status of the device. Once this activity is complete, a confirmation message is sent back to SAP.

The following diagram provides a visual representation of this processing:



## 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 Meter Data Management and SAP for Meter Data Unification and Synchronization.
- SAP Enterprise Web Services are used as the mode for communication between SAP and the Integration layer.
- The integration layer communicates with Oracle Utilities Meter Data Management using JMS queues.
- The integration processes are SOA composites using XSL transformations, JMS adapters, Webservices and Domain Value Maps (DVMs).
- All the end-to-end integration flows are asynchronous.

---

### Integration Points

The following integration points are available in Oracle Utilities Meter Data Management Integration to SAP for Meter data Unification and Synchronization Release 11.1 Media Pack.

---

### Master Data Synchronization Flows

#### Device Create/Change Sync Flow

##### Business Details

This is an SAP initiated flow, and Oracle Utilities Meter Data Management sends back the confirmation response. SAP sends a meter create and change message to Oracle Utilities Meter Data Management and the device gets created/updated in Oracle Utilities Meter Data Management. Oracle Utilities Meter Data Management then sends back the confirmation response to SAP.

##### Technical Details

This is an SAP initiated integration point with a single message. This integration flow accepts a meter create request and meter change request messages coming from SAP and sends a response confirmation back to SAP.

This flow has two request processes, one to handle meter create requests and another to handle meter change requests in addition to one response process to handle both meter create and change responses.

Both the device create request process and device change process writes to the same Oracle Utilities Meter Data Management queue (Device Sync Request Queue) since the same Oracle Utilities Meter Data Management process is used to handle both the create and change request messages.

### SOA Composites

Composite Name	Description
MDUSOUMDMDeviceCreateSyncReqEBF	Device Create Sync request composite BPEL process to transform incoming SAP meter create message to MDM format. After successful transformation, adds the transformed MDM message to the MDM request queue. The BPEL process includes transformations, extensions and error notifications.
MDUSOUMDMDeviceChangeSyncReqEBF	Device Change Sync request composite BPEL process to transform incoming SAP meter create message to MDM format. After successful transformation, adds the transformed MDM message to the MDM request queue. The BPEL process includes transformations, extensions and error notifications.
OUMDMMDUSDeviceSyncRespEBF	Device Sync response composite BPEL process to process both Device Create and Device Change Sync response messages. This process transforms the incoming response success or failure messages from MDM to the SAP format. The BPEL process includes transformations, extensions and error notifications. The messages are read from MDM response queue and sent to the SAP web service after transformation.

### JMS Queues

Queue Name	Description
MDUSDeviceSyncRequest	MDM Device Sync Request Used by integration to add transformed Device Sync request messages.
MDUSDeviceSyncRequestError	Error Queue for MDM Device Sync Request queue
MDUSDeviceSyncResponse	MDM Device Sync Response Used by Integration to read incoming Device Sync response messages from Oracle Utilities Meter Data Management.
MDUSDeviceSyncResponseError	Error Queue for MDM Device Sync response queue

## Device Configuration Create/Change and Install Sync

### Business Details

This is an SAP initiated flow and Oracle Utilities Meter Data Management sends back the confirmation response. SAP sends the meter register create and change messages to Oracle Utilities Meter Data Management and the device configuration, measuring components and install event get created/updated in Oracle Utilities Meter Data Management. Oracle Utilities Meter Data Management sends back the confirmation response to SAP.

### Technical Details

This is an SAP initiated integration point with a single message. This integration flow accepts the meter register create request and meter register change request messages coming from SAP and sends a response confirmation back to SAP.

This flow has two request processes (one to handle meter register create requests and another to handle meter register change requests) in addition to one response process to handle both meter register create and meter register change responses.

Both the device configuration install create request process and device configuration install change process will write to the same Oracle Utilities Meter Data Management queue (Device Register Install Sync Request Queue) since the same Oracle Utilities Meter Data Management process is used to handle both the create and change request messages.

The SAP meter register create service maps to the Oracle Utilities Meter Data Management device configuration install process which will create the device configuration, create the measuring components, and initiate the install event process.

The SAP meter register change service also maps to the Oracle Utilities Meter Data Management device configuration install process which will handle meter removal changes.

### SOA Composites

Composite Name	Description
MDUSOUMDMDeviceConfigInstallCreateSyncReqEBF	Device Configuration Install Create Sync request composite BPEL process to transform incoming SAP meter register create message to MDM format. After successful transformation, adds the transformed MDM message to the MDM request queue.  The BPEL process includes transformations, extensions and error notifications.
MDUSOUMDMDeviceConfigInstallChangeSyncReqEBF	Device Configuration Install Change Sync request composite BPEL process to transform incoming SAP meter change message to MDM format. After successful transformation, adds the transformed MDM message to the MDM request queue.  The BPEL process includes transformations, extensions and error notifications.
OUMDMMDUSDeviceConfigInstallSyncRespEBF	Device Configuration Install Sync response composite BPEL process which will process both Device Config Install Create and Device Config Install Change Sync response messages. This process transforms the incoming response

Composite Name	Description
	success or failure messages from MDM to the SAP format. The BPEL process includes transformations, extensions and error notifications. The messages will be read from MDM response queue and sent to SAP web service after transformation.

## JMS Queues

Queue Name	Description
MDUSDeviceConfigInstallSyncRequest	MDM Device Config Install Sync Request Used by integration to add transformed Device Config Install Sync request messages.
MDUSDeviceConfigInstallSyncRequestError	Error Queue for MDM Device Config Install Sync Request queue
MDUSDeviceConfigInstallSyncResponse	MDM Device Config Install Sync Response Used by Integration to read incoming Device Config Install Sync response messages from Oracle Utilities Meter Data Management.
MDUSDeviceConfigInstallSyncResponse Error	Error Queue for MDM Device Config Install Sync response queue

## Service Point Sync Flow

### Business Details

This is an SAP initiated integration point with a single message. This composite process is used to accept a meter location notification message sent by SAP.

### Technical Details

The SAP meter location service maps to the Oracle Utilities Meter Data Management service point sync process which updates the SP ID linked to the install event. This also initiates the meter registration activity in Oracle Utilities Meter Data Management if the related install event is still in its initial state (i.e., the particular meter location notification is associated with an install rather than a removal of a device). This is a one way flow and Oracle Utilities Meter Data Management will not send back a response to SAP.

## SOA Composites

Composite Name	Description
MDUSOUMDMInstallEventSPSyncReqEBF	Install Event SP Sync request composite BPEL process to transform incoming SAP message to MDM format. This BPEL process adds the incoming message to the MDM request queue after successful transformation. The BPEL process includes transformations, extensions and error notifications.

### JMS Queues

Queue Name	Description
MDUSInstallEventSPSyncRequest	MDM Install Event SP Sync Request Used by integration to add transformed Meter Location request messages.
MDUSInstallEventSPRequestError	Error Queue for MDM Install Event SP Sync Request queue

## Meter Registered Notification Sync Flow

### Business Details

This is an Oracle Utilities Meter Data Management initiated integration point with a single message. When the enable service activity in Oracle Utilities Meter Data Management is completed, it adds the meter registered notification request message to the meter registered notification request queue to send out to SAP.

### Technical Details

This is a one way Oracle Utilities Meter Data Management initiated flow and there is no response from SAP.

### SOA Composites

Composite Name	Description
OUMDMMDUSMeterRegisteredNotificationReqEBF	Meter Registered Notification request composite BPEL process to transform incoming MDM message to SAP format. This BPEL process will read message from the MDM queue and invoke SAP web service after successful transformation. The BPEL process will include transformations, extensions and error notifications.

### JMS Queues

Queue Name	Description
MDUSMeterRegisteredNotificationRequest	MDM Meter Registered Notification Request Used by Oracle Utilities Meter Data Management to add Meter Registered Notification request messages. Integration reads the message and invokes the SAP service.
MDUSMeterRegisteredNotificationRequestError	Error Queue for MDM Meter Registered Notification Request queue

## Profile Allocation Sync Flow

### Business Details

This is an SAP initiated integration point with a single message. This process uses the Utilities Time Series ERP Measurement Task Assignment Change Request message sent by SAP.

In SAP, registers are assigned to a profile. The profile to which a register is assigned will be captured in Oracle Utilities Meter Data Management as an identifier on the measuring component.

### Technical Details

Integration layer maps the SAP message Utilities Time Series ERP Measurement Task Assignment Change Request to the MDM message profile allocation activity.

For the response, the integration layer maps the MDM profile allocation activity message to the Utilities Time Series ERP Measurement Task Assignment Change Confirmation.

### SOA Composites

Composite Name	Description
MDUSProfileAllocationSyncReqJMSProducer	MDM Profile Allocation Sync JMS Producer. Used in the request process.
MDUSProfileAllocationSyncRespJMSConsumer	MDM Profile Allocation Sync JMS Consumer. Used in the response process.

### JMS Queues

Queue Name	Description
MDUSProfileAllocationSyncRequest	MDM Profile Allocation Sync Request Used by integration to add transformed Profile allocation request messages.
MDUSProfileAllocationRequestError	Error Queue for MDM Profile Allocation Sync Request queue
MDUSProfileAllocationSyncResponse	MDM Profile Allocation Sync response Used by integration to add read Profile allocation response messages.
MDUSProfileAllocationSyncResponseError	Error Queue for MDM Profile Allocation Sync Response queue



## Equipment Relationship Sync Flow

### Business Details

This is a one way flow initiated by SAP. Equipment relationships will not be modeled in Oracle Utilities Meter Data Management, but the installation constant in the message needs to be stored on the install event.

### Technical Details

This is a one way flow invoked by Oracle Utilities Meter Data Management. Integration layer maps Smart Meter Utilities Measurement Task Device Assignment Notification to the measurement task device assignment activity (for the installation constant). It is assumed that only one value for the installation factor is sent in a message.

Integration layer maps the SAP message Utilities Time Series ERP Measurement Task Assignment Change Request to the MDM message Measurement Task Device Assignment Activity.

### SOA Composites

Composite Name	Description
MDUSOUMDEquipmentRelSyncReqEBF	Equipment Relationship Sync request composite BPEL process to transform incoming SAP message to the MDM format. This BPEL process adds the incoming message to the MDM request queue after successful transformation. The BPEL process includes transformations, extensions and error notifications.
MDUSOUMDEquipmentRelSyncReqEBF	Equipment Relationship Sync request composite BPEL process to transform incoming SAP message to the MDM format. This BPEL process adds the incoming message to the MDM request queue after successful transformation. The BPEL process includes transformations, extensions and error notifications.

### JMS Queues

Queue Name	Description
MDUSEquipmentRelSyncRequest	MDM Equipment Relationship Sync Request Used by integration to add transformed Equipment Relationship request messages.
MDUSEquipmentRelRequestError	Error Queue for MDM Equipment Relationship Sync Request queue

## Usage Related Flows

### Usage Flow

#### Business Details

This is an SAP initiated integration point with a bulk message. This process uses the Utilities Time Series Calculation Creation Bulk Request message sent by SAP.

#### Technical Details

Integration layer maps the SAP message Utilities Time Series Calculation Creation as Bulk Request to the MDM message Usage Transaction Business Object.

Integration breaks the list of Utilities Times Series Calculation requests into individual usage request messages sent to Oracle Utilities Meter Data Management.

For the response, the integration layer can map the MDM usage response message to the SAP Utilities Time Series Calculation Creation Confirmation as Bulk message. The collation of the usage response messages is done by Oracle Utilities Meter Data Management.

#### SOA Composites

Composite Name	Description
MDUSOUMDMBulkUsageReqEBF	<p>Bulk Usage request composite</p> <p>BPEL process to transform incoming SAP message to MDM format.</p> <p>This BPEL process adds the incoming message to the MDM request queue after successful transformation. The BPEL process will include transformations, extensions and error notifications. This process will pick up the Bulk Usage request message, split the message into individual Usage requests and write them to the Usage request queue. At the end this process will write the Bulk Confirmation Activity request message to the Usage Response queue.</p>
OUMDMMDUSBulkUsageRespEBF	<p>Bulk Usage response composite</p> <p>BPEL process to transform incoming MDM message to the SAP message format.</p> <p>This BPEL process reads a message from the MDM response queue and invokes the SAP confirmation web service. The BPEL process includes transformations, extensions and error notifications.</p>

#### JMS Queues

Queue Name	Description
MDUSUsageRequest	<p>MDM Usage Request</p> <p>Used by integration to add transformed Usage request messages.</p>

Queue Name	Description
MDUSUsageRequestError	Error Queue for MDM Usage Request queue
MDUSBulkUsageResponse	MDM Bulk Usage response Used by integration to read Bulk Usage Response process
MDUSBulkUsageResponseError	Error Queue for MDM Bulk Usage Response queue

---

## AMI Commands Related Flows

### Device Status Check Flow

#### Business Details

This is an SAP initiated integration point with a single message. This process uses the Utilities Device ERP Smart Meter Operational State by ID Query Request message sent by SAP.

#### Technical Details

Integration layer maps the SAP message Utilities Device ERP Smart Meter Operational State by ID Query Request to the MDM message Device Status Check Activity.

For the response Integration layer can map the MDM Device Status Check Activity response message to Utilities Device ERP Smart Meter Operational State by ID Query Confirmation.

#### SOA Composites

Composite Name	Description
MDUSOUMDMDeviceStatusCheckReqEBF	Device Status Check request composite BPEL process to transform the incoming message to MDM format. This BPEL process adds the incoming message to the MDM request queue after successful transformation. The BPEL process includes transformations, extensions and error notifications.
OUMDMMDUSDeviceStatusCheckRespEBF	Device Status Check response composite BPEL process to transform incoming MDM message to the SAP message format. This BPEL process reads the message from the MDM response queue and invokes the SAP confirmation web service. The BPEL process will include transformations, extensions and error notifications.

## JMS Queues

Queue Name	Description
MDUSDeviceStatusCheckRequest	MDM Device Status Check Request Used by integration to add transformed Device status check request messages.
MDUSDeviceStatusCheckRequestError	Error Queue for MDM Device Status Check Request queue
MDUSDeviceStatusCheckResponse	MDM Device Status Check response Used by integration to add Device status check response messages.
MDUSDeviceStatusCheckResponseError	Error Queue for MDM Device Status Check Response queue

## Device Remote Connect Flow

### Business Details

This is an SAP initiated integration point with a single message. This process uses the SAP Smart Meter Utilities Connection Status Change Request ERP Create Request message sent by SAP.

### Technical Details

Integration layer maps the SAP message SAP Smart Meter Utilities Connection Status Change Request ERP Create Request to the Oracle Utilities Meter Data Management message for a device remote connect activity.

For the response, the integration layer maps the Oracle Utilities Meter Data Management device remote connect activity response message to SAP Smart Meter Utilities Connection Status Change Request ERP Create Confirmation.

## SOA Composites

Composite Name	Description
MDUSOUMDMDeviceRemoteConnectionReqEBF	Composite name for the request process which will contain the Mediator to route the request and the Remote connect and Remote disconnect BPEL components.
MDUSOUMDMDeviceStatusChangeInterface	This process is used to determine if the Device Connect or Disconnect process needs to be invoked. If UtilitiesConnectionStatusChangeRequest--> CategoryCode in the SAP request is 2 then the XAI service for Remote Connect will be used in MDM. If UtilitiesConnectionStatusChangeRequest--> CategoryCode in the SAP request is 1 then the XAI service for Remote Disconnect will be used in MDM. This is a Mediator service and routes the message to the appropriate BPEL component.
MDUSOUMDMDeviceRemoteConnectReqEBF	Device Remote Connect BPEL component composite BPEL process to transform incoming SAP message to MDM format.

Composite Name	Description
	This BPEL process adds the incoming message to the MDM request queue after successful transformation. The BPEL process includes transformations, extensions and error notifications.
OUMDMMDUSDeviceRemoteConnectRespEBF	Device Remote Connect response composite BPEL process to transform incoming MDM message to SAP message format. This BPEL process reads the message from the MDM response queue and invokes the SAP confirmation web service. The BPEL process includes transformations, extensions and error notifications.

## JMS Queues

Queue Name	Description
MDUSDeviceRemoteConnectRequest	MDM Device Remote Connect Request Used by integration to add transformed Device Remote Connect request messages.
MDUSDeviceRemoteConnectRequestError	Error Queue for MDM Device Remote Connect Request queue
MDUSDeviceRemoteConnectResponse	MDM Device Remote Connect response Used by integration to add Device Remote Connect response messages.
MDUSDeviceRemoteConnectResponseError	Error Queue for MDM Device Remote Connect Response queue

## Device Remote Disconnect Flow

### Business Details

This is an SAP initiated integration point with a single message. This process uses the Smart Meter Utilities Connection Status Change Request ERP Create Request message sent by SAP.

### Technical Details

Integration layer maps the SAP message Smart Meter Utilities Connection Status Change Request ERP Create Request to the MDM message for a device remote disconnect activity.

For the response, the integration layer maps the MDM device remote disconnect activity response message to the SAP Smart Meter Utilities Connection Status Change Request ERP Create Confirmation.

### SOA Composites

Composite Name	Description
MDUSOUMDMDeviceRemoteConnectionReqEBF	Composite name for the request process which contains the Mediator to route the request and the Remote connect and Remote disconnect BPEL components.
MDUSOUMDMDeviceStatusChangeInterface	This process is used to determine if the Device Connect or Disconnect process needs to be invoked. If UtilitiesConnectionStatusChangeRequest --> CategoryCode in

Composite Name	Description
	<p>the SAP request is 2 then the XAI service for Remote Connect will be used in MDM. If UtilitiesConnectionStatusChangeRequest --&gt; CategoryCode in the SAP request is 1 then the XAI service for Remote Disconnect will be used in MDM.</p> <p>This is a Mediator service and routes the message to the appropriate BPEL component.</p>
MDUSOUMDMDeviceRemoteDisconnectReqEBF	<p>Device Remote Disconnect request BPEL component</p> <p>BPEL process to transform the incoming SAP message to the MDM format.</p> <p>This BPEL process adds the incoming message to the MDM request queue after successful transformation. The BPEL process includes transformations, extensions and error notifications.</p>
OUMDMMDUSDeviceRemoteDisconnectRespEBF	<p>Device Remote Disconnect response composite</p> <p>BPEL process to transform incoming MDM message to the SAP message format.</p> <p>This BPEL process will read message from the MDM response queue and invoke the SAP confirmation web service. The BPEL process will include transformations, extensions and error notifications.</p>

## JMS Queues

Queue Name	Description
MDUSDeviceRemoteDisconnectRequest	<p>MDM Device Remote Disconnect Request</p> <p>Used by integration to add transformed Device Remote Disconnect request messages.</p>
MDUSDeviceRemoteDisconnectRequestError	<p>Error Queue for MDM Device Remote Disconnect Request queue</p>
MDUSDeviceRemoteDisconnectResponse	<p>MDM Device Remote Disconnect response</p> <p>Used by integration to add Device Remote Disconnect response messages.</p>
MDUSDeviceRemoteDisconnectResponseError	<p>Error Queue for MDM Device Remote Disconnect Response queue</p>

## Prerequisites

All participating applications: SAP v6.0 EHP5, 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](#)

[Monitoring and Troubleshooting](#)

[Customization Options](#)

[Appendix A: Data Mapping](#)

[Appendix B: Cross References](#)

## Configuring the Integration

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

- Integration Configuration Checklist
- Setting Up SAP for Meter Data Unification and Synchronization
- Setting Up Oracle Utilities Meter Data Management Adapter for SAP Meter Data Unification and Synchronization
- Setting Up Process Integration

---

### Integration Configuration Checklist

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

---

### SAP for Meter Data Unification and Synchronization Configuration

Refer to the Supplemental Implementation Guide on Configuring SAP for the Oracle Utilities Meter Data Management to SAP for Meter Data Unification and Synchronization Integration solution document. Contact Oracle customer support for more information.

---

### Oracle Utilities Meter Data Management Configuration

Task	Description
<b>Admin Data Setup</b>	
<a href="#">Admin Data Setup</a>	Admin tables that are essential to the integration include 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.
<b>System Data Setup</b>	
<a href="#">Sync Busines Objects</a>	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 the external system.
<a href="#">Extendable Lookups</a>	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.



Task	Description
<a href="#">Lookup Field</a>	Configure the required values for this lookup field.
<a href="#">Batch Scheduling</a>	Note the batch jobs involved in the sync, remote commands processing, and billing processes and ensure that these are incorporated in your scheduler accordingly.
<b>JMS Configuration</b>	
<a href="#">JMS Setup</a>	Configure the JMS to receive JMS messages from the integration layer.
<b>XAI Configuration</b>	
<a href="#">XAI Setup</a>	Configure JNDI server, JMS connection and queue, XAI sender, outbound message types and external systems for the integration.

---

## Integration Product Configuration

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

---

## Setting Up SAP for Meter Data Unification and Synchronization

**For more information** on configuring the SAP system, refer to the Supplemental Implementation Guide on Configuring SAP for the Oracle Utilities Meter Data Management to SAP for Meter Data Unification and Synchronization Integration solution document. Contact Oracle customer support for more information.

## Setting Up Oracle Utilities Meter Data Management Adapter for SAP Meter Data Unification and Synchronization

A BPA script is 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. This script is intended to be executed only once prior to any customizations being made to any of the sync objects:

- DX-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 Business Object to instantiate. The information is keyed to external system, Maintenance Object, 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	MDUS_Country

### Service Point Type

Create the required default SP Type to use for device installations.

Navigation	Guideline	Corresponding DVM
Admin Menu > Service Point Type	Create default SP Type	NA

### Usage Subscription Type

Create the required default US Type to use for device installations.

Navigation	Guideline	Corresponding DVM
Admin Menu > Usage Subscription Type	Create default US Type. Specify the default SP Type as valid for this US Type.	NA

### 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	MDUS_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	MDUS_Manufacturer
	Create Model codes	NA

## Device Configuration Type

Create the required Device Configuration Types.

Navigation	Guideline	Corresponding DVM
Admin Menu > Device Configuration Type	Create Device Configuration Types. Only one valid device configuration type is expected for each device type. The value that maps to the device type needs to also represent the device configuration type since SAP does not have this object represented.	NA

## Measuring Component Type

Create the required Measuring Component Types.

Navigation	Guideline	Corresponding DVM
Admin Menu > Measuring Component Type	Create Measuring Component Types. MC Types are matched based on the consumptive/subtractive flag and the interval size (the interval/scalar flag is assumed to be interval if the interval size is populated). The UOM/TOU are further matched against the measurement in the MC Type ('D1MS'). Matching of MC Types is narrowed down to those MC Types that are valid for the device config type (see above).	NA

## 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	NA

## 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.	MDUS_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	MDUS_TOU

## TOU Map Template

Define the Time of Use map template. The dates and time ranges here must match the TOU Interface values used in SAP.

Navigation	Guideline	Corresponding DVM
Admin Menu > TOU Map Template	Define time of use map template date and time ranges	NA

## TOU Map Type

Define the Time of Use map type to be used in generating the TOU map.

Navigation	Guideline	Corresponding DVM
Admin Menu > TOU Map Type	Define time of use map type	NA

## Service Quantity Identifier

Define the SQI 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	NA

## Service Provider (Usage Recipient)

Create a service provider that references the external system for SAP.

In order to create usage transactions (and calculate bill determinants) based on usage requests from SAP, add this processing method:

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

In order to send usage (bill determinants) related information back to SAP, 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>

Navigation	Guideline	Corresponding DVM
Admin Menu > Service Provider	Define service provider record. Specify the service provider in the MDUS master configuration record.	MDUS_Sender (used only for mapping to Requester ID in the AMI commands)

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

## Usage Group

Define the Usage Groups to be used by any usage rule or usage rule combination.

Navigation	Guideline	Corresponding DVM
Admin Menu > Usage Group	Define usage groups	NA

## Usage Rule

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

Navigation	Guideline	Corresponding DVM
Admin Menu > Usage Rule	Define the usage rule. Only usage rules that reference a TOU Map are currently supported.	MDUS_UsageRule

## Time Zone

Define the Time Zone. The Time Zone code defined here must exactly match values in the DVM indicated.

