Oracle Utilities Integration for Device Operations Using Oracle Integration Cloud

Configuration Guide

Release 1.0

E97554-01

June 2018

ORACLE

Oracle Utilities Integration for Device Operations Using Oracle Integration Cloud, Release 1.0 Configuration Guide

Contents

Chapter 4

Appendix A

Preface

Welcome to the Oracle Utilities Integration for Device Operations Using Oracle Integration Cloud Configuration Guide.

This document focuses on the configuration and administration information for the integration between Oracle Utilities Operational Device Management and Oracle Utilities Operational Device Management using Oracle Integration Cloud.

The preface includes the following:

Audience

This document is intended for anyone implementing the Oracle Utilities Integration for Device Operations Using Oracle Integration Cloud.

Documentation and Resources

The following table provides the links to Oracle documentation and resources required for this integration.

Resource	Documentation Location
Edge application documentation: Oracle Utilities Meter Data Management and Oracle Utilities Operational Device Management	http://docs.oracle.com/cd/E72219_01/documentation.html
Oracle Integration Cloud	https://docs.oracle.com/en/cloud/paas/integration-cloud-um/index.html

Documentation Accessibility

For information about Oracle's commitment to accessibility, visit the Oracle Accessibility Program website at http://www.oracle.com/pls/topic/lookup?ctx=acc&id=docacc.

Access to Oracle Support
Oracle customers have access to electronic support for the hearing impaired. Visit: http://www.oracle.com/pls/topic/lookup?ctx=acc&id=info or http://www.oracle.com/pls/topic/lookup?ctx=acc&id=trs

Conventions

The following text conventions are used in this document:

Convention	Meaning
boldface	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.
italic	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.
`monospace`	Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.

Abbreviations

The following terms are used through out this document:

Term	Expanded Form
ODM	Oracle Utilities Operational Device Management

Term	Expanded Form
MDM	Oracle Utilities Meter Data Management
C2M	Oracle Utilities Customer to Meter
ICS	Integration Cloud Service
OIC	Oracle Integration Cloud
MO	Maintenance Object
BO	Business Object
BPA	Business Process Script
IWS	Inbound Web Services

Part 1

Understanding the Integration

This section provides an overview of the participating applications and information regarding the business processes addressed by the integration. It includes the following chapters:

- Overview
- Understanding the Integration Process

Chapter 1

Overview

This chapter provides an overview about the integration between Oracle Utilities Operational Device Management and Oracle Utilities Meter Data Management using Oracle Integration Cloud. It includes the following:

Prerequisites

All participating applications (namely, Oracle Utilities Meter Data Management, Oracle Utilities Operational Device Management, Oracle Integration Cloud) and the pre-built integration packages from Oracle Market Place must be imported into Oracle Integration Cloud.

About the Integration Product

This section provides general information about the functionality and processing of Oracle Utilities Integration for Device Operations Using Oracle Integration Cloud.

Oracle Utilities Operational Device Management is an Oracle Utilities' solution offered in on-premises or cloud for maintaining the device information required for business.

Oracle Utilities Meter Data Management is an Oracle Utilities' solution offered in on-premises or cloud and drives the service points and associated contacts (along with installation/removal) to Oracle Utilities Operational Device Management.

The communication between these two applications happens via Oracle Integration Cloud using the pre-built integrations.

About the Products

This integration involves the following products:

- Oracle Utilities Operational Device Management
- Oracle Utilities Meter Data Management
- Oracle Integration Cloud

Oracle Utilities Operational Device Management

Oracle Utilities Operational Device Management provides the functionality to manage the receipt, installation, maintenance, tracking, and removal of large volumes of assets.

Oracle Utilities Meter Data Management

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

Oracle Integration Cloud

Oracle Integration Cloud is Oracle's integration platform as a service (iPaas). It includes the following:

- An intuitive web-based integration designer for point-and-click integration between applications
- Rich monitoring dashboard providing real-time insight into transactions
- Runs on a mature runtime platform on Oracle Cloud

Software Requirements

This integration supports a combination of cloud and on-premises applications.

The following is a list of supported applications. You may choose any of these based on the requirement.

- Oracle Integration Cloud (OIC) v18.1.5 or above
- Oracle Utilities Operational Device Management v2.2.0.1 or above
- Oracle Utilities Meter Data Management v2.2.0.2/ Oracle Utilities Customer To Meter v2.6.0.1 or above
- Work and Asset Cloud Service (WACS) v18.1 or above
- Operational Device Cloud Service (ODCS) v18.1 or above
- Meter Solutions Cloud Service (MSCS) v18.1 or above

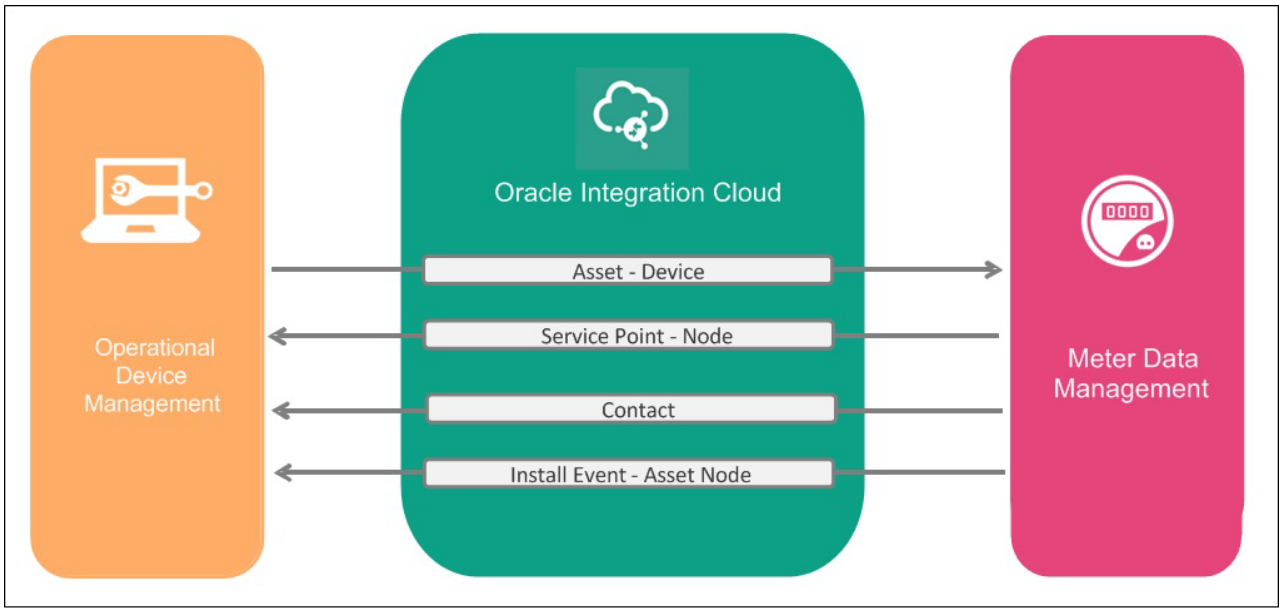
Supported Business Processes

This integration supports the following business processes:

- Asset - Device Synchronization
- Service Point - Node Synchronization
- Contact Synchronization
- Install Event - Asset Node Synchronization

  Note: Only the Asset - Device Synchronization flow is initiated from Oracle Utilities Operational Device Management.

The following diagram provides a visual representation of this processing:



ODM-MDM Business Process Diagram

Chapter 2

Understanding the Integration Process

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

Technical Overview

The technical aspects involved in Oracle Utilities Integration for Device Operations Using Oracle Integration Cloud are as follows:

- This is an integration between Oracle Utilities Operational Device Management and Oracle Utilities Meter Data Management.
- All end-to-end integration processes are synchronous.
- The integration layer is made up of integration processes deployed on Oracle Integration Cloud.
- Both Oracle Utilities Operational Device Management and Oracle Utilities Meter Data Management interact with the Oracle Integration Cloud using web services.
- Both Oracle Utilities Operational Device Management and Oracle Utilities Meter Data Management send messages using outbound message and receive messages using Inbound Web Services (IWS).
- Two Oracle Integration Cloud integration processes manage each integration point - one for request and one for response processing respectively.

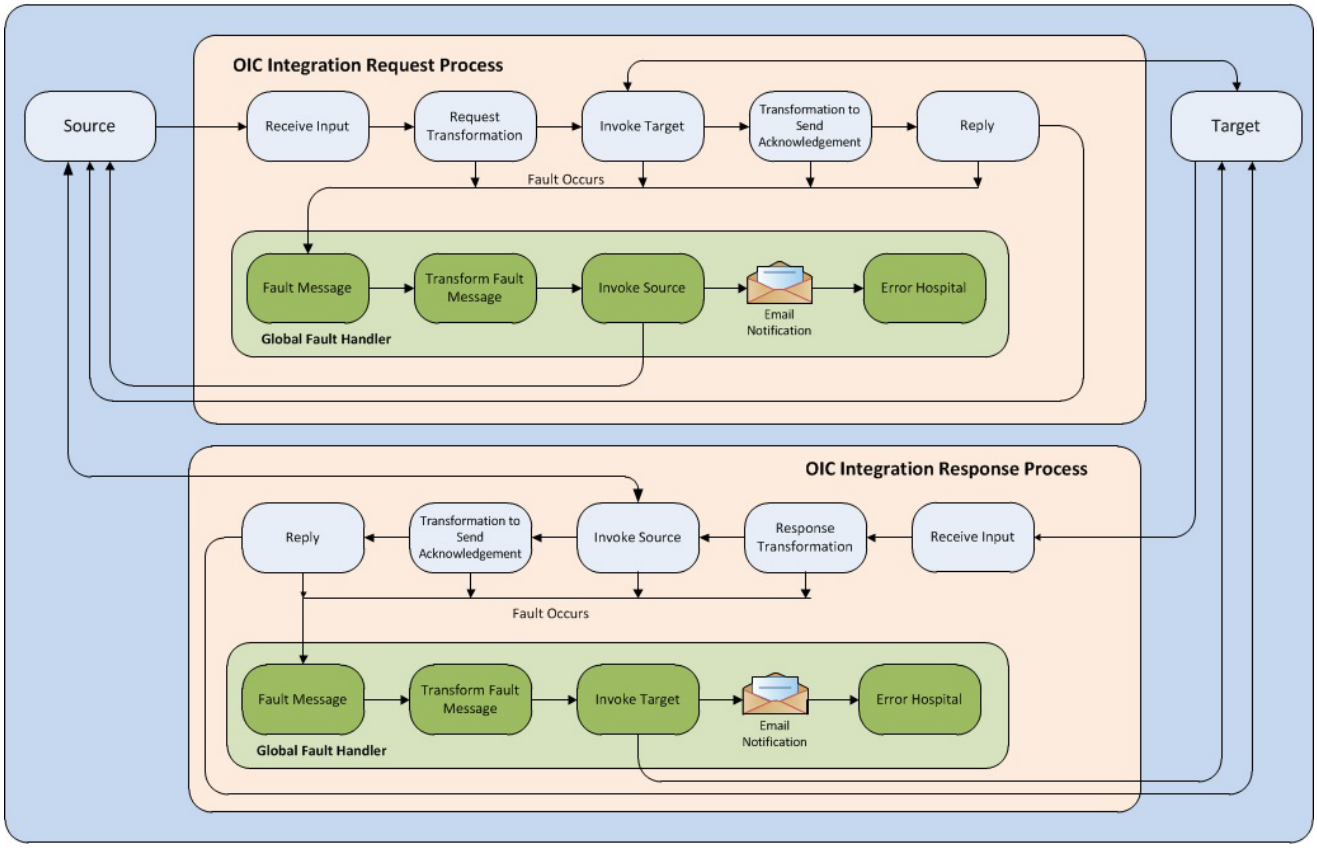
The **Request** integration process includes the following:

- Receives request message from the source application.
- Transforms message from the source to the target format. Lookups are used for data translations.
- Invokes target application using an IWS.
- Transforms the message (after invoking the target application) from the target format back to the source format. It sends back an acknowledgment as the application IWS called by Oracle Integration Cloud is a synchronous service.
- In case of any error, the global fault handler catches them and sends the transformed error message to the source application.
- An email notification will be sent to the respective users as configured.

The **Response** integration process includes the following:

- Receives response message from the target application.
- Transforms message from the target to the source format. Lookups are used for data translations.
- Invokes source applications using an IWS.
- Transforms the message (after invoking the target application) from the source to the target format. It is used to send back an acknowledgment as the invoking application IWS is a synchronous service.
- In case of any error, the global fault handler catches them and sends the transformed error messages to the target application.
- An email notification will be sent to the respective users as configured.

The following diagram provides a graphical representation of this processing.



Technical Flow Diagram

Integration Points

The integration scope supports the following business processes:

- Data synchronization of new devices from Oracle Utilities Operational Device Management to Oracle Utilities Meter Data Management.
- Data synchronization of service points and associated contacts from Oracle Utilities Meter Data Management to Oracle Utilities Operational Device Management
- Data synchronization of installations/removals from Oracle Utilities Meter Data Management to Oracle Utilities Operational Device Management.

The key integration points for this integration are as follows:

- Asset - Device Synchronization
- Service Point - Node Synchronization
- Contact Synchronization
- Install Event - Asset Node Synchronization

Note: The location information is stored as Node information in Oracle Utilities Operational Device Management. Asset Location information is stored as Asset Node information.

Master Data Synchronization Processes

The following integration processes are available in Oracle Utilities Integration for Device Operations Using Oracle Integration Cloud:

- Meter and component data are synchronized from Oracle Utilities Operational Device Management to Oracle Utilities Meter Data Management system.
- Contact, Service Point, and Install Event data are synchronized from Oracle Utilities Meter Data Management to Oracle Utilities Operational Device Management.
- The integration uses the sync request process to capture data changes and communicate or synchronize the data changes between the two systems by sending out a sync request message to the integration layer.
- The sync request process is implemented using business object technology; therefore, much of the business rules and processing logic are defined in the algorithms associated to the business objects used by the sync process.
- The Audit plug-in spot defined on the entity's Maintenance Object (MO) is used to detect changes in Oracle Utilities Meter Data Management data and to create sync requests. The Audit plug-in spot on the entity's business object (BO) is used to detect changes in Oracle Utilities Operational Device Management data and to create sync requests.

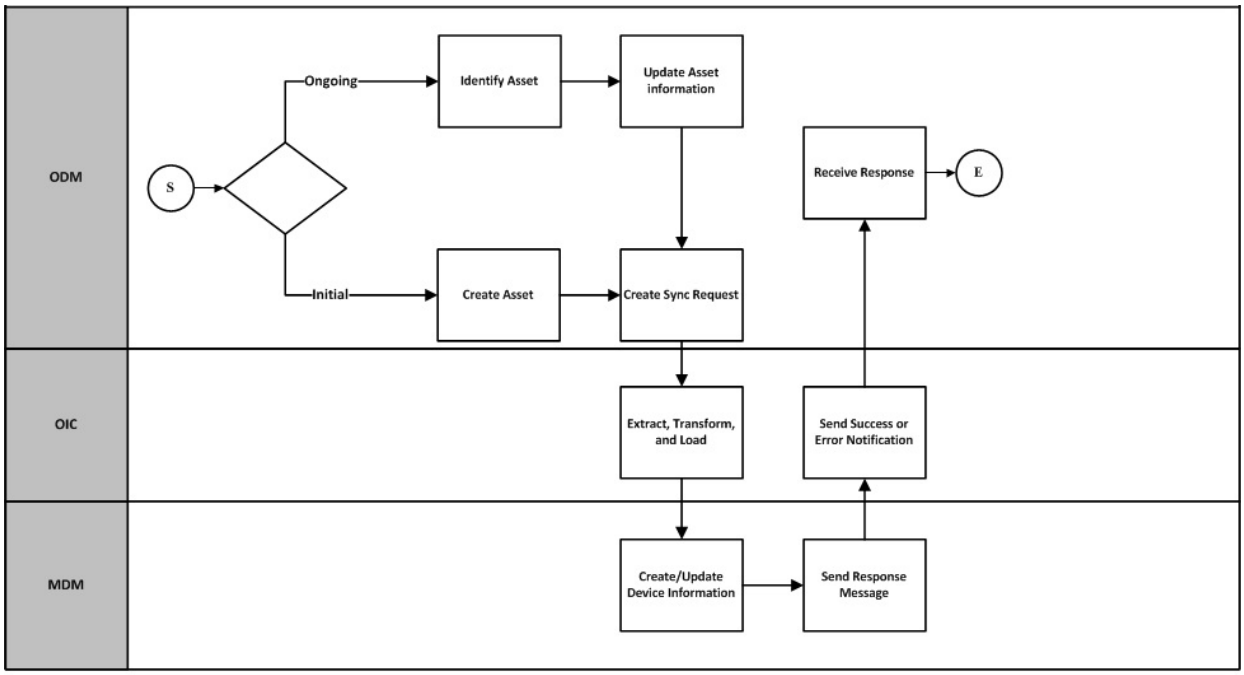
  These two plug-ins work in the same way, except Oracle Utilities Operational Device Management tracks changes at a business object level. Since only a subset of Oracle Utilities Operational Device Management assets (meters and components) are synchronized to Oracle Utilities Meter Data Management, having the audit plug-in at business object level avoids the unnecessary creation of sync requests that will eventually be discarded.
- The sync request life cycle captures the change in data, sends sync request message to the integration, and awaits an acknowledgment back from the external system - whether positive or negative. Timeouts and negative acknowledgment received from the external system results in the sync request being transitioned to the Error state. As an option, implementation may choose to create a To Do entry in this case.
- There is a portal used for searching and viewing sync requests.

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

Asset - Device Synchronization

This process synchronizes the device details required by Oracle Utilities Meter Data Management from Oracle Utilities Operational Device Management.

The following diagram provides a graphical representation of this integration process.



