

**Oracle Utilities Digital Asset Cloud
Service Integration to Oracle Utilities Grid
Edge Distributed Energy Resources
Management System**

Configuration Guide

Release 23B

F85357-01

September 2023

Oracle Utilities Digital Asset Cloud Service Integration to Oracle Utilities Grid Edge Distributed Energy Resources Management System Configuration Guide, Release 23B

Copyright © 2000, 2023 Oracle and/or its affiliates.

Contents

Preface	i
Audience	ii
Documentation and Resources	ii
Documentation Accessibility	iii
Conventions.....	iii
Acronyms.....	iii
Chapter 1	
Overview	1-1
Overview of the Integration	1-2
About Oracle Utilities Digital Asset Cloud Service.....	1-2
About Oracle Utilities Grid Edge Distributed Energy Resources Management System	1-2
About Oracle Integration Cloud	1-3
Software Requirements	1-3
Prerequisites.....	1-3
Supported Business Processes.....	1-4
Chapter 2	
Solution Architecture	2-1
Solution Overview	2-2
Synchronous.....	2-3
One-way Asynchronous.....	2-4
Solution Diagram.....	2-4
Integration Flows.....	2-5
Enrollment Request (DERMS Initiated).....	2-5
Enrollment Sync.....	2-8
Device Status Check	2-12
Event Device Reservation (DERMS Initiated)	2-16
Program Event Status Update (DERMS Initiated).....	2-19
Send Device Score (DACS Initiated).....	2-22
Event Device Outcome (DERMS Initiated)	2-27
Common Error Handler (OIC Initiated)	2-31
Chapter 3	
Configuring Oracle Utilities Digital Asset Cloud Service	3-1
Configuring Admin Data in Oracle Utilities Digital Asset Cloud Service	3-2
Message Senders	3-2
External System.....	3-3
Inbound Web Service (IWS)	3-3
Master Configuration.....	3-3
Head End System.....	3-4
Activity Type.....	3-4
Communication Type.....	3-4
Service Task Type	3-4

Sync Request Process	3-5
Scheduling Batch Jobs	3-5
Adding Oracle Integration Cloud Certificates	3-5
Chapter 4	
Configuring Oracle Utilities Grid Edge Distributed Energy Resources Management System	4-1
Configuring Admin Data in Oracle Utilities Grid Edge Distributed Energy Resources Management System.....	4-2
Chapter 5	
Importing, Configuring, and Testing Integration Connections	5-1
Importing the Oracle Integration Cloud Package from Oracle Cloud Marketplace.....	5-2
Verifying the Package Import.....	5-2
Configuring Connections in Oracle Integration Cloud	5-3
OU REST DACS for DACS-DRMS Connection	5-4
OU REST DRMS for DACS-DRMS Connection	5-4
OU REST for DACS-DRMS Connection.....	5-4
OU FTP DACS for DACS-DRMS Connection.....	5-4
OU REST DRMSVC for DACS-DRMS Connection	5-5
OU REST DACS Object Storage for DACS Connection	5-5
Configuring Agent (if applicable).....	5-6
Possible Combinations.....	5-6
Creating an Agent Group.....	5-6
Downloading Agent Installer	5-7
Installing On-Premises Agent	5-7
Setting up Certificates for Security.....	5-8
Chapter 6	
Configuring Lookups, Error Handling, and Email Notifications	6-1
Configuring Lookups	6-2
Editing Lookups.....	6-3
Configuration Properties	6-3
Error Handling.....	6-7
Error Handling Ways.....	6-7
Resubmitting the Error Instances in Oracle Integration Cloud	6-11
Email Notifications	6-11
Chapter 7	
Customizations	7-1
Adding New Mappings.....	7-2
Chapter 8	
Activating and Testing the Integration Flows.....	8-1
Activating Integration Flows	8-2
Chapter 9	
Monitoring and Troubleshooting	9-1
Oracle Utilities Digital Asset Cloud Service	9-2
Oracle Utilities Digital Asset Cloud Service Error Logs.....	9-2
Oracle Integration Cloud.....	9-2
Monitoring Integration Flows	9-2
Troubleshooting.....	9-3
Appendix A	
Limitations and Workarounds	A-1

Preface

Welcome to the Oracle Utilities Digital Asset Cloud Service Integration to Oracle Utilities Grid Edge Distributed Energy Resources Management System Configuration Guide for release 23B. Use this information to learn what you need to configure the integration between Oracle Utilities Digital Asset Cloud Service and Oracle Utilities Grid Edge Distributed Energy Resources Management System using Oracle Integration Cloud.

The preface includes the following:

- [Audience](#)
- [Documentation and Resources](#)
- [Documentation Accessibility](#)
- [Conventions](#)
- [Acronyms](#)

Audience

This document is intended for anyone implementing the Oracle Utilities Digital Asset Cloud Service integration with Oracle Utilities Grid Edge Distributed Energy Resources Management System.

Documentation and Resources

For more information regarding this integration, foundation technology and the edge applications, refer to the following documents:

Product Documentation

Topic	Location
Oracle Utilities Digital Asset Cloud Service Integration to Oracle Utilities Grid Edge Distributed Energy Resources Management System documentation	https://docs.oracle.com/en/industries/energy-water/integrations-index.html
Oracle Utilities Network Management System documentation	https://docs.oracle.com/en/industries/energy-water/network-management-system/
Oracle Utilities Digital Asset Cloud Service documentation	https://docs.oracle.com/en/industries/energy-water/digital-asset-cloud-service/

Additional Documentation

Resource	Location
Oracle Support	<p>Visit My Oracle Support at https://support.oracle.com regularly to stay informed about updates and patches.</p> <p>Refer to the <i>Certification Matrix for Oracle Utilities Products (Doc ID 1454143.1)</i> on My Oracle Support to determine if support for newer versions of the listed products is included.</p> <p>For more information, refer to the Oracle Utilities Integrations page at http://my.oracle.com/site/tugbu/productsindustry/productinfo/utilities/integration/index.htm</p>
Oracle Technology Network (OTN) Latest versions of documents	http://www.oracle.com/technetwork/index.html
Oracle University for training opportunities	http://education.oracle.com/

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.
<i>italic</i>	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.

Acronyms

The following terms are used in this document:

Term	Expanded Form
DACS	Oracle Utilities Digital Asset Cloud Service
DERMS	Oracle Utilities Grid Edge Distributed Energy Resources Management System
OIC	Oracle Integration Cloud
IWS	Inbound Web Service
DRMS	Demand Response Management System
LEC	Oracle Utilities Live Energy Connect
OUIAI	Oracle Utilities Analytics Insights

Chapter 1

Overview

This chapter provides an overview of the integration between Oracle Utilities Digital Asset Cloud Service and Oracle Utilities Grid Edge Distributed Energy Resources Management System using Oracle Integration Cloud. It also provides information about software requirements, participating applications, and supported business processes of the integration.

The chapter includes the following:

- [Overview of the Integration](#)
- [About Oracle Utilities Digital Asset Cloud Service](#)
- [About Oracle Utilities Grid Edge Distributed Energy Resources Management System](#)
- [About Oracle Integration Cloud](#)
- [Software Requirements](#)
- [Prerequisites](#)
- [Supported Business Processes](#)

Overview of the Integration

The Oracle Utilities Digital Asset Cloud Service integration to Oracle Utilities Grid Edge Distributed Energy Resources Management System facilitates the exchange of information related to a customer's controllable device(s) during program enrollment or unenrollment, program event participation and device score used for event planning.

About Oracle Utilities Digital Asset Cloud Service

Oracle Utilities Digital Asset Cloud Service provides the core functionality for utilities to create, run, and maintain demand response and distributed energy resource programs.

It comprises the following functional areas:

- **Asset and Device Management:** Maintenance of controllable assets, such as “smart” thermostats, electric vehicle chargers, storage batteries, and other types of devices.
- **Program Enrollment/Unenrollment:** Identifying specific customers that are eligible for particular programs, and establishing relationships between the customers, the programs, and if appropriate, device locations where one or more controllable devices are (or have been) installed.
- **Program Management:** Creation and maintenance of Demand Response Programs to which customers can subscribe and which allows utilities to temporarily alter the settings of specific devices in their homes as a response to periods of high demand.
- **Program Subscriptions:** Maintenance of a customer's program subscriptions that represent the customer's enrollment in a program and device registration. Program subscriptions link the customer to a program and device location where controllable devices are installed.
- **Demand Response Event Management:** Identification and reservation of a customer's controllable devices in response to usage demand.

About Oracle Utilities Grid Edge Distributed Energy Resources Management System

Oracle Utilities Grid Edge Distributed Energy Resources Management System is built on Oracle Utilities Network Management System (NMS). It adds incremental support to the Oracle Utilities Network Management System platform for the management of behind the meter demand response resources. Oracle Utilities Grid Edge Distributed Energy Resources Management System can initiate control signals to devices inside customer homes, such as smart thermostats. Oracle Utilities Network Management System facilitates the modeling of individual Demand Response devices down to the customer service point and/or aggregated to load transformers to support Oracle Utilities Network Management System driven optimization. In conjunction with Oracle Utilities Network Management System the Oracle Utilities Grid Edge Distributed Energy Resources Management System component can help optimize electrical networks both operationally and commercially.

Oracle Utilities Grid Edge Distributed Energy Resources Management System offers strategy templates to be used for forecasting for various scenarios during event management. It provides event functions that help grid operators manage and review the forecasted impact of an event. This includes the ability to nominate, approve or reject an event; monitor or cancel an ongoing event and audit historical events. Oracle Utilities Grid Edge Distributed Energy Resources Management System supports automatic generation of event stages (blocks of field device activity) for configured objectives. Stages are built based on cost scores and reduction forecasts received from external applications used to help monitor and manage the Demand Response programs.

About Oracle Integration Cloud

Oracle Integration Cloud is a cloud-based integration application designed to integrate cloud and on-premises applications, automate business processes, gain insight into your business processes, develop visual applications, process files, and exchange business documents with a B2B partner.

With the Process Builder business processes can be rapidly designed, automated, and managed in the cloud. Continuous business flows are quickly created by connecting and integrating applications that live in the cloud and/or on-premise.

Domain Value Map or lookups are available to match application specific codes between the applications.

Integration Insights and Stream Analytics help to simplify and extract business metrics and create custom dashboards.

Software Requirements

The following software is required for the integration to work:

- Oracle Utilities Digital Asset Cloud Service
- Oracle Utilities Grid Edge Distributed Energy Resources Management System
- Oracle Integration Cloud

For specific application versions, refer to the *Oracle Utilities Digital Assets Cloud Service Integration to Oracle Utilities Grid Energy Distributed Energy Resources Management System Release Notes* included in this release.

The documentation is available on Oracle Help Center at: <https://docs.oracle.com/en/industries/energy-water/integrations-index.html>

Prerequisites

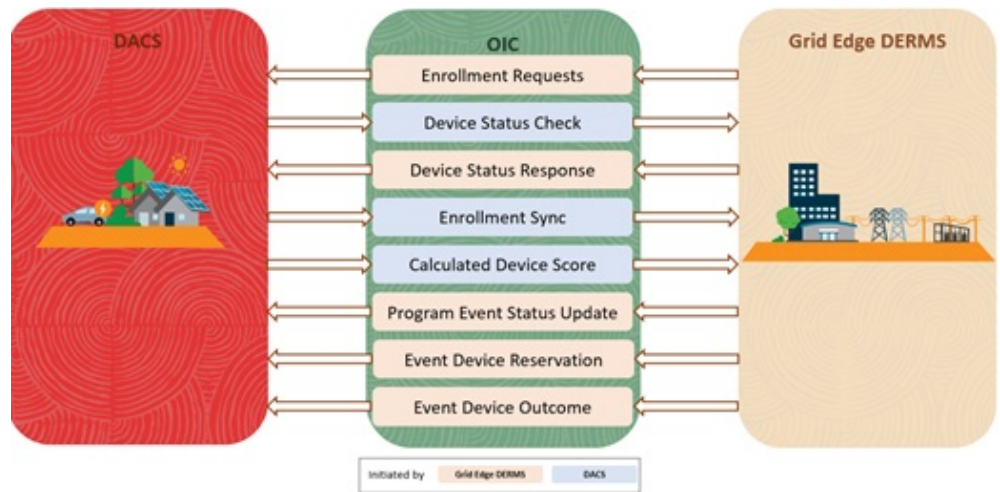
Make sure all participating applications must be installed, set up, and working properly.

Customer Information must be synchronized from the Customer Information System or Oracle Utilities Customer Care and Billing to the following applications:

- Oracle Utilities Digital Asset Cloud Service
- Oracle Utilities Grid Edge Distributed Energy Resources Management System

Supported Business Processes

The following diagram illustrates the supported business processes of this integration:



To summarize, the integration can be leveraged to:

- Send enrollment requests for customer owned devices from Oracle Utilities Grid Edge Distributed Energy Resources Management System to Oracle Utilities Digital Asset Cloud Service. This initiates the controllable device's enrollment process in Oracle Utilities Digital Asset Cloud Service.
- Send controllable device status check request initiated from Oracle Utilities Digital Asset Cloud Service and receive the most recent controllable device status response from Oracle Utilities Grid Edge Distributed Energy Resources Management System.
- Synchronize customer, controllable device(s), and program subscription information on successful enrollments, unenrollment, and device replacements from Oracle Utilities Digital Asset Cloud Service to Oracle Utilities Grid Edge Distributed Energy Resources Management System.
- Periodically transfer the device score values calculated from Oracle Utilities Digital Asset Cloud Service to Oracle Utilities Grid Edge Distributed Energy Resources Management System for event planning.
- Send scheduled event and stage information from Oracle Utilities Grid Edge Distributed Energy Resources Management System to Oracle Utilities Digital Asset Cloud Service. Oracle Utilities Grid Edge Distributed Energy Resources Management System also sends the succeeding event-stage status updates to Oracle Utilities Digital Asset Cloud Service.
- Send device reservation information, which are the selected controllable devices participating in an upcoming scheduled event, from Oracle Utilities Grid Edge Distributed Energy Resources Management System to Oracle Utilities Digital Asset Cloud Service.
- Send device outcome for all participating devices in an event from Oracle Utilities Grid Edge Distributed Energy Resources Management System to Oracle Utilities Digital Asset Cloud Service.

Chapter 2

Solution Architecture

This chapter provides an overview of the application architecture used by the integration, including:

- [Solution Overview](#)
- [Solution Diagram](#)
- [Integration Flows](#)

Solution Overview

The technical aspects involved in the integration between Oracle Utilities Digital Asset Cloud Service and Oracle Utilities Grid Edge Distributed Energy Resources Management System are:

- The integration layer consists of integration processes deployed on Oracle Integration Cloud.
- The integration processes interact with other applications using the following adapters:
 - Oracle Utilities Adapter interacts with the DACS REST APIs and NMS Grid Edge DERMS REST APIs.
 - REST Adapter interacts with Oracle Cloud Infrastructure Object Storage APIs and DERMS REST APIs with file attachments.
 - FTP Adapter interacts with Oracle Utilities Digital Asset Cloud Service On Premise Server to list, get, and rename files in the server.
- Two types of email notifications can be configured in this integration, namely, business and technical error email notification. Email notifications are optional, but by default are enabled.

- Business email notifications:

This notification is used in file processing flows.

Configure the property name

`notification.email.process.complete.flag` in the **OUTL-BRT-DACS_DRMS_ConfigProps** lookup to 'true' to receive email notification when the process is completed or partially processed. By default, this is set to 'true'.

Configure the property name

`notification.email.process.nofile.flag` in the **OUTL-BRT-DACS_DRMS_ConfigProps** lookup to 'true' to receive email notification when no file is found in the source location. By default, this is set to 'true'.

The recipient(s) of these email notification are configured in the `to.process.notification` recipients of the **OUTL-BRT-DACS_DRMS_Email_ID** lookup. These are sent to the business users of the applications.

- Technical error email notifications:

Configure the property name `notification.email.error.flag` in the **OUTL-BRT-DACS_DRMS_ConfigProps** lookup to 'true' to receive email notification when errors are encountered. By default, this is set to 'true'.

The recipient(s) of the email notification sent out for technical errors is configured in the `to` recipients of the **OUTL-BRT-DACS_DRMS_Email_ID** lookup. These are sent to the administrators of the applications.

- The **OUTL-BRT-DACS_DRMS_ConfigProps** lookup is used to define the default values needed by the integration flows. Make sure the properties in the lookup are configured.