Navigation	Guideline	Corresponding DVM
Admin Menu > Time Zone	Define Time zones	MDUS_TimeZone

## External System

Define the External System. The External system code defined here must exactly match values in the DVM indicated.

Navigation	Guideline	Corresponding DVM
Admin Menu > External System	Define External system	MDUS_ExternalSystem

## Master Configuration

Three master configurations (Master Data Synchronization Configuration, Seeder Sync Request Master Configuration, and MDUS Master Configuration) need to be completed. A BPA script is provided to pre-populate the first two with the information necessary to support the base objects included in the sync. Run DX-PopMstCfg to accomplish this. The third one captures the service provider and outbound message type information that is used by the billing process to send the bulk response to SAP.

## Configure System Data Tables

### Business Objects

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

Business Object	Description
DX-OngoingSyncRequestDevice, DX-OngoingSyncRequestIE, D1-OngoingSyncRequestDC, D1-OngoingSyncRequestMC, DX-OngoingSyncRequestSP, DX-CompositeSyncRequestDCI	<p>These business objects define the behavior of the ongoing sync requests. The 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 DX-DataSyncConfirmationMsg 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 Install Event, Device Configuration and Measuring Component, but does have to be configured on the Composite Sync Request for Device Configuration Install.)</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.</p>

Business Object	Description
DX-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"> <li>• Create a service provider that references the usage subscriber's external system (for example. MDUS – External system for MDUS integration).</li> <li>• 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 DX-UsageTransaction as the default processing method.</li> </ul> <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"> <li>• Processing Role: Usage Transaction Notification - Online, Business Object: How To Send US Related Information, Default Processing Method Outbound Message Type: &lt;outbound message for usage transaction response for an online usage request&gt;</li> <li>• Processing Role: Usage Transaction Notification - Batch, Business Object: How To Send US Related Information, Default Processing Method Outbound Message Type: &lt;outbound message for usage transaction response for a batch usage request&gt;</li> <li>• Processing Role: Usage Transaction Error Notification - Online, Business Object: How To Send US Related Information, Default Processing Method Outbound Message Type: &lt;outbound message for usage transaction error response for an online usage request&gt;</li> <li>• Processing Role: Usage Transaction Error Notification - Batch, Business Object: How To Send US Related Information, Default Processing Method Outbound Message Type: &lt;outbound message for usage transaction error response for a batch usage request&gt;</li> <li>• Processing Role: Usage Transaction Subsequent Correction Notification - Batch, Business Object: How To Send US Related Information, Default Processing Method Outbound Message Type: &lt;outbound message for usage transaction subsequent correction notification&gt;</li> </ul>

**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.

## Extendable Lookups

The following extendable lookups do not to be configured but are included here to highlight their corresponding DVMs:

- D1-DvcConnectionStatLookup – MDUS\_DeviceConnectionStatus
- D1-DvcCommunicationStatLookup – MDUS\_DeviceCommunicationStatus
- D1-DvcFunctionalStateLookup – MDUS\_DeviceFunctionalState



## Lookups

The following lookups do not to be configured but are included here to highlight their corresponding DVMs:

- CONSUMPTIVE\_SUBTRACTIVE\_FLG – MDUS\_ConsumptiveSubtractive
- MSR\_PEAK\_QTY\_FLG – MDUS\_PeakQuantity

## 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 splits the composite sync request for device configuration into its constituent MO-based sync requests for device configuration and measuring components.
D1-SIOPE	This is the batch process to transition ongoing sync request out of the <b>PENDING</b> 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 <b>ERROR</b> state.

The following batch processes are used for usage transaction processing

Batch Code	Description
DX-UTCD	This is the batch process to transition usage transactions out of the <b>Calculation Deferred</b> state. Usage transactions created as a result of batch billing initiated usage requests stop in the Calculation Deferred state. Run this batch process to proceed with the calculation.
DX-UTID	This is the batch process to transition usage transactions out of the <b>Issue Detected</b> state. Usage transactions that encounter issues during calculation stop in the Issue Detected state. Run this batch process to retry calculation.
DX-VALER	This is the batch process to transition usage transactions out of the <b>Validation Error</b> state. Usage transactions that encounter issues during Validation state, where the inbound request is processed into a form that is usable in MDM, stop in the Issue Validation Error state. Run this batch process to reprocess the record.

The following batch processes are used for remote commands processing:

Batch Code	Description
D1-CRWT	This is the batch process to transition remote connect/disconnect requests out of the <b>Communication in Progress</b> state. It is also used to transition remote connects from the <b>Waiting for Measurement</b> state. Run this batch process to proceed with the processing.

Batch Code	Description
D1-CRERR	This is the batch process to transition remote command requests out of the <b>Validation Error</b> , <b>Communication Error</b> , and <b>Completion Events Error</b> states. It is also used to transition remote connects and disconnects out of the <b>Wait Expired</b> state. Run this batch process to reprocess the request.

## JMS Configuration

This section describes the JMS configuration to be done in the Oracle Utilities Meter Data Management Adapter for SAP Meter Data Unification and Synchronization 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 Adapter for SAP Meter Data Unification and Synchronization WebLogic server login 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: `MDMIntegrationModule`

### 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: `MDUSForeignServer`
  - **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.

#### Device Create/Change Sync

Destination Name	Local JNDI Name	Remote JNDI Name
MDUSDeviceSyncRequest	jms/LocalMDUSDeviceSyncRequest	jms/MDUSDeviceSyncRequest

#### Device Config Create/Change Sync

Destination Name	Local JNDI Name	Remote JNDI Name
MDUSDeviceConfigInstallSyncRequest	jms/LocalMDUSDeviceConfigInstallSyncRequest	jms/MDUSDeviceConfigInstallSyncRequest

#### Install Event SP Sync

Destination Name	Local JNDI Name	Remote JNDI Name
MDUSInstallEventSPSyncRequest	jms/LocalMDUSInstallEventSPSyncRequest	jms/MDUSInstallEventSPSyncRequest

#### Profile Allocation Sync

Destination Name	Local JNDI Name	Remote JNDI Name
MDUSProfileAllocationSyncRequest	jms/LocalMDUSProfileAllocationSyncRequest	jms/MDUSProfileAllocationSyncRequest

#### Equipment Relationship Sync

Destination Name	Local JNDI Name	Remote JNDI Name
MDUSEquipmentRelSyncRequest	jms/LocalMDUSEquipmentRelSyncRequest	jms/MDUSEquipmentRelSyncRequest

#### Usage Request

Destination Name	Local JNDI Name	Remote JNDI Name
MDUSUsageRequest	jms/LocalMDUSUsageRequest	jms/MDUSUsageRequest

#### Device Status Check

Destination Name	Local JNDI Name	Remote JNDI Name
MDUSDeviceStatusCheckRequest	jms/LocalMDUSDeviceStatusCheckRequest	jms/MDUSDeviceStatusCheckRequest

#### Device Remote Connect

Destination Name	Local JNDI Name	Remote JNDI Name
MDUSDeviceRemoteConnectRequest	jms/LocalMDUSDeviceRemoteConnectRequest	jms/MDUSDeviceRemoteConnectRequest

#### Device Remote Disconnect

Destination Name	Local JNDI Name	Remote JNDI Name
MDUSDeviceRemoteDisconnectRequest	jms/LocalMDUSDeviceRemoteDisconnectRequest	jms/MDUSDeviceRemoteDisconnectRequest

#### 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
MDUSConnectionFactory	jms/LocalMDUSConnectionFactory	jms/MDUSConnectionFactory

## 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:** The released MDM product will have the Message Driven Beans configuration already built in. The following steps should be followed to configure the Message Driven Beans manually.

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 initialSetup.sh (Unix) or initialSetup.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:

```
<!--Device Create/Change Sync Integration Point -->
  <message-driven>
    <description>MDB for MDUSDeviceSyncRequest</description>
    <display-name>MDUSDeviceSyncRequest</display-name>
    <ejb-name>MDUSDeviceSyncRequest</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>

  <!--Device Config Create/Change Sync Integration Point -->
  <message-driven>
    <description>MDB for
MDUSDeviceConfigInstallSyncRequest</description>
    <display-name>MDUSDeviceConfigInstallSyncRequest</display-
name>
    <ejb-name>MDUSDeviceConfigInstallSyncRequest</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>

  <!--Install Event SP Sync Integration Point -->
  <message-driven>
    <description>MDB for
MDUSInstallEventSPSyncRequest</description>
    <display-name>MDUSInstallEventSPSyncRequest</display-name>
    <ejb-name>MDUSInstallEventSPSyncRequest</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>

  <!--Profile Allocation Sync Integration Point -->
  <message-driven>
    <description>MDB for
MDUSProfileAllocationSyncRequest</description>
    <display-name>MDUSProfileAllocationSyncRequest</display-
name>
    <ejb-name>MDUSProfileAllocationSyncRequest</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>

  <!--Equipment Relationship Sync Integration Point -->
```

```
<message-driven>
  <description>MDB for
MDUSEquipmentRelSyncRequest</description>
  <display-name>MDUSEquipmentRelSyncRequest</display-name>
  <ejb-name>MDUSEquipmentRelSyncRequest</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>

<!--Usage Request Integration Point -->
<message-driven>
  <description>MDB for MDUSUsageRequest</description>
  <display-name>MDUSUsageRequest</display-name>
  <ejb-name>MDUSUsageRequest</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>

<!--Device Status Check Integration Point -->
<message-driven>
  <description>MDB for
MDUSDeviceStatusCheckRequest</description>
  <display-name>MDUSDeviceStatusCheckRequest</display-name>
  <ejb-name>MDUSDeviceStatusCheckRequest</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>

<!--Device Remote Connect Integration Point -->
<message-driven>
  <description>MDB for
MDUSDeviceRemoteConnectRequest</description>
  <display-name>MDUSDeviceRemoteConnectRequest</display-name>
  <ejb-name>MDUSDeviceRemoteConnectRequest</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>

<!--Device Remote Disconnect Integration Point -->
<message-driven>
  <description>MDB for
MDUSDeviceRemoteDisconnectRequest</description>
  <display-name>MDUSDeviceRemoteDisconnectRequest</display-
name>
  <ejb-name>MDUSDeviceRemoteDisconnectRequest</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:**

```
<!--Device Create/Change Sync Integration Point -->
<container-transaction>
  <method>
    <ejb-name>MDUSDeviceSyncRequest</ejb-name>
    <method-name>onMessage</method-name>
  </method>
  <trans-attribute>NotSupported</trans-attribute>
</container-transaction>

<!--Device Config Create/Change Sync Integration Point -->
<container-transaction>
  <method>
    <ejb-name>MDUSDeviceConfigInstallSyncRequest</ejb-name>
    <method-name>onMessage</method-name>
  </method>
  <trans-attribute>NotSupported</trans-attribute>
</container-transaction>

<!--Install Event SP Sync Integration Point -->
<container-transaction>
  <method>
    <ejb-name>MDUSInstallEventSPSyncRequest</ejb-name>
    <method-name>onMessage</method-name>
  </method>
  <trans-attribute>NotSupported</trans-attribute>
</container-transaction>

<!--Profile Allocation Sync Integration Point -->
<container-transaction>
  <method>
    <ejb-name>MDUSProfileAllocationSyncRequest</ejb-name>
    <method-name>onMessage</method-name>
  </method>
  <trans-attribute>NotSupported</trans-attribute>
</container-transaction>

<!--Equipment Relationship Sync Integration Point -->
<container-transaction>
  <method>
    <ejb-name>MDUSEquipmentRelSyncRequest</ejb-name>
    <method-name>onMessage</method-name>
  </method>
  <trans-attribute>NotSupported</trans-attribute>
</container-transaction>

<!--Usage Request Integration Point -->
<container-transaction>
  <method>
    <ejb-name>MDUSUsageRequest</ejb-name>
    <method-name>onMessage</method-name>
  </method>
  <trans-attribute>NotSupported</trans-attribute>
</container-transaction>

<!--Device Status Check Integration Point -->
<container-transaction>
  <method>
    <ejb-name>MDUSDeviceStatusCheckRequest</ejb-name>
    <method-name>onMessage</method-name>
  </method>
```



```

        <trans-attribute>NotSupported</trans-attribute>
    </container-transaction>

    <!--Device Remote Connect Integration Point -->
    <container-transaction>
        <method>
            <ejb-name>MDUSDeviceRemoteConnectRequest</ejb-name>
            <method-name>onMessage</method-name>
        </method>
        <trans-attribute>NotSupported</trans-attribute>
    </container-transaction>

    <!--Device Remote Disconnect Integration Point -->
    <container-transaction>
        <method>
            <ejb-name>MDUSDeviceRemoteDisconnectRequest</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:

```

    <!--Device Create/Change Sync Integration Point -->
    <weblogic-enterprise-bean>
        <ejb-name>MDUSDeviceSyncRequest</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/LocalMDUSDeviceSyncRequest</destination-jndi-name>
            <connection-factory-jndi-
name>jms/LocalMDUSConnectionFactory</connection-factory-jndi-name>
            </message-driven-descriptor>
        </weblogic-enterprise-bean>

    <!--Device Config Create/Change Sync Integration Point -->
    <weblogic-enterprise-bean>
        <ejb-name>MDUSDeviceConfigInstallSyncRequest</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/LocalMDUSDeviceConfigInstallSyncRequest</destination-jndi-name>
            <connection-factory-jndi-
name>jms/LocalMDUSConnectionFactory</connection-factory-jndi-name>
            </message-driven-descriptor>
        </weblogic-enterprise-bean>

