Oracle Utilities Customer Cloud Service Integration to Oracle Utilities Network Management System

Configuration Guide

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Oracle Utilities Customer Cloud Service Integration to Oracle Utilities Network Management System Configuration Guide

Contents

Preface

Welcome to the Oracle Utilities Customer Cloud Service Integration to Oracle Utilities Network Management System Configuration Guide. This document describes the configurations necessary for the integration to work, and also focuses on the business standpoint of the integration.

The preface includes the following:

Audience

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

- Oracle Utilities Customer Cloud Service
- Oracle Utilities Network Management System

You can also use this document as a reference for implementing the following:

- Oracle Utilities Customer Cloud Service integrations.
- Oracle Utilities Customer Care and Billing and Oracle Utilities Meter Data Management (separate instance) integration.

  Important! For Oracle Utilities Customer Care and Billing and Oracle Utilities Meter Data Management (separate instance) implementations, this document assumes that the direct integration has been configured.

Documentation and Resources

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

Product Documentation

Topic	Description
Oracle Utilities Customer Cloud Service Integration to Oracle Utilities Network Management System documentation	https://docs.oracle.com/en/industries/energy-water/cloud-integrations/index.html
Oracle Utilities Customer Cloud Service documentation	https://docs.oracle.com/en/industries/energy-water/customer-cloud-service/index.html
Oracle Utilities Customer Care and Billing documentation	https://docs.oracle.com/en/industries/energy-water/ccb/index.html
Oracle Utilities Network Management System documentation	https://docs.oracle.com/en/industries/energy-water/network-management-system/index.html

Additional Documentation

Resource	Location
Oracle Integration Cloud Service documentation	https://docs.oracle.com/en/cloud/paas/integration-cloud/index.html
Oracle Support	Visit My Oracle Support regularly to stay informed about updates and patches. The details are provided in Certification Matrix for Oracle Utilities Products (Doc ID 1454143.1).

Resource	Location
Oracle Technology Network (OTN) Latest versions of documents	http://www.oracle.com/technetwork/index.html
Oracle University for training opportunities	http://education.oracle.com/

Updates to Documentation

The complete Oracle Utilities Customer Cloud Service Integration to Oracle Utilities Network Management System documentation set is available from Oracle Help Center at https://docs.oracle.com/en/industries/energy-water/index.html.

Visit My Oracle Support for additional and updated information about the product.

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
OUC2M/C2M	Oracle Utilities Customer to Meter
OUCCS/CCS	Oracle Utilities Customer Cloud Service
OUCCB/CCB	Oracle Utilities Customer Care and Billing
OUNMS/NMS	Oracle Utilities Network Management System
OIC	Oracle Integration Cloud
DVM	Domain Value Map
Edge applications	Applications involved in the integration: • Oracle Utilities Customer Care and Billing (CCB) • Oracle Utilities Network Management System (NMS)
SOAP	Simple Object Access Protocol It is a protocol specification for exchanging structured information in the implementation of Web Services in computer networks.
SA	CCB Service Agreement
SP	CCB Service Point
XSD	A schema definition file
Fuzzy Calls	Trouble Calls that are not initially associated with a customer or device.
UI	User Interface

Chapter 1

Introduction

This chapter provides an overview about the integration between Oracle Utilities Customer Cloud Service and Oracle Utilities Network Management System using Oracle Integration Cloud. It focuses on software requirements, Oracle Integration Cloud, and business standpoint of the integration.

The following topics are included:

Overview of the Integration

Oracle Utilities Customer Cloud Service integration to Oracle Utilities Network Management System helps to manage outage business process between customer information and outage management systems.

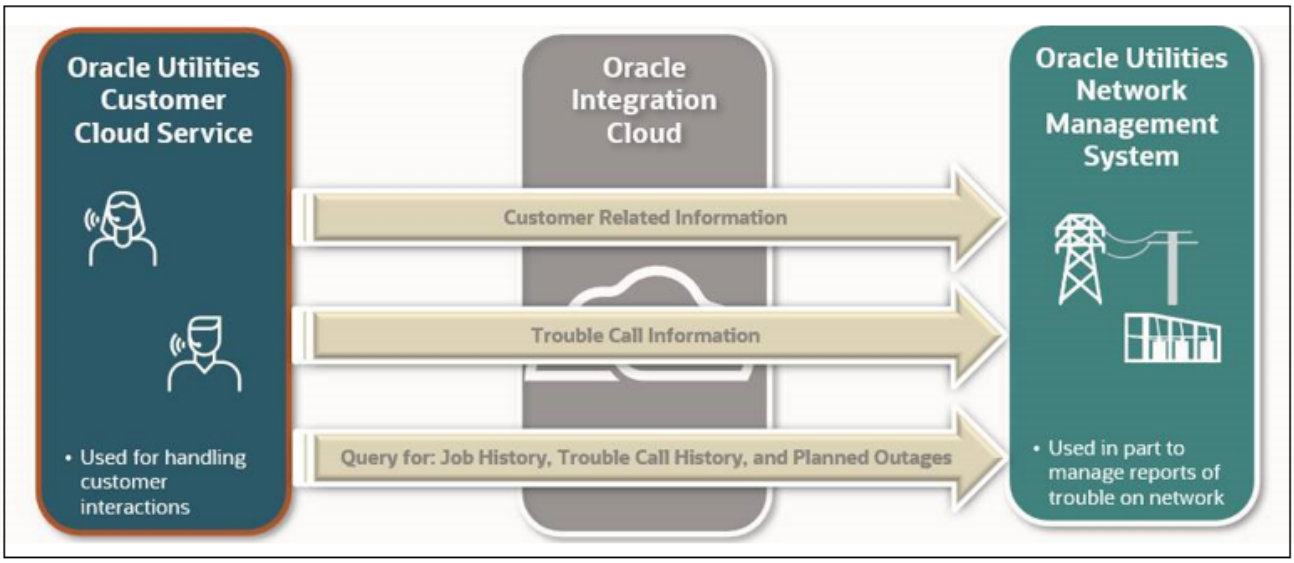
This pre-built integration between the leading applications makes sure the seamless automated flow of outage information. It also makes relevant outage information visible from a single application. Key business processes automated by this integration include synchronization of customer data and trouble calls from Oracle Utilities Customer Cloud Service to Oracle Utilities Network Management System. It also supports the ability to query job history, trouble call history, and planned outages from Oracle Utilities Customer Cloud Service.

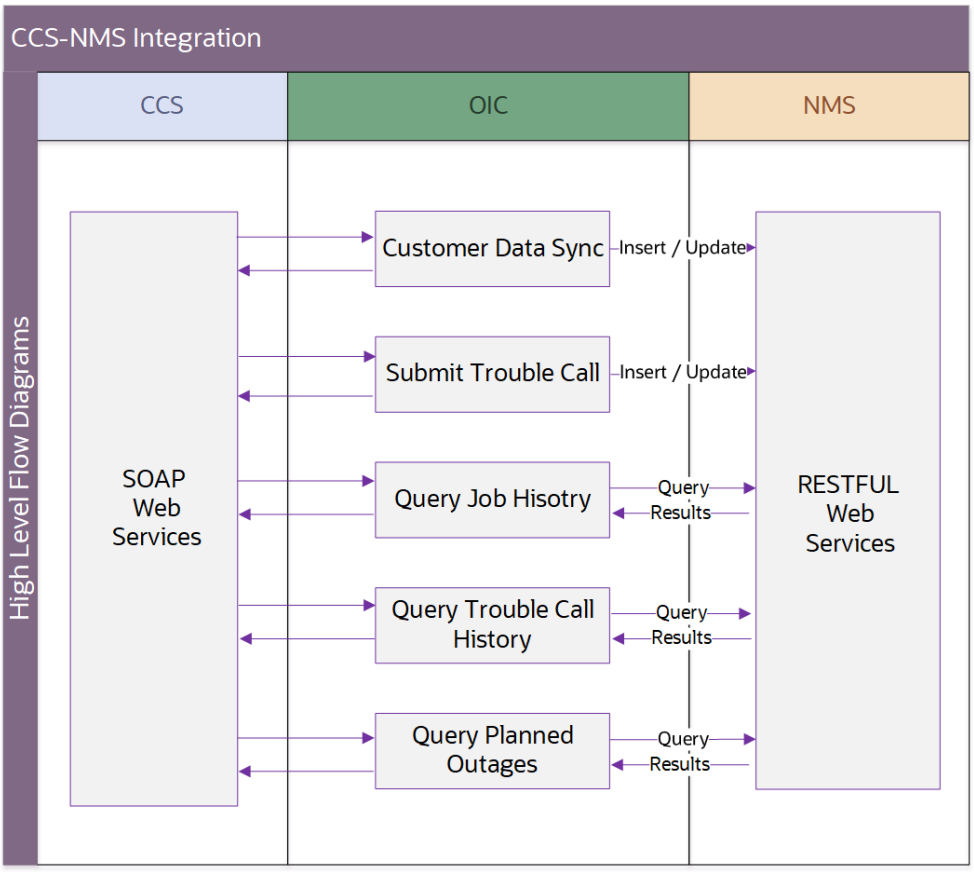
The integration supports the following flows:

- Synchronize customer data: Customer data is synchronized between Oracle Utilities Customer Cloud Service and Oracle Utilities Network Management System. To view customer information in Oracle Utilities Network Management System, only current information is required to associate customers with service location and supply nodes in the network data model.
- Send trouble calls to Oracle Utilities Network Management System: Capture trouble calls created or updated in Oracle Utilities Customer Cloud Service and send to Oracle Utilities Network Management System. The integration handles both trouble calls created for a particular customer with a known service point as well as "fuzzy" calls that are not initially associated with a customer or device.
- Query trouble calls: Query trouble calls that were placed by a particular customer or caller in Oracle Utilities Network Management System and display the results in Oracle Utilities Customer Cloud Service.
- Query job history: Query the current or recent Oracle Utilities Network Management System jobs that impact a particular customer and display the results in Oracle Utilities Customer Cloud Service.
- Query planned outages: Query planned outage jobs in Oracle Utilities Network Management System impacting a particular customer and display the results in Oracle Utilities Customer Cloud Service.
- Common Error Handler: In the existing integration flows, the alert notification is used to send an email with the detailed format. However, the same alert notification needs to add where ever we want to send an notification in integration flow.

  Moreover, this alert notification is added in every fault condition like remote or business or technical fault, and also in global fault handler and scope fault handlers.

The following diagram shows the business processes that are supported in this integration product:





About Oracle Utilities Customer Cloud Service (CCS)

Oracle Utilities Customer Cloud Service is a central repository for customer information (such as name, address, and phone number) that manages all aspects of the utility customer lifecycle, including service connections, trouble calls and outages.

About Oracle Utilities Network Management System (NMS)

Oracle Utilities Network Management System processes trouble calls from customers and analyzes them to determine probable outage locations. It can generate estimated restoration times (ERTs) that can then be provided back to customers.

Oracle Utilities Network Management System also keeps a history of all of the customer calls that were entered in the system, as well as a history of all events that were known to affect a customer even if the customer did not call in. In addition to responding to unplanned outages and non-outage problems, Oracle Utilities Network Management System can help a utility plan maintenance work or new construction that may impact existing customers. When the detailed switching plans are generated in Oracle Utilities Network Management System, information can be provided to customers about planned outages that will impact them.

About Oracle Integration Cloud (OIC)

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

Using the 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 following software is required for the integration to work:

- Oracle Utilities Customer Cloud Service
- Oracle Integration Cloud
- Oracle Utilities Network Management System

For specific application versions, refer to the *Oracle Utilities Customer Cloud Service Integration to Oracle Utilities Network Management System Release Notes* included in this release.

The complete documentation for this release is available on the Oracle Energy and Water Integrations page on Oracle Help Center.

Chapter 2

Solution Architecture

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

- Integration Processes

Integration Processes

This section provides detailed process and technical overviews of each of the business processes facilitated by the integration. These include the following:

- Customer Data Synchronization Process
- Trouble Call Entry Process
- Job History Query Process
- Call History Query Process
- Planned Outages Query Process
- Global Error Handler

Customer Data Synchronization Process

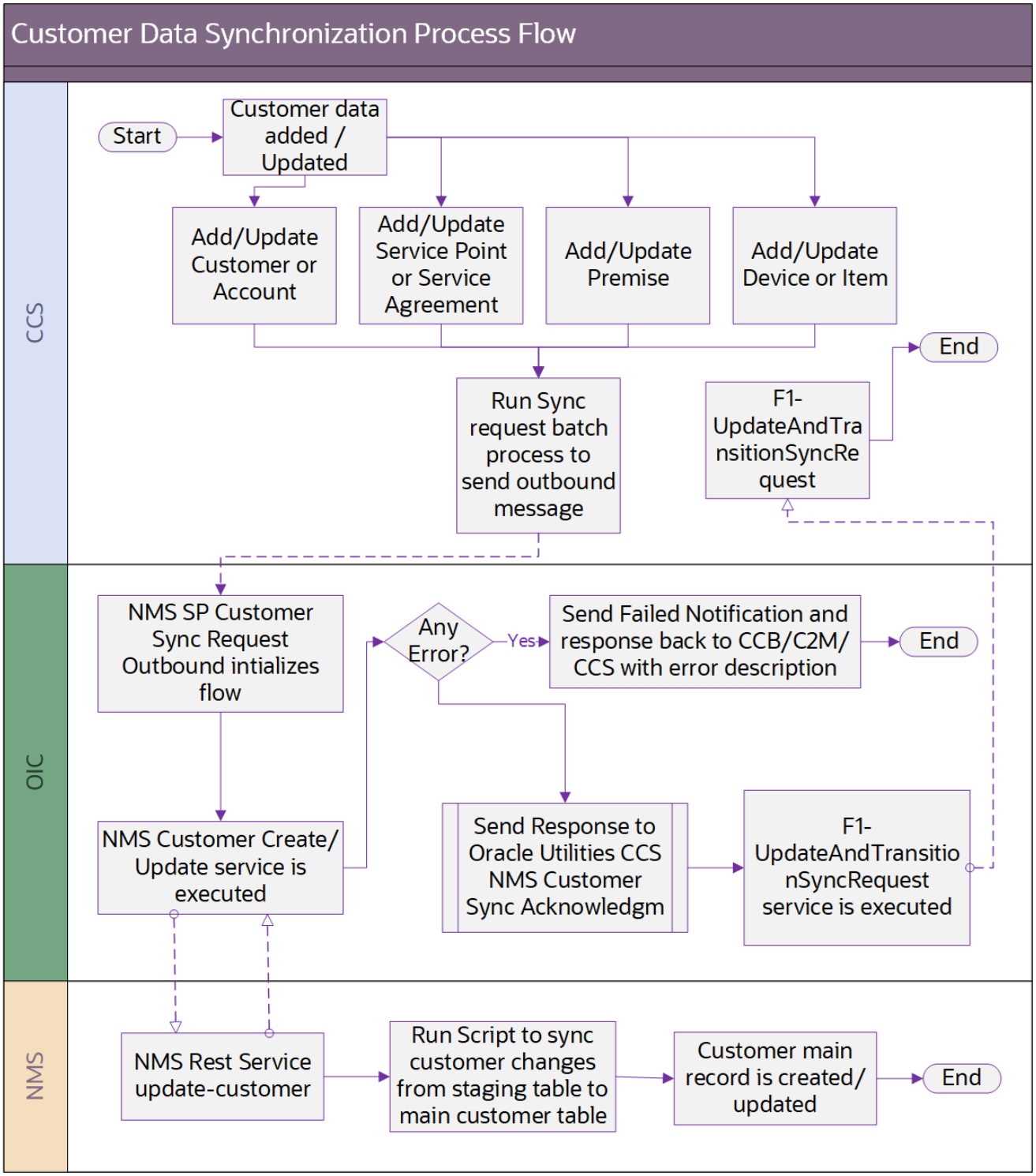
Customer data is synchronized in one direction from Oracle Utilities Customer Cloud Service to Oracle Utilities Network Management System to support the following functionality.

Supported Functionality

This integration point supports the following functionalities:

- Sends customer data from Oracle Utilities Customer Cloud Service to Oracle Utilities Network Management System.
- Initial Sync (or Full Initial Load): It is the first data load to create a Customer Data model in Oracle Utilities Network Management System.
- Incremental Sync: The changes since the last synchronization to the customer information in Oracle Utilities Customer Cloud Service are sent to Oracle Utilities Network Management System overwriting the last synchronized information.
- Only relevant and current electric customer data which is stored and maintained in Oracle Utilities Customer Cloud Service and that is needed to create the Oracle Utilities Network Management System customer model is synchronized. This involves getting data from the Person, Account, Premise, Service Point, Facility, Service Agreement, and Device tables in Oracle Utilities Customer Cloud Service.

