

Oracle Utilities Customer Self Service

Implementation Guide

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Chapter 1

Product Overview

Oracle Utilities Customer Self Service provides utility companies with a portal that enables their customers to manage their accounts, monitor consumption, and interact with the utility.

The application can provide both unsecured access for finding general information and utility offerings, and secured access for managing accounts, paying bills, or reviewing usage history.

Oracle Utilities Customer Self Service is a flexible and user-friendly packaged utility portal that is pre-integrated with Oracle Utilities applications. It empowers consumers to manage their accounts, take control of their consumption, and it increases utility efficiency by facilitating interaction with consumers and highlighting incentives to optimize energy usage and reduce costs.

Functional Overview

Oracle Utilities Customer Self Service modules include the following functionality:

- Account Management Module:
 - User registration
 - Password management
 - Self-service information management
 - Account information management
 - Alerts and notifications
- Billing and Payment Management Module:
 - Billing notification preferences
 - Account charges summary
 - View bill/payment history
 - Service charges to-date
 - Compare rate plans and analysis
 - Setup electronic billing
 - One-time payments
 - Automatic recurring payments
 - View rate plans and products

- View promotions
- Customer Service Management Module:
 - Add scalar meter read data
 - Detailed service usage

Two additional secured areas are available to provide the following capabilities:

- Administration
 - View and manage metadata used by the application (labels, messages, other entities)
 - View and manage access roles and security rules
- Customer support
 - Allow a CSR login and view core modules as selected customer

Technical Overview

Oracle Utilities Customer Self Service is based on service oriented standards based architecture and leverages industry leading Oracle application development technology.

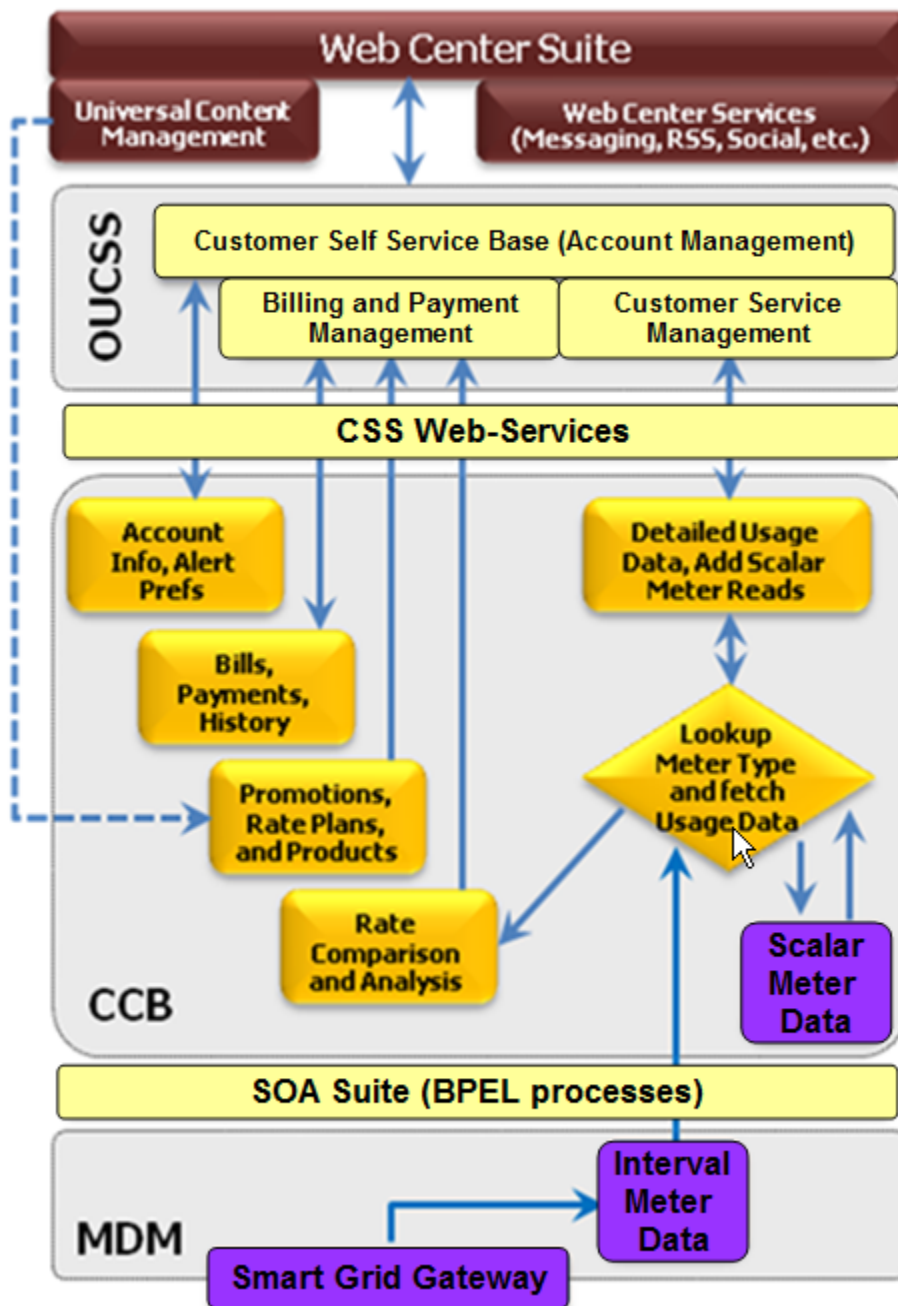
- Portal/Taskflow components are developed using Oracle Application Development Framework (ADF) 11g and packaged as WSPR 2.0 compliant portlets
- Taskflows/Portlets are pre-integrated with OU Customer Care and Billing services using standards based web service API
- Oracle Webcenter 11g is a recommended portal platform for consumption with two approaches:
 - OUCSS taskflows consumed directly by Extending WebCenter spaces methodology
 - OUCSS taskflows consumed as WSRP 2.0 portlets in WebCenter
- Reference GroupSpaces Oracle Webcenter application (with preconfigured security, navigation model and page templates) is provided with the release package to facilitate implementation and development activities. The group spaces are configured using OUCSS Taskflows by Extending WebCenter spaces.

Security

OUCSS offers Tier1 and Tier 2 security.

- Tier-1 Security of group spaces is managed in WebCenter. Most of the pages in OUCSS group spaces are secured and are accessed only by certain Groups. For more information on this type of security see the [Reference Security Roles](#) section.
- Tier-2 security controls actions and fields on taskflows/portlets. For more information on this type of security, see the [Security Configuration](#) section.

OUCSS Architecture



Chapter 2

OUCSS Implementation

Oracle Utilities Customer Care and Billing Configuration

To set up Oracle Utilities Customer Care and Billing for self-service implementation, the following admin data setup need to be configured:

- 1. Self-Service Integration Master Configuration
- 2. Self-Service Task Types

Note: For more information on configuring and working with Oracle Utilities Customer Care and Billing, see the Oracle Utilities Customer Care and Billing user documentation.

Self-Service Integration Master Configuration

Important- If you installed CCB 2.3.1.2 and configured OUCSS master configuration for Service Tasks, and later applied the changes described in Bug/Enhancement [12861348](#) as a Single Fix or as part of a Rollup or Service Pack, you will need to update your master configuration.

Create a master configuration for self-service integration in Oracle Utilities Customer Care and Billing.

Navigation	Guideline
Admin Menu → Master Configuration	Create a master configuration to be used for self-service integration.

Note: For more information on configuring self-service integration master configuration, please see the online help provided in Oracle Utilities Customer Care and Billing.

Self-Service Task Types

Create self-service task types for each self-service task in Oracle Utilities Customer Care and Billing. Note that one and only one active self-service task type can be configured per self-service task.

Navigation	Guideline
Admin Menu → Self-Service Task Type	Create self-service task types for each self-service task business objects.

Note: For more information on configuring self-service integration master configuration, please see the online help provided in Oracle Utilities Customer Care and Billing.

XAI Inbound Services

The following are the base XAI Inbound Services invoked by Oracle Utilities Customer Self Service.

Name	Description
WXAccountChargesSummaryRetriever	This inbound service retrieves account charge summary information to display in the self-service application. The following is returned:

	<ul style="list-style-type: none"> - The most recent bill for the account (excludes off cycle bill generated bills) - Account's current balance
WXAutoPaySetup	This inbound service is used by the self-service application. It's responsible for retrieving and maintaining an account's auto pay details. For auto pay updates, the service merely creates an instance of the Auto Pay Setup business object defined on the Self-Service Integration master configuration.
WXBillPayHistoryRetriever	This inbound service retrieves an accounts bills and payments for a period to display in the self-service application.
WXBillView	This inbound service retrieves and account's bill details to display in the self-service application.
WXCreateMeterRead	This inbound service is used by the self-service application. It is responsible for retrieving and adding manual or scalar meter reads. When adding a new meter read, the service merely creates an instance of the Meter Read Creation business object defined on the Self-Service Integration master configuration.
WXEBillSetup	<p>This inbound service is used by the self-service application. It's responsible for retrieving and maintaining a customer's bill routing method, i.e. postal, email, etc. This service supports the following modes:</p> <ul style="list-style-type: none"> - On READ action, it retrieves the account's current bill routing method setting - On UPDATE action, it updates the account's current bill routing method setting
WXGetCCBAAlerts	<p>This inbound service retrieves a list of alerts to display in the self-service application.</p> <p>The list of alert types and corresponding scripts are defined on the Self-Service Integration master configuration.</p>
WXGetConsumptionSummary	This inbound service retrieves consumption information to display in the self-service application. It retrieves consumption for service agreements that do not require MDM bill determinants.
WXGetRatedSAs	<p>This inbound service retrieves the rated service agreements of an account.</p> <p>It also returns the valid rate schedules for every SA's SA Type.</p>
WXGetSelfServiceDropdowns	<p>This inbound service retrieves data for populating dropdown lists in the self-service application. The following is returned:</p> <ul style="list-style-type: none"> - Valid credit card types as defined on the Self-Service Integration master configuration - Valid payment types as defined on the Self-Service Integration master configuration - Valid bill route types - Valid phone types
WXGetSelfServiceLabels	This inbound service retrieves data for populating field labels in the self-service application.
WXInvitePersonList	This inbound service is used by the self-service application. It's responsible for retrieving persons related to an account.
WXMaintainMailingAddressInfo	<p>This inbound service is used by the self-service application. It's responsible for maintaining a customer's mailing address. This service supports the following modes:</p> <ul style="list-style-type: none"> - On READ action, it retrieves the account's current mailing address - On UPDATE action, it updates the account's mailing address. Note that when a mailing address is updated, it is stored on the person correspondence information
WXMaintainPhoneInfo	This inbound service is used by the self-service application. It's responsible for maintaining a customer's phone numbers. This service supports the following

	<p>modes:</p> <ul style="list-style-type: none"> - On READ action, it retrieves the customer's current phone information - On UPDATE action, it updates the customer's phone information
WXMakePayment	This inbound service is used by the self-service application to allow creation of online payments.
WXRateAnalysis	This inbound service receives an SA and a new rate schedule and does a comparison of the bill segments of the SA versus what the charges would have been if the SA was billed using the new rate schedule.
WXSetBillNotifyPreference	This inbound service is used by the self-service application. It's responsible for maintaining the billing notification preferences of a self-service user.
WXUsageChargesToDate	This inbound service retrieves the charges to date for a self-service user's account. The system only attempts to calculate unbilled charges to date for service agreement's that require bill determinants from MDM.
WXUsageDetail	This inbound service retrieves usage details for a self-service user's account for some period (i.e. year, month or day). The system will attempt to retrieve usage information from MDM for each of the account's service agreements that require bill determinants. This service may also return temperature information.
WXUsageOverview	This inbound service retrieves an x-day usage overview for a self-service user's account. The number of days is provided as input to this service. The system will attempt to retrieve usage information from MDM for each of the account's service agreements that require bill determinants.
WXVerifyAccount	<p>This inbound service enrolls an account of a self-service user for web access.</p> <p>A self-service user must provide answers to verification fields and must match what is stored in the system. If all answers match, then his/her account is enrolled for web access.</p> <p>The list of verification fields per line of business are defined on the Self-Service Integration master configuration.</p>
WXViewAccount	This inbound service retrieves account information to display in the self-service application.
WXViewAccountList	<p>This inbound service accepts a list of accounts from self-service and returns corresponding account information.</p> <p>It uses the information scripts defined on the Self-Service Integration master configuration.</p>