Asset - Device Synchronization Process Diagram

Business Processing

The Asset - Device Sync *request* integration process includes the following activities:

1. Oracle Utilities Operational Device Management sends Asset sync information in the form of XML messages to Asset Sync request integration process SYNC_ASSETREQ_ODMTOMDM which is deployed on Oracle Integration Cloud.
2. The request integration process transforms asset request messages in the Oracle Utilities Operational Device Management format to Device messages in the Oracle Utilities Meter Data Management format and invokes D1-SyncRequestInbound inbound web service in Oracle Utilities Meter Data Management.
3. An immediate acknowledgment is sent to Oracle Utilities Operational Device Management.
4. Any errors are reported back to Oracle Utilities Operational Device Management through the global fault handler.
5. An email notification with error details will be sent to the users configured in the UA_ODMMDM_Email_ID lookup.

The Asset - Device Sync *response* integration process includes the following activities:

1. After running the batch job in Oracle Utilities Meter Data Management, Device sync response in the form of XML messages are sent to the Device sync response

integration process SYNC_DEVICERESP_MDMTOODM which is deployed on Oracle Integration Cloud.

2. The response integration process transforms the device response message in the Oracle Utilities Meter Data Management format to Asset message in the Oracle Utilities Operational Device Management format and invokes F1-UpdateAndTransitionSyncRequest inbound web service in Oracle Utilities Operational Device Management.
3. An immediate acknowledgment is sent to Oracle Utilities Meter Data Management.
4. Any errors are reported back to Oracle Utilities Meter Data Management through the global fault handler.
5. An email notification with error details will be sent to the users configured in the UA_ODMMDM_Email_ID lookup.

Technical Details

This section provides the integration process, as well as Oracle Utilities Meter Data Management and Oracle Utilities Operational Device Management inbound web services used for the Asset - Device Synchronization integration point.

Integration Flow Name	Description
SYNC_ASSETREQ_ODMTOMDM	Asset - Device Sync request integration process that transforms Asset request form Oracle Utilities Operational Device Management to device in Oracle Utilities Meter Data Management
SYNC_DEVICERESP_ MDMTOODM	Asset - Device Sync response integration process that transforms device response from Oracle Utilities Meter Data Management to Asset in Oracle Utilities Operational Device Management.

Integration Package Name	Description
oracle.util.odmmdm.assetsync	Asset - Device Sync request and response flows (.iar) are included this package file (.par)

Oracle Utilities Meter Data Management Services

Web Service Catalog	Description
https://MDM_HOST:MDM_PORT/ouaf/webservices/builtin/ServiceCatalog?wsdl	Web service catalog including Oracle Utilities Meter Data Management business objects/ IWS needed for Oracle Utilities Integration for Device Operations Using Oracle Integration Cloud.

Service Name	Description
D1-SyncRequestInbound	Invoked by the integration layer to instantiate sync requests whose information applies to only one maintenance object. It is mapped to the generic sync request business object, which uses the information in the seeder sync request master configuration (business object D1-SeederSyncMasterConfig) to derive the correct sync request to create.

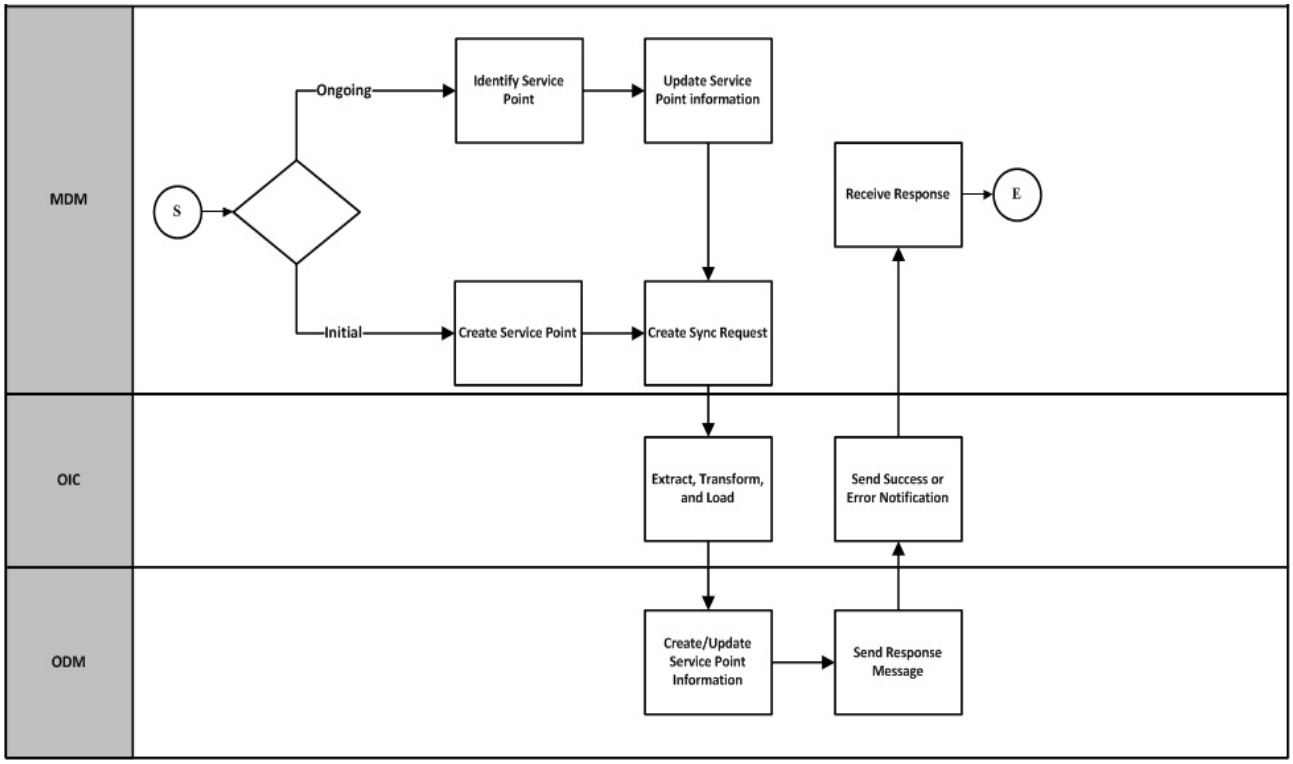
Oracle Utilities Operational Device Management Services

Service Name	Description
F1-UpdateAndTransitionSyncRequest	Updates a Transition Master Data Sync Request. This service is invoked by the integration layer to send sync response messages.

Service Point - Node Synchronization

This process synchronizes node/location details required by Oracle Utilities Operational Device Management from a service point in Oracle Utilities Meter Data Management.

The following diagram provides a graphical representation of this integration process.



Service Point - Node Synchronization Process Diagram

Business Processing

The Service Point - Node Sync *request* integration process includes the following activities:

1. Oracle Utilities Meter Data Management sends the Service Point sync information in the form of XML messages to the service point sync request integration process SYNC_SPREQ_MDMTOODM which is deployed on Oracle Integration Cloud.
2. The request integration process transforms Service Point request messages in the Oracle Utilities Meter Data Management format to Node messages in the Oracle Utilities Operational Device Management format and invokes W1-SyncRequestInbound inbound web service in Oracle Utilities Operational Device Management.
3. An immediate acknowledgment is sent to Oracle Utilities Meter Data Management.
4. Any errors are reported back to Oracle Utilities Meter Data Management through the global fault handler.
5. An email notification with error details will be sent to the users configured in the UA_ODMMDM_Email_ID lookup.

The Service Point - Node Sync *response* integration process includes the following activities:

1. After running the batch job in Oracle Utilities Operational Device Management, Service Point - Node sync response in the form of XML messages are sent to the Node sync response integration process SYNC_NODERESP_ODMTOMDM which is deployed on Oracle Integration Cloud.
2. The response integration process transforms the Node response message in the Oracle Utilities Operational Device Management format to Service Point message in the Oracle Utilities Meter Data Management format and invokes F1-UpdateAndTransitionSyncRequest inbound web service in Oracle Utilities Meter Data Management.
3. An immediate acknowledgment is sent to Oracle Utilities Meter Data Management.
4. Any errors are reported back to Oracle Utilities Meter Data Management through the global fault handler.
5. An email notification with error details will be sent to the users configured in the UA_ODMMDM_Email_ID lookup.

   Note: The Location information is stored as Node information in Oracle Utilities Operational Device Management.

Technical Details

This section provides the integration process, as well as Oracle Utilities Meter Data Management and Oracle Utilities Operational Device Management inbound web services used for the Service Point - Node Synchronization integration point.

Integration Flow Name	Description
SYNC_SPREQ_MDMTOODM	Service Point - Node sync request integration process that transforms Service Point request from Oracle Utilities Meter Data Management to Service Point in Oracle Utilities Operational Device Management.

Integration Flow Name	Description
SYNC_NODERESP_ODMTOMDM	Service Point - Node sync response integration process that transforms Service Point response from Oracle Utilities Operational Device Management to Service Point in Oracle Utilities Meter Data Management.

Oracle Utilities Operational Device Management Services

Integration Package Name	Description
oracle.util.odmmdm.spsync	Service Point - Node sync request and response flows (.iar) are included in this package file (.par)

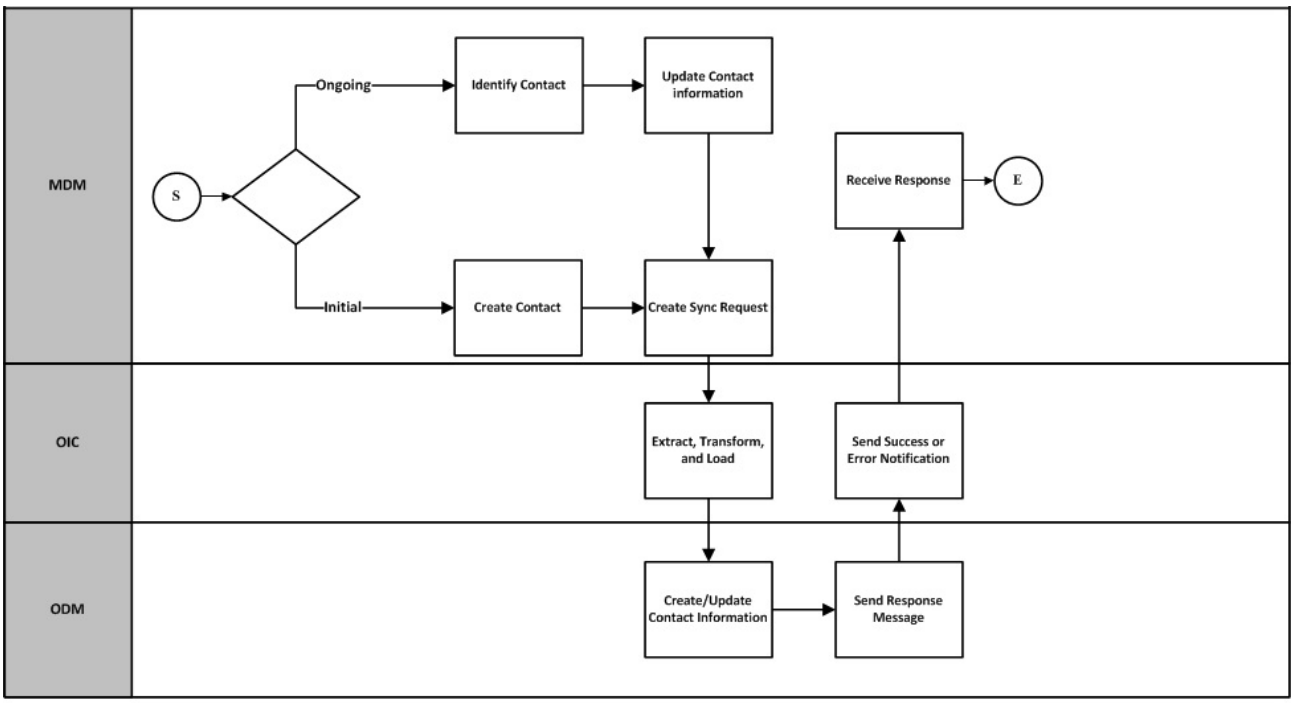
Service Name	Description
W1-SyncRequestInbound	An inbound web service to process the sync request from integration layer.

Oracle Utilities Meter Data Management Services

Service Name	Description
F1-UpdateAndTransitionSyncRequest	Updates a Transition Master Data Sync request. This inbound web service is invoked by the integration layer to send the sync response message.

Contact Synchronization

This process synchronizes the contact details needed by Oracle Utilities Operational Device Management from Oracle Utilities Meter Data Management.



Contact Synchronization Process Diagram

Business Processing

The Contact Sync *request* integration process includes the following activities:

1. Oracle Utilities Meter Data Management sends the Contact sync information in the form of XML messages to the Contact sync request integration process SYNC_CONTACTREQ_MDMTOODM which is deployed on Oracle Integration Cloud.
2. The request integration process transforms Contact request messages in the Oracle Utilities Meter Data Management format to Contact messages in the Oracle Utilities Operational Device Management format and invokes W1-SyncRequestInbound inbound web service in Oracle Utilities Operational Device Management.
3. An immediate acknowledgment is sent to Oracle Utilities Meter Data Management.
4. Any errors are reported back to Oracle Utilities Meter Data Management through the global fault handler.
5. An email notification with error details will be sent to the users configured in the UA_ODMMDM_Email_ID lookup.

The Contact Sync *response* integration process includes the following activities:

1. After running the batch job in Oracle Utilities Operational Device Management, Contact sync response in the form of XML messages are sent to Contact sync response integration process SYNC_CONTACTRES_ODMTOMDM which is deployed on Oracle Integration Cloud.
2. The response integration process transforms the Contact response message in the Oracle Utilities Operational Device Management format to Contact message in the Oracle Utilities Meter Data Management format and invokes F1-

UpdateAndTransitionSyncRequest inbound web service in Oracle Utilities Meter Data Management.

3. An immediate acknowledgment is sent to Oracle Utilities Meter Data Management.
4. Any errors are reported back to Oracle Utilities Meter Data Management through the global fault handler.
5. An email notification with error details will be sent to the users configured in the UA_ODMMDM_Email_ID lookup.

Technical Details

This section provides the integration process, as well as the Oracle Utilities Meter Data Management and Oracle Utilities Operational Device Management inbound web services used for the Contact Synchronization integration point.

Integration Flow Name	Description
SYNC_CONTACTREQ_ MDMTOODM	Contact Sync Request integration process that transforms Contact request from Oracle Utilities Meter Data Management to Contact in Oracle Utilities Operational Device Management.
SYNC_CONTACTRES_ ODMTOMDM	Contact Sync Response integration process that transforms Contact response from Oracle Utilities Operational Device Management to Contact in Oracle Utilities Meter Data Management.

Integration Package Name	Description
oracle.util.odmmdm.contactsync	Contact sync request and response flows (.iar) are included in this package file (.par)

Oracle Utilities Operational Device Management Services

Service Name	Description
W1-SyncRequestInbound	The inbound web service to process the sync request from integration layer.

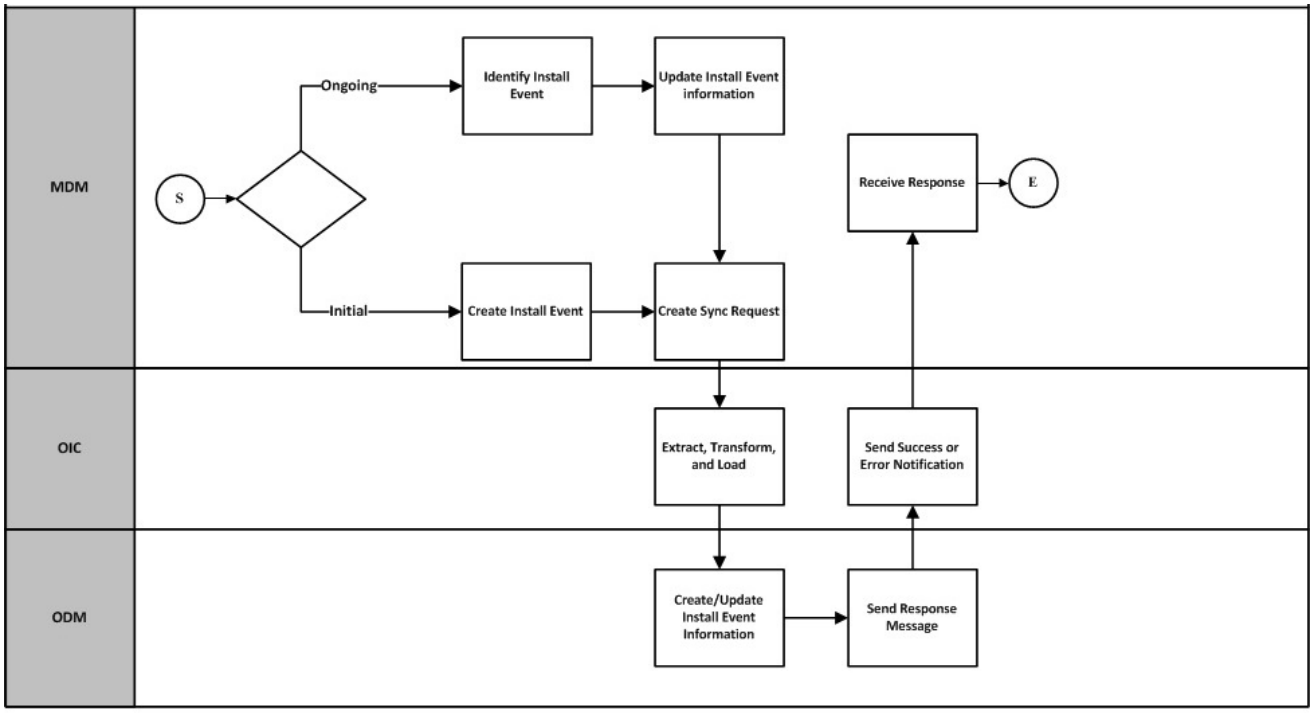
Oracle Utilities Meter Data Management Services

Service Name	Description
F1-UpdateAndTransitionSyncRequest	Updates a Transition Master Data Sync Request. This IWS is invoked by the integration layer to send the sync response message.

Install Event - Asset Node Synchronization

This process synchronizes asset node details required by Oracle Utilities Operational Device Management from install event in Oracle Utilities Meter Data Management.