```

```
        </pool>
        <destination-jndi-
name>jms/LocalMDUSDeviceConfigInstallSyncRequest</destination-jndi-
name>
        <connection-factory-jndi-
name>jms/LocalMDUSConnectionFactory</connection-factory-jndi-name>
        </message-driven-descriptor>
    </weblogic-enterprise-bean>

    <!--Install Event SP Sync Integration Point -->
    <weblogic-enterprise-bean>
        <ejb-name>MDUSInstallEventSPSyncRequest</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/LocalMDUSInstallEventSPSyncRequest</destination-jndi-name>
        <connection-factory-jndi-
name>jms/LocalMDUSConnectionFactory</connection-factory-jndi-name>
        </message-driven-descriptor>
    </weblogic-enterprise-bean>

    <!--Profile Allocation Sync Integration Point -->
    <weblogic-enterprise-bean>
        <ejb-name>MDUSProfileAllocationSyncRequest</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/LocalMDUSProfileAllocationSyncRequest</destination-jndi-
name>
        <connection-factory-jndi-
name>jms/LocalMDUSConnectionFactory</connection-factory-jndi-name>
        </message-driven-descriptor>
    </weblogic-enterprise-bean>

    <!--Equipment Relationship Sync Integration Point -->
    <weblogic-enterprise-bean>
        <ejb-name>MDUSEquipmentRelSyncRequest</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/LocalMDUSEquipmentRelSyncRequest</destination-jndi-name>
        <connection-factory-jndi-
name>jms/LocalMDUSConnectionFactory</connection-factory-jndi-name>
        </message-driven-descriptor>
    </weblogic-enterprise-bean>

    <!--Usage Request Integration Point -->
    <weblogic-enterprise-bean>
        <ejb-name>MDUSUsageRequest</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/LocalMDUSUsageRequest</destination-jndi-name>
    <connection-factory-jndi-
name>jms/LocalMDUSConnectionFactory</connection-factory-jndi-name>
    </message-driven-descriptor>
</weblogic-enterprise-bean>

<!--Device Status Check Integration Point -->
<weblogic-enterprise-bean>
    <ejb-name>MDUSDeviceStatusCheckRequest</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/LocalMDUSDeviceStatusCheckRequest</destination-jndi-name>
    <connection-factory-jndi-
name>jms/LocalMDUSConnectionFactory</connection-factory-jndi-name>
    </message-driven-descriptor>
</weblogic-enterprise-bean>

<!--Device Remote Connect Integration Point -->
<weblogic-enterprise-bean>
    <ejb-name>MDUSDeviceRemoteConnectRequest</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/LocalMDUSDeviceRemoteConnectRequest</destination-jndi-name>
    <connection-factory-jndi-
name>jms/LocalMDUSConnectionFactory</connection-factory-jndi-name>
    </message-driven-descriptor>
</weblogic-enterprise-bean>

<!--Device Remote Disconnect Integration Point -->
<weblogic-enterprise-bean>
    <ejb-name>MDUSDeviceRemoteDisconnectRequest</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/LocalMDUSDeviceRemoteDisconnectRequest</destination-jndi-
name>
    <connection-factory-jndi-
name>jms/LocalMDUSConnectionFactory</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>MDUSIntegrationExampleModule</name>
  <target>myserver</target>
  <sub-deployment>
    <name>MDUSIntegrationExample</name>
    <target>myserver</target>
  </sub-deployment>
  <descriptor-file-name>jms/Module-for-MDUS-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: MDUS\_JNDI
3. Enter the XAI JNDI server description. For example: MDUS 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 to which Oracle Utilities Meter Data Management will be publishing or writing messages.

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

#### Device Create/Change Sync Integration Point

XAI JMS Queue	Description	Queue Name	Target Client Flag	XAI JNDI Server
MDUSDevRes	MDUS MDM Device Sync Response	jms/MDUSDeviceSyncResponse	JMS	MDUS_JNDI

#### Device Configuration Create/Change Sync Integration Point

XAI JMS Queue	Description	Queue Name	Target Client Flag	XAI JNDI Server
MDUSDCIRes	Device Configuration Sync Response	jms/MDUSDeviceConfigurationInstallSyncResponse	JMS	MDUS_JNDI

#### Meter Registered Notification Integration Point

XAI JMS Queue	Description	Queue Name	Target Client Flag	XAI JNDI Server
MDUSMtrRgReq	Meter Registered Notification Request	jms/MDUSMeterRegisteredNotificationRequest	JMS	MDUS_JNDI

#### Profile Allocation Sync Integration Point

XAI JMS Queue	Description	Queue Name	Target Client Flag	XAI JNDI Server
MDUSPrAIRes	Profile allocation Sync Response	jms/MDUSProfileAllocationSyncResponse	JMS	MDUS_JNDI

#### Usage Integration Point

XAI JMS Queue	Description	Queue Name	Target Client Flag	XAI JNDI Server
MDUSUsgRes	Usage Response	jms/MDUSBulkUsageResponse	JMS	MDUS_JNDI

#### Device Status Check Integration Point

XAI JMS Queue	Description	Queue Name	Target Client Flag	XAI JNDI Server
MDUSDvcSCRes	Device Status Check Response	jms/MDUSDeviceStatusCheckResponse	JMS	MDUS_JNDI

### Device Remote Connect Integration Point

XAI JMS Queue	Description	Queue Name	Target Client Flag	XAI JNDI Server
MDUSDvcRCRes	Device Remote Connect Response	jms/MDUSDeviceRemoteConnectResponse	JMS	MDUS_JNDI

### Device Remote Disconnect Integration Point

XAI JMS Queue	Description	Queue Name	Target Client Flag	XAI JNDI Server
MDUSDvcRDRes	Device Remote Disconnect Response	jms/MDUSDeviceRemoteDisconnectResponse	JMS	MDUS_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
MDUS_CF	MDM SAP Integration Connection	MDUS_JNDI	jms/MDUSConnectionFactory

## XAI Sender

To create a new realtime XAI sender

The XAI sender communicates with the integration layer. Create one 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** – ***RTJMSQSNDR*** (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:

**Device Create/Change Sync Integration Point**

XAI Sender	Description	XAI JMS Connection	XAI JMS Queue
MDUSDevRes	Device Sync Response Sender to MDUS	MDUS_CF	MDUSDevRes

**Device Configuration Create/Change Sync Integration Point**

XAI Sender	Description	XAI JMS Connection	XAI JMS Queue
MDUSDCIRes	Device Configuration Sync Response Sender to MDUS	MDUS_CF	MDUSDCIRes

**Meter Registered Notification Integration Point**

XAI Sender	Description	XAI JMS Connection	XAI JMS Queue
MDUSMtrRgReq	Meter Registered Notification Sender to MDUS	MDUS_CF	MDUSMtrRgReq

**Profile Allocation Sync Integration Point**

XAI Sender	Description	XAI JMS Connection	XAI JMS Queue
MDUSPrAIRes	Profile Allocation Sync Response Sender to MDUS	MDUS_CF	MDUSPrAIRes

### Usage Integration Point

XAI Sender	Description	XAI JMS Connection	XAI JMS Queue
MDUSUsgRes	Usage Response Sender to MDUS	MDUS_CF	MDUSUsgRes

### Device Status Check Integration Point

XAI Sender	Description	XAI JMS Connection	XAI JMS Queue
MDUSDvcSCRes	Device Status Check Response Sender to MDUS	MDUS_CF	MDUSDvcSCRes

### Device Remote Connect Integration Point

XAI Sender	Description	XAI JMS Connection	XAI JMS Queue
MDUSDvcRCRes	Device Remote Connect Response to MDUS	MDUS_CF	MDUSDvcRCRes

### Device Remote Disconnect Integration Point

XAI Sender	Description	XAI JMS Connection	XAI JMS Queue
MDUSDvcRDRes	Device Remote Disconnect Response to MDUS	MDUS_CF	MDUSDvcRDRes

## 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:

### Device Create/Change Sync Integration Point

Outbound Message Type	Description	Business Object
DMCON-DVC	MDUSMDM Sync Request Outbound Message Type Device	DX-SAPConfirmationMsg

### Device Configuration Create/Change Sync Integration Point

Outbound Message Type	Description	Business Object
DM-DCI	MDUSMDM Sync Request Outbound Message Type Device Configuration	DX-SAPConfirmationMsg



#### Profile Allocation Sync Integration Point

Outbound Message Type	Description	Business Object
DM-PROFALL	MDUSMDM Sync Request Outbound Message Type Profile Allocation	DX-SAPConfirmationMsg

#### Usage Integration Point

Outbound Message Type	Description	Business Object
DM- TSBULKRES	MDUSMDM Time Series Calculation Usage Response	DX-TSCalcBulkConfirmationMsg

#### Device Status Check Integration Point

Outbound Message Type	Description	Business Object
DM-DSCMSG	MDUSMDM Device Status Check Response Message	D1-OutboundMessage

#### Device Remote Connect Integration Point

Outbound Message Type	Description	Business Object
DM-AMIMSG	MDUSMDM Device Remote Connect Response Message	D1-OutboundMessage

#### Device Remote Disconnect Integration Point

Outbound Message Type	Description	Business Object
DM-RDCMSG	MDUSMDM Device Remote Disconnect Response Message	D1-OutboundMessage

## 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 = MDUS, Description = Meter Data Unification & Synchronization
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** - DX-SAPMDMJMSQAddNamespace.xsl

For example: **External System – MDUS**

Outbound Message Type	Processing Method	XAI Sender	Message XSL
DMCON-DVC	Real-time	MDUSDevRes	DX-SAPMDMJMSQAddNamespace.xsl
DM-DCI	Real-time	MDUSDCIRes	DX-SAPMDMRegisterSyncAddNamespace.xsl
DM-PROFALL	Real-time	MDUSPrAIRes	DX-SAPMDMProfileAllocationAddNamespace.xsl
DM-TSBULKRES	Real-time	MDUSUsgRes	DX-SAPMDMTimeSeriesCalcAddNamespace.xsl
DM-DSCMSG	Real-time	MDUSDvcSCRes	DX-SAPMDMDeviceStatusCheckAddNamespace.xsl
DM-AMIMSG	Real-time	MDUSDvcRCRes	DX-SAPMDMDeviceRemoteConnectAddNamespace.xsl
DM-DCMSG	Real-time	MDUSDvcRDRes	DX-SAPMDMDeviceRemoteDisconnectAddNamespace.xsl

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

## Setting Up 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/MDUS/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 11.1 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
SAP.SeverityCode.DefaultCode	3	Severity code sent with a negative confirmation response back to SAP
MDUS.GenericDVMException.Message Number	11401	Place holder for MDM Message Category
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	<Administrator needs to add this>	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.
MDM.InitialLoad	F1IC	This is the flag which indicates to MDM if this is the Initial load synchronization
MDM.ExternalSystem	SAP	External system value configured in MDM

Module Name	Default / Shipped Value	Description
MDM.TransactionTypeFlag.Create	ADD	Transaction type flag configured in MDM for CREATE action
MDM.TransactionTypeFlag.Change	CHNG	Transaction type flag configured in MDM for CHANGE action
DVM.MDUS_MaterialID.ThrowException	false	Exception flag for the MDUS_MaterialID DVM
DVM.MDUS_PartyInternalID.ThrowException	false	Exception flag for the MDUS_PartyInternalID DVM
DVM.MDUS_SenderBusinessSystemID.ThrowException	false	Exception flag for the MDUS_SenderBusinessSystemID DVM
DVM.MDUS_UOM.ThrowException	false	Exception flag for the MDUS_UOM DVM
DVM.MDUS_TOU.ThrowException	false	Exception flag for the MDUS_TOU DVM
DVM.MDUS_ConsumptiveSubtractive.ThrowException	false	Exception flag for the MDUS_ConsumptiveSubtractive DVM
DVM.OUMDM_PeakQuantity.ThrowException	false	Exception flag for the MDUS_PeakQuantity DVM
MDM.Requester	SAP - MDUS SPR	Default requester value set in MDM for AMI commands request
SAP.Default.TypeID	013(EF_SE_MP_MSG)	The default SAP Type ID send back as part of successful response message
SAP.Default.TypeID.Negative	001(EF_SE_MSG)	The default SAP Type ID send back as part of unsuccessful response message

## Service Configurations

Service Name	Property Name	Default / Shipped Value	Description
MDUSOUMDMDeviceCreateReqEBF	Default.SystemID	MDUS_01	Initiating system ID.
	Extension.PreXformCreateMeterMDUtoMDM	false	If set to true, the pre transformation extension service is invoked.
	Extension.PreInvokeEnQueueToMDM	false	If set to true, the post transformation extension service is invoked.
	BusinessError.NotificationFlag	true	If set to true, business error notification is sent via Email.
	TechnicalError.NotificationFlag	true	If set to true, technical error notification is sent via Email.
	BaseXFormFlag	true	Flag to indicate if the Base xsl will be used

Service Name	Property Name	Default / Shipped Value	Description
	createMeterRespServiceName	<Administrator needs to add this>	The service name for the UtilitiesDeviceERP SmartMeterCreateConfirmation_In webservice
	createMeterRespPortName	<Administrator needs to add this>	Port name for the UtilitiesDeviceERP SmartMeterCreateConfirmation_In webservice
	createMeterRespEndpoint	<Administrator needs to add this>	Endpoint for the UtilitiesDeviceERP SmartMeterCreateConfirmation_In webservice
	MDM.TargetMO.Device	D1-DEVICE	Maintenance object used for the Device synchronization in MDM
MDUSOUMDMDeviceChangeReqEBF	Default.SystemID	MDUS_01	Initiating system ID.
	Extension.PreXformChangeMeterMDUtoMDM	false	If set to true, the pre transformation extension service is invoked.
	Extension.PreInvokeEnQueueToMDM	false	If set to true, the post transformation extension service is invoked.
	BusinessError.NotificationFlag	true	If set to true, business error notification is sent via Email.
	TechnicalError.NotificationFlag	true	If set to true, technical error notification is sent via Email.
	BaseXFormFlag	true	Flag to indicate if the Base xsl will be used
	changeMeterRespEndpoint	<Administrator needs to add this>	The Endpoint for the UtilitiesDeviceERP SmartMeterChangeConfirmation_In webservice
	changeMeterRespServiceName	<Administrator needs to add this>	The service name for the UtilitiesDeviceERP SmartMeterChangeConfirmation_In webservice
	changeMeterRespPortName	<Administrator needs to add this>	The Port name for the UtilitiesDeviceERP SmartMeterChangeConfirmation_In webservice
	MDM.TargetMO.Device	D1-DEVICE	Maintenance object used for the Device synchronization in MDM
OUMDMMDUSDeviceSyncRespEBF	Default.SystemID	OU_MDM_01	Initiating system ID.
	Extension.PreXformMDUtoMDUS	false	If set to true, the pre transformation extension service is invoked.
	Extension.PreInvokeMDUSCreateMeterResp	false	If set to true, the post transformation extension service is invoked for meter create

Service Name	Property Name	Default / Shipped Value	Description
	Extension.PreInvokeMDUSChangeMeterResp	false	If set to true, the post transformation extension service is invoked for meter change
	BusinessError.NotificationFlag	true	If set to true, business error notification is sent via Email.
	TechnicalError.NotificationFlag	true	If set to true, technical error notification is sent via Email.
	BaseXFormFlag	true	Flag to indicate if the Base xsl will be used
	createMeterRespServiceName	<Administrator needs to add this>	The service name for the UtilitiesDeviceERP SmartMeterCreateConfirmation_In webservice
	createMeterRespPortName	<Administrator needs to add this>	Port name for the UtilitiesDeviceERP SmartMeterCreateConfirmation_In webservice
	createMeterRespEndPoint	<Administrator needs to add this>	Endpoint for the UtilitiesDeviceERP SmartMeterCreateConfirmation_In webservice
	changeMeterRespEndPoint	<Administrator needs to add this>	The Endpoint for the UtilitiesDeviceERP SmartMeterChangeConfirmation_In webservice
	changeMeterRespServiceName	<Administrator needs to add this>	The service name for the UtilitiesDeviceERP SmartMeterChangeConfirmation_In webservice
	changeMeterRespPortName	<Administrator needs to add this>	The Port name for the UtilitiesDeviceERP SmartMeterChangeConfirmation_In webservice
MDUSOUMDMDeviceConfigInstallCreateReqEBF	Default.SystemID	MDUS_01	Initiating system ID.
	Extension.PreXformCreateRegisterMDUtoMDM	false	If set to true, the pre transformation extension service is invoked.
	Extension.PreInvokeEnQueueToMDM	false	If set to true, the post transformation extension service is invoked.
	BusinessError.NotificationFlag	true	If set to true, business error notification is sent via Email.
	TechnicalError.NotificationFlag	true	If set to true, technical error notification is sent via Email.
	BaseXFormFlag	true	Flag to indicate if the Base xsl will be used
	createConfigInstallRespServiceName	<Administrator needs to add this>	The service name for the UtilitiesDeviceERP SmartMeterRegisterCreateConfirmation_In webservice

Service Name	Property Name	Default / Shipped Value	Description
	createConfigInstallRespPortName	<Administrator needs to add this>	Port name for the UtilitiesDeviceERP SmartMeterRegisterCreate Confirmation_In webservice
	createConfigInstallRespEndPoint	<Administrator needs to add this>	Endpoint for the UtilitiesDeviceERP SmartMeterRegisterCreate Confirmation_In webservice
	MDM.RegisterMultiplier	1	Register multiplier configured in MDM
	MDM.HowToUse	+	How to use indicator configured in MDM
	MDM.DeviceConfigInstall.TargetMO	D1-DVCCONFIG	Maintenance object used for the Device Config synchronization in MDM
MDUSOUMDMDeviceConfigInstallChangeReqEBF	Default.SystemID	MDUS_01	Initiating system ID.
	Extension.PreXformChangeRegisterMDUtoMDM	false	If set to true, the pre transformation extension service is invoked.
	Extension.PreInvokeEnQueueToMDM	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	true	If set to true, technical error notification is sent via Email.
	BaseXFormFlag	true	Flag to indicate if the Base xsl will be used
	changeConfigInstallRespServiceName	<Administrator needs to add this>	The service name for the UtilitiesDeviceERP SmartMeterRegisterChange Confirmation_In webservice
	changeConfigInstallRespPortName	<Administrator needs to add this>	Port name for the UtilitiesDeviceERP SmartMeterRegisterChange Confirmation_In webservice
	changeConfigInstallRespEndPoint	<Administrator needs to add this>	Endpoint for the UtilitiesDeviceERP SmartMeterRegisterChange Confirmation_In webservice
	MDM.RegisterMultiplier	1	Register multiplier configured in MDM
	MDM.HowToUse	+	How to use indicator configured in MDM
	MDM.DeviceConfigInstall.TargetMO	D1-DVCCONFIG	Maintenance object used for the Device Config synchronization in MDM
OUMDMMDUSDeviceConfigInstallSyncRespEBF	Default.SystemID	OU_MDM_01	Initiating system ID.

Service Name	Property Name	Default / Shipped Value	Description
	Extension.PreXformMD MtoMDUS	false	If set to true, the pre transformation extension service is invoked.
	Extension.PreInvokeMD USCreateResp	false	If set to true, the post transformation extension service is invoked.
	Extension.PreInvokeMD USChangeResp	false	If set to true, the post transformation extension service is invoked.
	BusinessError.NotificationFlag	true	If set to true, business error notification is sent via Email.
	TechnicalError.NotificationFlag	true	If set to true, technical error notification is sent via Email.
	BaseXFormFlag	true	Flag to indicate if the Base xsl will be used
	createRespServiceName	<Administrator needs to add this>	The service name for the UtilitiesDeviceERPSmartMeterRegisterCreate Confirmation_In webservice
	createRespPortName	<Administrator needs to add this>	Port name for the UtilitiesDeviceERPSmartMeterRegisterCreate Confirmation_In webservice
	createRespEndPoint	<Administrator needs to add this>	Endpoint for the UtilitiesDeviceERPSmartMeterRegisterCreate Confirmation_In webservice
	changeRespServiceName	<Administrator needs to add this>	The service name for the UtilitiesDeviceERPSmartMeterRegisterChange Confirmation_In webservice
	changeRespPortName	<Administrator needs to add this>	Port name for the UtilitiesDeviceERPSmartMeterRegisterChange Confirmation_In webservice
	changeRespEndPoint	<Administrator needs to add this>	Endpoint for the UtilitiesDeviceERPSmartMeterRegisterChange Confirmation_In webservice
MDUSOUMDMInstallEventSPSyncReqEBF	Default.SystemID	OU_MDM_01	Initiating system ID.
	Extension.PreXformSPS yncMDUStoMDM	false	If set to true, the pre transformation extension service is invoked.
	Extension.PreInvokeEn QueueToMDM	false	If set to true, the post transformation extension service is invoked.
	BusinessError.NotificationFlag	true	If set to true, business error notification is sent via Email.
	TechnicalError.NotificationFlag	true	If set to true, technical error notification is sent via Email.
	BaseXFormFlag	true	Flag to indicate if the Base xsl will be used



Service Name	Property Name	Default / Shipped Value	Description
	MDM.InstallEventSP.TargetMO	D1-SP	Maintenance object used for the Install Event SP synchronization in MDM
OUUMMDUSMeterRegisteredNotificationReqEBF	Default.SystemID	OU_MDM_01	Initiating system ID.
	Extension.PreXformMDMtoMDUS	false	If set to true, the pre transformation extension service is invoked.
	Extension.PreInvokeMDUSConfService	false	If set to true, the post transformation extension service is invoked.
	BusinessError.NotificationFlag	true	If set to true, business error notification is sent via Email.
	TechnicalError.NotificationFlag	true	If set to true, technical error notification is sent via Email.
	BaseXFormFlag	true	Flag to indicate if the Base xsl will be used
	MRNReqServiceName	<Administrator needs to add this>	The service name for the UtilitiesDeviceERP SmartMeterRegisteredNotification_In webservice
	MRNReqPortName	<Administrator needs to add this>	Port name for the UtilitiesDeviceERP SmartMeterRegisteredNotification_In webservice
	MRNReqEndPoint	<Administrator needs to add this>	Endpoint for the UtilitiesDeviceERP SmartMeterRegisteredNotification_In webservice
MDUSOUMDMPProfileAllocationSyncReqEBF	Default.SystemID	OU_MDM_01	Initiating system ID.
	Extension.PreXformMDMtoMDUS	false	If set to true, the pre transformation extension service is invoked.
	Extension.PreInvokeEnQueueToMDM	false	If set to true, the post transformation extension service is invoked.
	BusinessError.NotificationFlag	true	If set to true, business error notification is sent via Email.
	TechnicalError.NotificationFlag	true	If set to true, technical error notification is sent via Email.
	BaseXFormFlag	true	Flag to indicate if the Base xsl will be used
	MDM.ProfileAllocation.TargetBO	DX-ProfileAllocationActivity	The Business object configured in MDM for Profile Allocation
	responseServiceName	<Administrator needs to add this>	The service name for the UtilitiesTimeSeriesERP MeasurementTaskAssignmentChangeConfirmation_In webservice

Service Name	Property Name	Default / Shipped Value	Description
	responsePortName	<Administrator needs to add this>	Port name for the UtilitiesTimeSeriesERPMeasurementTaskAssignmentChangeConfirmation_In webservice
	responseEndPoint	<Administrator needs to add this>	Endpoint for the UtilitiesTimeSeriesERPMeasurementTaskAssignmentChangeConfirmation_In webservice
OUMDMMDUSProfileAllocationSyncRespEBF	Default.SystemID	OU_MDM_01	Initiating system ID.
	Extension.PreXformMDMtoMDUS	false	If set to true, the pre transformation extension service is invoked.
	Extension.PreInvokeMDUSEnQueue	false	If set to true, the post transformation extension service is invoked.
	BusinessError.NotificationFlag	true	If set to true, business error notification is sent via Email.
	TechnicalError.NotificationFlag	true	If set to true, technical error notification is sent via Email.
	BaseXFormFlag	true	Flag to indicate if the Base xsl will be used
	changeRespServiceName	<Administrator needs to add this>	The service name for the UtilitiesTimeSeriesERPMeasurementTaskAssignmentChangeConfirmation_In webservice
	changeRespPortName	<Administrator needs to add this>	Port name for the UtilitiesTimeSeriesERPMeasurementTaskAssignmentChangeConfirmation_In webservice
	changeRespEndPoint	<Administrator needs to add this>	Endpoint for the UtilitiesTimeSeriesERPMeasurementTaskAssignmentChangeConfirmation_In webservice
MDUSOUMDMEquipmentRelSyncReqEBF	Default.SystemID	MDUS_01	Initiating system ID.
	Extension.PreXformMDUStoMDM	false	If set to true, the pre transformation extension service is invoked.
	Extension.PreInvokeEnQueueToMDM	false	If set to true, the post transformation extension service is invoked.
	BusinessError.NotificationFlag	true	If set to true, business error notification is sent via Email.
	TechnicalError.NotificationFlag	true	If set to true, technical error notification is sent via Email.
	BaseXFormFlag	true	Flag to indicate if the Base xsl will be used
MDUSOUMDMDeviceStatusCheckReqEBF	Default.SystemID	MDUS_01	Initiating system ID.

Service Name	Property Name	Default / Shipped Value	Description
	Extension.PreXformDeviceStatusCheckMDUStoMDM	false	If set to true, the pre transformation extension service is invoked.
	Extension.PreInvokeEnQueueToMDM	false	If set to true, the post transformation extension service is invoked.
	BusinessError.NotificationFlag	true	If set to true, business error notification is sent via Email.
	TechnicalError.NotificationFlag	true	If set to true, technical error notification is sent via Email.
	BaseXFormFlag	true	Flag to indicate if the Base xsl will be used
	deviceStatusCheckRespServiceName	<Administrator needs to add this>	The service name for the UtilitiesDeviceERPSmartMeterOperationalStateByIDResponse_In webservice
	deviceStatusCheckRespPortName	<Administrator needs to add this>	Port name for the UtilitiesDeviceERPSmartMeterOperationalStateByIDResponse_In webservice
	deviceStatusCheckRespEndPoint	<Administrator needs to add this>	Endpoint for the UtilitiesDeviceERPSmartMeterOperationalStateByIDResponse_In webservice
	MDM.DeviceStatusCheck.TargetBO	D1-DeviceStatusCheck	The Business object configured in MDM for Device Status Change
OUMDMMDUSDeviceStatusCheckRespEBF	Default.SystemID	OU_MDM_01	Initiating system ID.
	Extension.PreXformMDMtoMDUS	false	If set to true, the pre transformation extension service is invoked.
	Extension.PreInvokeMDUSEnQueue	false	If set to true, the post transformation extension service is invoked.
	BusinessError.NotificationFlag	true	If set to true, business error notification is sent via Email.
	TechnicalError.NotificationFlag	true	If set to true, technical error notification is sent via Email.
	BaseXFormFlag	true	Flag to indicate if the Base xsl will be used
	deviceStatusCheckRespServiceName	<Administrator needs to add this>	The service name for the UtilitiesDeviceERPSmartMeterOperationalStateByIDResponse_In webservice
	deviceStatusCheckRespPortName	<Administrator needs to add this>	Port name for the UtilitiesDeviceERPSmartMeterOperationalStateByIDResponse_In webservice

Service Name	Property Name	Default / Shipped Value	Description
	deviceStatusCheckRespEndPoint	<Administrator needs to add this>	Endpoint for the UtilitiesDeviceERP SmartMeterOperationalStateByIDResponse_In webservice
MDUSOUMDMDeviceRemoteConnectionReqEBF	Default.SystemID	MDUS_01	Initiating system ID.
	BusinessError.NotificationFlag	true	If set to true, business error notification is sent via Email.
	TechnicalError.NotificationFlag	true	If set to true, technical error notification is sent via Email.
	BaseXFormFlag	true	Flag to indicate if the Base xsl will be used
	Extension.PreXformMDUStoRemoteConnectMDM	false	If set to true, the pre transformation extension service is invoked for remote connect.
	Extension.PreInvokeRemoteConnectQueueToMDM	false	If set to true, the post transformation extension service is invoked for remote connect.
	Extension.PreXformMDUStoRemoteDisconnectMDM	false	If set to true, the pre transformation extension service is invoked for remote disconnect.
	Extension.PreInvokeRemoteDisconnectQueueToMDM	false	If set to true, the post transformation extension service is invoked for remote disconnect.
	MDM.DeviceRemoteConnect.TargetBO	D1-RemoteConnect	The Business object configured in MDM for Device Remote Connect
	MDM.DeviceRemoteDisconnect.TargetBO	D1-RemoteDisconnect	The Business object configured in MDM for Device Remote Disconnect
	ConnectRespServiceName	<Administrator needs to add this>	The service name for the SmartMeterUtilitiesConnectionStatusChangeRequestERPCreateConfirmation_In webservice
	ConnectRespPortName	<Administrator needs to add this>	Port name for the SmartMeterUtilitiesConnectionStatusChangeRequestERPCreateConfirmation_In webservice
	ConnectRespEndPoint	<Administrator needs to add this>	Endpoint for the SmartMeterUtilitiesConnectionStatusChangeRequestERPCreateConfirmation_In webservice
	DisconnectRespServiceName	<Administrator needs to add this>	The service name for the SmartMeterUtilitiesConnectionStatusChangeRequestERPCreateConfirmation_In webservice

Service Name	Property Name	Default / Shipped Value	Description
	DisconnectRespPortName	<Administrator needs to add this>	Port name for the SmartMeterUtilitiesConnectionStatusChangeRequestERPCreateConfirmation_In webservice
	DisconnectRespEndPoint	<Administrator needs to add this>	Endpoint for the SmartMeterUtilitiesConnectionStatusChangeRequestERPCreateConfirmation_In webservice
OUMDMMDUSDeviceRemoteConnectRespEBF	Default.SystemID	OUMDM_01	Initiating system ID.
	BusinessError.NotificationFlag	true	If set to true, business error notification is sent via Email.
	TechnicalError.NotificationFlag	true	If set to true, technical error notification is sent via Email.
	BaseXFormFlag	true	Flag to indicate if the Base xsl will be used
	Extension.PreXformMDMtoMDUS	false	If set to true, the pre transformation extension service is invoked.
	Extension.PreInvokeMDUSEnQueue	false	If set to true, the post transformation extension service is invoked.
	ConnectRespServiceName	<Administrator needs to add this>	The service name for the SmartMeterUtilitiesConnectionStatusChangeRequestERPCreateConfirmation_In webservice
	ConnectRespPortName	<Administrator needs to add this>	Port name for the SmartMeterUtilitiesConnectionStatusChangeRequestERPCreateConfirmation_In webservice
	ConnectRespEndPoint	<Administrator needs to add this>	Endpoint for the SmartMeterUtilitiesConnectionStatusChangeRequestERPCreateConfirmation_In webservice
OUMDMMDUSDeviceRemoteDisconnectRespEBF	Default.SystemID	OUMDM_01	Initiating system ID.
	BusinessError.NotificationFlag	true	If set to true, business error notification is sent via Email.
	TechnicalError.NotificationFlag	true	If set to true, technical error notification is sent via Email.
	BaseXFormFlag	true	Flag to indicate if the Base xsl will be used
	Extension.PreXformMDMtoMDUS	false	If set to true, the pre transformation extension service is invoked.
	Extension.PreInvokeMDUSEnQueue	false	If set to true, the post transformation extension service is invoked.

Service Name	Property Name	Default / Shipped Value	Description
	DisconnectRespServiceName	<Administrator needs to add this>	The service name for the SmartMeterUtilitiesConnectionStatusChangeRequestERPCreateConfirmation_In webservice
	DisconnectRespPortName	<Administrator needs to add this>	Port name for the SmartMeterUtilitiesConnectionStatusChangeRequestERPCreateConfirmation_In webservice
	DisconnectRespEndPoint	<Administrator needs to add this>	Endpoint for the SmartMeterUtilitiesConnectionStatusChangeRequestERPCreateConfirmation_In webservice
MDUSOUMDMBulkUsageReqEBF	Default.SystemID	MDUS_01	Initiating system ID.
	Extension.PreXformMDUStoMDM	true	If set to true, the pre transformation extension service is invoked.
	Extension.PreInvokeEnQueueToMDM	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	true	If set to true, technical error notification is sent via Email.
	BaseXFormFlag	true	Flag to indicate if the Base xsl will be used
	RespServiceName	<Administrator needs to add this>	The service name for the UtilitiesTimeSeriesCalculationERPBulkCreateConfirmation_In webservice
	RespPortName	<Administrator needs to add this>	Port name for the UtilitiesTimeSeriesCalculationERPBulkCreateConfirmation_In webservice
	RespEndPoint	<Administrator needs to add this>	Endpoint for the UtilitiesTimeSeriesCalculationERPBulkCreateConfirmation_In webservice
OUMDMMDUSBulkUsageRespEBF	Default.SystemID	MDUS_01	Initiating system ID.
	Extension.PreXformMDMtoMDUS	false	If set to true, the pre transformation extension service is invoked.
	Extension.PreInvokeMDUSEnQueue	false	If set to true, the post transformation extension service is invoked.
	BusinessError.NotificationFlag	true	If set to true, business error notification is sent via Email.
	TechnicalError.NotificationFlag	true	If set to true, technical error notification is sent via Email.
	BaseXFormFlag	true	Flag to indicate if the Base xsl will be used

Service Name	Property Name	Default / Shipped Value	Description
	RespServiceName	<Administrator needs to add this>	The service name for the UtilitiesTimeSeriesCalculationERPBulkCreateConfirmation_In webservice
	RespPortName	<Administrator needs to add this>	Port name for the UtilitiesTimeSeriesCalculationERPBulkCreateConfirmation_In webservice
	RespEndPoint	<Administrator needs to add this>	Endpoint for the UtilitiesTimeSeriesCalculationERPBulkCreateConfirmation_In webservice

## 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:

1. Open a browser and access the SOA Composer application.
2. On the SOA Composer, click the “Open” dropdown and select “Open DVM”. This displays a list of all DVM files in MDS.
3. Select the relevant DVM you wish to maintain.
4. Edit the selected DVM. The Edit button in the top navigation bar enables editing the DVM.
5. Once the DVM has been edited, click Save in the navigation bar. This saves the DVM data for that session.
6. Click Commit after updating each DVM. This saves the DVM data in MDS.

The DVMs for SAP Customer Relations and Billing Integration to Oracle Utilities Meter Data Management Release 11.1 Media Pack are listed as follows:

DVM	Integration Points	Description
MDUS_ConsumptiveSubtractive	Device Configuration Sync	Maps the SAP Utilities Measurement Task Category Code to MDM Consumptive Subtractive element
MDUS_DeviceCommunicationStatus	Device Status Check	To convert the MDM Device communication status to SAP Device state indicator
MDUS_DeviceConnectionStatus	Device Status Check	To convert the MDM Device connection status to SAP Device state indicator

DVM	Integration Points	Description
MDUS_DeviceFunctionalState	Device Status Check	To convert the MDM Device Functional status to SAP Device state indicator
MDUS_DeviceType	Device Sync	Maps the SAP Device Category (MaterialID) to MDM Device Type
MDUS_ExternalSystem	Device, Device Configuration and Install Event SP Sync	Maps the SAP Message Header SenderBusinessSystemID to MDM External
MDUS_Manufacturer	Device Sync	Maps the SAP manufacturer code to MDM manufacturer code
MDUS_Sender	Device Status Check, Device Remote Connect and Device Remote Disconnect	To convert the SAP sender Id to the MDM requester
MDUS_TOU	Device Configuration Sync	Maps the SAP Utilities Time of Use Code to MDM TOU Code
MDUS_UOM	Device Configuration Sync	Maps the SAP Measure Unit Code to MDM UOM Code
MDUS_UsageRule	Usage	Maps the SAP Utilities Time Series Calculation Method Code to MDM Usage Rule
MDUS_PeakQuantity	Usage	Maps the MDM Usage measures peak quantity indicator to the SAP Utilities Time Series Calculation Result Category Code
MDUS_TimeZone	Install Event SP Sync	Maps the SAP Time zone code to MDM Time zone code
MDUS_Country	Install Event SP Sync	Maps the SAP Country Code to the MDM Country Code

**Note:** 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.

## MDUS\_ConsumptiveSubtractive

This DVM is used by the integration layer to map Meter Data Unification & Synchronization Maintenance SAP Utilities Measurement Task Category Code Object value to corresponding Oracle Utilities Meter Data Management Maintenance Consumptive Subtractive Object value. This DVM is used in the Device Configuration Sync mapping.

OUMDM_ConsumptiveSubtractive	SAP_UtlitiesMeasurementTaskCategoryCode
MDM Consumptive Subtractive flag	SAP Utilities Device ERP Smart Meter Register Create/Change Request Utilities Measurement Task Category Code



## MDUS\_DeviceCommunicationStatus

This DVM is used by the integration layer to map Meter Data Unification & Synchronization Maintenance UtilitiesDeviceERP SmartMeterOperationalStateByIDResponse Device operational state indicator object value to corresponding Oracle Utilities Meter Data Management Maintenance Device communication state indicator object value. This DVM is used in Device Status Check mapping.

OUMDM_DeviceCommunicationStatus	SAP_DeviceStateIndicator
Device communication state indicator	UtilitiesDeviceERP SmartMeterOperationalStateByIDResponse Device operational state indicator

## MDUS\_DeviceConnectionStatus

This DVM is used by the integration layer to map Meter Data Unification & Synchronization Maintenance UtilitiesDeviceERP SmartMeterOperationalStateByIDResponse Device operational state indicator object value to corresponding Oracle Utilities Meter Data Management Maintenance Device connection state indicator object value. This DVM is used in Device Status Check mapping.

OUMDM_DeviceConnectionStatus	SAP_DeviceStateIndicator
Device connection state indicator	UtilitiesDeviceERP SmartMeterOperationalStateByIDResponse Device operational state indicator

## MDUS\_DeviceFunctionalState

This DVM is used by the integration layer to map Meter Data Unification & Synchronization Maintenance UtilitiesDeviceERP SmartMeterOperationalStateByIDResponse Device operational state indicator object value to corresponding Oracle Utilities Meter Data Management Maintenance Device connection state indicator object value. This DVM is used in Device Status Check mapping.

OUMDM_DeviceFunctionalState	SAP_DeviceStateIndicator
Device functional state indicator	UtilitiesDeviceERP SmartMeterOperationalStateByIDResponse Device operational state indicator

## MDUS\_DeviceType

This DVM is used by the integration layer to map Meter Data Unification & Synchronization Maintenance UtilitiesDeviceERP SmartMeterCreateRequest Material ID object value to corresponding Oracle Utilities Meter Data Management Maintenance Device type object value. This DVM is used in Device Sync mapping.

OUMDM_DeviceType	SAP_MaterialID
Device Type	Utilities Device ERP Smart Meter Create/Change Request Material ID

## MDUS\_ExternalSystem

This DVM is used by the integration layer to map Meter Data Unification & Synchronization Maintenance SenderBusinessSystemID object value to corresponding Oracle Utilities Meter Data Management Maintenance External System object value. This DVM is used in Device Sync, Device Configuration and Install Event SP Sync mapping.

<b>OUMDM_ExternalSystem</b>	<b>SAP_SenderBusinessSystemID</b>
External System	SenderBusinessSystemID

## MDUS\_Manufacturer

This DVM is used by the integration layer to map Meter Data Unification & Synchronization Maintenance UtilitiesDeviceERPSmartMeterCreateRequest Manufacturer Party Internal ID object value to corresponding Oracle Utilities Meter Data Management Maintenance Device manufacturer object value. This DVM is used in Device Sync mapping.

<b>OUMDM_Manufacturer</b>	<b>SAP_PartyInternalID</b>
Device manufacturer	UtilitiesDeviceERPSmartMeterCreateRequest Manufacturer Party Internal ID

## MDUS\_Sender

This DVM is used by the integration layer to map Meter Data Unification & Synchronization Maintenance Sender System ID object value to corresponding Oracle Utilities Meter Data Management Maintenance Requester object value. This DVM is used in Device Status Check, Device Remote connect and Device Remote disconnect mapping.

<b>OUMDM_Requester</b>	<b>SAP_SenderID</b>
Requester	Sender System ID

## MDUS\_TOU

This DVM is used by the integration layer to map Meter Data Unification & Synchronization Maintenance SAP Utilities Measurement Task Unit of Measure object value to corresponding Oracle Utilities Meter Data Management Maintenance Device Config Time of Use object value. This DVM is used in the Device Configuration Sync mapping.

<b>OUMDM_TOU</b>	<b>SAP_UtilityTimeOfUseCode</b>
Device Config Time of Use	Utilities Measurement Time of Use

## MDUS\_UOM

This DVM is used by the integration layer to map Meter Data Unification & Synchronization Maintenance SAP Utilities Measurement Task Measure Unit code object value to corresponding Oracle Utilities Meter Data Management Maintenance Device Config Unit of Measure object value. This DVM is used in the Device Configuration Sync mapping.

<b>OUMDM_UOM</b>	<b>SAP_MeasureUnitCode</b>
Device Config Measure Unit Code	Utilities Measurement Task Unit of Measure

## MDUS\_UsageRule

This DVM is used by the integration layer to map Meter Data Unification & Synchronization Maintenance SAP Utilities Time Series Calculation Method Code object value to corresponding Oracle Utilities Meter Data Management Maintenance Usage Rule object value. This DVM is used in the Usage mapping.

OUMDM_UsageRule	SAP_CalcMethodCode
Usage Rule code	SAP Utilities Time Series Calculation Method Code

### MDUS\_PeakQuantity

This DVM is used by the integration layer to map Meter Data Unification & Synchronization Maintenance SAP Utilities Time Series Calculation Result Category Code object value to corresponding Oracle Utilities Meter Data Management Maintenance Usage Rule object value. This DVM is used in the Usage mapping.

OUMDM_PeakQuantity	SAP_TSCalcResultCategoryCode
Usage measures peak quantity indicator	SAP Utilities Time Series Calculation Result Category Code

### MDUS\_TimeZone

This DVM is used by the integration layer to map Meter Data Unification & Synchronization Maintenance SAP Utilities Device ERP Smart Meter Location Notification Time zone object value to corresponding Oracle Utilities Meter Data Management Maintenance Time zone object value. This DVM is used in the Install Event SP Sync mapping.

OUMDM_TimeZone	SAP_TimeZoneCode
MDM Time zone code	SAP Utilities Device ERP Smart Meter Location Notification Time zone code

### MDUS\_Country

This DVM is used by the integration layer to map Meter Data Unification & Synchronization Maintenance SAP Utilities Device ERP Smart Meter Location Notification country code object value to corresponding Oracle Utilities Meter Data Management Maintenance country code object value. This DVM is used in the Install Event SP Sync mapping.

OUMDM_CountryCode	SAP_CountryCode
MDM Country Code	SAP Utilities Device ERP Smart Meter Location Notification country code

---

## 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.

To retry the technical error failure messages:

1. In the WebLogic console, navigate to Services → Messaging → JMS Modules.
2. Select MDUS-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 MDUS-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 SAP-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
2	IP_Name	Name of the composite processed. Example MDUSOUMDMDeviceCreateSyncReq EBF	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"> <li>• HALTED (waiting for manual intervention),</li> <li>• NOT REQUIRED</li> <li>• ALIVE</li> </ul>	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/MDUS-MDM/UpdateIntegrationErrorLookupTable/updateintegrationerrorlookuptablebpel\\_client\\_ep?](http://<hostname>:<soa server port>/soa-infra/services/MDUS-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 provides details about the how to complete monitoring from each edge application. Topics include:

- Monitoring from SAP Customer Relations and Billing
- Monitoring from Oracle Utilities Meter Data Management
- Monitoring from the Integration
- Troubleshooting

---

### Monitoring from SAP Customer Relations and Billing

**For more information** on monitoring within the SAP system, please refer to the Supplemental Implementation Guide on Configuring SAP for the Oracle Utilities Meter Data Management to SAP for Meter Data Unification and Synchronization Integration solution document. Contact Oracle customer support for more information.

---

### 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 (MDM) 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 MDM are stored in the \$SPLOUTPUT/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 SAP for Meter Data Unification and Synchronization, it will send a response back to SAP via the integration layer. 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 in processing the message, an `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 will be created, if configured.

For example: If Oracle Utilities Meter Data Management receives a Device sync request message from the Oracle Utilities Meter Data Management Device sync request queue and an error is encountered, the message will be moved to the Oracle Utilities Meter Data Management Device 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 processing 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. Implementations 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 → MDUS-MDM.

All composite processes deployed for integration are available under the partition MDUS-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 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 **MDUSMDMJMSModule**.

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.

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.

---

## Troubleshooting

At times, Oracle Utilities Meter Data Management Integration to SAP for Meter Data Unification and Synchronization 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.

**Error 1:** SAP application sends out a message but the message does not reach the MDM.

Go to WebLogic Console to check if the message reached the source queue. See [Monitoring the Queues using WebLogic Console](#) 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.
2. Check the composite process in the Integration layer to see if any error was thrown in the Integration layer.
3. Check if the message reached the MDM queue but was not consumed by the Oracle Utilities Meter Data Management application because there are no active consumers on the MDM queue from the Oracle Utilities Meter Data Management application.
4. Check the MDM error queue to see if there was any error and the message was moved to the error queue by the Oracle Utilities Meter Data Management application.
5. Check the MDM logs to see if there are any errors reported due to which the message failed in MDM.

**Error 2:** Oracle Utilities Meter Data Management application sends out a message but the message does not reach the SAP.

1. Check the source application logs to see if any errors are encountered while trying to send the message out.
2. Check if the message reached the MDM queue but was not consumed by the integration layer because the integration process is not up and running
3. Check the composite process in the Integration layer to see if any error was thrown in the Integration layer.
4. Check the MDM error queue to see if there was any error and the message was moved to the error queue by the integration process

## Customization Options

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

- Extension Points
- Custom Transformations

---

### Extension Points

This section includes information on the following:

- Pre Transformation Extension Points
- Post Transformation Extension Points
- Steps to Implement Extension Points

---

#### Pre Transformation Extension Points

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.

---

#### 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 [Setting Configuration Properties](#).

- 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/MDUS-MDM/AIAMetaData/AIAComponents/ExtensionServiceLibrary/MDUS
- /apps/MDUS-MDM/AIAMetaData/AIAComponents/ExtensionServiceLibrary/OUMDM

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.

- 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/MDUS-MDM/AIAMetaData/AIAComponents/ExtensionServiceLibrary/CRB
- \$PRODUCT\_HOME/MDS-Artifacts/MDUS-MDM/AIAMetaData/AIAComponents/ExtensionServiceLibrary/OUMDM

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 Meter Data Management Integration to SAP for Meter Data Unification and Synchronization Release 11.1 Media Pack Installation Guide, under Deploying MDS Folder section.

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

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