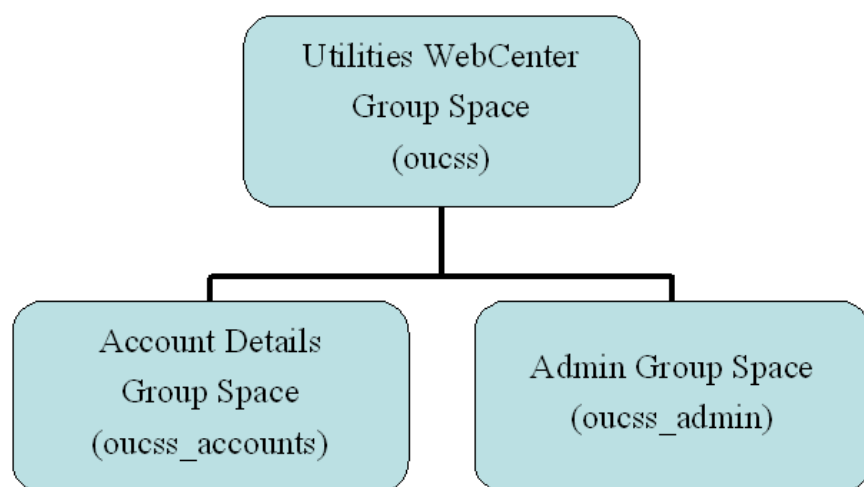
WebCenter Group Spaces Application Configuration

The reference WebCenter Group Space archive contains OUCSS taskflows. The taskflows are spread across different pages and logically grouped. The group space uses the default WebCenter security model to allow access only to certain groups and users.

Group Spaces

OUCSS group space archive has a two-level hierarchy of group spaces. The **Utilities WebCenter** group space (oucss_tf) has two sub-spaces **Account Details** (oucss_tf_accounts) and **Admin** (oucss_tf_admin).

The pre-configured **WSSAdmin** user is the moderator of all the three group spaces. This user has complete control on all the group spaces and can add, modify, delete any resource of the group space.



Utilities WebCenter Group Space (oucss_tf)

The **Utilities WebCenter** group space is a public group space to allow any user in the World Wide Web access to public pages like Home, About, Forgot Password, etc. This group space has only one secured page which is the **Accounts** page. This group space also has implementation of other group space resources like page template, navigation model and resource catalog.

Visible Public Pages

- Home
- About

Hidden Public Pages

- Forgot Password

Visible Secured Pages

- Accounts

Taskflows Dropped in Group Space Pages

- Home
 - Change User Information
 - Change Password
- About
 - No taskflows.
- Forgot Password
 - Forgot Password
- Accounts
 - View Account List

Account Details Group Space (oucss_tf_accounts)

The **Account Details** group space is a subspace of the **Utilities WebCenter** group space. It contains pages that display taskflows related to the user's account. This group space is secured and only accessible by users who are members of **WSSEnrolledGroup** and **WSSCSRGroup** enterprise groups.

Some pages in this group space are visible so that a user can directly access the pages using the sub menu. Some pages are not visible until a user clicks on a button or hyperlink to navigate to them.

Visible Secured Pages

- Dashboard
- Information
- Billing History
- Bill
- Rate Plans
- Usage

Hidden Secured Pages

- Pay Now
- Manage Address
- Manage Phone
- Manage Electronic Bill Option
- Manage Billing Notification Preference
- Manage Automatic Payment Option
- Add Meter Read

Taskflows Dropped in Group Space Pages

- Welcome User (All Pages)
- Dashboard
 - Account Charges Summary
 - Service Charges to Date
 - Usage Overview
 - Scalar Consumption Summary
 - Banner Promotion
 - Alerts (on right)
- Information
 - View Mailing Address
 - View Phone Information
 - View Billing Notification Preferences
 - View Bill Delivery Method
 - View Automatic Payment Option
 - Alerts (on right)
- Bill History
 - Billing History
 - Standard Promotion
 - Alerts (on right)
- Bill
 - View Bill

- Alerts (on right)
- Rate Plans
 - Compare Rate Plans
 - Column Promotions (on right)
- Usage
 - Usage Detail
 - Column Promotions (on right)
- Scalar Read
 - Add Meter Reading
 - Alerts (on right)
- Pay Now
 - Make One Time Payment
 - Alerts (on right)
- Manage Address
 - Update Mailing Address
 - Alerts (on right)
- Manage Phone
 - Update Phone Information
 - Alerts (on right)
- Manage Auto Pay
 - Update Automatic Payment Option
 - Alerts (on right)
- Manage Bill Notify
 - Update Billing Notification Preferences
 - Alerts (on right)
- Manage EBill
 - Update Electronic Bill Option
 - Alerts

Admin (oucss_tf_admin)

The **Admin** group space is a subspace of the **Utilities WebCenter** group space. It contains all the administration-related taskflows. This group space is secured and accessible only by users who are members of the **WSSAdminGroup** enterprise group. Users who are members of the **WSSCSRGroup** enterprise group have access only to the **Users** page of the group space to perform CSR related activity.

Visible Secured Pages

- Users
- Access Roles
- Labels
- Language
- Edge Application
- Line of Business
- Lookup

- Offer Set
- Security
- Portlets
- Message

Group Space Resources

Page Template

One common page template **OUCSS Page Template** is used by all three group spaces. **OUCSS Page Template** controls the layout, navigation (both main menu and sub-menu) as well as the links on the boiler plate. Moderator of this group space can add more page templates or modify the existing one to change the look and feel of the group space and pages.

Navigation

Utilities WebCenter group space implements three separate navigation models to control the Main Menu and the sub-menu depending on the sub-space.

OUCSS Top Navigation

This navigation model is used as the default navigation in the page template and is displayed as the Top Menu. This navigation model has links to all Utilities WebCenter group space [visible public pages](#) and links to navigate to **Account Details** and **Admin** group space. Public pages are always displayed but secured pages and additional links to sub spaces are displayed depending on the role of the logged in user.

Utilities Pages

This evaluates to all the accessible pages from the **Utilities WebCenter** group space depending on the user role.

Details

Link to Account Details sub-space and is only visible to members of **WSSEnrolledGroup** and **WSSCSRGroup**. Users are redirected to the Dashboard page of Account Details group space.

Admin

Link to Admin sub-space and is only visible to members of **WSSAdminGroup**. Users are redirected to User page in **Admin** group space.

OUCSS Accounts Navigation

This navigation model is displayed as a sub menu when the user navigates to the Account Details group space. This navigation displays all the visible pages of the **Account Details** group space.

Account Details

This evaluates to all the accessible pages of the **Account Details** group space depending on the user role.

OUCSS Admin Navigation

This navigation model is displayed as sub menu when the user navigates to the **Admin** group space. This navigation displays all the visible pages of **Admin** group space. For a CSR user, only the User page is displayed.

Admin

This evaluates to all the accessible pages of the **Admin** group space depending on the user role.

Resource Catalog

Resource catalog controls what can be added to a page in edit mode. A common resource catalog **OUCSS Core Taskflows** is implemented to restrict only OUCSS taskflows to be added to the page. All the three group spaces are configured to use the same catalog.

Reference Security Roles

Tier-1 security of group space is managed in WebCenter. Most of the pages in OUCSS group spaces are secured and are accessed only by specific enterprise groups/role. Some pages are public which can be accessed by any user without logging into WebCenter.

As part of the installation, four enterprise groups and two users are imported into LDAP. The enterprise groups are hierarchical.

Enterprise Groups

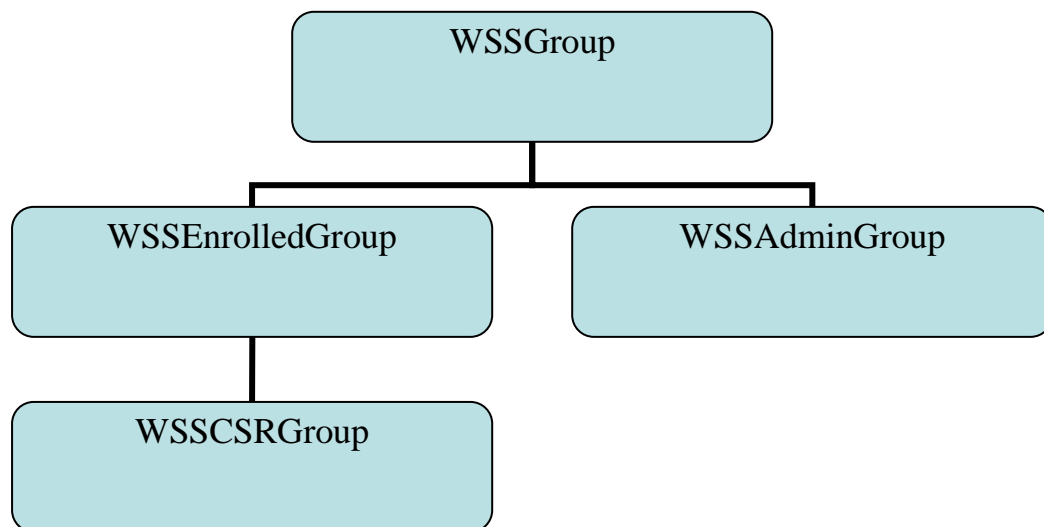
There are four enterprise groups provided in the OUCSS application.

All users who have registered in OUCSS WebCenter will automatically belong to the **WSSGroup** enterprise group.

Users who have gained access to a utility account by enrollment will automatically belong to the **WSSEnrolledGroup** enterprise group. Users who are members of this group can view details and perform certain actions on their utility accounts.

Users who belong to the **WSSAdminGroup** enterprise group will serve as administrators of the OUCSS application. Members of this group are the moderators of the OUCSS group spaces. Ideally, your system administrators will be members of this group.

Users who belong to the **WSSCSRGroup** enterprise group can perform CSR-related functions. Ideally, your CSRs who directly interact with consumers will be members of this group.



Pre-configured Users

WSSAdmin is the moderator of all three group spaces. This user has control to manage all resources of the three group spaces. This user is a member of **WSSGroup**, **WSSEnrolledGroup** and **WSSAdminGroup**.

WSSCSR is provided for certain group of users that need to perform CSR-related functions. This user is part of **WSSCSRGroup**. This user can carry out the same set of actions for any registered user who has access to a utility account.

The following table provides a snapshot of roles to group space access.

Role/Group Space	oucss	oucss_accounts	oucss_admin
WSSGroup	✓ (only Accounts Page)	×	×

WSSEnrolledGroup	✓	✓	✗
WSSAdminGroup	✓	✗	✓
WSSCSRGroup	✓	✓	✓ (only Users Page)

OUCSS Application Configuration

Label

Open this page using **Admin Menu, Label**.

Some fields on this screen are protected as only the product development group may change them.

Label Code uniquely identifies this label.

Important! If you introduce new fields, you must prefix the code with **CM**. If you do not do this, there is a possibility that a future release of the application could introduce a new label with the name you allocated.

Description contains the text of the label. This is the text that appears on the various screens on which the label is displayed. Note, the label's description can be overridden by specifying a **Description Override**.

Help and **Help Override** are reserved for future use.

Translatable and **Translatable Context** are used if your OUCSS implementation supports multiple languages.

Labels in Oracle Utilities Customer Care and Billing

There is one configuration wherein source of labels are originating from CC&B. These are the “challenge questions” when enrolling your CC&B account.

To load these labels from CC&B into OUCSS automatically, go to Admin Menu, Labels. On the Actions menu dropdown, select Reload Labels. After a successful reload, you will need to flush the cache by selecting Flush Cache from the Actions menu dropdown.

Note: To configure these labels, please refer to the online help provided in the Self-Service Integration Master Configuration defined in the CC&B system.

Lookup

Open this page using **Admin Menu, Lookup**.

Lookup Code is the unique name of the field whose lookup values are maintained in the grid.

Important! If you introduce new lookups, you must prefix the code with **CM**. If you do not do this, there is a possibility that a future release of the application could introduce a new lookup with the name you allocated.

