Oracle Utilities Work and Asset Management Integration to Oracle Field Service Cloud

Configuration Guide

Release 19C

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ORACLE

Oracle Utilities Work and Asset Management Integration to Oracle Field Service Cloud Configuration Guide, Release 19C

Contents

Preface

Welcome to the Oracle Utilities Work and Asset Management Integration to Oracle Field Service Cloud Configuration Guide.

Audience

This document is intended for anyone implementing the integration of the following products with Oracle Field Service Cloud:

- Oracle Utilities Work and Asset Management

Documentation and Resources

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

Product Documentation

Topic	Description
Oracle Utilities Work and Asset Management Integration to Oracle Field Service Cloud Configuration Guide Oracle Utilities Work and Asset Management documentation	Refer to the Oracle Utilities applications documentation page: http://docs.oracle.com/cd/E72219_01/documentation.html
Oracle Field Service Cloud documentation	https://docs.oracle.com/en/cloud/saas/field-service/19d/index.html

Additional Documentation

Resource	Location
Oracle Support	Visit My Oracle Support at https://support.oracle.com regularly to stay informed about updates and patches. Access the support site for the Edge Application Certification Matrix for Oracle Utilities Products (Doc ID 1454143.1) or refer to the Oracle Utilities Integrations page at http://my.oracle.com/site/tugbu/productsindustry/productinfo/utilities/integration/index.htm
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.
italic	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.
`monospace`	Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.

Acronyms

The following terms are used in this document:

Term	Expanded Form
OFSC	Oracle Field Service Cloud
OIC	Oracle Integration Cloud

Term	Expanded Form
ICS	Integration Cloud Service
DVM	Domain Value Map (Lookup)
WAM	Oracle Utilities Work and Asset Management
WACS	Oracle Utilities Work and Asset Cloud Service

Chapter 1

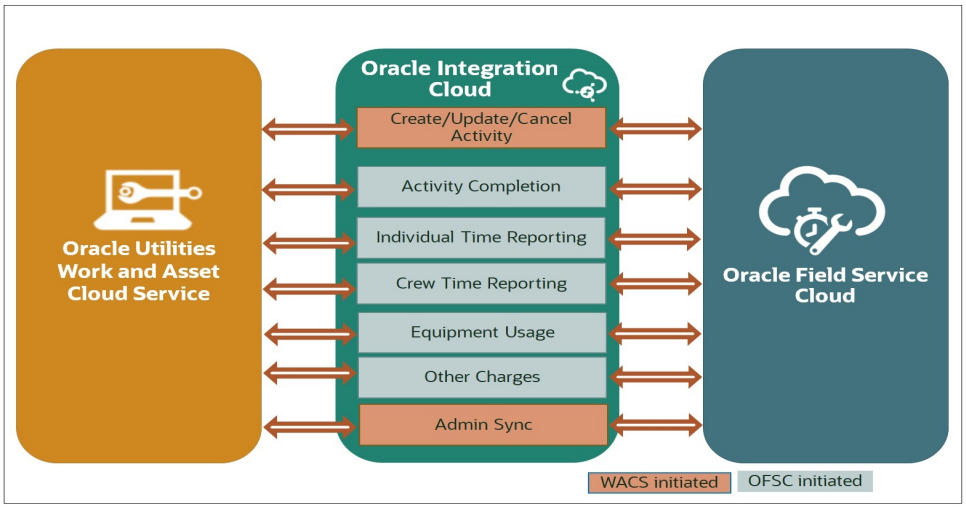
Introduction

This chapter provides an overview about Oracle Utilities Work and Asset Management Integration to Oracle Field Service Cloud using Oracle Integration Cloud. It focuses on software requirements, Oracle Integration Cloud, and business standpoint of the integration. It focuses on the following:

Overview of the Integration

Oracle Utilities Work and Asset Management Integration to Oracle Field Service Cloud helps to manage a fieldwork originated in the Oracle Utilities Work and Asset Management solution in Oracle Field Service Cloud. The integration can be leveraged to create /update/cancel and complete activities in the field using the Oracle Field Service Cloud solution.

The major business flows revolve around activities and usage reporting. The activities are created in Oracle Utilities Work and Asset Management and sent to Oracle Field Service Cloud for the mobile worker to perform the activity. The field activity completion information is sent from Oracle Field Service Cloud to Oracle Utilities Work and Asset Management. In addition, the integration supports admin sync from Oracle Utilities Work and Asset Management to Oracle Field Service Cloud.



About Oracle Utilities Work and Asset Management

Oracle Utilities Work and Asset Management efficiently manages asset lifecycles, streamlines maintenance operations, maximizes supply chain performance, enhances safety, and improves regulatory compliance.

About Oracle Field Service Cloud

Oracle Field Service Cloud is built on time-based, self-learning, and predictive technology, empowering to solve business problems while evolving the field service organization. It has various modules to choose, such as forecasting, routing, capacity, mobility, collaboration, core manage, smart location, customer communication, and more. It leverages the performance pattern profiles to create optimal daily routes and schedules and continues to learn as employee work patterns change over time.

About Oracle Integration Cloud

Oracle Integration Cloud is a unified platform to integrate the applications, automate processes, and create applications.

Using Process Builder the business processes can be rapidly designed, automated, and managed in the cloud. Using integrations connect the applications into a continuous business flow. The integrations can be quickly developed and activated between both the applications that live in the cloud; and the applications still live on premises. The lookups help to match application specific codes between the two applications.

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

Software Requirements

The application supported versions are:

- Oracle Utilities Work and Asset Management - v2.2.0.6
  or
  Oracle Utilities Work and Asset Cloud Service - 19C
- Oracle Integration Cloud - v19.4.3 and higher
- Oracle Field Service Cloud - 19D or higher

Chapter 2

Solution Architecture

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

- Solution Diagram
- Business Flows

Solution Diagram

The technical aspects involved in Oracle Utilities Work and Asset Management Integration to Oracle Field Service Cloud are:

- An integration between Oracle Utilities Work and Asset Management and Oracle Field Service Cloud.
- The integration layer is made up of integration processes deployed on Oracle Integration Cloud.
- It uses web services and REST APIs to facilitate communication between the two applications.
- In the Oracle Utilities Work and Asset Management initiated processes, outbound messages are sent and Oracle Field Service Cloud uses REST API to receive the messages.
- In the Oracle Field Service Cloud initiated processes, events are triggered and Oracle Utilities Work and Asset Management uses inbound web services (IWS) to receive the messages.