```
<binding name="MDUSInstallEventSPSyncReqV1ExtensionServiceSOAPBinding"
  type="mdusext:MDUSInstallEventSPSyncReqV1ExtensionService">
  <soap:binding style="document"
    transport="http://schemas.xmlsoap.org/soap/http"/>
  <operation name="PreXformSPSyncMDUStoMDM">
    <soap:operation style="document"

soapAction="http://xmlns.oracle.com/MDUSOUMDMInstallEventSPSyncReqEBF/MD
USInstallEventSPSyncReqExtension/V1/PreXformSPSyncMDUStoMDM"/>
    <input>
      <soap:body use="literal"

parts="UtilitiesDeviceERPSmartMeterLocationNotification"/>
    </input>
    <output>
      <soap:body use="literal"

parts="UtilitiesDeviceERPSmartMeterLocationNotification"/>
    </output>
    <fault name="fault">
      <soap:fault name="fault" use="literal"/>
    </fault>
  </operation>
```



```
<operation name="PreInvokeMDMEnQueue">
  <soap:operation style="document"

  soapAction="http://xmlns.oracle.com/MDUSOUMDMInstallEventSPSyncReqEBF/MD
  USInstallEventSPSyncReqExtension/V1/PreInvokeMDMEnQueue"/>
    <input>
      <soap:body use="literal" parts="MDMEnQueue"/>
    </input>
    <output>
      <soap:body use="literal" parts="MDMEnQueue"/>
    </output>
    <fault name="fault">
      <soap:fault name="fault" use="literal"/>
    </fault>
  </operation>
</binding>
<service name="MDUSInstallEventSPSyncReqV1ExtensionService">
  <port name="MDUSInstallEventSPSyncReqV1ExtensionService_pt"

  binding="mdusext:MDUSInstallEventSPSyncReqV1ExtensionServiceSOAPBinding"
  >
<!--          <soap:address location="http://www.example.com"/>-->
  <soap:address location=""><endpoint url of the Extension service></>

  </port>
</service>
```

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

---

## Custom Transformations

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

Custom transformation can be implemented in two different ways:

- Custom Transformation templates

Each base transformation file has custom templates embedded which are defined in custom transformation files. 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.

- Externalized Transformations

The BPEL component in the process composite invokes extended transformation. The extended transformation file invokes the base transformation or the implementation specific custom transformation based on a Service module level flag. Using this approach an implementation team can override the complete base transformation with their own transformation.

---

## Custom Transformation Templates

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 for MDM has a corresponding CustomType xsd file in which the complexType elements for each customElements tag are defined.
3. To pass additional elements in the customElements tag, the corresponding complexType needs to be modified. Add the additional elements required in MDM complexType.
4. 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.
5. These custom templates are invoked at the location where each customElements tag is present.
6. The custom XSL can be modified to add transformation for the newly added elements in custom XSD files.
7. The custom XSD files are located in product install home under the following directory:

`<PRODUCT_HOME>/MDS-Artifacts/ MDUS-MDM/AIAMetaData/AIAComponents/  
ApplicationObjectLibrary/OUMDM/V1/schemas`

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

`<PRODUCT_HOME>/MDS-Artifacts/ MDUS-MDM  
/AIAMetaData/Transformation/extended/RequestEBF/<Process Name>`

8. 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 SAP Customer Relations and Billing Integration to Oracle Utilities Meter Data Management Release 11.1 Media Pack Installation Guide, under Deploying MDS Folder section.

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

For example: In the Device synchronization process, to pass  
UtilitiesDeviceERPSmartMeterCreateRequest → MessageHeader → UUID element in SAP  
Customer Relations and Billing to DX-OngoingSyncRequestDevice → finalSnapshot →  
customElements → uuid element in MDM, the following changes need to be done:

- a. In OUMDMDeviceRequestCustomType.xsd, add the uuid element in the schema. This xsd file is located in MDUS-MDM/MDS-Artifacts/MDUS-MDM/AIAMetaData/AIAComponents/ ApplicationObjectLibrary/OUMDM/V2/schemas folder.

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

- b. Transformation XformMDUSDeviceCreateReq\_to\_OUMDMDeviceSyncReq\_Custom.xsl

```
<xsl:template name="finalSnapshot-customElements">
```

```
<!-- this template is use for Xformation of
//finalSnapshot/customElements in Request Message-->
<uuid>
  <xsl:value-of
select="/ns0:UtilitiesDeviceERPSmartMeterCreateRequest/MessageHeader/UUID" />
</uuid>
</xsl:template>
```

---

## Externalized Transformations

1. The transformation xsl files invoked from the BPEL components are stored in MDS. In the PRODUCT installation folder these files are at the location <PRODUCT\_HOME>/MDS-Artifacts/MDUS-MDM/AIAMetaData/Transformation/extended/RequestEBF/<Process\_Name> and <PRODUCT\_HOME>/MDS-Artifacts/MDUS-MDM/AIAMetaData/Transformation/extended/ResponseEBF/<Process\_Name>
2. The base transformation xsl files are also stored in MDS. In the PRODUCT installation folder these files are at the location <PRODUCT\_HOME>/MDS-Artifacts/MDUS-MDM/AIAMetaData/Transformation/base/RequestEBF/<Process\_Name> and <PRODUCT\_HOME>/MDS-Artifacts/MDUS-MDM/AIAMetaData/Transformation/base/ResponseEBF/<Process\_Name>
3. The ConfigurationProperties.xml has a BaseXFormFlag flag. If set to true the extended xsl file invokes the base xsl transformation. If the BaseXFormFlag is set to false the extended xsl transformation invokes the implementation specific xsl which can be plugged in into the extended xsl.
4. After modifying the extended xsl transformation file the steps to update MDS need to be invoked and the server has to be restarted.

For example: To override the Base xsl in the Device Status Check request flow the following needs to be done

- In the ConfigurationProperties.xml set the BaseXFormFlag for the Device Status Check Request service to false.
- In the <PRODUCT\_HOME>/MDS-Artifacts/MDUS-MDM/AIAMetaData/Transformation/base/RequestEBF/MDUSOUMDMDeviceStatusCheckReqEBF folder modify the Xform\_MDUSDeviceStatusCheckReq\_to\_OUMDMDeviceStatusCheckReq\_extended.xsl file. In this file the when BaseXFormFlag is false add the xsl code which needs to be invoked instead of the base xsl.

```
<xsl:template match="/">
  <xsl:choose>
    <xsl:when test="$useBaseXFormFlag='false'">
      <D1-DeviceStatusCheck
xmlns="http://xmlns.oracle.com/OUMDM/OUMDMDeviceStatusCheckRequest"
dateTimeTagFormat="xsd">
        <requesterTransactionId>
          <xsl:value-of
select="/ns0:UtilitiesDeviceERPSmartMeterOperationalStateByIDQuery/Messa
geHeader/UUID" />
        </requesterTransactionId>
      </D1-DeviceStatusCheck>
```