Customizable check box indicates whether you are allowed to add valid values for a lookup field whose owner is not **Customer Modification**.

Description describes the lookup. Note, the lookup's description can be overridden by specifying a **Description Override**.

Help and **Help Override** are reserved for future use.

In this release, there are 3 sources of where lookups are coming from.

- Lookups defined in Oracle Utilities Customer Self-Service
- Lookups defined in Oracle Utilities Customer Care and Billing
- Lookups defined in Oracle Utilities Meter Data Management

The grid contains the values for a specific lookup.

Lookup Value is the unique identifier. If you add a new value, it must begin with a **CM** (in order to allow future upgrades to differentiate between your implementation-specific values and base-package values).

Status indicates if the value is **Active** or **Inactive**. The system does not allow **Inactive** values to be used (the reason we allow Inactive values is to support historical data that references a value that is no longer valid).

Attached Data is additional information associated with a lookup value.

Description is the name of the lookup value that appears on the various transactions in the system. Note, the lookup value's description can be overridden by specifying an **Override Description**.

Help and **Help Override** are reserved for future use.

Lookups in Oracle Utilities Customer Care and Billing

There are several configurations originating from CC&B that are stored in OUCSS as lookups. They are the following:

Valid Payment Types (e.g. Credit Card, Checking, Savings)

Valid Card Types (e.g. Visa, American Express, Discover)

Valid Bill Route Types (e.g. Postal, Email, Fax)

Valid Phone Types (e.g. Mobile Phone, Home Phone, etc.)

To load these labels from CC&B into OUCSS automatically, go to Admin Menu, Lookups. On the Actions menu dropdown, select Reload Lookups. After a successful reload, you will need to flush the cache by selecting Flush Cache from the Actions menu dropdown.

Note: To configure the valid Payment Type and Card Type lookups, please refer to the online help provided in the Self-Service Integration Master Configuration defined in the CC&B system. For the Bill Route Type and Phone Type lookups, these will be part of your regular CC&B configuration. Please refer to the Oracle Utilities Customer Care and Billing Documentation.

Lookups in Oracle Utilities Meter Data Management

There is one configuration originating from MDM that is stored in OUCSS as a lookup. It is the valid Time Of Use codes and their associated color for graphical display (e.g. On peak data will be seen as red, Off peak data will be seen as blue, etc.).

You must define in OUCSS all the supported Time Of Use codes in MDM. For each Time Of Use codes, you must associate it with a unique color defined in hexadecimal format (e.g. #BB7D3E, #602040, etc.) in the **Attached Data** field.

Message

Open this page using **Admin Menu, Message**.

Message Code uniquely identifies this message.

Important! If you introduce new messages, you must prefix the code with CM. If you do not do this, there is a possibility that a future release of the application could introduce a new message with the name you allocated.

Message Category identifies if the message is any of the following categories:

- Error
- Informational
- Warning
- Fatal
- Email

Description is the text of the message that appears on the various transactions in the system. Note, the message's description can be overridden by specifying a **Description Override**.

Help and **Help Override** are reserved for future use.

Portlet

Open this page using **Admin Menu, Portlet**.

Portlet Code uniquely identifies this portlet.

Important! If you introduce new portlets, you must prefix the code with CM. If you do not do this, there is a possibility that a future release of the application could introduce a new portlet with the name you allocated.

Description is the text of the message that appears on the various transactions in the system. Note, the portlet's description can be overridden by specifying a **Description Override**.

Help and **Help Override** are reserved for future use.

The grid contains the values for the valid actions allowed on a specific portlet.

Action Value is a dropdown of the allowed actions. The values for **Action Value** are defined in the base lookup ACTION_FLG.

Access Role

Open this page using **Admin Menu, Access Role**.

Access Role Code uniquely identifies this access role.

Important! If you introduce new access roles, you must prefix the code with CM. If you do not do this, there is a possibility that a future release of the application could introduce a new message with the name you allocated.

Status indicates if an access role is **Active** or **Inactive**.

Description is the text of the message that appears on the various transactions in the system. Note, the access role's description can be overridden by specifying a **Description Override**.

Help and **Help Override** are reserved for future use.

Edge Application

Open this page using **Admin Menu, Edge Application**.

Edge Application Code uniquely identifies this edge application.

Important! If you introduce new edge applications, you must prefix the code with CM. If you do not do this, there is a possibility that a future release of the application could introduce a new edge application with the name you allocated.

Server Reference is the server information where the edge application is running.

Description is the text of the message that appears on the various transactions in the system. Note, the edge application's description can be overridden by specifying a **Description Override**.

Help and **Help Override** are reserved for future use.

The grid contains the keys used to access this edge application. You can define up to 5 keys for each edge application.

Key Field Name uniquely identifies the key.

XML Field Name is the xml tag used to identify this key.

Line of Business

Open this page using **Admin Menu, Line of Business**.

Line of Business Code uniquely identifies this Line of Business.

Important! If you introduce new lines of business, you must prefix the code with CM. If you do not do this, there is a possibility that a future release of the application could introduce a new line of business with the name you allocated.

Description is the text of the message that appears on the various transactions in the system. Note, the line of business' description can be overridden by specifying a **Description Override**.

Help and **Help Override** are reserved for future use.

Edge Application is the owner of this line of business. All accounts associated with this line of business are maintained within this edge application.

Status indicates if a line of business is **Active** or **Inactive**.

Security

Taskflow/Portlet Security Overview

The Tier 2 security controls access to the links and buttons on the taskflows/portlets. The access rights for a logged in user are loaded from the database based on the configuration.

Taskflow/Portlet security restricts access to its transactions as follows:

1. Each taskflow/portlet must be defined in Portlets table with list of actions allowed for this portlet
2. Available actions should be defined for each Line Of Business and Access Role. Every user has each Line Of Business and Access Role
3. Specific user interface components (buttons, links) can be hidden or visible based on the access role.

When you grant an Access Role access to a portal, you must also define the permitted action.

For example, you may indicate a Line Of Business/Access Role has inquire-only access to a taskflow/portlet, whereas another role has also change privilege to the same taskflow/portlet.

How to Configure Security Settings

In order to add or change security settings, user must login to the system as administrator.

Changes in security for a specific user or group of users will be visible in the system only after the user logs out and logs in again.

User

The link between Line of Business / Access Role and User is done during registration process.

A new link between User and Line of Business / Access Role is created if a user is invited as guest. If the guess access is revoked, this link is removed.

Security

Go to Admin group on the Top menu, then Security

For each combination of Line of Business and Access Role, specify portals a user can access and list of actions user can perform.

Field Level Security

Specific user interface components (buttons, links) can be hidden or visible based on the access role.

The SSBaseManagedBean contains a Java method isActionAllowed() which takes two parameters portlet name and action name and returns a boolean value. The boolean value indicates if the user has access to the particular UI component

For example, to show or hide the “Update” button on the View Mailing address taskflow/portlet the following code needs to be added for the Update button. The rendered property of the button is set using the isActionAllowed method.

```
<af:commandButton text="{ssBundle.ACCOUNT_UPDATE_LBL}"
    partialSubmit="true" id="amupclnk"
    inlineStyle="white-space:nowrap"
    disabled="{pageFlowScope.accountAddressManagedBean.updatePageURL eq null}"
    rendered="{pageFlowScope.accountAddressManagedBean.isActionAllowed['WSS_AccountAddressInfo,UPDATE']}">
```

Locale

A locale exists for every language spoken by your users. The system uses this code to supply information to users in their respective language. Open this page using **Admin Menu, Locale**.

The system provides support for multiple languages in a single environment. Users can use the system in their preferred language, as long as a translation into that language has been provided. By default, a user sees the system in their default language which is defined on their browser (e.g. Internet Explorer, Firefox).

Locale is a string that uniquely identifies the ISO language code in lower case. The following are valid locales supported out of box:

- en (English)
- fr (French)
- pt (Portuguese)
- it (Italian)
- es (Spanish)
- ru (Russian)

Display Direction indicates if this language is written **Left to Right** or **Right to Left**.

Supported checkbox indicates if this language is currently supported in the system or not.

Offers and Promotions

Offers means both Rates and Promotions. There are 3 styles of formats available for displaying Offers.

- Banner format
- Standard format
- Column format

This provides the company with a choice about how (and where) to display this information to the customer.

Banner

This format will be used when a single promotion is to be highlighted using a wide image (a standard web format banner).

- This is restricted to a single entry.
- The most important information for this taskflow/portlet is the image. It is assumed that the image should encourage further investigation if it sounds appealing.
- Clicking the image/link will take the customer to a page for further information/action.

Standard

This format will be used to display offers in the standard format (rows and 3 columns). First column displays the image or the title to capture the offer. Second column displays a link for more information and the third column displays a detailed description about the offer.

- This format allow multiple entries to be displayed.
- The most important information for this taskflow/portlet is the promotion title or a picture. The text or picture should be a draw for the customer to request more information.
- Clicking on image or title will take the customer to a page for further information/action.

Column

This format will be used when a narrow column running down the page is desired. It is recommended that the column should normally be configured to the right of the screen.

- This format allow for multiple entries displayed in column format.
- The most important information for this taskflow/portlet is the name or image of the promotion. It is assumed that the name/image should encourage further investigation if it sounds appealing.
- Clicking on image or title will take the customer to a page for further information/action.

There are six taskflows/portlets implemented to cater all three Offers formats. The taskflows are:

Promotions

- Banner Promotion
- Standard Promotion
- Column Promotion

Rates

- Banner Rates
- Standard Rates
- Column Rates

The input parameter to these offers is Offer Set Code and Locale. An Offer Set Code captures all the details like Type of Offer, Format and required values from the database. The locale is automatically picked up from the locale of the User. Customers can drop any of the offers taskflows/portlets on to a page and configure the Offer Set Code to a new or existing value to display the intended information.

Offer Service (Web Service)

Offer Service is installed by default as part of installation as a separate application on the same managed server as the taskflows/portlets. The service is implemented using ADF BC and exposed as WebService. This service uses the Offer Set Code and Locale to fetch the required data from the database (Offers tables in OUCSS schema). The taskflows uses this data to display the data in required format.

Check the Offers taskflow/portlet in Admin module for more information on the format of the Offer database table and their relations in order to add/delete/modify data for the service. If you are using the out-of-box solution, you can use the Offers Admin taskflow/portlet to add/delete/modify entries for the offers you want to maintain.

To allow users to reuse the Offers taskflows, the taskflows are build using Web Service. Customers can build their own Web Service with complex logic to display offers. The new web service should match the WSDL of the out-of-the-box web service for the offers to render properly.

If the you choose to implement and use your own web service then

1. Implement the Web Service and make sure the WSDLs are identical to the current service.
2. To update the Web Service used by Offers,
3. Login to EM
4. Click **OUCSS application** (oracle.ugbu.ss_2.0.0).
5. From the **Application Deployment** menu select **ADF -> Configure ADF Connections**.
6. Select **Offers Service** connection and click **Edit**.
7. Update the WSDL and Service Name of the connection to a new service.
8. Click **OK**, then open the **Advanced Connection Configurations** menu and select the port to update the **End Point URL**.
9. Select the **Configurations** tab.
10. Update the **Endpoint Address** in the **General** section, then click **Apply** to commit the changes.
11. Click **Apply** again to commit the changes to the **Offer Service** connection (restart is not required).

Note: You can optionally undeploy the Offer Service application if the “out of the box” solution is not required.

Configuration Properties

The SS_CONFIGURATION table contains properties which serve as system defaults. It also contains flags to enable email-sending-related properties.