The following diagram provides a graphical representation of this processing:



Install Event - Asset Node Synchronization Process Diagram

Business Processing

The Install Event - Asset Node Sync *request* integration process includes the following activities:

1. Oracle Utilities Meter Data Management sends the Install Event sync information in the form of XML messages to the Install Event sync request integration process SYNC_INSTALLEVE_MDMTOODM which is deployed on Oracle Integration Cloud.
2. The request integration process transforms Install Event request messages in the Oracle Utilities Meter Data Management format to Asset Node messages in the Oracle Utilities Operational Device Management format and invokes W1-SyncRequestInboundAssetNode inbound web service in Oracle Utilities Operational Device Management.
3. An immediate acknowledgment is sent to Oracle Utilities Meter Data Management.
4. Any errors are reported back to Oracle Utilities Meter Data Management through the global fault handler.
5. An email notification with error details will be sent to the users configured in the UA_ODMMDM_Email_ID lookup.

The Install Event - Asset Node Sync *response* integration process includes the following activities:

1. After running the batch job in Oracle Utilities Operational Device Management, Asset Node sync response in the form of XML messages are sent to the Asset Node sync response integration process SYNC_ASSETNODER_ODMTOMDM which is deployed on Oracle Integration Cloud.
2. The response integration process transforms the Asset Node response message in the Oracle Utilities Operational Device Management format to Install Event message in the Oracle Utilities Meter Data Management format and invokes F1-UpdateAndTransitionSyncRequest inbound web service in Oracle Utilities Meter Data Management.
3. An immediate acknowledgment is sent to Oracle Utilities Operational Device Management.
4. Any errors are reported back to Oracle Utilities Operational Device Management through the global fault handler.
5. An email notification with error details will be sent to the users configured in the UA_ODMMDM_Email_ID lookup.

Technical Details

This section provides the integration process, as well as Oracle Utilities Meter Data Management and Oracle Utilities Operational Device Management inbound web services used for the Install Event - Asset Node Synchronization integration point.

Integration Flow Name	Description
SYNC_INSTALLEVE_ MDMTOODM	Transforms Install Event request from Oracle Utilities Meter Data Management to Asset Node in Oracle Utilities Operational Device Management.
SYNC_ASSETNODER_ ODMTOMDM	Transforms Asset Node response from Oracle Utilities Operational Device Management to Service Point in Oracle Utilities Meter Data Management.

Integration Package Name	Description
oracle.util.odmmdm.installeventsync	Install Event - Asset Node sync request and response flows (.iar) are included in this package file (.par).

Oracle Utilities Operational Device Management Services

Service Name	Description
W1-SyncRequestInboundAssetNode	Processes the Asset Node sync request from integration layer.

Oracle Utilities Meter Data Management Services

Service Name	Description
F1-UpdateAndTransitionSyncRequest	Updates a Transition Master Data Sync Request. This inbound web service is invoked by the integration layer to sends the sync response message.

Part 2

Implementing the Integration Product

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

It provides details about the configuration settings required for the integration and discusses details related to:

- Configuring the Participating Applications and Integration Layer
- Monitoring and Troubleshooting
- Data Mapping for Integration Flows

Chapter 3

Configuring the Participating Applications and Integration Layer

This chapter provides details regarding the configuration settings required for the integration. The following are discussed in detail:

- Synchronizing Data
- Setting Up Oracle Utilities Operational Device Management
- Setting Up Oracle Utilities Meter Data Management
- Setting Up the Integration Process

Synchronizing Data

In this integration, Oracle Utilities Meter Data Management serves as the database for contacts, service points, and meter device connections, while Oracle Utilities Operational Device Management manages assets (meters and components).

Any asset data addition in Oracle Utilities Operational Device Management is communicated to Oracle Utilities Meter Data Management. Based on a template ID, device, device configuration, and measuring component, the records are associated. Once these devices are installed at service points in Oracle Utilities Meter Data Management, the installation information is communicated to Oracle Utilities Operational Device Management.

Service point and contact information are necessary to communicate installation information. These are synchronized separately from Oracle Utilities Meter Data Management to Oracle Utilities Operational Device Management.

Setting Up Oracle Utilities Operational Device Management

To set up Oracle Utilities Operational Device Management for the integration, configure the admin data and system data tables, outbound messages, and catalog services.

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

- Configuring Admin Data Tables
- Configuring System Data Tables
- Configuring Outbound Messages
- Managing Catalog Service

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

For more information on configuring and working with Oracle Utilities Operational Device Management, refer to the Oracle Utilities Operational Device Management documentation.

Configuring Admin Data Tables

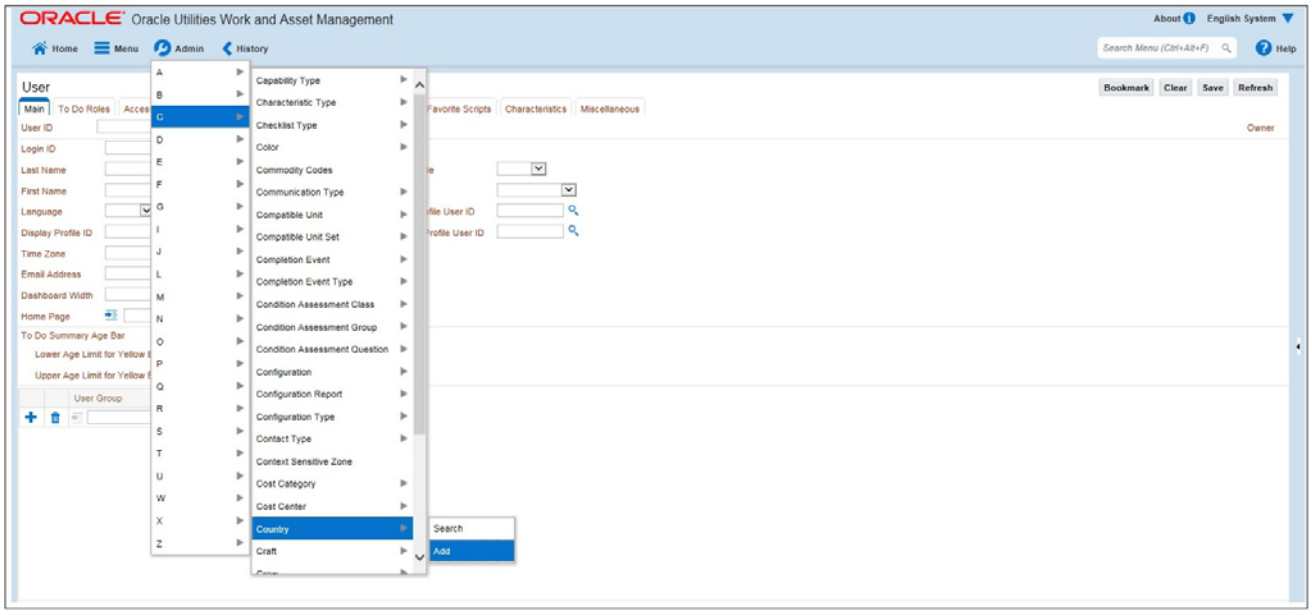
This section describes the unique setup issues specifically related to configuring your system for the integration.

To configure Admin Data Tables, define the following entities:

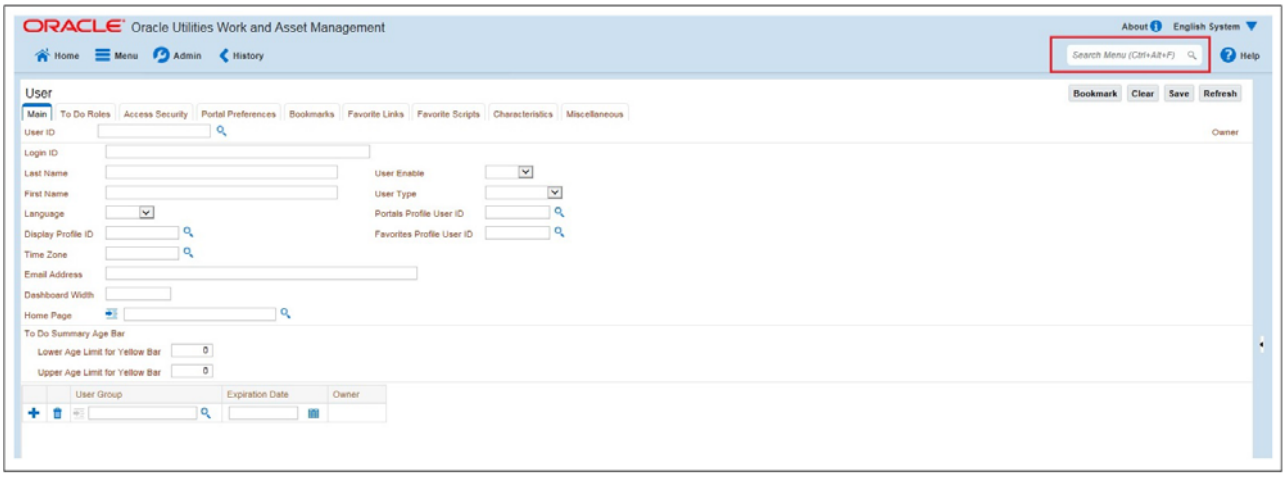
- Country
- Contact Type
- Asset Location Type
- Time Zone
- Asset Type

- Specification
- Master Configuration

Important: In the following sections, alphabetical menus are used to specify the navigation path. Alternatively, you can either navigate to the required entity using functional menus or search for a specific entity using the **Search Menu**.



Navigation using Alphabetical Menu



Navigation using Search Menu

Country

Create a country code in Oracle Utilities Operational Device 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 defined. The codes defined here must exactly match values in the Lookups/DVMs indicated.

Country Code Details for Oracle Utilities Operational Device Management

Navigation	Guidelines	Corresponding DVM
Admin > C > Country	Create the Country codes	UA_ODMMDM_Country

Contact Type

Create the required Contact Types. The codes defined here must exactly match values in the lookup indicated.

Contact Type Code Details for Oracle Utilities Operational Device Management

Navigation	Guidelines	Corresponding DVM
Admin > C > Contact Type	Create Contact Types	UA_MDMODM_ContactType

Asset Location Type

Create the required Asset Location Types. The codes defined here must exactly match values in the lookup indicated.

Asset Location Type Code Details for Oracle Utilities Operational Device Management

Navigation	Guidelines	Corresponding DVM
Admin > A > Asset Location Type	Create Asset Location Types	UA_ODMMDM_SPNodeType

Time Zone

Create the required Time Zones. The codes defined here must exactly match values in the lookup indicated.

Time Zone Code for Oracle Utilities Operational Device Management

Navigation	Guidelines	Corresponding DVM
Admin > T > TimeZone	Create Timezone Types	UA_ODMMDM_TimeZone

Asset Type

Create the required Asset Types. The codes defined here must exactly match values in the lookup.

Specification Codes for Oracle Utilities Operational Device Management

Navigation	Guidelines	Corresponding DVM
Admin > A > Asset Type	Create Asset Types	UA_ODMMDM_AssetDevice Type

Specification

Create the required Specification codes. The codes defined here will be used by the Specification extendable lookup in Oracle Utilities Meter Data Management.

Specification Codes for Oracle Utilities Operational Device Management

Navigation	Guidelines	Corresponding DVM
Menu > Asset Management > Specification	Create Specification codes	N/A

Master Configuration

Two master configurations - Master Data Synchronization Configuration and Seeder Sync Request Master Configuration - have to be configured. A business process analysis script is provided to pre-populate these with the information necessary to support the base objects included in the sync. Execute W2-MDMPreMCf to accomplish this.

A third master configuration, Oracle Utilities Meter Data Management Integration Master Configuration, needs to be completed manually. The Oracle Utilities Meter Data Management URL, timeout threshold hours for outbound requests, and the maintenance object/Outbound Message Type combinations used by outbound requests are all defined here. The To Do Type to use for asset-location sync scenarios that require manual intervention is also defined here as well as the time out number of hours used by the outbound sync.

Configuring System Data Tables

To configure the System Data tables, the following are required:

- Business Objects
- Business Object Algorithms
- Extendable Lookups
- Menus
- Batch Scheduling

Business Objects

This section describes the unique setup issues specifically related to integration system configuration.

Business Object	Business Object Description
W1-OngoingSyncRequestContact W1-OngoingSyncRequestLocation W1-OngoingSyncRequestAssetNode	Defines the behavior of inbound sync requests. The schema elements define information required to maintain the master data in Oracle Utilities Operational Device Management. As part of sync request processing, an acknowledgment message is sent to the external system (either positive or negative). The "Outbound Message Type" business object option contains a reference to the outbound message business object to use for this purpose. The base package includes business object W1-MDMAssetSyncReqOutMsg to be used on the outbound message type configuration. For more information, refer to the Configuring Outbound Messages section.
	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 business object status options. If your implementation needs to introduce custom values, add a higher sequenced row for the option you need to modify. The algorithms will automatically use these values. The Create To Do algorithm (W1-CRE-SRITD) has been delivered to use the base package supplied To Do Type W1-SYRQI 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. The monitor process on the initial states of these business objects may be removed by the implementation if immediate processing of the sync requests as they are received is desired.

Business Object	Business Object Description
W1-MDMAssetSyncRequest	Defines the behavior of an outbound sync request. The schema elements define the information needed by Oracle Utilities Meter Data Management to maintain device master data. The business object and data area necessary to build the sync snapshot are defined as business object options on the sync request business object. The business object W1-MDMAsset and DA W1-MDMAssetSnapshot are included in the base for use with these options. If your implementation needs to use your own snapshot business object or DA, simply add a higher sequenced row for the relevant option. The Post Service Script for Extract option allows your implementation to perform additional manipulation of the data during the building of the snapshot. The Create To Do algorithm (W1-CRE-SROTD) has been delivered to use the base package supplied To Do Type W1-SYRQO 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.
W2-SmartMeter, W2-ManualMeter W2-CommunicationComponent	These base asset business objects need to have the audit plug-in configured to create outbound sync requests. For more details, refer to the Business Object Algorithms section. The sync request business object to use for Oracle Utilities Meter Data Management is defined as a business object Option on these business objects. The base includes W1-MDMAssetSyncRequest for this purpose.

Business Object Algorithms

The following table lists the business object algorithm types.

Algorithm Type	Description for Business Object Algorithm Types
W1-GCHG-CDCP	An audit algorithm that creates a sync request (if there is not already a Pending one in existence) for the particular record being modified. It retrieves the Sync Request business object option from the record's business object.

Algorithm Type	Description for Business Object Algorithm Types
W1-EXTSYSRST	A monitor algorithm that sets a timeout limit on the receipt of a response from the external system. It retrieves this timeout limit from the MDM Integration Master Configuration. Use the latter to define the number of hours your implementation wishes to wait for a response from Oracle Utilities Meter Data Management before transitioning the sync request into the Error state.

Extendable Lookups

Configure the following extendable lookups in Oracle Utilities Operational Device Management:

- W2-SmartMeterConfiguration - Configure the values to be used by Oracle Utilities Meter Data Management to identify a template device.

  This value is used in Oracle Utilities Meter Data Management in conjunction with the Specification to select a template device from which to create the device configuration and measuring components. Both configuration and specification values need to be set up in the Specification extendable lookup in Oracle Utilities Meter Data Management.

- W2-ManualMeterConfiguration - Configure the values to be used by Oracle Utilities Meter Data Management to identify a template device.

  This value is used in Oracle Utilities Meter Data Management in conjunction with the Specification to select a template device from which to create the device configuration and measuring components. Both configuration and specification values need to be set up in the Specification extendable lookup in Oracle Utilities Meter Data Management.

Menus

Make sure that the users have access to the W1-GOTOMDM application service. This application service is defined in the business process analysis scripts to allow you to switch from Oracle Utilities Operational Device Management to Oracle Utilities Meter Data Management. The context menu items appear on **Asset**.

Batch Scheduling

This batch process runs the sync request. It is a generic batch process used for different sync processes. The parameters in this batch are used to control which sync request business objects should be processed.

The following batch processes are used for Initial Sync requests:

> **Note**: 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 Scheduling Details

Batch Code	Batch Process Description
F1-SYNRQ	Transitions all the sync requests out of the **PENDING** state.
F1-SAKRQ	Pre-allocates the production key to each record and transitions all the sync requests out of the Transformed/Schema Validated state into the Key Allocated state.
W1-SIKCN	Resolves any foreign keys within the schema as well as executes the validation algorithms on the target business objects. This batch code is for processing Contact initial sync requests.
W1-SILCN	Loads the records for Contact into the production tables.
W1-SIKSP	Resolves any foreign keys within the schema as well as executes the validation algorithms on the target business objects. This batch code is for processing service point initial sync requests.
W1-SILSP	Loads the records for service point into the production tables.
W1-SILDD	Transitions all initial sync requests into the Additional Processing state from the Loaded state. An algorithm in the Additional Processing state sends an acknowledgment back to the external system along with the production ID of the synchronized object in Oracle Utilities Operational Device Management.
W1-SIIER	Transitions sync request out of the **ERROR** state.

Note: If any sync requests exist in the Validation Error state after errors have been investigated and resolved, run W1- SIIER to retry the data transformation/schema validation process. If any sync requests exist in the Resolution/Business Object Validation Error state, run its respective W1-SIK* batch job.

Refer to the above table for proper suffix to use for each master data record being synchronized.

Batch Processes for Ongoing Sync Requests

Batch Code	Batch Process Description
W1-SIOPE	Transitions ongoing sync request out of the **PENDING** state. It is a generic batch process that is used for different sync processes. It has a couple of parameters that can be used to control which sync request business objects to process.
W1-SIOER	Transitions ongoing sync request out of the **ERROR** state.

Batch Processes for Outbound Sync Requests

Batch Code	Batch Process Description
F1-SYNRQ	Runs the sync request. The Sync Request Monitor Process 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 business objects to process.
F1-SYNIL	Creates an initial sync request business object for a particular maintenance object. The algorithm parameters for filtering records are provided, so implementations can further restrict the creation of initial sync requests to certain records within the maintenance object.

Note: To generate initial sync requests, submit the F1-SYNIL batch job. To transition Sync Requests out of the Pending state, run the F1-SYNRQ batch job.