```
</xsl:when>
<xsl:otherwise>
  <xsl:call-template name="base"/>
</xsl:otherwise>
</xsl:choose>
</xsl:template>
```

5. Update MDS after the changes are made and restart the SOA server. After the server has been restarted the custom xsl is invoked.

## Appendix A: Data Mapping

This section provides mapping details for each integration point.

### Device Create

#### Device Create Request Mapping

SAP Meter Request Message			MDM Device Request Message			DVM Mapping		
Element Name	Parent Element	Type	Element Name	Parent Element	Type	DVM	MDM Column	SAP Column
UtilitiesDeviceERPSmartMeterCreateRequest		OutermostTag	DX-OngoingSyncRequestDevice		OutermostTag			
			syncRequestId	DX-OngoingSyncRequestDevice	Field			
			bo	DX-OngoingSyncRequestDevice	Field			
			boStatus	DX-OngoingSyncRequestDevice	Field			
			createDateTime	DX-OngoingSyncRequestDevice	Field			
			statusDateTime	DX-OngoingSyncRequestDevice	Field			
			initialLoad	DX-OngoingSyncRequestDevice	Field			
			targetMo	DX-OngoingSyncRequestDevice	Field			
			externalPkValue1	DX-OngoingSyncRequestDevice	Field			
			externalPkValue2	DX-OngoingSyncRequestDevice	Field			
			externalPkValue3	DX-OngoingSyncRequestDevice	Field			

SAP Meter Request Message			MDM Device Request Message			DVM Mapping		
Element Name	Parent Element	Type	Element Name	Parent Element	Type	DVM	MDM Column	SAP Column
			externalPkValue4	DX-OngoingSyncRequestDevice	Field			
			externalPkValue5	DX-OngoingSyncRequestDevice	Field			
			productionPkValue	DX-OngoingSyncRequestDevice	Field			
Message Header	UtilitiesDeviceERPSmartMeterCreateRequest	Group						
ID	MessageHeader	Field						
UUID	MessageHeader	Field	externalReferenceId	DX-OngoingSyncRequestDevice	Field			
ReferenceID	MessageHeader	Field						
ReferenceUUID	MessageHeader	Field						
CreationDate	MessageHeader	Field						
TestDataIndicator	MessageHeader	Field						
ReconciliationIndicator	MessageHeader	Field						
SenderBusinessSystemID	MessageHeader	Field	externalSystem	DX-OngoingSyncRequestDevice	Field	MDUS_ExternalSystem.dvm	OUMDM_ExternalSystem	SAP_SenderBusinessSystemID
RecipientBusinessSystemID	MessageHeader	Field						
SenderParty	MessageHeader	Group						
InternalID	SenderParty	Field						
StandardID	SenderParty	List						
ContactPerson	SenderParty	Group						
InternalID	ContactPerson	Field						
OrganisationFormattedName	ContactPerson	List						
PersonFormattedName	ContactPerson	List						
PhoneNumber	ContactPerson	List						
FaxNumber	ContactPerson	List						
EmailURI	ContactPerson	List						
RecipientParty	MessageHeader	List						
InternalID	RecipientParty	Field						

SAP Meter Request Message			MDM Device Request Message			DVM Mapping		
Element Name	Parent Element	Type	Element Name	Parent Element	Type	DVM	MDM Column	SAP Column
	rty							
StandardID	RecipientParty	List						
ContactPerson	RecipientParty	Group						
InternalID	ContactPerson	Field						
OrganisationFormattedName	ContactPerson	List						
PersonFormattedName	ContactPerson	List						
PhoneNumber	ContactPerson	List						
FaxNumber	ContactPerson	List						
EmailURI	ContactPerson	List						
BusinessScope	MessageHeader	List						
TypeCode	BusinessScope	Field						
InstanceID	BusinessScope	Field						
ID	BusinessScope	Field						
UtilitiesDevice	UtilitiesDeviceERPSmartMeterCreateRequest	Group	syncRequestDetails	DX-OngoingSyncRequestDevice	Group			
			original	syncRequestDetails	Group			
			finalSnapshot	original	Group			
			transactionType	finalSnapshot	Field			
ID	UtilitiesDevice	Field	externalId	finalSnapshot	Field			
			unmappedElements	finalSnapshot	Group			
			UtilitiesDevice	unmappedElements	Group			
StartDate	UtilitiesDevice	Field	StartDate	UtilitiesDevice	Field			
EndDate	UtilitiesDevice	Field	EndDate	UtilitiesDevice	Field			
SerialID	UtilitiesDevice		serialNumber	finalSnapshot	Field			
MaterialID	UtilitiesDevice	Field	deviceType	finalSnapshot	Field	MDUS_DeviceType	OUMDM_DeviceType	SAP_MaterialID
ProductUniqueItemID	UtilitiesDevice	Field	internalMeterNumber	finalSnapshot	Field			
IndividualMaterialManufacturerInformation	UtilitiesDevice	Group	IndividualMaterialManufacturerInformation	unmappedElements	Group			

SAP Meter Request Message			MDM Device Request Message			DVM Mapping		
Element Name	Parent Element	Type	Element Name	Parent Element	Type	DVM	MDM Column	SAP Column
PartyInternalID	IndividualMaterialManufacturerInformation	Field	manufacturer	finalSnapshot	Field	MDUS_Manufacturer	OUMDM_Manufacturer	SAP_PartyInternalID
PartNumberID	IndividualMaterialManufacturerInformation	Field	PartNumberID	IndividualMaterialManufacturerInformation	Field			
SerialID	IndividualMaterialManufacturerInformation	Field	SerialID	IndividualMaterialManufacturerInformation	Field			
SmartMeter	UtilitiesDevice	Group						
UtilitiesAdvancedMeteringSystemID	SmartMeter	Field	UtilitiesAdvancedMeteringSystemID	finalSnapshot	Field			
			customElements	finalSnapshot	Field			
			formattedElements	finalSnapshot	Group			

## Device Create Response Mapping

MDM Device Sync Response Message			SAP Meter Sync Response Message		
Element Name	Parent Element	Type	Element Name	Parent Element	Type
sendDetails		OutermostTag	UtilitiesDeviceERPSmartMeterCreateConfirmation		OutermostTag
transactionType	sendDetails	Field			
			MessageHeader	UtilitiesDeviceERPSmartMeterCreateConfirmation	Group
			ID	MessageHeader	Field
			UUID	MessageHeader	Field
			ReferenceID	MessageHeader	Field
externalReferenceID	sendDetails	Field	ReferenceUUID	MessageHeader	Field
			CreationDateTime	MessageHeader	Field
			TestDataIndicator	MessageHeader	Field
			ReconciliationIndicator	MessageHeader	Field
			SenderBusinessSystemID	MessageHeader	Field
			RecipientBusinessSystemID	MessageHeader	Field
			SenderParty	MessageHeader	Group
			InternalID	SenderParty	Field



MDM Device Sync Response Message			SAP Meter Sync Response Message		
Element Name	Parent Element	Type	Element Name	Parent Element	Type
			StandardID	SenderParty	List
			ContactPerson	SenderParty	Group
			InternalID	ContactPerson	Field
			OrganisationFormattedName	ContactPerson	List
			PersonFormattedName	ContactPerson	List
			PhoneNumber	ContactPerson	List
			FaxNumber	ContactPerson	List
			EmailURI	ContactPerson	List
			RecipientParty	MessageHeader	List
			InternalID	RecipientParty	Field
			StandardID	RecipientParty	List
			ContactPerson	RecipientParty	Group
			InternalID	ContactPerson	Field
			OrganisationFormattedName	ContactPerson	List
			PersonFormattedName	ContactPerson	List
			PhoneNumber	ContactPerson	List
			FaxNumber	ContactPerson	List
			EmailURI	ContactPerson	List
			BusinessScope	MessageHeader	List
			TypeCode	BusinessScope	Field
			InstanceID	BusinessScope	Field
			ID	BusinessScope	Field
			UtilitiesDevice	UtilitiesDeviceERPSmartMeterCreateConfirmation	Group
deviceID	sendDetails	Field	ID	UtilitiesDevice	Field
exceptionInformation	sendDetails	Group	Log	UtilitiesDeviceERPSmartMeterCreateConfirmation	Group
			BusinessDocumentProcessingResultCode	Log	Field
			MaximumLogItemSeverityCode	Log	Field
exceptionInformationList	exceptionInformation	List	Item	Log	List
sequence	exceptionInformationList	Field			
			TypeID	Item	Field
messageCategory	exceptionInformationList	Field			

MDM Device Sync Response Message			SAP Meter Sync Response Message		
Element Name	Parent Element	Type	Element Name	Parent Element	Type
			CategoryCode	Item	Field
messageNumber	exceptionInformationList	Field	SeverityCode	Item	Field
			ReferenceObjectNode SenderTechnicalID	Item	Field
comments	exceptionInformationList	Field	Note	Item	Field
messageParameters	exceptionInformationList	List			
parameterSequence	messageParameters	Field			
messageParameterType	messageParameters	Field			
messageParameterValue	messageParameters	Field			
			WebURI	Item	Field
customElements	sendDetails	Field			

## Device Change

### Device Change Request Mapping

SAP Meter Request Message			MDM Device Request Message			DVM Mapping		
Element Name	Parent Element	Type	Element Name	Parent Element	Type	DVM	MDM Column	SAP Column
UtilitiesDeviceERPSmartMeterChangeRequest		Outermost Tag	DX-OngoingSyncRequestDevice		OutermostTag			
			syncRequestId	DX-OngoingSyncRequestDevice	Field			
			bo	DX-OngoingSyncRequestDevice	Field			
			boStatus	DX-OngoingSyncRequestDevice	Field			
			createDateTime	DX-OngoingSyncRequestDevice	Field			

SAP Meter Request Message			MDM Device Request Message			DVM Mapping		
Element Name	Parent Element	Type	Element Name	Parent Element	Type	DVM	MDM Column	SAP Column
			statusDateTime	DX-OngoingSyncRequestDevice	Field			
			initialLoad	DX-OngoingSyncRequestDevice	Field			
			targetMo	DX-OngoingSyncRequestDevice	Field			
			externalPkValue1	DX-OngoingSyncRequestDevice	Field			
			externalPkValue2	DX-OngoingSyncRequestDevice	Field			
			externalPkValue3	DX-OngoingSyncRequestDevice	Field			
			externalPkValue4	DX-OngoingSyncRequestDevice	Field			
			externalPkValue5	DX-OngoingSyncRequestDevice	Field			
			productionPkValue	DX-OngoingSyncRequestDevice	Field			
MessageHeader	UtilitiesDeviceERPSmartMeterChangeRequest	Group						
ID	MessageHeader	Field						
UUID	MessageHeader	Field	externalReferenceId	DX-OngoingSyncRequestDevice	Field			
ReferenceID	MessageHeader	Field						
ReferenceUUID	MessageHeader	Field						
CreationDateTime	MessageHeader	Field						
TestDataIndicator	MessageHeader	Field						
ReconciliationIndicator	MessageHeader	Field						
SenderBusinessSystemID	MessageHeader	Field	externalSystem	DX-OngoingSyncRequestDevice	Field	MDUS_ExternalSystem.dvm	OUMDM_ExternalSystem	SAP_SenderBusinessSystemID

SAP Meter Request Message			MDM Device Request Message			DVM Mapping		
Element Name	Parent Element	Type	Element Name	Parent Element	Type	DVM	MDM Column	SAP Column
RecipientBusinessSystemID	MessageHeader	Field						
SenderParty	MessageHeader	Group						
InternalID	SenderParty	Field						
StandardID	SenderParty	List						
ContactPerson	SenderParty	Group						
InternalID	ContactPerson	Field						
OrganisationFormattedName	ContactPerson	List						
PersonFormattedName	ContactPerson	List						
PhoneNumber	ContactPerson	List						
FaxNumber	ContactPerson	List						
EmailURI	ContactPerson	List						
RecipientParty	MessageHeader	List						
InternalID	RecipientParty	Field						
StandardID	RecipientParty	List						
ContactPerson	RecipientParty	Group						
InternalID	ContactPerson	Field						
OrganisationFormattedName	ContactPerson	List						
PersonFormattedName	ContactPerson	List						
PhoneNumber	ContactPerson	List						
FaxNumber	ContactPerson	List						
EmailURI	ContactPerson	List						
BusinessScope	MessageHeader	List						
TypeCode	BusinessScope	Field						
InstanceID	BusinessScope	Field						
ID	BusinessScope	Field						
UtilitiesDevice	UtilitiesDeviceERP SmartMeterChangeRequest	Group	syncRequestDetails	DX-OngoingSyncRequestDevice	Group			
			original	syncRequestDetails	Group			
			finalSnapshot	original	Group			

SAP Meter Request Message			MDM Device Request Message			DVM Mapping		
Element Name	Parent Element	Type	Element Name	Parent Element	Type	DVM	MDM Column	SAP Column
			transactionType	finalSnapshot	Field			
ID	UtilitiesDevice	Field	externalId	DX-OngoingSyncRequestDevice	Field			
			unmappedElements	finalSnapshot	Group			
			UtilitiesDevice	unmappedElements	Group			
StartDate	UtilitiesDevice	Field	StartDate	UtilitiesDevice	Field			
EndDate	UtilitiesDevice	Field	EndDate	UtilitiesDevice	Field			
SerialID	UtilitiesDevice		serialNumber	finalSnapshot	Field			
MaterialID	UtilitiesDevice	Field	deviceType	finalSnapshot	Field	MDU S_DeviceType	OUMDM_ DeviceType	SAP_Mat erialID
ProductUniqueItemID	UtilitiesDevice	Field	internalMeterNumber	finalSnapshot	Field			
IndividualMaterialManufacturerInformation	UtilitiesDevice	Group	IndividualMaterialManufacturerInformation	unmappedElements	Group			
PartyInternalID	IndividualMaterialManufacturerInformation	Field	manufacturer	finalSnapshot	Field	MDU S_Manufacturer	OUMDM_ Manufacturer	SAP_Par tyInternalID
PartNumberID	IndividualMaterialManufacturerInformation	Field	PartNumberID	IndividualMaterialManufacturerInformation	Field			
SerialID	IndividualMaterialManufacturerInformation	Field	SerialID	IndividualMaterialManufacturerInformation	Field			
SmartMeter	UtilitiesDevice	Group						
UtilitiesAdvancedMeteringSystemID	SmartMeter	Field	UtilitiesAdvancedMeteringSystemID	finalSnapshot	Field			
			customElements	finalSnapshot	Field			
			formattedElements	finalSnapshot	Group			

## Device Change Response Mapping

MDM Device Sync Response Message			SAP Meter Sync Response Message		
Element Name	Parent Element	Type	Element Name	Parent Element	Type
sendDetails		Outermost Tag	UtilitiesDeviceERPSmartMeterChangeConfirmation		OutermostTag
transactionType	sendDetails	Field			
			MessageHeader	UtilitiesDeviceERPSmartMeterChangeConfirmation	Group
			ID	MessageHeader	Field
			UUID	MessageHeader	Field
			ReferenceID	MessageHeader	Field
externalReferenceId	sendDetails	Field	ReferenceUUID	MessageHeader	Field
			CreationDateTime	MessageHeader	Field
			TestDataIndicator	MessageHeader	Field
			ReconciliationIndicator	MessageHeader	Field
			SenderBusinessSystemID	MessageHeader	Field
			RecipientBusinessSystemID	MessageHeader	Field
			SenderParty	MessageHeader	Group
			InternalID	SenderParty	Field
			StandardID	SenderParty	List
			ContactPerson	SenderParty	Group
			InternalID	ContactPerson	Field
			OrganisationFormattedName	ContactPerson	List
			PersonFormattedName	ContactPerson	List
			PhoneNumber	ContactPerson	List
			FaxNumber	ContactPerson	List
			EmailURI	ContactPerson	List
			RecipientParty	MessageHeader	List
			InternalID	RecipientParty	Field
			StandardID	RecipientParty	List
			ContactPerson	RecipientParty	Group
			InternalID	ContactPerson	Field
			OrganisationFormattedName	ContactPerson	List
			PersonFormattedName	ContactPerson	List
			PhoneNumber	ContactPerson	List
			FaxNumber	ContactPerson	List
			EmailURI	ContactPerson	List
			BusinessScope	MessageHeader	List
			TypeCode	BusinessScope	Field
			InstanceID	BusinessScope	Field
			ID	BusinessScope	Field
			UtilitiesDevice	UtilitiesDeviceERPSmartMeterChangeConfirmation	Group

MDM Device Sync Response Message			SAP Meter Sync Response Message		
Element Name	Parent Element	Type	Element Name	Parent Element	Type
deviceId	sendDetails	Field	ID	UtilitiesDevice	Field
exceptionInformation	sendDetails	Group	Log	UtilitiesDeviceERPSmartMeterChangeConfirmation	Group
			BusinessDocumentProcessingResultCode	Log	Field
			MaximumLogItemSeverityCode	Log	Field
exceptionInformationList	exceptionInformation	List	Item	Log	List
sequence	exceptionInformationList	Field			
messageParameters	exceptionInformationList	List			
parameterSequence	messageParameters	Field			
messageParameterType	messageParameters	Field			
messageParameterValue	messageParameters	Field			
			TypeID	Item	Field
messageCategory	exceptionInformationList	Field			
			CategoryCode	Item	Field
messageNumber	exceptionInformationList	Field	SeverityCode	Item	Field
			ReferenceObjectNodeSenderTechnicalID	Item	Field
comments	exceptionInformationList	Field	Note	Item	Field
			WebURI	Item	Field
customElements	sendDetails	Field			

## Device Configuration Create

### Device Configuration Create Request Mapping

SAP Meter Register Request Message			MDM Device Config Request Message			DVM Mapping		
Element Name	Parent Element	Type	Element Name	Parent Element	Type	DVM	MDM Column	SAP Column
UtilitiesDeviceERPSmartMeterRegisterCreateRequest		Outermost Tag	DX-SyncRequestInboundComposite		Outermost Tag			
			syncRequestID	DX-Composite SyncRequestDCI	Field			

SAP Meter Register Request Message			MDM Device Config Request Message			DVM Mapping		
Element Name	Parent Element	Type	Element Name	Parent Element	Type	DVM	MDM Column	SAP Column
			bo	DX-Composite SyncRequestDCI	Field			
			boStatus	DX-Composite SyncRequestDCI	Field			
			createDateTime	DX-Composite SyncRequestDCI	Field			
			statusDateTime	DX-Composite SyncRequestDCI	Field			
			initialLoad	DX-Composite SyncRequestDCI	Field			
			targetMo	DX-Composite SyncRequestDCI	Field			
			externalPkValue1	DX-Composite SyncRequestDCI	Field			
			externalPkValue2	DX-Composite SyncRequestDCI	Field			
			externalPkValue3	DX-Composite SyncRequestDCI	Field			
			externalPkValue4	DX-Composite SyncRequestDCI	Field			
			externalPkValue5	DX-Composite SyncRequestDCI	Field			
			productionPkValue	DX-Composite SyncRequestDCI	Field			
MessageHeader	UtilitiesDeviceERPSmartMeterRegisterCreateRequest	Group						
ID	MessageHeader	Field						
UUID	MessageHeader	Field	externalReferenceld	DX-Composite SyncRequestDCI	Field			
ReferenceID	MessageHeader	Field						
ReferenceUUID	MessageHeader	Field						



SAP Meter Register Request Message			MDM Device Config Request Message			DVM Mapping		
Element Name	Parent Element	Type	Element Name	Parent Element	Type	DVM	MDM Column	SAP Column
	header							
CreationDateTi me	MessageH eader	Field						
TestDataIndicat or	MessageH eader	Field						
ReconciliationIn dicator	MessageH eader	Field						
SenderBusines sSystemID	MessageH eader	Field	externalSyste m	DX- Composite SyncRequ estDCI	Field	MDUS _Exter nalSys tem.dv m	OUMDM _External System	SAP_Sen derBusiness SystemID
RecipientBusin essSystemID	MessageH eader	Field						
SenderParty	MessageH eader	Group						
InternalID	SenderPar ty	Field						
StandardID	SenderPar ty	List						
ContactPerson	SenderPar ty	Group						
InternalID	ContactPe rson	Field						
OrganisationFo rmattedName	ContactPe rson	List						
PersonFormatt edName	ContactPe rson	List						
PhoneNumber	ContactPe rson	List						
FaxNumber	ContactPe rson	List						
EmailURI	ContactPe rson	List						
RecipientParty	MessageH eader	List						
InternalID	RecipientP arty	Field						
StandardID	RecipientP arty	List						
ContactPerson	RecipientP arty	Group						
InternalID	ContactPe rson	Field						
OrganisationFo rmattedName	ContactPe rson	List						
PersonFormatt edName	ContactPe rson	List						
PhoneNumber	ContactPe rson	List						
FaxNumber	ContactPe rson	List						
EmailURI	ContactPe rson	List						
BusinessScope	MessageH eader	List						
TypeCode	BusinessS cope	Field						
InstanceID	BusinessS cope	Field						

SAP Meter Register Request Message			MDM Device Config Request Message			DVM Mapping		
Element Name	Parent Element	Type	Element Name	Parent Element	Type	DVM	MDM Column	SAP Column
ID	BusinessScope	Field						
UtilitiesDevice	UtilitiesDeviceERPSmartMeterRegisterCreateRequest	Group	syncRequestDetails	DX-Composite SyncRequestDCI	Group			
			original	syncRequestDetails	Group			
			finalSnapshot	original	Group			
			transactionType	syncRequestDetails	Field			
			deviceConfigurationInfo	finalSnapshot	Group			
			deviceConfigurationType	deviceConfigurationInfo	Field			
ID	UtilitiesDevice	Field	deviceId	deviceConfigurationInfo	Field			
			externalId	deviceConfigurationInfo	Field			
			effectiveDateTime	deviceConfigurationInfo	Field			
			customElements	deviceConfigurationInfo	Group			
			formattedElements	deviceConfigurationInfo	Group			
			measuringComponentInfo	finalSnapshot	Group			
			measuringComponentList	measuringComponentInfo	List			
			measuringComponentType	measuringComponentList	Field			
			deviceConfigurationId	measuringComponentList	Field			
			unmappedElements	measuringComponentList	Group			
Register	UtilitiesDevice	List	register	unmappedElements	Group			
StartDate	Register	Field	startDate	register	Field			
EndDate	Register	Field	endDate	register	Field			
			channelId	measuringComponentList	Field			
UtilitiesMeasurementTaskId	Register	Field	utilitiesMeasurementTaskId	measuringComponentList	Field			
UtilitiesObjectIdentificationSystemCodeText	Register	Field	utilitiesObjectIdentificationSystemCodeText	register	Field			

SAP Meter Register Request Message			MDM Device Config Request Message			DVM Mapping		
Element Name	Parent Element	Type	Element Name	Parent Element	Type	DVM	MDM Column	SAP Column
UtilitiesMeasurementTaskCategoryCode	Register	Field	consumptiveSubtractive	measuringComponentList	Field	MDUS_ConsumptiveSubtractive.dvm	OUMDM_ConsumptiveSubtractive	SAP_UtilitiesMeasurementTaskCategoryCode
UtilitiesDivisionCategoryCode	Register	Field	utilitiesDivisionCategoryCode	register	Field			
UtilitiesMeasurementRecurrenceCode	Register	Field	intervalSize	measuringComponentList	Field			
TimeZoneCode	Register	Field	timeZoneCode	register	Field			
Specifications	Register	Group						
UtilitiesTimeOfUseCode	Specifications	Field	tou	measuringComponentList	Field	MDUS_TOU.dvm	OUMDM_TOU	SAP_UtilitiesTimeOfUseCode
MeasureUnitCode	Specifications	Field	uom	measuringComponentList	Field	MDUS_UOM.dvm	OUMDM_UOM	SAP_MeasureUnitCode
DecimalValuePrecision	Specifications	Group	fullScale	measuringComponentList	Field			
TotalDigitNumberValue	DecimalValuePrecision	Field	numberOfDigitsRight	measuringComponentList	Field			
FractionDigitNumberValue	DecimalValuePrecision	Field	numberOfDigitsLeft	measuringComponentList	Field			
MeterReadingResultAdjustmentFactorValue	Specifications	Field	registerMultiplier	measuringComponentList	Field			
			channelMultiplier	measuringComponentList	Field			
			howToUse	measuringComponentList	Field			
SmartMeter	UtilitiesDevice	Group	smartMeter	unmappedElements	Group			
UtilitiesAdvancedMeteringSystemID	SmartMeter	Field	utilitiesAdvancedMeteringSystemID	smartMeter	Field			
			customElements	measuringComponentList	Group			
			formattedElements	measuringComponentList	Group			
			installEventInfo	finalSnapshot	Group			
			deviceConfigurationId	installEventInfo	Field			
ID	UtilitiesDevice	Field	deviceId	installEventInfo	Field			
			installationConstant	installEventInfo	Field			
			installDateTime	installEventInfo	Field			
			removalDateTime	installEventInfo	Field			

SAP Meter Register Request Message			MDM Device Config Request Message			DVM Mapping		
Element Name	Parent Element	Type	Element Name	Parent Element	Type	DVM	MDM Column	SAP Column
			externalId	installEvenInfo	Field			
			spld	installEvenInfo	Field			
			customElements	installEvenInfo	Group			
			formattedElements	installEvenInfo	Group			

## Device Configuration Create Response Mapping

MDM Device Config Response Message			SAP Meter Register Response Message		