The following diagram shows a graphical representation of the Customer Data Synchronization process:



Creation and Update of Customer Data

Customer information is created and updated in Oracle Utilities Customer Cloud Service and this application is always the owner of customer data. Customer information must be kept up to date in Oracle Utilities Network Management System so that outage

information can be properly synchronized with the appropriate customers and service points.

Initial Synchronization/Incremental Updates

At the start of the implementation, the current customer data is synchronized from Oracle Utilities Customer Cloud Service to Oracle Utilities Network Management System by batch processing which is run on initial load from Oracle Utilities Customer Cloud Service. Oracle Utilities Customer Cloud Service then keeps the data in synchronization with Oracle Utilities Network Management System using periodic incremental updates.

Oracle Utilities Customer Cloud Service sends one message to every customer that needs to be synchronized in Oracle Utilities Network Management System. This message contains the entire customer related data load or updates for the customer relevant to Oracle Utilities Network Management System (person, account, premise, SP, SA, meter/item information).

Only current customer information from Oracle Utilities Customer Cloud Service is synchronized when the following criteria is satisfied:

- "The customer has an active or pending stopped service agreement (SA)
- "The SA has an effective SA/SP link
- "The SP linked to the SA is connected and in service

When Oracle Utilities Customer Cloud Service sends an update to Oracle Utilities Network Management System, the message may contain customer data with meter information or customer data with the item information.

Meter Information Updates

Messages containing the customer data with meter information are processed and sent to Oracle Utilities Network Management System.

Inactive Customer Data

When a customer becomes inactive in Oracle Utilities Customer Cloud Service, this information is sent so that Oracle Utilities Network Management System can mark the customer as inactive. This update only indicates that the customer is inactive, but does not provide details regarding whether the customer is inactive due to disconnection of service, for non-payment or if the customer has moved out.

Integration Process and Technical Details

This integration point supports asynchronous data synchronization from Oracle Utilities Customer Cloud Service to Oracle Utilities Network Management System.

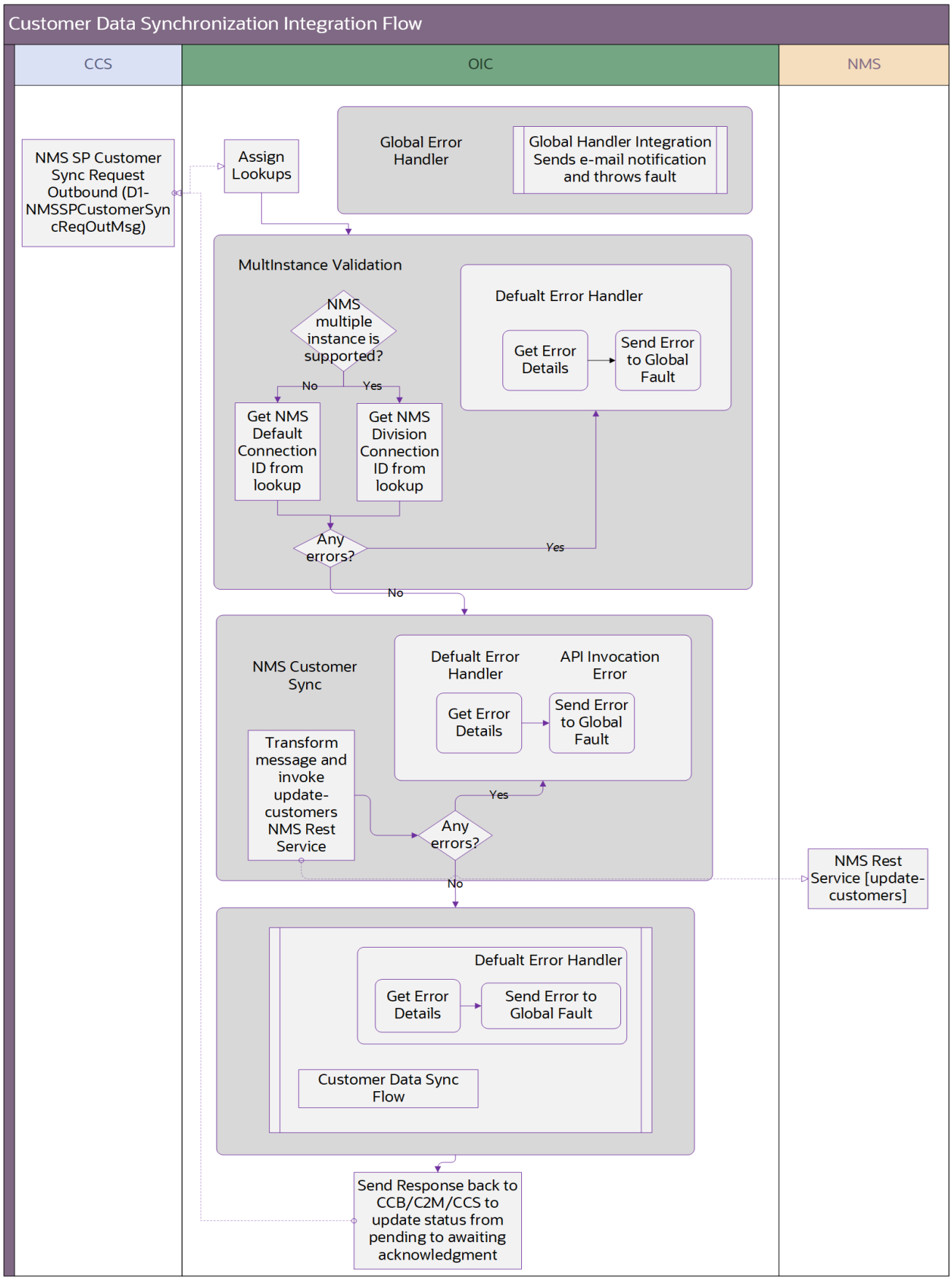
Following are the assumptions in this integration:

- Device information for each customer or service point must be setup in Oracle Utilities Customer Cloud Service first before the customer synchronization batch is run. Device ID used in Oracle Utilities Customer Cloud Service must be in the Oracle Utilities Network Management System Supply Nodes table. Oracle Utilities Customer Cloud Service stores the device information in the SP Facility record and Oracle Utilities Network Management System stored it in Device ID.
- The Oracle Utilities Customer Cloud Service Customer Data synchronization is driven by SP and the data to be synchronized to Oracle Utilities Network Management System can be filtered by SP Type(s). The Oracle Utilities Customer Cloud Service NMS Sync Integration master configuration filters the

data to be synchronized by SP Type. Implementation teams can configure the SP Type(s) that need to be synchronized in the master configuration and only those specified are synchronized over to Oracle Utilities Network Management System. In a multi CIS Division environment supporting separate Oracle Utilities Network Management System instances per division, implementation teams can also configure the SP Type(s) that need to be synchronized by division. If nothing is specified in the master configuration, all SP Types are synchronized over.

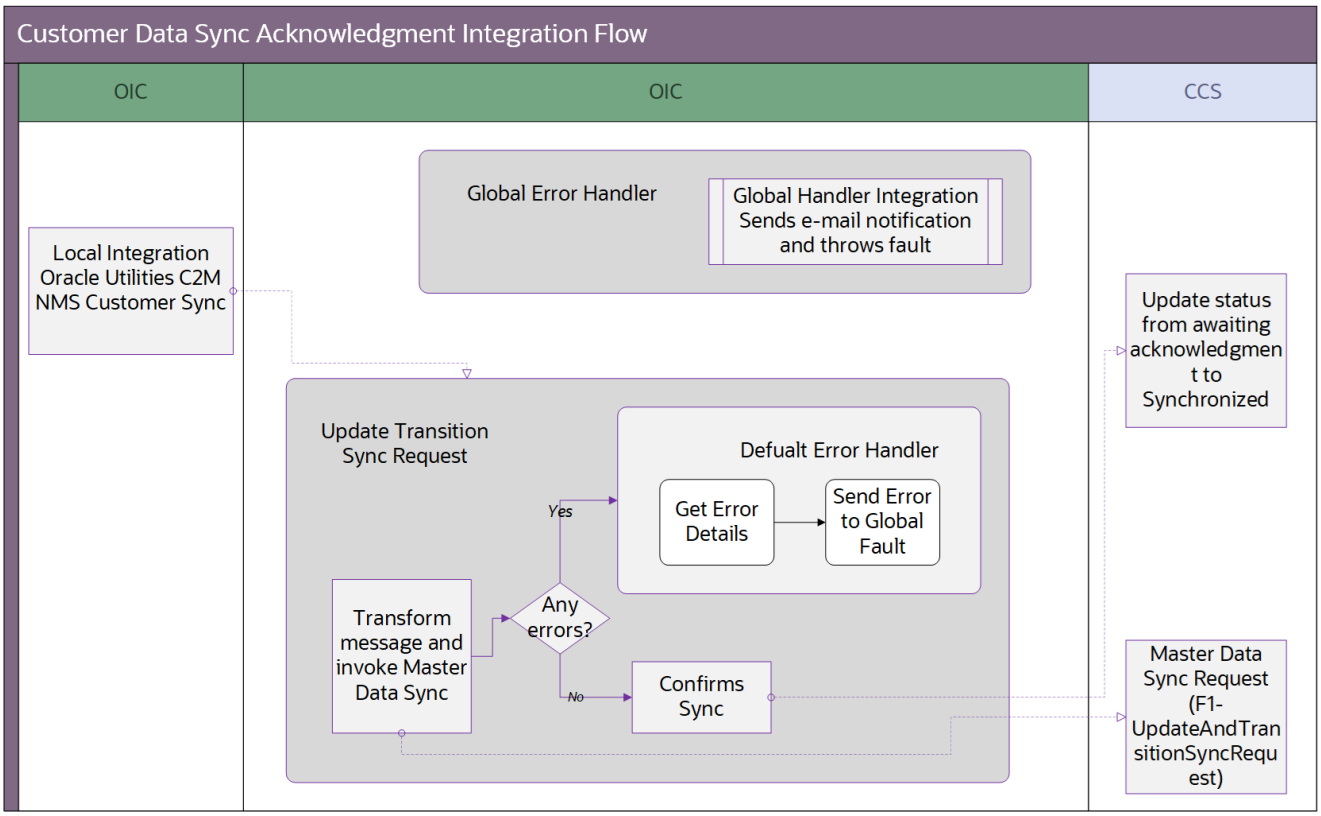
First Flow

- Oracle Utilities Customer Cloud Service sends a SOAP outbound message to trigger Oracle Integration Cloud integration.
- Verifies if the NMS.MultipleInstance multi-instance flag is set to 'false' or 'true' from the OUTL-BRT-CCS_NMS_ConfigProps lookup. If 'false', it will set the instance as DEFAULT from the lookup.
- Prepares and transforms message data to call Oracle Utilities Network Management System Restfull service update-customers.
- Upon successful response from Oracle Utilities Network Management System, integration will publish message to Customer Sync Acknowledment with synchronization request ID.


Customer Data Synchronization Integration Flow
CCS
OIC
NMS
NMS SP Customer Sync Request Outbound (D1-NMSSPCustomerSyncReqOutMsg)
Assign Lookups
Global Error Handler
Global Handler Integration Sends e-mail notification and throws fault
MultInstance Validation
NMS multiple instance is supported?
No
Yes
Get NMS Default Connection ID from lookup
Get NMS Division Connection ID from lookup
Any errors?
Yes
No
Defualt Error Handler
Get Error Details
Send Error to Global Fault
NMS Customer Sync
Transform message and invoke update-customers NMS Rest Service
Any errors?
Yes
No
Defualt Error Handler
API Invocation Error
Get Error Details
Send Error to Global Fault
NMS Rest Service [update-customers]
Defualt Error Handler
Get Error Details
Send Error to Global Fault
Customer Data Sync Flow
Send Response back to CCB/C2M/CCS to update status from pending to awaiting acknowledgment

Second Flow

- Customer Data Sync Acknowledgment Integration Flow will recieve message from Customer Data Sync.
- Transforms data and calls the F1-UpdateAndTransitionSyncRequest SOAP web service to acknowledge successfull customer synchronization to Oracle Utilities Customer Cloud Service.



Trouble Call Entry Process

This process is a real-time synchronous interface of the trouble calls created in Oracle Utilities Customer Cloud Service.

Oracle Utilities Network Management System is the central repository for trouble calls. However, trouble calls may originate in Oracle Utilities Customer Cloud Service and these trouble calls are sent to Oracle Utilities Network Management System.

Mapping

Trouble code mapping must be synchronized between the edge applications so that the trouble code sent from Oracle Utilities Customer Cloud Service is interpreted similarly when the trouble code is received by Oracle Utilities Network Management System.

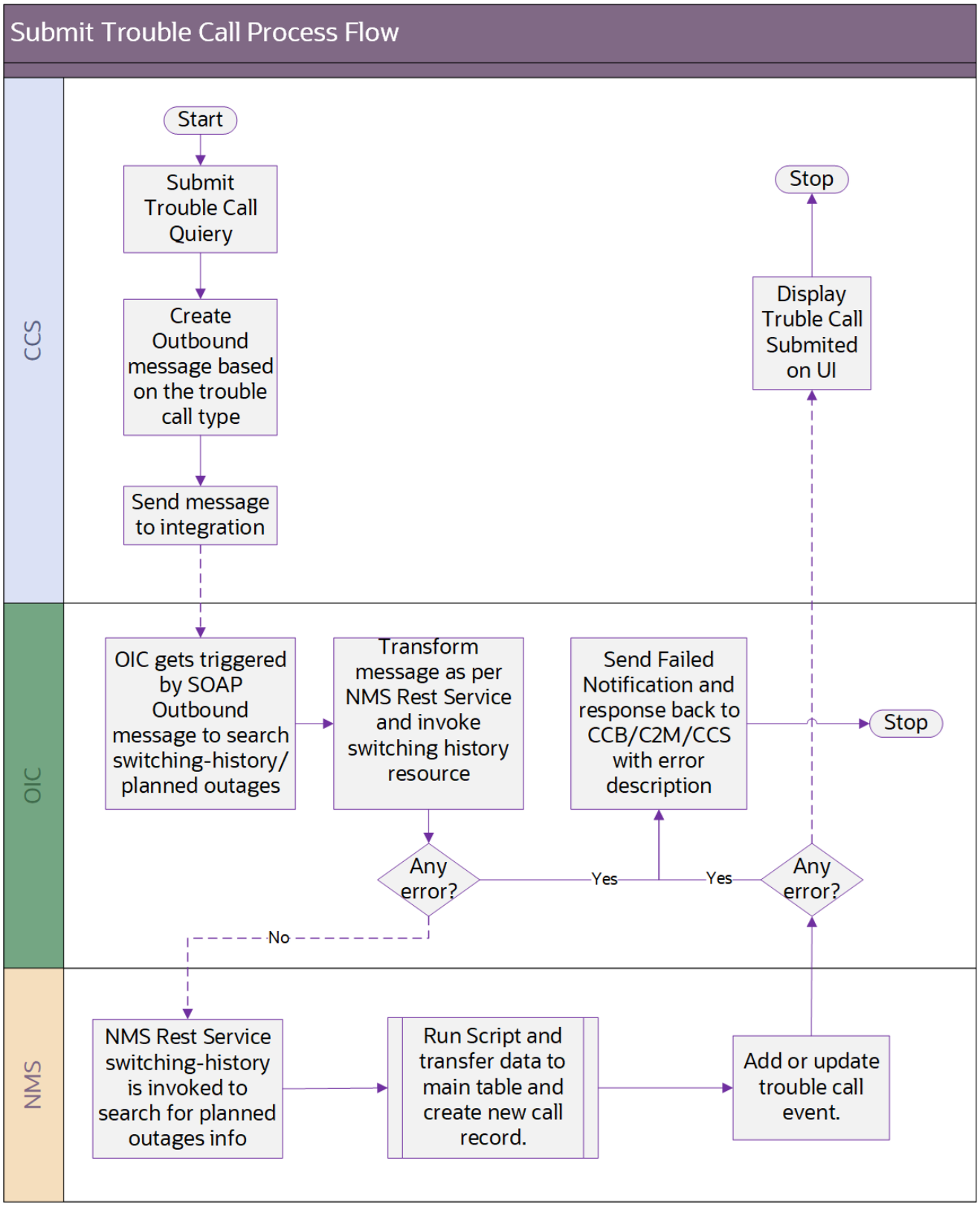
Refer to the *Data Mapping Guide* included in this release for more details.

Supported Functionality

The integration point supports the following functionalities:

- Transmit to Oracle Utilities Network Management System trouble calls created in Oracle Utilities Customer Cloud Service.
- The following types of calls are interfaced:
  - Electric trouble calls for a particular customer (known premise/service point)
  - Fuzzy calls. When a fuzzy call is created, at least one of the following call identifiers must be provided:
    - The caller's name.
    - The caller's phone number.
    - The caller's ID (911 reference ID provided by the caller (911)).
    - Location must also be provided. A location can be any of the following:
      - Street intersection (provide two street names).
      - Street segment (provide a block number and a street name).
      - City and State are optional.