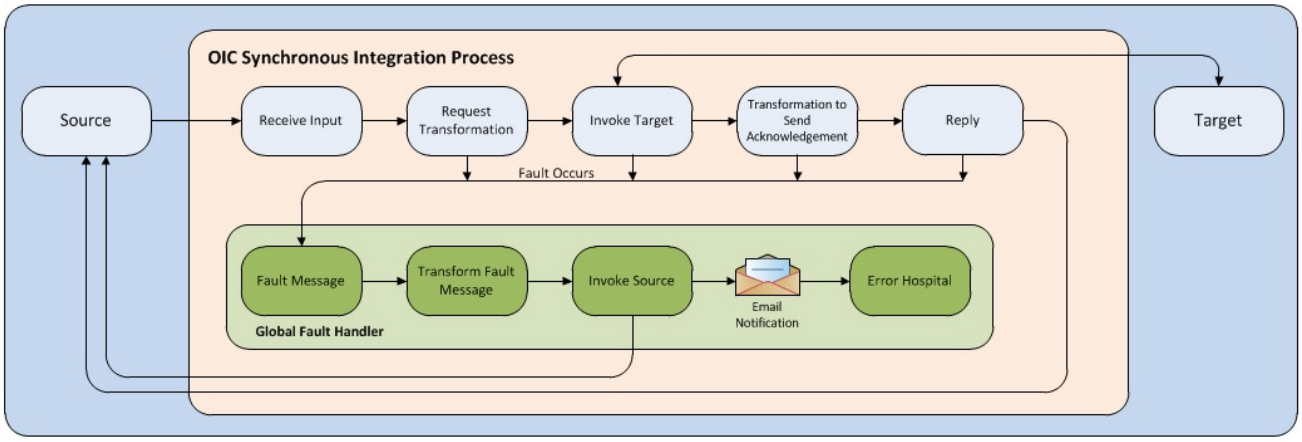
The integration patterns used in this solution are:

- Synchronous
- One-way Asynchronous

Synchronous

The synchronous integration process:

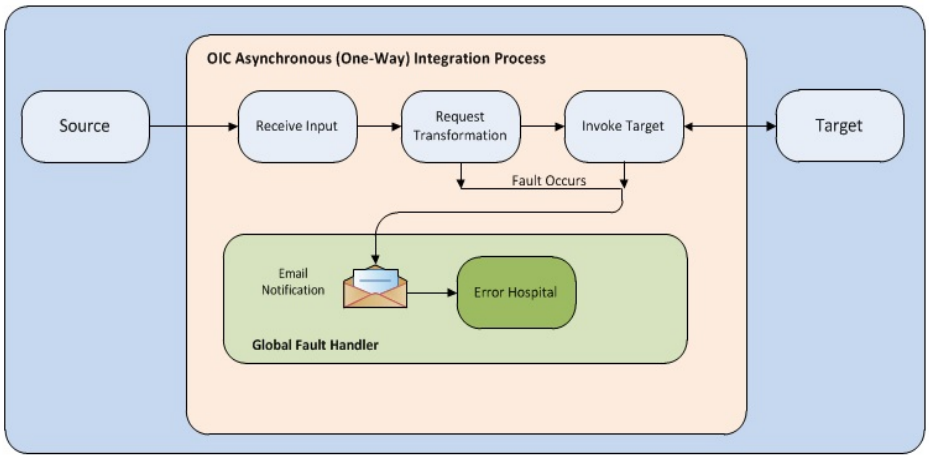
1. Receives request message from the source application.
2. Transforms the message from source format to the target format. Lookups are used for data translations.
3. Invokes the target application.
4. Transforms the message (after invoking the target application) from the target format back to the source format. It sends back an acknowledgment/synchronous response.
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.
3. Invokes target application to send the request message.
4. In case of any error, the global fault handler catches them.
5. The error instance can be re-submitted from Oracle Integration Cloud. Refer to the Error Handling section in Chapter 6: Configuring Lookups, Error Handling, and Email Notifications for more details.



Business Flows

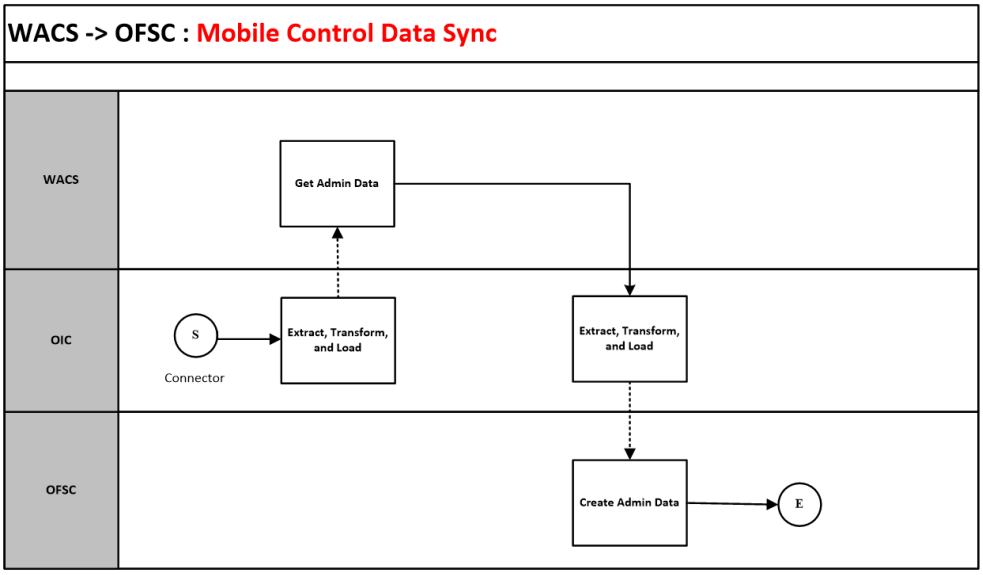
The integration scope supports the following business processes:

- Mobile Control Data Sync (Oracle Utilities Work and Asset Management Initiated)
- Process Activity (Oracle Utilities Work and Asset Management Initiated)
- Activity Completion (Oracle Field Service Cloud Initiated)
- Resource Usage (Oracle Field Service Cloud Initiated)

Mobile Control Data Sync (Oracle Utilities Work and Asset Management Initiated)

This integration process is used to sync the control data from Oracle Utilities Work and Asset Management to Oracle Field Service Cloud. It also creates the work skill related configurations needed in Oracle Field Service Cloud to match activities with resources and for crew tracking. It is run on initial installation or on a need only basis when new control data from Oracle Utilities Work and Asset Management or work skill related configurations needs to be created or updated in Oracle Field Service Cloud.