- Integration related DVM lookups are used for translation of values from one application to the other. Make sure these DVM lookups are configured.
- In the Oracle Utilities Digital Asset Cloud Service initiated processes, batch processes are used to send the outbound messages or to create file(s) and upload to the content server defined for an external application to pull for processing. Oracle Utilities Digital Asset Cloud Service uses REST inbound web services (IWS) to receive messages.
- In the Oracle Utilities Grid Edge Distributed Energy Resources Management System initiated processes, events are triggered to send the outbound messages and files, if applicable. Oracle Utilities Grid Edge Distributed Energy Resources Management System uses REST APIs to receive the messages and files, if applicable.
- For Scheduled Integration processes related to file transfer, make sure the dependent application extract processes are ran first so the files are already available in the content server for the integration process to pick up.

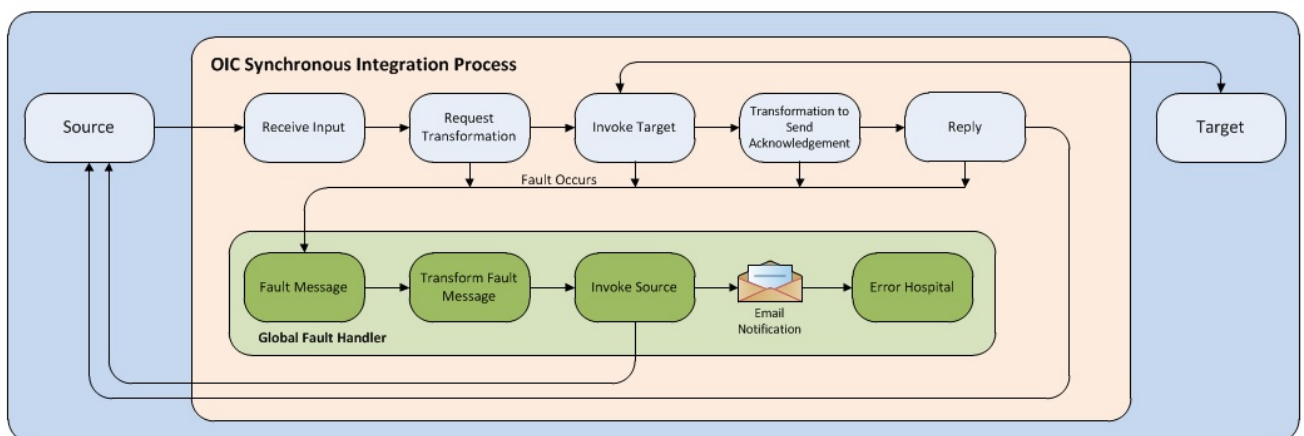
The integration patterns used in this solution are:

- [Synchronous](#)
- [One-way Asynchronous](#)

Synchronous

The synchronous integration process:

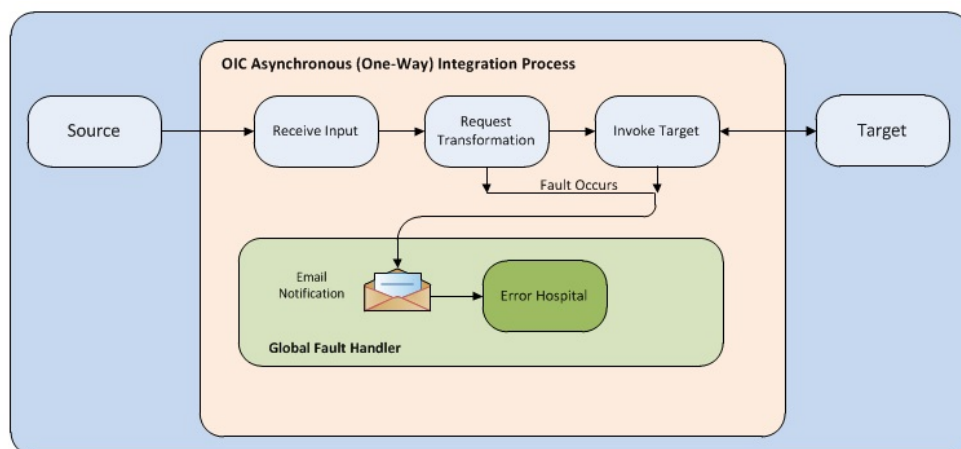
1. Receives request message from the source application.
2. Transforms the message from source format to the target format. Lookups are used for data translations, if applicable.
3. Invokes the target application.
4. Transforms the response message from the target format back to the source format. It sends back the response to the source application.
5. In case of any error, the global fault handler catches them and sends the transformed error message to the source application.
6. An optional email notification is sent to the respective users as configured.



One-way Asynchronous

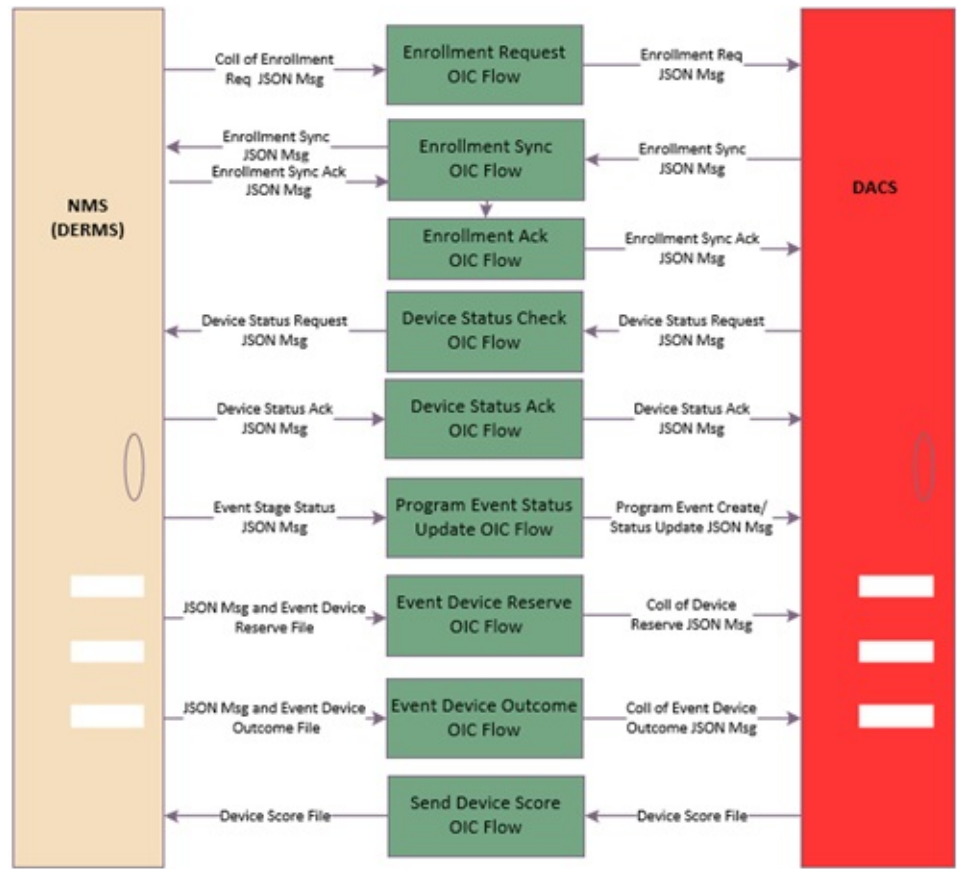
The one-way asynchronous integration process:

1. Receives request message from the source application.
2. Transforms message from the source to the target format. Lookups are used for data translations, if applicable.
3. Invokes target application to send the request message.
4. In case of any error, the global fault handler catches the error.
5. An optional email notification is sent to the respective users as configured.
6. The error instance can be re-submitted from Oracle Integration Cloud. Refer to the [Error Handling](#) section in [Configuring Lookups, Error Handling, and Email Notifications](#) for more details.



Solution Diagram

The solution diagram for the integration between Oracle Utilities Digital Asset Cloud Service and Oracle Utilities Grid Edge Distributed Energy Resources Management System is shown below.



Integration Flows

The integration supports the following processes:

- [Enrollment Request \(DERMS Initiated\)](#)
- [Enrollment Sync](#)
- [Device Status Check](#)
- [Event Device Reservation \(DERMS Initiated\)](#)
- [Program Event Status Update \(DERMS Initiated\)](#)
- [Send Device Score \(DACS Initiated\)](#)
- [Common Error Handler \(OIC Initiated\)](#)

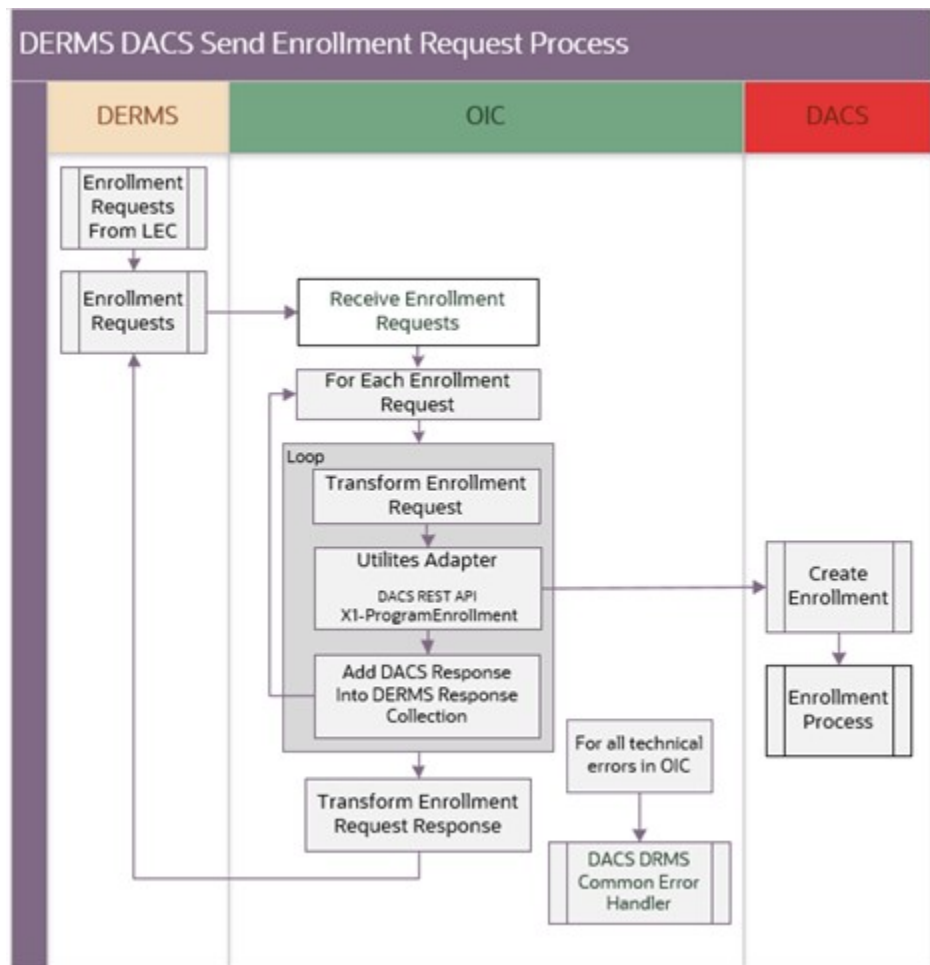
Enrollment Request (DERMS Initiated)

When customers enroll their smart controllable device(s) in a program through the head-end system provider or aggregator/vendor, such as Ecobee or Google Nest, the enrollment requests are sent to Oracle Utilities Live Energy Connect.

This integration process sends the enrollment request that Oracle Utilities Grid Edge Distributed Energy Resources Management System received from Oracle Utilities Live Energy Connect to Oracle Utilities Digital Asset Cloud Service.

The integration then sends the list of responses for each enrollment request back to Oracle Utilities Grid Edge Distributed Energy Resources Management System when the process is completed.

The following diagram shows a graphical representation of the Enrollment Request integration process.



Processing Details

The integration process deployed on Oracle Integration Cloud is exposed as a REST API and performs the following activities:

1. The process is triggered when it receives a request message from Oracle Utilities Grid Edge Distributed Energy Resources Management System. The incoming request message can contain multiple enrollment requests, but the DACS REST API only process a single enrollment request.
2. The integration loops through each incoming request:
 - Transforms the enrollment request payload from Oracle Utilities Grid Edge Distributed Energy Resources Management System to Oracle Utilities Digital Asset Cloud Service format.

- Invokes the Program Enrollment DACS REST endpoint to create the enrollment in Oracle Utilities Digital Asset Cloud Service. The enrollment is created in PENDING status.
 - Response per enrollment request coming from Oracle Utilities Digital Asset Cloud Service are collected and later returned to Oracle Utilities Grid Edge Distributed Energy Resources Management System. If an error is encountered, the process continues to the next enrollment request.
 - If the enrollment is successfully created, it will return the enrollment ID.
 - If Oracle Utilities Digital Asset Cloud Service returns an ERROR, it will be captured and returned inside the collection.
3. After all the records are processed, it transforms the Oracle Utilities Digital Asset Cloud Service response into the Oracle Utilities Grid Edge Distributed Energy Resources Management System response payload. It will set the overall **ackType** field in the response with the following code:
- **SUCCESS**, if all enrollment responses from Oracle Utilities Digital Asset Cloud Service have the SUCCESS value in the **responseCode** field.
 - **FAILURE**, or ERROR if at least one **responseCode** within the enrollment responses from Oracle Utilities Digital Asset Cloud Service contains one of those values.
4. For technical faults encountered in the process (such as Oracle Utilities Digital Asset Cloud Service unavailable), the integration will set the **ackType** to “FAILURE”.
- If it encounters a technical error while processing an enrollment request, but can continue processing the collection, the error details will be captured inside the response back to Oracle Utilities Grid Edge Distributed Energy Resources Management System and an error email notification is sent out on the first time the error is encounter.
 - If it faults and cannot continue processing the collection, Oracle Integration Cloud will try to send a response back to Oracle Utilities Grid Edge Distributed Energy Resources Management System with the details and will also send an email notification with the error details via a common error handler to the users configured in the 'to' recipients of the **OUTL-BRT-DACS_DRMS_Email_ID** lookup.
 - If Oracle Integration Cloud is trying to send a failure response, but that fails, it will send an email notification with the error details via a common error handler to the users configured in the 'to' recipients of the **OUTL-BRT-DACS_DRMS_Email_ID** lookup.

Technical Details

The following table describes the integration processes and the respective Oracle Utilities Digital Asset Cloud Service and Oracle Utilities Grid Edge Distributed Energy Resources Management System artifacts used in this integration process.

Artifacts	Value
Integration Process Name	OU DERMS DACS Enrollment Request
Integration Process Identifier	OUTL-BA-DRMS_DACS_ENROLLRQ

Artifacts	Value
Integration Package Name	outl.ba.dacs_derms.01_23_2000
Source Connection (Oracle Utilities Adapter)	OU REST DRMS for DACS-DRMS
trigger	<ul style="list-style-type: none"> DERMS Service Name: NMS-DACSO outbound openAPIUrl: https://{host}:{port}/nms-drms/outbound/openapi.json OperationId: enroll Method: POST URI: /enroll-to-dacs
Target Connection (Oracle Utilities Adapter)	OU REST DACS for DACS-DRMS
invoke	<ul style="list-style-type: none"> Web Service Name: X1-ProgramEnrollment Computed URL: https://{host}:{port}/{tenant}/{domain}/ccs/rest/apis/cross/digitalAssets/programEnrollments Method: POST URI: /enroll
Local Integrations	OU DACS DERMS CommonErrorHandler

Lookups Referenced

The following table describes the customized properties referenced in the integration. For more information about the lookup properties, refer to [Configuring Lookups, Error Handling, and Email Notifications](#).

DVM	Property
OUTL-BRT-DACS_DRMS_ConfigProps	<ul style="list-style-type: none"> notification.email.flag notification.type.email
OUTL-BRT-DACS_DRMS_EnrollmentStatus	<ul style="list-style-type: none"> DACS_status DRMS_responseCode
OUTL-BRT-DACS_DRMS_AssetSpec	<ul style="list-style-type: none"> DRMS_MAKE_MODEL DACS_SPECIFICATION
OUTL-BRT-DACS_DRMS_AssetType	<ul style="list-style-type: none"> DRMS_ASSET_TYPE DACS_ASSET_TYPE

Enrollment Sync

When customers enroll, unenroll, or replace their smart controllable device(s) in a program successfully in Oracle Utilities Digital Asset Cloud Service, the enrollment information is sent to Oracle Utilities Grid Edge Distributed Energy Resources Management System.