The following process diagram shows a graphical representation of the trouble call entry process:



New Trouble Calls Created in Oracle Utilities Customer Cloud Service

When a trouble call is created in Oracle Utilities Customer Cloud Service, the contact name and contact phone passed to Oracle Utilities Network Management System are not always used as the customer name and customer phone stored in the incident record.

If the Generic IVR Adapter, which processes trouble calls received from Oracle Utilities Customer Cloud Service, is run with the 'command line option '-docustquery' for customers that exist in the Oracle Utilities Network Management System Customer Model, the system uses the customer name and customer phone stored in the Oracle Utilities Network Management System customer model rather than the contact name and contact phone coming from Oracle Utilities Customer Cloud Service.

Updating Phone Numbers

When Oracle Utilities Customer Cloud Service passes a contact phone to the integration layer, the integration layer removes all delimiters and characters, and only passes the numeric value to Oracle Utilities Network Management System.

Integration Process and Technical Details

This integration point supports trouble calls created or updated in Oracle Utilities Customer Cloud Service and sent to Oracle Utilities Network Management System with the following processing:

- When a trouble call is created in Oracle Utilities Customer Cloud Service as a Service Task, a synchronous xml message is sent to the OIC Integration flow. It transforms the message to the equivalent Oracle Utilities Network Management System field format and invokes the submit call REST Service to insert/update the trouble call information in the Oracle Utilities Network Management System Trouble Calls table.
- The Oracle Utilities CCS NMS Submit Calls process handles the following:
  - Request Message transformation from the source (CCS) to the target (NMS) application format.
  - Insert/Update of trouble calls in the Trouble Calls table using a REST Adapter to interact with the Oracle Utilities Network Management System to invoke the Oracle Utilities Network Management System trouble calls Rest Service submit- calls that inserts/updates the trouble call record to the Trouble Calls table.

Successful Update

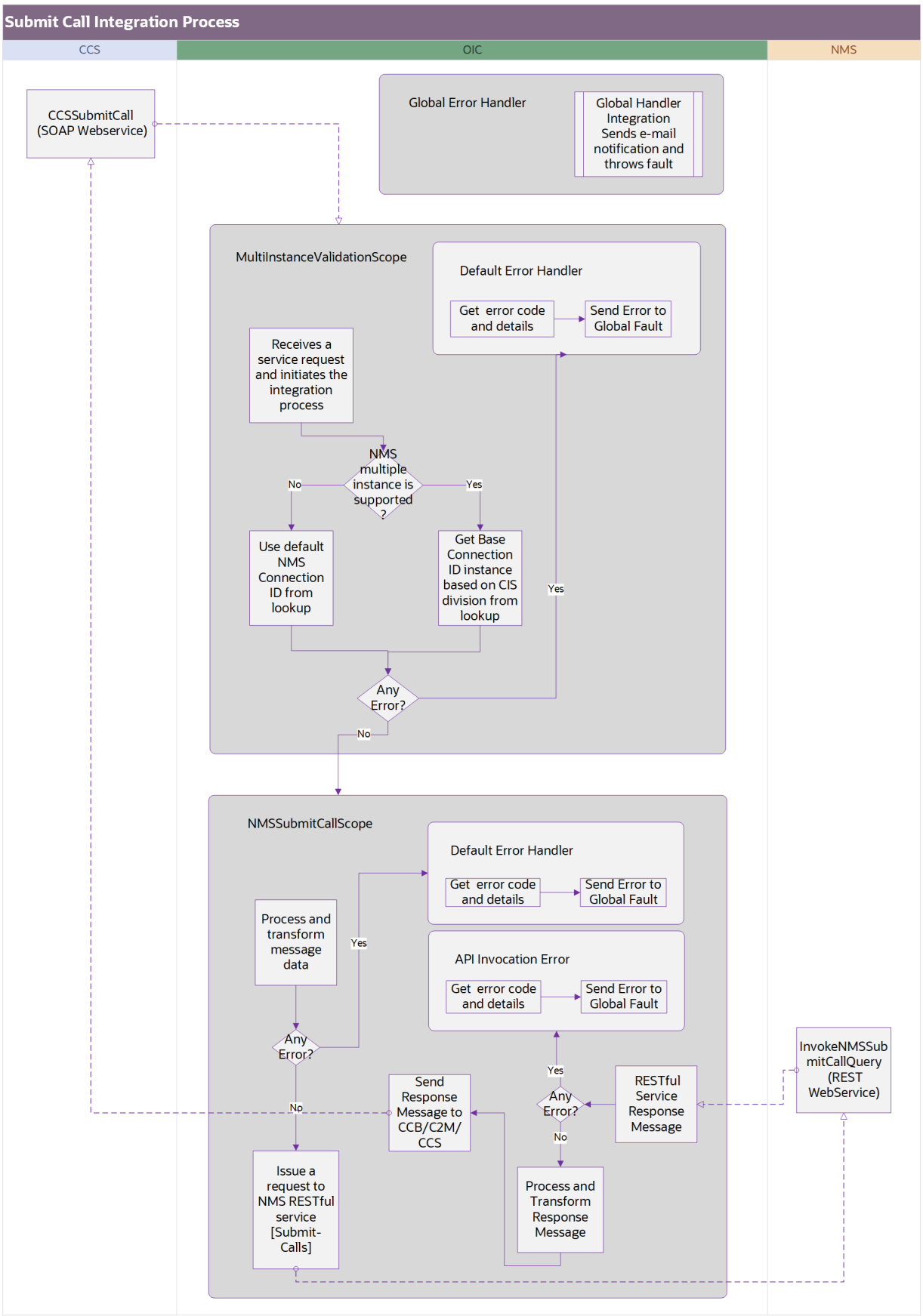
When the Oracle Utilities Network Management System tables are successfully updated, the integration layer sends a positive acknowledgment to the Oracle Utilities Customer Cloud Service.

Error Scenario

Considering the two scopes in this integration, there are three different error handlers:

- Multi-Instance Default Handler: Using the Default Handler, the Fault Object is stored in a Logger allowing us to send the Error Code, Reason, and Details to the Global Fault.

- API Invocation Error: Using the API Invocation Error, the Current Fault Object is stored in a Logger allowing us to send the Type, Title, Detail, Error Code, and Error Details (type, instance, title, errorPath, errorCode) to the Global Fault.
- Call HistoryDefault Handler: Using the Default Handler, the Fault Object is stored in a Logger allowing us to send the Error Code, Reason, and Details to the Global Fault.
- Global Fault: Using the Re-throw fault action, the global fault receives each type of error, and using an integration sends an email with the details to the specific users. For more details about the functionality, refer to the Global Error Handler section.


Submit Call Integration Process
CCS
OIC
NMS
CCSSubmitCall (SOAP Webservice)
Global Error Handler
Global Handler Integration Sends e-mail notification and throws fault
MultiInstanceValidationScope
Default Error Handler
Get error code and details
Send Error to Global Fault
Receives a service request and initiates the integration process
NMS multiple instance is supported ?
No
Yes
Use default NMS Connection ID from lookup
Get Base Connection ID instance based on CIS division from lookup
Yes
Any Error?
No
NMSSubmitCallScope
Default Error Handler
Get error code and details
Send Error to Global Fault
Process and transform message data
Yes
API Invocation Error
Get error code and details
Send Error to Global Fault
Any Error?
Yes
No
Send Response Message to CCB/C2M/ CCS
Any Error?
RESTful Service Response Message
InvokeNMSSubmitCallQuery (REST WebService)
No
Issue a request to NMS RESTful service [Submit-Calls]
Process and Transform Response Message

Integration Service

These values are cross referenced in the **Service Configurations** section.

Name	Description
OUTL-BA-CCS_NMS_SUBMIT_CALLS	This process is a real-time synchronous interface of the trouble calls created in Oracle Utilities Customer Cloud Service. Oracle Utilities Network Management System is the central repository for trouble calls. However, trouble calls may originate in Oracle Utilities Customer Cloud Service and these trouble calls are sent to Oracle Utilities Network Management System.

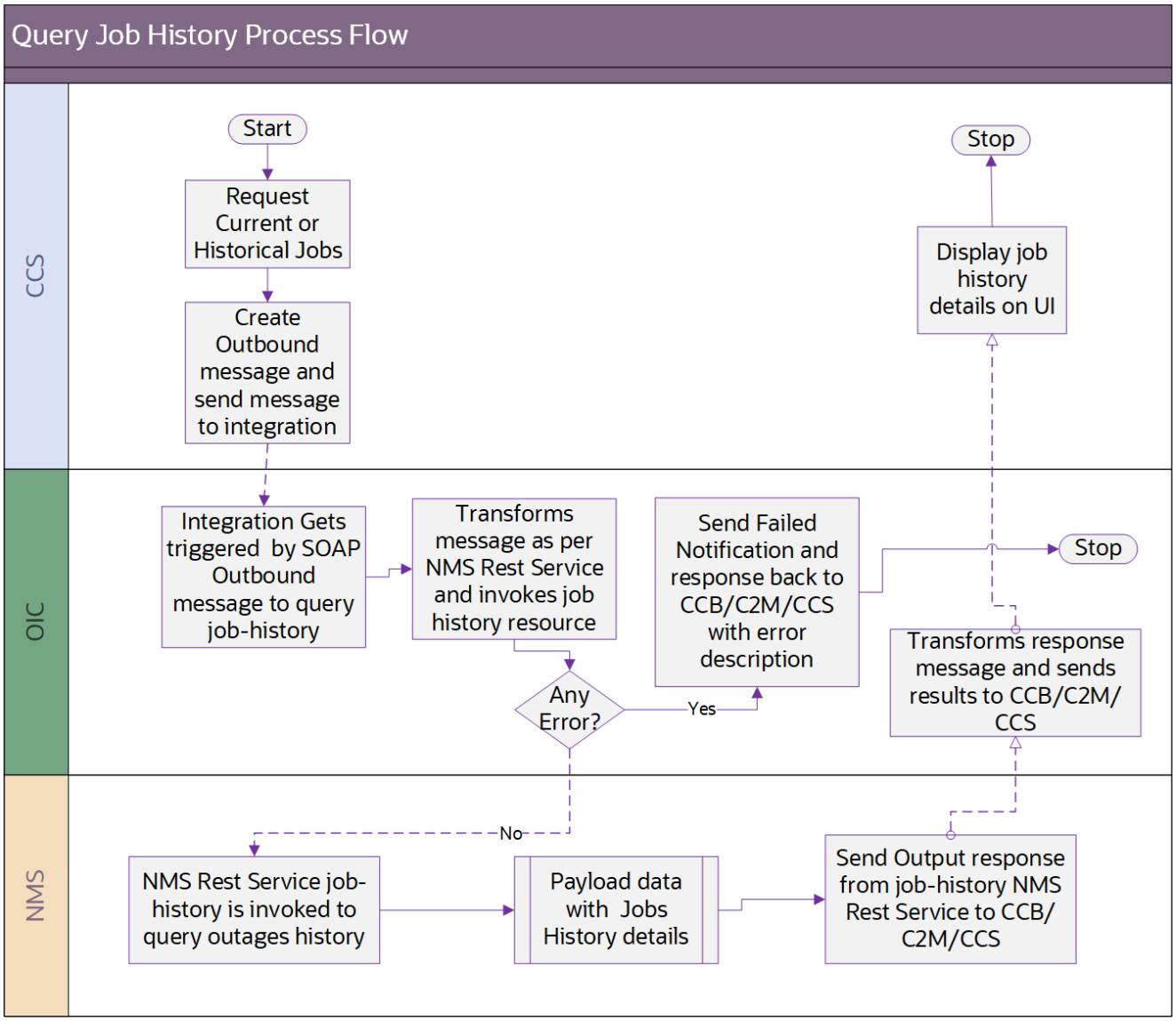
Adapter Services

Name	Description
Oracle Utilities SOAP CCS for CCS-NMS	Oracle utilities adapter connection of Oracle Utilities Customer Cloud Service for the integration.
Oracle Utilities REST NMS for CCS-NMS	Oracle utilities adapter connection of Oracle Utilities Network Management System for the integration.
Oracle Utilities REST for CCS-NMS	Oracle utilities adapter connection common error handler for the integration.

Job History Query Process

This process is a real-time synchronous interface between Oracle Utilities Customer Cloud Service and Oracle Utilities Network Management System. It efficiently retrieves job history information from Oracle Utilities Network Management System for a particular customer, location, or call identifier, and displays the results back in Oracle Utilities Customer Cloud Service.

Refer to the **Job History Query Process** section for message mapping information for this integration point.



Supported Functionality

Oracle Utilities Customer Cloud Service transmits query information as XML messages that are processed and transformed by Oracle Integration Cloud before being sent to Oracle Utilities Network Management System. Oracle Utilities Network Management System then generates a Trouble Job History based on the provided input criteria. The response is subsequently transformed by Oracle Integration Cloud and sent back to Oracle Utilities Customer Cloud Service.

The number of days to get the job history is taken from the OUTL-BRT-CCS_NMS_ConfigProps lookup if the Outage Integration Parameters in the Master Configuration: NMS Outage Integration Master Config are empty.

Based on the search/query type, Oracle Integration Cloud will search by the ID's or Location search identifiers. The parameters can be any of the following:

- Location search identifiers:
  - Location Type
  - Street Name and Cross Street Name
  - City or State
- ID identifiers:
  - Account ID
  - Premise ID
  - SP ID
  - Call Ref ID
  - Contact name and number
  - Outage Call ID

Based on the search/query type, Oracle Utilities Network Management System will show the payload. The search data could be by Account/Premise, Location, or Fuzzy Call.

> **Note**: Fuzzy Call can find the trouble call details for a fuzzy call (calls that are not associated with a customer or with a device in Oracle Utilities Network Management System). Search by any of the following call identifiers:
>
> - Caller's Name
> - Caller's Phone Number
> - Call Identifier Number (911 Call Identifier)
> - External ID (Outage Call ID in Oracle Utilities Customer Cloud Service or IVR ID)

Assumptions

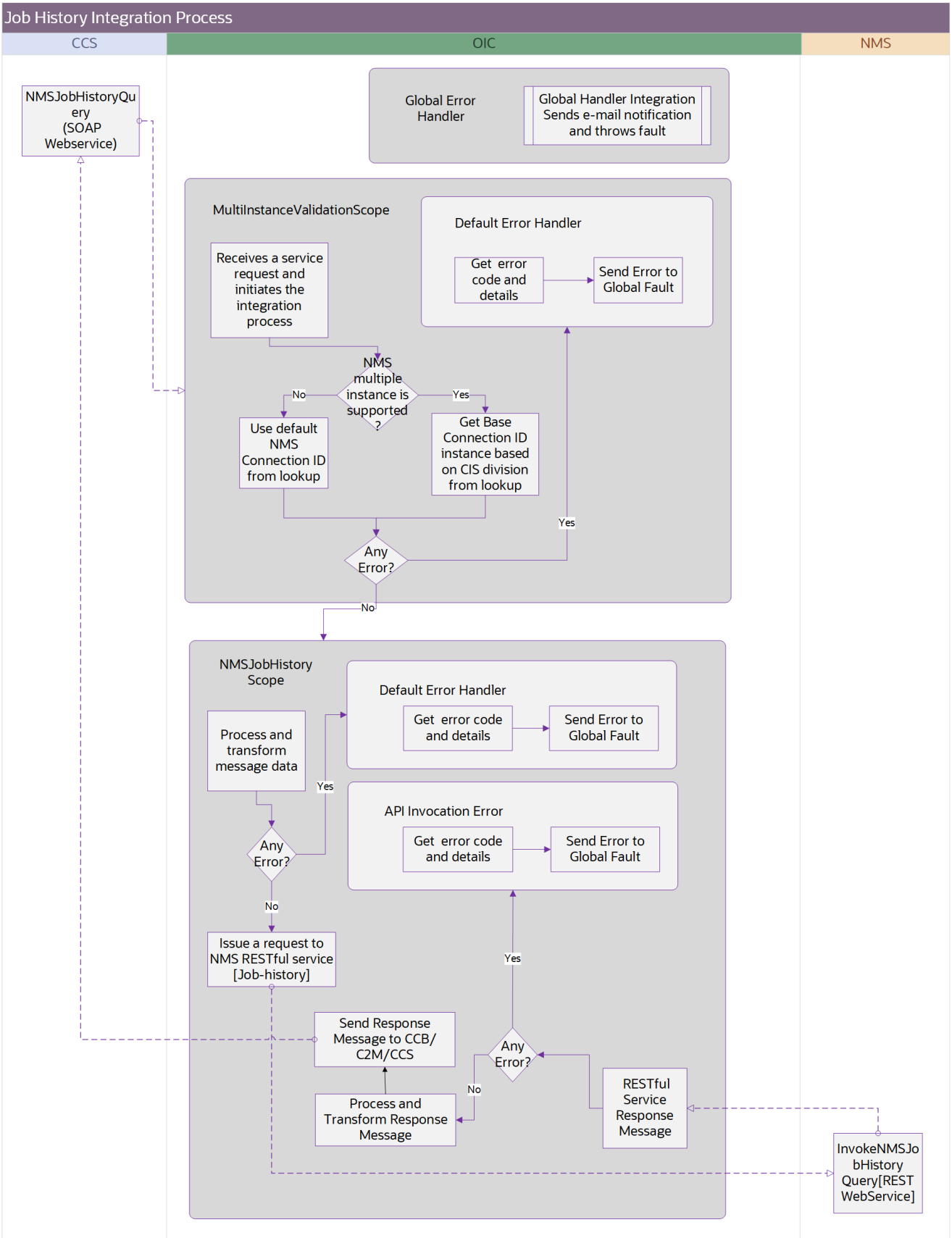
When searching Trouble Job History by contact phone, the integration layer removes all delimiters and characters from the contact phone that Oracle Utilities Customer Cloud Service passes to the integration and only passes the numeric value to Oracle Utilities Network Management System.