The following diagram shows a graphical representation of the Mobile Control Data Sync integration process.



Business Processing

This synchronous integration process includes the following activities:

1. Sync_MobileControlData_WAMToOFSC deployed on Oracle Integration Cloud is run to retrieve the control data from Oracle Utilities Work and Asset Management needed in the Oracle Field Service Cloud application. This includes codes and descriptions of selected admin entities, characteristic type valid values and extendable lookup values. It also includes craft, equipment and other direct changes, whose resource type is internal, needed to support timesheet and resource usage.

Note: Once a resource is created in Oracle Utilities Work and Asset Management, the resource code (craft code, equipment code and other resource code) cannot be changed. This sync integration process uses the resource codes to create the enumeration values for equipment, craft and other resource property in OFSC. Slash (/) also cannot be part of the resource code.

2. Run this integration sync process manually from Oracle Integration Cloud (OIC) by scheduling the integration process to run on a scheduled date or selecting **Submit Now** from the menu of the activated sync integration process to initiate an instance of the integration. An optional language parameter can be entered to determine the description to retrieve from Oracle Utilities Work and Asset Management and to know in which language code the property name should be created in Oracle Field Service Cloud. The language parameter entered should be an ISO 2 letter language code; if the language parameter is not populated or blank, it is defaulted to English (en).
3. It populates the enumeration values for the following Oracle Field Service Cloud properties:
    - Craft
    - Crew Shift Types
    - Downtime Reason
    - Equipment Type
    - Labor Earning Type
    - Measurement Meter Reason
    - Measurement Gauge Reason
    - Other Resource Type
    - Overtime Type
    - Resource Unit of Measure

The enumeration values are obtained from the corresponding Oracle Utilities Work and Asset Management admin information.

OFSC Property Label	Synced WAM Information
wam_craft	Craft
wam_crew_shift_type	Crew Shift Type
wam_downtime_reason	Downtime Reason
wam_equipment_type	Equipment
wam_labor_earning_type	Labor Earning Type
wam_measurement_gauge_reason	Measurement Gauge Reason
wam_measurement_meter_reason	Measurement Meter Reason
wam_other_resource_type	Other Resource
wam_overtime_type	Overtime Type
wam_resource_uom	Unit of Measure-Resource

Note: If admin data is deleted in Oracle Utilities Work and Asset Management, the enumeration value will not be deleted in Oracle Field Service Cloud. The sync integration process cannot delete enumeration values added to a property in Oracle Field Service Cloud; the OFSC REST API that updates the enumeration values of a property does not allow it. The only way to delete an enumeration value(s) in a property is by deleting the property, recreating the property, and run the sync to get the latest values.

4. It creates a work skill and work skill property for each craft retrieved from Oracle Utilities Work and Asset Management.
   - The label format for Work Skill created in Oracle Field Service Cloud is:
     - W_ + WAM craftcode

       Example: Label is W_Carpenter
   - The label format for Work Skill property created in Oracle Field Service Cloud is:
     - W_ + WAM craftcode + _Nd

       Example: Work Skill Property Label is W_Carpenter_Nd
   - The name format for Work Skill property created in Oracle Field Service Cloud is:
     - WAM Craft Code Description + value of property workSkillProperty.nameSuffix.default from WAMOFSC_ConfigProps Lookup.

       Example: WAM Craft Code description is Carpenter. workSkillProperty.nameSuffix.default value is needed. Work Skill Property Name is Carpenter Needed.
5. It also creates the work skill conditions based on the craft and the property value of workSkillCond.actvtySameSkillMaxWorker.default from WAMOFSC_ConfigProps Lookup.

   In this example: For work skill = Carpenter and workSkillCond.actvtySameSkillMaxWorker.default = 3, there will be 3 work skill conditions created.
6. If a technical fault is encountered, when Oracle Utilities Work and Asset Management or Oracle Field Service Cloud is down, it will stop the process and send an optional email notification with error details to the users configured in the WAMOFSC_Email_ID lookup.
7. If any error occurs in the flow when creating or update the record(s) in Oracle Field Service Cloud, it will continue the process and send an email notification to the users configured in the WAMOFSC_Email_ID lookup of what record was not created/ updated.
8. Email notification is optional. Configure the property name email.flag in the WAMOFSC_ConfigProps Lookup to true to receive email notification when errors are encountered.

Technical Details

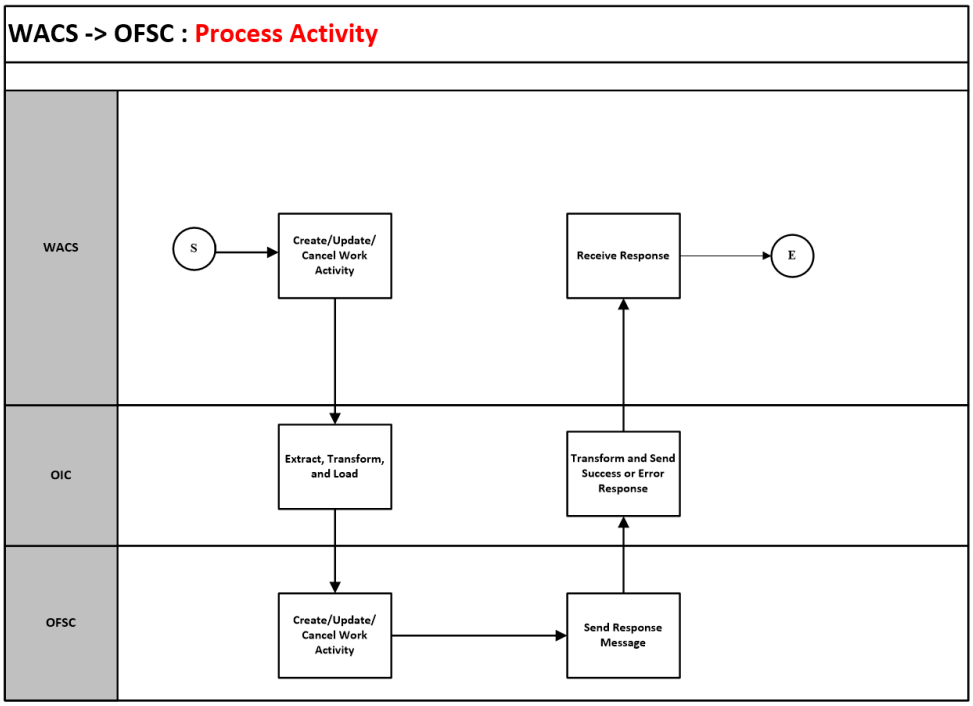
The following table describes the integration processes and the respective Oracle Utilities Work and Asset Management and Oracle Field Service Cloud artifacts used in this integration process.