The following configuration properties must be configured prior to use of the system:

Configuration Property	Description	Value
installation.owner.flag	This is the current owner of the application. For your implementation, this property must be set to CM (Customer Modification).	CM
edgeapplication.ccb.datasource	This is the edge application code. E.g. C1, M1 etc. from where the data is pulled.	C1
lookups.webservice.status	This is the status of the lookup values when they are loaded into OUCSS. Allowed values are ACTIVE or INACTIVE .	ACTIVE
webcenter.login.url	This is the URL link to login to webcenter.	http://<Specify Server Name>:<Specify Port Number>/webcenter/spaces/oucss/page/Accounts
webcenter.register.url	This is the URL link to login to webcenter together with a registration key.	http://<Specify Server Name>:<Specify Port Number>/webcenter/spaces/oucss/page/Accounts?regKey=
mail.session.jndi.name	JNDI reference to the Mail Session to send emails.	Mail/OUCSS
validate.regex.username	Regular expression based on Java Regular Expression to validate the username	[a-zA-Z0-9_]*
validate.regex.email	Regular expression based on Java Regular Expression to validate the email	[a-zA-Z0-9._%+-]+@[a-zA-Z0-9.-]+\.[a-zA-Z]{2,4}
validate.length.password.min	Minimum length of password in integer	6
validate.length.password.max	Maximum length of password in integer	12
validate.regex.password	Regular expression based on Java Regular Expression to validate the password.	[a-zA-Z0-9]*
oucss.default.locale	Default locale that is to be used if a valid supported locale is not found in user request.	en

User Maintenance

Change User Information

User information can be modified in the Change Personal Information page. This page is accessible via the Home page link once the user is logged in.

Change User Password

The user password can be modified by going to the Change Password page. The password is stored in LDAP. This page is accessible via the Home page link once the user is logged in.

User Search

The user search page is accessible only to Administrators. The user search page is accessible to the Administrator by going to the Admin -> Users menu.

The user search allows the Administrator to search for the user based on following search criteria

1. User Id
2. First Name
3. Last Name
4. Email Address

The list of users will be rendered based on the search criteria. The Administrator can now go and view all the user pages by clicking on the View User Pages button for a particular user in the user list. This will set the current selected user from the user list in the context and the Administrator user will be able to see the user pages and carry out any action for that user.

Chapter 3

Customization and Extension Methodology

OUCSS core taskflows/portlets can be extended using the ADF customization methodology. Customizations are stored in MDS. The OUCSS producer application is pre-configured to allow for customization. To facilitate the extension, the CC&B web services exposed 10 custom fields (field1 through field 10) in the “custom” node of the WSDL. These custom fields can be used to dynamically extend the taskflows/portlets without redeploying any piece of code.

Note: You will need a JDeveloper IDE in order to customize/extend taskflow.

Steps to Customize a Taskflow

Create Customization Documents

1. In CC&B Configure custom fields (field1 through 10) that are intended to be extended for a given module.
2. Open JDeveloper and create a new Fusion Web Application.
3. In the zip file provided in the installation files, find the ADF library containing the taskflow of the module and its respective data control. For example, if you need to extend Account Summary module, then copy oracle.ugbu.ss.billing.accountsummary.model_2.0.0 and oracle.ugbu.ss.billing.accountsummary.view_2.0.0 to a CM folder (e.g. C:\SS\2.0.0\portlet_applications\CM) in the machine where JDeveloper is running.

Note: You can extend more than one module at the same time by copying all the related ADF libraries in the same folder to facilitate customization.
4. In the Resource Palette, create a File System connection to the CM folder containing the ADF Libraries.
5. Choose the View Project of the newly created application and from the resource palette file connection, right click on all the ADF Libraries one by one and select/click on “Add to Project”.
6. Make sure that the corresponding data control (e.g. “AccountSummaryService”) is listed in the Data Control panel of the application.
7. In the JDeveloper Application Navigator, choose to show libraries.
8. Browse and open the summary.jsf from within account summary view “ADF Library” listed in Application Navigator.
9. In order to customize/extend the content, switch to Customization Mode of JDeveloper.
10. Select Tools -> Preferences in JDeveloper.
11. In the left pane, select Roles.
12. Choose “Customization Developer” from the list of roles on the right and click Ok.
13. JDeveloper will restart (on Windows) or advice you to restart JDeveloper (on Linux). Restart the JDeveloper.
14. On restart, make sure the Customization Context (bottom right panel in JDeveloper) has the following

“Edit with following Customization Context” is enabled.

Tip Layer is selected with both Name and Value as “site”. This is very important since the OUCSS application is configured to listen to customization with value “site”.

15. In customization mode, you can edit any content on the page. When you drag and drop data control entries into the jsff, JDeveloper will create the required customization files that would record the delta of the updates you have made. In this case the file generated will be summary.jsf.xml. Make the necessary changes to extend the default display.
16. Select any Custom Field1 to 10 from the Data Control and drag it to the location in jsff where it needs to be rendered.
17. Optionally customer can select other fields (which are not custom) available in data control but not part of the out-of-box UI.
18. Ensure that you are extending using the corresponding Data Control of the module of the jsff you are extending.
19. The “oracle” under <<ApplicationFolder>>/mds contains all the customization files created from above. Copy this folder to any location where the application managed server is running.
20. In case of any wrong updates, delete the jsff.xml and pageDef.xml file from <<application_folder>>/mds folder and start over.

Applying the Customization

For a Portlet based Solution

1. Run the WLST and connect to the server running the OUCSS application.
2. Run the WLST command `importMetadata(application='<<OUCSS_PortletApplication_Name>>', server='<<PortletManagedServerName>>', fromLocation='<<CopyLocation from Step 19 above>>', docs='/**')`.
3. Login to the application and verify the changes. (Generally no restart is necessary)

For a Taskflow based Solution (using WebCenter Extension)

1. Navigate to the copy location from Taskflow Customization Step 19 where the taskflows customization documents are located.
 - Rename all folders with the pattern “mdssys/cust/site/site/” to “mdssys/cust/site/webcenter”. This is required as WebCenter MDS is configured use “/site/webcenter” for the customization layer.
2. Run the WLST and connect to the server running the WebCenter application as Admin user.
3. Run the WLST command `importMetadata(application='<<WebCenter_Application_Name>>', server='<<WebCenterManagedServerName>>', fromLocation='<<CopyLocationFromAbove>>', docs='/**')`.
4. Login to the application and verify the changes. (Generally no restart is necessary).

More step-by-step customization and extension instructions can be found in the whitepaper at <http://www.oracleimg.com/technetwork/middleware/webcenter/owcs-ps1-custom-taskflow-wp-129410.pdf>. This document explains how to customize a WebCenter Spaces ADF library.

Chapter 4

Monitoring and Troubleshooting OUCSS

Monitoring Oracle Utilities Self Service

The Self Service application involves different and distributed systems, and the root cause of issues is sometimes difficult to identify. Monitoring of key elements can help isolate issues and make them easier to address.

Monitor WebCenter Group Spaces using Enterprise Manager

- Login to WebLogic enterprise manager as WLS Admin.
- From the Domain Menu (e.g. Farm_<<domain_name>> on the left, expand WebCenter ->WebCenter Spaces
- Click on webcenter(11.1.1.4) to load the WebCenter Spaces application summary page.
- Monitor the Graphs with title “Most Active Spaces”, “Slowest Spaces” and “Spaces with Most Errors” to get an overall idea of how the groups spaces are performing.
- In the above graphs, move the mouse over utilities group spaces to display more statistics about the group space.
- To drill down more, click on “More Info” at the bottom right of each graph window. This will load another page with more statistics and other graphs to measure Invocations, Errors, Page Throughput and Average Processing Time.
- From the Space Metrics table, click on any Utilities group space to load another popup with to display how each page is responding in the selected group space.
- Monitoring the group spaces health and average processing time along with monitoring pages of group space and their average processing time would provide vital information about any potential issues in near future.

Monitor the OUCSS Portlets Producer Application using WebLogic Enterprise Manager (for Portlet based Solution)

- Login to WebLogic enterprise manager as WLS Admin.
- From the Domain Menu (e.g. Farm_<<domain_name>> on the left, expand Application Deployments
- Click on oracle.ugbu.ss_2.0.0 to load Summary of OUCSS Producer application.
- Monitor the Response and Load group on the right pane to check the health of the producer application.
- Optionally you can also select Performance Summary from “Application Deployment” menu on the top to get more details on Request, their processing time, active sessions and other metrics.

Monitor the OUCSS Portlets in WebCenter (for Portlet based Solution)

- Login to WebLogic enterprise manager as WLS Admin.
- From the Domain Menu (e.g. Farm_<<domain_name>> on the left, expand WebCenter ->WebCenter Spaces
- Click on webcenter(11.1.1.4) to load the WebCenter Spaces application summary page.
- From the WebCenter menu on Top, select Monitoring -> Service Metrics to load the Service metrics Summary page.
- From Services Summary table, click on Portlets to load metrics about the portlets used being used in WebCenter Spaces.
- Optionally, if you have more than one portlet producer and want to monitor only OUCSS related portlets, then from Services Summary table, select Portlet Producers.
- Select OUCSS_Portlets from Summary table below. This loads a popup with service metrics of portlets from OUCSS only.

Monitor using Oracle WebLogic Logs

WebLogic logs can be monitored to get more information on exceptions and application status. Logs can be monitored either using Oracle Enterprise Manager or by directly accessing the physical machine on which the managed servers are running. Logs monitored from EM are more interactive and allows search capabilities which makes it easier to diagnose an issue quickly. But command line administrators can directly use the logs on the physical machine. For more details refer to WebCenter Spaces Administrator guide to know more about logs.

Monitor Logs using Oracle EM

WebCenter Spaces Logs

- Login to WebLogic enterprise manager as WLS Admin.
- From the Domain Menu (e.g. Farm_<<domain_name>> on the left, expand WebCenter ->WebCenter Spaces
- Click on webcenter(11.1.1.4) to load the WebCenter Spaces application summary page.
- From WebCenter menu on top, Select Logs -> View Log Messages to load the Log Messages page.
- Select the criteria from the form, for e.g. set Date Range to 5 hours and click on “Search”.
- Select any row in the table showing all log entries to load the details in the bottom preview pane.
- Optionally click on the Log File name to refine more on logs from the log file selected.

OUCSS Producer Application Logs (for Portlet based Solution)

- Login to WebLogic enterprise manager as WLS Admin.
- From the Domain Menu (e.g. Farm_<<domain_name>> on the left, expand Application Deployments
- Click on oracle.ugbu.ss_2.0.0 to load Summary of OUCSS Producer application.
- From “Application Deployment” menu on top, Select Logs -> View Log Messages to load the Log Messages page.
- Select the criteria from the form, for e.g. set Date Range to 5 hours and click on “Search”.
- Select any row in the table showing all log entries to load the details in the bottom preview pane.
- Optionally click on the Log File name to refine more on logs from the log file selected.

Monitor Logs from Physical Machine

Logs related to WebCenter Spaces and OUCSS Producer are recorded in a log file with name <<Managed_Server_Name>>.log and <<Managed_Server_Name>>-diagnostics.log under domain home. To access this logs directly from the physical machine,

- Login to server where the managed servers are running. Make sure the user has permissions to the domain home.

- Change directory to <<Domain_Home>>/servers.
- To access WebCenter Spaces logs, go to WC_Spaces/logs folder and to access OUCSS Producer application logs, go to <<ManagedServerName>>/logs.

If, for example, the domain home is /u01/oracle/product/webcenter/user_projects/domains/webcenter_domain, then:

- WebCenter Logs (WC_Spaces.log and WC_Spaces-diagnostics.log) will be found under :
/u01/oracle/product/webcenter/user_projects/domains/webcenter_domain/servers/WC_Spaces/logs.
- OUCSS Producer logs if deployed under WC_Portlets manager server will be found under
/u01/oracle/product/webcenter/user_projects/domains/webcenter_domain/servers/WC_Portlets/logs.

Monitoring Document References

Monitor Oracle Fusion Middleware :

http://download.oracle.com/docs/cd/E17904_01/core.1111/e10105/monitor.htm#CFAEHCGG

Monitoring Oracle WebCenter Performance :

http://download.oracle.com/docs/cd/E14571_01/webcenter.1111/e12405/wcadm_performance.htm#BBAGHAAD

Monitoring Oracle Utilities Customer Care and Billing

Oracle Utilities Customer Care and Billing Error Logs

Errors related to the CCB services are stored in the CCB_ENVIRONMENT_NAME/logs/system folder (e.g., V231_CCB_PERF_LIN_ORA_WLS/logs/system).

Communications to the Oracle Utilities Customer Care and Billing system is done via XAI. User will find all incoming requests and responses in xai.trc file.

Note: For more information about errors and notifications see the Oracle Utilities Customer Care and Billing documentation.