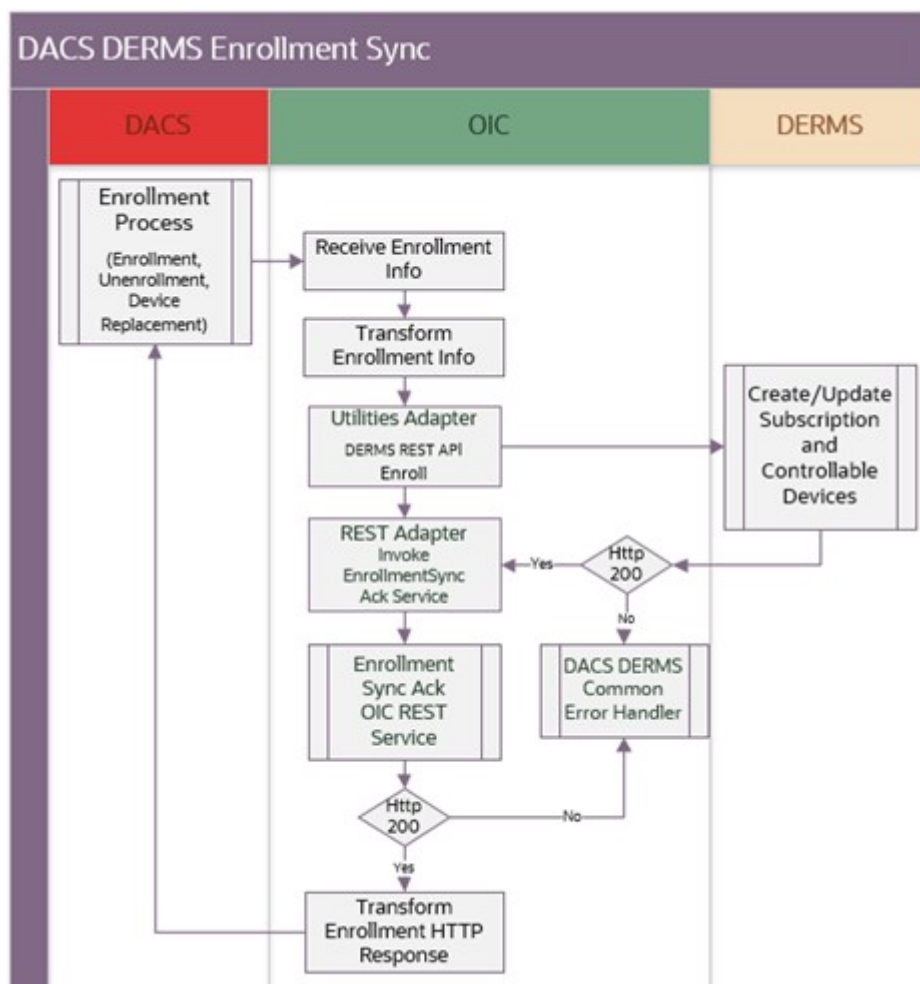
This integration process synchronizes the enrollment information from Oracle Utilities Digital Asset Cloud Service to Oracle Utilities Grid Edge Distributed Energy Resources Management System. The integration then sends an acknowledgment back to Oracle Utilities Digital Asset Cloud Service.

The enrollment synchronization and acknowledgment are handled by the following Oracle Integration Cloud integration flows:

- [Enrollment Sync \(DACS Initiated\)](#)
- [Enrollment Sync Acknowledgment \(DERMS Initiated\)](#)

Enrollment Sync (DACS Initiated)

The following diagram shows a graphical representation of the Enrollment Sync integration process:



Processing Details

The integration process deployed on Oracle Integration Cloud is exposed as a REST API and performs the following activities:

1. The process is triggered when it receives a request from Oracle Utilities Digital Asset Cloud Service.
2. Transform the payload to Oracle Utilities Grid Edge Distributed Energy Resources Management System format.

3. Invoke the Oracle Utilities Grid Edge Distributed Energy Resources Management System enrollment service endpoint and Oracle Utilities Grid Edge Distributed Energy Resources Management System responds synchronously whether the request has been processed successfully or with an error.
4. If the REST service returns:
 - Status 200 (OK),
 - Invoke the internal Oracle Utilities DERMS DACS Enrollment Sync Ack Oracle Integration Cloud integration process.
 - Enrollment Sync integration will finish the initial request by returning the incoming "syncRequestId" into the response "externalId".
 - Error Status, such as 400 or 500,
 - Throws a fault back to Oracle Utilities Digital Asset Cloud Service and an error email notification with the error details is sent via the common error handler.
5. For any errors encountered in this process:
 - An error email notification with error details is sent via the common error handler.
 - The process will return a fault to Oracle Utilities Digital Asset Cloud Service.
 - The integration flow will stop processing.

Technical Details

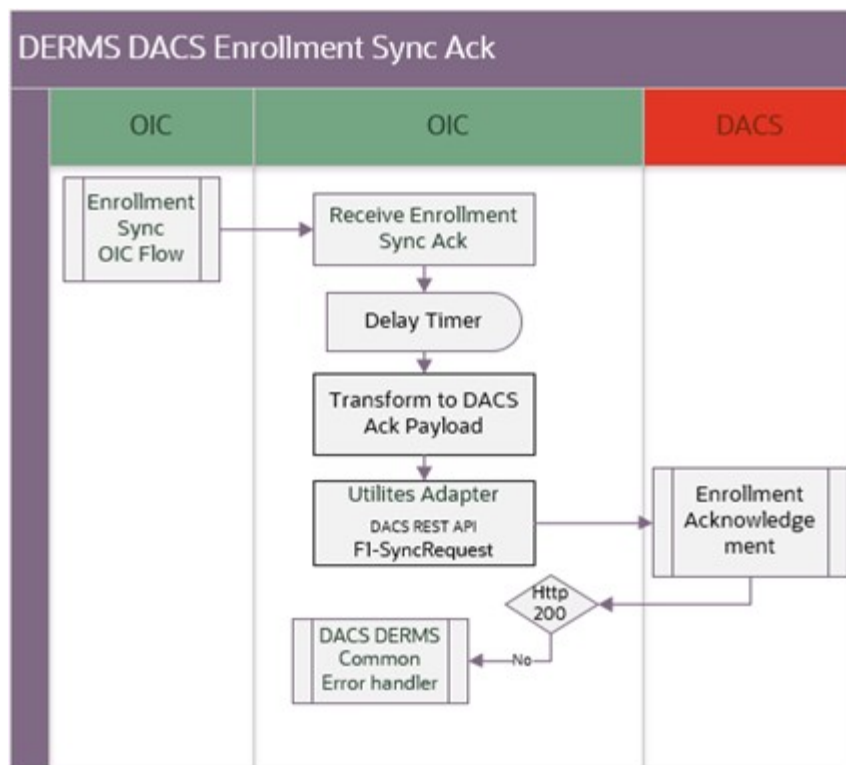
The following table describes the integration processes and the respective Oracle Utilities Digital Assets Cloud Service and Oracle Utilities Distributed Energy Resources Management System artifacts used in this integration process.

Artifacts	Value
Integration Process Name	OU DACS DERMS Enrollment Sync
Integration Process Identifier	OUTL-BA-DACS_DRMS_ENROLL_SYNC
Integration Package Name	outl.ba.dacs_derms.01_23_2000
Source Connection (Oracle Utilities Adapter)	OU REST DACS for DACS-DRMS
trigger	Outbound Message Type: X1-NMSDASMSG (Synchronize Digital Asset (NMS))
Target Connection (Oracle Utilities Adapter)	OU REST DRMS for DACS-DRMS
invoke	<ul style="list-style-type: none"> • DERMS Service Name: NMS-DACSInbound • openAPIUrl: https://{host}:{port} /nms-drms/rest/v1/openapi.json • OperationId: enroll • Method: POST • URI: /enroll
Local Integrations	<ul style="list-style-type: none"> • OU DERMS DACS Enroll Sync Ack • OU DACS DERMS CommonErrorHandler

Artifacts	Value
OIC Lookup	<ul style="list-style-type: none"> • OUTL-BRT-DACS_DRMS_ConfigProps • OUTL-BRT-DACS_DRMS_Email_ID • OUTL-BRT-DACS_DRMS_Routing

Enrollment Sync Acknowledgment (DERMS Initiated)

The following diagram shows a graphical representation of the Enrollment Sync Acknowledgment integration process:



Processing Details

The integration process deployed on Oracle Integration Cloud is exposed as a REST API, called internally by the DACS-DERMS Enrollment Sync OIC integration process, and performs the following activities:

1. The process is triggered when it receives the Oracle Utilities Grid Edge Distributed Energy Resources Management System acknowledgment from the Enrollment Sync Process.
2. Transforms the enrollment acknowledgment payload to Oracle Utilities Digital Asset Cloud Service format.
3. Invokes Oracle Utilities Digital Asset Cloud Service Sync Request Update REST endpoint to send the acknowledgment. The EnrollmentSyncAck process is delayed by a configurable amount of second to ensure Oracle Utilities Digital Asset Cloud Service has processed the initial request prior to receiving this acknowledgment.
4. For any errors encountered in this process:

- An error email notification with error details is sent via the common error handler.
- The integration flow will stop processing.

Technical Details

The following table describes the integration processes and the respective Oracle Utilities Digital Assets Cloud Service and Oracle Utilities Distributed Energy Resources Management System artifacts used in this integration process.

Artifacts	Value
Integration Process Name	OU DERMS DACS Enroll Sync Ack
Integration Process Identifier	OUTL-BA-DRMS_DACS_SYNC_ACK
Integration Package Name	outl.ba.dacs_derms.01_23_2000
Target Connection (Oracle Utilities Adapter)	OU REST DACS for DACS-DRMS
invoke	<ul style="list-style-type: none"> • Web Service Name: F1-SyncRequest • Computed URL: https://{host}:{port}/{tenant}/{domain}/ouaf/rest/apis/common/sync/syncRequest • Method: PATCH • URI: /{syncRequestId}
Library	NMSDERMS_SleepTimer[sleepTimer] javascript function
OIC Lookup	<ul style="list-style-type: none"> • OUTL-BRT-DACS_DRMS_ConfigProps • OUTL-BRT-DACS_DRMS_Email_ID

Device Status Check

This integration process sends a device status check from Oracle Utilities Digital Asset Cloud Service to Oracle Utilities Grid Edge Distributed Energy Resources Management System to retrieve the most recent communication status for the device. Oracle Utilities Grid Edge Distributed Energy Resources Management System then gets the device status from Oracle Utilities Live Energy Connect.

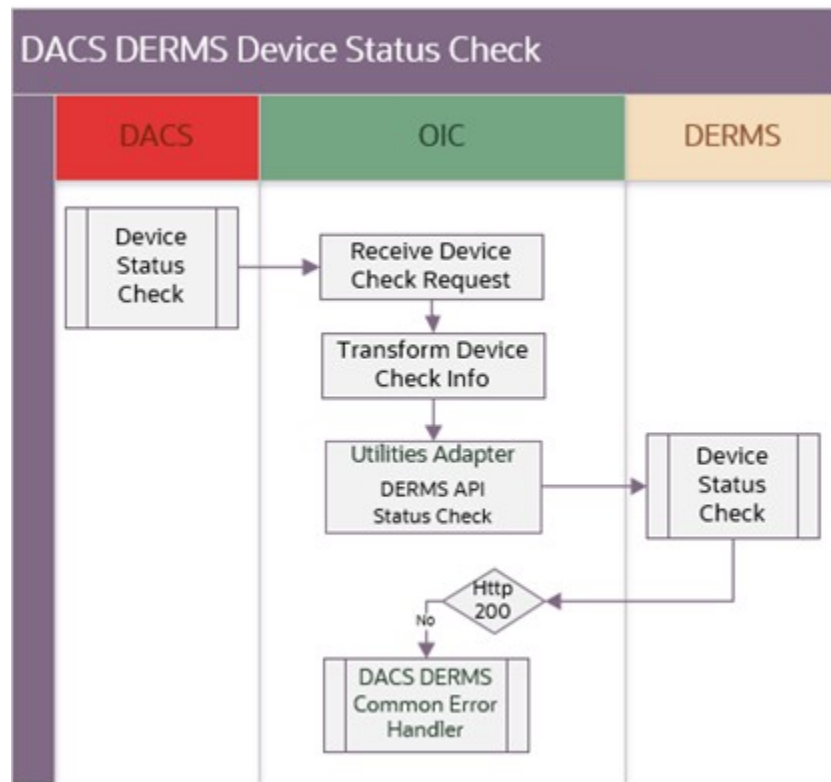
When Oracle Utilities Grid Edge Distributed Energy Resources Management System gets the device status from Oracle Utilities Live Energy Connect, it sends an asynchronous response back to Oracle Utilities Digital Asset Cloud Service for the corresponding device status check request.

Device status check request and response are asynchronous processes:

- [Device Status Check \(DACS Initiated\)](#)
- [Device Status Check Acknowledgment \(DERMS Initiated\)](#)

Device Status Check (DACS Initiated)

The following diagram shows a graphical representation of the Device Status Check integration process:



Processing Details

The integration process deployed on Oracle Integration Cloud is exposed as a REST API and performs the following activities:

1. The process is triggered when it receives a request from Oracle Utilities Digital Asset Cloud Service.
2. The payload is transformed to the Oracle Utilities Grid Edge Distributed Energy Resources Management System format.
3. Invokes the Oracle Utilities Grid Edge Distributed Energy Resources Management System Status Check REST Service.
4. If the REST service returns:
 - Status 200 (OK), end the process.
 - Error Status, such as 400 or 500, an error email notification with the error details is sent via common error handler. The process returns a fault to Oracle Utilities Digital Asset Cloud Service.

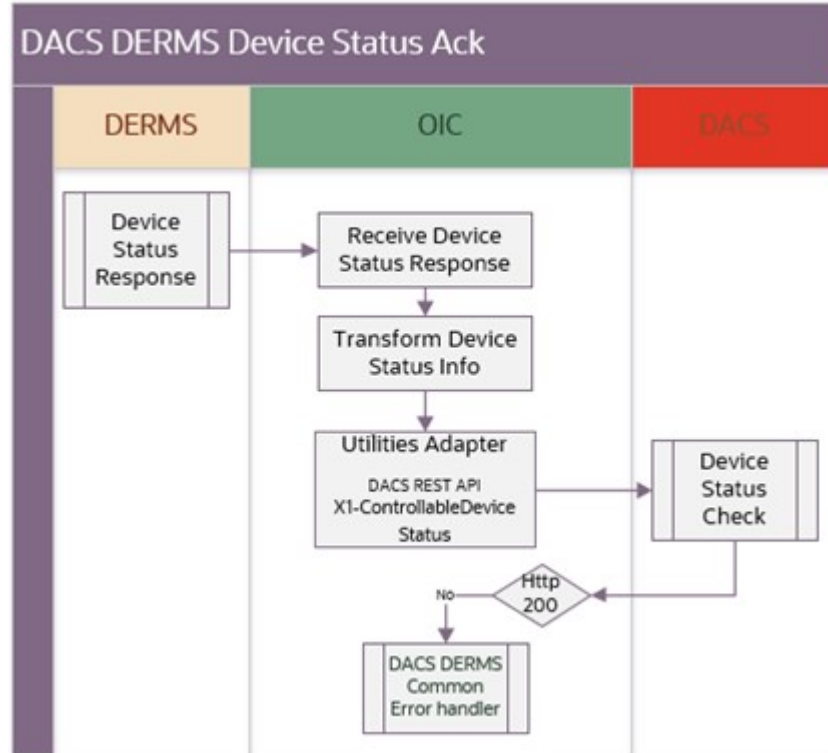
Technical Details

The following table describes the integration processes and the respective Oracle Utilities Digital Assets Cloud Service and Oracle Utilities Distributed Energy Resources Management System artifacts used in this integration process.