Artifacts	Value
Integration Process Name	Sync_MobileControlData_WAMToOFSC
Integration Package Name	oracle.util.wamofsc
OFSC REST URI	To update or replace enumeration values for a property: Method: PUT URI: /rest/ofscMetadata/v1/properties/{label}/enumerationList To create or replace a WorkSkill: Method: PUT URI: /rest/ofscMetadata/v1/workSkills/{label} To create or replace a property for WorkSkill: Method: PUT URI: /rest/ofscMetadata/v1/properties/{label} To replace WorkSkill conditions: Method: PUT URI: /rest/ofscMetadata/v1/workSkillConditions
WACS SOAP IWS	W1-ExtMobileControlData

Process Activity (Oracle Utilities Work and Asset Management Initiated)

This integration process is used to accept request from Oracle Utilities Work and Asset Management to create, update, or cancel activities in Oracle Field Service Cloud. The information is sent synchronously from Oracle Utilities Work and Asset Management, regardless of the activity type, and Oracle Field Service Cloud sends back a response.

The following diagram shows a graphical representation of the Process Activity integration process.



Business Processing

The integration process includes the following activities:

1. Oracle Utilities Work and Asset Management sends the create/update/cancel activity request to the Process_Activity_WAMToOFSC integration process deployed on Oracle Integration Cloud.
2. If Oracle Utilities Work and Asset Management sends create or update activity request, the Process_Activity_WAMToOFSC process transforms the request message from Oracle Utilities Work and Asset Management to the request message format in Oracle Field Service Cloud and invokes bulkUpdate API.
3. Oracle Field Service Cloud sends the success or failure response to the integration.
4. If the activity creation is successful in Oracle Field Service Cloud, the integration process does the following:
    a. Transforms the attachments data from Oracle Utilities Work and Asset Management (if any) and invokes "Set File Property" OFSC REST API.
    b. Transforms the labor data from Oracle Utilities Work and Asset Management (if any) and invokes "Update activity" OFSC REST API.
5. Transforms and sends the success/failure response from Oracle Field Service Cloud to Oracle Utilities Work and Asset Management.
6. If Oracle Utilities Work and Asset Management sends the cancel activity request, the Process_Activity_WAMToOFSC process transforms the request message from Oracle Utilities Work and Asset Management to the request message format in Oracle Field Service Cloud and invokes bulkUpdate API.

7. Oracle Field Service Cloud sends the success or failure response to the integration transformed and sent to Oracle Utilities Work and Asset Management.
8. Any errors are reported back to Oracle Utilities Work and Asset Management through the global fault handler.
9. An optional email notification with error details is sent to the users configured in the WAMOFSC_Email_ID lookup.
10. Email notification is optional. Configure the property name email.flag in the WAMOFSC_ConfigProps Lookup to true to receive email notification when errors are encountered.

Technical Details

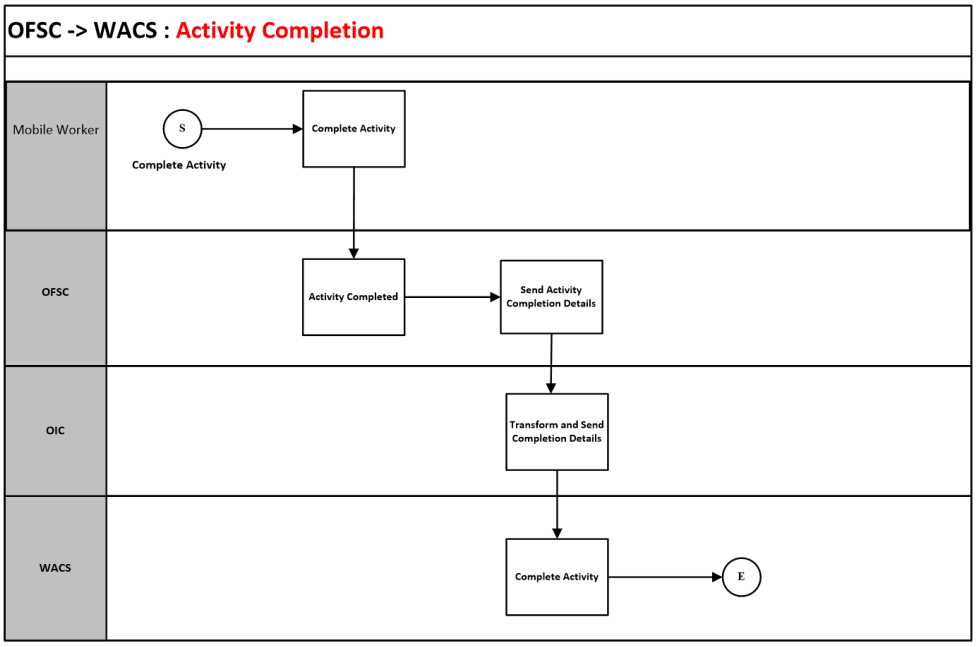
The following table describes the integration processes and the respective Oracle Utilities Work and Asset Management and Oracle Field Service Cloud artifacts used in this integration process.

Artifacts	Value
Integration Process Name	Process_Activity_WAMToOFSC
Integration Package Name	oracle.util.wamofsc
OFSC BO/Operation	Activity / Bulk Update Activity Activity / Set File Property Activity / Update activity
OFSC API	bulkUpdate
WAM BO	W1-WOActivityActiveOutboundMsg

Activity Completion (Oracle Field Service Cloud Initiated)

This integration process is used to send the field activity completion details from Oracle Field Service Cloud to Oracle Utilities Work and Asset Management. Oracle Field Service Cloud sends the activity completion details, along with the completion status, to complete the activity in Oracle Utilities Work and Asset Management.