Troubleshooting OUCSS (Taskflows based Solution)

Symptom	Possible Cause	Corrective Action	Comments/Reference
Unable to Login as WSSAdmin	The password of WSSAdmin could be Changed.	Login to WebLogic console as WLS Administrator and change the password of WSSAdmin	
WSSAdmin unable to see OUCSS Group Spaces	Tier-1/Group Space Security associated with WSSAdmin user might not be proper.	Login to WebLogic console as WLS Administrator and Check the out-of-box Groups are available in LDAP. Check WSSAdmin is member of WSSEnrolledGroup and WSSAdminGroup	Check OUCSS Implementation Guide (OUCSS Security) section to understand more on Security setup of OUCSS Group Spaces.
WSSCSR Admin is not able to see Account Detail taskflow.	Tier-1/Group Space security associated with WSSCSR group is not proper	Login to WebLogic console or LDAP as Administrator and Check the out-of-box OUCSS Enterprise Groups are available in LDAP. Check that WSSCSRGroup is member WSSEnrolledGroup Check WSSCSR is member of WSSCSRGroup.	Check OUCSS Implementation Guide (OUCSS Security) section to understand more on Security setup of OUCSS Group Spaces.

Taskflows in OUCSS Group Space fail to load with ‘Target application is unavailable’ error.	Web Service connection to CCB is either down or not configured properly	<p>Check if the CCB service is Up and running.</p> <p>Login to Oracle EM as WLS Administrator and go to the ADF Connections page of Producer application. Check all the connections are configured properly and pointing to right server.</p>	Sometimes, either the connections are not configured properly or configured to a wrong server (e.g. test CCB instance instead of production CCB servers).
When logging to WebCenter spaces, user see Space is Unavailable The Space Utilities WebCenter is currently offline. Only the Space moderator can access the Space.	Group Space(s) are offline for maintenance.	Login to WebCenter Spaces as WebCenter Administrator and bring the group space online	Check “Bring the Group Space Online” section under Installing OUCSS in OUCSS Installation guide.
When logging to WebCenter Spaces user is informed that oucss is no longer available The Space may have been deleted or renamed.	OUCSS group spaces might be deleted/closed or renamed.	<p>Login to WebCenter Spaces as WebCenter Administrator and go to Administrator -> Spaces page.</p> <p>Make sure “Oracle Utilities” group space is listed and contains 2 Subspaces and all 3 are active.</p> <p>If the group space is available but not active, make it active.</p> <p>If the group space is not seen in the list, then the need to be imported again.</p>	<p>Check Oracle WebCenter Spaces Administrator guide see how to maintain group space states.</p> <p>If the group space is not seen in the list, then Check “Import Oracle Utilities WebCenter Spaces” section in Oracle Installation guide.</p>
After login, only some users see “The page you requested is not found.”	<p>The user is not registered to the system using the WSS Register User taskflow.</p> <p>Note: WebLogic and/or WebCenter Administrators will not be registered using OUCSS taskflows. These users will get this error.</p>	<p>Login to WLS console or LDAP and delete the User from ID Store.</p> <p>Register this user again using WSS Register User taskflow.</p>	Check the “Setting default page in WebCenter Spaces” section under Post-Installation steps in OUCSS Installation guide. As per this setting users are directed to OUCSS group space upon logon. As Administrators are not part of required group (Tier-1 security), they do not have permission to access these group spaces.
Offers (Promotion or Rates) taskflows do not render any data or throw exception.	<p>Either the offer service is not returning any rows for the Offer Set and Locale.</p> <p>Or</p> <p>Offer Web Service connection is not configured properly.</p>	<p>Test the service to make sure values are returned for the given Offer Set Code and Locale.</p> <p>For Banner Promotion make sure the image used is accessible.</p> <p>Login to Oracle EM and load the ADF connections page of OUCSS Producer application. Check the Offer Service connection has right configuration.</p>	Check the “Offers and Promotions” section in OUCSS Implementation guide to know more about Offers.
After enrolling to a new Account, the user does not see the View Button to see Account Details	If it's the first time user enrolling first account, he is added to WSSEnrolledGroup. This security does not take effect until he logs in again.	Logout and Log back.	

Chapter 5

CCB-MDM Integrated Flows

This section provides general information about the functionality and processing of the Oracle Utilities Customer Care and Billing Integration to Oracle Utilities Meter Data Management for Self Service Release. This is an AIA Direct Integration using SOA Suite and does not require the AIA Foundation Pack to be installed.

About the Products

Oracle Utilities Customer Care and Billing

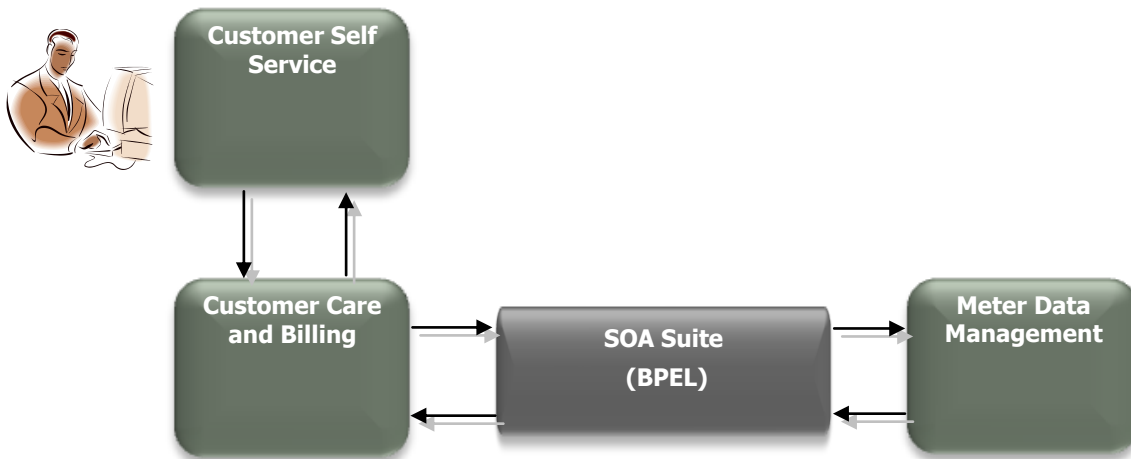
Oracle Utilities Customer Care and Billing (CCB) is a customer and billing system that manages all aspects of customer service needed by most utilities to operate their business.

Oracle Utilities Meter Data Management

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

Supported Business Processes

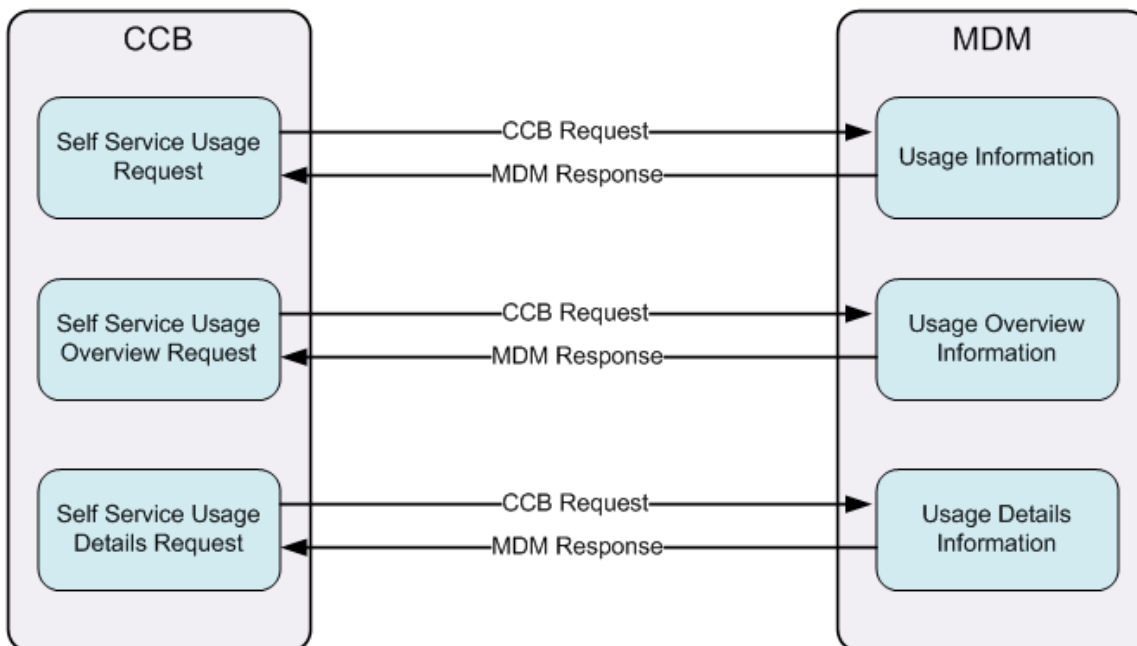
This integration between Customer Care and Billing and Meter Data Management is used to support the business use cases described below for the web self-service solution for Oracle Utilities.



The Business use cases are as follows

Business Process	Description
Compare Rate Plan and Analysis	Provide a tool where the customer can see the difference to their bill if they should choose to transfer to a different rate plan
Current Bill-To and Estimate Graph	A customer will often use a Self Service application to pay their bill. While paying their bill, it would be opportune to present them any unbilled charges to-date.
Usage Overview	Shows customer their daily usage for the last x days
Usage Detail	Retrieved from MDM (this is not billed usage). Overlay lines will cater for Previous Year and Temperature.

This integration will provide a real time interface in CCB to request usage from MDM.



CCB-MDM Integration Points for Self Service

Chapter 6

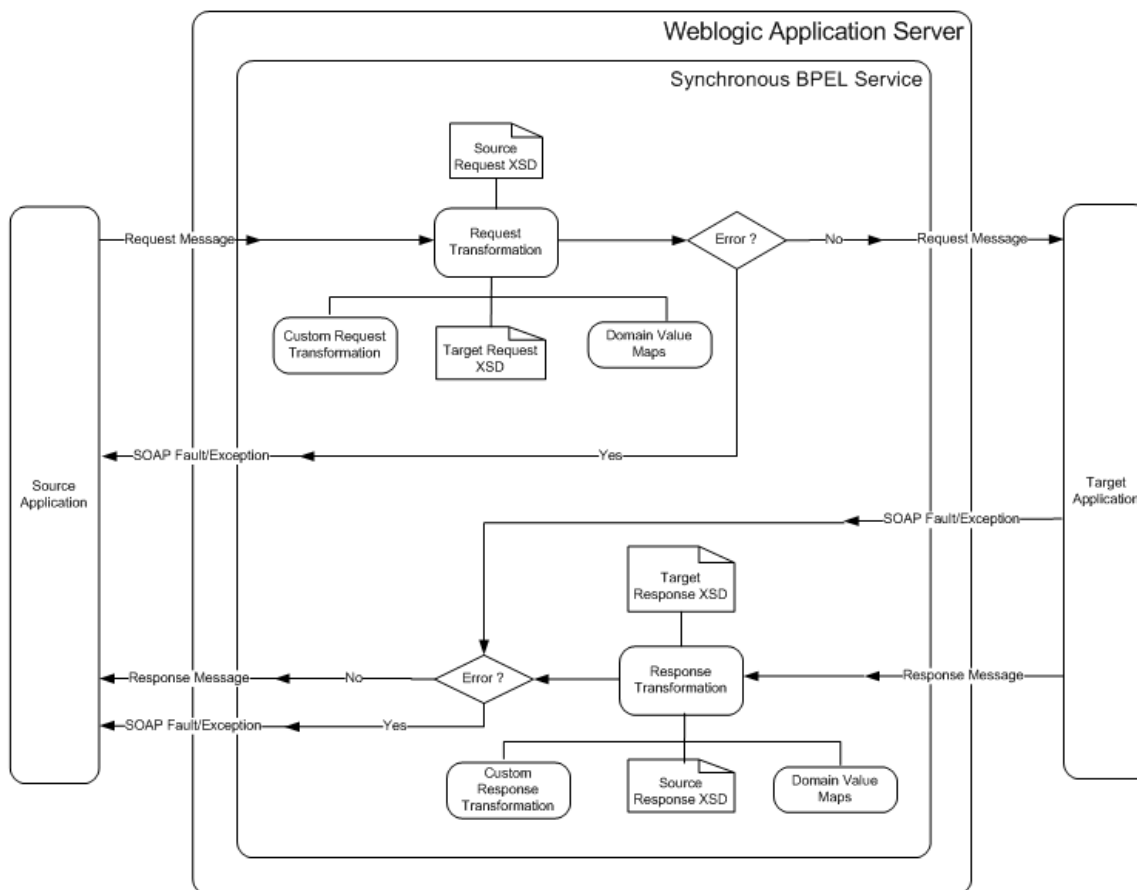
Understanding the Integration Processes

This section outlines the overall Technical overview, business process and specific integration points handled by this integration.