Artifacts	Value
Integration Process Name	OU DACS DERMS Device Status Check
Integration Process Identifier	OUTL-BA-DACS_DRMS_DEVICE_STATUS
Integration Package Name	outl.ba.dacs_derms.01_23_2000
Source Connection (Oracle Utilities Adapter)	OU REST DACS for DACS-DRMS
trigger	Outbound Message Type: X1-CTRLDVCS (Controllable Device Status Check)
Target Connection (Oracle Utilities Adapter)	OU REST DRMS for DACS-DRMS
invoke	<ul style="list-style-type: none"> DERMS Service Name: NMS-DACSInbound openAPIUrl: https://{host}:{port} /nms-drms/rest/v1/openapi.json OperationId: statusCheck Method: POST URI: /status-check
Local Integrations	OU DACS DERMS CommonErrorHandler
OIC Lookup	<ul style="list-style-type: none"> OUTL-BRT-DACS_DRMS_ConfigProps OUTL-BRT-DACS_DRMS_Routing

Device Status Check Acknowledgment (DERMS Initiated)

The following diagram shows a graphical representation of the Device Status Check Response integration process:



Processing Details

The integration process deployed on Oracle Integration Cloud is exposed as a REST AP and performs the following activities:

1. The process is triggered when it receives the device status from Oracle Utilities Grid Edge Distributed Energy Resources Management System.
2. The payload is transformed to the Oracle Utilities Digital Asset Cloud Service format.
3. Invokes the Oracle Utilities Digital Asset Cloud Service postControllableDeviceStatus REST Service using the Utilities Adapter.
4. If the REST service returns:
 - Status 200 (OK), the process returns a response to Oracle Utilities Grid Edge Distributed Energy Resources Management System with the Oracle Utilities Digital Asset Cloud Service boStatus in the Oracle Utilities Grid Edge Distributed Energy Resources Management System responseCode and a SUCCESS ackType.
 - Error Status, such as 400 or 500, the process returns a response to Oracle Utilities Grid Edge Distributed Energy Resources Management System with a FAILURE ackType.
5. For any errors encountered in this process:
 - An error email notification with error details is sent via the common error handler.

Technical Details

The following table describes the integration processes and the respective Oracle Utilities Digital Assets Cloud Service and Oracle Utilities Distributed Energy Resources Management System artifacts used in this integration process.

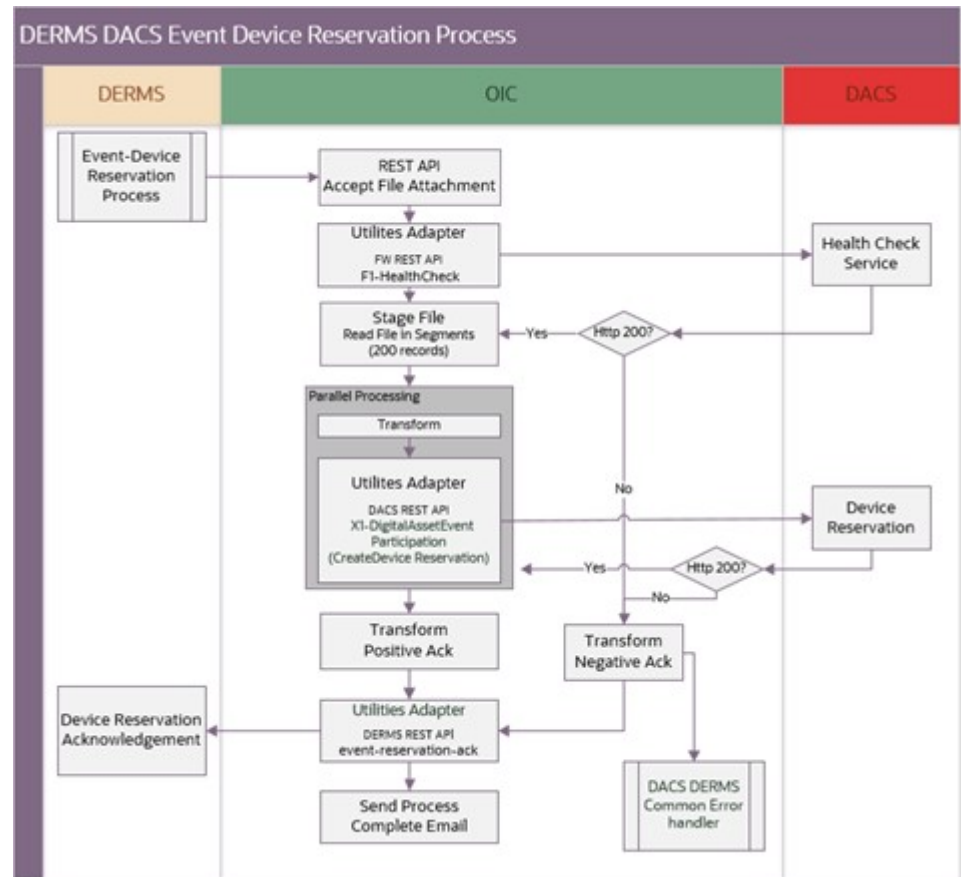
Artifacts	Value
Integration Process Name	OU DERMS DACS Device Status Ack
Integration Process Identifier	OUTL-BA-DACS_DRMS_DEVICE_STATUS
Integration Package Name	outl.ba.dacs_derms.01_23_2000
Source Connection (Oracle Utilities Adapter)	OU REST DRMS for DACS-DRMS
trigger	<ul style="list-style-type: none"> DERMS Service Name: NMS-DACSO outbound openAPIUrl: https://{host}:{port}/nms-drms/outbound/openapi.json OperationId: deviceStatusCheckAck Method: POST URI: /status-check-ack-to-dacs
Target Connection (Oracle Utilities Adapter)	OU REST DACS for DACS-DRMS
invoke	<ul style="list-style-type: none"> Web Service Name: X1-CtrlDvcStatusCheckResp Computed URL: https://{host}:{port}/{tenant}/{domain}/ouaf/rest/apis/cross/digitalAssets/controllableDeviceStatus Method: POST URI: /response
Local Integrations	OU DACS DERMS CommonErrorHandler
OIC Lookup	OUTL-BRT-DACS_DRMS_ConfigProps

Event Device Reservation (DERMS Initiated)

When controllable devices are selected to participate in an upcoming event, Oracle Utilities Grid Edge Distributed Energy Resources Management System notifies Oracle Utilities Digital Asset Cloud Service of the devices reserved for the specific event.

This integration process sends the devices reserved for the event to Oracle Utilities Digital Asset Cloud Service. It then sends an acknowledgment back to Oracle Utilities Grid Edge Distributed Energy Resources Management System when the process is completed or encountered an error.

The following diagram shows a graphical representation of the Event Device Reservation integration process.



Processing Details

The integration process deployed on Oracle Integration Cloud is exposed as a REST API and performs the following activities:

1. The process is triggered when Oracle Utilities Grid Edge Distributed Energy Resources Management System invokes the REST endpoint to send the device reservation information for a specific stage or program event to Oracle Utilities Digital Asset Cloud Service. The message received is a json payload with a csv file attachment. The json message contains the stage information and the csv file contains the devices participating in the stage.
2. Prior to sending the file, the integration invokes F1-HealthCheckRest Rest endpoint to check if the Oracle Utilities Digital Asset Cloud Service environment is up and accessible.
 - If the REST service returns HTTP status 200, DACS is accessible and proceed to Step 3.
 - Else:
 - Transforms Negative Acknowledgment message. Send 'FAILURE' ackType to Oracle Utilities Grid Edge Distributed Energy Resources Management System so it can auto retry the failed message according to the MAX_RETRIES setting in their DRMS_PARAMETERS table.
 - Invokes DERMS Event Reservation Acknowledgment REST endpoint.

3. Uses Stage File operation “ReadFileInSegments” to read the file in segments of 200 records with parallel processing option.
 - Transforms the stage and device reservation payload from Oracle Utilities Grid Edge Distributed Energy Resources Management System to Oracle Utilities Digital Asset Cloud Service format.
 - Invokes the Program Event Participation-Reserve Device DACS REST endpoint to pass the Program Event Device Reservation information to Oracle Utilities Digital Asset Cloud Service.
 - If any of the REST service invocation returns an HTTP Error status:
 - Transforms Negative Acknowledgment message. Send 'FAILURE' ackType to Oracle Utilities Grid Edge Distributed Energy Resources Management System so it can auto retry the failed message according to the MAX_RETRIES setting in their DRMS_PARAMETERS table.
 - Invokes Oracle Utilities Grid Edge Distributed Energy Resources Management System Event Reservation Acknowledgment REST endpoint.
 - When all the records are successfully created in Oracle Utilities Digital Asset Cloud Service:
 - Transforms Positive Acknowledgment message. Send 'SUCCESS' ackType to Oracle Utilities Grid Edge Distributed Energy Resources Management System.
 - Invokes Oracle Utilities Grid Edge Distributed Energy Resources Management System Event Reservation Acknowledgment REST endpoint.
4. After all the records in the file are processed:
 - A process completed email notification is sent to the users defined in to.processnotification recipients in **OUTL-BRT-DACS_DRMS_Email_ID** lookup.
5. For any errors encountered in this process:
 - An error email notification with error details is sent via the common error handler OIC process to the users defined in 'to' recipients in the **OUTL-BRT-DACS_DRMS_Email_ID** lookup.
 - The integration flow will stop processing.

Technical Details

The following table describes the integration processes and the respective Oracle Utilities Digital Asset Cloud Service and Oracle Utilities Grid Edge Distributed Energy Resources Management System artifacts used in this integration process.

Artifacts	Value
Integration Process Name	OU DERMS DACS Event Device Reserve
Integration Process Identifier	OUTL_BA_DRMS_DACS_EVT_DVCRESV
Integration Package Name	outl.ba.dacs_derms.01_23_2000

Artifacts	Value
Source Connection (REST Adapter - Trigger)	OU REST for DACS-DRMS
Target Connection (Oracle Utilities Adapter)	OU REST DACS for DACS-DRMS
invoke	<ul style="list-style-type: none"> DACS Web Service Name: X1-ProgramEventParticipation Computed URL: https://{host}:{port}/{tenant}/{domain}/ccs/rest/apis/cross/service/programEventParticipation Method: POST URI: /reserveDevice
Target Connection (Oracle Utilities Adapter)	OU REST DRMS for DACS-DRMS
invoke	<ul style="list-style-type: none"> DERMS Service Name: NMS-DACSInbound openAPIUrl: https://{host}:{port}/nms-drms/rest/v1/openapi.json Method: POST URI: /event-reservation-ack
Local Integrations	<ul style="list-style-type: none"> OU DACS NMS-DERMS CommonErrorHandler
OIC Lookup	<ul style="list-style-type: none"> OUTL-BRT-DACS_DRMS_ConfigProps OUTL-BRT-DACS_DRMS_Email_ID OUTL-BRT-DACS_DRMS_EventType OUTL-BRT-DACS_DRMS_Routing

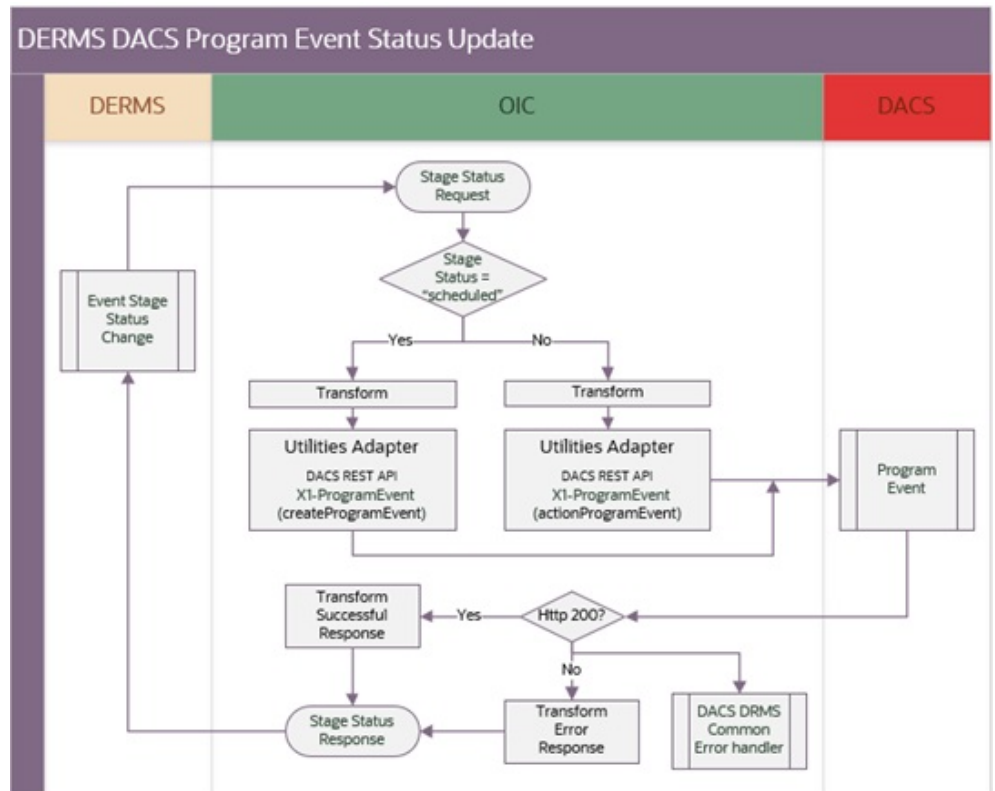
Program Event Status Update (DERMS Initiated)

When Oracle Utilities Grid Edge Distributed Energy Resources Management System creates an event, it can have multiple stages in it where each stage consists of a specific time frame for a specific program. Each stage is equivalent to a Oracle Utilities Digital Asset Cloud Service program event.

When the event is transition to SCHEDULED status, Oracle Utilities Grid Edge Distributed Energy Resources Management System sends an outbound message for each stage in the event to Oracle Utilities Digital Asset Cloud Service for program event creation.

When an event stage status transitions to a different status in Oracle Utilities Grid Edge Distributed Energy Resources Management System, the status update information is also sent to Oracle Utilities Digital Asset Cloud Service.

The following diagram shows a graphical representation of the Program Event Stage Status integration process.



Processing Details

The integration process deployed on Oracle Integration Cloud is exposed as a REST API and performs the following activities:

1. The process is triggered when Oracle Utilities Grid Edge Distributed Energy Resources Management System invokes REST endpoint to send the stage information and status to Oracle Utilities Digital Asset Cloud Service. The message received is a JSON payload.
2. Transforms the payload from Oracle Utilities Grid Edge Distributed Energy Resources Management System to Oracle Utilities Digital Asset Cloud Service format.
3. Depending on the incoming stage status, Oracle Integration Cloud invokes one of the following operations from Program Event on the DACS REST endpoint:
 - Map to createProgramEvent for a “scheduled” status value.
 - Map to actionProgramEvent for all other values.
4. For any errors encountered in this process:
 - An error email notification with error details is sent via the common error handler Oracle Integration Cloud process to the users defined in 'to' recipients in the **OUTL-BRT-DACS_DRMS_Email_ID** lookup.
 - Return a negative response to Oracle Utilities Grid Edge Distributed Energy Resources Management System.

Technical Details

The following table describes the integration processes and the respective Oracle Utilities Digital Asset Cloud Service and Oracle Utilities Grid Edge Distributed Energy Resources Management System artifacts used in this integration process.

Artifacts	Value
Integration Process Name	OU DERMS DACS ProgramEvent Stage Status Update
Integration Process Identifier	OUTL-BA-DRMS_DACS_STAGE_STAT_UPD
Integration Package Name	outl.ba.dacs_derms.01_23_2000
Source Connection (Oracle Utilities Adapter)	OU REST DRMS for DACS-DRMS
trigger	<ul style="list-style-type: none"> • Service Name: NMS-DACSO outbound • openAPIUrl: https://{host}:{port}/nms-drms/outbound/openapi.json • Method: POST • URI: /stage-status-to-dacs
Target Connection (Oracle Utilities Adapter)	OU REST DACS for DACS-DRMS
invoke	<ul style="list-style-type: none"> • DACS Web Service Name: X1-ProgramEvent • Computed URL: https://{host}:{port}/{tenant}/{domain}/ouaf/rest/apis/cross/service/programEvent • Method: POST • <i>createProgramEvent</i> URI: / • <i>actionProgramEvent</i> URI: /lifecycle
Local Integrations	OU DACS DERMS CommonErrorHandler
OIC Lookup	<ul style="list-style-type: none"> • OUTL-BRT-DACS_DRMS_EventType • OUTL-BRT-DACS_DRMS_StageStatus • OUTL-BRT-DACS_DRMS_ConfigProps

Lookups Referenced

The following table describes the customized properties referenced in the integration. For more information about the lookup properties, refer to [Configuring Lookups, Error Handling, and Email Notifications](#).