To make the name search and street name search compatible, a wildcard character (%) must be added at the end of the value.

Example: Smith%

Integration Process and Technical Details

This process is a real-time synchronous interface from Oracle Utilities Customer Cloud Service to retrieve the Trouble Job History information from Oracle Utilities Network Management System for a particular customer, location, or call identifier, and display the results back in Oracle Utilities Customer Cloud Service.


Job History Integration Process
CCS
OIC
NMS
NMSJobHistoryQuery (SOAP Webservice)
Global Error Handler
Global Handler Integration Sends e-mail notification and throws fault
MultiInstanceValidationScope
Default Error Handler
Receives a service request and initiates the integration process
Get error code and details
Send Error to Global Fault
NMS multiple instance is supported ?
No
Yes
Use default NMS Connection ID from lookup
Get Base Connection ID instance based on CIS division from lookup
Yes
Any Error?
No
NMSJobHistory Scope
Default Error Handler
Process and transform message data
Get error code and details
Send Error to Global Fault
Yes
API Invocation Error
Any Error?
Get error code and details
Send Error to Global Fault
No
Issue a request to NMS RESTful service [Job-history]
Yes
Send Response Message to CCB/ C2M/CCS
Any Error?
No
Process and Transform Response Message
RESTful Service Response Message
InvokeNMSJobHistory Query[REST WebService]

Integration Details

- Receives the SOAP outbound message from Oracle Utilities Customer Care and Billing/Oracle Utilities Customer Cloud Service/Oracle Utilities Customer to Meter.
- From the payload, the Call Source ID is captured and gets value for the Oracle Utilities Network Management System instance from the OUTL-BRT-CCS_NMS_ConfigProps lookup.
- From the payload, the CIS division is captured and gets value for the Oracle Utilities Network Management System instance from the OUTL-BRT-CCS_NMS_INSTANCE lookup, and with a stitch function, the CIS division ID is stored in a global function.
- The request message is processed and transformed to the equivalent Oracle Utilities Network Management System input fields that will be used by job history.
- Requests mapping from Oracle Utilities Customer Cloud Service elements to the Oracle Utilities Network Management System Job History RESTful service.
- Oracle Utilities Network Management System output data from the call history RESTfull service is processed and the call history response from Oracle Utilities Network Management System is transformed and stored in a global object called G-NMSJobHistoryResult and sent back to the Oracle Utilities Customer Care and Billing/Oracle Utilities Customer Cloud Service/Oracle Utilities Customer to Meter UI.

Error Scenario

Considering the 2 scopes in this integration, there are 3 different error handlers:

- Multi-Instance Default Handler: Using the Default Handler, the Fault Object is stored in a Logger allowing us to send the Error Code, Reason, and Details to the Global Fault.
- API Invocation Error: Using the API Invocation Error the Current Fault Object is stored in a Logger allowing us to send the Type, Title, Detail, Error Code, and Error Details (type, instance, title, errorPath, errorCode) to the Global Fault.
- Call HistoryDefault Handler: Using the Default Handler, the Fault Object is stored in a Logger allowing us to send the Error Code, Reason, and Details to the Global Fault.
- Global Fault: Using the re-throw fault action, global fault receives each type of error, and using an integration, sends an email with the details to the specific users. For more details, refer to the Global Error Handler section.

Integration Service

These values are cross referenced in the **Service Configurations** section.

Name	Description
OUTL-BA-CCS_NMS_JOB_HISTORY	This process is a real-time synchronous interface of the trouble calls created in Oracle Utilities Customer Cloud Service. Oracle Utilities Network Management System is the central repository for trouble calls. However, trouble calls may originate in Oracle Utilities Customer Cloud Service and these trouble calls are sent to Oracle Utilities Network Management System.

Adapter Services

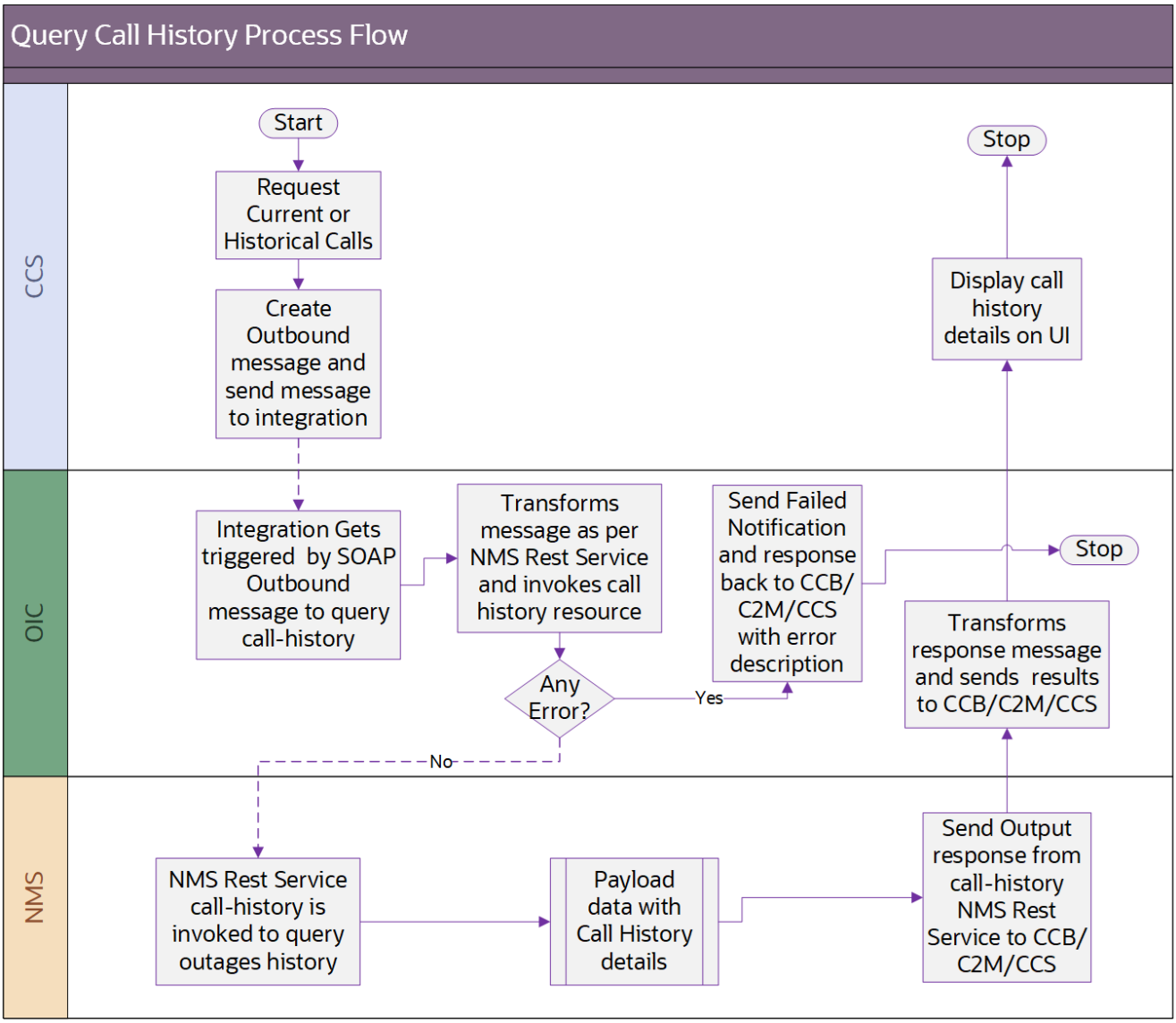
Name	Description
Oracle Utilities SOAP CCS for CCS-NMS	Oracle utilities adapter connection of Oracle Utilities Customer Cloud Service for the integration.
Oracle Utilities REST NMS for CCS-NMS	Oracle utilities adapter connection of Oracle Utilities Network Management System for the integration.
Oracle Utilities REST for CCS-NMS	Oracle utilities adapter connection common error handler for the integration.

Call History Query Process

This process is a real-time synchronous interface from Oracle Utilities Customer Cloud Service to retrieve the trouble call history information from Oracle Utilities Network Management System for a particular customer, location, or call identifier, and display the results back in Oracle Utilities Customer Cloud Service.

Refer to the **Trouble Call History Query Process** section for message mapping information for this integration point.

The following process diagram shows a graphical representation of the Trouble Call History Query process:



Supported Functionality

Oracle Utilities Customer Cloud Service transmits query information as XML messages, that are processed and transformed by Oracle Integration Cloud before being sent to Oracle Utilities Network Management System. Oracle Utilities Network Management System then generates a Trouble Call History based on the provided input criteria. This response is subsequently transformed by Oracle Integration Cloud and sent back to Oracle Utilities Customer Cloud Service.

Number of days to get the job history is taken from the OUTL-BRT-CCS_NMS_ConfigProps lookup if the Outage Integration Parameters in the Master Configuration: NMS Outage Integration Master Config are empty.

Based on the search/query type, Oracle Integration Cloud will search by the ID's or Location search identifiers. The parameters can be any of the following:

- Location search identifiers:
  - Location Type
  - Street Name and Cross Street Name
  - City or State
- ID identifiers:
  - Account ID
  - Premise ID
  - SP ID
  - Call Ref ID
  - Contact name and number
  - Outage Call ID

Based on the search/query type, Oracle Utilities Network Management System will show the payload. The search data could be by Account/Premise, Location, or Fuzzy Call.

> **Note**: Fuzzy Call can find the trouble call details for a fuzzy call (calls that are not associated with a customer or with a device in Oracle Utilities Network Management System). Search by any of the following call identifiers:
>
> - Caller's Name
> - Caller's Phone Number
> - Call Identifier Number (911 Call Identifier)
> - External ID (Outage Call ID in Oracle Utilities Customer Cloud Service or IVR ID)

Assumptions

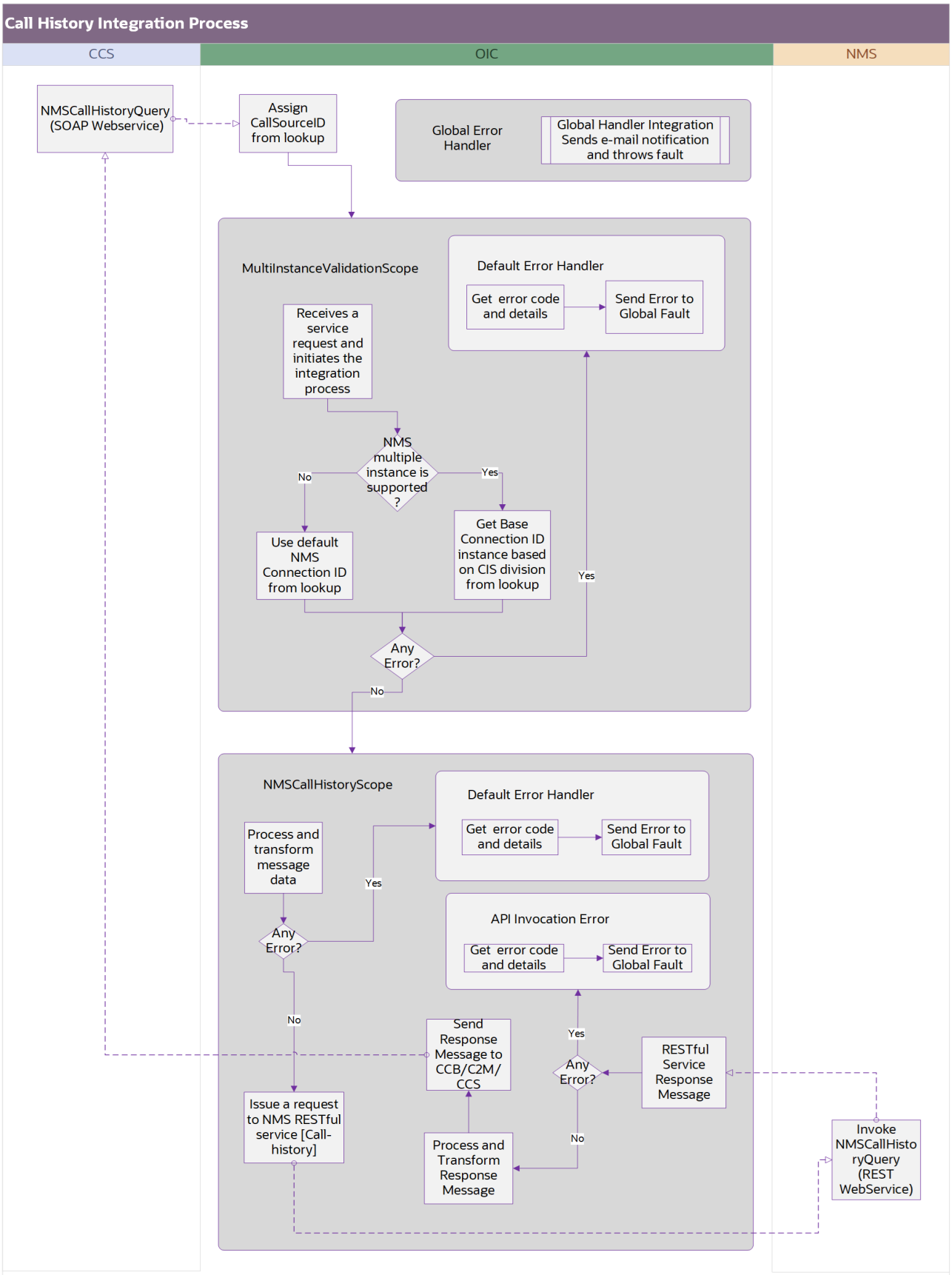
When searching Trouble Call History by contact phone, the integration layer removes all delimiters and characters from the contact phone that Oracle Utilities Customer Cloud Service passes to the integration and only passes the numeric value to Oracle Utilities Network Management System.

To make the name search and street name search compatible, a wildcard character (%) must be added at the end of the value.

Example: Smith%

Integration Process and Technical Details

This process is a real-time synchronous interface from Oracle Utilities Customer Cloud Service to retrieve trouble call history information from Oracle Utilities Network Management System for a particular customer, location, or call identifier, and display the results back in Oracle Utilities Customer Cloud Service.


Call History Integration Process
CCS
OIC
NMS
NMSCallHistoryQuery (SOAP Webservice)
Assign CallSourceID from lookup
Global Error Handler
Global Handler Integration Sends e-mail notification and throws fault
MultiInstanceValidationScope
Default Error Handler
Get error code and details
Send Error to Global Fault
Receives a service request and initiates the integration process
NMS multiple instance is supported ?
No
Yes
Use default NMS Connection ID from lookup
Get Base Connection ID instance based on CIS division from lookup
Yes
Any Error?
No
NMSCallHistoryScope
Default Error Handler
Get error code and details
Send Error to Global Fault
Process and transform message data
Yes
Any Error?
API Invocation Error
Get error code and details
Send Error to Global Fault
No
Send Response Message to CCB/C2M/ CCS
Yes
Any Error?
RESTful Service Response Message
Issue a request to NMS RESTful service [Call-history]
Process and Transform Response Message
No
Invoke NMSCallHistoryQuery (REST WebService)

Integration Details

- Receives the SOAP outbound message from Oracle Utilities Customer Cloud Service/Oracle Utilities Customer to Meter.
- From the payload, the Call Source ID is captured and gets value for the Oracle Utilities Network Management System instance from the OUTL-BRT-CCS_NMS_ConfigProps lookup.
- From the payload, the CIS division is captured and gets value for the Oracle Utilities Network Management System instance from the OUTL-BRT-CCS_NMS_INSTANCE lookup, and with a stitch function, the CIS division ID is stored in a global function.
- The request message is processed and transformed to the equivalent Oracle Utilities Network Management System input fields that will be used by job history.
- Requests mapping from Oracle Utilities Customer Cloud Service elements to the Oracle Utilities Network Management System Job History RESTful service.
- Oracle Utilities Network Management System output data from the call history RESTfull service is processed and the call history response from Oracle Utilities Network Management System is transformed and stored in a global object called G-NMSJobHistoryResult and sent back to the Oracle Utilities Customer Cloud Service/Oracle Utilities Customer to Meter UI.