Technical Overview

- This is a direct integration between Oracle Utilities Customer Care and Billing (CCB) and Oracle Utilities Meter Data Management (MDM) to get usage, usage overview, and usage details.
- All the end-to-end integration flows are synchronous.
- One BPEL process manages each integration flow and the BPEL flow is exposed as a web service. The BPEL Process handles the following:
 - Transform the request message coming from the source application (CC&B) to the target application's (MDM) format and invoke the MDM service synchronously.
 - Receives the response message coming from the target application (MDM) and transforms the message to the source application (CC&B) format.
 - Handles message extensions.
- Any exception encountered by the integration will send back a SOAP Fault to CCB. This includes technical errors (i.e. connectivity errors) and transformation errors.
- Any exception or faults that the integration receives from MDM will be sent back to CCB.

The following diagram provides a graphical representation of this processing:



Technical Flow Diagram

Integration Points

Self Service Usage Request Integration Flow

Business Details

This process is a real-time synchronous interface from Oracle Utilities Customer Care and Billing (CCB) to get usage from Oracle Utilities Meter data management (MDM) to be used for Rate Analysis and Usage Charges To Date Calculation.

Oracle Utilities Customer Care and Billing (CCB) sends out a usage request to Oracle Utilities Meter Data Management (MDM) for rate analysis and calculation of usage charges to date if the Service Agreement (SA) requires bill determinants.

- When CCB does Rate Analysis for a given service agreement (SA), it first determines the most recent 12 months charges for the given SA. If the SA requires bill determinants from MDM, it sends a real time usage request to MDM to get the usage for the 12 month periods provided for both the base rate schedule and the comparison rate schedule. The request contains a list of bill segment periods for the given SA, base rate schedule and any rate version break periods and another list of bill segment periods for the given SA and the comparison rate schedule and any rate version break periods. Oracle Utilities Meter Data Management (MDM) calculates bill determinants (usage) based on the available read data and usage subscription configuration. These Bill determinants are returned to Oracle Utilities Customer Care and Billing (CCB) and used for rate calculation.
- When CCB calculates the Usage Charges to Date for a specific SA or specific account, which can have more than one SA, and the SA(s) requires bill determinants from MDM, it sends a real time usage request to MDM to get the usage for the period provided for the SA(s). The request can contain a SA or a list of SAs for a given bill segment period. Oracle Utilities Meter Data Management (MDM) calculates bill determinants (usage) based on the available read data and usage subscription configuration. These Bill determinants are returned to Oracle Utilities Customer Care and Billing and used for calculation of usage charges to date.

Technical Details

Oracle Utilities Customer Care and Billing initiates a Usage Request when Rate Analysis Service or Usage To Date service requires bill determinants and Oracle Utilities Meter Data Management returns bill determinants for each request.

- CCB will send the usage request information in form of xml messages which will be transformed by integration and sent to MDM. MDM will respond back with the usage information which will be transformed by integration and sent back to CCB.
- DVMs are used for some of the data transformation. No new DVMs are introduced, only existing DVMs used for CCB-MDM2 integration are used.
- For missing DVM lookup values, where the value coming from an element in the CCB message is not found in the DVM table, integration will always pass the value as is to MDM and vice versa for messages coming from MDM to CCB. It will not throw any error to CCB. The exception flag defined in the configuration properties are not used in this flow.
- Integration passes the language value coming from the CCB request message to MDM by assigning the language in the SOAP Header when the MDM XAI Inbound service, *[D2_CalculateUsageMultipleRequests](#)*, is invoked. This language that CCB passed to MDM is the CSS user's language. This is use to get the appropriate descriptions in MDM as part of the response message going back to CSS given the CSS user's language.
- CCB's request message contains a list of usage request and MDM respond with a list of usage back to CCB. (refer to [Usage Request mapping in Data Mapping Section](#) for more details)
 - For Rate Analysis, a list of bill segment periods for the given SA, the base rate schedule, and any rate version break periods and another list of bill segment periods for the given SA and the comparison rate schedule and any rate version break.
 - For the Usage To Date Calculation, a SA for a given bill segment period or a list of SAs for a given bill segment period.
 - While processing a record in the usage request list and MDM encounters an application error, MDM populates the error in the exception information of the MDM response and move on to the next record on the list. When integration gets the response back, it will map the exception information from the MDM response to the error information in the CCB response message.
 - If the SA Id of a record in the usage request list is not supported in MDM, MDM will skip the record and marked it as skipped in the response message and proceed to the next record.
- If integration encounters an exception (i.e. connectivity error, transformation error) while processing the message, integration will return a SOAP fault back to CCB.
- If MDM sends an exception or fault back to the integration, integration will return a SOAP fault back to CCB.
- No email notifications for Business and Technical errors will be sent out from the integration service.

Integration Services

Name	Description
OUCCB2OUMDM2SSUsageReqEBF	Self Service Usage Request BPEL Process Synchronous BPEL process to transform incoming CCB request message to MDM format and invoke the MDM inbound service. Transform the response coming from MDM back to CCB format.

Usage Overview Integration Flow

Business Details

This process is a real-time synchronous interface from Oracle Utilities Customer Care and Billing (CCB) to get usage overview from Oracle Utilities Meter data management (MDM) for a given account or Service Agreement (SA) that requires bill determinant.

Technical Details

Oracle Utilities Customer Care and Billing initiates a request when Usage Overview Service requires bill determinants and Oracle Utilities Meter Data Management returns bill determinants for each request.

- CCB will send the usage request information in form of xml messages which will be transformed by integration and sent to MDM. MDM will respond back with the usage information which will be transformed by integration and sent back to CCB.
- No DVMs are used for data transformation.
- Integration passes the language value coming from the CCB request message to MDM by assigning the language in the SOAP Header when the MDM XAI Inbound service, [WX_GetUsageOverview](#), is invoked. This language that CCB passed to MDM is the CSS user's language. This is use to get the appropriate descriptions in MDM as part of the response message going back to CSS given the CSS user's language.
- For more details about the request and response message, refer to [Usage Overview Mapping in Data Mapping Section](#).
- If the SA Id of a record in the request list is not supported in MDM, i.e. SA does not have a smart meter and cannot return any data, MDM will skip the record and marked it as skipped in the response message and proceed to the next record.
- If integration encounters an exception (i.e. connectivity error, transformation error) while processing the message, integration will return a SOAP fault back to CCB.
- If MDM sends an exception or fault back to the integration, integration will return a SOAP fault back to CCB.
- No email notifications for Business and Technical errors will be sent out from the integration service.

Integration Services

Name	Description
OUCCB2OUMDM2SSUsageOverviewReqEBF	Self Service Usage Overview Request BPEL Process Synchronous BPEL process to transform incoming CCB request message to MDM format and invoke the MDM inbound service. Transform the response coming from MDM back to CCB format. transformations.

Usage Detail Integration Flow

Business Details

This process is a real-time synchronous interface from Oracle Utilities Customer Care and Billing (CCB) to get usage detail from Oracle Utilities Meter data management (MDM) for a given account or Service Agreement (SA) that requires bill determinant.

Technical Details

Oracle Utilities Customer Care and Billing initiates a request when Usage Detail Service requires bill determinants and Oracle Utilities Meter Data Management returns bill determinants for each request.

- CCB will send the usage request information in form of xml messages which will be transformed by integration and sent to MDM. MDM will respond back with the usage information which will be transformed by integration and sent back to CCB.
- No DVMs are used for data transformation.
- Integration passes the language value coming from the CCB request message to MDM by assigning the language in the SOAP Header when the MDM XAI Inbound service, [WX_RETWSSTOUMappingService](#), is invoked. This language that CCB passed to MDM is the CSS user's language. This is use to get the appropriate descriptions in MDM as part of the response message going back to CSS given the CSS user's language.
- For more details about the request and response message, refer to Usage Detail Mapping in Data Mapping Section.

- If the SA Id of a record in the request list is not supported in MDM, i.e. SA does not have a smart meter and cannot return any data, MDM will skip the record and marked it as skipped in the response message and proceed to the next record.
- If integration encounters an exception (i.e. connectivity error, transformation error) while processing the message, integration will return a SOAP fault back to CCB.
- If MDM sends an exception or fault back to the integration, integration will return a SOAP fault back to CCB.
- No email notifications for Business and Technical errors will be sent out from the integration service.

Integration Services

Name	Description
OUCCB2OUMDM2SSUsageDetailReqEBF	Self Service Usage Detail Request BPEL Process Synchronous BPEL process to transform incoming CCB request message to MDM format and invoke the MDM inbound service. Transform the response coming from MDM back to CCB format.

Chapter 7

Implementing the Integration Product

Prerequisites

Oracle Utilities Customer Care and Billing Integration to Oracle Utilities Meter Data Management Release 3.1.1 Media Pack must be installed and configured.

Chapter 8

Configuring the Integration

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

- [Setting up Oracle Utilities Customer Care and Billing](#)
- [Setting up Oracle Utilities Meter Data Management](#)
- [Setting up the AIA Direct integration layer](#)

Integration Configuration Checklist

Oracle Utilities Customer Care and Billing Configuration

Important- If you installed CCB 2.3.1.2 and configured OUCSS master configuration for Service Tasks, and later applied the changes described in Bug/Enhancement [12861348](#) as a Single Fix or as part of a Rollup or Service Pack, you will need to update your master configuration.

Task	Remarks
Admin Data Setup	
Admin Data Setup	The Master Configuration admin tables is essential to the integration.
XAI Configuration	
XAI Setup	Configure XAI sender, outbound message types, and external system for the integration.

Oracle Utilities Meter Data Management Configuration

Task	Remarks
Admin Data Setup	
Admin Data Setup	The Master Configuration admin tables is essential to the integration.
XAI Configuration	
XAI Setup	Configure XAI sender, outbound message types, and external system for the integration

Integration Product Configuration

Task	Remarks
Setting Configuration Properties	Update the ConfigurationProperties.xml file.
Setting System Properties	Set the Module Configurations properties that are shared by multiple integration flows and Service Configurations properties that are used by a specific BPEL process.
Domain Value Maps	Set the Domain value maps (DVMs) to map codes and other static values across applications.
Error Handling	Set up error notifications.

Data Synchronization

Oracle Utilities Meter Data Management serves as the database of record for meter device connections and usage while Oracle Utilities Customer Care and Billing manages customers (persons), accounts (service agreements), and service points. The person, SP, SA, meter, meter configuration, and SP-meter history sync integration points add relevant SP/SA and meter data from Oracle Utilities Customer Care and Billing in Oracle Utilities Meter Data Management.

The data synchronization for rates is not completed by the integration product.

See the *Implementation Guide for Oracle Utilities Customer Care and Billing Integration to Oracle Utilities Meter Data Management Release 3.1.1* for data synchronization processes between two systems.

Oracle Utilities Customer Care and Billing Configuration

Admin Data Setup

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

For more information about configuring Oracle Utilities Customer Care and Billing, see the *Oracle Utilities Customer Care and Billing User Guide*.

Self-service Master Configuration

Your implementation must configure an instance of the self-service master configuration. The master configuration contains pertinent information needed for a CCB and self-service integration, including the following:

- List of alerts that should be returned to the self-service application
- Valid payment and credit card types used when setting a customer up on auto pay
- Verification information required when a self-service customer enrolls an account
- Scripts used to construct information strings displayed in the self-service application
- Self-service task business objects used for the various requests supported e.g. meter read creation, one-time payment, automatic payment setup, bill ready notification, etc.
- Information needed to interact with an external system, e.g. requesting usage from MDM, sending email notifications to a self-service user, etc.

See the demo environment for a sample self-service master configuration. Embedded help is available on the master configuration to guide you through the setup process.