Lookup	Property
OUTL-BRT-DACS_DRMS_ConfigProps	notification.type.email.flag
OUTL-BRT-DACS_DRMS_EventType	<ul style="list-style-type: none"> • DRMS_EventType • DACS_EventType

Lookup	Property
OUTL-BRT- DACS_DRMS_StageStatus	<ul style="list-style-type: none"> DRMS_StageStatus DACS_StageStatus

Send Device Score (DACS Initiated)

Oracle Utilities Digital Asset Cloud Service computes and maintains the device score for each controllable device enrolled in a program and sends the information periodically to Oracle Utilities Grid Edge Distributed Energy Resources Management System through a file extract. The calculation depends on factors, such as equipment specifications, monthly/annual capacity, device participation history, and more.

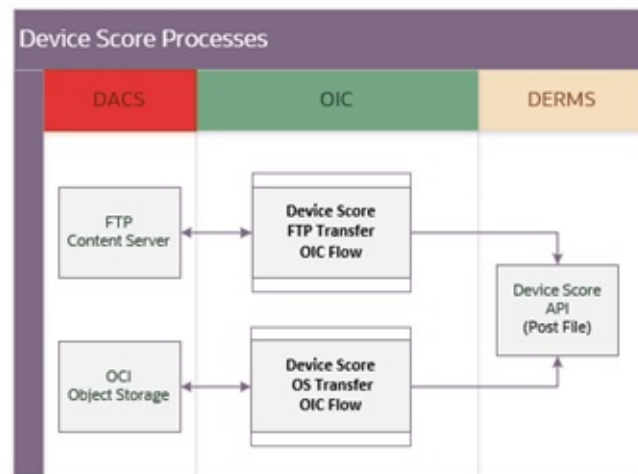
This integration process transfers the device score from Oracle Utilities Digital Asset Cloud Service to Oracle Utilities Grid Edge Distributed Energy Resources Management System to facilitate its eligibility evaluation during event planning.

Oracle Utilities Digital Asset Cloud Service can place the file in an On Premise FTP Server or in an Oracle Integration Cloud Object Storage location and Oracle Utilities Grid Edge Distributed Energy Resources Management System receives the files through a REST web service.

The device score file transfer is handled by the following Oracle Integration Cloud integration flows depending on the file transfer preference:

- [Device Score FTP Transfer \(DACS Initiated\)](#)
- [Device Score OS Transfer \(DACS Initiated\)](#)

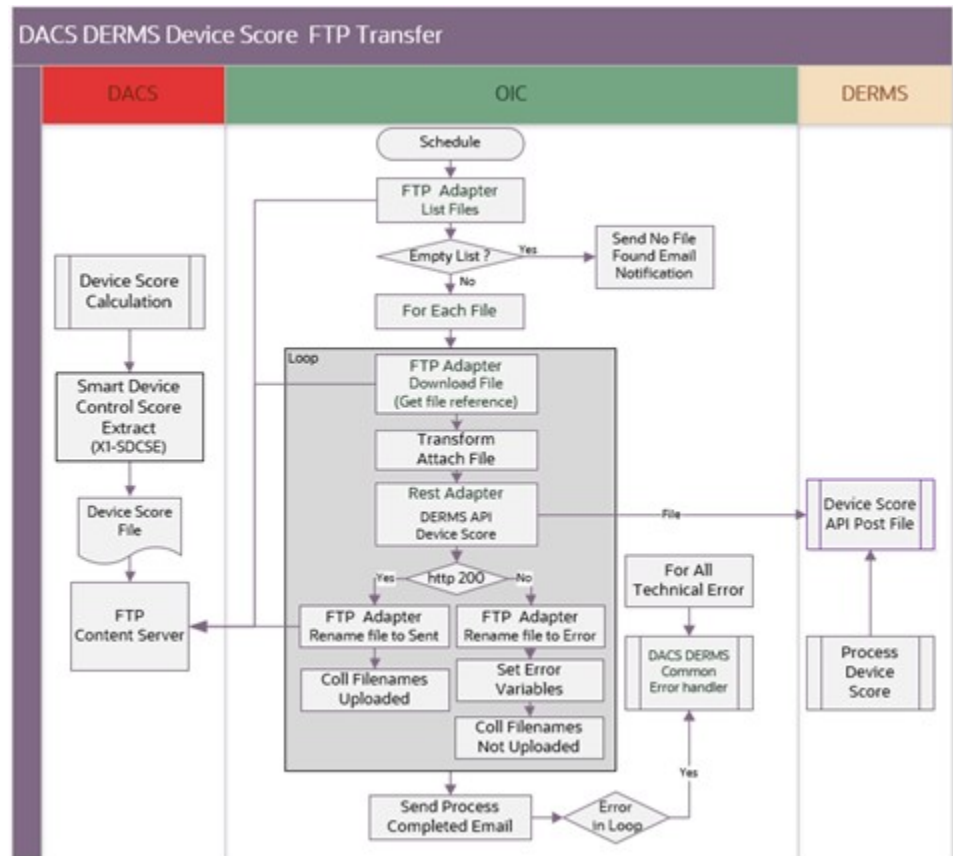
The following diagram shows the Device Score related processes:



Device Score FTP Transfer (DACS Initiated)

This integration process retrieves the device score data file(s) from an FTP content storage location where Oracle Utilities Digital Asset Cloud Service uploads files and sends it to Oracle Utilities Grid Edge Distributed Energy Resources Management System through a REST API call.

The following diagram shows a graphical representation of the Device Score Transfer integration process from an FTP Server:



Processing Details

This is a scheduled integration process deployed on Oracle Integration Cloud and performs the following activities:

- The process is triggered by a schedule or it can also be triggered manually.
 - Define the integration schedule for this process and make sure the Smart Control Device Score Extract Job (X1-SDCSE) schedule in Oracle Utilities Digital Asset Cloud Service is always run first, so the file is available to be processed by the integration.
 - A couple of the default values used in this integration are defined in the **OUTLBRT-DACS_DRMS_ConfigProps**. Make sure to define the properties needed for this integration.
- It invokes the FTP adapter to list files from the Oracle Utilities Digital Asset Cloud Service on-premises location obtained from the file path set in the property `dacs.dvcScore.ftp.input.directory`. It will retrieve files matching the prefix set in property `dacs.dvcScore.extract.filename.prefix`.

Note: The value `dacs.dvcScore.extract.filename.prefix` should match the beginning of the parameter filename in Oracle Utilities Digital Asset Cloud Service Batch X1-SDCSE.

- If no file is found and `notification.email.process.nofile.flag` is *true* (by default it is false), it will send a no file found email notification to

`to.process.notification` recipients defined in lookup **OUTL-BRT-DACS_DRMS_EMAIL_ID** and the process will stop.

- If files are found, go to the next step.
3. For each file, do the following:
 - Invoke the FTP Adapter with Download File operation to get the actual file to process.
 - Invoke DERMS Device Score REST API and send the file as a binary attachment.
 - If Oracle Utilities Grid Edge Distributed Energy Resources Management System returns an HTTP 200 or 202, invoke the FTP adapter to rename the source file obtained from the server by adding the prefix set in property `dacs.prefixtag.fileuploaded` and the next file in the list is processed.
 4. After the successful transfer of all files, if the `notification.email.process.complete.flag` is true, a Process Complete email notification is sent to `to.process.notification` recipients defined in the lookup **OUTL-BRT-DACS_DRMS_Email_ID** lookup.
 5. Error Handling.

For any errors encountered in this process:

- Invoke the FTP Adapter to rename the source file obtained from the server by adding the prefix set in property `dacs.prefixtag.filenotuploaded`.
- An error email notification with error details is sent via the common error handler Oracle Integration Cloud process to the users defined in `to` recipients in lookup **OUTL-BRT-DACS_DRMS_Email_ID**.
- If the error happens while processing the list of files, the Process Complete email notification is also sent out containing the summary of files transferred and not transferred.

Technical Details

The following table describes the integration processes and the respective Oracle Utilities Digital Asset Cloud Service and Oracle Utilities Grid Edge Distributed Energy Resources Management System artifacts used in this integration process.

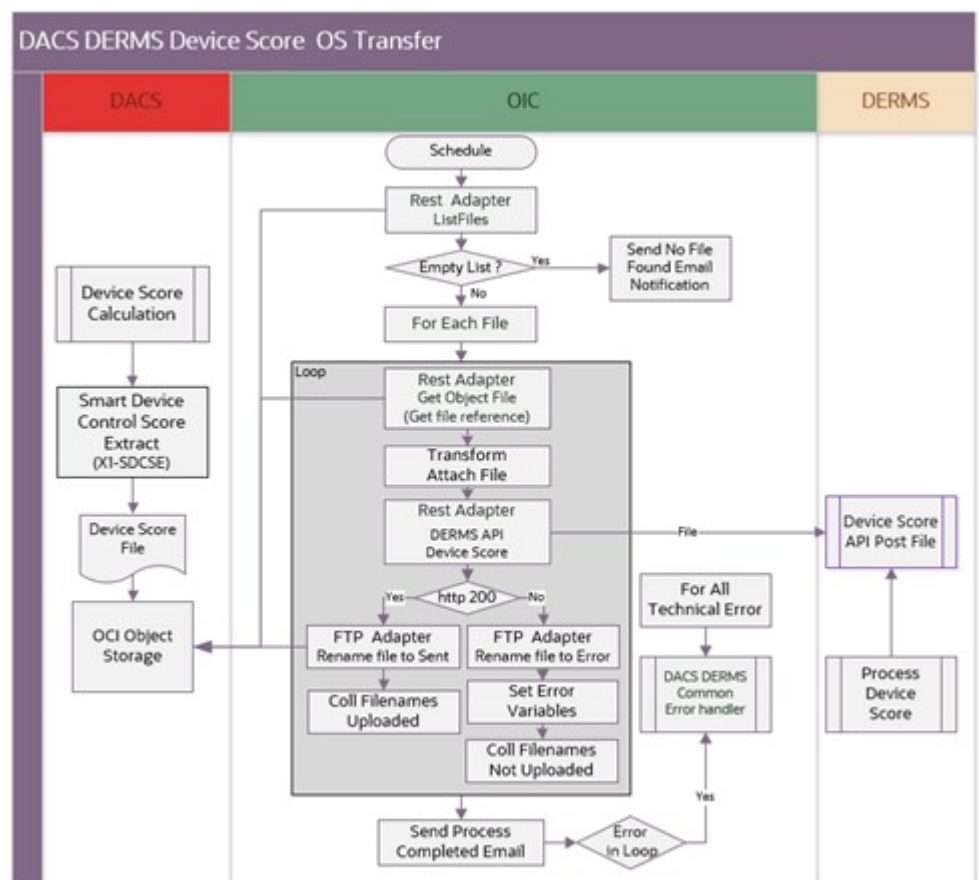
Artifacts	Value
Integration Process Name	OU DACS DERMS Device Score FTP Transfer
Integration Process Identifier	OUTL-BA-DRMS_DACS_SEND_DVCSCORE
Integration Package Name	outl.ba.dacs_derms.01_23_2000
Source Connection (FTP Adapter)	OU FTP DACS for DACS-DRMS
Target Connection (REST Adapter)	OU REST DRMSVC for DACS-DRMS
invoke	<ul style="list-style-type: none"> • DERMS Service Name: NMS-DACSInbound • openAPIUrl: <code>https://{host}:{port} /nms-drms/rest/v1/openapi.json</code> • OperationId: deviceScore • Method: POST • URI: <code>/device-score/{file-name}</code>

Artifacts	Value
Local Integrations	OU DACS DERMS Common Error Handler
OIC Lookup	<ul style="list-style-type: none"> • OUTL-BRT-DACS_DRMS_ConfigProps • OUTL-BRT-DACS_DRMS_Email_ID

Device Score OS Transfer (DACS Initiated)

This integration process retrieves the device score data file(s) from an Oracle Integration Cloud Object Storage location where Oracle Utilities Digital Asset Cloud Service uploads files and transfer it Oracle Utilities Grid Edge Distributed Energy Resources Management System through a REST API call.

The following diagram shows a graphical representation of the Device Score Transfer integration process from an Oracle Integration Cloud Object Storage:



Processing Details

This is a scheduled integration process deployed on Oracle Integration Cloud and performs the following activities:

1. The process is triggered by a schedule or can also be triggered manually.
 - a. Define the integration schedule for this process and makes sure the Smart Control Device Score Extract Job (X1-SDCSE) schedule in Oracle Utilities Digital Asset Cloud Service is always run first, so the file is available to be processed by the integration.

Technical Details

The following table describes the integration processes and the respective Oracle Cloud Infrastructure Object Storage and Oracle Utilities Grid Edge Distributed Energy Resources Management System artifacts used in this integration process.

Artifacts	Value
Integration Process Name	OU DACS DERMS Device Score OS Transfer
Integration Process Identifier	OUTL-BA-DRMS_DACS_SEND_DVCSOREC
Integration Package Name	outl.ba.dacs_derms.01_23_2000
Source Connection (REST Adapter)	OU REST DACS Object Storage for DACS
Target Connection (REST Adapter)	OU REST DRMSVC for DACS-DRMS
invoke	<ul style="list-style-type: none"> DERMS Service Name: NMS-DACSInbound openAPIUrl: https://{host}:{port} /nms-drms/rest/v1/openapi.json OperationId: deviceScore Method: POST URI: /device-score/{file-name}
Local Integrations	OU DACS DERMS Common Error Handler
OIC Lookup	<ul style="list-style-type: none"> OUTL-BRT-DACS_DRMS_ConfigProps OUTL-BRT-DACS_DRMS_Email_ID

Event Device Outcome (DERMS Initiated)

Customers enrolled in an active program are called upon to participate in program events for a specific duration.

After events have completed, Oracle Utilities Grid Edge Distributed Energy Resources Management System receives the actual outcome of all devices' event participation from Oracle Utilities Live Energy Connect (LEC).

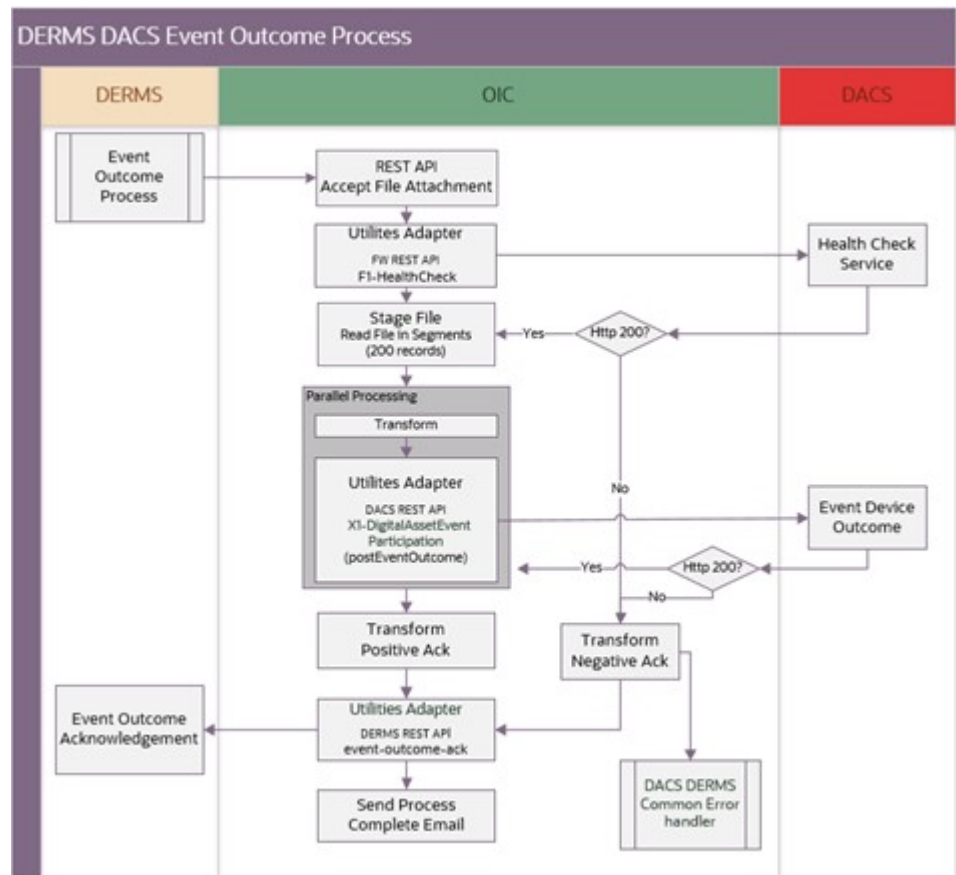
Oracle Utilities Grid Edge Distributed Energy Resources Management System aggregates and sends both Oracle Utilities Digital Asset Cloud Service and Oracle Utilities Analytics Insights the post event outcome for all controllable devices called to participate in an event or events through a file extract.