Element Name	Parent Element	Type	Element Name	Parent Element	Type
sendDetails		OutermostTag	UtilitiesDeviceERP SmartMeterCreateConfirmation		OutermostTag
transactionType	sendDetails	Field			
			MessageHeader	UtilitiesDeviceERP SmartMeterRegisterCreateConfirmation	Group
			ID	MessageHeader	Field
			UUID	MessageHeader	Field
			ReferenceID	MessageHeader	Field
externalReferenceId	sendDetails	Field	ReferenceUUID	MessageHeader	Field
			CreationDateTime	MessageHeader	Field
			TestDataIndicator	MessageHeader	Field
			ReconciliationIndicator	MessageHeader	Field
			SenderBusinessSystemID	MessageHeader	Field
			RecipientBusinessSystemID	MessageHeader	Field
			SenderParty	MessageHeader	Group
			InternalID	SenderParty	Field
			StandardID	SenderParty	List
			ContactPerson	SenderParty	Group
			InternalID	ContactPerson	Field
			OrganisationFormattedName	ContactPerson	List
			PersonFormattedName	ContactPerson	List
			PhoneNumber	ContactPerson	List
			FaxNumber	ContactPerson	List
			EmailURI	ContactPerson	List
			RecipientParty	MessageHeader	List
			InternalID	RecipientParty	Field

MDM Device Config Response Message			SAP Meter Register Response Message		
Element Name	Parent Element	Type	Element Name	Parent Element	Type
			StandardID	RecipientParty	List
			ContactPerson	RecipientParty	Group
			InternalID	ContactPerson	Field
			OrganisationFormattedName	ContactPerson	List
			PersonFormattedName	ContactPerson	List
			PhoneNumber	ContactPerson	List
			FaxNumber	ContactPerson	List
			EmailURI	ContactPerson	List
			BusinessScope	MessageHeader	List
			TypeCode	BusinessScope	Field
			InstanceID	BusinessScope	Field
			ID	BusinessScope	Field
			UtilitiesDevice	UtilitiesDeviceERP SmartMeterRegisterCreateConfirmation	Group
deviceID	sendDetails	Field	ID	UtilitiesDevice	Field
exceptionInformation	sendDetails	Group	Log	UtilitiesDeviceERP SmartMeterRegisterCreateConfirmation	Group
			BusinessDocumentProcessingResultCode	Log	Field
			MaximumLogItemSeverityCode	Log	Field
exceptionInformationList	exceptionInformation	List	Item	Log	List
sequence	exceptionInformationList	Field			
			TypeID	Item	Field
messageCategory	exceptionInformationList	Field			
			CategoryCode	Item	Field
messageNumber	exceptionInformationList	Field	SeverityCode	Item	Field
			ReferenceObjectNodeSenderTechnicalID	Item	Field
comments	exceptionInformationList	Field	Note	Item	Field
messageParameters	exceptionInformationList	List			
parameterSequence	messageParameters	Field			
messageParameterType	messageParameters	Field			
messageParameterValue	messageParameters	Field			
			WebURI	Item	Field
customElements	sendDetails	Field			

## Device Configuration Change

### Device Configuration Change Request Mapping

SAP Meter Register Request Message			MDM Device Config Request Message			DVM Mapping		
Element Name	Parent Element	Type	Element Name	Parent Element	Type	DVM	MDM Column	SAP Column
UtilitiesDevice ERPSmartMeterRegisterChangeRequest		OutermostTag	DX-SyncRequestInboundComposite		OutermostTag			
			syncRequestId	DX-CompositeSyncRequestDCI	Field			
			bo	DX-CompositeSyncRequestDCI	Field			
			boStatus	DX-CompositeSyncRequestDCI	Field			
			createDateTime	DX-CompositeSyncRequestDCI	Field			
			statusDateTime	DX-CompositeSyncRequestDCI	Field			
			initialLoad	DX-CompositeSyncRequestDCI	Field			
			targetMo	DX-CompositeSyncRequestDCI	Field			
			externalPkValue1	DX-CompositeSyncRequestDCI	Field			
			externalPkValue2	DX-CompositeSyncRequestDCI	Field			
			externalPkValue3	DX-CompositeSyncRequestDCI	Field			
			externalPkValue4	DX-CompositeSyncRequestDCI	Field			
			externalPkValue5	DX-CompositeSyncRequestDCI	Field			
			productionPkValue	DX-CompositeSyncRequestDCI	Field			

SAP Meter Register Request Message			MDM Device Config Request Message			DVM Mapping		
Element Name	Parent Element	Type	Element Name	Parent Element	Type	DVM	MDM Column	SAP Column
MessageHeader	UtilitiesDeviceERPSmartMeterRegisterChangeRequest	Group						
ID	MessageHeader	Field						
UUID	MessageHeader	Field	externalReferenceId	DX-CompositeSyncRequestCI	Field			
ReferenceID	MessageHeader	Field						
ReferenceUID	MessageHeader	Field						
CreationDateTime	MessageHeader	Field						
TestDataIndicator	MessageHeader	Field						
ReconciliationIndicator	MessageHeader	Field						
SenderBusinessSystemID	MessageHeader	Field	externalSystem	DX-CompositeSyncRequestCI	Field	MDUS_ExternalSystem.dvm	OUMDM_ExternalSystem	SAP_SenderBusinessSystemID
RecipientBusinessSystemID	MessageHeader	Field						
SenderParty	MessageHeader	Group						
InternalID	SenderParty	Field						
StandardID	SenderParty	List						
ContactPerson	SenderParty	Group						
InternalID	ContactPerson	Field						
OrganisationFormattedName	ContactPerson	List						
PersonFormattedName	ContactPerson	List						
PhoneNumber	ContactPerson	List						
FaxNumber	ContactPerson	List						
EmailURI	ContactPerson	List						
RecipientParty	MessageHeader	List						
InternalID	RecipientParty	Field						
StandardID	RecipientParty	List						
ContactPerson	RecipientParty	Group						
InternalID	ContactPerson	Field						
OrganisationFormattedName	ContactPerson	List						

SAP Meter Register Request Message			MDM Device Config Request Message			DVM Mapping		
Element Name	Parent Element	Type	Element Name	Parent Element	Type	DVM	MDM Column	SAP Column
PersonFormattedName	ContactPerson	List						
PhoneNumber	ContactPerson	List						
FaxNumber	ContactPerson	List						
EmailURI	ContactPerson	List						
BusinessScope	MessageHeader	List						
TypeCode	BusinessScope	Field						
InstanceID	BusinessScope	Field						
ID	BusinessScope	Field						
UtilitiesDevice	UtilitiesDeviceERPSmartMeterRegisterChangeRequest	Group	syncRequestDetails	DX-CompositeSyncRequestDetails	Group			
			original	syncRequestDetails	Group			
			finalSnapshot	original	Group			
			transactionType	syncRequestDetails	Field			
			deviceConfigurationInfo	finalSnapshot	Group			
			deviceConfigurationType	deviceConfigurationInfo	Field			
ID	UtilitiesDevice	Field	deviceId	deviceConfigurationInfo	Field			
			externalId	deviceConfigurationInfo	Field			
			effectiveDateTime	deviceConfigurationInfo	Field			
			customElements	deviceConfigurationInfo	Group			
			formattedElements	deviceConfigurationInfo	Group			
			measuringComponentInfo	finalSnapshot	Group			
			measuringComponentList	measuringComponentInfo	List			
			measuringComponentType	measuringComponentList	Field			
			deviceConfigurationId	measuringComponentList	Field			
			unmappedElements	measuringComponentList	Group			
			utilitiesDevice	unmappedElements	Group			
RegisterListCompleteTransmissionIndicator	UtilitiesDevice	Field	registerListCompleteTransmissionIndicator	utilitiesDevice	Field			



SAP Meter Register Request Message			MDM Device Config Request Message			DVM Mapping		
Element Name	Parent Element	Type	Element Name	Parent Element	Type	DVM	MDM Column	SAP Column
Register	UtilitiesDevice	List	register	unmappedElements	Group			
StartDate	Register	Field	startDate	register	Field			
EndDate	Register	Field	endDate	register	Field			
			channelId	measuringComponentList	Field			
UtilitiesMeasurementTaskID	Register	Field	utilitiesMeasurementTaskId	measuringComponentList	Field			
UtilitiesObjectIdentificationSystemCodeText	Register	Field	utilitiesObjectIdentificationSystemCodeText	register	Field			
UtilitiesMeasurementTaskCategoryCode	Register	Field	consumptiveSubtractive	measuringComponentList	Field	MDUS_ConsumptiveSubtractive.dvm	OUMDM_ConsumptiveSubtractive	SAP_UtilityMeasurementTaskCategoryCode
UtilitiesDivisionCategoryCode	Register	Field	utilitiesDivisionCategoryCode	register	Field			
UtilitiesMeasurementRecurrenceCode	Register	Field	intervalSize	measuringComponentList	Field			
TimeZoneCode	Register	Field	timeZoneCode	register	Field			
Specifications	Register	Group	specifications	unmappedElements	Group			
StartDate	Specifications	Field	startDate	specifications	Field			
EndDate	Specifications	Field	endDate	specifications	Field			
UtilitiesTimeOfUseCode	Specifications	Field	tou	measuringComponentList	Field	MDUS_TOU.dvm	OUMDM_TOU	SAP_UtilityTimeOfUseCode
MeasureUnitCode	Specifications	Field	uom	measuringComponentList	Field	MDUS_UOM.dvm	OUMDM_UOM	SAP_MeasureUnitCode
DecimalValuePrecision	Specifications	Group	fullScale	measuringComponentList	Field			
TotalDigitNumberValue	DecimalValuePrecision	Field	numberOfDigitsRight	measuringComponentList	Field			
FractionDigitNumberValue	DecimalValuePrecision	Field	numberOfDigitsLeft	measuringComponentList	Field			
MeterReadingResultAdjustmentFactorValue	Specifications	Field	registerMultiplier	measuringComponentList	Field			
			channelMultiplier	measuringComponentList	Field			
			howToUse	measuringComponentList	Field			

SAP Meter Register Request Message			MDM Device Config Request Message			DVM Mapping		
Element Name	Parent Element	Type	Element Name	Parent Element	Type	DVM	MDM Column	SAP Column
SmartMeter	UtilitiesDevice	Group	smartMeter	unmappedElements	Group			
UtilitiesAdvancedMeteringSystemID	SmartMeter	Field	utilitiesAdvancedMeteringSystemID	smartMeter	Field			
			customElements	measuringComponentList	Group			
			formattedElements	measuringComponentList	Group			
			installEventInfo	finalSnapshot	Group			
			deviceConfigurationId	installEventInfo	Field			
			deviceId	installEventInfo	Field			
			installationConstant	installEventInfo	Field			
			installDateTime	installEventInfo	Field			
			removalDateTime	installEventInfo	Field			
			externalId	installEventInfo	Field			
			spld	installEventInfo	Field			
			customElements	installEventInfo	Group			
			formattedElements	installEventInfo	Group			

## Device Configuration Change Response Mapping

MDM Device Config Response Message			SAP Meter Register Response Message		
Element Name	Parent Element	Type	Element Name	Parent Element	Type
sendDetails		Outermost Tag	UtilitiesDeviceERPSmartMeterChangeConfirmation		OutermostTag
transactionType	sendDetails	Field			
			MessageHeader	UtilitiesDeviceERPSmartMeterRegisterChangeConfirmation	Group
			ID	MessageHeader	Field
			UUID	MessageHeader	Field
			ReferenceID	MessageHeader	Field
externalReferenceId	sendDetails	Field	ReferenceUUID	MessageHeader	Field
			CreationDateTime	MessageHeader	Field
			TestDataIndicator	MessageHeader	Field
			ReconciliationIndicator	MessageHeader	Field
			SenderBusinessSystemID	MessageHeader	Field
			RecipientBusinessSystemID	MessageHeader	Field

MDM Device Config Response Message			SAP Meter Register Response Message		
Element Name	Parent Element	Type	Element Name	Parent Element	Type
			SenderParty	MessageHeader	Group
			InternalID	SenderParty	Field
			StandardID	SenderParty	List
			ContactPerson	SenderParty	Group
			InternalID	ContactPerson	Field
			OrganisationFormattedName	ContactPerson	List
			PersonFormattedName	ContactPerson	List
			PhoneNumber	ContactPerson	List
			FaxNumber	ContactPerson	List
			EmailURI	ContactPerson	List
			RecipientParty	MessageHeader	List
			InternalID	RecipientParty	Field
			StandardID	RecipientParty	List
			ContactPerson	RecipientParty	Group
			InternalID	ContactPerson	Field
			OrganisationFormattedName	ContactPerson	List
			PersonFormattedName	ContactPerson	List
			PhoneNumber	ContactPerson	List
			FaxNumber	ContactPerson	List
			EmailURI	ContactPerson	List
			BusinessScope	MessageHeader	List
			TypeCode	BusinessScope	Field
			InstanceID	BusinessScope	Field
			ID	BusinessScope	Field
			UtilitiesDevice	UtilitiesDeviceE RPSmartMeterR egisterChangeC onfirmation	Group
deviceld	sendDetails	Field	ID	UtilitiesDevice	Field
exceptionInformation	sendDetails	Group	Log	UtilitiesDeviceE RPSmartMeterR egisterChangeC onfirmation	Group
			BusinessDocumentProcessingResultCode	Log	Field
			MaximumLogItemSeverityCode	Log	Field
exceptionInformationList	exceptionInformation	List	Item	Log	List
sequence	exceptionInformationList	Field			
			TypeID	Item	Field
messageCategory	exceptionInformationList	Field			
			CategoryCode	Item	Field
messageNumber	exceptionInformationList	Field	SeverityCode	Item	Field
			ReferenceObjectNodeSenderTechnicalID	Item	Field

MDM Device Config Response Message			SAP Meter Register Response Message		
Element Name	Parent Element	Type	Element Name	Parent Element	Type
comments	exceptionInformationList	Field	Note	Item	Field
messageParameters	exceptionInformationList	List			
parameterSequence	messageParameters	Field			
messageParameterType	messageParameters	Field			
messageParameterValue	messageParameters	Field			
			WebURI	Item	Field
customElements	sendDetails	Field			

## Service Point Sync

### Service Point Sync Request Mapping

SAP Meter Request Message			MDM Device Request Message			DVM Mapping		
Element Name	Parent Element	Type	Element Name	Parent Element	Type	DVM	MDM Column	SAP Column
UtilitiesDeviceERPSmartMeterLocationNotification		OutermostTag	D1-SyncRequestInbound		OutermostTag			
			syncRequestId	DX-OngoingSyncRequestSP	Field			
			bo	DX-OngoingSyncRequestSP	Field			
			boStatus	DX-OngoingSyncRequestSP	Field			
			createDateTime	DX-OngoingSyncRequestSP	Field			
			statusDateTime	DX-OngoingSyncRequestSP	Field			
			initialLoad	DX-OngoingSyncRequestSP	Field			
			targetMo	DX-OngoingSyncRequestSP	Field			

SAP Meter Request Message			MDM Device Request Message			DVM Mapping		
Element Name	Parent Element	Type	Element Name	Parent Element	Type	DVM	MDM Column	SAP Column
			externalPkV alue1	DX- OngoingSy ncRequest SP	Field			
			externalPkV alue2	DX- OngoingSy ncRequest SP	Field			
			externalPkV alue3	DX- OngoingSy ncRequest SP	Field			
			externalPkV alue4	DX- OngoingSy ncRequest SP	Field			
			externalPkV alue5	DX- OngoingSy ncRequest SP	Field			
			productionP kValue	DX- OngoingSy ncRequest SP	Field			
MessageHeader	UtilitiesDevice ERPSmartMet erLocationNoti fication	Group						
ID	MessageHeader	Field						
UUID	MessageHeader	Field	externalRef erenceId	DX- OngoingSy ncRequest SP	Field			
ReferenceID	MessageHeader	Field						
ReferenceU UID	MessageHeader	Field						
CreationDate Time	MessageHeader	Field						
TestDataIndi cator	MessageHeader	Field						
Reconciliatio nIndicator	MessageHeader	Field						
SenderBusin essSystemID	MessageHeader	Field	externalSyst em	DX- OngoingSy ncRequest Device	Field	MDUS_ External System. dvm	OUMDM _External System	SAP_Send erBusiness SystemID
RecipientBus inessSystemI D	MessageHeader	Field						
SenderParty	MessageHeader	Group						
InternalID	SenderParty	Field						
StandardID	SenderParty	List						
ContactPers on	SenderParty	Group						
InternalID	ContactPerso n	Field						
Organisation FormattedNa me	ContactPerso n	List						

SAP Meter Request Message			MDM Device Request Message			DVM Mapping		
Element Name	Parent Element	Type	Element Name	Parent Element	Type	DVM	MDM Column	SAP Column
PersonFormattedName	ContactPerson	List						
PhoneNumber	ContactPerson	List						
FaxNumber	ContactPerson	List						
EmailURI	ContactPerson	List						
RecipientParty	MessageHeader	List						
InternalID	RecipientParty	Field						
StandardID	RecipientParty	List						
ContactPerson	RecipientParty	Group						
InternalID	ContactPerson	Field						
OrganisationFormattedName	ContactPerson	List						
PersonFormattedName	ContactPerson	List						
PhoneNumber	ContactPerson	List						
FaxNumber	ContactPerson	List						
EmailURI	ContactPerson	List						
BusinessScope	MessageHeader	List						
TypeCode	BusinessScope	Field						
InstanceID	BusinessScope	Field						
ID	BusinessScope	Field						
UtilitiesDevice	UtilitiesDeviceERPSmartMeterLocationNotification	Group	syncRequestDetails	DX-OngoingSyncRequestSP	Group			
			original	syncRequestDetails	Group			
			finalSnapshot	original	Group			
			spType	finalSnapshot	Field			
ID	UtilitiesDevice	Field	deviceId	finalSnapshot	Field			
			unmappedElements	finalSnapshot	Group			
			location	unmappedElements	Group			
Location	UtilitiesDevice	List	locationList	location	List			
StartDate	Location	Field	startDate	locationList	Field			
EndDate	Location	Field	endDate	locationList	Field			
InstallationPointID	Location	Field	installationPointID	locationList	Field			
InstallationPointID	Location	Field	externalId	finalSnapshot	Field			
InstallationPointAddressInf	Location	Group	installationPointAddress	locationList	Group			

SAP Meter Request Message			MDM Device Request Message			DVM Mapping		
Element Name	Parent Element	Type	Element Name	Parent Element	Type	DVM	MDM Column	SAP Column
Information			Information					
HouseID	InstallationPointAddressInformation	Field	houseID	InstallationPointAddressInformation	Field			
StreetPostalCode	InstallationPointAddressInformation	Field	postal	finalSnapshot	Field			
StreetPostalCode	InstallationPointAddressInformation	Field	streetPostalCode	InstallationPointAddressInformation	Field			
CityName	InstallationPointAddressInformation	Field	city	finalSnapshot	Field			
CityName	InstallationPointAddressInformation	Field	cityName	InstallationPointAddressInformation	Field			
StreetName	InstallationPointAddressInformation	Field	address1	finalSnapshot	Field			
StreetName	InstallationPointAddressInformation	Field	streetName	InstallationPointAddressInformation	Field			
CountryCode	InstallationPointAddressInformation	Field	country	finalSnapshot	Field	MDUS_Country	OUMDM_CountryCode	SAP_CountryCode
CountryCode	InstallationPointAddressInformation	Field	countryCode	InstallationPointAddressInformation	Field			
RegionCode	InstallationPointAddressInformation	Field	RegionCode	InstallationPointAddressInformation	Field			
TimeZoneCode	InstallationPointAddressInformation	Field	timeZone			MDUS_TimeZone	OUMDM_TimeZone	SAP_TimeZoneCode
TimeZoneCode	InstallationPointAddressInformation	Field	TimeZoneCode	InstallationPointAddressInformation	Field			
InstallationPointHierarchyRelationship	Location	Group	installationPointHierarchyRelationship	locationList	Group			
ParentInstallationPointID	InstallationPointHierarchyRelationship	Field	parentInstallationPointID	InstallationPointHierarchyRelationship	Field			
SmartMeter	UtilitiesDevice	Group	smartMeter	unmappedElements	Group			
UtilitiesAdvancedMeteringSystemID	SmartMeter	Field	utilitiesAdvancedMeteringSystemID	SmartMeter	Field			
			customElements	finalSnapshot	Group			
			formattedElements	finalSnapshot	Group			

## Meter Registered Notification Sync

### Meter Registered Notification Sync Request Mapping

MDM Meter Registration Message			SAP Meter Registered Notification Message		
Element Name	Parent Element	Type	Element Name	Parent Element	Type
sendDetails		Outermost Tag	UtilitiesDeviceERPSmartMeterRegisteredNotification		OutermostTag
			MessageHeader	UtilitiesDeviceERPSmartMeterRegisteredNotification	Group
			ID	MessageHeader	Field
			UUID	MessageHeader	Field
			ReferenceID	MessageHeader	Field
externalReferenceId	sendDetails	Field	ReferenceUUID	MessageHeader	Field
			CreationDateTime	MessageHeader	Field
			TestDataIndicator	MessageHeader	Field
			ReconciliationIndicator	MessageHeader	Field
			SenderBusinessSystemID	MessageHeader	Field
			RecipientBusinessSystemID	MessageHeader	Field
			SenderParty	MessageHeader	Group
			InternalID	SenderParty	Field
			StandardID	SenderParty	List
			ContactPerson	SenderParty	Group
			InternalID	ContactPerson	Field
			OrganisationFormattedName	ContactPerson	List
			PersonFormattedName	ContactPerson	List
			PhoneNumber	ContactPerson	List
			FaxNumber	ContactPerson	List
			EmailURI	ContactPerson	List
			RecipientParty	MessageHeader	List
			InternalID	RecipientParty	Field
			StandardID	RecipientParty	List
			ContactPerson	RecipientParty	Group
			InternalID	ContactPerson	Field
			OrganisationFormattedName	ContactPerson	List
			PersonFormattedName	ContactPerson	List
			PhoneNumber	ContactPerson	List
			FaxNumber	ContactPerson	List
			EmailURI	ContactPerson	List
			BusinessScope	MessageHeader	List
			TypeCode	BusinessScope	Field
			InstanceID	BusinessScope	Field
			ID	BusinessScope	Field
			UtilitiesDevice	UtilitiesDeviceERPSmartMeterRegisteredNotification	Group



MDM Meter Registration Message			SAP Meter Registered Notification Message		
Element Name	Parent Element	Type	Element Name	Parent Element	Type
deviceId	sendDetails	Field	ID	UtilitiesDevice	Field
			SmartMeter	UtilitiesDevice	Group
lastStatusUpdateDateTime	sendDetails	Field	StartDate	SmartMeter	Field
utilitiesAdvancedMeteringSystemId	sendDetails	Field	UtilitiesAdvancedMeteringSystemID	SmartMeter	Field

## Profile Allocation Sync

### Profile Allocation Sync Request Mapping

SAP Time Series ERP Measurement Task Assignment Change Request Message			MDM Profile Allocation Request Message		
Element Name	Parent Element	Type	Element Name	Parent Element	Type
UtilitiesTimeSeriesERPMeasurementTaskAssignmentChangeRequest		OutermostTag	DX-ProfileAllocationActivity		OutermostTag
			activityId	DX-ProfileAllocationActivity	Field
			bo	DX-ProfileAllocationActivity	Field
			boStatus	DX-ProfileAllocationActivity	Field
			activityType	DX-ProfileAllocationActivity	Field
			startDateTime	DX-ProfileAllocationActivity	Field
			statusReason	DX-ProfileAllocationActivity	Field
			parentActivityId	DX-ProfileAllocationActivity	Field
			creationDateTime	DX-ProfileAllocationActivity	Field
			statusDateTime	DX-ProfileAllocationActivity	Field
			msrmtTskDvcActivityId	DX-ProfileAllocationActivity	Field
MessageHeader	UtilitiesTimeSeriesERPMeasurementTaskAssignmentChangeRequest	Group			

SAP Time Series ERP Measurement Task Assignment Change Request Message			MDM Profile Allocation Request Message		
ID	MessageHeader	Field			
UUID	MessageHeader	Field	externalReferenceId	DX-ProfileAllocationActivity	Field
ReferenceID	MessageHeader	Field			
ReferenceUUID	MessageHeader	Field			
CreationDateTime	MessageHeader	Field			
TestDataIndicator	MessageHeader	Field			
ReconciliationIndicator	MessageHeader	Field			
SenderBusinessSystemID	MessageHeader	Field			
RecipientBusinessSystemID	MessageHeader	Field			
SenderParty	MessageHeader	Group			
InternalID	SenderParty	Field			
StandardID	SenderParty	List			
ContactPerson	SenderParty	Group			
InternalID	ContactPerson	Field			
OrganisationFormattedName	ContactPerson	List			
PersonFormattedName	ContactPerson	List			
PhoneNumber	ContactPerson	List			