The following diagram shows a graphical representation of the Activity Completion integration process:



Business Processing

The integration process includes the following activities:

1. Oracle Field Service Cloud sends the activity completion details to the Complete_Activity_OFSCToWAM integration process deployed on Oracle Integration Cloud, when the "Activity Completed" event occurs.
2. The Complete_Activity_OFSCToWAM process transforms the completion event data and get the activity details from Oracle Field Service Cloud by invoking the getActivity API.
3. The integration process gets the asset/inventory details from a file property by invoking the getActivityFileProperty Oracle Field Service Cloud API, also gets the service history attachment(s) data if any by invoking the same Oracle Field Service Cloud API.
4. The integration process transforms the activity completion message from Oracle Field Service Cloud to the message format in Oracle Utilities Work and Asset Management and invokes the W1-MblActCom inbound web service.
5. Any errors are captured through the global fault handler.
6. An optional email notification with error details are sent to the users configured in the WAMOFSC_Email_ID lookup.
7. Email notification is optional. Configure the property name email.flag in the WAMOFSC_ConfigProps Lookup to true to receive email notification when errors are encountered.

Technical Details

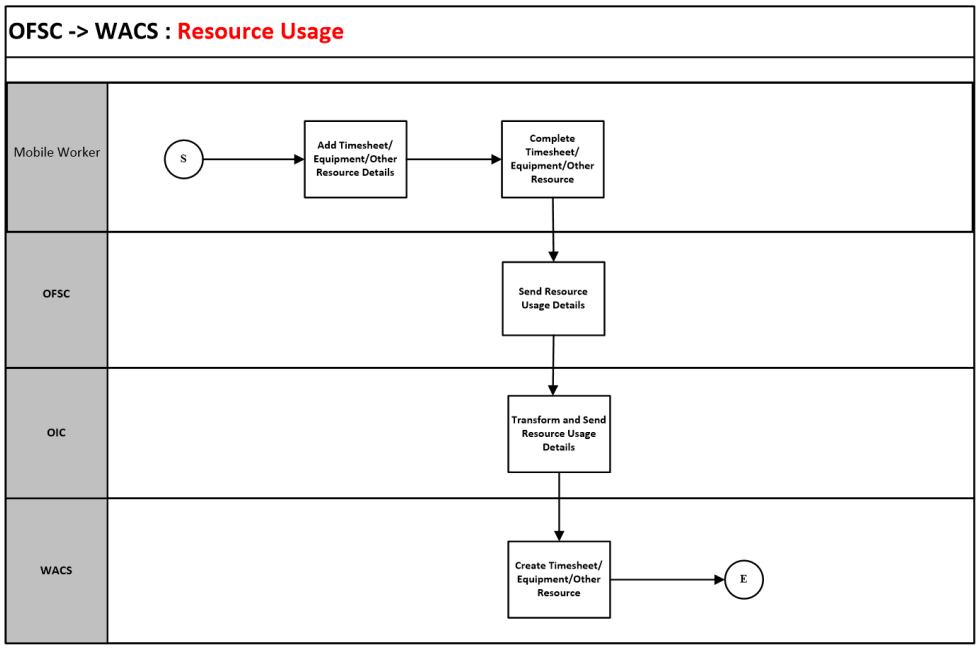
The following table describes the integration processes and the respective Oracle Utilities Work and Asset Management and Oracle Field Service Cloud artifacts used in this integration process.

Artifacts	Value
Integration Process Name	Complete_Activity_OFSCToWAM
Integration Package Name	oracle.util.wamofsc
OFSC Event	Activity/Activity Completed
OFSC BO/Operation	Activity/Get Activity
OFSC API	getFileProperty
WACS IWS	W1-MblActCom

Resource Usage (Oracle Field Service Cloud Initiated)

This integration process is used to send the resource usage details from Oracle Field Service Cloud to Oracle Utilities Work and Asset Management. Oracle Field Service Cloud sends the details either before the completion or after the completion of the activity.

The following diagram shows a graphical representation of the Resource Usage integration process.



Business Processing

The integration process includes the following activities:

1. Oracle Field Service Cloud sends the resource usage details that can include either the individual time sheet or crew time sheets by supervisor or equipment usage or other equipment usage to the Send_ResourceUsageDetails_OFSCToWAM integration process deployed on Oracle Integration Cloud.
2. The Send_ResourceUsageDetails_OFSCToWAM process transforms the message from Oracle Field Service Cloud to the message format in Oracle Utilities Work and Asset Management and invokes the W1-IntTMSDtl inbound web service if its individual time sheet or crew time usage submitted by supervisor or invokes the W1-IntODCDtl inbound web service if its equipment usage or other equipment usage information.
3. Any errors are captured through the global fault handler.
4. An optional email notification with error details are sent to the users configured in the WAMOFSC_Email_ID lookup.
5. Email notification is optional. Configure the property name email.flag in the WAMOFSC_ConfigProps Lookup to true to receive email notification when errors are generated.

Technical Details

The following table describes the integration processes and the respective Oracle Utilities Work and Asset Management and Oracle Field Service Cloud artifacts used in this integration process.

Artifacts	Value
Integration Process Name	Send_ResourceUsageDetails_OFSCToWAM
Integration Package Name	oracle.util.wamofsc
OFSC Entity	Custom Plugin : Resource Usage
WACS IWS	W1-IntTMSDtl W1-IntODCDtl

Chapter 3

Configuring Oracle Utilities Work and Asset Management

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

- Configuring Admin Data
- Adding Oracle Integration Cloud Certificates
- Managing Catalog Services

Configuring Admin Data

To configure the Oracle Utilities Work and Asset Management setup for the integration:

1. Login to Oracle Utilities Work and Asset Management.
2. Create message senders. Refer to the Message Senders section for details.
3. Create outbound message types. Refer to the Outbound Message Types section for details.
4. Create an external system. Refer to the External System section for details.
5. Complete the master configuration.
6. Create activity types. Refer to the Admin Entities section for details.
7. Generate certificates. Refer to the Adding Oracle Integration Cloud Certificates section for more details.
8. Add the required Admin types.

Message Senders

Create a new message sender for each integration service initiated from Oracle Utilities Work and Asset Cloud Service.

To create a message sender:

1. Navigate to the **Message Sender** page from the **Admin** menu or from the **Search** menu.
2. Enter a unique message sender and its description.
3. Populate the following values:
   - Invocation Type - Real-time
   - Message Class - SOAPSNDR
   - Active - Select the checkbox.
   - MSG Encoding - UTF-8 message encoding
4. Select the **Context** tab and set values for the following context types:
   - HTTP Header - SOAPAction:"<operation name in Oracle Integration for Cloud Activated Integration wsdl url>"
   - HTTP Login User - User ID to access the Oracle Integration for Cloud flow
   - HTTP Password - Password to access the OIC flow
   - HTTP Method (POST/GET) - POST
   - HTTP Timeout - 60
   - HTTP Transport Method - SendReceive
   - HTTP URL 1 - Set the Activated Integration end point URL by removing the ?wsdl from the URL.