The data in the file can be from one or multiple events. Each device that is called to participate in an event will have one record in the file. Example, if a service point has 2 devices linked to in and both participated in an event, then each device will have one outcome record in the file.

Once the file is ready, Oracle Utilities Grid Edge Distributed Energy Resources Management System sends the JSON outbound message with the file attachment.

The integration process sends the post event outcome file from Oracle Utilities Grid Edge Distributed Energy Resources Management System to Oracle Utilities Digital Asset Cloud Service and sends an acknowledgment back to Oracle Utilities Grid Edge Distributed Energy Resources Management System when the process is completed or encountered an error.

The following diagram shows a graphical representation of the Event Device Outcome integration process.



Processing Details

The integration process deployed on Oracle Integration Cloud is exposed as a REST API and performs the following activities:

1. The process is triggered when Oracle Utilities Grid Edge Distributed Energy Resources Management System invokes the REST endpoint to send the post event outcome information to Oracle Utilities Digital Asset Cloud Service. The message received is a json payload with a CSV file attachment.
2. Before sending the file, the integration invokes F1-HealthCheckRest Rest endpoint to check if the Oracle Utilities Digital Asset Cloud Service environment is up and accessible.
 - If the REST service returns HTTP status 200, Oracle Utilities Digital Asset Cloud Service is accessible and proceed to Step 3.
 - Else,
 - Transforms Negative Acknowledgment message. Send 'FAILURE' ackType to Oracle Utilities Grid Edge Distributed Energy Resources Management System, so Oracle Utilities Grid Edge Distributed Energy Resources Management System can auto retry the failed message according to the MAX_RETRIES setting in their DRMS_PARAMETERS table.

- Invokes Oracle Utilities Grid Edge Distributed Energy Resources Management System Event Outcome Acknowledgment REST endpoint
3. Uses Stage File operation “ReadFileInSegments” to read the file in segments of 200 records with parallel processing option and loops through each incoming request:
 - Transforms the event outcome request payload from Oracle Utilities Grid Edge Distributed Energy Resources Management System to Oracle Utilities Digital Asset Cloud Service format.
 - Invokes the Program event participation post event outcome Oracle Utilities Digital Asset Cloud Service rest endpoint to update event outcome from the participated device reservation. The event outcome status will be changed accordingly.
 - It is expected that Oracle Utilities Digital Asset Cloud Service will not return any business faults but handle these with a To-Do task instead.
 4. After processing all records, a positive post event outcome acknowledgment is invoked to Oracle Utilities Grid Edge Distributed Energy Resources Management System.
 5. For any errors encountered in this process:
 - An error email notification with error details is sent via the common error handler.
 - A negative Acknowledgment with 'FAILURE' ackType is sent to Oracle Utilities Grid Edge Distributed Energy Resources Management System so Oracle Utilities Grid Edge Distributed Energy Resources Management System can auto retry the failed message according to the MAX_RETRIES setting in their DRMS_PARAMENTERS table.
 - The integration flow will stop processing.

Technical Details

The following table describes the integration processes and the respective Oracle Utilities Grid Edge Distributed Energy Resources Management System and Oracle Utilities Analytics Insights artifacts used in this integration process.

Artifacts	Value
Integration Process Name	OU DERMS DACS Event Outcome Transfer
Integration Process Identifier	OUTL-BA-DRMS_DACS_EVT_OUTC_TRNFR
Integration Package Name	outl.ba.dacs_derms.01_23_2000
Source Connection (REST Adapter-Trigger)	OU REST Outbound for DACS-DRMS
Target Connection (Oracle Utilities Adapter)	OU REST DACS for DACS-DRMS

Artifacts	Value
invoke	<ul style="list-style-type: none"> DACS Web Service Name: X1-ProgramEventParticipation Computed URL: https://{host}:{port}/{tenant}/{domain}/rest/apis/cross/service/programEventParticipation Method: POST URI: /postEventOutcome
Target Connection (Oracle Utilities Adapter)	OU REST DRMS for DACS-DRMS
invoke	<ul style="list-style-type: none"> DERMS Service Name: NMS-DACSIInbound openAPIUrl: https://{host}:{port}/nms-drms/rest/v1/openapi.json OperationId: deviceOutcomeAck Method: POST URI: /device-outcome-ack
Local Integrations	OU DACS DRMS Common Error Handler
OIC Lookup	<ul style="list-style-type: none"> OUTL-BRT-DACS_DRMS_ConfigProps OUTL-BRT-DACS_DRMS_Email_ID OUTL-BRT-DACS_DRMS_EventOutcome OUTL-BRT-DACS_OUAI_Routing

Lookups Referenced

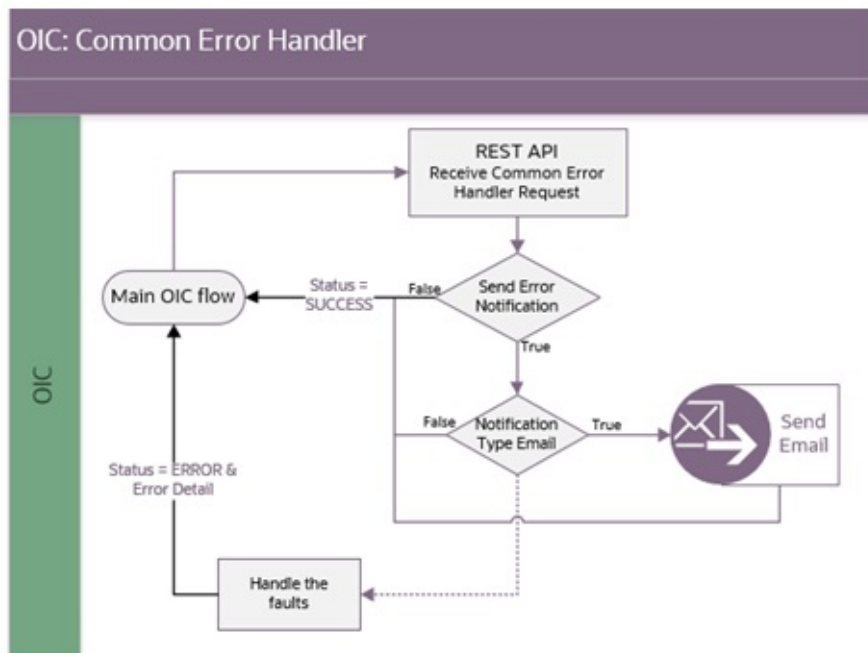
The following table describes the customized properties referenced in the integration. For more information about the lookup properties, refer to [Configuring Lookups, Error Handling, and Email Notifications](#).

Lookup	Property
OUTL-BRT-DACS_DRMS_ConfigProps	<ul style="list-style-type: none"> notification.type.email.flag notification.email.process.complete.flag
OUTL-BRT-OUAI_DACS_DRMS_Email_ID	<ul style="list-style-type: none"> from to to.process.notification
OUTL-BRT-DACS_OUAI_Routing	<ul style="list-style-type: none"> DRMS_Instance DRMS_Site_Connection OUTL-BRT-OUAI_DACS_Email_ID

Common Error Handler (OIC Initiated)

This integration process is used to send email notification in case of errors in Oracle Integration Cloud.

The following diagram shows a graphical representation of the Common Error Handler integration process.



Business Processing

The integration process deployed on Oracle Integration Cloud is exposed as a REST API and performs the following activities:

1. This process is invoked internally by other Oracle Integration Cloud flows when a technical error occurs in any of the main integration flow.
2. The request message received is processed based on the property names (`notification.email.error.flag` and `notification.type.email`) in the **OUTL-BRT-DACS_DRMS_ConfigProps** lookup. If both are set to true, then an email notification will be sent on error.

Technical Details

The following table describes the integration processes used in this integration process.

Artifacts	Value
Integration Process Name	OU DACS DERMS Common Error Handler
Integration Process Identifier	OUTL-BA-DACS_DRMS_ERROR
Integration Package Name	outl.ba.dacs_derms.01_23_2000
Source Connection	local integration
trigger	/receiveMessage

Lookups Referenced

The following table describes the customized properties referenced in the integration. For more information about the lookup properties, refer to [Configuring Lookups](#), [Error Handling](#), and [Email Notifications](#).

DVM	Property
OUTL-BRT-DACS_DRMS_ConfigProps	<ul style="list-style-type: none">notification.type.emailnotification.email.flag
OUTL-BRT-DACS_DRMS_Email_ID	<ul style="list-style-type: none">fromto

Chapter 3

Configuring Oracle Utilities Digital Asset Cloud Service

This chapter elaborates about the configuration of about various data, messages and catalog for the integration used by Oracle Utilities Digital Asset Cloud Service. It includes the following sections:

- [Configuring Admin Data in Oracle Utilities Digital Asset Cloud Service](#)
- [Adding Oracle Integration Cloud Certificates](#)

Configuring Admin Data in Oracle Utilities Digital Asset Cloud Service

This section describes the admin data setup in Oracle Utilities Digital Asset Cloud Service related to the integration. The **Admin** menus can be configured to be grouped alphabetically or by functional groups. The descriptions that follow will include both groupings.

- [Message Senders](#)
- [External System](#)
- [Inbound Web Service \(IWS\)](#)
- [Master Configuration](#)
- [Head End System](#)
- [Activity Type](#)
- [Communication Type](#)
- [Service Task Type](#)
- [Sync Request Process](#)
- [Scheduling Batch Jobs](#)

Message Senders

Create a new or update an existing real-time message sender for each Oracle Utilities Digital Asset Cloud Service Outbound Message.

To create a message sender:

1. In the **Admin** menu navigate to **[M or Integration] > Message Sender > Add**.
2. Enter a unique message sender and its description.
3. Populate the following values:
 - **Message Sender:** Sender name in Oracle Utilities Digital Asset Cloud Service
 - **Description:** Sender's description
 - **Invocation Type:** Real-time
 - **Message Class:** RTJSONSNDR (Sender for real-time HTTP / JSON messages)
 - **Active:** Select the check box.
 - **MSG Encoding:** UTF-8 message encoding
4. Select the **Context** tab and set values for the following context types:
 - **HTTP Header:** application/json
 - **HTTP Login User:** User ID to access OIC
 - **HTTP Login Password:** Password to access OIC
 - **HTTP Method (POST/GET):** POST
 - **HTTP Timeout:** 300

External System

Create a new or update an existing external system to support the Distributed Energy Resources Management System.

To create an external system:

1. In the **Admin** menu navigate to **[M or Integration] > External System > Add**.
2. Enter a unique **External System** and its **Description**.
3. Associate the outbound message types created to the external system. For each outbound message type, set the following:
 - **Outbound Message Type**
 - **Controllable Device Status Check:** Use the X1-CTRLDVCS (Controllable Device Status Check) outbound message type
 - **Synchronize Digital Asset:** Use the X1-NMSDASMSG (Synchronize Digital Asset (NMS)) outbound message type
 - **Processing Method:** Real-time
 - **Message Sender:** Set the corresponding message sender for the outbound message
 - **Date/Time Format:** XSD
 - **JSON Conversion Method:** Base JSON conversion

Inbound Web Service (IWS)

The following REST inbound web services are delivered for this integration:

- X1-ProgramEnrollment
- X1-ControllableDeviceStatus
- X1-ProgramEventParticipation
- X1-ProgramEvent

The full URI component for the REST inbound web service is configurable.

The Oracle Utilities Digital Asset Cloud Service documentation provides instructions about the one-time setup. Refer to the [Documentation and Resources](#) section in [Configuring Oracle Utilities Digital Asset Cloud Service](#) for information about documentation resources.

Master Configuration

This section describes the master configuration details for the integration. The following Master Configurations can be found from the **Admin menu > [M or General] > Master Configuration**.

- Cross Product Configuration
- Seeder Sync Request Master Configuration
- Master Data Synchronization Master Configuration
- Digital Asset Integration Master Configuration

Head End System

Create a new or update an existing head end system for each external energy aggregator interfaced to Oracle Utilities Live Energy Connect.

To create a head end system:

1. In the **Admin** menu navigate to [**H or Digital Asset Management**] > **Head End System** > **Add**.
2. Enter a unique head end system and its description.
3. Specify the external system created for Oracle Utilities Grid Edge Distributed Energy Resources Management System.
4. Add a processing method for processing role Device Status Check. On the processing method, set the following:
 - **Default Business Object:** X1-CtrlDvcStatusCheckComm (Controllable Device - Device Status Check)
 - **Default Outbound Message Type:** Controllable Device Status Check

Activity Type

Create a new or update an existing activity type for the Controllable Device Status Check activity.

To create an activity type:

1. In the **Admin** menu, navigate to [**A or Communication**].
2. Add or edit the **Controllable Device Status Check** activity and its description. Refer to the embedded help for more information.

Communication Type

Create a new or update an existing communication type for the following Communication Types:

- Controllable Device: Device Status Check
- Controllable Device: Device Status Check Response

To create a communication type:

1. In the **Admin** menu navigate to [**C or Communication Type**].
2. Enter a unique communication type and its description. Refer to the embedded help for more information.

Service Task Type

Create a new or update an existing service task type for the following Service Task Type Business Objects:

- Digital Asset Enrollment Request Task Type
- Digital Asset Unenrollment Request Task Type

To create a service task type:

1. In the **Admin** menu navigate to [**S or General**].
2. Enter a unique service task type and its description. Refer to the embedded help for more information.

Sync Request Process

The Sync Request Process is used to synchronize customer enrollment and unenrollment data from Oracle Utilities Digital Asset Cloud Service to Oracle Utilities Grid Edge Distributed Energy Resources Management System. Maintenance Object - Audit algorithms are responsible for instantiating subscription based sync request records.

To configure a Maintenance Object:

1. In the **Admin** menu, navigate to [**M or Database**] > **Maintenance Object** > **Search**.
2. Navigate to the following Maintenance Objects and configure the following:
 - **Usage Subscription (D1-US)**: Under the **Maintenance Object - Options** tab, add the “Sync Request BO” MO Option with an option value “X1-NMSDigitalAssetCustSync (NMS Digital Asset Customer Sync Request)”. Plug in the F1-GCHG-CDCP (Generic Change Data Capture) MO audit algorithm. When a change is detected on a program subscription, this algorithm is responsible for instantiating the sync request.
 - **Contact (D1-CONTACT)**: Plug in the X1-CNTCDCDA (Contact Change Data Capture (Digital Asset Subscription Based)) MO audit algorithm. When a change is detected on a contact associated to an eligible program subscription, this algorithm is responsible for instantiating the sync request.
 - **Device (D1-DEVICE)**: Plug in the X1-DVCCDCDA (Device Change Data Capture (Digital Asset Subscription Based)) MO audit algorithm. When a change is detected on a controllable device associated to an eligible program subscription, this algorithm is responsible for instantiating the sync request.
 - **Service Point (D1-SP)**: Plug in the X1-LOCCDCDA (Location Change Data Capture (Digital Asset Subscription Based)) MO audit algorithm. When a change is detected on a device location associated to an eligible program subscription, this algorithm is responsible for instantiating the sync request.

Scheduling Batch Jobs

Make sure to schedule the following batch jobs in the order they are listed:

1. **X1-CALAS**: Updates control scores of enrolled devices with the latest information.
2. **X1-SDCSE**: Extracts the latest control scores of enrolled devices.

Adding Oracle Integration Cloud Certificates

Add the Oracle Integration for Cloud certificate to the Oracle Utilities Digital Asset Cloud Service stores wherever applicable to send transactions to the Oracle Integration Cloud layer.

For more information about configuration, refer to the Oracle Utilities Digital Asset Cloud Service documentation at:

<https://docs.oracle.com/en/industries/energy-water/digital-asset-cloud-service/>

Chapter 4

Configuring Oracle Utilities Grid Edge Distributed Energy Resources Management System

This chapter includes information about the following:

- [Configuring Admin Data in Oracle Utilities Grid Edge Distributed Energy Resources Management System](#)

For more information about Oracle Utilities Grid Edge Distributed Energy Resources Management System, refer to the Oracle Utilities Network Management System (NMS) documentation on Oracle Help Center at:

<https://docs.oracle.com/en/industries/energy-water/network-management-system/>

Configuring Admin Data in Oracle Utilities Grid Edge Distributed Energy Resources Management System

To configure Admin data in Oracle Utilities Grid Edge Distributed Energy Resources Management System, establish the communication from Oracle Utilities Grid Edge Distributed Energy Resources Management System to Oracle Integration Cloud.