FaxNumber	ContactPerson	List			
EmailURI	ContactPerson	List			
RecipientParty	MessageHeader	List			
InternalID	RecipientParty	Field			
StandardID	RecipientParty	List			
ContactPerson	RecipientParty	Group			
InternalID	ContactPerson	Field			
OrganisationFormattedName	ContactPerson	List			
PersonFormattedName	ContactPerson	List			
PhoneNumber	ContactPerson	List			
FaxNumber	ContactPerson	List			
EmailURI	ContactPerson	List			
BusinessScope	MessageHeader	List			
TypeCode	BusinessScope	Field			
InstanceID	BusinessScope	Field			
ID	BusinessScope	Field			
			messageDetails	DX-ProfileAllocationActivity	Group
UtilitiesTimeSeries	UtilitiesTimeSeriesERPMeasurementTaskAssignmentChangeRequest	Group	utilitiesTimeSeries	messageDetails	Group
ID	UtilitiesTimeSeries	Field	id	utilitiesTimeSeries	Field
UtilitiesMeasurementRecurrenceCode	UtilitiesTimeSeries	Field	utilitiesMeasurementRecurrenceCode	utilitiesTimeSeries	Field
MeasureUnitCode	UtilitiesTimeSeries	Field	measureUnitCode	utilitiesTimeSeries	Field

SAP Time Series ERP Measurement Task Assignment Change Request Message			MDM Profile Allocation Request Message		
				es	
CurrencyCode	UtilitiesTimeSeries	Field	currencyCode	utilitiesTimeSeries	Field
DecimalValuePrecision	UtilitiesTimeSeries	Group	decimalValuePrecision	messageDetails	Group
TotalDigitNumberValue	DecimalValuePrecision	Field	totalDigitNumberValue	decimalValuePrecision	Field
FractionDigitNumberValue	DecimalValuePrecision	Field	fractionDigitNumberValue	decimalValuePrecision	Field
ItemsRemotelyStoredIndicator	UtilitiesTimeSeries	Field	itemsStoredRemotelyIndicator	decimalValuePrecision	Field
			measurementTaskAssignmentRole	messageDetails	Group
MeasurementTaskAssignmentRole	UtilitiesTimeSeries	List	measurementTaskAssignmentRoleList	measurementTaskAssignmentRoleList	List
StartDate	MeasurementTaskAssignmentRole	Field	startDate	measurementTaskAssignmentRoleList	Field
StartTime	MeasurementTaskAssignmentRole	Field	startTime	measurementTaskAssignmentRoleList	Field
EndDate	MeasurementTaskAssignmentRole	Field	endDate	measurementTaskAssignmentRoleList	Field
EndTime	MeasurementTaskAssignmentRole	Field	endTime	measurementTaskAssignmentRoleList	Field
UtilitiesTimeSeriesAssignmentRoleCode	MeasurementTaskAssignmentRole	Field	utilitiesTimeSeriesAssignmentRoleCode	measurementTaskAssignmentRoleList	Field
UtilitiesMeasurementTaskID	MeasurementTaskAssignmentRole	Field	utilitiesMeasurementTaskId	measurementTaskAssignmentRoleList	Field

## Profile Allocation Sync Response Mapping

MDM Profile Allocation Response Message			SAP Profile Allocation Response Message		
Element Name	Parent Element	Type	Element Name	Parent Element	Type
sendDetails		OutermostTag	UtilitiesTimeSeriesERPMeasurementTaskAssignmentChangeConfirmation		OutermostTag
			MessageHeader	UtilitiesTimeSeriesERPMeasurementTaskAssignmentChangeConfirmation	Group
			ID	MessageHeader	Field
			UUID	MessageHeader	Field
			ReferenceID	MessageHeader	Field
externalReferenceId	sendDetails	Field	ReferenceUUID	MessageHeader	Field
			CreationDateTime	MessageHeader	Field
			TestDataIndicator	MessageHeader	Field
			ReconciliationIndicator	MessageHeader	Field

MDM Profile Allocation Response Message			SAP Profile Allocation Response Message		
Element Name	Parent Element	Type	Element Name	Parent Element	Type
			SenderBusinessSystemID	MessageHeader	Field
			RecipientBusinessSystemID	MessageHeader	Field
			SenderParty	MessageHeader	Group
			InternalID	SenderParty	Field
			StandardID	SenderParty	List
			ContactPerson	SenderParty	Group
			InternalID	ContactPerson	Field
			OrganisationFormattedName	ContactPerson	List
			PersonFormattedName	ContactPerson	List
			PhoneNumber	ContactPerson	List
			FaxNumber	ContactPerson	List
			EmailURI	ContactPerson	List
			RecipientParty	MessageHeader	List
			InternalID	RecipientParty	Field
			StandardID	RecipientParty	List
			ContactPerson	RecipientParty	Group
			InternalID	ContactPerson	Field
			OrganisationFormattedName	ContactPerson	List
			PersonFormattedName	ContactPerson	List
			PhoneNumber	ContactPerson	List
			FaxNumber	ContactPerson	List
			EmailURI	ContactPerson	List
			BusinessScope	MessageHeader	List
			TypeCode	BusinessScope	Field
			InstanceID	BusinessScope	Field
			ID	BusinessScope	Field
			UtilitiesTimeSeries	UtilitiesTimeSeries ERPMeasurement TaskAssignmentChangeConfirmation	Group
timeSeriesId	sendDetails	Field	ID	UtilitiesTimeSeries	Field
exceptionInformation	sendDetails	Group	Log	UtilitiesTimeSeries ERPMeasurement TaskAssignmentChangeConfirmation	Group
			BusinessDocumentProcessingResultCode	Log	Field
			MaximumLogItemSeverityCode	Log	Field
exceptionInformationList	exceptionInformation	List	Item	Log	List
sequence	exceptionInformationList	Field			
			TypeID	Item	Field
messageCategory	exceptionInformationList	Field			
			CategoryCode	Item	Field
messageNumber	exceptionInformation	Field	SeverityCode	Item	Field

MDM Profile Allocation Response Message			SAP Profile Allocation Response Message		
Element Name	Parent Element	Type	Element Name	Parent Element	Type
informationList					
			ReferenceObjectNodeSenderTechnicalID	Item	Field
comments	exceptionInformationList	Field	Note	Item	Field
messageParameters	exceptionInformationList	List			
parameterSequence	messageParameters	Field			
messageParameterType	messageParameters	Field			
messageParameterValue	messageParameters	Field			
			WebURI	Item	Field
customElements	sendDetails	Field			

## Equipment Relationship Sync

### Equipment Relationship Sync Request Mapping

SAP Smart Meter Utilities Measurement Task Device Assignment Notification Request Message			MDM Profile Allocation Request Message		
Element Name	Parent Element	Type	Element Name	Parent Element	Type
SmartMeterUtilitiesMeasurementTaskERPDeviceAssignmentNotification		OutermostTag	DX-MsrmtTaskDvcAssgmtActivity		OutermostTag
			activityId	DX-MsrmtTaskDvcAssgmtActivity	Field
			bo	DX-MsrmtTaskDvcAssgmtActivity	Field
			boStatus	DX-MsrmtTaskDvcAssgmtActivity	Field
			activityType	DX-MsrmtTaskDvcAssgmtActivity	Field
			startDateTime	DX-MsrmtTaskDvcAssgmtActivity	Field
			statusReason	DX-MsrmtTaskDvcAssgmtActivity	Field

SAP Smart Meter Utilities Measurement Task Device Assignment Notification Request Message			MDM Profile Allocation Request Message		
Element Name	Parent Element	Type	Element Name	Parent Element	Type
			parentActivityId	DX-MsrmtTaskDvcAssgmtActivity	Field
			creationDateTime	DX-MsrmtTaskDvcAssgmtActivity	Field
			statusDateTime	DX-MsrmtTaskDvcAssgmtActivity	Field
			msrmtTskDvcActivityId	DX-MsrmtTaskDvcAssgmtActivity	Field
MessageHeader	SmartMeterUtilitiesMeasurementTaskERPDeviceAssignmentNotification	Group			
ID	MessageHeader	Field			
UUID	MessageHeader	Field	externalReferenceId	DX-MsrmtTaskDvcAssgmtActivity	Field
ReferenceID	MessageHeader	Field			
ReferenceUUID	MessageHeader	Field			
CreationDateTime	MessageHeader	Field			
TestDataIndicator	MessageHeader	Field			
ReconciliationIndicator	MessageHeader	Field			
SenderBusinessSystemID	MessageHeader	Field			
RecipientBusinessSystemID	MessageHeader	Field			
SenderParty	MessageHeader	Group			
InternalID	SenderParty	Field			
StandardID	SenderParty	List			
ContactPerson	SenderParty	Group			
InternalID	ContactPerson	Field			
OrganisationFormattedName	ContactPerson	List			
PersonFormattedName	ContactPerson	List			
PhoneNumber	ContactPerson	List			
FaxNumber	ContactPerson	List			
EmailURI	ContactPerson	List			
RecipientParty	MessageHeader	List			

SAP Smart Meter Utilities Measurement Task Device Assignment Notification Request Message			MDM Profile Allocation Request Message		
Element Name	Parent Element	Type	Element Name	Parent Element	Type
InternalID	RecipientParty	Field			
StandardID	RecipientParty	List			
ContactPerson	RecipientParty	Group			
InternalID	ContactPerson	Field			
OrganisationFormattedName	ContactPerson	List			
PersonFormattedName	ContactPerson	List			
PhoneNumber	ContactPerson	List			
FaxNumber	ContactPerson	List			
EmailURI	ContactPerson	List			
BusinessScope	MessageHeader	List			
TypeCode	BusinessScope	Field			
InstanceID	BusinessScope	Field			
ID	BusinessScope	Field			
			messageDetails	DX-MsrmtTaskDvcAssgmtActivity	Group
UtilitiesMeasurementTask	SmartMeterUtilitiesMeasurementTaskERPDeviceAssignmentNotification	Group	utilitiesMeasurementTask	messageDetails	Group
ID	UtilitiesMeasurementTask	Field	id	utilitiesMeasurementTask	Field
			deviceAssignment	messageDetails	Group
DeviceAssignment	UtilitiesMeasurementTask	List	deviceAssignmentList	deviceAssignment	List
StartDate	DeviceAssignment	Field	startDate	deviceAssignment	Field
EndDate	UtilitiesMeasurementTask	Field	endDate	deviceAssignment	Field
TypeCode	UtilitiesMeasurementTask	Field	typeCode	deviceAssignment	Field
UtilitiesQuantityAdjustmentFactorValue	UtilitiesMeasurementTask	Field	utilitiesQuantityAdjustmentFactorValue	deviceAssignment	Field
AssignedUtilitiesDeviceID	UtilitiesMeasurementTask	Field	assignedUtilitiesDeviceId	deviceAssignment	Field
UtilitiesDevice	UtilitiesMeasurementTask	Group	utilitiesDevice	messageDetails	Group
UtilitiesDeviceID	UtilitiesDevice	Field	utilitiesDeviceId	utilitiesDevice	Field
SmartMeter	UtilitiesDevice	Group	smartMeter	messageDetails	Group

SAP Smart Meter Utilities Measurement Task Device Assignment Notification Request Message			MDM Profile Allocation Request Message		
Element Name	Parent Element	Type	Element Name	Parent Element	Type
UtilitiesAdvancedMeteringSystemID	SmartMeter	Field	utilitiesAdvancedMeteringSystemId	smartMeter	Field

## Usage

### Usage Request Mapping

SAP Utilities Time Series Calculation ERP Create Request Message			MDM Usage Request Message			DVM Mapping		
Element Name	Parent Element	Type	Element Name	Parent Element	Type	DVM	MDM Column	SAP Column
UtilitiesTimeSeriesCalculationERPBulkCreateRequest		OutermostTag	D2-UsageTransactionRequestInbound		OuterMost			
MessageHeader	UtilitiesTimeSeriesCalculationERPBulkCreateRequest	Group						
ID	MessageHeader	Field						
UUID	MessageHeader	Field	bulkMessageId	D2-UsageTransactionRequestInbound	Field			
ReferenceID	MessageHeader	Field						
ReferenceUUID	MessageHeader	Field						
CreationDateTime	MessageHeader	Field						
UtilitiesTimeSeriesCalculationERPCreateRequestMessage	UtilitiesTimeSeriesCalculationERPBulkCreateRequest	List						
MessageHeader	UtilitiesTimeSeriesCalculationERPCreateRequestMessage	Group						
ID	MessageHeader	Field						
UUID	MessageHeader	Field	externalId	D2-UsageTransactionRequestInbound	Field			
ReferenceID	MessageHeader	Field						



SAP Utilities Time Series Calculation ERP Create Request Message			MDM Usage Request Message			DVM Mapping		
Element Name	Parent Element	Type	Element Name	Parent Element	Type	DVM	MDM Column	SAP Column
ReferenceUID	MessageHeader	Field						
CreationDateTime	MessageHeader	Field						
TestDataIndicator	MessageHeader	Field						
ReconciliationIndicator	MessageHeader	Field						
SenderBusinessSystemID	MessageHeader	Field						
RecipientBusinessSystemID	MessageHeader	Field						
SenderParty	MessageHeader	Group						
InternalID	SenderParty	Field						
StandardID	SenderParty	List						
ContactPerson	SenderParty	Group						
InternalID	ContactPerson	Field						
OrganisationFormattedName	ContactPerson	List						
PersonFormattedName	ContactPerson	List						
PhoneNumber	ContactPerson	List						
FaxNumber	ContactPerson	List						
EmailURI	ContactPerson	List						
RecipientParty	MessageHeader	List						
InternalID	RecipientParty	Field						
StandardID	RecipientParty	List						
ContactPerson	RecipientParty	Group						
InternalID	ContactPerson	Field						
OrganisationFormattedName	ContactPerson	List						
PersonFormattedName	ContactPerson	List						
PhoneNumber	ContactPerson	List						
FaxNumber	ContactPerson	List						
EmailURI	ContactPerson	List						
BusinessScope	MessageHeader	List						
TypeCode	BusinessScope	Field						
InstanceID	BusinessScope	Field						
ID	BusinessScope	Field						

SAP Utilities Time Series Calculation ERP Create Request Message			MDM Usage Request Message			DVM Mapping		
Element Name	Parent Element	Type	Element Name	Parent Element	Type	DVM	MDM Column	SAP Column
			calculation Data	D2- UsageTrans actionReque stInbound	Group			
UtilitiesTimeSe riesCalculation	UtilitiesTi meSeries Calculatio nERP crea teRequest Message	Group	utilitiesTime SeriesCalcu lation	calculationD ata	Group			
ID	UtilitiesTi meSeries Calculatio n	Field	utilitiesTime SeriesCalcu lationId	utilitiesTimeS eriesCalculat ion	Field			
PriorityCode	UtilitiesTi meSeries Calculatio n	Field						
			item	utilitiesTimeS eriesCalculat ion	Group			
Item	UtilitiesTi meSeries Calculatio n	List	itemList	item	List			
ID	Item	Field	itemId	itemList	Field			
UtilitiesTimeSe riesCalculation MethodCode	Item	Field	usageRule	itemList	Field	MDUS_ UsageR ule	OUMDM _UsageR ule	SAP_Cal cMethod Code
ReplacementV aluesAllowedIn dicator	Item	Field	replacemen tValuesAllo wedIndicato r	itemList	Field			
InputParamete rLockIndicator	Item	Field	inputParam eterLockInd icator	itemList	Field			
			itemInputPa rameter	itemList	Group			
ItemInputPara meter	Item	List	itemInputPa rameterList	itemInputPar ameter	List			
UtilitiesTimeSe riesCalculation ParameterID	ItemInputP arameter	Field	utilitiesTime SeriesCalcu lationParam eterId	itemInputPar ameterList	Field			
UtilitiesTimeSe riesCalculation InputParamete rCategoryCode	ItemInputP arameter	Field	utilitiesTime SeriesCalcu lationInputP arameterCa tegoryCode	itemInputPar ameterList	Field			
Quantity	ItemInputP arameter	Field	quantity	itemInputPar ameterList	Field			
Indicator	ItemInputP arameter	Field	indicator	itemInputPar ameterList	Field			
UtilitiesTimeSe riesID	ItemInputP arameter	Field	utilitiesTime SeriesId	itemInputPar ameterList	Field			
ItemPeriodIncl uded	Item	Group	itemPeriodI ncluded	itemList	Group			
DateTimePerio d	ItemPeriod Included	Group	dateTimePe riod	itemPeriodIn cluded	Group			
StartDateTime	DateTime Period	Field	startDateTi me	dateTimePeri od	Field			

SAP Utilities Time Series Calculation ERP Create Request Message			MDM Usage Request Message			DVM Mapping		
Element Name	Parent Element	Type	Element Name	Parent Element	Type	DVM	MDM Column	SAP Column
EndDateTime	DateTimePeriod	Field	endDateTime	dateTimePeriod	Field			
WeekdaySelection	ItemPeriodIncluded	Group	weekdaySelection	itemPeriodIncluded	Group			
MondayIndicator	WeekdaySelection	Field	mondayIndicator	weekdaySelection	Field			
TuesdayIndicator	WeekdaySelection	Field	tuesdayIndicator	weekdaySelection	Field			
WednesdayIndicator	WeekdaySelection	Field	wednesdayIndicator	weekdaySelection	Field			
ThursdayIndicator	WeekdaySelection	Field	thursdayIndicator	weekdaySelection	Field			
FridayIndicator	WeekdaySelection	Field	fridayIndicator	weekdaySelection	Field			
SaturdayIndicator	WeekdaySelection	Field	saturdayIndicator	weekdaySelection	Field			
SundayIndicator	WeekdaySelection	Field	sundayIndicator	weekdaySelection	Field			
AggregationTimePeriod	ItemPeriodIncluded	Group	aggregationTimePeriod	itemPeriodIncluded	Group			
StartTime	AggregationTimePeriod	Field	startTime	aggregationTimePeriod	Field			
EndTime	AggregationTimePeriod	Field	endTime	aggregationTimePeriod	Field			
Duration	AggregationTimePeriod	Field	duration	aggregationTimePeriod	Field			
			itemPeriodExcluded	itemList	Group			
ItemPeriodExcluded	Item	List	itemPeriodExcludedList	itemPeriodExcludedList	List			
DateTimePeriod	ItemPeriodExcluded	Group	dateTimePeriod	itemPeriodExcludedList	Group			
StartDateTime	DateTimePeriod	Field	startDateTime	dateTimePeriod	Field			
EndDateTime	DateTimePeriod	Field	endDateTime	dateTimePeriod	Field			

## Usage Request Activity Mapping

SAP Utilities Time Series Calculation ERP Create Request Message			MDM Usage Request Message			Comments
Element Name	Parent Element	Type	Element Name	Parent Element	Type	
UtilitiesTimeSeriesCalculationERPBulkCreateRequest		OutermostTag	DX-TimeSeriesCalculationBulkUsageRequest		OuterMost	This message will be the last message added to the MDM usage request queue after all the usage messages are added. This message will be used by MDM for processing the Usage transactions
MessageHeader	UtilitiesTimeSeriesCalculationERPBulkCreateRequest	Group				

SAP Utilities Time Series Calculation ERP Create Request Message			MDM Usage Request Message		Type	Comments
Element Name	Parent Element	Type	Element Name	Parent Element		
ID	MessageHeader	Field				
UUID	MessageHeader	Field	bulkMessageId	DX-TimeSeriesCalculationBulkUsageRequest		
			bulkMessageCount	DX-TimeSeriesCalculationBulkUsageRequest		This field will be populated by Integration. The value for this field will be the total number of elements in the UtilitiesTimeSeriesCalculationERPCreateRequestMessage list. This will help MDM in checking if all usage requests have been processed before sending response to Integration.

## Usage Response Mapping

Time Series Calculation Bulk Confirmation Outbound Message			SAP Utilities Time Series Calculation ERP Bulk Create Confirmation Message			DVM Mapping		
Element Name	Parent Element	Type	Element Name	Parent Element	Type	DVM	MDM Column	SAP Column
sendDetails		Outermost Tag	UtilitiesTimeSeriesCalculationERPBulkCreateConfirmation		Outermost Tag			
			MessageHeader	UtilitiesTimeSeriesCalculationERPCreateConfirmationMessage	Group			
			ID	MessageHeader	Field			
			UUID	MessageHeader	Field			
			ReferenceID	MessageHeader	Field			
bulkMessageId	sendDetails	Field	ReferenceUID	MessageHeader	Field			
utilitiesTimeSeriesCalculation	sendDetails	Group						
utilitiesTimeSeriesCalculationList	utilitiesTimeSeriesCalculation	List	UtilitiesTimeSeriesCalculationERPCreateConfirmationMessage	UtilitiesTimeSeriesCalculationERPBulkCreateConfirmation	List			
			MessageHeader	UtilitiesTimeSeriesCalculationERPCreateConfirmationMessage	Group			
			ID	MessageHeader	Field			

Time Series Calculation Bulk Confirmation Outbound Message			SAP Utilities Time Series Calculation ERP Bulk Create Confirmation Message			DVM Mapping		
Element Name	Parent Element	Type	Element Name	Parent Element	Type	DVM	MDM Column	SAP Column
			UUID	MessageHeader	Field			
			ReferenceID	MessageHeader	Field			
externalId	sendDetails	Field	ReferenceUUID	MessageHeader	Field			
			CreationDateTime	MessageHeader	Field			
			TestDataIndicator	MessageHeader	Field			
			ReconciliationIndicator	MessageHeader	Field			
			SenderBusinessSystemID	MessageHeader	Field			
			RecipientBusinessSystemID	MessageHeader	Field			
			SenderParty	MessageHeader	Group			
			InternalID	SenderParty	Field			
			StandardID	SenderParty	List			
			ContactPerson	SenderParty	Group			
			InternalID	ContactPerson	Field			
			OrganisationFormattedName	ContactPerson	List			
			PersonFormattedName	ContactPerson	List			
			PhoneNumber	ContactPerson	List			
			FaxNumber	ContactPerson	List			
			EmailURI	ContactPerson	List			
			RecipientParty	MessageHeader	List			
			InternalID	RecipientParty	Field			
			StandardID	RecipientParty	List			
			ContactPerson	RecipientParty	Group			
			InternalID	ContactPerson	Field			
			OrganisationFormattedName	ContactPerson	List			
			PersonFormattedName	ContactPerson	List			
			PhoneNumber	ContactPerson	List			
			FaxNumber	ContactPerson	List			
			EmailURI	ContactPerson	List			
			BusinessScope	MessageHeader	List			
			TypeCode	BusinessScope	Field			

Time Series Calculation Bulk Confirmation Outbound Message			SAP Utilities Time Series Calculation ERP Bulk Create Confirmation Message			DVM Mapping		
Element Name	Parent Element	Type	Element Name	Parent Element	Type	DVM	MDM Column	SAP Column
				pe				
			InstanceID	BusinessScope	Field			
			ID	BusinessScope	Field			
			UtilitiesTimeSeriesCalculation	UtilitiesTimeSeriesCalculationERPCreateConfirmationMessage	Group			
utilitiesTimeSeriesCalculationId	utilitiesTimeSeriesCalculationList	Field	ID	UtilitiesTimeSeriesCalculation	Field			
item	utilitiesTimeSeriesCalculationList	Group						
itemList	item	List	Item	UtilitiesTimeSeriesCalculation	List			
itemId	itemList	Field	ID	Item	Field			
itemResults	itemList	Group						
itemResultsList	itemResults	List	ItemResult	Item	List			
utilitiesTimeSeriesCalculationParameterId	itemResultsList	Field	UtilitiesTimeSeriesCalculationParameterID	ItemResult	Field			
measuresPeakQuantity	itemResultsList	Field	UtilitiesTimeSeriesCalculationResultCategoryCode	ItemResult	Field	MDU S_PeakQuantity	OUMDM_PeakQuantity	SAP_TS CalcResultCategoryCode
quantity	itemResultsList	Field	Quantity	ItemResult	Field			
replacementValuesUsedIndicator	itemResultsList	Field	ReplacementValuesUsedIndicator	ItemResult	Field			
demandDateTime	itemResultsList	Field	DemandDateTime	ItemResult	Field			
exceptionInformation	sendDetails	Group	Log	UtilitiesTimeSeriesERPMeasurementTaskAssignmentChangeConfirmation	Group			
			BusinessDocumentProcessingResultCode	Log	Field			
			MaximumLogItemSeverityCode	Log	Field			
exceptionInformationList	exceptionInformation	List	Item	Log	List			
sequence	exceptionInformationList	Field						
			TypeID	Item	Field			

SAP Utilities Time Series Calculation ERP Bulk Create Confirmation Message			SAP Utilities Time Series Calculation ERP Bulk Create Confirmation Message			DVM Mapping		
Element Name	Parent Element	Type	Element Name	Parent Element	Type	DVM	MDM Column	SAP Column
messageCategory	exception InformationList	Field						
			CategoryCode	Item	Field			
messageNumber	exception InformationList	Field	SeverityCode	Item	Field			
			ReferenceObjectNodeSenderTechnicalID	Item	Field			
comments	exception InformationList	Field	Note	Item	Field			
messageParameters	exception InformationList	List						
parameterSequence	message Parameters	Field						
messageParameterType	message Parameters	Field						
messageParameterValue	message Parameters	Field						
			WebURI	Item	Field			
customElements	sendDetails	Field						

## Device Status Check

### Device Status Check Request Mapping

SAP Utilities Device ERP Smart Meter Operational State By ID Query Message			MDM Device Status Check Request Message			DVM Mapping		
Element Name	Parent Element	Type	Element Name	Parent Element	Type	DVM	MDM Column	SAP Column
UtilitiesDeviceERPSmartMeterOperationalStateByIDQuery		Outermost Tag	D1-DeviceStatusCheck					