     If the URL value does not fit, use the additional HTTP URL types to set the complete URL.

- Message Namespace URI - Provide the namespace of the schema in the respective integration process.

Important! Make sure the namespace does not include any extra spaces. Copy the namespaces into Notepad to check for any extra spaces.

Message sender configuration for integration services

Message Sender	Description	Message Namespace URI	HTTP Header	HTTP URL
Process Activity (create/update/cancel)				
WD_WO_PA	WAM process activity message Sender OFSC	http://ouaf.oracle.com/outbound/W1-WOActivityActiveOutboundMsg	SOAPAction: "OFSC_INT_WO_PA"	https://OIC_Host:OIC_Port/ic/ws/integration/v1/flows/oracleutilities/PROCESS_ACTIVITY_WAMTOOFSC/1.0/

Outbound Message Types

The following outbound message types are provided for each integration process.

On the **Admin** menu, navigate to the **Outbound Message Type** page. You can also navigate from the **Search** menu.

Add the following details to create the outbound message type:

- **Integration Service**: Process Activity (create/update/cancel)
- **Outbound Message Type**: W1-WOACTAMSG
- **Description**: Process Activity ((create/update/cancel activity) Outbound Message Type
- **Outbound Message BO**: W1-WOActivityActiveOutboundMsg
- **Priority**: 50

External System

To create a new external system to support the integration:

1. Navigate to the **External System** page from the **Admin** menu or from the **Search** menu.
2. Enter a unique external system and description.

   For example: Name = WD-EXT-ACT, Description = OFSC External System
3. Set the **Our Name in Their System** field to WAM.

4. Associate the outbound message types and message senders created to the external system.
   For each outbound message type, set the following:
   - **Outbound Message Type**: Outbound message type for the respective integration service
   - **Processing Method**: Real-time
   - **Message Sender**: Set the message sender created for the integration service
   - **Date/Time Format**: XSD
   - **Namespace Option**: Configured on sender

For more information about message senders and outbound message type for each integration service, refer to the Message Senders and External System sections respectively.

External system configuration for integration services

Example External System - WD-EXT-ACT

Integration Service	Outbound Message Type	Message Sender
Process Activity(create/ update/cancel)	W1-WOACTAMSG	WD_WO_PA

Admin Entities

This section describes the entities required to support the integration.

The definition of each Activity Type for work activities that are interfaced to Oracle Field Service Cloud should include the following configuration:

- Outbound Activity Information
  - External System: <Created above> WD-EXT-ACT
    - Outbound Message Type: W1-WOACTAMSG, Usage: Add(W1AD)
    - Outbound Message Type: W1-WOACTAMSG, Usage: Cancel(W1CA)
    - Outbound Message Type: W1-WOACTAMSG, Usage: Update(W1UP)
- An optional list of Planned Service History
- The following completion events:
  - Create Any Service History (W1-CrAnyServiceHistComplEvtTyp)
  - Create Operational Reading (W1-CreateOperationalRead)
  - Update Worked Assets (W1-MobileUpdateWorkedAssets)

Adding Oracle Integration Cloud Certificates

Add the Oracle Integration for Cloud certificate to the Oracle Utilities Work and Asset Management stores where ever applicable to send transactions to the OIC layer.

Managing Catalog Services

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

To configure the catalog service in Oracle Utilities Work and Asset Management:

1. Login to Oracle Utilities Work and Asset Management.
2. Navigate to the **Web Service Catalog** page either from the **Admin** menu or the **Search** menu.

   The external system and inbound web services mentioned in the table in step 3 are added to the catalog.
3. To get the catalog URL, append "webservices/builtin/ServiceCatalog?wsdl" to the Oracle Utilities Work and Asset Management URL.

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

Following is the list of artifacts to be included in web service catalog:

Service Type	Service Name	Device Verification
External System	WD-EXT-ACT	WD-EXT-ACT External System - Field Work System
Inbound Web Service	W1-ExtMobileControlData	External Mobile Control Data
Inbound Web Service	W1-IntODCDtl	Interface Other Direct Charge Details
Inbound Web Service	W1-IntTMSDtl	Interface Timesheet Details
Inbound Web Service	W1-MblActCom	Mobile Activity Completion

For more information about configuration, refer to the Oracle Utilities Work and Asset Management documentation.

Chapter 4

Configuring Oracle Field Service Cloud

The necessary Oracle Field Service Cloud configuration information is available in the Oracle Field Service Cloud Configurations for Oracle Work and Asset Cloud Service Integration to Oracle Field Service Cloud v19C whitepaper at https://docs.oracle.com/cd/F25987_01/index.htm.

Chapter 5

Importing, Configuring, and Testing Integration Connections

This chapter explains in details 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 Work and Asset Management".
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**. MyOracle Support portal opens.
8. Download the integration package from MyOracle 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.

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 successfully.

Verifying the Package Import

To verify the package import was successful:

1. Verify whether the following integrations are imported successfully.
   - Process_Activity_WAMToOFSC
   - Sync_MobileControlData_WAMToOFSC
   - Complete_Activity_OFSCToWAM
   - Send_ResourceUsageDetails_OFSCToWAM

2. Verify if the following connections are in place.
   - REST_WAMOFSC_RU
   - OFSC-REST-API
   - OFSC_WAMOFSC
   - WAM_WAMOFSC
3. Make sure that the following look ups are imported successfully.
   - WAMOFSC_ActivityType
   - WAMOFSC_Email_ID
   - WAMOFSC_ConfigProps
   - WAMOFSC_Language
   - OFSCWAM_TimeZone
   - WAMOFSC_AttachmentBO

Configuring Connections in Oracle Integration Cloud

After the packages are imported and verified, the respective connections have to be configured.

This section describes the procedure to set up the following connections:

- Configuring WAM_WAMOFSC Connection
- Configuring OFSC_WAMOFSC Connection
- Configuring REST_WAMOFSC_RU Connection
- Configuring OFSC-REST-API Connection

Configuring WAM_WAMOFSC Connection

This connection is used to communicate with Oracle Utilities Work and Asset Management using the Oracle Utilities adapter.

To configure the WAM_WAMOFSC connection:

1. Add the Oracle Utilities Work and Asset catalog to the **catalogURL** section.
2. On the **Security policy** tab, select the **Basic Authentication** policy.
3. In case of Oracle Utilities Work and Asset on-premises, configure the agent in the connection.
   a. In the **Agent Group** section, click **Configure Agents**.
   b. Select the agent group from the list created in Creating an Agent Group.
4. On the **Connection** page, enter the user name and password. Click **Test** at the upper-right corner.
5. After the connection is tested successfully, click **Save**.