Error Scenario

Considering the 2 scopes in this integration, there are 3 different error handlers:

- Multi-Instance Default Handler: Using the Default Handler, the Fault Object is stored in a Logger allowing us to send the Error Code, Reason, and Details to the Global Fault.
- API Invocation Error: Using the API Invocation Error the Current Fault Object is stored in a Logger allowing us to send the Type, Title, Detail, Error Code, and Error Details (type, instance, title, errorPath, errorCode) to the Global Fault.
- Call HistoryDefault Handler: Using the Default Handler, the Fault Object is stored in a Logger allowing us to send the Error Code, Reason, and Details to the Global Fault.
- Global Fault: Using the re-throw fault action, global fault receives each type of error, and using an integration, sends an email with the details to the specific users. For more details, refer to the Global Error Handler section.

Integration Service

These values are cross referenced in the **Service Configurations** section.

Name	Description
OUTL-BA-CCS_NMS_CALL_HISTORY	This process is a real-time synchronous interface from Oracle Utilities Customer Cloud Service to retrieve trouble call history information from Oracle Utilities Network Management System for a particular customer, location, or call identifier, and display the results back in Oracle Utilities Customer Cloud Service.

Adapter Services

Name	Description
Oracle Utilities SOAP CCS for CCS-NMS	Oracle utilities adapter connection of Oracle Utilities Customer Cloud Service for the integration.
Oracle Utilities REST NMS for CCS-NMS	Oracle utilities adapter connection of Oracle Utilities Network Management System for the integration.
Oracle Utilities REST for CCS-NMS	Oracle utilities adapter connection common error handler for the integration.

Planned Outages Query Process

The primary owner of the planned outage data is Oracle Utilities Network Management System.

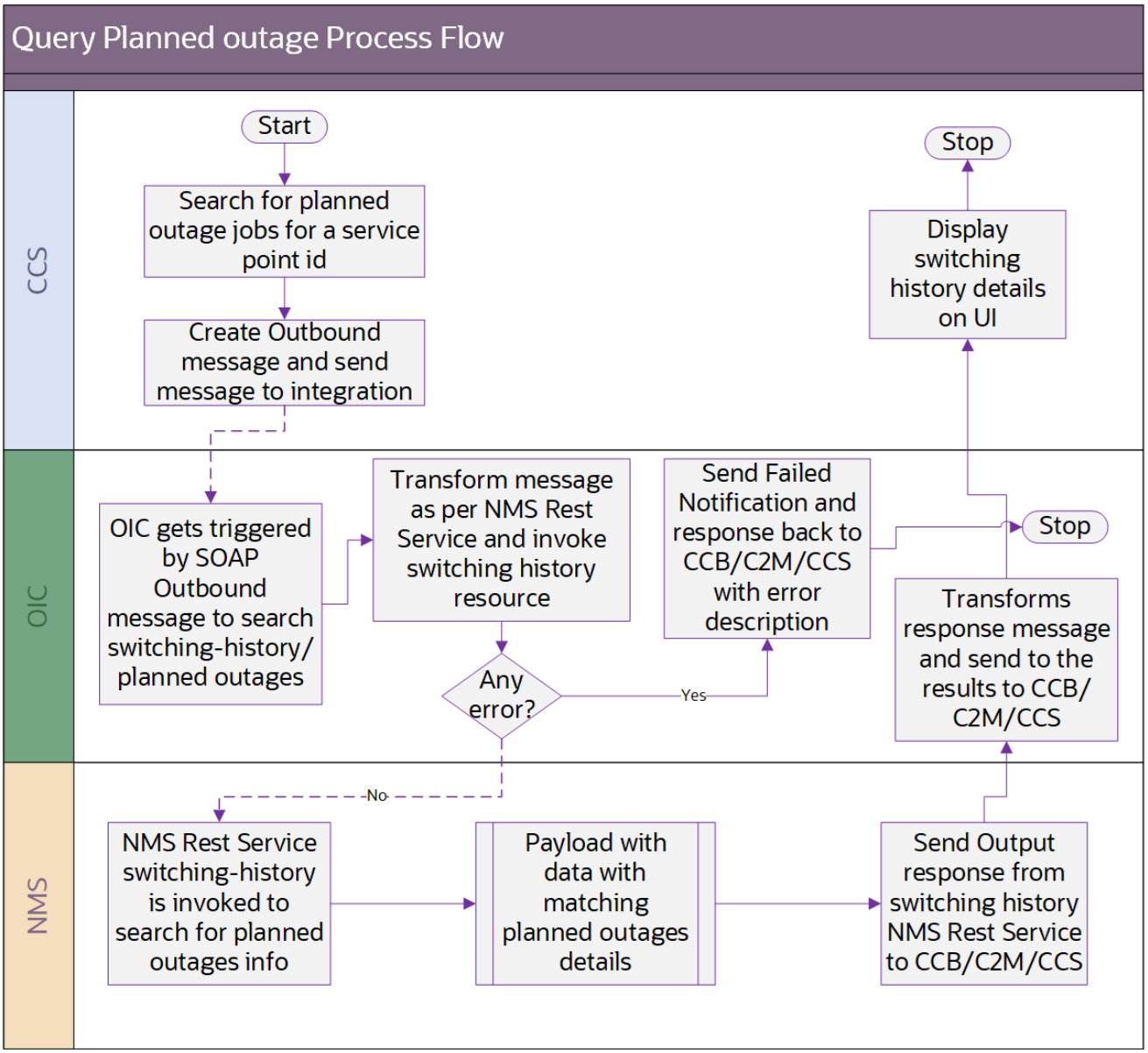
This process is a real-time synchronous interface from Oracle Utilities Customer Cloud Service to retrieve planned outages from Oracle Utilities Network Management System for a particular customer and display the results back in Oracle Utilities Customer Cloud Service.

Refer to the **Planned Outages Query Process** section for message mapping information for this integration point.

Supported Functionality

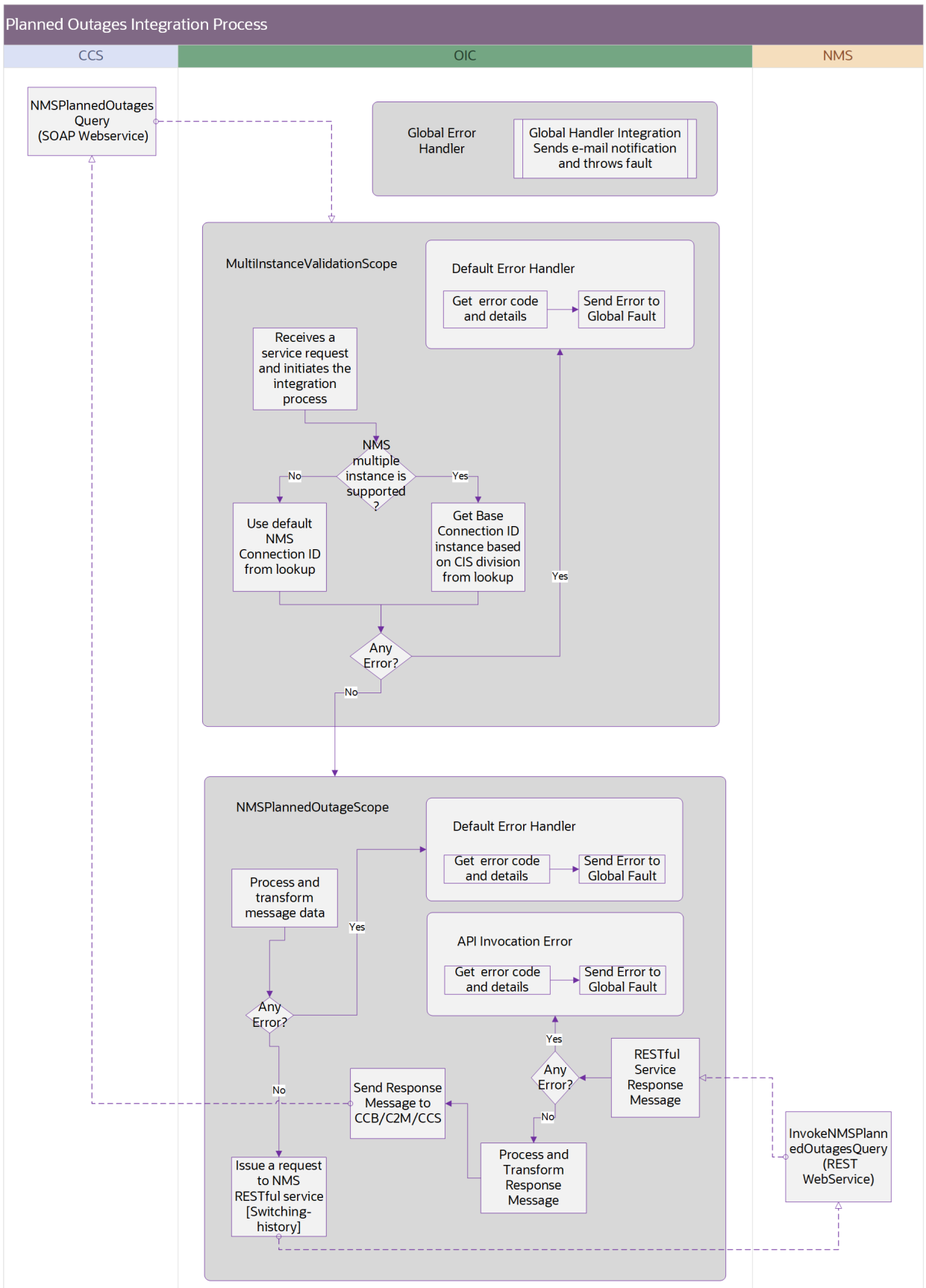
Whether or not to retrieve all planned outages affecting the customer (past, present, and future), or only those that are "active" (current and future, not past) is configurable.

The following process diagram shows a graphical representation of the Planned Outages Query process:



Integration Process and Technical Details

Oracle Utilities Customer Cloud Service sends query information in the form of XML messages, which are transformed by the integration and sent to Oracle Utilities Network Management System. Oracle Utilities Network Management System responds back with the Planned Outage Jobs based on the input criteria it received. The response is transformed by the integration layer and sent to Oracle Utilities Customer Cloud Service.


Planned Outages Integration Process
CCS
OIC
NMS
NMSPlannedOutages Query (SOAP Webservice)
Global Error Handler
Global Handler Integration Sends e-mail notification and throws fault
MultiInstanceValidationScope
Default Error Handler
Get error code and details
Send Error to Global Fault
Receives a service request and initiates the integration process
NMS multiple instance is supported ?
No
Yes
Use default NMS Connection ID from lookup
Get Base Connection ID instance based on CIS division from lookup
Yes
Any Error?
No
NMSPlannedOutageScope
Default Error Handler
Get error code and details
Send Error to Global Fault
Process and transform message data
Yes
API Invocation Error
Get error code and details
Send Error to Global Fault
Any Error?
Yes
RESTful Service Response Message
Any Error?
No
No
Send Response Message to CCB/C2M/CCS
Process and Transform Response Message
Issue a request to NMS RESTful service [Switching-history]
InvokeNMSPlannedOutagesQuery (REST WebService)

Integration Details

- Receives the SOAP outbound message from Oracle Utilities Customer Cloud Service/Oracle Utilities Customer to Meter.
- From the payload, the Call Source ID is captured and gets value for the Oracle Utilities Network Management System instance from the OUTL-BRT-CCS_NMS_ConfigProps lookup.
- From the payload, the CIS division is captured and gets value for the Oracle Utilities Network Management System instance from the OUTL-BRT-CCS_NMS_INSTANCE lookup, and with a stitch function, the CIS division ID is stored in a global function.
- The request message is processed and transformed to the equivalent Oracle Utilities Network Management System input fields that will be used by job history.
- Requests mapping from Oracle Utilities Customer Cloud Service elements to the Oracle Utilities Network Management System Switching History RESTful service.
- Oracle Utilities Network Management System output data from the Switching History RESTfull service is processed and the call history response from Oracle Utilities Network Management System is transformed and stored in a global object called G-NMSJobHistoryResult and sent back to the Oracle Utilities Customer Cloud Service/Oracle Utilities Customer to Meter UI.

Error Scenario

Considering the 2 scopes in this integration, there are 3 different error handlers:

- Multi-Instance Default Handler: Using the Default Handler, the Fault Object is stored in a Logger allowing us to send the Error Code, Reason, and Details to the Global Fault.
- API Invocation Error: Using the API Invocation Error the Current Fault Object is stored in a Logger allowing us to send the Type, Title, Detail, Error Code, and Error Details (type, instance, title, errorPath, errorCode) to the Global Fault.
- Call HistoryDefault Handler: Using the Default Handler, the Fault Object is stored in a Logger allowing us to send the Error Code, Reason, and Details to the Global Fault.
- Global Fault: Using the re-throw fault action, global fault receives each type of error, and using an integration, sends an email with the details to the specific users. For more details, refer to the Global Error Handler section.

Integration Service

These values are cross referenced in the **Service Configurations** section.

Name	Description
OUTL-BA-CCS_NMS_PLANNED_OUTAGES	Query planned outage jobs in Oracle Utilities Oracle Utilities Network Management System impacting a particular customer and display the results in Oracle Utilities Customer Cloud Service.

Adapter Services

Name	Description
Oracle Utilities SOAP CCS for CCS-NMS	Oracle utilities adapter connection of Oracle Utilities Customer Cloud Service for the integration.
Oracle Utilities REST NMS for CCS-NMS	Oracle utilities adapter connection of Oracle Utilities Network Management System for the integration.
Oracle Utilities REST for CCS-NMS	Oracle utilities adapter connection common error handler for the integration.

Global Error Handler

In the current integration flows, the alert notification is used to send an email with detailed information. However, the same alert notification needs to be included wherever notifications are required within the integration flow.

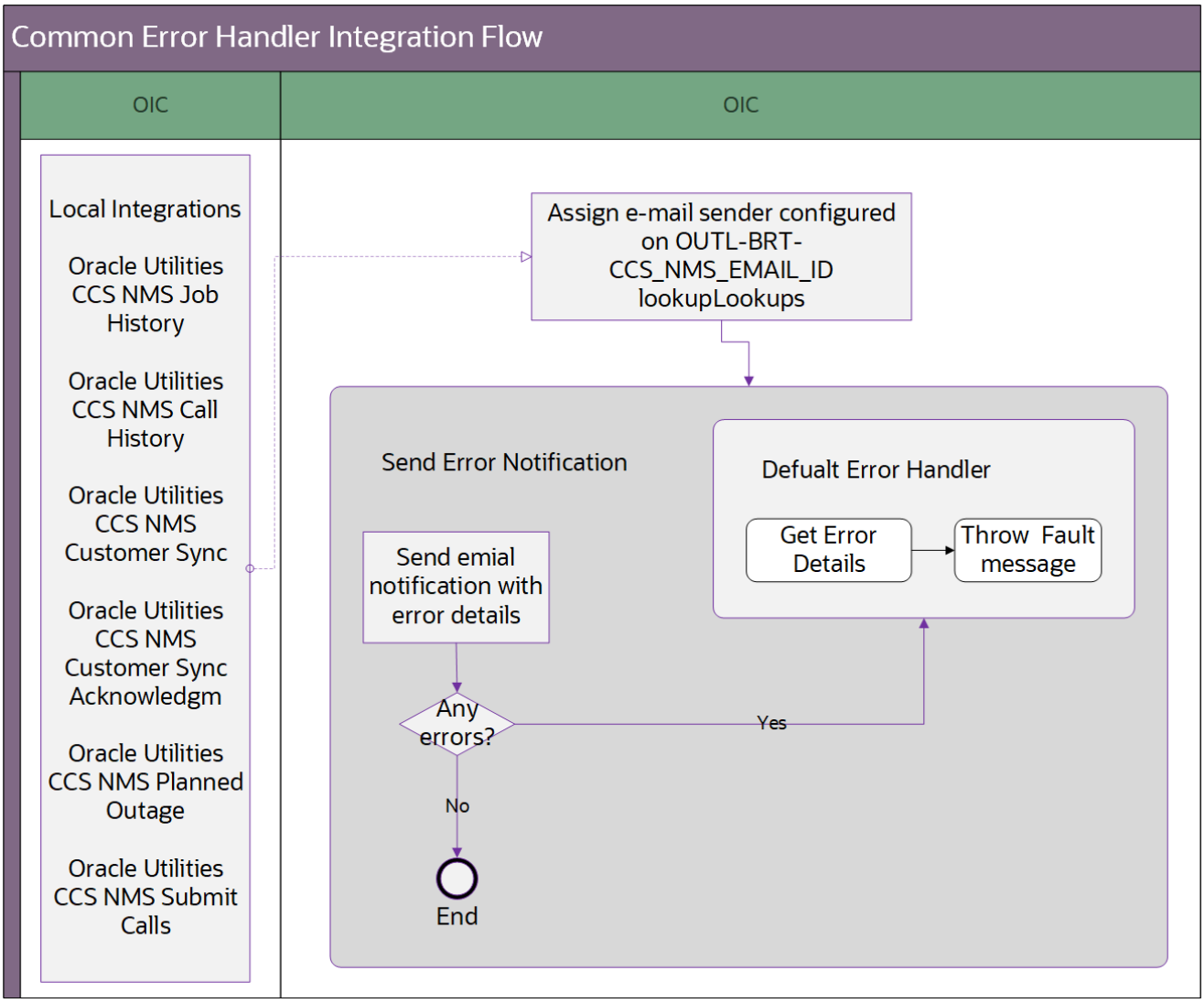
Supported Functionality

This alert notification is inserted in all fault conditions, such as remote, business, or technical faults, as well as in the global fault and scope fault handlers.