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

Configuring Outbound Messages

Configure the outbound messages to send them out to the integration layer. The following should be configured during the outbound message configuration:

- Message Sender
- Outbound Message Type
- External System

Message Sender

If Oracle Utilities Operational Device Management accesses Oracle Integration Cloud services, create a Message Sender for each integration service.

To configure a Message Sender for an integration service in Oracle Utilities Operational Device Management:

1. Navigate to the **Message Sender** page.

   You can do so from the **Admin** menu or from the **Search** menu.
2. Enter a unique **Message Sender** name and its description.
3. Populate the following values:
   - **Message Sender** - Sender name in Oracle Utilities Operational Device Management
   - **Description** - Sender description
   - **Invocation Type** - Real-time
   - **Message Class** - SOAPSNDR (SOAP Sender)
   - **Active** - Select the checkbox

- **Message Encoding** - UTF-8 message encoding

4. On the **Context** tab, set values for the following context types:
   - **HTTP Header** - SOAPAction:"Operation name in the respective OIC integration process wsdl"
   - **HTTP Login User** - User ID to access OIC Integration process
   - **HTTP Password** - Password to access OIC Integration process
   - **HTTP Method** (POST/GET) - POST
   - **HTTP Timeout** - 60
   - **HTTP Transport Method** - SendReceive
   - **HTTP URL 1** - Set the URL to be accessed.

     If the URL value is invalid, use the additional HTTP URL types to set the complete URL.
   - **SOAP Insert Timestamp (Y/N)** - Y
   - **Sender Security Type** - TEXT

Example Message Sender for Integration Services

Asset Device Sync Request Process

Message Sender	Description	HTTP Header	HTTP URL
ADSynReq	Asset Device Sync Request	SOAPAction:"ICS_MDM_AssetSync"	http://ICS_HOST:7003/ic/ws/integration/v1/flows/oracleutilities/SYNC_ASSETREQ_ODMTOMDM/1.0/

Contact Sync Response Process

Message Sender	Description	HTTP Header	HTTP URL
ConSynResp	Contact Sync Response	SOAPAction:"ICS_MDM_NodeSync"	http://ICS_HOST:7003/ic/ws/integration/v1/flows/oracleutilities/SYNC_CONTACTRES_ODMTOMDM/1.0/

Install Event Asset Node Sync Response Process

Message Sender	Description	HTTP Header	HTTP URL
InsEANSynResp	Install Event Asset Node Sync Response	SOAPAction:"ICS_MDM_AssetNodeSync"	http://ICS_HOST:7003/ic/ws/integration/v1/flows/oracleutilities/SYNC_ASSETNODER_ODMTOMDM/1.0/

SP Node Sync Response Process

Message Sender	Description	HTTP Header	HTTP URL
SPNSynResp	SP Node Sync Response	SOAPAction:"ICS_MDM_NodeSync"	http://ICS_HOST:7003/ic/ws/integration/v1/flows/oracleutilities/SYNC_NODERESP_ODMTOMDM/1.0/

Outbound Message Type

To create a new outbound message type for each integration process, do the following:

1. Navigate to the **Outbound Message Type** page.

   You can do so from the **Admin** menu or from the **Search** menu.

2. Enter an outbound message type, description, and detailed description.
3. Select the outbound message business object created for a specific service.

Example Outbound Message Types for Integration Points

Asset - Device Sync Integration Point Outbound Message

Outbound Message Type	Description	Business Object
WM-MDMASTSYN	Asset Sync Request - For Outbound Message	W1-MDMAssetSyncReqOutMsg

Service Point - Node Sync Integration Point Outbound Message

Outbound Message Type	Description	Business Object
WM-SP-SYNRSP	Service Point Sync Response - For Acknowledgment Message	W1-OutboundAcknowledgeMessage

Contact Sync Integration Point Outbound Message

Outbound Message Type	Description	Business Object
WM-CN-SYNRSP	Contact Sync Response - For Acknowledgment Message	W1-OutboundAcknowledge Message

Install Event - Asset Location Sync Integration Point Outbound Message

Outbound Message Type	Description	Business Object
WM-AN-SYNRSP	Asset - Node Sync Response - For Acknowledgment Message	W1-OutboundAcknowledge Message

External System

To create a new external system to support the integration:

1. Navigate to the **External System** page.

   You can do so from the **Admin** menu or from the **Search** menu.

2. Enter a unique external system and description.

   For example: Name = MDM_ICS, Description = Oracle Utilities Meter Data Management

3. Set the **Our Name in Their System** field to **ODM**.
4. Associate the outbound message types created to the external system.
5. For each outbound message type, set the following:
   - **Outbound Message Type** - Set the outbound message type created for Oracle Utilities Operational Device Management outbound queue.
   - **Processing Method** - Real-time
   - **Message Sender** - Set the message sender created for the queue.
   - **Date/Time Format** - XSD
   - **Namespace Option** - Standard Namespace
   - **Message XSL**

   For example: External System - MDM

If Oracle Utilities Operational Device Management sends messages to the integration service, use the Message Senders created for each integration.

For more information about Message Senders, refer to the Message Sender section.

External System Details

Outbound Message Type	Processing Method	Message Sender	Message XSL
WM-MDMASTSYN	Real-time	ADSynReq	W2-MDMODMRequestAddNamespace.xsl
WM-SP-SYNRSP	Real-time	SPNSynResp	W2-MDMODMResponseAddNamespace.xsl
WM-CN-SYNRSP	Real-time	ConSynResp	W2-MDMODMResponseAddNamespace.xsl
WM-AN-SYNRSP	Real-time	InsEANSynResp	W2-MDMODMResponseAddNamespace.xsl

Managing Catalog Service

The catalog service is used by Oracle Integration Cloud to communicate with the respective application. This is configured in Catalog URL in the Oracle Integration Cloud connection.

To configure the catalog service in Oracle Utilities Operational Device Management:

1. Navigate to the **Web Service Catalog** page.

   You can do so either from the **Admin** menu or the **Search** menu.

   The external system and inbound web services are added to the catalog.

2. To get the catalog URL, append "webservices/builtin/ServiceCatalog?wsdl" to the Oracle Utilities Operational Device Management URL.

   For example: http(s)://<ODM_HOST>:<ODM_PORT>/<ContextRoot>/webservices/builtin/ServiceCatalog?wsdl

For more information about configuration, refer to the Oracle Utilities Operational Device Management documentation.

Setting Up Oracle Utilities Meter Data Management

The D1-AddODMAlg and D1-ODMPreMcg business process analysis scripts aid in setting up Oracle Utilities Meter Data Management sync processing. Consequently, the setup effort by an implementation is greatly reduced.

These scripts insert Oracle Utilities Operational Device Management-specific algorithms to Sync Request business objects. They are intended to be executed only once prior to any customization(s) being made to any of the sync objects.

The details are as follows:

- **D1-AddODMAlg** - Inserts transformation algorithms specific to the Oracle Utilities Operational Device Management integration into the sync request business objects.

  If your implementation needs to introduce additional transformation algorithms, insert them after running this script.

- **D1-ODMPreMcg**- Used to setup 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 business object 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.

To set up Oracle Utilities Meter Data Management for the integration, configure the admin data and system data tables, outbound messages, and catalog services.

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

- Configuring Admin Data Tables
- Configure System Data Tables
- Configuring Outbound Messages
- Managing Catalog Service

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

For more information on configuring and working with Oracle Utilities Meter Data Management, refer to the Oracle Utilities Meter Data Management documentation.

Configuring Admin Data Tables

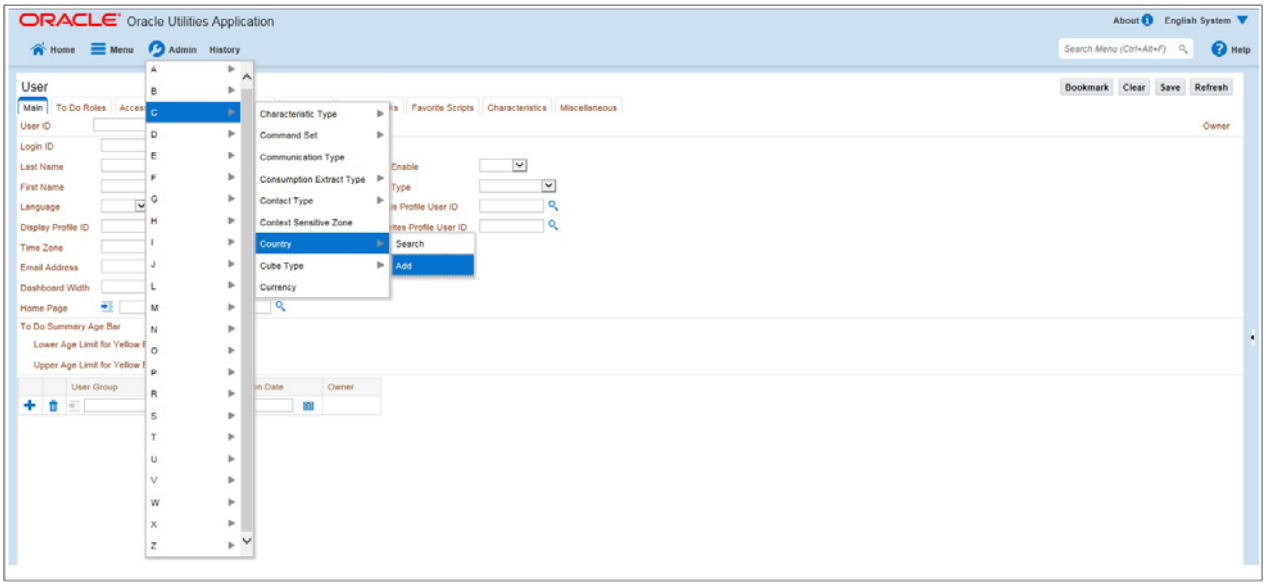
This section describes the unique setup issues specifically related to configuring the system for integration. For more information about configuring Oracle Utilities Meter Data Management, refer to the Oracle Utilities Meter Data Management *User's Guide*.

To configure Admin Data Tables, define the following codes and types:

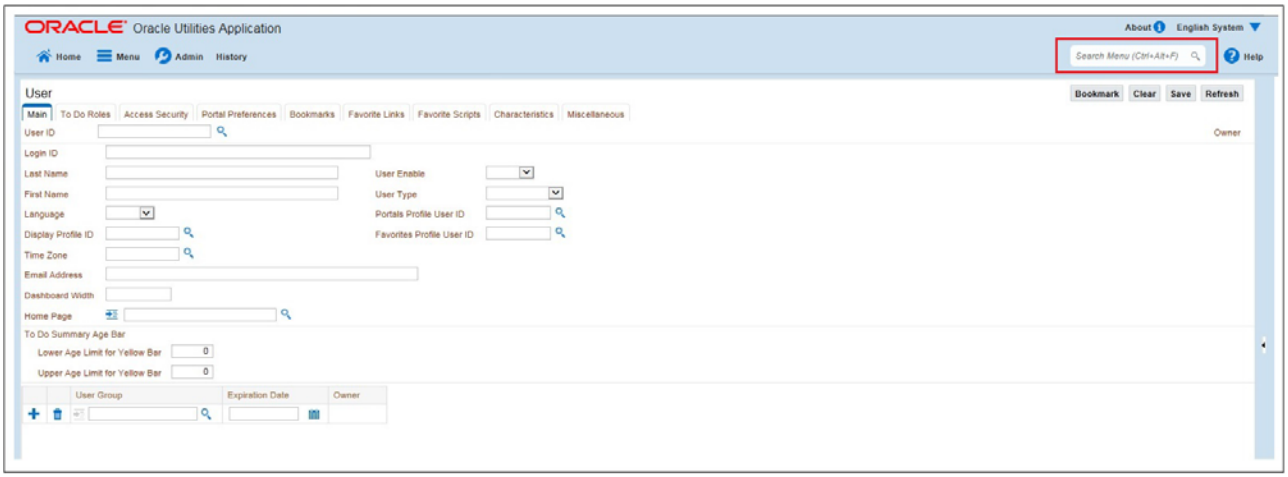
- Country
- Service Point Type
- Contact Type
- Device Type
- Master Configuration

  Important: In the following sections, alphabetical menus are used to specify the navigation path. Alternatively, you can either navigate to the

required entity using functional menus or search for a specific entity using the **Search Menu**.



Navigation using Alphabetical Menu



Navigation using Search Menu

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 defined.

Country Code Details for Oracle Utilities Meter Data Management

Navigation	Guidelines	Corresponding DVM
Admin > C > Country	Create the Country codes	UA_ODMMDM_Country

Service Point Type

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

Service Point Type Code for Oracle Utilities Meter Data Management

Navigation	Guidelines	Corresponding DVM
Admin Menu > S > Service Point Type	Create Service Point Types	UA_ODMMDM_SPNodeType

Contact Type

Create the required Contact Types. The codes defined here must exactly match values in the lookup indicated.

Contact Type Code Details for Oracle Utilities Meter Data Management

Navigation	Guidelines	Corresponding DVM
Admin > C > Contact Type	Create Contact Types	UA_MDMODM_ContactType

Device Type

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

Device Type Code Details for Oracle Utilities Meter Data Management

Navigation	Guidelines	Corresponding DVM
Admin > D > Device Type	Create Device Types	UA_ODMMDM_ AssetDeviceType

Master Configuration

Two master configurations - Master Data Synchronization Configuration and Seeder Sync Request Master Configuration - have to be configured. A business process analysis script is provided to pre-populate these with the information necessary to support the base objects included in the sync. Execute W2-MDMPreMCf to accomplish this.

A third master configuration, Oracle Utilities Meter Data Management Integration Master Configuration, needs to be completed manually. The Oracle Utilities Operational Device Management URL, timeout threshold hours for outbound requests, and the maintenance object/Outbound Message Type combinations used by outbound requests

are all defined here. The To Do Type to use for asset-location sync scenarios that require manual intervention is also defined here, as well as the time out number of hours used by the outbound sync.

Configure System Data Tables

To configure System Data Tables, the following are required:

- Business Objects
- Business Object Algorithms
- Maintenance Object
- Maintenance Object Algorithms
- Extendable Lookups
- Lookups
- Menus
- Batch Scheduling

Business Objects

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

Business Objects Details

Business Object	Business Object Description
D1-OngoingSyncRequestDevice	Defines the behavior of an ongoing sync request. The schema elements define information required to maintain the device master data in Oracle Utilities Meter Data Management. As part of sync request processing, an acknowledgment message is sent to the external system (either positive or negative). The "Outbound Message Type" business object option contains a reference to the outbound message business object to use for this purpose. The base package includes business object D1-OngoingSyncReqAckMsg to be used on the outbound message type configuration. 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 business object 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. 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. The monitor process on the initial states of these business objects may be removed by the implementation if immediate processing of the sync requests as they are received is desired.

Business Object	Business Object Description
D1-ODMContactSyncRequest D1-ODMSPSyncRequest D1-InstallEventSyncRequest	These business objects define the behavior of an outbound sync request. The schema elements define the information needed by Oracle Utilities Operational Device Management to maintain contact, SP, and asset-node master data. The business object and data area necessary to build the sync snapshot are defined as business object options on the sync request business object. The business objects D1-ContactODMBORead, D1-InstallEventBORead, and D1-ServicePointODMBORead as well as DAs D1-ODMContactBasedSnapshot, D1-ODMSPSnapshot, and D1-InstallEventSnapshot are included in the base for use with these options. If your implementation needs to use your own snapshot business object or DA, simply add a higher sequenced row for the relevant option. The Post Service Script for Extract option allows your implementation to perform additional manipulation of the data during the building of the snapshot. The Create To Do algorithm (D1-SRCRETODO) has been delivered to use the base package supplied To Do Type F1-SYNRQ 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.

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

Business Object Algorithms

Oracle Utilities Operational Device Management-specific algorithms need to be plugged in on the sync request business objects. A business process analysis script is provided to plug-in these algorithms on to the sync business objects. This business process analysis script should be executed prior to any further customizations done on the sync business objects. It should only be executed once. Run D1-AddODMAlg Insert Oracle Utilities Operational Device Management-specific algorithms to Sync Request business objects (MDF) to accomplish this.

Maintenance Object

Configure the Maintenance Object algorithm type.

Maintenance Object Alogrithm Type

Algorithm Type	Algorithm Type Description
D1-CONTACT	Specify the maintenance object Audit algorithm configured in the previous section.

Algorithm Type	Algorithm Type Description
D1-SP	Specify the generic maintenance object Audit algorithm D1-ODM-GCDCP. Also specify the D1-ODMSPSyncRequest business object in the Sync Request BO MO Option.
D1-INSTLEVT	Specify the generic MO Audit algorithm D1-ODM-GCDCP. Also specify the D1-InstallEventSyncRequest business object in the Sync Request BO MO Option.

Maintenance Object Algorithms

Configure the maintenance object Audit algorithms.

maintenance object Audit algorithms contain the logic to instantiate a sync request (as long as one does not already exist in the initial state for the maintenance object-Primary Keys combination).

A generic algorithm F1-GCHG-CDCP comes with the base product and is plugged in on maintenance objects that need to instantiate sync requests for the same maintenance object. This algorithm instantiates the business objects defined in the Sync Request business object maintenance object Option. For more details, refer to the Maintenance Object section. For maintenance objects that have idiosyncratic logic, unique algorithms that contain this logic are used.

For example: Changes to the Contact maintenance object are only communicated to Oracle Utilities Operational Device Management if the Contact is linked to an Service Point.

Algorithm Type	Description
D1-CONCDCSP	Instantiates a Contact-based sync request whenever a change to the Contact maintenance object is detected and the Contact is associated with an service point. Define the sync request business object to be instantiated in the algorithm's parameters.

Extendable Lookups

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

- D1-OkToEnterLookup – Configure the corresponding values from Oracle Utilities Operational Device Management (values are yes or no). Ensure that the values are mapped correctly using the DVM UA_ODMMDM_OkToEnterCode.

Lookups

Configure the following lookups in Oracle Utilities Meter Data Management:

- DL_LS_SL_FLG – Configure the corresponding values from Oracle Utilities Operational Device Management (values are Life Support or NA). Ensure that the values are mapped correctly using the DVM UA_ODMMDM_LifeSupportSensitiveLoad.