Update the Oracle Utilities Grid Edge Distributed Energy Resources Management System database table with the following Oracle Integration Cloud details.

Table Name	drms_parameters
OIC flow end point URL	<ul style="list-style-type: none"> Update the value with OIC flow end point URL <https://hostname:port /ic/api/integration/v1/flows/oracleutilities/OUTL-BA-DRMS_DACS_DEV_STAT_ACK/1.0/status-check-ack-to-dacs where the attrib = 'OIC_STATUS_ACK_URL' Update the value with OIC flow end point URL <https://hostname:port/ ic/api/integration/v1/flows/rest/OUTL_BA_DRMS_DACS_EVT_DVCRESV/1.0/reserveDevice> where the attrib='OIC_RESERVE_DEVICE_URL' Update the value with OIC flow end point URL <https://hostname:port /ic/api/integration/v1/flows/ oracleutilities/OUTL-BA-DRMS_DACS_PEVNT_STAT_UPD/1.0/statusUpdate where the attrib = 'OIC_STAGE_STATUS_CHANGE_URL' Update the value with OIC flow end point URL <https://hostname:port /ic/api/integration/v1/flows/rest/OUTL_BA_DRMS_DACS_PRE_EVENT_CANC/1.0/preEventCancel where the attrib = 'OIC_EVENT_CANCEL_URL' Update the value with OIC flow end point URL <https://hostname:port ic/api/integration/v1/flows/oracleutilities/OUTL-BA-DRMS_DACS_ENROLLRQ/1.0/enroll-to-dacs where the attrib = 'OIC_ENROLL_URL' Update the value with OIC flow end point URL <https://hostname:port/ic/api/integration/v1/flows/rest/OUTL-BA-DRMS_DACS_EVT_OUTC_TRNFR/1.0/eventOutcome where the attrib = 'OIC_DEVICE_OUTCOME_DACS_URL' Update the value with < OIC_USER Name> where the attrib=' OIC_USER' Update the value with <oic password> where the attrib=' OIC_PASS '
MAX_RETRIES	<ul style="list-style-type: none"> The value to be set to the amount of retries DERMS will perform upon receiving a technical fault or negative acknowledgment. The drms_outbound_messages database table holds the outbound messages to be resent when the status = 'FAIL' and the num_retries is less than the configured MAX_RETRIES value. If you want to resend a failed message that has already retried the maximum number of times, update the num_retries record back to 0. If you need to resend a successful message for any reason, also update the status to 'FAIL'.

Chapter 5

Importing, Configuring, and Testing Integration Connections

This chapter explains in detail the process for importing the connections, packages, and files needed for the integration and the configuration of these connections imported through the packages. After a successful import and configuration, the chapter lists out steps to help test the connections.

It includes the following sections:

- [Importing the Oracle Integration Cloud Package from Oracle Cloud Marketplace](#)
- [Verifying the Package Import](#)
- [Configuring Connections in Oracle Integration Cloud](#)
- [Configuring Agent \(if applicable\)](#)
- [Setting up Certificates for Security](#)

Importing the Oracle Integration Cloud Package from Oracle Cloud Marketplace

All integration points are shipped as part of single package (.par) file.

To import a pre-built integration from Oracle Cloud Marketplace:

1. Launch the Oracle Cloud Marketplace portal.
https://cloudmarketplace.oracle.com/marketplace/en_US/homePage.jspx
2. Click **Applications**.
3. Search for “Oracle Utilities Digital Asset Cloud Service”.
4. Browse through the list of applications and select the pre-built integration package to import.
5. Click **GetApp**.
6. Review and accept “Oracle Standard Terms and Restrictions”.
7. Click **Next**. My Oracle Support portal opens.
8. Download the integration package from My Oracle Support.
9. 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.

10. On the **Integrations** page, the individual integrations of the imported package file that are designated with a BUILT BY ORACLE message are displayed.

Important! This note is applicable only for existing customers. Make sure to take a backup of the existing package and lookups and perform the cleanup before proceeding with the new package import. The cleanup includes deactivating the existing flows in this package and deleting the package, connections, lookups and libraries used in the integration.

To import a package in Oracle Integration Cloud:

1. Login to Oracle Integration Cloud.
2. Navigate to **Integrations > Designer > Packages**.
3. Click **Import**.
4. Select the .par file downloaded from Oracle Cloud Marketplace.
5. Verify if the package is imported is successfully.

Verifying the Package Import

To verify the package import was successful:

1. Verify whether the following integrations are imported successfully.
 - OU DERMS DACS Enrollment Request (1.23.2000)
 - OU DACS DERMS Enrollment Sync (1.23.2000)

- OU DERMS DACS Enroll Sync Ack (1.23.2000)
 - OU DACS DERMS Device Status Check (1.23.2000)
 - OU DERMS DACS Device Status Ack (1.23.2000)
 - OU DACS DERMS Device Score FTP Transfer (1.23.2000)
 - OU DACS DERMS Device Score OS Transfer (1.23.2000)
 - OU DERMS DACS Program Event Status (1.23.2000)
 - OU DERMS DACS Event Device Reserve (1.23.2000)
 - OU DERMS DACS Event Outcome Process (1.23.2000)
 - OU DACS DERMS Common Error Handler (1.23.2000)
2. Verify if the following connections are in place.
 - OU REST DACS for DACS-DRMS
 - OU REST DRMS for DACS-DRMS
 - OU REST for DACS-DRMS
 - OU FTP DACS for DACS-DRMS
 - OU REST DRMSSVC for DACS-DRMS
 - OU REST DACS Object Storage for DACS
 3. Make sure that the following look ups are imported successfully.
 - OUTL-BRT-DACS_DRMS_AssetType
 - OUTL-BRT-DACS_DRMS_AssetSpec
 - OUTL-BRT-DACS_DRMS_ConfigProps
 - OUTL-BRT-DACS_DRMS_Email_ID
 - OUTL-BRT-DACS_DRMS_EventType
 - OUTL-BRT-DACS_DRMS_Routing
 - OUTL-BRT-DACS_DRMS_EnrollmentStatus
 - OUTL-BRT-DACS_DRMS_EventOutcome
 - OUTL-BRT-DACS_DRMS_DeviceLocationStatus
 - OUTL-BRT-DACS_DRMS_StageStatus

Configuring Connections in Oracle Integration Cloud

After the packages are imported and verified, configure the respective connections.

This section describes the procedure to configure the following:

- [OU REST DACS for DACS-DRMS Connection](#)
- [OU REST DRMS for DACS-DRMS Connection](#)
- [OU REST for DACS-DRMS Connection](#)
- [OU FTP DACS for DACS-DRMS Connection](#)

- [OU REST DRMSSVC for DACS-DRMS Connection](#)
- [OU REST DACS Object Storage for DACS Connection](#)

OU REST DACS for DACS-DRMS Connection

This connection is used to communicate with Oracle Utilities Digital Asset Cloud Service using the Utilities adapter.

To configure the OU REST DACS for DACS-DRMS connection:

1. Login to Oracle Integration Cloud and navigate to the connection.
2. Add the Oracle Utilities Digital Asset Cloud Service catalog URL in the **Catalog Url** element.
3. Select **Basic Auth** on the **Security** tab and enter the Oracle Utilities Digital Asset Cloud Service user name and password.

OU REST DRMS for DACS-DRMS Connection

This connection is used to communicate with Oracle Utilities Grid Edge Distributed Energy Resources Management System application service using the Utilities adapter.

To configure the OU REST DRMS for DACS-DRMS connection:

1. Login to Oracle Integration Cloud and navigate to the connection.
2. Add the Oracle Utilities Grid Edge Distributed Energy Resources Management System catalog URL in the **Catalog Url** element.
3. Select **Basic Auth** on the **Security** tab and enter the Oracle Utilities Grid Edge Distributed Energy Resources Management System user name and password.

OU REST for DACS-DRMS Connection

This connection is used to call integrations using the basic REST adapter.

To configure the OU REST for DACS-DRMS connection:

1. Login to Oracle Integration Cloud and navigate to the connection.
2. Select **Basic Auth** on the **Security policy** tab.
3. Click **Test** and **Save** the connection.

OU FTP DACS for DACS-DRMS Connection

This connection is used to communicate with Oracle Utilities Digital Asset Cloud Service FTP Service using the FTP adapter.

To configure the OU FTP DACS for DACS-DRMS connection:

1. Login to Oracle Integration Cloud and navigate to the connection.
2. Set the **FTP Server Host Address** (xxxx.com).
3. Do not modify anything on the **FTP Server port** and **SFTP connection** tabs.

4. Select the **FTP Server Access** policy on the **Security policy** tab and enter the Oracle Utilities Digital Asset Cloud Service FTP Server username and password.

Note: Make sure the FTP Server is setup and configured in Oracle Utilities Digital Asset Cloud Service.

OU REST DRMSSVC for DACS-DRMS Connection

This connection is used to communicate with Oracle Utilities Grid Edge DERMS application service using the REST adapter.

To configure the OU REST DRMSSVC for DACS-DRMS connection:

1. Login to Oracle Integration Cloud and navigate to the connection.
2. Add the **Rest Connection URL** in the **Connection URL** element.
3. Select **Basic Auth** on the **Security policy** tab and enter the Oracle Utilities Grid Edge Distributed Energy Resources Management System username and password.

OU REST DACS Object Storage for DACS Connection

This connection is used to communicate with Oracle Infrastructure Cloud Object Storage Services using the REST adapter.

To configure the OU REST DACS Object Storage for Oracle Utilities Digital Asset Cloud Service connection:

1. In the **Connection Properties** section, enter the object storage API endpoint in the **Connection URL** field.

The Connection URL follows this format: `https://objectstorage.{region}.oraclecloud.com`

Refer to the Oracle Cloud Infrastructure documentation/API Reference and Endpoints to see the Object Storage Service API and endpoints at:

<https://docs.oracle.com/en-us/iaas/api/>

2. In the **Security** section:
 - a. Select the **OCI Signature Version 1** security policy.
 - b. Provide the following Object Storage information:
 - Tenancy OCID
 - User OCID
 - Upload the private key
 - Fingerprint (obtained from object storage after register the public key for the appropriate user)

For more information, refer to the *Object Storage Setup Guide 20C* at: https://docs.oracle.com/cd/F35460_01/index.htm

3. After the connection is tested successfully, click **Save**.

Configuring Agent (if applicable)

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.

This section includes:

- [Possible Combinations](#)
- [Creating an Agent Group](#)
- [Downloading Agent Installer](#)
- [Installing On-Premises Agent](#)

Possible Combinations

The possible combination of an agent group is:

- Oracle Utilities Grid Edge Distributed Energy Resources Management System on-premises and Oracle Utilities Grid Edge Distributed Energy Resources Management System

Creating 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. Login to Oracle Integration Cloud.
2. On the **Home** page, click **Agents**.
3. Click **Create Agent Group**.
4. Enter the following information:
 - Agent Group Name
 - Identifier

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

 - Agent Type: “Connectivity Agent”
 - Description
5. Click **Create**.

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-agentinstaller.html>

Installing On-Premises Agent

To install an on-premises agent:

1. Login to Oracle Integration Cloud.
2. On the **Home** page, click **Agents**.
3. Click **Download**.
4. Select **Connectivity Agent**.
5. Select **Save File** when prompted to save the file to a directory location on your on-premises host.
6. Navigate to that directory and unzip **oic_connectivity_agent.zip**.
7. Change the file permissions to be executable.
8. Download the Oracle Utilities Digital Asset Cloud Service certificate and upload by running the below command from agent home directory.


```
keytool -import -file directoryPath/sample.crt -alias SampleCert -keystore <Agent_Home>/agenthome/agent/cert/keystore.jks
```
9. Modify **InstallerProfile.cfg** to include the following information:
 - a. Provide the oic_URL value with the OIC SSL host name.
For example: `https://OIC_host:OIC_port`
 - b. Provide the agent_GROUP_IDENTIFIER. It should be the agent group created in Oracle Integration Cloud.
 - c. Set the proxy parameters if the connectivity agent is used with a proxy in the on-premises environment.
 - d. Set the JAVA_HOME property to the directory/folder where JDK is installed.
Note: Before running the connectivity agent installer, perform the steps in the link below.
<https://docs.oracle.com/en/cloud/paas/integration-cloud/adapters/you-begin-setting-oracle-utilities-adapter.html#GUID-7F770AD1-5B87-4C62-968A-3AB30D043835>
 - e. Run the connectivity agent installer from the command prompt.

```
java -jar connectivityagent.jar
```
 - f. Provide the Oracle Integration Cloud credentials when prompted.
 - g. 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 **Agents** page in Oracle Integration Cloud.
2. Check if the agent count for your **Agent Group** is increased by one.
3. Click the number to view the agent details.

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

Setting up Certificates for Security

Important! Skip this section if there are valid CA certificates for the integration.

If there no valid certificates for this integration, download the Oracle Utilities Grid Edge Distributed Energy Resources Management System/Oracle Utilities Digital Asset Cloud Service certificates and upload them to Oracle Integration Cloud to handshake with Oracle Utilities Grid Edge Distributed Energy Resources Management System/Oracle Utilities Digital Asset Cloud Service.

To download the Oracle Utilities Grid Edge Distributed Energy Resources Management System/Oracle Utilities Digital Asset Cloud Service certificate:

1. Login to Oracle Utilities Digital Asset Cloud Service/Oracle Utilities Grid Edge Distributed Energy Resources Management System.
2. Click the URL on the top-left corner.
3. On the **Security** tab, click **View Certificate**.
4. On the **Details** tab, click **Export**.
5. Save the certificate.

To upload the certificate to Oracle Integration Cloud:

1. Login to Oracle Integration Cloud with Admin credentials.
2. Navigate to **Settings > Certificates**.
3. On the **Certificate** window, click **Upload**.
4. Select **Certificate Type** as **Trust Certificate**.
5. Provide the **Certificate Alias Name**.
6. Select the certificate to upload.
7. Click **Upload**.

Chapter 6

Configuring Lookups, Error Handling, and Email Notifications

This chapter focuses on the lookups configuration, handling business and technical errors, sending email notifications, and customizations in this integration. It includes the following sections:

- [Configuring Lookups](#)
- [Error Handling](#)
- [Email Notifications](#)

Configuring Lookups

The following table lists the lookups that are part of this integration.

Lookup Name	Integration Name	Purpose
OUTL-BRT-DACS_DRMS_AssetType	OU DERMS DACS Enrollment Request	
OUTL-BRT-DACS_DRMS_AssetSpec	OU DERMS DACS Enrollment Request	
OUTL-BRT-DACS_DRMS_ConfigProps	<ul style="list-style-type: none"> OU DACS DERMS CommonErrorHandler OU DACS DERMS Device Score FTP Transfer OU DACS DERMS Device Score OS Transfer OU DACS DERMS Device Status Check OU DERMS DACS Device Status Ack OU DERMS DACS Enrollment Request OU DACS DERMS Enrollment Sync OU DERMS DACS Enroll Sync Ack OU DERMS DACS Event Device Reserve OU DERMS DACS Event Outcome Process OU DERMS DACS ProgramEvent Status Update 	Generic properties and default values used in the integration's business logic and mappings
OUTL-BRT-DACS_DRMS_DeviceLocationStatus	OU DACS DERMS Enrollment Sync	Translate device status values between applications
OUTL-BRT-DACS_DRMS_Email_ID	<ul style="list-style-type: none"> OU DACS DERMS Common Error Handler OU DACS DERMS Device Score FTP Transfer OU DACS DERMS Device Score OS Transfer OU DERMS DACS Event Device Reserve OU DERMS DACS Event Outcome Process 	<p>Provide the email information to send error details:</p> <ul style="list-style-type: none"> to property contains the email address(es) of people who handle technical issues like network connection issues, 401 unauthorize issues. to.ProcessNotification property contains the email address(es) of business or application users in DACS and/or DERMS.
OUTL-BRT-DACS_DRMS_EventType	<ul style="list-style-type: none"> OU DERMS DACS ProgramEvent Status Update 	Translate event type between applications
OUTL-BRT-DACS_DRMS_Routing	<ul style="list-style-type: none"> OU DACS DERMS Device Status Check OU DERMS DACS Event Outcome Process OU DACS DERMS Enrollment Sync OU DERMS DACS Event Device Reserve 	Routing to the correct GE DERMS instance

Lookup Name	Integration Name	Purpose
OUTL-BRT-DACS_DRMS_EnrollmentStatus	OU DERMS DACS Enrollment Request	Translate the enrollment status to code
OUTL-BRT-DACS_DRMS_EventOutcome	OU DERMS DACS Event Outcome Process	Translates the incoming event outcome to DACS code
OUTL-BRT-DACS_DRMS_StageStatus	OU DERMS DACS ProgramEvent Status Update	Translate stage status values between applications

Editing Lookups

To edit a lookup:

1. Login to Oracle Integration for Cloud.
2. Navigate to **Integrations > Designer > Lookups**.
3. Select the lookup to edit and make the necessary changes.
4. Click **Save** and **Close**.