MessageHeader	UtilitiesDeviceERPSmartMeterOperationalStateByIDQuery	Group						
ID	MessageHeader	Field						
UUID	MessageHeader	Field	requesterTransactionId	D1-DeviceStatusCheck	Field			

SAP Utilities Device ERP Smart Meter Operational State By ID Query Message			MDM Device Status Check Request Message			DVM Mapping		
Element Name	Parent Element	Type	Element Name	Parent Element	Type	DVM	MDM Column	SAP Column
ReferenceID	MessageHeader	Field						
ReferenceUID	MessageHeader	Field						
CreationDateTime	MessageHeader	Field						
TestDataIndicator	MessageHeader	Field						
ReconciliationIndicator	MessageHeader	Field						
SenderBusinessSystemID	MessageHeader	Field	requester	D1-DeviceStatusCheck	Field	MDUS_Sender	OUMDM_Requester	SAP_SenderID
RecipientBusinessSystemID	MessageHeader	Field						
SenderParty	MessageHeader	Group						
InternalID	SenderParty	Field						
StandardID	SenderParty	List						
ContactPerson	SenderParty	Group						
InternalID	ContactPerson	Field						
OrganisationFormattedName	ContactPerson	List						
PersonFormattedName	ContactPerson	List						
PhoneNumber	ContactPerson	List						
FaxNumber	ContactPerson	List						
EmailURI	ContactPerson	List						
RecipientParty	MessageHeader	List						
InternalID	RecipientParty	Field						
StandardID	RecipientParty	List						
ContactPerson	RecipientParty	Group						
InternalID	ContactPerson	Field						
OrganisationFormattedName	ContactPerson	List						
PersonFormattedName	ContactPerson	List						
PhoneNumber	ContactPerson	List						
FaxNumber	ContactPerson	List						
EmailURI	ContactPerson	List						
BusinessScope	MessageHeader	List						
TypeCode	BusinessScope	Field						
InstanceID	BusinessScope	Field						
ID	BusinessScope	Field						
UtilitiesDeviceSmartMeterOperationalStateSelectionByID	UtilitiesDeviceERP SmartMeterOperationalStateByIDQuery	Group						



SAP Utilities Device ERP Smart Meter Operational State By ID Query Message			MDM Device Status Check Request Message			DVM Mapping		
Element Name	Parent Element	Type	Element Name	Parent Element	Type	DVM	MDM Column	SAP Column
UtilitiesDeviceID	UtilitiesDeviceSmartMeterOperationalStateSelectionByID	Field	utilityDeviceIdentifierNumber	D1-DeviceStatusCheck	Field			
			otherInformation	D1-DeviceStatusCheck	Group			
OperationalStateUtilitiesAdvancedMeteringDataOriginTypeCode	UtilitiesDeviceSmartMeterOperationalStateSelectionByID	Field	operationalStateUtilitiesAdvancedMeteringDataOriginTypeCode	otherInformation	Field			
SelectionByOperationalStatePriorityCode	UtilitiesDeviceSmartMeterOperationalStateSelectionByID	List	selectionByOperationalStatePriorityCode	otherInformation	List			
InclusionExclusionCode	SelectionByOperationalStatePriorityCode	Field	inclusionExclusionCode	selectionByOperationalStatePriorityCode	Field			
IntervalBoundaryTypeCode	SelectionByOperationalStatePriorityCode	Field	intervalBoundaryTypeCode	selectionByOperationalStatePriorityCode	Field			
LowerBoundaryPriorityCode	SelectionByOperationalStatePriorityCode	Field	lowerBoundaryPriorityCode	selectionByOperationalStatePriorityCode	Field			
UpperBoundaryPriorityCode	SelectionByOperationalStatePriorityCode	Field	upperBoundaryPriorityCode	selectionByOperationalStatePriorityCode	Field			
SmartMeterUtilitiesAdvancedMeteringSystemID	UtilitiesDeviceSmartMeterOperationalStateSelectionByID	Field	smartMeterUtilitiesAdvancedMeteringSystemID	otherInformation	Field			

## Device Status Check Response Mapping

MDM Device Status Check Response Message			SAP Utilities Device ERP Smart Meter Operational State By ID Response Message			DVM Mapping		
Element Name	Parent Element	Type	Element Name	Parent Element	Type	DVM	MDM Column	SAP Column
sendDetails		Outermost Tag	UtilitiesDeviceERP Smart Meter Operational State By ID Response		Outermost Tag			

MDM Device Status Check Response Message			SAP Utilities Device ERP Smart Meter Operational State By ID Response Message			DVM Mapping		
Element Name	Parent Element	Type	Element Name	Parent Element	Type	DVM	MDM Column	SAP Column
			MessageHeader	UtilitiesDeviceERP Smart Meter Operational State By ID Response	Group			
			ID	MessageHeader	Field			
			UUID	MessageHeader	Field			
			ReferenceID	MessageHeader	Field			
transaction	sendDetails	Group						
requester TransactionId	sendDetails	Field	ReferenceUUID	MessageHeader	Field			
			CreationDateTime	MessageHeader	Field			
			TestDataIndicator	MessageHeader	Field			
			ReconciliationIndicator	MessageHeader	Field			
			SenderBusiness SystemID	MessageHeader	Field			
			RecipientBusiness SystemID	MessageHeader	Field			
			SenderParty	MessageHeader	Group			
			InternalID	SenderParty	Field			
			StandardID	SenderParty	List			
			ContactPerson	SenderParty	Group			
			InternalID	ContactPerson	Field			
			OrganisationFormattedName	ContactPerson	List			
			PersonFormattedName	ContactPerson	List			
			PhoneNumber	ContactPerson	List			
			FaxNumber	ContactPerson	List			
			EmailURI	ContactPerson	List			
			RecipientParty	MessageHeader	List			
			InternalID	RecipientParty	Field			
			StandardID	RecipientParty	List			
			ContactPerson	RecipientParty	Group			

MDM Device Status Check Response Message			SAP Utilities Device ERP Smart Meter Operational State By ID Response Message			DVM Mapping		
Element Name	Parent Element	Type	Element Name	Parent Element	Type	DVM	MDM Column	SAP Column
			InternalID	ContactPerson	Field			
			OrganisationFormattedName	ContactPerson	List			
			PersonFormattedName	ContactPerson	List			
			PhoneNumber	ContactPerson	List			
			FaxNumber	ContactPerson	List			
			EmailURI	ContactPerson	List			
			BusinessScope	MessageHeader	List			
			TypeCode	BusinessScope	Field			
			InstanceID	BusinessScope	Field			
			ID	BusinessScope	Field			
			UtilitiesDevice	UtilitiesDeviceERP Smart Meter Operational State By ID Response	Group			
utilityDeviceIdentifierNumber	transaction		ID	UtilitiesDevice	Field			
			OperationalState	UtilitiesDevice	List			
			TypeCode	OperationalState	Field			
			UtilitiesAdvancedMeteringDataOriginTypeCode	OperationalState	Field			
			PriorityCode	OperationalState	Field			
			DateTime	OperationalState	Field			
deviceFunctionalState	sendDetails	Field	AdditionalInformationText	OperationalState	Field			
			Quantity	OperationalState	Field			
deviceFunctionalState	sendDetails	Field	Indicator	OperationalState	Field	MDUS_DeviceFunctionalState	OUMDM_DeviceFunctionalState	SAP_DeviceStateIndicator
			TypeCode	OperationalState	Field			

MDM Device Status Check Response Message			SAP Utilities Device ERP Smart Meter Operational State By ID Response Message			DVM Mapping		
Element Name	Parent Element	Type	Element Name	Parent Element	Type	DVM	MDM Column	SAP Column
			UtilitiesAdvancedMeteringDataOriginTypeCode	OperationalState	Field			
			PriorityCode	OperationalState	Field			
			DateTime	OperationalState	Field			
deviceCommunicationStatus	sendDetails	Field	AdditionalInformationText	OperationalState	Field			
			Quantity	OperationalState	Field			
deviceCommunicationStatus	sendDetails	Field	Indicator	OperationalState	Field	MDUS_DeviceCommunicationStatus	OUMDM_DeviceCommunicationStatus	SAP_DeviceStateIndicator
			TypeCode	OperationalState	Field			
			UtilitiesAdvancedMeteringDataOriginTypeCode	OperationalState	Field			
			PriorityCode	OperationalState	Field			
			DateTime	OperationalState	Field			
deviceConnectionStatus	sendDetails	Field	AdditionalInformationText	OperationalState	Field			
			Quantity	OperationalState	Field			
deviceConnectionStatus	sendDetails	Field	Indicator	OperationalState	Field	MDUS_DeviceConnectionStatus	OUMDM_DeviceConnectionStatus	SAP_DeviceStateIndicator
exceptionInformation	sendDetails	Group	Log	UtilitiesDeviceERP Smart Meter Operational State By ID Response	Group			
			BusinessDocumentProcessingResultCode	Log	Field			
			MaximumLogItemSeverityCode	Log	Field			
message	transaction	List	Item	Log	List			
			TypeID	Item	Field			
			CategoryCode	Item	Field			
			SeverityCode	Item	Field			

MDM Device Status Check Response Message			SAP Utilities Device ERP Smart Meter Operational State By ID Response Message			DVM Mapping		
Element Name	Parent Element	Type	Element Name	Parent Element	Type	DVM	MDM Column	SAP Column
			ReferenceObjectNodeSenderTechnicalID	Item	Field			
description	message	Field	Note	Item	Field			
			WebURI	Item	Field			

## Device Remote Connect

### Device Remote Connect Request Mapping

SAP Smart Meter Utilities Connection Status Change Request ERP Create Request Message			MDM AMI Commands Remote Connect Request Message			DVM Mapping		
Element Name	Parent Element	Type	Element Name	Parent Element	Type	DVM	MDM Column	SAP Column
SmartMeterUtilitiesConnectionStatusChangeRequestERPCreateRequest		Outermost Tag	D1-RemoteConnect		Outermost Tag			
MessageHeader	SmartMeterUtilitiesConnectionStatusChangeRequestERPCreateRequest	Group						
ID	MessageHeader	Field						
UUID	MessageHeader	Field	requesterTransactionId	D1-RemoteConnect	Field			
ReferenceID	MessageHeader	Field						
ReferenceUUID	MessageHeader	Field						
CreationDateTime	MessageHeader	Field						
TestDataIndicator	MessageHeader	Field						
ReconciliationIndicator	MessageHeader	Field						
SenderBusinessSystemID	MessageHeader	Field	requester	D1-RemoteConnect	Field	MDUS_Sender	OUMDM_Requester	SAP_SenderID
RecipientBusinessSystemID	MessageHeader	Field						

SAP Smart Meter Utilities Connection Status Change Request ERP Create Request Message			MDM AMI Commands Remote Connect Request Message			DVM Mapping		
Element Name	Parent Element	Type	Element Name	Parent Element	Type	DVM	MDM Column	SAP Column
SenderParty	MessageHeader	Group						
InternalID	SenderParty	Field						
StandardID	SenderParty	List						
ContactPerson	SenderParty	Group						
InternalID	ContactPerson	Field						
Organisation FormattedName	ContactPerson	List						
PersonFormattedName	ContactPerson	List						
PhoneNumber	ContactPerson	List						
FaxNumber	ContactPerson	List						
EmailURI	ContactPerson	List						
RecipientParty	MessageHeader	List						
InternalID	RecipientParty	Field						
StandardID	RecipientParty	List						
ContactPerson	RecipientParty	Group						
InternalID	ContactPerson	Field						
Organisation FormattedName	ContactPerson	List						
PersonFormattedName	ContactPerson	List						
PhoneNumber	ContactPerson	List						
FaxNumber	ContactPerson	List						
EmailURI	ContactPerson	List						
BusinessScope	MessageHeader	List						
TypeCode	BusinessScope	Field						
InstanceID	BusinessScope	Field						
ID	BusinessScope	Field						
UtilitiesConnectionStatus ChangeRequest	SmartMeterUtilitiesConnectionStatusChangeRequestERPCreateRequest	Group	otherInformation	D1-RemoteConnect	Group			
			connectionStatusChangeRequest	otherInformation	Group			

SAP Smart Meter Utilities Connection Status Change Request ERP Create Request Message			MDM AMI Commands Remote Connect Request Message			DVM Mapping		
Element Name	Parent Element	Type	Element Name	Parent Element	Type	DVM	MDM Column	SAP Column
ID	UtilitiesConnectionStatusChangeRequest	Field	connectionStatusChangeRequeststId	connectionStatusChangeRequest	Field			
CategoryCode	UtilitiesConnectionStatusChangeRequest	Field	categoryCode	otherInformation	Field			
UtilitiesServiceDisconnectionReasonCode	UtilitiesConnectionStatusChangeRequest	Field						
PlannedProcessingDateTime	UtilitiesConnectionStatusChangeRequest	Field	plannedProcessingDateTime	otherInformation	Field			
ImmediateStatusChangeIndicator	UtilitiesConnectionStatusChangeRequest	Field	immediateStatusChangeIndicator	otherInformation	Field			
			effectiveDateTime	D1-RemoteConnect	Field			
DeviceConnectionStatus	UtilitiesConnectionStatusChangeRequest	List	deviceConnectionStatus	otherInformation	List			
UtilitiesDeviceID	DeviceConnectionStatus	Field	utilitiesDeviceID	deviceConnectionStatus				
			utilityDeviceIdentifierNumber	D1-RemoteConnect	Field			
SmartMeter	DeviceConnectionStatus	Group	smartMeter	deviceConnectionStatus	Group			
UtilitiesAdvancedMeteringSystemID	SmartMeter	Field	utilitiesAdvancedMeteringSystemID	smartMeter	Field			

## Device Remote Connect Response Mapping

MDM Profile Allocation Response Message			SAP Profile Allocation Response Message		
Element Name	Parent Element	Type	Element Name	Parent Element	Type
sendDetails		OutermostTag	SmartMeterUtilitiesConnectionStatusChangeRequestERPCreateConfirmation		OutermostTag
			MessageHeader	SmartMeterUtilitiesConnectionStatusChangeRequestERPCreateConfirmation	Group
			ID	MessageHeader	Field
			UUID	MessageHeader	Field
transaction	sendDetails	Group			
			ReferenceID	MessageHeader	Field

MDM Profile Allocation Response Message			SAP Profile Allocation Response Message		
Element Name	Parent Element	Type	Element Name	Parent Element	Type
requesterTransactionId	transaction	Field	ReferenceUUID	MessageHeader	Field
			CreationDateTime	MessageHeader	Field
			TestDataIndicator	MessageHeader	Field
			ReconciliationIndicator	MessageHeader	Field
			SenderBusinessSystemID	MessageHeader	Field
			RecipientBusinessSystemID	MessageHeader	Field
			SenderParty	MessageHeader	Group
			InternalID	SenderParty	Field
			StandardID	SenderParty	List
			ContactPerson	SenderParty	Group
			InternalID	ContactPerson	Field
			OrganisationFormattedName	ContactPerson	List
			PersonFormattedName	ContactPerson	List
			PhoneNumber	ContactPerson	List
			FaxNumber	ContactPerson	List
			EmailURI	ContactPerson	List
			RecipientParty	MessageHeader	List
			InternalID	RecipientParty	Field
			StandardID	RecipientParty	List
			ContactPerson	RecipientParty	Group
			InternalID	ContactPerson	Field
			OrganisationFormattedName	ContactPerson	List
			PersonFormattedName	ContactPerson	List
			PhoneNumber	ContactPerson	List
			FaxNumber	ContactPerson	List
			EmailURI	ContactPerson	List
			BusinessScope	MessageHeader	List
			TypeCode	BusinessScope	Field
			InstanceID	BusinessScope	Field
			ID	BusinessScope	Field
			UtilitiesConnectionStatusChangeRequest	SmartMeterUtilitiesConnectionStatusChangeRequest ERPCreateConfirmation	Group
connectionStatusChangeRequestID	sendDetails	Field	ID	UtilitiesConnectionStatusChangeRequest	Field
			CategoryCode	UtilitiesConnectionStatusChangeRequest	Field
			DeviceConnectionStatus	UtilitiesConnectionStatusChangeRequest	List
transactionDateTime	transaction	Field	ProcessingDateTime	DeviceConnectionStatus	Field
			UtilitiesDeviceConnectionStatusProcessingResultCode	DeviceConnectionStatus	Field



MDM Profile Allocation Response Message			SAP Profile Allocation Response Message		
Element Name	Parent Element	Type	Element Name	Parent Element	Type
utilityDeviceIdentifierNumber	transaction	Field	UtilitiesDeviceID	DeviceConnectionStatus	Field
			Log	SmartMeterUtilitiesConnectionStatusChangeRequestERPCreateConfirmation	Group
			BusinessDocumentProcessingResultCode	Log	Field
			MaximumLogItemSeverityCode	Log	Field
message	transaction	List	Item	Log	List
			TypeID	Item	Field
			CategoryCode	Item	Field
			SeverityCode	Item	Field
			ReferenceObjectNodeSenderTechnicalID	Item	Field
description	message	Field	Note	Item	Field
			WebURI	Item	Field

## Device Remote Disconnect

### Device Remote Disconnect Request Mapping

SAP Smart Meter Utilities Connection Status Change Request ERP Create Request Message			MDM AMI Commands Request Message			DVM Mapping		
Element Name	Parent Element	Type	Element Name	Parent Element	Type	DVM	MDM Column	SAP Column
SmartMeterUtilitiesConnectionStatusChangeRequestERPCreateRequest		Outermost Tag	D1-RemoteDisconnect		Outermost Tag			
MessageHeader	SmartMeterUtilitiesConnectionStatusChangeRequestERPCreateRequest	Group						
ID	MessageHeader	Field						
UUID	MessageHeader	Field	requesterTransactionId	D1-RemoteDisconnect	Field			
ReferenceID	MessageHeader	Field						
ReferenceUUID	MessageHeader	Field						
CreationDateTime	MessageHeader	Field						
TestDataIndicator	MessageHeader	Field						

SAP Smart Meter Utilities Connection Status Change Request ERP Create Request Message			MDM AMI Commands Request Message			DVM Mapping		
Element Name	Parent Element	Type	Element Name	Parent Element	Type	DVM	MDM Column	SAP Column
ReconciliationIndicator	MessageHeader	Field						
SenderBusinessSystemID	MessageHeader	Field	requester	D1-RemoteDisconnect	Field	MDUS_Sender	OUMDM_Requester	SAP_SenderID
RecipientBusinessSystemID	MessageHeader	Field						
SenderParty	MessageHeader	Group						
InternalID	SenderParty	Field						
StandardID	SenderParty	List						
ContactPerson	SenderParty	Group						
InternalID	ContactPerson	Field						
OrganisationFormattedName	ContactPerson	List						
PersonFormattedName	ContactPerson	List						
PhoneNumber	ContactPerson	List						
FaxNumber	ContactPerson	List						
EmailURI	ContactPerson	List						
RecipientParty	MessageHeader	List						
InternalID	RecipientParty	Field						
StandardID	RecipientParty	List						
ContactPerson	RecipientParty	Group						
InternalID	ContactPerson	Field						
OrganisationFormattedName	ContactPerson	List						
PersonFormattedName	ContactPerson	List						
PhoneNumber	ContactPerson	List						
FaxNumber	ContactPerson	List						
EmailURI	ContactPerson	List						
BusinessScope	MessageHeader	List						
TypeCode	BusinessScope	Field						
InstanceID	BusinessScope	Field						
ID	BusinessScope	Field						
UtilitiesConnectionStatusChangeRequest	SmartMeterUtilitiesConnectionStatusChangeRequestERPCreateRequest	Group	otherInformation	D1-RemoteDisconnect	Group			

SAP Smart Meter Utilities Connection Status Change Request ERP Create Request Message			MDM AMI Commands Request Message			DVM Mapping		
Element Name	Parent Element	Type	Element Name	Parent Element	Type	DVM	MDM Column	SAP Column
			connectionStatusChangeRequest	otherInformation	Group			
ID	UtilitiesConnectionStatusChangeRequest	Field	connectionStatusChangeRequestid	connectionStatusChangeRequest	Field			
CategoryCode	UtilitiesConnectionStatusChangeRequest	Field	categoryCode	otherInformation	Field			
UtilitiesServiceDisconnectionReasonCode	UtilitiesConnectionStatusChangeRequest	Field	utilitiesServiceDisconnectionReasonCode	otherInformation	Field			
PlannedProcessingDateTime	UtilitiesConnectionStatusChangeRequest	Field	plannedProcessingDateTime	otherInformation	Field			
ImmediateStatusChangeIndicator	UtilitiesConnectionStatusChangeRequest	Field	immediateStatusChangeIndicator	otherInformation	Field			
			effectiveDateTime	D1-RemoteDisconnect	Field			
DeviceConnectionStatus	UtilitiesConnectionStatusChangeRequest	List	deviceConnectionStatus	otherInformation	List			
UtilitiesDeviceID	DeviceConnectionStatus	Field	utilitiesDeviceID	deviceConnectionStatus				
			utilityDeviceIdentifierNumber	D1-RemoteDisconnect	Field			
SmartMeter	DeviceConnectionStatus	Group	smartMeter	deviceConnectionStatus	Group			
UtilitiesAdvancedMeteringSystemID	SmartMeter	Field	utilitiesAdvancedMeteringSystemID	smartMeter	Field			

## Device Remote Disconnect Response Mapping

MDM Profile Allocation Response Message			SAP Profile Allocation Response Message		
Element Name	Parent Element	Type	Element Name	Parent Element	Type
sendDetails		Outermost Tag	SmartMeterUtilitiesConnectionStatusChangeRequestERPCreateConfirmation		OutermostTag
			MessageHeader	SmartMeterUtilitiesConnectionStatusChangeRequestERPCreateConfirmation	Group
			ID	MessageHeader	Field
			UUID	MessageHeader	Field

MDM Profile Allocation Response Message			SAP Profile Allocation Response Message		
Element Name	Parent Element	Type	Element Name	Parent Element	Type
transaction	sendDetails	Group			
			ReferenceID	MessageHeader	Field
requesterTransactionId	transaction	Field	ReferenceUUID	MessageHeader	Field
			CreationDateTime	MessageHeader	Field
			TestDataIndicator	MessageHeader	Field
			ReconciliationIndicator	MessageHeader	Field
			SenderBusinessSystemID	MessageHeader	Field
			RecipientBusinessSystemID	MessageHeader	Field
			SenderParty	MessageHeader	Group
			InternalID	SenderParty	Field
			StandardID	SenderParty	List
			ContactPerson	SenderParty	Group
			InternalID	ContactPerson	Field
			OrganisationFormattedName	ContactPerson	List
			PersonFormattedName	ContactPerson	List
			PhoneNumber	ContactPerson	List
			FaxNumber	ContactPerson	List
			EmailURI	ContactPerson	List
			RecipientParty	MessageHeader	List
			InternalID	RecipientParty	Field
			StandardID	RecipientParty	List
			ContactPerson	RecipientParty	Group
			InternalID	ContactPerson	Field
			OrganisationFormattedName	ContactPerson	List
			PersonFormattedName	ContactPerson	List
			PhoneNumber	ContactPerson	List
			FaxNumber	ContactPerson	List
			EmailURI	ContactPerson	List
			BusinessScope	MessageHeader	List
			TypeCode	BusinessScope	Field
			InstanceID	BusinessScope	Field
			ID	BusinessScope	Field
			UtilitiesConnectionStatusChangeRequest	SmartMeterUtilitiesConnectionStatusChangeRequestERPCreateConfirmation	Group
connectionStatusChangeRequestId	sendDetails	Field	ID	UtilitiesConnectionStatusChangeRequest	Field
			CategoryCode	UtilitiesConnectionStatusChangeRequest	Field
			DeviceConnectionStatus	UtilitiesConnectionStatusChangeRequest	List
transactionDateTime	transaction	Field	ProcessingDateTime	DeviceConnectionStatus	Field

MDM Profile Allocation Response Message			SAP Profile Allocation Response Message		
Element Name	Parent Element	Type	Element Name	Parent Element	Type
			UtilitiesDeviceConnectionStatusProcessingResultCode	DeviceConnectionStatus	Field
utilityDeviceIdentifierNumber	transaction	Field	UtilitiesDeviceID	DeviceConnectionStatus	Field
			Log	SmartMeterUtilitiesConnectionStatusChangeRequestERPCreateConfirmation	Group
			BusinessDocumentProcessingResultCode	Log	Field
			MaximumLogItemSeverityCode	Log	Field
message	transaction	List	Item	Log	List
			TypeID	Item	Field
			CategoryCode	Item	Field
			SeverityCode	Item	Field
			ReferenceObjectNodeSenderTechnicalID	Item	Field
description	message	Field	Note	Item	Field
			WebURI	Item	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**

For more information on domain value maps, refer to 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.

### **JMS Adapter**

For more information on JMS adapter, refer to [Oracle Fusion Middleware User's Guide for Technology Adapters](#).