Menus

Ensure that users have access to the application service D1-GOTOODM. This application service is defined on the business process analysis scripts that take a user from Oracle Utilities Meter Data Management into Oracle Utilities Operational Device Management. The context menu items appear on Contact and Service Point.

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.

> **Note**: 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 as follows.

Batch Processes for Initial Sync Requests

Batch Code	Description
F1-SYSRQ	Transitions all the sync requests out of the **PENDING** state.
F1-SAKRQ	Pre-allocates the production key to each record and transitions all the sync requests out of the Transformed/Schema Validated state into the Key Allocated state.
D1-SIKDV	Resolves any foreign keys within the schema as well as executes the validation algorithms on the target business objects. This batch code is for processing Device initial sync requests.
D1-SILDV	Loads the records for Device into the production tables.
D1-SIIER	Transitions sync request out of the ERROR state.

> **Note**: If any sync requests exist in the Validation Error state after errors have been investigated and resolved, run W1- SIIER to retry the data transformation/schema validation process. If any sync requests exist in the Resolution/Business Object Validation Error state, run its respective W1-SIK* batch job.
>
> Refer to the above table for proper suffix to use for each master data record being synchronized.

Batch Code for Ongoing Sync Requests

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

Note: Depending on how sync requests are sent from Oracle Utilities Operational Device Management, it is possible that interdependent sync requests might be received out of order.

If you wish to control the order of processing the ongoing sync requests within, you can either introduce your own batch controls to replace D1-SIOPE (each batch control will have the specific ongoing sync business object defaulted in the input parameter); or you can submit D1-SIOPE several times, each time specifying a different ongoing sync business object in the input parameter. Otherwise, you can let the built-in retry processing within the ongoing sync request life cycle resolve the error by running D1-SIOER.

Batch Processes for Usage Transaction Processing

Batch Code	Batch Process Description
F1-SYNRQ	Runs the sync request. The Sync Request Monitor Process 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 business objects to process.
F1-SYNIL	Creates an initial sync request business object for a particular maintenance object. The algorithm parameters for filtering records are provided, so implementations can further restrict the creation of initial sync requests to certain records within the maintenance object.

Configuring Outbound Messages

Configure the outbound messages to send them out to the integration layer. The following should be configured during the outbound message configuration:

- Message Sender
- Outbound Message Type
- External System

Message Sender

If Oracle Utilities Meter Data Management accesses Oracle Integration Cloud processes, create a Message Sender for each integration process.

To configure a Message Sender for an integration service:

1. Navigate to **Admin** menu > **M** > **Message Sender**.
2. Enter a unique **Message Sender name** and its description.
3. Populate the following values:
    - **Message Sender** - Sender name in Oracle Utilities Operational Device Management
    - **Description** - Sender description
    - **Invocation Type** - Real-time
    - **Message Class** - SOAPSNDR (SOAP Sender)

- **Active** - Select the checkbox
- **Message Encoding** - UTF-8 message encoding

4. On the **Context** tab, set values for the following context types:
   - **HTTP Header** - SOAPAction:"Operation Name in OIC integration process wsdl"
   - **HTTP Login User** - User ID to access OIC Integration process
   - **HTTP Password** - Password to access OIC Integration process
   - **HTTP Method (POST/GET)** - POST
   - **HTTP Timeout** - 60
   - **HTTP Transport Method** - SendReceive
   - **HTTP URL 1** - Set the URL to be accessed.

     If the URL value is invalid, use the additional HTTP URL types to set the complete URL.
   - **SOAP Insert Timestamp (Y/N)** - Y
   - **Sender Security Type** - TEXT

Example Message Sender for Integration Services

Asset Device Sync Response Integration Service

Message Sender	Description	HTTP Header	HTTP URL
ADSynResp	Asset Device Sync Response	SOAPAction:"ICS_ODM_DeviceSync"	http://ICS_HOST:7003/ic/ws/integration/v1/flows/oracleutilities/SYNC_DEVICERESP_MDMTOODM/1.0/

Contact Sync Request Integration Service

Message Sender	Description	HTTP Header	HTTP URL
ConSynReq	Contact Sync Request	SOAPAction:"ICS_ODM_ContactSync"	http://ICS_HOST:7003/ic/ws/integration/v1/flows/oracleutilities/SYNC_DEVICERESP_MDMTOODM/1.0/

Install Event Asset Node Sync Request Integration Service

Message Sender	Description	HTTP Header	HTTP URL
InsEANSynReq	Install Event Asset Node Sync Request	SOAPAction:"ICS_ODM_IESync"	http://ICS_HOST:7003/ic/ws/integration/v1/flows/oracleutilities/SYNC_CONTACTREQ_MDMTOODM/1.0/

Service Point Node Sync Request Integration Service

Message Sender	Description	HTTP URL

Message Sender	Description	HTTP Header	HTTP URL
SPNSynReq	SP Node Sync Request	SOAPAction:"ICS_ODM_SPSync"	http://ICS_HOST:7003/ic/ws/integration/v1/flows/oracleutilities/SYNC_SPREQ_MDMTOODM/1.0/

Outbound Message Type

To create a new outbound message type for each Oracle Utilities Meter Data Management outbound process:

1. Navigate to **Admin** menu > **O** > **Outbound Message Type**.
2. Enter an outbound message type, description, and detailed description.
3. Select the outbound message business object created for a specific service.

Example Outbound Message Types for Integration Points

Outbound Message Type for Asset -Device Sync

Outbound Message Type	Description	Business Object
DM-OMT-DEF	Device Sync Response Outbound Message Type	D1-OngoingSyncReqAckMsg

Outbound Message Type for SP-Node Configuration Sync

Outbound Message Type	Description	Business Object
DMSPODMMSG	ODM Service Point Outbound Message	D1-OutboundMessage

Outbound Message Type for Contact Sync

Outbound Message Type	Description	Business Object
DM-CONTMSG	ODM Contact Outbound Message	D1-OutboundMessage

Outbound Message Type for Install Event - Asset Node Sync

Outbound Message Type	Description	Business Object
DMIERESMSG	ODM Install Event Outbound Message	D1-OutboundMessage

External System

To create a new external system to support the integration:

1. Navigate to **Admin** menu > **E** > **External System**.
2. Enter a unique external system and description.

   For example: Name = ODM_ICS, Description = Oracle Utilities Operational Device Management
3. Set the **Our Name in Their System** field to MDM.
4. Associate the outbound message types created to the external system.
5. For each outbound message type, set the following:
   - **Outbound Message Type** - Set the outbound message type created for Oracle Utilities Meter Data Management outbound process.
   - **Processing Method** - Real-time
   - **Message Sender** - Set the message sender created for the process.
   - **Date/Time Format** - XSD
   - **Namespace Option** - Standard Namespace
   - **Message XSL**

   For example: External System - ODM_ICS

External System Details

Outbound Message Type	Processing Method	Message Sender	Message XSL
DM-OMT-DEF	Real-time	ADSynResp	D1-MDMODMResponseAddNamespace.xsl
DMSPODMMSG	Real-time	SPNSynReq	D1-MDMODMRequestAddNamespace.xsl
DM-CONTMSG	Real-time	ConSynReq	D1-MDMODMRequestAddNamespace.xsl
DMIERESMSG	Real-time	InsEANSynReq	D1-MDMODMRequestAddNamespace.xsl

Managing Catalog Service

The catalog service is used by Oracle Integration Cloud to communicate with the application. This is configured in Catalog URL in the Oracle Integration Cloud connection.

To configure the catalog service in Oracle Utilities Operational Device Management:

1. Navigate to **Admin** menu > **W** > **Web Service Catalog**. The external system and Inbound Web Services are added to the catalog.
2. To get the catalog URL, append "webservices/builtin/ServiceCatalog?wsdl" to the Oracle Utilities Meter Data Management URL.

   For example: http(s)://<MDM_HOST>:<MDM_PORT>/<ContextRoot>/webservices/builtin/ServiceCatalog?wsdl

For more information about configuration, refer to the Oracle Utilities Meter Data Management documentation.

Setting Up the Integration Process

The following sections describe the steps to configure the integration pack to meet the requirements for this integration.

- Configuring Oracle Integration Cloud
- Configuring Lookups
- Error Handling
- Email Notifications
- Customizations

Configuring Oracle Integration Cloud

Oracle Integration Cloud is a complete, secure, but lightweight integration solution that enables to connect your applications in the cloud. It simplifies connectivity between the applications, and connects both the applications that live in the cloud and those that still are on-premises.

Oracle Integration Cloud provides secure, enterprise-grade connectivity regardless of the applications you are connecting or where they reside. The adapters simplify connectivity by handling the underlying complexities of connecting to applications using industry-wide best practices. Only a connection has to be created that provides minimal connectivity information for each system.

To use any Oracle Integration Cloud integration, do the following:

1. Download the integration package from the Oracle Market Place.
2. Import the package into the Oracle Integration Cloud server and configure the connections.
3. Update connections with the respective edge application's catalog URLs and activate the integration before doing the end-to-end testing.

Perform the following tasks to configure the Oracle Integration Cloud integration:

- Working with Install Agent
- Configuring Connections
- Importing Pre-built Integration Packages
- Activating Integration Flows
- Testing Integration Flows
- Setting Up Security

Working with Install Agent

Create an agent group in Oracle Integration Cloud and install agent on the on-premises server before creating/activating an integration in which messages are exchanged between the on-premises applications and Oracle Integration Cloud.

The agent related configurations are needed only if the server points to an on-premises application. The possible combinations are as follows:

- Oracle Utilities Operational Device Management on Cloud and Oracle Utilities Meter Data Management on Cloud
- Oracle Utilities Operational Device Management on Cloud and Oracle Utilities Meter Data Management On-Premises
- Oracle Utilities Operational Device Management On-Premises and Oracle Utilities Meter Data Management on Cloud

> **Important**: While modifying the configuration of any cloud and on-premises application combination, make sure that the package is downloaded from Oracle Market Place. Please do not download the package from the existing Oracle Integration Cloud environment.

Oracle Utilities Operational Device Management on Cloud and Oracle Utilities Meter Data Management on Cloud

When both the edge applications are on cloud, the connectivity agent is not required and an agent group need not be created in Oracle Integration Cloud.

Perform the following steps:

1. Import the integration package from Oracle Market Place.

   For instructions to import an integration package, refer to the Importing Pre-built Integration Packages section.

2. Edit the Oracle Utilities Operational Device Management and Oracle Utilities Meter Data Management connections.

   For instructions to edit the application connections, refer to the Configuring Connections section.

3. Activate the integrations.

   For instructions to activate the integration, refer to the Activating Integration Flows section.

The following table shows the complete setup in edge applications/Oracle Integration Cloud required for this combination..

Integration Scenario	ODM	MDM
Application is on cloud	Yes	Yes
Application is on-premises	No	No
Need Agent group in Oracle Integration cloud connection	No	No
Install Agent on-premises	No	No

Oracle Utilities Operational Device Management on Cloud and Oracle Utilities Meter Data Management On-Premises

When Oracle Utilities Operational Device Management is on cloud and Oracle Utilities Meter Data Management is on-premises:

1. Create an agent group '**UAG**' in Oracle Integration Cloud.

   For instructions to create an agent group, refer to the Create an Agent Group section.

2. Install the agent in Oracle Utilities Meter Data Management on-premises server.

   For steps to download the agent installer and install on-premises, refer to the Downloading Agent Installer and Install On-Premises Agent sections.

3. Import the integration package.

   For steps to import the integration package, refer to the Importing Pre-built Integration Packages section.

4. Edit the UAC_MDM connection.

   a. Update the catalog URL and security details.

b. Check if the agent group is displayed in the **Agent Group** section.

c. Save and test the connection.

For steps to configure an Oracle Utilities Meter Data Management connection, refer to Configuring the Oracle Utilities Meter Data Management Connection section.

5. Edit the UAC_ODM connection.

a. Update the catalog URL and security details.

b. If **UAG** is displayed in the **Agent Group** section, remove it. It is not needed since Oracle Utilities Operational Device Management is on cloud.

c. Save and test the connection.

For steps to configure an Oracle Utilities Operational Device Management connection, refer to Configuring the Oracle Utilities Operational Device Management Connection section.

6. Activate the integrations.

For steps to activate the integration, refer to the Activating Integration Flows section.

The following table shows the complete setup in edge applications/Oracle Integration Cloud required for this combination.

Integration Entities	ODM	MDM
Application is on cloud	Yes	No
Application is on-premises	No	Yes
Need Agent group in Oracle Integration cloud connection	No	Yes
Install Agent on-premises	No	Yes

Oracle Utilities Operational Device Management On-Premises and Oracle Utilities Meter Data Management on Cloud

When Oracle Utilities Operational Device Management is on-premises and Oracle Utilities Meter Data Management is on cloud, perform the following steps:

1. Create an agent group '**UAG**' in Oracle Integration Cloud.

For instructions to create an agent group, refer to the Create an Agent Group section.

2. Install the agent in Oracle Utilities Operational Device Management on-on-premises server.

For steps to download the agent installer and install on-premises, refer to the Downloading Agent Installer and Install On-Premises Agent sections.

3. Import the integration package.

For steps to import the integration package, refer to the Importing Pre-built Integration Packages section.

4. Edit the UAC_ODM connection.
   a. Update the catalog URL and security details.
   b. Check if the agent group is displayed in the Agent Group section.
   c. Save and test the connection.

      For steps to configure an Oracle Utilities Operational Device Management connection, refer to Configuring the Oracle Utilities Operational Device Management Connection section.
5. Edit the UAC_MDM connection.
   a. Update the catalog URL and security details.
   b. If **UAG** is displayed in the **Agent Group** section, remove it. It is not needed since Oracle Utilities Operational Device Management is on cloud.
   c. Save and test the connection.

      For steps to configure an Oracle Utilities Operational Device Management connection, refer to Configuring the Oracle Utilities Meter Data Management Connection section.
6. Activate the integrations.

   For steps to activate the integration, refer to the Activating Integration Flows section.

The following table shows the complete setup in edge applications/Oracle Integration Cloud required for this combination..

Integration Entities	ODM	MDM
Application is on cloud	No	Yes
Application is on-premises	Yes	No
Need Agent group in Oracle Integration Cloud connection	Yes	No
Install Agent on-premises	Yes	No

Create an Agent Group

Create an agent group in Oracle Integration Cloud before running the agent installer. When the on-premises agent is installed in the environment, the on-premises agent is associated with the agent group identifier. Only one on-premises agent can be associated with an agent group. For a single Oracle Integration Cloud instance, you can create up to five agent groups. Creating the agent group also creates the necessary queues required for message exchange.

To create an agent group:

1. On the Oracle Integration Cloud **Home** page, click **Agents**.
2. Click **Create Agent Group**.
3. Enter the following information and click **Create**.
   - Agent Group Name
   - Identifier

- Agent Type: "Connectivity Agent"
- Description

  Note: The agent group name and identifier must be same.

Downloading Agent Installer

Download the agent installer from Oracle Integration Cloud and run the installer to install the on-premises agent in your local environment.

During the installation, associate the agent with the Agent Group Identifier generated when creating an agent group in Oracle Integration Cloud.

For more information on agent installer, see https://docs.oracle.com/en/cloud/paas/integration-cloud/integrations-user/downloading-and-running-premises-agent-installer.html

Install On-Premises Agent

To install an on-premises agent:

1. On the Oracle Integration Cloud **Home** page, click **Agents**.
2. Click **Download**.
3. Select **Connectivity Agent**.
4. Select **Save File** when prompted to save the file to a directory location on your on-on-premises host.
5. Navigate to that directory and unzip **oic_connectivity_agent.zip**.
6. Change the file permissions to be executable.
7. Modify **InstallerProfile.cfg** to include the following information.

```
# Required Parameters
# oic_URL format should be https://hostname:sslPort
oic_URL=https://icshost:sslport
agent_GROUP_IDENTIFIER=

#Proxy Parameters
proxy_HOST=
proxy_PORT=
proxy_USER=
proxy_PASSWORD=
proxy_NON_PROXY_HOSTS=
```

8. Set the JAVA_HOME property to the directory/folder where JDK is installed.
9. Run the connectivity agent installer from the command prompt.

```
java -jar connectivityagent.jar
```

10. Provide the Oracle Integration Cloud credentials when prompted.
11. Wait for a successful installation message to appear.

After the installation is complete, an agent instance is created to interact with Oracle Integration Cloud.

To verify if the agent instance was created:

1. Navigate to the **Agent Groups** page.
2. Check if the agent count increased by one. Click the number to view the agent details.

Note: For more details, refer to Oracle Integration Cloud documentation at https://docs.oracle.com/en/cloud/paas/integration-cloud-service/index.html

Importing Pre-built Integration Packages

Every integration point is shipped as a package (.par) file.

To import a pre-built integration from Oracle Market Place:

1. Open the **Oracle Market Place** portal.

   https://cloudmarketplace.oracle.com/marketplace/en_US/homePage.jspx

2. Click **Applications**.
3. Browse through the list of applications and select the pre-built integration package to import.
4. When prompted, select the server where the pre-built integration file should be uploaded.

The pre-built integration is imported as a package file that is visible on the **Packages** page in Oracle Integration Cloud. On the **Integrations** page, you can view the individual integrations of that imported package file that are designated with a BUILT BY ORACLE message.

Configuring Connections

After a successful import, the following connections are available in your Oracle Integration Cloud environment by default.

- UAC_ODM - Oracle Utilities Operational Device Management connection.

  For steps to configure this connection, refer to the Configuring the Oracle Utilities Operational Device Management Connection section.

- UAC_MDM - Oracle Utilities Meter Data Management connection.

  For steps to configure this connection, refer to the Configuring the Oracle Utilities Meter Data Management Connection section.

Configuring the Oracle Utilities Operational Device Management Connection

To configure an Oracle Utilities Operational Device Management connection:

1. On the Oracle Integration Cloud **Home** page, click **Connections**.
2. On the **Connections** page, search for the connection name: **UAC_ODM**.
3. From the **Actions** menu, select **Edit**. You can alternatively click the connection name. The **Connection** page is displayed.
4. Enter your email address in the **Email Address** field to receive email notifications during issues.
5. Click **Configure Connectivity**.
6. Enter the URL for the Oracle Utilities Operational Device Management web service catalog in the **Catalog URL** field.