Displaying Alerts

The base product provides a sample alert for displaying budget enrollment information for a self-service customer, i.e. whether the customer is currently on a budget or not. The following steps should be followed if your implementation requires additional alerts:

- Create a script that contains the alert construction logic
- Define an alert type for the new alert by adding a value for the lookup field **WX_CCB_ALERT_TYPE_FLG**
- Alert type, priority and the corresponding script must be defined on the self-service master configuration for CCB to include this type of alert when building the alert list returned to the self-service application.

Payment Processing

Payment types that your business accepts via self-service must be defined on the self-service master configuration along with a corresponding tender type. The base product includes values for Checking, Savings and Credit Card Withdrawal.

Additional payment types can be introduced by adding new values for the lookup field **EXT_TYPE_FLG**. The tender type associated with each payment type will be used when creating a payment tender for the online payment made by the self-service user. The tender type, along with an external source id (or bank routing number), is also used to retrieve an auto pay source when setting a self-service user enrolls in an automatic payment plan with either checking or savings withdrawal.

In addition, credit card types that your business accepts via self-service must be defined on the self-service master configuration along with a corresponding autopay source. New credit card types may be defined by adding values for the lookup field **CARD_TYPE_FLG**. The credit card types defined are used to build a dropdown list of valid credit cards when a user posts a payment in the self-service application. It's also used to retrieve an auto pay source when a self-service user enrolls in an automatic payment plan.

Enrolling Accounts

A self-service user is prompted for certain information when requesting access to an account. The required information or verification fields must be defined on the self-service master configuration for each line of business you've classified in the self-service application. Verification fields can be defined for one of the following field types:

- **Match Identifier.** The identifier type to use is required. The identifier type description is displayed as the verification field label in the self-service application. For example, assume that the identifier type specified here is social security number. The self-service user will be prompted to enter the social security number along with the account number that they want to enroll. A service call will then be made to CCB to verify that the SSN that the customer entered in the self-service application actually matches the SSN captured in CCB for the account.
- **Match Phone Type.** The phone type to use is required. The phone type description is displayed as the verification field label in the self-service application.
- **Match Any Phone.** A field name is required. The field description is displayed as the verification field label in the self-service application. A service call will then be made to CCB to verify that the phone number that the customer entered in the self-service application actually matches one of the phone numbers captured in CCB for the account.

Additional field types can be introduced by adding new values for the lookup field **WX_FIELD_TYPE_FLG**. If additional field types are introduced, your implementation must ensure that the appropriate logic to validate the new field values is added to the lifecycle of the Account Verification business object defined on the self-service master configuration.

Processing Scripts

The base product provides processing scripts that contain the logic used to build information strings displayed on taskflows/portlets in the self-service application. These include scripts that build the following information strings: Person, Account, Service Agreement, SP/Meter and Register. Your implementation should ensure that these processing scripts are defined on the self-service master configuration.

Self-service Tasks

Ensure that the tasks supported by your implementation are defined on the self-service master configuration. The corresponding business object must be specified for each service task identifier. This is the business object that the system will use when an inbound request is received for a specific task. Refer to the business object's detailed description in CCB for more information on the service task. The following guidelines should be followed if your implementation requires additional service task identifiers:

- Setup an XAI inbound service to create the task instance (see the XAI configuration section below)
- Add the service task type and service task business objects
- Configure the corresponding service task type

- Add a lookup value to the lookup field **WX_BO_SSTASK_TYPE_FLG** for the new service task identifier
- Update this self-service master configuration to include the new task identifier and corresponding task business object
- Create the corresponding user interface or taskflow/portlet in OUCSS using Oracle ADF (Application Development Framework) that will be responsible for invoking the inbound service

External Communications

The base product provides the following request types that are used to request data from an external party in a self-service integration:

- **Usage Overview.** This is used to retrieve an x-day usage overview for a self-service user's account, where the number of days is provided as input. The system will attempt to retrieve usage information from MDM for each of the account's service agreements that require bill determinants. The base product includes a business object for the MDM request called **WX-UsageOverviewRequest** that should be defined on the outbound message type.
- **Usage Details.** This is used to retrieve usage details for a self-service user's account for some period (i.e. year, month or day). The system will attempt to retrieve usage information from MDM for each of the account's service agreements that require bill determinants. This service may also return temperature information. The base product includes a business object for the MDM request called **WX-UsageOverviewRequest** that should be defined on the outbound message type
- **Usage Request.** This is used to request bill determinants from MDM when needed for either rate analysis calculations, or when attempting to calculate unbilled charges to date. The base product includes a business object for the MDM request called **C1-UsageRequestOutMsg** that should be defined on the outbound message type

These request types along with the corresponding external system and outbound message type should be specified on the self-service master configuration.

In addition, an email address must also be specified on the self-service master configuration. This email address is used when sending email notifications to a self-service user; e.g. if the self-service user has signed up for bill ready notifications. The outbound message type and external system used when creating the email outbound message are defined on the appropriate service task types. The **Email Address** is used to populate the 'from' address on the email.

XAI Configuration

XAI Sender

To create a Real-time XAI sender configured to communicate with the integration layer:

XAI Sender for Usage Request Integration Service

Create a new XAI Sender which points to the Usage Request EBF endpoint URL for Usage Request integration service.

1. Navigate to Admin Menu, XAI Sender.
2. Enter a unique XAI Sender and Description.
3. Populate values as follows:
 - Invocation Type = Real-time
 - XAI Class = RTHTTPSNDR. (Real Time Sender to route messages via HTTP)
 - Select the Active check box.
 - MSG Encoding = UTF-8 message encoding
4. Select the Context tab and set values for the following Context Types:
5. **HTTP Login User** – User ID for the URL to be accessed
HTTP Login Password – Password for the URL to be accessed
HTTP Header – SOAPAction: "process"
HTTP Method (POST/GET) – POST
HTTP Proxy Host – Set the proxy server name if applicable

HTTP Proxy Port – Port for the proxy server if applicable

HTTP Transport Method – SendReceive

HTTP Timeout: 60 (put timeout in seconds)

HTTP URL 1 – Set the URL to be accessed. If the URL value does not fit, use the additional HTTP URL types to set the complete URL. This should point to the Usage Request EBF endpoint URL.

For example:

http://demoenv:8015/soa-infra/services/CCB2-MDM2/OUCCB2OUMDM2SSUsageReqEBF/ouccb2oumdm2ssusagereqebf_client_ep

Note: The endpoint URL for the process can be obtained from the SOA Enterprise Manager. From the SOA folder in the Navigator, under **soa-infra** -> **CCB2-MDM2**, select the **OUCCB2OUMDM2SSUsageReqEBF** composite application. At the top of the page, click Test tab. In the test tab, you will see the composite application's endpoint URL.

XAI Sender for Usage Overview Integration Service

Create a new XAI Sender which points to the Usage Overview EBF endpoint URL for Usage Overview integration service.

1. Navigate to Admin Menu, XAI Sender.
2. Enter a unique XAI Sender and Description.
3. Populate values as follows:

Invocation Type = Real-time

XAI Class = RTHTTPSNDR. (Real Time Sender to route messages via HTTP)

Select the Active check box.

MSG Encoding = UTF-8 message encoding

4. Select the Context tab and set values for the following Context Types:

5. **HTTP Login User** – User ID for the URL to be accessed

HTTP Login Password – Password for the URL to be accessed

HTTP Header – SOAPAction: "process"

HTTP Method (POST/GET) – POST

HTTP Proxy Host – Set the proxy server name if applicable

HTTP Proxy Port – Port for the proxy server if applicable

HTTP Transport Method – SendReceive

HTTP Timeout: 60 (put timeout in seconds)

HTTP URL 1 – Set the URL to be accessed. If the URL value does not fit, use the additional HTTP URL types to set the complete URL. This should point to the Usage Overview EBF endpoint URL.

For example:

http://demoenv:8015/soa-infra/services/CCB2-MDM2/OUCCB2OUMDM2SSUsageOverviewEBF/ouccb2oumdm2ssusageoverviewebf_client_ep

Note: The endpoint URL for the process can be obtained from the SOA Enterprise Manager. From the SOA folder in the Navigator, under **soa-infra** -> **CCB2-MDM2**, select the **OUCCB2OUMDM2SSUsageOverviewEBF** composite application. At the top of the page, click the Test tab to show the composite application's endpoint URL.

XAI Sender for Usage Detail Integration Service

Create a new XAI Sender which points to the Usage Detail EBF endpoint URL for Usage Detail integration service.

1. Navigate to Admin Menu, XAI Sender.
2. Enter a unique XAI Sender and Description.
3. Populate values as follows:

Invocation Type = Real-time

XAI Class = RTHTTPSNDR. (Real Time Sender to route messages via HTTP)

Select the Active check box.

MSG Encoding = UTF-8 message encoding

4. Select the Context tab and set values for the following Context Types:

HTTP Login User – User ID for the URL to be accessed

HTTP Login Password – Password for the URL to be accessed

HTTP Header – SOAPAction: "process"

HTTP Method (POST/GET) – POST

HTTP Proxy Host – Set the proxy server name if applicable

HTTP Proxy Port – Port for the proxy server if applicable

HTTP Transport Method – SendReceive

HTTP Timeout: 60 (put timeout in seconds)

HTTP URL 1 – Set the URL to be accessed. If the URL value does not fit, use the additional HTTP URL types to set the complete URL. This should point to the Usage Detail EBF endpoint URL.

For example:

`http://demoenv:8015/soa-infra/services/CCB2-`

`MDM2/OUCCB2OUMDM2SSUsageDetailEBF/ouccb2oumdm2ssusedetailebf_client_ep`

Note: The endpoint URL for the process can be obtained from the SOA Enterprise Manager. From the SOA folder in the Navigator, under **soa-infra** -> **CCB2-MDM2**, select the **OUCCB2OUMDM2SSUsageDetailEBF** composite application. At the top of the page, click Test tab. In the test tab, you will see the composite application's endpoint URL.

Outbound Message Type

To create a Outbound Message Type for each process in this the integration:

Usage Request Integration Service

1. Navigate to Admin Menu, Outbound Message Type.
2. Enter a unique Outbound Message Type and Description.
3. Populate values as follows:
Business Object = *C1-UsageRequestOutMsg* (Usage Request Outbound Message)
Priority = (choose from the selection)

Usage Overview Integration Service

1. Navigate to Admin Menu, Outbound Message Type.
2. Enter a unique Outbound Message Type and Description.
3. Populate values as follows
Business Object = *WX-UsageOverviewRequest* (Usage Overview Request Outbound Message)
Priority = (choose from the selection)

Usage Detail Integration Service

1. Navigate to Admin Menu, Outbound Message Type.
2. Enter a unique Outbound Message Type and Description.
3. Populate values as follows
Business Object = *WX-UsageDetailRequest* (Usage Detail Request Outbound Message)
Priority = (choose from the selection)

External System

Create a new External System for this integration:

1. Navigate to Admin Menu, External System.
2. Enter a unique External System and Description.
3. Set Our Name in Their System to *CC&B*
4. Define the Outbound Message Types associated with the integration.

For Usage Request Outbound Message Types, populate the values as follows:

- **Outbound Message Type** = (Outbound Message Type for Usage Request)
- Processing Method = *Real-time*
- **XAI Sender** = (XAI Sender for Usage Request Integration Service)
- Message XSL = CDxAddEnvelope-SOAP1-2.xsl
- Response XSL = C1-CCBRemoveEnvEnvelopeAndNamespace.xsl

For Usage Overview Outbound Message Types, populate the values as follows:

- **Outbound Message Type** = (Outbound Message Type for Usage Overview)
- Processing Method = *Real-time*
- **XAI Sender** = (XAI Sender for Usage Overview Integration Service)
- Message XSL = CDxAddEnvelope-SOAP1-2.xsl
- **Response XSL** = C1-CCBRemoveEnvEnvelopeAndNamespace.xsl

For Usage Detail Outbound Message Types, populate the values as follows:

- **Outbound Message Type** = (Outbound Message Type for Usage Detail)
- Processing Method = *Real-time*
- **XAI Sender** = (XAI Sender for Usage Detail Integration Services)
- Message XSL = CDxAddEnvelope-SOAP1-2.xsl
- Response XSL = C1-CCBRemoveEnvEnvelopeAndNamespace.xsl

Oracle Utilities Meter Data Management Configuration

Admin Data Setup

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

Self-service Master Configuration

Your implementation must configure an instance of the self-service master configuration. The master configuration contains pertinent information needed for a MDM and self-service integration, including the following:

- Temperature Source Details
- Supported Usage Groups List
 - In order for MDM to return usage-to-date information for a given usage subscription, the usage subscription's usage group must be defined in this list. Note that for Self Service, only interval usage may be returned by MDM so only interval related usage groups must be defined in this list.