Integration Details

- The integration is responsible for managing error handling within the Oracle Utilities Customer Cloud Service-Oracle Utilities Network Management System solution and sending email notifications to the recipients defined in the OUTL-BRT-CCS_NMS_EMAIL_ID lookup.
- When an error occurs in one of the integrations, the error-handling integration receives the message. It checks if UCCB_OUNMS_notification.email.error.flag is set to "true" in the OUTL-BRT-CCS_NMS_ConfigProps lookup.
- If the condition is met, it sends an email containing the error details from the integration that triggered the error.
- Global Fault: Sends details to default error handling if an email is not sent.

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



Integration Service

These values are cross referenced in the **Service Configurations** section.

Name	Description
Oracle Utilities CCS NMS Global Error Handler	Error handler integration to be used in the global error handler on each integration.

Adapter Services

Name	Description
Oracle Utilities REST for CCS-NMS	Oracle utilities adapter connection common error handler in the integration.

Chapter 3

Configuring Oracle Utilities Customer Cloud Service

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

Configuring Admin Data

To configure the Oracle Utilities Customer Cloud Service setup for the integration:

1. Login to Oracle Utilities Customer Cloud Service.
2. Configure the administrative tables. Refer to the Configuring Administrative Tables section.
3. Configure the Sync Request process. Refer to the Configuring the Sync Request Process section.
4. Create message senders. Refer to the Message Senders section for details.
5. Create outbound message types. Refer to the Outbound Message Types section for details.
6. Create an external system. Refer to the External System section for details.

Configuring Administrative Tables

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

- Characteristic Types
- Feature Configuration
- Master Configuration
- Service Type
- Device Type

Characteristic Types

The following characteristic types must be defined to facilitate the integration. For Oracle Utilities Customer Cloud Service and Oracle Utilities Meter Data Management (separate instance) implementations, the Critical Customer characteristic type is defined in Oracle Utilities Meter Data Management. The remaining characteristic types are defined in Oracle Utilities Customer Care and Billing.

Characteristic Type	Guideline	Characteristic Entity Collection	Corresponding DVM
Critical Customer	• Service Point characteristic used to define the critical customer for the service point. • Pre-defined characteristic type. • The critical customer pre-defined values listed here must be defined in the NMS Sync Integration master configuration, under the **Critical Customer Types Characteristics Mapping** section.	Include *Service Point*.	
Location City	• Characteristic used to identify the location city for an outage without a premises. • Adhoc characteristic type.	Include *Service Task*.	N/A
Location State	• Characteristic used to identify the location state for an outage without a premises. • Adhoc characteristic type.	Include *Service Task*.	N/A
Location 1	• Characteristic used to identify a location used for an outage without a premises. (The location would be either a street name for location type street segment or intersection street1 for location type street intersection). • Adhoc characteristic type.	Include *Service Task*.	N/A
Location 2	• Characteristic used to identify a location (intersection street2) used to for an outage without a premises if the location type is a street intersection. • Adhoc characteristic type.	Include *Service Task*.	N/A
Block Number	• Characteristic used to identify a block number used for an outage without a premises if the location type is a street segment. • Adhoc characteristic type. • The Block Number adhoc value must be numeric.	Include *Service Task*.	N/A
Contact Name	• Characteristic used to identify a contact name used for an outage without a premises. • Adhoc characteristic type.	Include *Service Task*.	N/A

Characteristic Type	Guideline	Characteristic Entity Collection	Corresponding DVM
Contact Number	• Characteristic used to identify a contact number used for an outage without a premise. • Adhoc characteristic type.	Include *Service Task*.	N/A
Call Identifier	• Characteristic used to identify a call identifier used for an outage without a premises. • Adhoc characteristic type.	Include *Service Task*.	N/A

Outage Codes 1 - N	• These characteristics are used to describe the outage problem.
	  • Create at least one and up to N pre-defined characteristic type. N being the number of outage codes needed by the implementation.
	  • For each characteristic type, define its list of valid values.
		Include *Service Task*.	N/A

Feature Configuration

To create a new feature configuration, complete the following:

- Schema Constants

Schema Constants

To create a new feature configuration with Schema Constants:

1. Navigate to **Admin** > **General** > **Feature Configuration**.
2. Create new feature configuration with **Schema Constants** as the **Feature Type** or select a feature configuration with **Schema Constants** as the **Feature Type** if one already exists.
3. Enter the required option types and necessary values.

Option	Notes
Home Phone Type	The user defined home phone number type code. The **Option Value** must be set as a valid Phone Number Type defined in the Phone Type table.
Business Phone Type	The user defined business phone number type code. The **Option Value** must be set as a valid Phone Number Type defined in the Phone Type table.
Device Geographic Type	The user defined device ID geo type code. The **Option Value** must be set as a valid Geographic Type defined in the Geographic Type table.

Option	Notes
Outage Call Contact Name Characteristic Type	The characteristic type code your implementation uses to capture a contact name on a trouble call. The **Option Value** must be set as a valid Characteristic Type defined in the Characteristic Type table.
Outage Call Contact Number Characteristic Type	The characteristic type code your implementation uses to capture a contact number on a trouble call. The **Option Value** must be set as a valid Characteristic Type defined in the Characteristic Type table.
Outage Call Identifier Characteristic Type	The characteristic type code your implementation uses to capture a call identifier on a trouble call. The **Option Value** must be set as a valid Characteristic Type defined in the Characteristic Type table.
Outage Call Street Name Characteristic Type	The characteristic type code your implementation uses to capture a street name on a trouble call. The **Option Value** must be set as a valid Characteristic Type defined in the Characteristic Type table.
Outage Call Street Name Characteristic Type	The characteristic type code your implementation uses to capture a street name on a trouble call. The **Option Value** must be set as a valid Characteristic Type defined in the Characteristic Type table.
Outage Call Cross Street Name Characteristic Type	The characteristic type code your implementation uses to capture a cross street name on a trouble call. The **Option Value** must be set as a valid Characteristic Type defined in the Characteristic Type table.
Outage Call Block Number Characteristic Type	The characteristic type code your implementation uses to capture a block number on a trouble call. The **Option Value** must be set as a valid Characteristic Type defined in the Characteristic Type table.
Outage Call City Characteristic Type	The characteristic type code your implementation uses to capture a city on a trouble call. The **Option Value** must be set as a valid Characteristic Type defined in the Characteristic Type table.
Outage Call State Characteristic Type	The characteristic type code your implementation uses to capture a state on a trouble call. The **Option Value** must be set as a valid Characteristic Type defined in the Characteristic Type table.

Master Configuration

To create a new master configuration with the Oracle Utilities Network Management System integration:

1. Navigate to **Admin** > **General** > **Feature Configuration**.
2. Create a new master configuration for the NMS Outage Integration Master Config or broadcast the master configuration if one already exists. Refer to the embedded help for more information.

For Oracle Utilities Customer Care and Billing and Oracle Utilities Meter Data Management (separate instance) implementations, this is configured in Oracle Utilities Customer Care and Billing.

3. Create a new master configuration for the NMS Sync Integration Master Config or broadcast the master configuration if one already exists. Refer to the embedded help for more information.

   For Oracle Utilities Customer Care and Billing and Oracle Utilities Meter Data Management (separate instance) implementations, this is configured in Oracle Utilities Meter Data Management.

Service Type

Every service point type references a service type. The service type defines the type of service you provide to your customer (such as, electric, water, gas).

The code defined here must exactly match the values defined in the DVM specified in the table below.

Navigation	Guideline	Corresponding DVM
Admin > General > Service Type	Define your service types.	OUC2M_OUNMS_Account Type

Device Type

Every meter or item references a device type. The device type defines the type of service and common characteristics shared by its meters and items.

The code defined here must exactly match the values defined in the DVM specified in the table below.

Navigation	Guideline	Corresponding DVM
Admin > Device > Device Type	Define your device types.	OUC2M_OUNMS_MeterType

Configuring the Sync Request Process

The Sync Request process is used to synchronize customer data from Oracle Utilities Customer to Meter to Oracle Utilities Network Management System.

For Oracle Utilities Customer Care and Billing and Oracle Utilities Meter Data Management (separate instance) implementations, this is configured in Oracle Utilities Meter Data Management.

Batch Code

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

Batch	Description
F1-SYNRQ	Sync Request Monitor Process

Batch Parameters	Parameter Description	Value
maintenanceObject	Sync Request maintenance object	F1-SYNC REQ This is the defaulted value.
isRestrictedByBatchCode	The 'true' value restricts processing to sync requests whose current state is linked to this batch code.	
restrictToBusinessObject	Enter a business object code here to limit the process to sync requests linked to this business object.	D1-NMSSP CustomerSyncRequest Populate this value to run only the NMS customer sync request.
restrictToBOStatus	Enter a status code here to limit the process to sync requests in this state.	PENDING Populate this value to only process a sync request in 'Pending' status.

This batch process is used to run the initial load synchronization request. It has a couple of parameters that can be used to control which synchronization request BOs to process.

Batch	Description
D1-NMSSP	NMS SP Customer Sync Initial Load

Batch Parameters	Parameter Description	Value
syncRequestMO	Maintenance Object	D1-SP This is the defaulted value.
syncRequestBO	Enter a business object code here to limit the process to sync requests linked to this business object.	D1-NMSSPCustomer SyncRequest

Batch Parameters	Parameter Description	Value
filterAlgorithm	Enter a filter algorithm here to limit the process to sync requests that should be sent to Oracle Utilities Network Management System.	D1-NMSSPCustomerSync Request This algorithm filters for eligible service point types as defined in the NMS Sync Integration Master Configuration.

MO Algorithms

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

For more information, refer to the Maintenance Objects section.

Algorithm Type	Description
D1-CUSCDCSP	This algorithm instantiates SP-based sync request whenever a change to the Contact MO is detected (updating a person record in CCS/C2M triggers an internal sync to the contact record, which in turn will trigger this audit algorithm). Define the D1-NMSSPCustomerSyncRequest sync request BO to be instantiated in the algorithm's parameters.
D1-USCDCSP	This algorithm instantiates SP-based sync request whenever a change to the Usage Subscription MO is detected (updating a SA record in CCS/C2M triggers an internal sync to the usage subscription record, which in turn will trigger this audit algorithm). Define the D1- NMSSPCustomerSyncRequest sync request BO to be instantiated in the algorithm's parameters.
D1-SPIE-CDCP	This algorithm instantiates SP-based sync request whenever a change to the Install Event MO is detected. Define the D1- NMSSPCustomerSyncRequest sync request BO to be instantiated in the algorithm's parameters.
D1-SPDV-CDCP	This algorithm instantiates SP-based sync request whenever a change to the Device MO is detected. Define the D1- NMSSPCustomerSyncRequest sync request BO to be instantiated in the algorithm's parameters.

Maintenance Objects

Maintenance Objects	Description
D1-CONTACT	Specify the MO Audit algorithm configured in the MO Algorithms section.
D1-US	Specify the MO Audit algorithm configured in the MO Algorithms section.
D1-INSTLEVT	Specify the MO Audit algorithm configured in the MO Algorithms section.
D1-DEVICE	Specify the MO Audit algorithm configured in the MO Algorithms section.
D1-SP	Specify the generic MO Audit algorithm F1-GCHG-CDCP. Also, specify the D1-NMSSPCustomerSyncRequest BO in the Sync Request BO MO Option.

Business Objects

Business Object	Description
D1- NMSSPCustomer SyncRequest	This business object defines the behavior of the outbound sync request for NMS. It contains the schema elements monitored and synchronized to NMS. The following must be configured and defined on the NMS Sync Integration master configuration as they are necessary to create the outbound sync request: • **Outbound Message Type**: This contains a reference to the outbound message BO to use. The base package includes BO D1-NMSSPCustomerSyncReqOutMsg for the NMS SP Sync. Refer to the **Defining Outbound Message Types** section in the user documentation for more information. • **External System**: This contains the reference to the outbound message type and its corresponding configuration for communicating with the external system. Refer to the **External Systems** section in the user documentation for more information. • Specify the pre-processing algorithm configured in the MO Algorithms section. • Specify the time out algorithm as a monitor algorithm on the Awaiting Acknowledgement state for this BO. • Specify the To Do creation algorithm on the Error state for this BO. Depending on the technology used to communicate the sync request to the external system, you may need to create your own enter algorithm and plug it into the Send Request state.

For more information about the sync request process, the business objects, maintenance objects, and other components use for this process, see the Data Synchronization section

in the Oracle Utilities Framework Administrative User Guide.

Message Senders

This section provides the message sender configuration details in Oracle Utilities Network Management System and Oracle Utilities Customer Cloud Service.

- Configuring Message Sender in Oracle Utilities Customer Cloud Service

Configuring Message Sender in Oracle Utilities Customer Cloud Service

Create a new message sender for each integration service initiated from Oracle Utilities Customer Cloud Service (Customer Data Sync, Submit Truble Call, Job History Query and Planned Outages Query).

To create a message sender:

1. Navigate to Admin > Integration > Message Sender from the menu or from the **Search** bar.
2. Enter a unique message sender and its description.
3. Populate the following values:
   - **Message Sender**: Message Sender Name
   - **Description**: Short description about the message sender.
   - **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 (click **+**) for the following context types:
   - **HTTP Header**: SOAPAction:"" <HTTP Login User: User ID to access the Oracle Integration Cloud (OIC) flow>
   - **HTTP Password**: Password to access the Oracle Integration Cloud flow.
   - **HTTP Method (POST/GET)**: POST
   - **HTTP Timeout**: 60
   - **HTTP Trasnport Method**: SendReceive
   - **HTTP URL 1**: Set the Activated Integration end point URL by removing ?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.

- **SOAP Insert Timestamp (Y/N)**: Y
- **Sender Security Type**: TEXT

Message sender configuration for integration services

Message Sender	Description	Message Namespace URI	HTTP Header	HTTP URL
NMS-CDSOIC	NMS Customer Data Sync from OIC	http://ouaf.oracle.com/webservices/outbound/NMS_NMS-SPSYNC	SOAPAction:"NMS_NMS-SPSYNC"	https://ewgen3instance1-id09o3eaz21u-ia.integration.us-ashburn-1.ocp.oraclecloud.com
NMS-QCH-OIC	NMS Call History Query from OICNMS-QJHOIC	http://ouaf.oracle.com/outbound/NMS_C1-NMSCAHST	SOAPAction:"NMS_C1-NMSCALHST"	https://ewgen3instance1-id09o3eaz21u-ia.integration.us-ashburn-1.ocp.oraclecloud.com/ic/ws/integration/v2/flows/oracleutilities/project/OUTL-BA-CCS_NMS/OUTL-BA-CCS_NMS_CALL_HISTORY/1.0/
NMS-QJHOIC	NMS Job History Query from OIC	http://ouaf.oracle.com/outbound/NMS_C1-NMSJOBHST	SOAPAction:"NMS_C1-NMSJOBHST"	https://ewgen3instance1-id09o3eaz21u-ia.integration.us-ashburn-1.ocp.oraclecloud.com/ic/ws/integration/v2/flows/oracleutilities/project/OUTL-BA-CCS_NMS/OUTL-BA-CCS_NMS_JOB_HISTORY/1.0/
NMS-QPO-OIC	NMS Query Planned Outage Query from OIC	http://ouaf.oracle.com/outbound/NMS_C1-NMSCAHST	SOAPAction:"NMS_C1-NMSPLNOUT"	https://ewgen3instance1-id09o3eaz21u-ia.integration.us-ashburn-1.ocp.oraclecloud.com/ic/ws/integration/v2/flows/oracleutilities/project/OU_CCS_NMS/OUTL-BA-CCS_NMS_PLANNED_OUTAGES/1.0/
NMS-SC-OIC	NMS Outage Call Processing Submit Calls from OIC	http://ouaf.oracle.com/outbound/C1-OutageCallOutboundMsg	SOAPAction:"NMS_C1-NMSOUTCAL"	https://ewgen3instance1-id09o3eaz21u-ia.integration.us-ashburn-1.ocp.oraclecloud.com/ic/ws/integration/v2/flows/oracleutilities/project/OU_CCS_NMS/OUTL-BA-CCS_NMS_SUBMIT_CALLS/1.0/

Outbound Message Types

Create an Outbound Message Type for each integration service initiated from Oracle Utilities Customer Cloud Service (Customer Data Sync, Submit Trouble Call, Job History Query, and Planned Outages Query).