7. Click **OK**.
8. Click **Configure Security** and select a security policy.
9. Enter the respective details in the **Username**, **Password**, and **Confirm Password** fields.
10. Check if the **UAG** agent group is displayed in the **Agent Group** section.

    If the integration uses the Oracle Utilities Operational Device Management Cloud environment, remove this agent group from the connection page.
11. Click **OK**.
12. Click **Test** in the upper-right corner of the page.
13. Click **Save** to save the connection.

Configuring the Oracle Utilities Meter Data Management Connection

To configure a Oracle Utilities Meter Data Management connection:

1. On the Oracle Integration Cloud **Home** page, click **Connections**.
2. On the **Connections** page, search for the connection name: **UAC_MDM**.
3. From the **Actions** menu, select **Edit**. You can alternatively click the connection name. The **Connection** page is displayed.
4. Enter your email address in the **Email Address** field to receive email notifications during issues.
5. Click **Configure Connectivity**.
6. Enter the URL for the Oracle Utilities Meter Data Management web service catalog in the **Catalog URL** field.
7. Click **OK**.
8. Click **Configure Security** and select a security policy.
9. Enter the respective details in the **Username**, **Password**, and **Confirm Password** fields.
10. Check if the **UAG** agent group is displayed in the **Agent Group** section.

    If the server point to the Oracle Utilities Meter Data Management cloud environment, remove this agent group.
11. Click **OK**.
12. Click **Test** in the upper-right corner of the page.
13. Click **Save** to save the connection.

Activating Integration Flows

After the package is imported, the integration process gets deployed in the Oracle Integration Cloud environment. The integration can now be activated to the run-time environment.

> **Note**: An integration is eligible for activation only if the connections, mappings, tracking, etc. are specified.

To activate an integration flow:

1. On the Oracle Integration Cloud **Home** page, click **Integrations**.
2. Select an integration to be activated from the **Integrations** list.
3. Click the **PENDING ACTIVATION** slider.
4. To collect detailed logging information about messages processed by this integration flow at runtime, select **Enable detailed tracing**.

   Detailed tracing may affect performance. To disable tracing, you must deactivate the integration, and then reactivate it without selecting the **Enable detailed tracing** check box.
   To access the detailed trace logging information, refer to Monitoring Integration Flows using Oracle Integration Cloud Logs section.
5. If the activation is successful, the status of the integration changes to **ACTIVE** in the list. If it fails, an error message is displayed at the top of the **Integrations** page.

   For information to troubleshoot the activation error, refer to the **Trouble Shooting** section.
6. To view active integrations, click the integration name. Alternatively, you can select **View** from the menu to the right.
7. The active integrations are displayed as read-only. You will not be able to do any of the following:
   - View **Save** or **Actions** buttons.
   - Add adapters as there is no **Connections Palette**.
   - Modify configuration details, such as the business identifiers under the **Tracking** tab, the source-to-target and target-to-source mappings in the mapper, and the configurations on the pages of the connection wizards.

Testing Integration Flows

An integration process can be tested only after it is activated.

To test an integration:

1. Check if the integration is activated.
2. In the **Integrations** list, click the **How to run** icon for an integration. It displays the WSDL URL of that integration to use for testing.
3. Test the integration.
   - To test only the integration process, test the WSDL URL retrieved in step 2 in SOAP UI.
   - To perform an end-to-end testing, configure the integration flow endpoint in the edge application.

     For instructions to configure Oracle Utilities Operational Device Management, refer to the Message Sender section. For instructions to configure Oracle Utilities Operational Device Management, refer to the Message Sender section.
4. After the necessary configurations are in place, create data in the application.

5. Run the respective batch job to trigger the sync request that invokes the integration service.

Setting Up Security

As part of the Oracle Utilities Integration for Device Operations Using Oracle Integration Cloud, Certificate mechanism is used to communicate with the application.

A Certificate Authority (CA) is a trusted entity that issues electronic documents that verify a digital entity's identity on the Internet. The electronic documents, which are called digital certificates, are an essential part of secure communication and play an important part in the public key infrastructure (PKI).

CA-signed certificates are used to communicate with the source applications as part of the Utilities adapter.

To upload the CA-signed certificates to Oracle Integration Cloud:

1. Log into the Oracle Integration Cloud as an Administrator.
2. Navigate to **Settings** > **Certificates**.
3. Click **Upload**.
4. Select **Certificate Type** as **Trust Certificate**.
5. Provide the **Certificate Alias Name** and choose the certificate to be uploaded.
6. Click **OK**.

Configuring Lookups

A lookup associates values for a specific field used by an application to the values for the same field used by other applications. This provides the capability to map values across vocabularies or systems. The tables are reusable across multiple integrations.

The lookup maps can be imported and exported to CSV format, allowing for reuse across Cloud to on-on-premises implementations.

Editing Lookups

To add any new record in the lookup:

1. On the Oracle Integration Cloud **Home** page, click the **Lookup** icon.
2. From the list of lookup tables, click the **Lookup** to be edited.
3. Click **+** next to the column names (adapter or domain name).
4. Enter/modify the values in the field below the adapter or domain name.
5. To add more rows for additional values, click **+**.
6. Click **Save** when complete.

Lookup Name	Integration Point	Description
UA_ODMMDM_ErrorCode	All Integration points	Maps error codes in MDM to ODM and ODM to MDM.

Lookup Name	Integration Point	Description
UA_ODMMDM_MO	Asset Device Sync	Maps Oracle Utilities Operational Device Management Maintenance Object value to the corresponding Oracle Utilities Meter Data Management Maintenance Object value.
UA_ODMMDM_ AssetDeviceType	Asset Device Sync	Maps Oracle Utilities Operational Device Management asset type to corresponding Oracle Utilities Meter Data Management device type
UA_ODMMDM_ AssetDeviceStatus	Asset Device Sync	Maps Oracle Utilities Operational Device Management asset status to corresponding Oracle Utilities Meter Data Management device status.
UA_ODMMDM_ DisconnectLocation	SP Node Sync	Maps Oracle Utilities Meter Data Management disconnect location code to corresponding Oracle Utilities Operational Device Management disconnect location code.
UA_ODMMDM_ NodeDisposition	SP Node Sync	Maps Oracle Utilities Meter Data Management Measurement node disposition to corresponding Oracle Utilities Operational Device Management node disposition.
UA_ODMMDM_ SPNodeType	SP Node Sync	Maps Oracle Utilities Meter Data Management service point type to corresponding Oracle Utilities Operational Device Management node type.
UA_ODMMDM_ Country	SP Node Sync	Maps Oracle Utilities Meter Data Management country code to corresponding Oracle Utilities Operational Device Management country code.
UA_ODMMDM_TimeZone	SP Node Sync	Maps Oracle Utilities Meter Data Management time zone code to corresponding Oracle Utilities Operational Device Management time zone code.
UA_ODMMDM_ OkToEnterCode	SP Node Sync	Maps Oracle Utilities Meter Data Management ok to enter code to corresponding Oracle Utilities Operational Device Management ok to enter code.

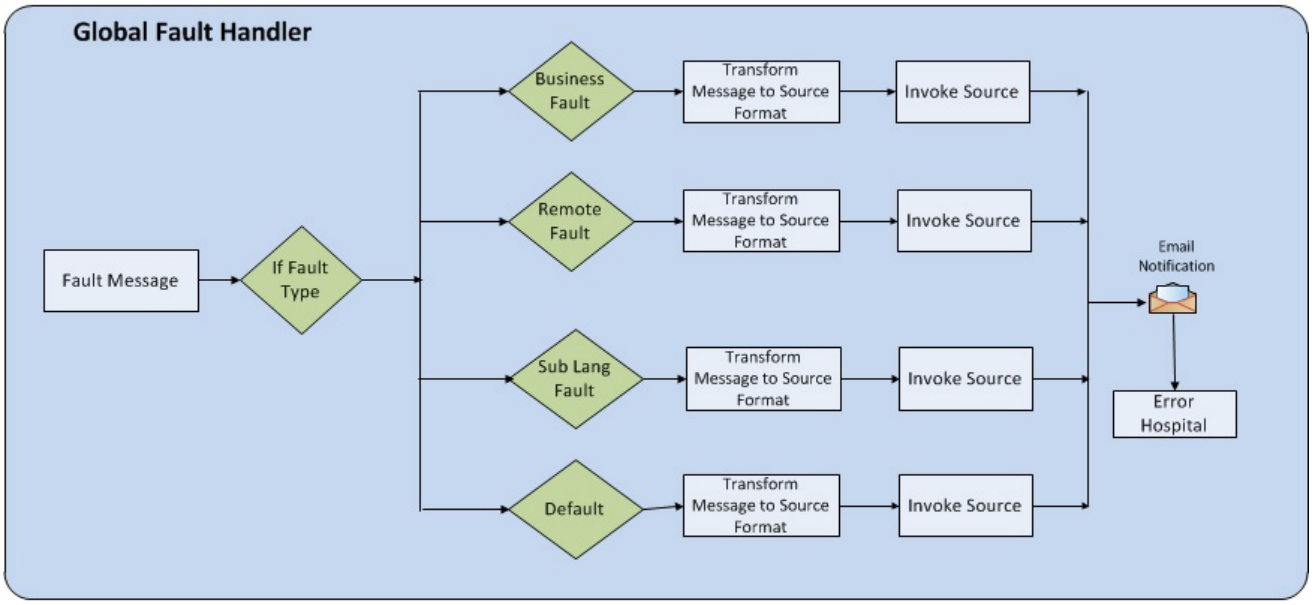
Lookup Name	Integration Point	Description
UA_ODMMDM_ LifeSupportSensitiveLoad	SP Node Sync	Maps Oracle Utilities Meter Data Management life support sensitive load flag to corresponding Oracle Utilities Operational Device Management life support sensitive load flag.
UA_ODMMDM_ ContactType	Contact Sync	Maps Oracle Utilities Meter Data Management Contact type value to corresponding Oracle Utilities Operational Device Management Contact Type value.
UA_ODMMDM_Email_ID	All Integration points	Lookup to configure and map email ids in From & To fields in Notification activity.
UA_ODMMDM_ ConfigProperties	Install Event Sync	Lookup to enable custom asset movement flag.
UA_MDMODM_MO	SP Node Sync Contact Sync Install Event Sync	Maps Oracle Utilities Meter Data Management Maintenance Object value to the corresponding Oracle Utilities Operational Device Management Maintenance Object value.

Error Handling

The integration includes two types of errors:

- **Business Errors** – Triggered when the target application throws any data related errors. 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 the integration layer and application or any assignment errors (sub language execution faults). Technical errors are sent to the source application.

The following diagram depicts the process for error handling:



Error Handling Process Diagram

Email Notifications

Whenever there is a fault in the integration flow, an email notification is sent to the recipient.

To receive an email with error details, provide a valid email ID in the **To** field of the **Notification** activity.

To edit the **To** field:

1. On the Oracle Integration Cloud **Home** page, click the **Lookup** icon.
2. On the **Lookup** page, edit the **UA_ODMMDM_Email_ID** lookup table.

   The lookup has the following columns:

Recipient	**email_id**
from	abc@domain.com
to	xyz@domain.com

3. Provide the valid email address in the **email_id** column.
4. Click **Save** to save the changes.

Customizations

Define a custom template in the existing main XSL. Apply the template just before the root element's closing tag. For any extra mappings, edit the custom template.

To add custom mappings, do the following:

1. Export the integration process (.iar).
2. Edit the respective XSL file.

3. Add the custom code/mappings to the custom template.
4. Import the updated XSL in the integration.
5. Save the changes and activate the integration flow.
6. Test the flow to check if the customized changes are in place.

Following is a list of integration processes and the corresponding XSL files where custom mappings can be included.

Integration Process	XSL Name
SYNC_ASSETREQ_ODMTOMDM	SYNC_ASSETREQ_ODMTOMDM_01.00.0000\icspackage\project\SYNC_ASSETREQ_ODMTOMDM_01.00.0000\resources\processor_191\resourcegroup_194\req_92be9d696bc847ad9b841bc308548293.xsl
SYNC_DEVICERESP_MDMTOODM	SYNC_DEVICERESP_MDMTOODM_01.00.0000\icspackage\project\SYNC_DEVICERESP_MDMTOODM_01.00.0000\resources\processor_35\resourcegroup_38\req_40340d9ba3f4478bbfbcff29957a1af4.xsl
SYNC_SPREQ_MDMTOODM	SYNC_SPREQ_MDMTOODM_01.00.0000\icspackage\project\SYNC_SPREQ_MDMTOODM_01.00.0000\resources\processor_35\resourcegroup_38\req_7cdc7e856e084f069b4f9ef99a3dc922.xsl
SYNC_NODERESP_ODMTOMDM	SYNC_NODERESP_ODMTOMDM_01.00.0000\icspackage\project\SYNC_NODERESP_ODMTOMDM_01.00.0000\resources\processor_35\resourcegroup_38\req_ec39ac4274e84ccd917fddd6114d23a0.xsl
SYNC_CONTACTREQ_MDMTOODM	SYNC_CONTACTREQ_MDMTOODM_01.00.0000\icspackage\project\SYNC_CONTACTREQ_MDMTOODM_01.00.0000\resources\processor_35\resourcegroup_38\req_28a29df18c6847d0ad327e34fc715093.xsl
SYNC_CONTACTRES_ODMTOMDM	SYNC_CONTACTRES_ODMTOMDM_01.00.0000\icspackage\project\SYNC_CONTACTRES_ODMTOMDM_01.00.0000\resources\processor_35\resourcegroup_38\req_1750c3500cac4e0283fa8ea1320788c0.xsl
SYNC_INSTALLEVE_MDMTOODM	SYNC_INSTALLEVE_MDMTOODM_01.00.0000\icspackage\project\SYNC_INSTALLEVE_MDMTOODM_01.00.0000\resources\processor_35\resourcegroup_38\req_3045201a8fda44e6a0a9ffcaab5888fd.xsl
SYNC_ASSETNODER_ODMTOMDM	SYNC_ASSETNODER_ODMTOMDM_01.00.0000\icspackage\project\SYNC_ASSETNODER_ODMTOMDM_01.00.0000\resources\processor_264\resourcegroup_267\req_ec445b21f06c48368c5ff29f7aeb4f5a.xsl

Chapter 4

Monitoring and Troubleshooting

This chapter discusses about monitoring and troubleshooting the integration:

Monitoring from Oracle Utilities Operational Device Management

This section describes the following:

Oracle Utilities Operational Device Management Error Logs

Monitoring the error logs is possible only in on-premises applications only. Applications on cloud cannot access the error logs.

The following error logs can be monitored for Oracle Utilities Operational Device Management:

- Errors related to the online integration invocation from Oracle Utilities Operational Device Management (OUODM) are stored in the ODM_ENVIRONMENT_NAME/logs/system folder.

  For example: V231_ODM_PERF_BLD10_LIN_ORA_WLS/logs/system\

- Errors related to batch integration invocation from Oracle Utilities Operational Device Management are stored in the $SPLOUTPUT/ ODM_ENVIRONMENT_NAME folder.

  For example: /spl/sploutput/V231_ODM_PERF_BLD10_LIN_ORA_WLS

For more information about errors and notifications, see the Oracle Utilities Operational Device Management documentation.

Notifications

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

When Oracle Utilities Operational Device Management receives the response message from the inbound Oracle Utilities Operational Device Management response queue, the message is parsed and converted to an XML document, checked that the XML is valid and that the XML has a valid Inbound Web Service.

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

  For example: If Oracle Utilities Operational Device Management receives a contact sync response message from the Oracle Utilities Operational Device Management contact sync response queue and an error is encountered, the message will be moved

to the Oracle Utilities Operational Device Management contact sync response error queue.

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

  Note: The Inbound Web Service is invoked to process the response message. Regardless of whether To-Do was set up or not, the errors are logged in spl-service.log file.

Connection Errors

The log files provide detailed information about errors and reasons for failure.

For more information about error logs and their respective folders, refer to the Oracle Utilities Operational Device Management Error Logs section.

Monitoring from Oracle Utilities Meter Data Management

This section describes the following:

- Oracle Utilities Meter Data Management Error Logs
- Notifications
- Connection Errors

Oracle Utilities Meter Data Management Error Logs

The following Oracle Utilities Meter Data Management error logs can be monitored:

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

  For example: V201_MDM_BLD10_LIN_ORA_WLS/logs/system

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

  For example: /spl/sploutput/V201_MDM_BLD10_LIN_ORA_WLS

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

Notifications

When Oracle Utilities Meter Data Management receives a request message from Oracle Utilities Operational Device Management, it will send a response back to Oracle Utilities Operational Device Management. 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 Inbound Web Service.

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

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

- If the message was processed successfully, the Business Object or Business Service or Service Script (business object/BS/SS) defined on Inbound Web Service is invoked. If an application error is encountered inside the business object/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.

  Note: The Inbound Web Service is invoked to process the request message. Regardless of whether To-Do was set up or not, the errors are logged in spl-service.log file.

Connection Errors

The log files provide detailed information about errors and reasons for failure.

For more information about error logs and their respective folders, refer to the Oracle Utilities Meter Data Management Error Logs section.

Monitoring from the Integration Layer

To monitor the integration flow, use any of the following method:

- Monitoring Integration Flows from Oracle Integration Cloud Dashboard
- Monitoring Integration Flows using Oracle Integration Cloud Logs

Monitoring Integration Flows from Oracle Integration Cloud Dashboard

On the Oracle Integration Cloud dashboard, you can view how the running integrations process messages, such as:

- Messages received and processed
- Successful messages and errors occurred
- Overall success rate

Note: Only activated integrations are listed on this page.

To monitor integrations from the Oracle Integration Cloud dashboard:

1. On the Oracle Integration Cloud **Home** page, click the **Monitoring** icon.
2. On the navigation pane, click **Dashboards** to see the overall success/failure rate of the integration.
3. On the navigation pane, click **Integrations**.

   A list of running integrations is shown. Also, processing information about the number of messages received, the number of messages processed, the number of successful messages, and the number of failed messages is displayed.
4. From the **In Retention Period** list, select the time period for which the integration information should be displayed.