Configuring OFSC_WAMOFSC Connection

This connection is used to communicate with Oracle Field Service Cloud using the Oracle Field Service Cloud adapter.

Configure the Oracle Field Service Cloud connection with the required details:

1. Enter the API URL in the **Field Service Cloud API URL** field.
2. Enter the **Instance ID**.
3. From the **Security Policy** drop-down list, select **Basic Authentication**.
4. As part of the user name and password, provide ClientID and Client Secret (you can retrieve them from the Oracle Field Service Cloud environment).

   Note: For more information, refer to:

   https://www.oracle.com/webfolder/technetwork/tutorials/tutorial/cloud/fsvc/releases/19C/19C-field-service-wn.htm
5. On the **Connection** page, enter the user name and password. Click **Test** at the upper-right corner.
6. After the connection is tested successfully, click **Save**.

Configuring REST_WAMOFSC_RU Connection

This connection is used to communicate with Oracle Field Service Cloud using the REST adapter. It is used in the Report usage flows (Oracle Field Service Cloud initiated flows triggered by Oracle Field Service Cloud).

Edit the REST_WAMOFSC_RU connection and test it to make sure it is successful. Click **Save**.

Configuring OFSC-REST-API Connection

This connection is used to communicate with the OFSC API using the REST adapter. It is used in the Admin sync flow inbound to Oracle Field Service Cloud.

Configure the OFSC-REST-API connection with required details:

1. From the **Connection Type** drop-down box, select **REST API Base URL**.
2. Do not configure the TLS version.
3. Enter **https://api.etadirect.com/rest** in the **Connection URL** field.
4. From the **Security Policy** drop-down list, select **Basic Authentication**.
5. On the **Connection** page, enter the user name and password. Click **Test** at the upper-right corner.
6. 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

The possible combination of an agent group is:

- Oracle Utilities Work and Asset Management on-premises and Oracle Field Service Cloud

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-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 Work and Asset Management 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/utilities-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 Work and Asset Management certificates and upload them to Oracle Integration Cloud to handshake with Oracle Utilities Work and Asset Management.

To download the Oracle Utilities Work and Asset Management certificate:

1. Login to Oracle Utilities Work and Asset Management.
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

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

Lookup Name	Integration Name	Purpose
WAMOFSC_Attachment BO	Complete_Activity_OFSC ToWAM	Translates OFSC attachment MIME type to WAM BO name. **Note**: Only on the edit of a service history, can we add an attachment to a service history. If a specific file type cannot be attached at service history, check if the corresponding file type is mentioned in this lookup; add it if is missing. Also, verify if the respective MIME type is available in OFSC properties wam_upload_attachment_1 to wam_upload_attachment_5.
WAMOFSC_ ActivityType	Process_Activity_WAMTo OFSC	Translates the WAM Activity Type to OFSC Activity Type.
WAMOFSC_Email_ID	Send_ResourceUsage Details_OFSCToWAM Complete_Activity_OFSC ToWAM Sync_MobileControlData_ WAMToOFSC Process_Activity_WAMTo OFSC	Used to configure the email IDs of the respective users. Under the Email_Id column where the value of Recipient is "to", add comma separated email IDs to send an email to multiple users. Do not change or add any values under the Recipient column.
WAMOFSC_ ConfigProps	Send_ResourceUsageDetail s_OFSCToWAM Complete_Activity_OFSC ToWAM Sync_MobileControlData_ WAMToOFSC Process_Activity_WAMTo OFSC	Used for configurable properties.
WAMOFSC_Language	Sync_MobileControlData_ WAMToOFSC	Translates the language code from WAM to OFSC.
OFSCWAM_TimeZone	Complete_Activity_OFSC ToWAM	Translates the timezone of the OFSC to WAM.

Editing Lookups

To edit a lookup:

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

Configuration Properties

WAMOFSC_ConfigProps lookup contains the properties that can be defaulted in the integration. It also contains a flag to enable email notifications.

Property Name	Sample Value	Description	Used in Integration Process Name
source.system	WAM	Defines the WAM product code	Process_Activity_WAMToOFSC Complete_Activity_ OFSCToWAM
asset.inventory.type	Asset	Defines asset inventory type	Process_Activity_WAMToOFSC
email.flag	true	Configures the optional email notification. If the value is set to true, email notification will be sent to the configured users.	Sync_MobileControlData_WAM ToOFSC Process_Activity_WAMToOFSC Send_ ResourceUsageDetails_ OFSCToWAM Complete_Activity_ OFSCToWAM
wam.offset	-07:00	Provides offset for WAM/ WACS timezone	Process_Activity_WAMToOFSC Complete_Activity_OFSCTo WAM
ofsc.offset	-04:00	Configures offset as per the OFSC time zone	Process_Activity_WAMToOFSC
ofsc.bucket	OHMeter	Configures the bucket name available in OFSC to assign the tasks	Process_Activity_WAMToOFSC
activeFlag.default	true	Used for enumeration property values and workskill creation	Sync_MobileControlData_WAM ToOFSC
workSkill.sharing.default	summary	Default sharing used for workskill creation	Sync_MobileControlData_WAM ToOFSC

Property Name	Sample Value	Description	Used in Integration Process Name
workSkillProperty.type.default	string	Default type used for workskill property creation	Sync_MobileControlData_WAMToOFSC
workSkillProperty.entity.default	activity	Default entity used for workskill property creation	Sync_MobileControlData_WAMToOFSC
workSkillProperty.gui.default	text	Default GUI used for workskill property creation	Sync_MobileControlData_WAMToOFSC
workSkillProperty.nameSuffix.default	needed	Name suffix default used for workskill property creation	Sync_MobileControlData_WAMToOFSC
workSkillCond.actvtySameSkillMaxWorker.default	12	Default value for maximum number of people with the same work skill allowed to work simultaneously in an activity used for workskill condition creation	Sync_MobileControlData_WAMToOFSC
workSkillCond.function.default	in	Default function used for workskill condition creation	Sync_MobileControlData_WAMToOFSC

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

Synchronous Flow Error Handling

As part this error handler the errors are sent back to the respective system in the same 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 error information is sent back to the respective system as a fault.

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.

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 fault occurs, the error information is sent to the source system and an optional email notification is sent to the respective user.

Resubmitting the Error Instances in Oracle Integration Cloud

In this integration, the flows initiated by Oracle Field Service Cloud are asynchronous flows, and the resubmit option is available only for asynchronous flows.