Customer Sync Interface

1. Enter "Add Outbound Message Type" on the global Search bar and select the option.
2. Enter a unique **Outbound Message Type** and **Description**.
3. Populate the following values:
   - **Business Object**: NMS-MDSYNC (Customer Sync Outbound Message BO)
   - **Priority**: (choose from the selection)

Submit Trouble Calls Interface

1. Navigate to **Admin menu** > **O** > **Outbound Message Type**.
2. Enter a unique **Outbound Message Type** and **Description**.
3. Populate the following values:
   - **Business Object**: C1-NMSOUTCAL (Submit Calls Outbound Message BO)
   - **Priority**: (choose from the selection)

Query Job History Interface

1. Navigate to **Admin menu** > **O** > **Outbound Message Type**.
2. Enter a unique **Outbound Message Type** and **Description**.
3. Populate the following values:
   - **Business Object**: C1-NMSJOBHST (Job History Query Outbound Message BO)
   - **Priority**: (choose from the selection)

Query Trouble Call History Interface

1. Navigate to **Admin menu** > **O** > **Outbound Message Type**.
2. Enter a unique **Outbound Message Type** and **Description**.
3. Populate the following values:
   - **Business Object**: C1-NMSCALHST (Call History Query Outbound Message BO)
   - **Priority**: (choose from the selection)

Query Planned Outages Interface

1. Navigate to **Admin menu** > **O** > **Outbound Message Type**.
2. Enter a unique **Outbound Message Type** and **Description**.
3. Populate the following values:
   - **Business Object**: C1-NMSPLNOUT (Planned Outages Query Outbound Message BO)
   - **Priority**: (choose from the selection)

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.

   Example: Name = NMS, Description = NMS External System
3. Set the **Our Name in Their System** field to "Oracle Utility".
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 created 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 Outbound Message Types sections respectively.

Chapter 4

Configuring Oracle Utilities Network Management System

This chapter describes how to configure the Oracle Utilities Network Management System to meet the requirements for the integration. It includes the following:

About Generic IVR Adapter

The Generic IVR Adapter processes trouble calls received from Oracle Utilities Customer to Meter. It is part of the Oracle Utilities Outage Management Standard Edition.

The Generic IVR Adapter has to run with the '-troublecall' command line option to enable trouble call data flow. The command line option '-docustquery' should not be used, because the accurate customer information is expected to be received from the Oracle Utilities Customer to Meter system.

For more information about configuring the Generic IVR Adapter, see the Generic IVR Adapter chapter in Oracle Utilities Network Management System Adapters Guide.

Configuring Time Zone

The TIMEZONE parameter in the CES_PARAMETERS database table specifies the name of the time zone used by the Oracle Utilities Network Management System backend services and database.

This parameter is used by the PK_CCB PL/SQL package to convert input data to the correct timezone for storing in the Oracle Utilities Network Management System database and to add timezone information to output data. A list of the time zone region names known to the database can be obtained from the V$TIMEZONE_NAME dynamic performance view. Time zone region name should be used instead of a simple offset to ensure that Daylight Savings Time is accounted for.

Example:

```
INSERT INTO CES_PARAMETERS (APP, ATTRIB, VALUE) VALUES ('NMS',
'TIMEZONE', 'America/Chicago');
```

External ID Prefix

All valid external ID prefix values must be specified using the configuration rule 'callIdPrefix'. If this is not configured, retrieving call and job history by the External ID of a call may not work properly.

External ID prefix is the first few characters of the external ID and is used to identify the system where the trouble call originated (example: If external ID is '2389583093', then '2' can be the prefix indicating that this call came from Oracle Utilities Customer Care and Billing). It is also used to guarantee that each call has unique external ID value.

For more information on configuring and working with Oracle Utilities Network Management System, see the Oracle Utilities Network Management System User Guide. The Building the System Data Model chapter in the Oracle Utilities Network Management System Configuration Guide includes information about connecting customer data to the Oracle Utilities Network Management System electrical model.

Setting Up the Integration Pack

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

To configure the integration you must complete the following:

- Setting Up Configuration Properties
- Setting Up Lookup Value Maps

Setting Up Configuration Properties

Various configurations that apply to the entire integration and specific processes for the integration services are stored in the OUTL-BRT-CCS_NMS_ConfigProps lookups section. These configurations hold several configurable values that are picked up by the integration at runtime to:

- Set the default values to be used in the integration.
- Activate error handling.

  Note: Whenever the OUTL-BRT-CCS_NMS_ConfigProps lookup is updated, all integrations must be restarted by deactivating and reactivating integration.

Setting Up Lookup Value Maps

Lookups is a feature of Oracle Integration Cloud which maps codes and other static values across applications.

Example: "FOOT" and "FT" or "US" and "USA"

The lookup values are static in nature, though administrators can add additional maps as needed.

Chapter 5

Importing, Configuring, and Testing Integration Connections

This chapter explains the process for importing the connections, lookups, and libraries needed for the integration and the configuration of these connections imported through a project accelerator. 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 Project Based Accelerator Package from Oracle Cloud Marketplace
- Verifying the Project Import
- Configuring Connections in Oracle Integration Cloud
- Configuring Agent (if applicable)
- Setting up Certificates for Security

Importing the Oracle Integration Cloud Project Based Accelerator Package from Oracle Cloud Marketplace

All integration artifacts are shipped into single project (.car) 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 "Utilities Customer Cloud Service & Network Management System".
4. Browse through the list of applications and select the pre-built integration project to import.
5. Click **GetApp**.
6. Review and accept "Oracle Standard Terms and Restrictions".
7. Click **Next**. MyOracle Support portal opens.
8. From the integration artifacts table, download the Integration OIC accelerator project (.car) file.
9. Perform the following steps before importing the new project based accelerator project (.car) file into your Oracle Integration Cloud instance.
   a. Take the backup of the existing customized integrations and lookups.
   b. Perform cleanup by deactivating and deleting the existing flows, connections, lookups, libraries used in the integration, and the .par package file.

      Note: If your previous pre-built integration was packaged based (.par file), you will see that:

      - The package is visible on the **Design-Packages** page in the Oracle Integration Cloud instance.
      - The individual integration flows are visible on the Design-Integrations Each integration flow are designated with an accelerator, and "BUILT BY ORACLE" message is displayed.

10. Navigate to **Integrations** > **Projects**.
11. Click **Add**.
12. Select **Import Project** and drag-and-drop the .car file downloaded from Oracle Cloud Marketplace.

    Note: Make sure to select the **Anyone can edit, view, and monitor** checkbox.

    The new project will show up in the list, but with the "Configured" status due to the connections not being completed yet.

13. Click **Project Edit** and follow the verification and configuration steps documented in the following sections.

14. If all configurations are complete, activate the integration by:
    - Clicking **Activate** in the Design section.
    - Or, activate the latest deployment plan in the Deploy section.
15. Verify if the project is imported is successfully.

Verifying the Project Import

To verify the project import was successful:

1. Verify that the following 7 integrations are imported successfully as seen in the **Integrations** section of the project.
    - Oracle Utilities CCS NMS Customer Sync
    - Oracle Utilities CCS NMS Submit Calls
    - Oracle Utilities CCS NMS Planned Outages
    - Oracle Utilities CCS NMS Call History
    - Oracle Utilities CCS NMS Job History
    - Oracle Utilities CCS NMS Customer Sync Acknoledgm
    - Oracle Utilities CCS NMS Global Error Handler
2. Verify if the 3 connections listed below are imported successfully as seen in the **Connections** section of the project.
    - Oracle Utilities SOAP CCS for CCS-NMS
    - Oracle Utilities REST NMS for CCS-NMS
    - Oracle Utilities REST FOR CCS-NMS
3. Make sure that the following 8 lookups are imported successfully as seen in the **Lookups** section of the project.
    - OUTL-BRT-CCS_NMS_ACCOUNT_TYPE
    - OUTL-BRT-CCS_NMS_ALARM_STATE
    - OUTL-BRT-CCS_NMS_ CALL_BACK_INIDICATOR
    - OUTL-BRT-CCS_NMS_CALL_CANCEL_INDICATOR
    - OUTL-BRT-CCS_NMS_STATUS
    - OUTL-BRT-CCS_NMS_CAUSE
    - OUTL-BRT-CCS_NMS_ConfigProps
    - OUTL-BRT-CCS_NMS_EMAIL_ID
    - OUTL-BRT-CCS_NMS_ETR_SOURCE
    - OUTL-BRT-CCS_NMS_INSTANCE
    - OUTL-BRT-CCS_NMS_JOB_HISTORY_STATUS
    - OUTL-BRT-CCS_NMS_SUPPORT_INDICATOR
    - OUTL-BRT-CCS_NMS_MANUFACTURER

- OUTL-BRT-CCS_NMS_METER_TYPE
- OUTL-BRT-CCS_NMS_NEW_CALL_INDICATOR
- OUTL-BRT-CCS_NMS_USAGESUB_STATUS

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 Oracle Utilities SOAP CCS for CCS-NMS
- Configuring Oracle Utilities REST NMS for CCS-NMS
- Configuring Oracle Utilities REST for CCS-NMS
- Configuring Oracle Utilities NMS Multi Instance
- Configuring Oracle Utilities NMS Single Instance

Configuring Oracle Utilities SOAP CCS for CCS-NMS

This connection is used to communicate with Oracle Utilities Customer Cloud Service using the Oracle Utilities Adapter.

To configure the Oracle Utilities SOAP CCS for CCS-NMS connection:

1. Add the Oracle Utilities Customer Cloud Service catalog to the **catalogURL** section.

   Note:

   For the on-premises application, the catalog format is:

   http(s)://<C2M_HOST>:<C2M_PORT>/<ContextRoot>/rest/ouaf/openapi/iws/catalog

   For Oracle Utilities Customer Cloud Service, the catalog format is: https://{host}:{port}/{tenant}/{domain}/{appName}/rest/openapi/iws/catalog

2. On the **Security policy** tab, select the applicable security policy to access the application.

   For more information on the supported security policies, refer to the Understand the Oracle Utilities Adapter chapter in the Using the Oracle Utilities Adapter with Oracle Integration 3 documentation.

3. For Oracle Utilities Customer to Meter 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 username and password. Click **Test** at the upper-right corner.

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

Configuring Oracle Utilities REST NMS for CCS-NMS

This connection is used to trigger from or invoke the Oracle Utilities Network Management System using the Oracle Utilities Adapter.

To configure the Oracle Utilities REST NMS for CCS-NMS connection:

1. Add the Oracle Utilities Network Management System catalog to the **catalogURL** section.

   Format: https://{NMS-Host}:{NMS-Port}/nms-ofs/rest/v1/catalog

2. On the **Security** section, select the applicable security policy to access the application.

   For more information on the supported security policies, refer to the Understand the Oracle Utilities Adapter chapter in the Using the Oracle Utilities Adapter with Oracle Integration 3 documentation.

3. When the connection is made to the Oracle Utilities Network Management System on-premises application:

   a. Configure the appropriate **Agent Group**.

   b. Select the agent group from the list created in the Creating an Agent Group procedure.

4. On the **Connection** page, click **Test**.

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

Configuring Oracle Utilities REST for CCS-NMS

This connection is used to communicate with the Global Error Handler Service using the REST adapter. It is used in the CCS-NMS Integration common error handler triggered by Oracle Utilities Customer Cloud Service.

Edit the Oracle Utilities REST Outbound for CCS-NMS connection and test it to make sure it is successful. Click **Save**.

Configuring Oracle Utilities NMS Multi Instance

To enable the multi-instance NMS.MultipleInstance flag from the OUTL-BRT-CCS_NMS_ConfigProps lookup must be set to 'true'.

An additional Oracle Utilities Adapter must be created to be used whenever multi-instance is required:

1. Select the OU CCS NMS project.

2. Click **+** in the connection's menu.

3. Enter "Oracle Utilities" and select the adapter to create a connection.

4. Enter the required information.

   The **Identifier** must have the "BAEXT_" prefix. Else, it will not be created since it is an accelerator.

5. To configure the connection, add the Oracle Utilities Network Management System catalog URL.

   Format: https://{NMS-Host}:{NMS-Port}/nms-ofs/rest/v1/catalog

6. On the **Security** section, select the applicable security policy to access the application.

   For more information on the supported security policies, refer to the Understand the Oracle Utilities Adapter chapter in the Using the Oracle Utilities Adapter with Oracle Integration 3 documentation.

7. When the connection is set to the Oracle Utilities Network Management System on-premises application:

   a. Configure the appropriate **Agent Group**.

   b. Select the agent group from the list created in the Creating an Agent Group section.

8. On the **Connection** page, click **Test**.

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

After creating and configurating connection, copy the Identifier of the adapter and add it to the OUTL-BRT-CCS_NMS_INSTANCE Division lookup with the matching Identifier as the value for NMS_Site_Connection.

Configuring Oracle Utilities NMS Single Instance

For single instance, NMS.MultipleInstance flag from the OUTL-BRT-CCS_NMS_ConfigProps lookup must be set to 'false'.

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 Customer Cloud Service on-premises and Oracle Utilities Network Management System
- Oracle Utilities Customer Cloud Service and Oracle Utilities Network Management System on-premises

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 about agent installer, refer to the Manage the Agent Group and Connectivity Agent chapter in the the Using the Oracle Utilities Adapter with Oracle Integration 3 documentation.

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 Customer Care and Billing 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.

      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 listed on the following page:

      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.

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 Network Management System/Oracle Utilities Customer Cloud Service certificates and upload them to Oracle Integration Cloud to handshake with Oracle Utilities Network Management System/Oracle Utilities Customer Cloud Service.

To download the Oracle Utilities Network Management System/Oracle Utilities Customer Cloud Service certificate:

1. Login to Oracle Utilities Customer Cloud Service/Oracle Utilities Network 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

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

Lookup Name	Integration Name	Purpose
OUTL-BRT-CCS_NMS_ACCOUNT_TYPE	Oracle Utilities CCS NMS Customer Sync	Transform CCS Service Type value to NMS Account Type value.
OUTL-BRT-CCS_NMS_ALARM_STATE	Oracle Utilities CCS NMS Job History	Transform Alarm State code between CCS and NMS.
OUTL-BRT-CCS_NMS_NEW_CALL_INDICATOR	Oracle Utilities CCS NMS Submit Calls	Transform CCS Outage Call Action code to NMS Update Existing Call Flag.
OUTL-BRT-CCS_NMS_CALL_CANCEL_INDICATOR	Oracle Utilities CCS NMS Submit Calls	Transform CCS Status to NMS Call Cancel Flag value.
OUTL-BRT-CCS_NMS_CALL_BACK_INIDICATOR	Oracle Utilities CCS NMS Submit Calls	Transform callback indicator between CCS and NMS.
OUTL-BRT-CCS_NMS_CALL_CANCEL_INDICATOR	Oracle Utilities CCS NMS Submit Calls	Transform CCS Status to NMS Call Cancel Flag value.
OUTL-BRT-CCS_NMS_CALL_STATUS	Oracle Utilities CCS NMS Call History	Transform Call Status between CCS and NMS.
OUTL-BRT-CCS_NMS_CAUSE	Oracle Utilities CCS NMS Job History	Transform Cause between CCS and NMS.
OUTL-BRT-CCS_NMS_ConfigProps	• Oracle Utilities CCS NMS Job History • Oracle Utilities CCS NMS Planned Outages • Oracle Utilities CCS NMS Submit Calls • Oracle Utilities CCS NMS Call History • Oracle Utilities CCS NMS Customer Sync	Configuration Properties for CCS-NMS Cloud Integration.
OUTL-BRT-CCS_NMS_EMAIL_ID	Oracle Utilities CCS NMS Global Error Handler	Define From and To emails for the Global Error Handler Notifications.
OUTL-BRT-CCS_NMS_ETR_SOURCE	Oracle Utilities CCS NMS Job History	Transform ETR Source code between CCS and NMS.