   For example: one hour, six hours, one day, two days, three days, or since the first activation
5. From the **Integrations** list, select **Activity Stream** to view the activity stream for the integrations.

Monitoring Integration Flows using Oracle Integration Cloud Logs

To monitor integration flows using Oracle Integration Cloud logs, perform the following steps:

1. On the Oracle Integration Cloud **Home** page, click the **Monitoring** icon.
2. On the navigation pane, click **Dashboards** to see the overall success/failure rate of the integration.
3. Navigate to the **Logs** menu.
4. In the right pane, click the link to show options for downloading the Oracle Integration Cloud logs or diagnostics logs.
5. If there are issues with an integration, attach the diagnostic logs to a service request for help in debugging the issue.

Troubleshooting

If the activation fails, an error message is displayed at the top of the **Integrations** page.

To troubleshoot the activation error:

1. Click **Download diagnostic logs** to download the logs for diagnosing the issue.
2. If you selected to enable tracing, **TRACE ENABLED** is displayed next to **ACTIVE**.

Appendix A

Data Mapping for Integration Flows

This appendix provides mapping details for the following integration points:

- Asset - Device Synchronization
- Service Point - Node Synchronization
- Contact Synchronization
- Install Event - Asset Node Synchronization

Asset - Device Synchronization

Device Synchronization for each integration point consists of the following:

- Asset Sync Request Mapping
- Device Sync Response Mapping

Asset Sync Request Mapping

Asset Sync Request Mapping details for each integration point are as follows:

Oracle Utilities Operational Device Management Asset Sync Request Message Mapping			Oracle Utilities Meter Data Management Device Sync Request Message Mapping			Lookup Mapping		
Element Name	**Parent Element**	**Type**	**Element Name**	**Parent Element**	**Type**	**Lookup Name**	**Oracle Utilities Operational Device Management Column**	**Oracle Utilities Meter Data Mapping Column**
sendDetails		Outermost Tag	D1-SyncRequestInbound					
syncRequestId	sendDetails	Field	externalReferenceId	D1-SyncRequestInbound				
			syncRequestId	D1-SyncRequestInbound				
			bo	D1-SyncRequestInbound				
			boStatus	D1-SyncRequestInbound				
			createDateTime	D1-SyncRequestInbound				
			statusDateTime	D1-SyncRequestInbound				
initialLoad	sendDetails	Field	initialLoad	D1-SyncRequestInbound				
mo	sendDetails	Field	targetMo	D1-SyncRequestInbound				
sourceSystem	sendDetails	Field	externalSystem	D1-SyncRequestInbound				
pkValue1	sendDetails	Field	externalPkValue1	D1-SyncRequestInbound				
pkValue2	sendDetails	Field	externalPkValue2	D1-SyncRequestInbound				
pkValue3	sendDetails	Field	externalPkValue3	D1-SyncRequestInbound				
pkValue4	sendDetails	Field	externalPkValue4	D1-SyncRequestInbound				

Oracle Utilities Operational Device Management Asset Sync Request Message Mapping			Oracle Utilities Meter Data Management Device Sync Request Message Mapping			Lookup Mapping		
Element Name	**Parent Element**	**Type**	**Element Name**	**Parent Element**	**Type**	**Lookup Name**	**Oracle Utilities Operational Device Management Column**	**Oracle Utilities Meter Data Mapping Column**
pkValue5	sendDetails	Field	externalPkValue5	D1-SyncRequestInbound				
			productionPkValue	D1-SyncRequestInbound				
			version	D1-SyncRequestInbound				
			relatedCompositeSyncId	D1-SyncRequestInbound				
			clearExceptions	D1-SyncRequestInbound				
OUINT-235			targetBo	D1-SyncRequestInbound				
bo	sendDetails	Field						
boStatus	sendDetails	Field						
createDateTime	sendDetails	Field						
statusDateTime	sendDetails	Field						
version	sendDetails	Field						
syncRequired	sendDetails	Field						
forceSync	sendDetails	Field						
initialLoad	sendDetails	Field						
discardReason	sendDetails	Field						
cancelReason	sendDetails	Field						
syncRequestDetails	sendDetails	Group	syncRequestDetails	D1-SyncRequestInbound	Group			
			original	syncRequestDetails	Group			
initialSnapshot	syncRequestDetails	Group	initialSnapshot	original	Group			
deviceType	initialSnapshot	Field	deviceType	initialSnapshot	Field	UA_ODMMDM_AssetDeviceType	ODM_AssetType	MDM_DeviceType

Oracle Utilities Operational Device Management Asset Sync Request Message Mapping			Oracle Utilities Meter Data Management Device Sync Request Message Mapping			Lookup Mapping		
Element Name	**Parent Element**	**Type**	**Element Name**	**Parent Element**	**Type**	**Lookup Name**	**Oracle Utilities Operational Device Management Column**	**Oracle Utilities Meter Data Mapping Column**
boStatus	initialSnapshot	Field	boStatus	initialSnapshot	Field	UA_ODMMDM_AssetDeviceStatus	ODM_AssetStatus	MDM_DeviceStatus
			manufacturer	initialSnapshot	Field			
			model	initialSnapshot	Field			
customElements	initialSnapshot	Field	customElements	initialSnapshot	Field			
formattedElements	initialSnapshot	Field	formattedElements	initialSnapshot	Field			
finalSnapshot	syncRequestDetails	Group	finalSnapshot	original	Group			
deviceType	finalSnapshot	Field	deviceType	finalSnapshot	Field	UA_ODMMDM_AssetDeviceType	ODM_AssetType	MDM_DeviceType
boStatus	finalSnapshot	Field	boStatus	finalSnapshot	Field	UA_ODMMDM_AssetDeviceStatus	ODM_AssetStatus	MDM_DeviceStatus
			manufacturer	finalSnapshot	Field			
			model	finalSnapshot	Field			
customElements	finalSnapshot	Field	customElements	finalSnapshot	Field			
formattedElements	finalSnapshot	Field	formattedElements	finalSnapshot	Field			

Device Sync Response Mapping

The Device Sync Response Mapping details for each integration point are as follows:

Oracle Utilities Meter Data Management Device Sync Response Message Mapping			Oracle Utilities Operational Device Management Asset Sync Response Message Mapping			Lookup Mapping		
Element Name	**Parent Element**	**Type**	**Element Name**	**Parent Element**	**Type**	**Lookup Name**	**Oracle Utilities Operational Device Management Column**	**Oracle Utilities Meter Data Mapping Column**
sendDetails		Outermost Tag	F1-UpdateAndTransitionSync Request		Outermost Tag			
externalReferenceId	sendDetails	Field	syncRequestId	F1-UpdateAndTransitionSync Request	Field			
externalIds	sendDetails	Group	externalIds	F1-UpdateAndTransitionSync Request	Group			
entityIdList	externalIds	List	entityIdList	externalIds	List			
entity	entityIdList	Field	entity	entityIdList	Field			
externalPk1	entityIdList	Field	externalPk1	entityIdList	Field			
externalPk2	entityIdList	Field	externalPk2	entityIdList	Field			
externalPk3	entityIdList	Field	externalPk3	entityIdList	Field			
externalPk4	entityIdList	Field	externalPk4	entityIdList	Field			
externalPk5	entityIdList	Field	externalPk5	entityIdList	Field			
exceptionInformation	sendDetails	Group						
exceptionInformationList	exceptionInformation	List	exceptionInfo	F1-UpdateAndTransitionSync Request	Group			
messageCategory	exceptionInformation List	Field	messageCategory	exceptionInfo	Field			
messageNumber	exceptionInformation List	Field	messageNumber	exceptionInfo	Field	UA_ ODMMDM_ ErrorCode	ODM_ ErrorCode	MDM_ ErrorCode

Oracle Utilities Meter Data Management Device Sync Response Message Mapping			Oracle Utilities Operational Device Management Asset Sync Response Message Mapping			Lookup Mapping		
Element Name	**Parent Element**	**Type**	**Element Name**	**Parent Element**	**Type**	**Lookup Name**	**Oracle Utilities Operational Device Management Column**	**Oracle Utilities Meter Data Mapping Column**
sequence	exceptionInformation List	Field	sequence	exceptionInfo	Field			
comments	exceptionInformation List	Field	comments	exceptionInfo	Field			
messageParameters	exceptionInformation List	List	messageParameters	exceptionInfo	List			
parameterSequence	messageParameters	Field	parameterSequence	messageParameters	Field			
messageParameterValue	messageParameters	Field	messageParameterValue	messageParameters	Field			
messageParameterType	messageParameters	Field						
customElements	sendDetails	Field	customElements	F1-UpdateAndTransitionSyncRequest	Field			

Service Point - Node Synchronization

Service Point - Node Synchronization for each integration point consists of the following:

- Service Point Sync Request Mapping
- Node Sync Response Mapping

Service Point Sync Request Mapping

Service Point Sync Request Mapping details for each integration point are as follows:

Oracle Utilities Meter Data Management Service Point Request Message Mapping			Oracle Utilities Operational Device Management Node Request Mapping			DVM Mapping		
Element Name	**Parent Element**	**Type**	**Element Name**	**Parent Element**	**Type**	**DVM**	**Oracle Utilities Operational Device Management Column**	**Oracle Utilities Meter Data Mapping Column**
sendDetail		OutermostTag	W1-SyncRequestInbound		OutermostTag			
syncRequestId	sendDetail	Field	externalReferenceId	W1-SyncRequestInbound	Field			
			syncRequestId	W1-SyncRequestInbound	Field			
			bo	W1-SyncRequestInbound	Field			
			boStatus	W1-SyncRequestInbound	Field			
			createDateTime	W1-SyncRequestInbound	Field			
			statusDateTime	W1-SyncRequestInbound	Field			

Oracle Utilities Meter Data Management Service Point Request Message Mapping			Oracle Utilities Operational Device Management Node Request Mapping			DVM Mapping		
Element Name	**Parent Element**	**Type**	**Element Name**	**Parent Element**	**Type**	**DVM**	**Oracle Utilities Operational Device Management Column**	**Oracle Utilities Meter Data Mapping Column**
initialLoad	sendDetail	Field	initialLoad	W1-SyncRequestInbound	Field			
mo	sendDetail	Field	targetMo	W1-SyncRequestInbound	Field	UA_ODMMDM_MO	ODM_MO	MDM_MO
sourceSystem	sendDetail	Field	externalSystem	W1-SyncRequestInbound	Field			
pkValue1	sendDetail	Field	externalPkValue1	W1-SyncRequestInbound	Field			
pkValue2	sendDetail	Field	externalPkValue2	W1-SyncRequestInbound	Field			
pkValue3	sendDetail	Field	externalPkValue3	W1-SyncRequestInbound	Field			
pkValue4	sendDetail	Field	externalPkValue4	W1-SyncRequestInbound	Field			
pkValue5	sendDetail	Field	externalPkValue5	W1-SyncRequestInbound	Field			
			productionPkValue	W1-SyncRequestInbound	Field			
			version	W1-SyncRequestInbound	Field			
			relatedCompositeSyncId	W1-SyncRequestInbound	Field			

Oracle Utilities Meter Data Management Service Point Request Message Mapping			Oracle Utilities Operational Device Management Node Request Mapping			DVM Mapping		
Element Name	**Parent Element**	**Type**	**Element Name**	**Parent Element**	**Type**	**DVM**	**Oracle Utilities Operational Device Management Column**	**Oracle Utilities Meter Data Mapping Column**
			clearExceptions	W1-SyncRequestInbound	Field			
			targetBo	W1-SyncRequestInbound	Field			
bo	sendDetail	Field						
boStatus	sendDetail	Field						
createDateTime	sendDetail	Field						
statusDateTime	sendDetail	Field						
version	sendDetail	Field						
syncRequired	sendDetail	Field						
forceSync	sendDetail	Field						
initialLoad	sendDetail	Field						
discardReason	sendDetail	Field						
cancelReason	sendDetail	Field						
externalIds	sendDetail	Group						
externalIdsList	externalIds	List						
entity	externalIdsList	Field						
externalPkValue1	externalIdsList	Field						
externalPkValue2	externalIdsList	Field						

Oracle Utilities Meter Data Management Service Point Request Message Mapping			Oracle Utilities Operational Device Management Node Request Mapping			DVM Mapping		
Element Name	**Parent Element**	**Type**	**Element Name**	**Parent Element**	**Type**	**DVM**	**Oracle Utilities Operational Device Management Column**	**Oracle Utilities Meter Data Mapping Column**
externalPkValue3	externalIdsList	Field						
externalPkValue4	externalIdsList	Field						
externalPkValue5	externalIdsList	Field						
syncRequestDetails	sendDetail	Group	syncRequestDetails	W1-SyncRequestInbound	Group			
			original	syncRequestDetails	Group			
initialSnapshot	syncRequestDetails	Group	initialSnapshot	syncRequestDetails	Group			
nodeType	initialSnapshot	Field	nodeType	initialSnapshot	Field	UA_ODMMDM_SPNodeType	ODM_NodeType	MDM_SPType
nodeDisposition	initialSnapshot	Field	nodeDisposition	initialSnapshot	Field	UA_ODMMDM_NodeDisposition	ODM_NodeDisposition	MDM_NodeDisposition
disconnectLocation	initialSnapshot	Field	disconnectLocation	initialSnapshot	Field	UA_ODMMDM_DisconnectLocation	ODM_DisconnectLocation	MDM_DisconnectLocation
okToEnter	initialSnapshot	Field	okToEnter	initialSnapshot	Field	UA_ODMMDM_OkToEnterCode	ODM_OkToEnterCode	MDM_OkToEnterCode
location	initialSnapshot	Group	location	initialSnapshot	Group			
country	location	Field	country	location	Field	UA_ODMMDM_Country	ODM_CountryCode	MDM_CountryCode

Oracle Utilities Meter Data Management Service Point Request Message Mapping			Oracle Utilities Operational Device Management Node Request Mapping			DVM Mapping		
Element Name	**Parent Element**	**Type**	**Element Name**	**Parent Element**	**Type**	**DVM**	**Oracle Utilities Operational Device Management Column**	**Oracle Utilities Meter Data Mapping Column**
lifeSupportSensitiveLoad	initialSnapshot	Field	lifeSupportSensitiveLoad	initialSnapshot	Field	UA_ODMMDM_LifeSupportSensitiveLoad	ODM_LifeSupportSensitiveLoad	MDM_LifeSupportSensitiveLoad
timeZone	initialSnapshot	Field	timeZone	initialSnapshot	Field	UA_ODMMDM_TimeZone	ODM_TimeZone	MDM_TimeZone
customElements	initialSnapshot	Field	customElements	initialSnapshot	Field			
formattedElements	initialSnapshot	Field	formattedElements	initialSnapshot	Field			
finalSnapshot	syncRequestDetails	Group	finalSnapshot	syncRequestDetails	Group			
nodeType	finalSnapshot	Field	nodeType	finalSnapshot	Field	UA_ODMMDM_SPNodeType	ODM_NodeType	MDM_SPType
nodeDisposition	finalSnapshot	Field	nodeDisposition	finalSnapshot	Field	UA_ODMMDM_NodeDisposition	ODM_NodeDisposition	MDM_NodeDisposition
disconnectLocation	finalSnapshot	Field	disconnectLocation	finalSnapshot	Field	UA_ODMMDM_DisconnectLocation	ODM_DisconnectLocation	MDM_DisconnectLocation
okToEnter	finalSnapshot	Field	okToEnter	finalSnapshot	Field	UA_ODMMDM_OkToEnterCode	ODM_OkToEnterCode	MDM_OkToEnterCode
location	finalSnapshot	Group	location	finalSnapshot	Group			

Oracle Utilities Meter Data Management Service Point Request Message Mapping			Oracle Utilities Operational Device Management Node Request Mapping			DVM Mapping		
Element Name	**Parent Element**	**Type**	**Element Name**	**Parent Element**	**Type**	**DVM**	**Oracle Utilities Operational Device Management Column**	**Oracle Utilities Meter Data Mapping Column**
country	location	Field	country	location	Field	UA_ODMMDM_Country	ODM_CountryCode	MDM_CountryCode
lifeSupportSensitiveLoad	finalSnapshot	Field	lifeSupportSensitiveLoad	finalSnapshot	Field	UA_ODMMDM_LifeSupportSensitiveLoad	ODM_LifeSupportSensitiveLoad	MDM_LifeSupportSensitiveLoad
timeZone	finalSnapshot	Field	timeZone	finalSnapshot	Field	UA_ODMMDM_TimeZone	ODM_TimeZone	MDM_TimeZone
customElements	finalSnapshot	Field	customElements	finalSnapshot	Field			
formattedElements	finalSnapshot	Field	formattedElements	finalSnapshot	Field			

Node Sync Response Mapping

The Node Sync Response Mapping details for each integration point are as follows:

Oracle Utilities Operational Device Management Node Sync Response Message Mapping			Oracle Utilities Meter Data Management SP Sync Response Message Mapping			DVM Mapping		
Element Name	**Parent Element**	**Type**	**Element Name**	**Parent Element**	**Type**	**DVM**	**Oracle Utilities Operational Device Management Column**	**Oracle Utilities Meter Data Mapping Column**
sendDetails		OutermostTag	F1-UpdateAndTransitionSyncRequest		OutermostTag			
externalReferenceId	sendDetails	Field	syncRequestId	F1-UpdateAndTransitionSyncRequest	Field			
externalIds	sendDetails	Group	externalIds	F1-UpdateAndTransitionSyncRequest	Group			
entityIdList	externalIds	List	entityIdList	externalIds	List			
entity	entityIdList	Field	entity	entityIdList	Field			
externalPk1	entityIdList	Field	externalPk1	entityIdList	Field			
externalPk2	entityIdList	Field	externalPk2	entityIdList	Field			
externalPk3	entityIdList	Field	externalPk3	entityIdList	Field			
externalPk4	entityIdList	Field	externalPk4	entityIdList	Field			
externalPk5	entityIdList	Field	externalPk5	entityIdList	Field			
exceptionInformation	sendDetails	Group						