The following lookups include properties that can be configured and defaulted in the integration.

Lookup: OUTL-BRT-DACS_DRMS_ConfigProps

Property Name	Sample Value	Description
dacs.dvcScore.extract.filename.prefix	DeviceScore	Device Score Extract file name prefix. It should have the same beginning value as the batch parameter filename in Batch Process X1-SDCSE. Integration use this for filtering the file(s) to pick up from DACS file location by the Device Score flows.
dacs.dvcScore.ftp.input.directory	/sploutput/ DACSEnv/DvcScore	DACS ftp directory where the Device Score extract files are stored for OIC to pick up from. Required to be populated when DACS is on-premise.

Property Name	Sample Value	Description
dacs.os.dvcScore.bucket name	DACS_DVCSCORE	<p>Define the bucket name where the Device Score Extract files are stored in the DACS Object Storage for OIC to pick up from.</p> <p>It is used when calling the Object Storage APIs.</p> <p>Required to be populated when DACS is in the cloud.</p>
dacs.os.namespace	dacsnamespace	<p>DACS Object Storage namespace serves as a container for all DACS related buckets and objects.</p> <p>It is used when calling the Object Storage APIs.</p> <p>Required to be populated when DACS is in the cloud.</p>
dacs.prefixtag.filenot uploaded	Error-	<p>Prefix to append to the filename from DACS to mark the file as error or not uploaded to the target location.</p> <p>Shared property for all file related flows in this integration.</p>
dacs.prefixtag.fileuploaded	Sent-	<p>Prefix to append to the filename from DACS that has been transferred successfully to the target location.</p> <p>Shared property for all file related flows in this integration.</p>
enrollmentSyncAckDelay	5	
notification.email.flag	true	<p>If the value is set to true, email notification will be sent out for errors.</p> <p>Valid values: true/false. Default to true.</p> <p>Also, setup the OUTL-BRT-DACS_DRMS_Email_ID 'to' property for the users or administrators who should receive the email.</p>

Property Name	Sample Value	Description
notification.email.process.complete.flag	true	<p>If the value is set to true, email notification will be sent out when the process is completed.</p> <p>Valid values: true/false. Default to true.</p> <p>This is used by flows doing file processing. Also, setup the OUTL-BRT-DACS_DRMS_Email_ID 'to.process.notification' property for the users who should receive the email.</p>
notification.email.process.nofile.flag	true	<p>If the value is set to true, email notification will be sent out when no file was processed.</p> <p>Valid values: true/false. Default to true.</p> <p>This is used by flows doing file processing. Also, setup the OUTL-BRT-DACS_DRMS_Email_ID 'to.process.notification' property for the users who should receive the email.</p>
notification.type.email	email	Default to email

Lookup: OUTL-BRT-DACS_DRMS_EnrollmentStatus

Property Name	Value	Description
PENDING	SUCCESS	
ERROR	ERROR	
VALError	ERROR	
FAILURE	ERROR	
10589	SUCCESS	Duplicate errors can be ignored

Lookup: OUTL-BRT-OUAI_DACS_DRMS_Email_ID

Property Name	Sample Value	Description
From	admin@myCy.com	<p>The email address used to identify who is sending the notification.</p> <p>This value is the default email address for all outgoing emails for this package.</p>

Property Name	Sample Value	Description
To	errorDist@myCy.com	The email address(es) who should receive any error notification. Multiple emails can be configured by putting comma to separate the email IDs. These are likely the administrators or users who maintain the applications.
to.process.notification	busUserDist@myCy.com	The email address(es) who should receive notification when the file processing has completed, or no file was processed. Multiple emails can be configured by putting comma to separate the email IDs. These are likely the business or application users.

Lookup: OUTL-BRT-OUAI_DACS_DRMS_EventType

DRMS_EventType	DACS_EventType	Description
X1EC	X1EC	
X1EM	X1EM	
X1DT	X1DT	
X1RE	X1RE	

Lookup: OUTL-BRT-OUAI_DACS_DRMS_StageStatus

DRMS_StageStatus	DACS_StageStatus	Description
CANCELED	F1CN	
COMPLETED	F1CO	
IN_PROGRESS	X1IP	
SCHEDULED	X1SD	

Lookup: OUTL-BRT-DACS_DRMS_Routing

DRMS_Instance	DRMS_Site_Connection	DACS_CIS_Division	DACS_Connection
x	Name of OIC Connection	CIS Division value	Name of DACS Connection

Lookup: OUTL-BRT-DACS_DRMS_DeviceLocationStatus

DACS_DEVICE_LOC_STATUS	DRMS_DEVICE_STATUS	Description
D1YS	Active	Value for DACS/DERMS for active or inactive device
D1NO	Inactive	

Lookup: OUTL-BRT-DACS_DRMS_AssetType

DRMS_ASSET_TYPE	DACS_ASSET_TYPE	Description
SMART_THERMOSTAT	SMART THERMOSTAT	Value for DACS/DERMS for type of device

Lookup: OUTL-BRT-DACS_DRMS_AssetSpec

DRMS_MAKE_MODEL	DACS_SPECIFICATION	Description
NEST!N3GEN	EST_G3_SPEC	Value for DACS/DERMS for device
NEST!N4GEN	ZZ_CTRL_DVC_THERM_SPEC22	
ECOBEE!E3GEN	EcoBee_E3	

Error Handling

This section provides information about the different ways used to handle errors in the integration and also resubmitting the instances after rectifying the errors.

- [Error Handling Ways](#)
- [Resubmitting the Error Instances in Oracle Integration Cloud](#)

Error Handling Ways

In this integration, the errors are handled in different ways due to the limitation of Oracle Integration Cloud.

- [Synchronous Flow Error Handling](#)
- [Asynchronous Flow Error Handling](#)
- [Summary of Integration Error Handling](#)

Synchronous Flow Error Handling

As part this error handler the errors are sent back to global fault handler and the respective system via Common Error Handler flow.

Technical Fault

This fault occurs when there is a data mismatch or any Xpath related error. On this error, the flow immediately goes to global fault handler and the fault is sent back to the respective system.

Remote Fault

This fault occurs when the target system is down. When this error occurs the flow immediately goes to global fault handler and the fault is sent back to the respective system.

Business Fault

This fault occurs only when the business fault occurs in the target system due to invalid data. When this error occurs, the fault is sent back to the respective system as part of immediate response.

Asynchronous Flow Error Handling**Technical Fault**

This fault occurs when there is a data mismatch or any Xpath related error. When this error occurs, the flow immediately goes to global fault handler and an optional email to the respective user is sent via Common Error Handler flow.

Remote Fault

This fault occurs when the target system is down. When this error occurs, the flow immediately goes to global fault handler and an optional email is sent to the respective user.

Business Fault

This fault occurs only when the business fault occurs in the target system due to invalid data. When this error occurs the flow immediately goes to global fault handler and an optional email is sent to the respective user.

Summary of Integration Error Handling

Integration Process: Enrollment Request

Type of Error	Action	Notification Type	Retry
Technical Fault Example: DACS is not accessible	<ul style="list-style-type: none"> Send FAILURE ackType to DERMS Process Stop 	Error Email	Resend message from DERMS
Business Fault (For Each Record Processing) (DACS enrollProgram returns - Status VAL-ERROR or ERROR)	<ul style="list-style-type: none"> Set Error to record's AckType response to DERMS Add to DERMS AckType Collection Process Next Record At the end of the collection processing, send ackType Collection and ERROR ackType to DERMS 		None Enrollments created in DACS DACS handles the validation errors

Type of Error	Action	Notification Type	Retry
Business Fault (For Each Record Processing) (DACS enrollProgram messageNumber = 10589)	<ul style="list-style-type: none"> • Error means the enrollment req exist in DACS already • Ignore the error • Process Next Record 		None Resend message from

Integration Process: Enrollment Sync

Type of error	Action	Notification Type	Retry
Technical Fault Example: DERMS is not accessible	Process Stop	Error Email	Resend message from DACS
Business Fault	Continue Process	Send error in message	Data fix in DACS: 1. Resend message from DACS.
Business Fault	N/A		

Integration Process: Device Status Check

Type of error	Action	Notification Type	Retry
Technical Fault Example: DERMS is not accessible	Process Stop	Error Email	Resend message from DACS

Integration Process: Event Device Reservation

Type of error	Action	Notification Type	Retry
Technical Fault Example: DERMS is not accessible	<ul style="list-style-type: none"> • Send FAILURE ackType to DERMS • Process Stop 	Error Email	Resend message from DACS
Business Fault	N/A		None

Integration Process: Send Device Score

Type of error	Action	Notification Type	Retry
Technical Fault Example: Source FTP or Source Object storage is not accessible	Process Stop	Error Email	Next scheduled run will pick up the files from DACS source content server or manually run the OIC process
Partial Processing Technical Fault During Processing in Loop Example: DERMS is not accessible	Process Stop	Error Email Process Complete Email (includes list of files not transferred)	Rename the file in DACS content server by removing the “Error-” prefix in the filename then manually run the OIC Process
Business errors	N/A		

Integration Process: Event Outcome

Type of error	Action	Notification Type	Retry
Technical Fault Example: DACS storage is not accessible	<ul style="list-style-type: none"> Send FAILURE ackType to DERMS Process Stop 	Error Email	Resend message from DERMS
Business Fault	N/A		

Resubmitting the Error Instances in Oracle Integration Cloud

In this integration, the flows initiated are asynchronous flows. The **Resubmit** option is available only for asynchronous flows.

To resubmit the error instances in Oracle Integration Cloud:

1. Login to Oracle Integration Cloud.
2. Navigate to **Integrations > Monitoring > Errors**.
3. Select the integration to resubmit.
4. Click the **Resubmit** icon.

Email Notifications

This pre-built integration includes a configurable email notification when technical errors are encountered in Oracle Integration Cloud.

To receive an email notification:

1. Login to Oracle Integration Cloud.

2. Navigate to **Integrations > Designer > Lookups**.
3. Edit the **OUTL-BRT-DACS_DRMS_ConfigProps** lookup.
Change the `notification.email.error.flag` property value to *true*.
4. Edit the **OUTL-BRT-DACS_DRMS_Email_ID** lookup.
 - a. In the **from** field, enter the email ID to receive an email from.
 - b. In the **to** field, enter the email ID to send the email to.
 - c. In the **Email_Id** field, provide the comma separated email IDs.

Note: In the **OUTL-BRT-DACS_DRMS_Email_ID** lookup, do not edit the values provided in the **Recipient** column.

Chapter 7

Customizations

This chapter describes options for customizing the integration to meet specific business requirements, including:

- [Adding New Mappings](#)

Adding New Mappings

To add a new mapping for the elements available in the Oracle Integration Cloud application schema, the pre-built integration provides a customization template for all the integration flows.

As the integration is delivered as business accelerator, the base integration flow cannot be edited and they need to clone the existing integration flow to add any customizations to the existing xsl mapper files.

The supported cases are:

- **Case 1:** In the Oracle Utilities Digital Asset Cloud Service application schema, elements exist but are not mapped in the Oracle Integration Cloud pre-built integration.
- **Case 2:** In Oracle Utilities Digital Asset Cloud Service, properties exist but are not mapped in the Oracle Integration Cloud pre-built integration.

This section provides the steps to add a new mapping using the import xsl.

In this integration, Oracle Utilities Digital Asset Cloud Service is the source and Oracle Field Service is the target.

To add custom mappings in Oracle Integration Cloud layer:

1. Login to Oracle Integration Cloud.
2. Identify the integration to add custom mappings.
3. Clone the integration.
4. Export the respective cloned integration from Oracle Integration Cloud to your local machine.
5. Unzip the .iar file and identify the mapping/xsl file in which the custom mappings have to be added.
6. This integration has all mappers as import xsl. To add any new mapping, edit the respective mapper/xsl file.

Note: Mappings cannot be added using the Mapper Design view.

7. In all integration mappings, a template is added under every complex element. Any custom elements under that complex element can be added directly in the template provided.
8. Add the mapping under the respective customization template. Save the changes.
9. In Oracle Integration Cloud, click the integration to add the mapping for an extra element. Select the respective map activity.
10. Click **Import** and upload the updated mapper/xsl file.
11. Save and close and activate the integration to reflect the custom mappings.

Following is the list of integrations and the respective mappers/xsls with customization templates defined.

Every integration process (.iar) file has a folder structure after exporting and unzipping it. Mappings/xsls are found under the **Resources** folder.

Example:

```
<integration_process_identifier_name>\icspackage\project\<integration_process_identifier_name>\resources\<processor_xxx>\<resourcegroup_xxx>\<req_xxx.xsl>
```


Chapter 8

Activating and Testing the Integration Flows

This section provides an overview of how integration flows are activated and tested. It includes the following sections:

- [Activating Integration Flows](#)

Activating Integration Flows

To activate the integration flows:

1. Navigate to the integration to activate.
2. Drag the slider for that integration. When prompted to enable tracing, click **Yes** to view the instances.
3. Click **Activate**.

The integration takes time to get activated. The activated integration appears at the top of the integrations list.

Chapter 9

Monitoring and Troubleshooting

This section provides information about monitoring and troubleshooting the integration. It includes the following:

- [Oracle Utilities Digital Asset Cloud Service](#)
- [Oracle Integration Cloud](#)

Oracle Utilities Digital Asset Cloud Service

This section provides information about monitoring Oracle Utilities Digital Asset Cloud Service.

Oracle Utilities Digital Asset Cloud Service Error Logs

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

The following error logs can be monitored for Oracle Utilities Digital Asset Cloud Service:

- Errors related to the online integration invocation from Oracle Utilities Digital Asset Cloud Service are stored in the `NMS_ENVIRONMENT_NAME/logs/` or `NMS_ENVIRONMENT_NAME/logs/system` folder.

Example: `V27_NMS_ORA_WLS/logs/system\`

For more information about errors and notifications, see the Oracle Utilities Digital Asset Cloud Service documentation.

Oracle Integration Cloud

This section focuses on the monitoring Oracle Integration Cloud and troubleshooting any issues that occur during the integration activation.

Monitoring Integration Flows

Integration flows are monitored using the following:

- Dashboard
- Cloud Logs

To monitor the integration flows from the Oracle Integration Cloud dashboard:

1. Login to Oracle Integration Cloud.
2. On the **Home** page, click **Monitoring**.
3. Select any of the following as required:
 - **Dashboards:** To monitor the complete dashboard of integration.
 - **Integrations:** To monitor each integration.
 - **Tracking:** To monitor instance and flow trace/activity stream of the integration.
 - **Error:** To monitor the integrations in 'error' state. Re-submit the asynchronous integration flows.

To monitor the integration flows using Oracle Integration Cloud logs:

1. Login to Oracle Integration Cloud.
2. On the **Home** page, click **Monitoring**.

3. On the navigation pane, click **Dashboards** to view the overall success/failure rate of the integration.
4. Navigate to the **Logs** menu.
5. In the right pane, click the link to show options for downloading the Oracle Integration Cloud logs or diagnostics logs.
6. In case of any issues, attach the diagnostic logs to a service request for help.

Troubleshooting

If an activation fails, the Integrations page displays an error message.

To troubleshoot the activation error:

1. Click **Download Diagnostic Logs** to download the logs for diagnosing the issue.
2. Select **Enable Tracing**.

TRACE ENABLED is displayed next to ACTIVE.

A few sample cases are as follows:

- For any connectivity errors while activating the integration, make sure the trigger connection is successful. Test the connection and refresh the metadata, and then activate the integration.
- If the integration (Oracle Utilities Network Management System initiated flows) is activated for the first time, make sure the Oracle Utilities Network Management System catalog is configured accurately.

Appendix A

Limitations and Workarounds

For a list of limitations and workarounds in this integration and in the respective edge applications, refer to the *Oracle Utilities Digital Asset Cloud Service Integration to Oracle Utilities Grid Energy Distributed Energy Resources Management System Release Notes* included in this release. The documentation is available on Oracle Help Center at:

<https://docs.oracle.com/en/industries/energy-water/integrations-index.html>