Lookup Name	Integration Name	Purpose
OUTL-BRT-CCS_NMS_INSTANCE	• Oracle Utilities CCS NMS Job History • Oracle Utilities CCS NMS Planned Outages • Oracle Utilities CCS NMS Submit Calls • Oracle Utilities CCS NMS Call History • Oracle Utilities CCS NMS Customer Sync	Define the CCS Division and its equal NMS instance mapping.
OUTL-BRT-CCS_NMS_JOB_HISTORY_STATUS	Oracle Utilities CCS NMS Job History	Transform Job History Status between CCS and NMS.
OUTL-BRT-CCS_NMS_SUPPORT_INDICATOR	Oracle Utilities CCS NMS Customer Sync	Transform Life Support Indicator from CCS value to NMS value.
OUTL-BRT-CCS_NMS_MANUFACTURER	Oracle Utilities CCS NMS Customer Sync	Transform Manufacturer from CCS to NMS.
OUTL-BRT-CCS_NMS_METER_TYPE	Oracle Utilities CCS NMS Customer Sync	Transform Meter Type code from CCS to NMS.
OUTL-BRT-CCS_NMS_USAGESUB_STATUS	Oracle Utilities CCS NMS Customer Sync	Transform CCS usage subscription status value to NMS status value.

Editing Lookups

To edit a lookup:

1. Login to Oracle Integration for Cloud.
2. Navigate to **Projects** > **Look for the project "OU CCS NMS"** > **Lookups dashlet**.
3. Select the lookup to edit.
4. Make the necessary changes.
5. Click **Save** and **Close**.

Configuration Properties

OUTL-BRT-CCS_NMS_ConfigProps 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
OUCCB_OUNMS_notification.email.error.flag	true	Used for enabling the email notifications.	• Oracle Utilities CCS NMS Get Service Call Details • Oracle Utilities CCS NMS Query Service Call • Oracle Utilities CCS NMS Process Service Call • Oracle Utilities CCS NMS Get Service Call Details
ccs.remote.fault.messagecategory	Numeric value	Used to configure default message category value.	Oracle Utilities CCS NMS Process Service Call
ccs.remote.fault.messagenumber	Numeric value	Used to configure default message number.	Oracle Utilities CCS NMS Process Service Call

The following lookup properties can be defaulted in the integration:

Lookup: OUTL-BRT-CCS_NMS_ACCOUNT_TYPE

OUCCS_ServiceType	OUNMS_AccountType
C	0
E	1
G	0
M	0
O	0
RF	0
W	0
WW	0
ZZEUGENSPTYPE	1
ZZEU_ELECTRIC_ITEM_SP_TYPE	1
ELECTRICAL	1

Lookup: OUTL-BRT-CCS_NMS_ALARM_STATE

OUCCB_Alarm_State	OUNMS_Alarm_State
C1AS	ASN
C1CC	C-CNL

OUCCB_Alarm_State	OUNMS_Alarm_State
C1CM	CMP
C1CN	CNL
C1CR	CRT
C1EN	ENR
C1FA	F-ASN
C1FC	F-CMP
C1FL	F-CNL
C1FE	F-ENR
C1FN	F-NEW
C1FO	F-ONS
C1IN	INC
C1MC	M-CMP
C1MI	M-INC
C1MN	M-NEW
C1MP	MNP
C1MR	M-RCVD
C1MS	M-SNT
C1MU	M-UAS
C1NE	NEW
C1NF	NFY
C1ON	ONS
C1PC	P-CMP
C1PI	P-INC
C1PN	P-NEW
C1PR	P-RCVD
C1PS	PSNT
C1PU	P-UAS
C1RC	RCVD
C1RE	RED
C1RS	RSCH
C1RT	RST
C1SA	S-ASN
C1SC	S-CMP

OUCCB_Alarm_State	OUNMS_Alarm_State
C1SE	S-ENR
C1SI	S-INC
C1SM	S-MNP
C1SN	S-NEW
C1SB	SNT
C1SO	S-ONS
C1SR	S-RCVD
C1ST	S-RST
C1SS	S-SNT
C1SD	S-SUS
C1SK	S-UAS
C1SV	SUS
C1US	UAS
C1VF	VFY
C1WA	W-ASN
C1WC	W-CMP
C1WL	W-CNL
C1WE	W-ENR
C1WO	W-ONS
C1WR	W-RCVD
C1WS	W-SNT
C1WU	W-SUS
C1WK	W-UAS

Lookup: OUTL-BRT-CCS_NMS_CALL_BACK_INDI

OUC2M_CallbackRequested	OUNMS_CallbackFlag
TRUE	1
FALSE	0

Lookup: OUTL-BRT-CCS_NMS_CALL_CANCEL_IN

OUC2M_Status	OUNMS_CallCancelFlag
PENDING	N

OUC2M_Status	OUNMS_CallCancelFlag
SENT	N
COMPLETE	N
CANCELED	Y

Lookup: OUTL-BRT-CCS_NMS_CALL_STATUS

OUNMS_Call_Status	OUC2M_Call_Status
Y	C1YA
N	C1NO
C	C1CC
E	C1EC

Lookup: OUTL-BRT-CCS_NMS_CAUSE

OUCCB_Cause	OUNMS_Cause
C1TC	TROUBLE_CALL
C1MA	MANUAL
C1CF	CONFIRMED
C1NO	NON_OUTAGE

Lookup: OUTL-BRT-CCS_NMS_ConfigProps

Property Name	Value
NMS.MultipleInstance	TRUE
NMS.NumberOfDaysOfHistory	60
NMS.CCBCallSourceID	CC
OUCCB_OUNMS_ETR_SOURCE.ThrowException	FALSE
OUCCB_OUNMS_Job_History_Status.ThrowException	FALSE
OUCCB_OUNMS_Alarm_State.ThrowException	FALSE
OUCCB_OUNMS_CALL_STATUS.ThrowException	FALSE
OUCCB_OUNMS_CallBackIndicator.ThrowException	TRUE
OUCCB_OUNMS_Cause.ThrowException	FALSE
OUCCB_OUNMS_MeetType.ThrowException	FALSE
OUCCB_OUNMS_NewCallIndicator.ThrowException	FALSE

Property Name	Value
OUCCB_OUNMS_CallCancelIndicator.ThrowException	TRUE
OUCCB_OUNMS_AccountType.ThrowException	FALSE
OUCCB_OUNMS_MeterType.ThrowException	FALSE
OUCCB_OUNMS_LifeSupportIndicator.ThrowException	TRUE
OUCCB_OUNMS_ErrorCode.ThrowException	FALSE
OUCCB_OUNMS_notification.email.error.flag	TRUE

Lookup: OUTL-BRT-CCS_NMS_EMAIL_ID

Property Name	Value
Recipient	Email_ID
from	user@oracle.com
to	admin@oracle.com,user@oracle.com

Lookup: OUTL-BRT-CCS_NMS_ETR_SOURCE

OUCCB_ETR_Source	OUNMS_ETR_Source
C1NO	N
C1NC	S
C1UN	0
C1MP	G
C1ME	C
C1DE	I
C1NP	P
C1BT	M
C1NR	m
C1AE	A
C1OD	D
C1RE	E
C1UE	U
C1SW	W

Lookup: OUTL-BRT-CCS_NMS_INSTANCE

Division	NMS_Site_Connection
OH	OUTL-BRT-NMS_CCSNMS
CA	OUTL-BRT-NMS_CCSNMS_CA
DEFAULT	OUTL-BRT-NMS_CCSNMS

Lookup: OUTL-BRT-CCS_NMS_JOB_HISTORY_ST

OUCCB_Job_History_Status	OUNMS_Job_History_Status
C1FZ	0
C1PS	1
C1PD	2
C1RS	3
C1RD	4
C1NO	5
C1MT	6
C1FM	7
C1CO	8
C1VO	9
C1NF	10
C1PM	11
C1RM	12
C1PL	13
C1SW	14
C1FC	15
C1CT	16
C1VY	17
C1TT	18

Lookup: OUTL-BRT-CCS_NMS_LIFE_SUPPORT_I

OUCCS_LifeSupportIndicator	OUNMS_LifeSupportIndicator
N	0
Y	1
ZZNL	0

OUCCS_LifeSupportIndicator	OUNMS_LifeSupportIndicator
ZZLS	1

Lookup: OUTL-BRT-CCS_NMS_MANUFACTURER

OUCCS_Manufacturer	OUNMS_Manufacturer
INT-ELECTRIC MANUFACTURER1	GE
C2M_ELECTRIC_MANUFACTURER	C2M_ELECTRIC

Lookup: OUTL-BRT-CCS_NMS_METER_TYPE

OUCCS_MeterType	OUNMS_MeterType
E-SIMPLE	E-SIMPLE
E-TOU	E-TOU
E-HV	E-HV
E-NODUP	E-NODUP
E-INTRVL	E-INTRVL
E-HVTEST	E-HVTEST
G-HV	
G-SIMPLE	
W-HV	
W-SIMPLE	
ZZEU_ITEM_GDKWH_SUM_BASEL	E-SIMPLE
INT-OFSC-DVC-MANUALMTR1	INT-OFSC

Lookup: OUTL-BRT-CCS_NMS_NEW_CALL_INDIC

OUC2M_OutageCallAction	OUNMS_UpdateExistingFlag
C1AD	0
C1CN	1
C1CH	1

Lookup: OUTL-BRT-CCS_NMS_USAGESUB_STATU

OUCCS_Status	OUNMS_Status
ACTIVE	Y

OUCCS_Status	OUNMS_Status
INACTIVE	N

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 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.

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.

Resubmitting the Error Instances in Oracle Integration Cloud

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

To resubmit the error instances in Oracle Field Service:

1. Login to Oracle Field Service.
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 **OUTL-BRT-CCS_NMS_ConfigProps** lookup.

   Change the **email.flag** property value to 'true'.
4. Edit the **OUTL-BRT-CCS_NMS_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-CCS_NMS_Email_ID lookup, do not edit the values provided under the **Recipient** column.

Chapter 7

Customizations

In Oracle Integration Generation 3, you can extend (customize) an integration in an accelerator project by adding and configuring an extension group. An extension group enables you to extend your integration by adding invoke connections; stitch, for-each, switch, map, and integration actions; and global variables to the integrations in your accelerator project.

For more details on how to perform these changes, refer to the **Manage a Project** section in **Using Integrations in Oracle Integration 3** at: https://docs.oracle.com/en/cloud/paas/application-integration/integrations-user/manage-project.html#GUID-A840E945-3F4E-4917-8DAF-5234840CF8F4

In addition, a knowledge base article is available at: https://support.oracle.com/epmos/faces/DocumentDisplay?_afrLoop=407954934694303&id=3017378.1&_adf.ctrl-state=611abf54g_77

Chapter 9

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 catalogs in Oracle Utilities Customer Cloud Service and Oracle Utilities Network Management System are configured completely to activate integration flows.

Activating Integration Flows

To activate the integration flows:

1. Navigate to the integration to activate.
2. Click **Activate**. 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
Oracle Utilities CCS NMS Job History	https:// OICHost:port /ic/ws/integration/v2/flows/oracleutilities/project/OUTL-BA-CCS_NMS/OUTL-BA-CCS_NMS_JOB_HISTORY/1.0?wsdl	
Oracle Utilities CCS NMS Planned Outages	https:// OICHost:port /ic/ws/integration/v2/flows/oracleutilities/project/OUTL-BA-CCS_NMS/OUTL-BA-CCS_NMS_PLANNED_OUTAGES/1.0?wsdl	
Oracle Utilities CCS NMS Submit Calls	https:// OICHost:port /ic/ws/integration/v2/flows/oracleutilities/project/OUTL-BA-CCS_NMS/OUTL-BA-CCS_NMS_SUBMIT_CALLS/1.0?wsdl	
Oracle Utilities CCS NMS Call History	https:// OICHost:port /ic/ws/integration/v2/flows/oracleutilities/project/OUTL-BA-CCS_NMS/OUTL-BA-CCS_NMS_CALL_HISTORY/1.0?wsdl	
Oracle Utilities CCS NMS Global Error Handler	/ic/api/integration/v2/flows/rest/project/OUTL-BA-CCS_NMS/OUTL-BA-CCS_NMS_ERRORHANDLER/1.0/ccs-nms-common-error-handler	
Oracle Utilities CCS NMS Customer Sync	https://OICHost:port/ic/ws/integration/v2/flows/oracleutilities/project/OUTL-BA-CCS_NMS/OUTL-BA-CCS_NMS_CUSTOMER_SYNC/1.0?wsdl	

Chapter 10

Monitoring and Troubleshooting

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

- Oracle Utilities Customer Cloud Service
- Oracle Utilities Network Management System
- Oracle Integration Cloud

Oracle Utilities Customer Cloud Service

This section provides information about monitoring Oracle Utilities Customer Cloud Service logs.

For more information, refer to the **Troubleshooting** section in the Oracle Utilities Cloud Services Implementation Guide.

Cloud Service Logs

The customer or system integrator can request access logs from cloud environments. Every Access Log request will require a service request to be logged in My Oracle Support.

On-premises Application Logs

Application related error logs can be viewed from:

- Errors related to the online integration invocation from Oracle Utilities Customer Cloud Service are stored in the CCS_ENVIRONMENT_NAME/ logs/ or C2M_ENVIRONMENT_NAME/logs/system folder.

  Example: V27_C2M_ORA_WLS/logs/system\

For more information about errors and notifications, see the Oracle Utilities Customer Cloud Service documentation on Oracle Help Center.

Oracle Utilities Network Management System

This section provides information about monitoring Oracle Utilities Network Management System logs.

Cloud Service Logs

The customer or system integrator can request access logs from cloud environments. Every Access Log request will require a service request to be logged in My Oracle Support.

On-premises Application Logs

Application related error logs can be viewed from:

- Errors related to the online integration invocation from Oracle Utilities Network Management System are stored in the NMS_ENVIRONMENT_NAME/ logs/ or NMS_ENVIRONMENT_NAME/logs/system folder.

  Example: NMS_ORA_WLS/logs/system\

For more information about errors and notifications, see the Oracle Utilities Network Management System documentation on Oracle Help Center.

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
- Troubleshooting

Monitoring Integration Flows

Integration flows are monitored using the following:

- Project (for project based instances)
- Observability (for non project based instances)

To monitor the integration flows within a project:

1. Login to Oracle Integration Cloud.
2. Click **Projects**. On the navigation pane, click the relevant project.
3. Navigate to the **Observe** menu.
4. You can review:
    a. **Integrations** to view the count of various statuses of instances created per integration flows.
    b. **Instances** to view instances of integrations of the project.
    c. **Future runs** to view all the runs scheduled or started for scheduled integrations.
    d. **Audit** to view and download design-time audit logs.

For more information, refer to the Monitor Integrations in a Project section in Using Integrations in Oracle Integration 3.

To monitor integration flows from the Oracle Integration Cloud **Observability** menu option:

1. Login to Oracle Integration Cloud.
2. Click **Observability** on the menu.
3. Select any of the following as required:
    - **Dashboards**: To monitor the complete dashboard of integration. Get at-a-glance information about the number and status of your projects, integrations, connections and more.
    - **Integrations**: The **Monitor integrations** page lets you view the message processing status of your running integrations. It shows the number of messages that are:
        - Received and processed
        - Successful, in error, or aborted, and errors have occurred
        - Aborted
    - **Instances**: To filter and track the status of integration instances and show the flow trace/activity stream of the integration.

- **Error**: To manage errors in Oracle Integrations. Resubmit failed instances, discard failed instances, view message recovery status, and view basic and detailed error messages.

For more information, refer to the **Explore the Navigation Pane** section at: https://docs.oracle.com/en/cloud/paas/application-integration/int-get-started/navigate-oracle-integration.html#GUID-BD4DA10C-D7DB-4F69-BFF3-937C9C3827DB

Troubleshooting

To troubleshoot errors in the workflow through the generated instances, you can set tracing level to DEBUG to generate detailed logs.

To enable DEBUG:

1. Select **Configure Activation** and then select the **Tracing Level** to be 'DEBUG'.
2. Run the integration and check the activity stream which now will include the runtime log details of the flow.
3. If an activation fails, the **Integrations** page displays an error.

   Sample cases:

   - While activating the integration, if there are any connectivity errors, make sure to trigger the connection, test it, refresh the metadata, and then activate the integration.
   - For Oracle Utilities Customer Cloud Service initiated integration flows activated for the first time, make sure that theOracle Utilities Network Management System catalog is configured accurately. All external systems and inbound web services used by the integration are defined in the catalog.