Oracle Utilities Operational Device Management Node Sync Response Message Mapping			Oracle Utilities Meter Data Management SP Sync Response Message Mapping			DVM Mapping		
Element Name	**Parent Element**	**Type**	**Element Name**	**Parent Element**	**Type**	**DVM**	**Oracle Utilities Operational Device Management Column**	**Oracle Utilities Meter Data Mapping Column**
exceptionInformationList	exceptionInformation	List	exceptionInfo	F1-UpdateAndTransitionSyncRequest	List	UA_ODMMDM_ErrorCode	MDM_ErrorCode	ODM_ErrorCode
messageCategory	exceptionInformationList	Field	messageCategory	exceptionInfo	Field	UA_ODMMDM_ErrorCode	MDM_ErrorCode	ODM_ErrorCode
messageNumber	exceptionInformationList	Field	messageNumber	exceptionInfo	Field			
sequence	exceptionInformationList	Field	sequence	exceptionInfo	Field			
comments	exceptionInformationList	Field	comments	exceptionInfo	Field			
messageParameters	exceptionInformationList	List	messageParameters	exceptionInfo	List			
parameterSequence	messageParameters	Field	parameterSequence	messageParameters	Field			
messageParameterValue	messageParameters	Field	messageParameterValue	messageParameters	Field			
messageParameterType	messageParameters	Field						
customElements	sendDetails	Field	customElements	F1-UpdateAndTransitionSyncRequest	Field			

Contact Synchronization

Contact Synchronization for each integration point consists of the following:

- Contact Sync Request Mapping
- Contact Sync Response Mapping

Contact Sync Request Mapping

Mapping details for Contact Synchronization are as shown in the following table:

Oracle Utilities Meter Data Management Contact Sync Request Message Mapping			Oracle Utilities Operational Device Management Device Request Message Mapping			Lookup Mapping		
Element Name	**Parent Element**	**Type**	**Element Name**	**Parent Element**	**Type**	**Lookup Name**	**Oracle Utilities Meter Data Mapping Column**	**Oracle Utilities Operational Device Management Column**
sendDetail		OutermostTag	W1-SyncRequestInbound		OutermostTag			
syncRequestId	sendDetails	Field	externalReferenceId	W1-SyncRequestInbound	Field			
bo	sendDetails	Field			Field			
boStatus	sendDetails	Field			Field			
createDateTime	sendDetails	Field			Field			
statusDateTime	sendDetails	Field			Field			
version	sendDetails	Field			Field			
sourceSystem	sendDetails	Field	externalSystem	W1-SyncRequestInbound	Field			
syncRequired	sendDetails	Field			Field			
forceSync	sendDetails	Field			Field			
initialLoad	sendDetails	Field	initialLoad	W1-SyncRequestInbound	Field			
discardReason	sendDetails	Field			Field			

Oracle Utilities Meter Data Management Contact Sync Request Message Mapping			Oracle Utilities Operational Device Management Device Request Message Mapping			Lookup Mapping		
Element Name	Parent Element	Type	Element Name	Parent Element	Type	Lookup Name	Oracle Utilities Meter Data Mapping Column	Oracle Utilities Operational Device Management Column
cancelReason	sendDetails	Field			Field			
exceptioninfo	sendDetails	List			Field			
sequence	exceptioninfo	Field			Field			
messageCategory	exceptioninfo	Field			Field			
messageNumber	exceptioninfo	Field			Field			
comments	exceptioninfo	Field			Field			
messageParameters	exceptioninfo	List			Field			
parameterSequence	messageParameters	Field			Field			
messageParameterValue	messageParameters	Field						
mo	sendDetails	Field	targetMo	W1-SyncRequestInbound	Field	UA_MDMODM_MO	MDM_MO	ODM_MO
pkValue1	sendDetails	Field	externalPkValue1	W1-SyncRequestInbound	Field			
pkValue2	sendDetails	Field	externalPkValue2	W1-SyncRequestInbound	Field			
pkValue3	sendDetails	Field	externalPkValue3	W1-SyncRequestInbound	Field			
pkValue4	sendDetails	Field	externalPkValue4	W1-SyncRequestInbound	Field			
pkValue5	sendDetails	Field	externalPkValue5	W1-SyncRequestInbound	Field			
externalIds	sendDetails	Field						
entityIdList	externalIds	List						
entity	entityIdList	Field						

Oracle Utilities Meter Data Management Contact Sync Request Message Mapping			Oracle Utilities Operational Device Management Device Request Message Mapping			Lookup Mapping		
Element Name	Parent Element	Type	Element Name	Parent Element	Type	Lookup Name	Oracle Utilities Meter Data Mapping Column	Oracle Utilities Operational Device Management Column
externalPk1	entityIdList	Field			Group			
externalPk2	entityIdList	Field			Group			
externalPk3	entityIdList	Field			Group			
externalPk4	entityIdList	Field			Field			
externalPk5	entityIdList	Field			Field			
externalSystem	sendDetails	Field			Field			
entityBO	sendDetails	Field			Field			
snapshotDA	sendDetails	Field			Field			
postScript	sendDetails	Field			Field			
elementPopulationRules	sendDetails	Group			Group			
elementPopulationRule	elementPopulationRules	List			Field			
targetElement	elementPopulationRule	Field			Field			
sourceElement	elementPopulationRule	Field			Field			
populateTargetWithInfoString	elementPopulationRule	Field			Field			
syncRequestDetails	sendDetails	List	syncRequestDetails	W1-SyncRequestInbound	List			
InitialSnapshot	syncRequestDetails	List	initialSnapshot	original	List			
contactType	IntialSnapshot	Field	contactType	initialsnapshot	Field	UA_MDMODM_ContactType	MDM_ContactType	ODM_ContactType
customElements	IntialSnapshot	List	customElements	initialsnapshot	Field			
formattedelements	IntialSnapshot	Group	Formattedelements	initialsnapshot	Field			

Oracle Utilities Meter Data Management Contact Sync Request Message Mapping			Oracle Utilities Operational Device Management Device Request Message Mapping			Lookup Mapping		
Element Name	**Parent Element**	**Type**	**Element Name**	**Parent Element**	**Type**	**Lookup Name**	**Oracle Utilities Meter Data Mapping Column**	**Oracle Utilities Operational Device Management Column**
FinalSnapshot	sendDetails	List	FinalSnapshot	original	List			
contactType	FinalSnapshot	Field	contactType	FinalSnapshot	Field	UA_MDMODM_ContactType	MDM_ContactType	ODM_ContactType
customElements	FinalSnapshot	List	customElements	FinalSnapshot	Field			
formattedelements	FinalSnapshot	Group	Formattedelements	FinalSnapshot	Field			

Contact Sync Response Mapping

Details for Contact Synchronization details for each integration point are as follows:

Oracle Utilities Operational Device Management Contact Sync Response Message Mapping			Oracle Utilities Meter Data Management Device Response Message Mapping			Lookup Mapping		
Element Name	**Parent Element**	**Type**	**Element Name**	**Parent Element**	**Type**	**Lookup Name**	**Oracle Utilities Operational Device Management Column**	**Oracle Utilities Meter Data Mapping Column**
sendDetails		OutermostTag	F1-UpdateAndTransitionSyncRequest		OutermostTag			
externalReferenceId	sendDetails		syncRequestId	F1-UpdateAndTransitionSyncRequest				
externalIds	sendDetails	Group	externalIds	F1-UpdateAndTransitionSyncRequest	Group			
entityIdList	externalIds	List	entityIdList	externalIds	List			

Oracle Utilities Operational Device Management Contact Sync Response Message Mapping			Oracle Utilities Meter Data Management Device Response Message Mapping			Lookup Mapping		
Element Name	**Parent Element**	**Type**	**Element Name**	**Parent Element**	**Type**	**Lookup Name**	**Oracle Utilities Operational Device Management Column**	**Oracle Utilities Meter Data Mapping Column**
entity	entityIdList	Field	entity	entityIdList	Field			
externalPk1	entityIdList	Field	externalPk1	entityIdList	Field			
externalPk2	entityIdList	Field	externalPk2	entityIdList	Field			
externalPk3	entityIdList	Field	externalPk3	entityIdList	Field			
externalPk4	entityIdList	Field	externalPk4	entityIdList	Field			
externalPk5	entityIdList	Field	externalPk5	entityIdList	Field			
exceptionInformation	sendDetails							
exceptionInformationList	exceptionalInformation	List	exceptionInfo	F1-UpdateAndTransitionSyncRequest	List			
sequence	exceptionalInformation	Field	sequence	exceptionInfo	Field			
messageCategory	exceptionalInformation	Field	messageCategory	exceptionInfo	Field	UA_MDMODM_ErrorCode	ODM_ErrorCode	MDM_ErrorCode
messageNumber	exceptionalInformation	Field	messageNumber	exceptionInfo	Field	UA_MDMODM_ErrorCode	ODM_ErrorCode	MDM_ErrorCode
comments	exceptionalInformation	Field	comments	exceptionInfo	Field			
messageParameters	exceptionalInformation	List	messageParameters	exceptionInfo	List			
parameterSequence	messageParameters	Field	parameterSequence	messageParameters	Field			
messageParameterType	messageParameters	Field			Field			
messageParameterValue	messageParameters	Field	messageParameterValue	messageParameters	Field			

Install Event - Asset Node Synchronization

Install Event - Asset Node Synchronization for each integration point consists of the following:

- Install Event Request Mapping
- Asset Node Sync Response Mapping

Install Event Request Mapping

Install Event Request Mapping details for each integration point are as follows:

Oracle Utilities Meter Data Management Install Event Sync Request Message Mapping			Oracle Utilities Operational Device Management Install Event Sync Request Message Mapping			Lookup Mapping		
Element Name	**Parent Element**	**Type**	**Element Name**	**Parent Element**	**Type**	**Lookup Name**	**Oracle Utilities Operational Device Management Column**	**Oracle Utilities Meter Data Mapping Column**
sendDetails		Outermost Tag	W1-SyncRequestInboundAssetNode		Outermost Tag			
syncRequestId	sendDetails	Field	externalReferenceId	W1-SyncRequestInboundAssetNode	Field			
bo	sendDetails	Field			Field			
boStatus	sendDetails	Field			Field			
createDateTime	sendDetails	Field			Field			
statusDateTime	sendDetails	Field			Field			
version	sendDetails	Field			Field			
sourceSystem	sendDetails	Field	externalSystem	W1-SyncRequestInboundAssetNode	Field			

Oracle Utilities Meter Data Management Install Event Sync Request Message Mapping			Oracle Utilities Operational Device Management Install Event Sync Request Message Mapping			Lookup Mapping		
Element Name	Parent Element	Type	Element Name	Parent Element	Type	Lookup Name	Oracle Utilities Operational Device Management Column	Oracle Utilities Meter Data Mapping Column
syncRequired	sendDetails	Field			Field			
forceSync	sendDetails	Field			Field			
initialLoad	sendDetails	Field	initialLoad	W1-SyncRequest InboundAssetNode	Field			
discardReason	sendDetails	Field			Field			
cancelReason	sendDetails	Field			Field			
exceptioninfo	sendDetails	List			Field			
sequence	exceptioninfo	Field			Field			
messageCategory	exceptioninfo	Field			Field			
messageNumber	exceptioninfo	Field			Field			
comments	exceptioninfo	Field			Field			
messageParameters	exceptioninfo	List			Field			
parameterSequence	messageParameters	Field			Field			
messageParameterValue	messageParameters	Field						
mo	sendDetails	Field	targetMo	W1-SyncRequest InboundAssetNode	Field	UA_MDM_ODM_MO	MDM_MO	ODM_MO
pkValue1	sendDetails	Field	externalPkValue1	W1-SyncRequest InboundAssetNode	Field			

Oracle Utilities Meter Data Management Install Event Sync Request Message Mapping			Oracle Utilities Operational Device Management Install Event Sync Request Message Mapping			Lookup Mapping		
Element Name	**Parent Element**	**Type**	**Element Name**	**Parent Element**	**Type**	**Lookup Name**	**Oracle Utilities Operational Device Management Column**	**Oracle Utilities Meter Data Mapping Column**
pkValue2	sendDetails	Field	externalPkValue2	W1-SyncRequest InboundAssetNode	Field			
pkValue3	sendDetails	Field	externalPkValue3	W1-SyncRequest InboundAssetNode	Field			
pkValue4	sendDetails	Field	externalPkValue4	W1-SyncRequest InboundAssetNode	Field			
pkValue5	sendDetails	Field	externalPkValue5	W1-SyncRequest InboundAssetNode	Field			
externalIds	sendDetails	Field						
entityIdList	externalIds	List						
entity	entityIdList	Field						
externalPk1	entityIdList	Field			Group			
externalPk2	entityIdList	Field			Group			
externalPk3	entityIdList	Field			Group			
externalPk4	entityIdList	Field			Field			
externalPk5	entityIdList	Field			Field			
externalSystem	sendDetails	Field			Field			
entityBO	sendDetails	Field			Field			
snapshotDA	sendDetails	Field			Field			
postScript	sendDetails	Field			Field			

Oracle Utilities Meter Data Management Install Event Sync Request Message Mapping			Oracle Utilities Operational Device Management Install Event Sync Request Message Mapping			Lookup Mapping		
Element Name	**Parent Element**	**Type**	**Element Name**	**Parent Element**	**Type**	**Lookup Name**	**Oracle Utilities Operational Device Management Column**	**Oracle Utilities Meter Data Mapping Column**
elementPopulationRules	sendDetails	Group			Group			
elementPopulationRule	elementPopulationRules	List			Field			
targetElement	elementPopulationRule	Field			Field			
sourceElement	elementPopulationRule	Field			Field			
populateTargetWith InfoString	elementPopulationRule	Field			Field			
syncRequestDetails	sendDetails	List	syncRequestDetails	W1-SyncRequest Inbound	List			
InitialSnapshot	syncRequestDetails	List	initialSnapshot	original	List			
customElements	IntialSnapshot	List	customElements	initialsnapshot	Field			
formattedelements	IntialSnapshot	Group	Formattedelements	initialsnapshot	Field			
FinalSnapshot	sendDetails	List	FinalSnapshot	original	List			
customElements	FinalSnapshot	List	customElements	FinalSnapshot	Field			
formattedelements	FinalSnapshot	Group	Formattedelements	FinalSnapshot	Field			
createToDo	syncRequestDetails	Field	createToDo	syncRequestDetails				
updateEffectiveDateTime	syncRequestDetails	Field	updateEffectiveDateTime	syncRequestDetails	Field			
assetMovements	syncRequestDetails	Group	assetMovements	syncRequestDetails	Group			
assetMovementsList	assetMovements	List	assetMovementsList	assetMovements	List			
sequence	assetMovementsList	Field	sequence	assetMovementsList	Field			

Oracle Utilities Meter Data Management Install Event Sync Request Message Mapping			Oracle Utilities Operational Device Management Install Event Sync Request Message Mapping			Lookup Mapping		
Element Name	Parent Element	Type	Element Name	Parent Element	Type	Lookup Name	Oracle Utilities Operational Device Management Column	Oracle Utilities Meter Data Mapping Column
assetId	assetMovementsList	Field	assetId	assetMovementsList	Field			
assetDisposition	assetMovementsList	Field	assetDisposition	assetMovementsList	Field			
effectiveDateTime	assetMovementsList	Field	effectiveDateTime	assetMovementsList	Field			
nodeId	assetMovementsList	Field	nodeId	assetMovementsList	Field			
attachedToAssetId	assetMovementsList	Field	attachedToAssetId	assetMovementsList	Field			
originalEffectiveDateTime	assetMovementsList	Field	originalEffectiveDateTime	assetMovementsList	Field			

Asset Node Sync Response Mapping

The Asset Node Sync Response mapping details for each integration are as follows:

Oracle Utilities Operational Device Management Asset Node Sync Response Message Mapping			Oracle Utilities Meter Data Management Asset Node Sync Response Message Mapping			Lookup Mapping		
Element Name	Parent Element	Type	Element Name	Parent Element	Type	Lookup Name	Oracle Utilities Operational Device Management Column	Oracle Utilities Meter Data Mapping Column
sendDetails		OutermostTag	F1-UpdateAndTransitionSyncRequest		Outermost Tag			
externalReferenceId	sendDetails		syncRequestId	F1-UpdateAndTransitionSyncRequest				

Oracle Utilities Operational Device Management Asset Node Sync Response Message Mapping			Oracle Utilities Meter Data Management Asset Node Sync Response Message Mapping			Lookup Mapping		
Element Name	**Parent Element**	**Type**	**Element Name**	**Parent Element**	**Type**	**Lookup Name**	**Oracle Utilities Operational Device Management Column**	**Oracle Utilities Meter Data Mapping Column**
externalIds	sendDetails	Group	externalIds	F1-UpdateAndTransitionSyncRequest	Group			
entityIdList	externalIds	List	entityIdList	externalIds	List			
entity	entityIdList	Field	entity	entityIdList	Field			
externalPk1	entityIdList	Field	externalPk1	entityIdList	Field			
externalPk2	entityIdList	Field	externalPk2	entityIdList	Field			
externalPk3	entityIdList	Field	externalPk3	entityIdList	Field			
externalPk4	entityIdList	Field	externalPk4	entityIdList	Field			
externalPk5	entityIdList	Field	externalPk5	entityIdList	Field			
exceptionInformation	sendDetails							
exceptionInformationList	exceptionInformation	List	exceptionInfo	F1-UpdateAndTransitionSyncRequest	List			
sequence	exceptionInformation	Field	sequence	exceptionInfo	Field			
messageCategory	exceptionInformation	Field	messageCategory	exceptionInfo	Field	UA_MDM_ODM_ErrorCode	ODM_ErrorCode	MDM_ErrorCode
messageNumber	exceptionInformation	Field	messageNumber	exceptionInfo	Field	UA_MDM_ODM_ErrorCode	ODM_ErrorCode	MDM_ErrorCode
comments	exceptionInformation	Field	comments	exceptionInfo	Field			
messageParameters	exceptionInformation	List	messageParameters	exceptionInfo	List			
parameterSequence	messageParameters	Field	parameterSequence	messageParameters	Field			
messageParameterType	messageParameters	Field			Field			
messageParameterValue	messageParameters	Field	messageParameterValue	messageParameters	Field			