To resubmit the error instances in Oracle Field Service Cloud:

1. Login to Oracle Field Service Cloud.
2. Navigate **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.

To receive an email notification:

1. Login to Oracle Integration Cloud.
2. Navigate to **Integrations** > **Designer** > **Lookups**.

3. Edit the **WAMOFSC_ConfigProps** look up.

   Change the **email.flag** property value to 'true'.

4. Edit the **WAMOFSC_Email_ID** look up.

   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 WAMOFSC_Email_ID lookup, do not edit the values provided under the **Recipient** column.

Chapter 7

Extension Libraries in Oracle Integration Cloud

The extension libraries provide a means to register and organize JavaScript for use in integrations. Library functions are automatically available for you to drag from the **Actions** palette to your orchestration integrations.

This integration includes the following extension libraries:

Extension Library	Function	Description	Used in Integration Process
WAMOFSC_DateTimeZoneConversion	WAMOFSC_DateTimeZoneConversion	Converts date time from WAM timezone to OFSC timezone and vice versa	Complete_Activity_OFSC Process_Activity_WAMToOFSC
WAMOFSC_OFSCDateTimeZoneConversion	WAMOFSC_OFSCDateTimeZoneConversion	Converts date time from WAM to OFSC date time format.	Process_Activity_WAMToOFSC
ConcatAddress	WAMOFSC_ConcatAddress	Concatenates address1, address2, address3, address4 from WAM and sends it to streetAddress in OFSC.	Process_Activity_WAMToOFSC

The same extension libraries can be accessed from the **Libraries** page in Oracle Integration Cloud.

For more information regarding extension libraries, refer to the Oracle Integration Cloud documentation at:

https://docs.oracle.com/en/cloud/paas/integration-cloud-service/ icsug/using-libraries-manage-functions-integrations.html.

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:

- Prerequisites
- Activating Integration Flows
- Testing the Integration Flows

Prerequisites

Make sure the catalog in Oracle Utilities Work and Asset Cloud Service is configured completely to activate an integration process.

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.

Testing the Integration Flows

The following table lists the end point URLs for respective applications in which these endpoints need to be configured. Configure the same and perform an end-to-end testing.

Integration Name	End Point URL to be Configured	Application to be Configured
Process_Activity_WAMToOFSC	https://OIC_Host:OIC_Port/ic/ws/integration/v1/flows/oracleutilities/PROCESS_ACTIVITY_WAMTOOFSC/1.0/	WAM/WACS
Complete_Activity_OFSCToWAM	https://OIC_Host:OIC_Port/ic/api/integration/v1/flows/ofsccloudadapter/COMPLETE_ACTIVITY_OFSCTOWAM/1.0/notify	As OFSC is event based, there is no need to configure the integration endpoint URLs. Subscription for the event will be created once the respective integration is activated.
Sync_MobileControlData_WAMToOFSC	https://OIC_Host:OIC_Port/ic/api/integration/v1/integrations/SYNC_MOBILECONT_WAMTOOFSC%7C01.00.0000/schedule/jobs	An OIC initiated flow that can be triggered by selecting the hamburger and select **Submit Now**.
Send_ResourceUsageDetails_OFSCToWAM	https://OIC_Host:OIC_Port/ic/api/integration/v1/flows/rest/SEND_RESOURCEUSAGEDATA_OFSCTOWAM/1.0/resourceUsage	OFSC

Chapter 9

Monitoring and Troubleshooting

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

- Oracle Utilities Work and Asset Cloud Service
- Oracle Integration Cloud

Oracle Utilities Work and Asset Cloud Service

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

Oracle Utilities Work and 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 Work and Asset Cloud Service:

- Errors related to the online integration invocation from Oracle Utilities Work and Asset Cloud Service are stored in the WACS_ENVIRONMENT_NAME/logs/ or WAM_ENVIRONMENT_NAME/logs/system folder.

  For example: V22060_WAM_ORA_WLS/logs/system\

For more information about errors and notifications, see the Oracle Utilities Work and 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.

Some of the 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 Work and Asset Cloud Service initiated flows) is activated for the first time, ensure the Oracle Utilities Work and Asset Cloud Service catalog is configured accurately.

Appendix A

Known Issues

This appendix focuses on the known issues in this integration and in the respective applications.

- Oracle Field Service Cloud
- Oracle Utilities Work and Asset Management

Oracle Field Service Cloud

The known issues pertaining to Oracle Field Service Cloud in this integration are:

- When crews are assigned activities, the cross combinations of Offline and Online cannot be performed. The Oracle Field Service Cloud lock functionality is needed for this. It will be available in the future releases.
- If the resources are deleted in Oracle Utilities Work and Asset Management, they should be manually deleted from Oracle Field Service Cloud since the delete API is not available.
- The Resource Usage Details record cannot be complete when crew is in Offline mode as it needs the Oracle Integration Cloud connectivity to complete. Once the crew is Online, the details can be submitted.
- If the WACS_OFSC_Dispatcher_User_Type.xml is already imported into the environment and pointed to **Resources** < **Admin** user, make sure to remove the reference and user type, and re-import the file. Make sure to take the backup before they are deleted.

  The following error is displayed if the details are not deleted.

Oracle Utilities Work and Asset Management

The known issues pertaining to Oracle Utilities Work and Asset Management in this integration are:

- As part of completion message being sent from Oracle Field Service Cloud with attachments as part of attachmentData, duplicate attachments are being created in service history. This will be resolved part of bug 30630453.
- Once a resource is created in Oracle Utilities Work and Asset Management, for craft, equipment or other resources, the resource type code must not be changed to avoid a mismatch in property enumeration values between Oracle Utilities Work and Asset Management and Oracle Field Service Cloud.

Appendix B

Validation Algorithms

This appendix focuses on the algorithms in inbound communication and completion events.

- Completion Events

Completion Events

The completion events in this integration are as follows:

Activity Type	Completion Events	Required	Algorithm	Description
WD-EXT-ACT	W1-CrAnyServiceHistComplEvtTyp	Optional		Create Any Service History The Required value source xpath needs to be configured: rawMessage/completion/assetLocationAssets/assetLocationAssetList/serviceHistories
	W1-CreateOperationalRead	Optional		Create Operational Reading The required source xpath needs to be configured: rawMessage/completion/assetLocationAssets/assetLocationAssetList/measurements
	W1-MobileUpdateWorkedAssets	Optional		Update Worked Assets The required source xpath needs to be configured: rawMessage/activityId