See the demo environment for a sample self-service master configuration.

Temperature Source

Your implementation must define the following in order to show temperature details.

Temperature Zone Characteristic Type

This will hold the available temperature zones. See the demo environment for a sample temperature zone characteristic type.

Temperature Source Measuring Component

This will hold the temperature values. See the demo environment for a sample temperature source measuring component.

Temperature Source Factor

This is used to retrieve the measuring component from which the temperature values are retrieved. See the demo environment for a sample temperature source factor.

Service Point Business Object (Update)

Add temperature zone to the business object schema. This should be a flattened characteristic that references the temperature zone characteristic type. See the demo environment for a sample service point business object.

Note: Each service point instance must then reference a temperature zone.

Self Service Integration Master Configuration (New)

This object is used to define usage groups eligible for self-service calculations and define temperature information.

Integration Product Configuration

The following sections describe the configuration needed in the integration pack to meet the requirements for this integration. Configuration steps include setting the following:

- Configuration properties
- System properties
- Domain value maps
- Error handling

Setting Configuration Properties

The ConfigurationProperties.XML file contains properties which can be defaulted in the integration. Also, it contains flags to enable extension points within the integration.

ConfigurationProperties.XML is located in MDS under the directory apps/CCB-MDM/AIAMetaData/config.

Note. Whenever the ConfigurationProperties.XML file is updated, it must be reloaded to MDS for updates to be reflected in the applications or services that use the updated properties. You can perform the reload by rebooting the SOA server.

Setting System Properties

There are two sets of configuration properties described in this section:

- Module Configurations are the properties that are shared by multiple integration flows within this Oracle Utilities Customer Care and Billing Integration to Oracle Utilities Meter Data Management Release 3.1.1 Media Pack. No new properties were introduced for this integration and this integration is not referring to any of the properties in the module configuration.
- Service Configurations are the properties that are used by a specific BPEL process.

Service Configurations

Service Name	Property Name	Default / Shipped Value	Description
OUCCB2OUMDM2SSUsageReqEBF	Default.SystemID	OU_CCB2_01	Initiating system ID.
	Extension.PreXformCCB2toMDM2	false	If set to true, the pre transformation extension service for the request message is invoked.
	Extension.PostXformCCB2toMDM2	false	If set to true, the post transformation extension service for the request message is invoked.
	Extension.PreXformMDM2toCCB2	false	If set to true, the pre transformation extension service for the response message is invoked.
	Extension.PostXformMDM2toCCB2	false	If set to true, the post transformation extension service for the response message is invoked.
OUCCB2OUMDM2SSUsageOverviewEBF	Default.SystemID	OU_MDM2_01	Initiating system ID.
	Extension.PreXformCCB2toMDM2	false	If set to true, the pre transformation extension service for the request message is invoked.
	Extension.PostXformCCB2toMDM2	false	If set to true, the post transformation extension service for the request message is invoked.
	Extension.PreXformMDM2toCCB2	false	If set to true, the pre transformation extension service for the response message is invoked.
	Extension.PostXformMDM2toCCB2	false	If set to true, the post transformation extension service for the response message is invoked.
OUCCB2OUMDM2SSUsageDetailEBF	Default.SystemID	OU_CCB2_01	Initiating system ID.
	Extension.PreXformCCB2toMDM2	false	If set to true, the pre transformation extension service for the request message is invoked.
	Extension.PostXformCCB2toMDM2	false	If set to true, the post transformation extension service for the request message is invoked.
	Extension.PreXformMDM2toCCB2	false	If set to true, the pre transformation extension service for the response message is invoked.
	Extension.PostXformMDM2toCCB2	false	If set to true, the post transformation extension service for the response message is invoked.

Domain Value Maps

Domain value maps (DVMs) are a standard feature of the Oracle SOA Suite which maps codes and other static values across applications. For example: “US” and “USA”

DVMs are static in nature, though Administrators can add additional maps as needed. Transactional business processes never update DVMs - they only read from them. They are stored in XML files and cached in memory at runtime.

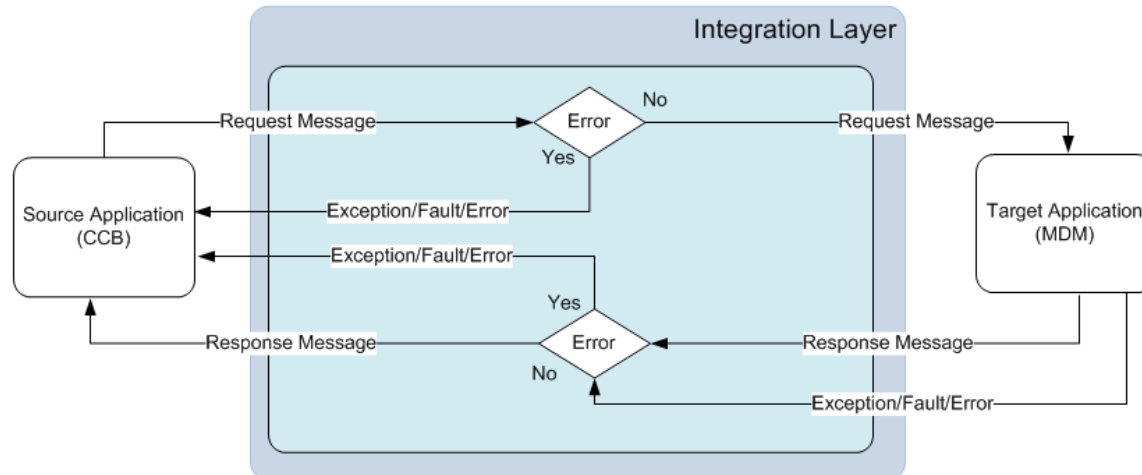
To maintain information within the domain value maps:

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

The DVMs used for this integration are the existing DVMs for Oracle Utilities Customer Care and Billing Integration to Oracle Utilities Meter Data Management Release 3.1.1 Media Pack. No new DVMs were introduced for this integration. The lists of DVMs reused for this integration are as follows:

DVM	Integration Points	Description
OUCCB2_OUMDM2_AllowEstimate	Usage request	Transform CCB Allow Estimate to MDM Allow Estimate and vice versa.
OUCCB2_OUMDM2_BillCondition	Usage request	Transform CCB Bill Condition to MDM Bill Condition and vice versa.
OUMDM2_OUCCB2_IsEstimate	Usage request	Transform MDM Is Estimate flag to CCB Is Estimate flag and vice versa.
OUMDM2_OUCCB2_UOM	Usage request	Transform CCB UOM to MDM UOM and vice versa.
OUMDM2_OUCCB2_TOU	Usage request	Transform CCB TOU to MDM TOU and vice versa.
OUMDM2_OUCCB2_SQI	Usage request	Transform CCB SQI to MDM SQI and vice versa.
OUMDM2_OUCCB2_UsageType	Usage request	Transform the MDM usage type to CCB usage type. For example: Interval, Scalar, etc.
OUMDM2_OUCCB2_SPHowToUse	Usage request	Transform MDM SP How to Use flag to CCB SP How to Use Flag and vice versa
OUMDM2_OUCCB2_MeasuresPeakQuantity	Usage request	Transform MDM Measures Peak Quantity flag to CCB Measures Peak Quantity flag and vice versa

Error Handling



Any exception or error thrown by the integration service is sent back to CCB as a SOAP Fault or exception which will change the outbound message status to be in 'Error'.

Integration service will also send back the exception or SOAP fault received from MDM to CCB. This will also change the outbound message status to be in 'Error'

No email notifications for Business and Technical errors will be sent out from the integration service.

Customization and Extension Methodology

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

- Pretransformation Extension Point
- Posttransformation Extension Point
- Custom Transformations

Pretransformation Extension Point

The pretransformation extension point is invoked before the main transformation is executed. This transformation aids in transforming the source XML coming as an input to the integration process.

The integration layer defines an external call from the pretransformation extension point. This extension point accepts source XML as input and gives the source XML as output. The implementation can choose to plug in a concrete WSDL instead of the abstract WSDL. This can assist the implementation in invoking any external Web service and transform the input XML.

Post Transformation Extension Point

The post transformation extension point is invoked after the main transformation is executed. This transformation aids in transforming the target XML going as an input to the target queue.

The integration layer defines an external call from the post transformation extension point. This extension point accepts the target XML as input and gives the target XML as output. The implementation can choose to plug in a concrete WSDL instead of the abstract WSDL. This can assist the implementation in invoking any external Web service and transform the output XML.

Custom Transformations

The custom transformations are used to add data to custom elements in the incoming and outgoing messages. The incoming and outgoing messages have custom elements defined in the message. These custom elements refer to a custom XML schema. The main transformation invokes custom transformation.

Empty custom transformation and custom schemas are shipped with the product. The implementation team can add additional fields in the custom schema and map them using the custom transformations.

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

Steps to Implement Extension Points

1. Each process in the integration has a pre- and post-transformation extension point which can be used to invoke Web services and transform the payload.
2. The desired extension point can be triggered from the process by enabling it using the ConfigurationProperties.xml pre- and post-transformation extension flags as described in section Setting Configuration Properties.
3. Each process has its own concrete wsdl which is used to read the endpoint location for the extension service.

These concrete wsdl files are located in MDS under the following directories:

/apps/CCB2-MDM2/AIAMetaData/AIAComponents/ExtensionServiceLibrary/OUCCB2

Update the concrete wsdl file to define the binding and service details for the extension service to be called and move the concrete wsdl file to MDS. See [Sample](#) below.

4. To move the concrete wsdl to MDS, update the appropriate wsdl in the product install home. The directories to put the concrete wsdl in product install home are the following:

\$PRODUCT_HOME/MDS-Artifacts/CCB2-

MDM2/AIAMetaData/AIAComponents/ExtensionServiceLibrary/OUCCB2

Then deploy the concrete wsdl to MDS by running the ant deploy command for Deploying MDS folder.

Note: For more information about the command to use to deploying to MDS, see the Oracle Utilities Customer Care and Billing Integration to Oracle Utilities Meter Data Management Release 3.1.1 Media Pack Installation Guide, under Deploying MDS Folder section.

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

Sample wsdl File with Binding and Service Details

For example: To enable the extension points for OUCCB2OUMDM2SSUsageOverviewEBF, add the binding and service elements to the OUCCB2OUMDM2SSUsageOverviewEBF ExtensionConcrete.wsdl.

```
<binding name="OUCCB2OUMDM2SSUsageOverviewV1ExtensionServiceSOAP11Binding"
  type="ccbext:OUCCB2OUMDM2SSUsageOverviewV1ExtensionService">
  <soap:binding style="document"
    transport="http://schemas.xmlsoap.org/soap/http"/>
  <operation name="PreXformCCB2toMDM2">
    <soap:operation style="document"
      soapAction="http://xmlns.oracle.com/OUCCB2OUMDM2SSUsageOverviewEBF/OUCCB2OUMDM2SSUsageOverviewExtension/V1/PreXformCCB2toMDM2"/>
    <input>
      <soap:body use="literal" parts="PreXform_CCB2ToMDM2"/>
    </input>
    <output>
      <soap:body use="literal" parts="PreXform_CCB2ToMDM2"/>
    </output>
    <fault name="fault">
      <soap:fault name="fault" use="literal"/>
    </fault>
  </operation>
  <operation name="PostXformCCB2toMDM2">
```

```

        <soap:operation style="document"
soapAction="http://xmlns.oracle.com/OUCCB2OUMDM2SSUsageOverviewEBF/OUCCB2OUMDM2SSUsageOvervie
wExtension/V1/PostXformCCB2toMDM2"/>
        <input>
            <soap:body use="literal" parts="PostXform_CCB2ToMDM2"/>
        </input>
        <output>
            <soap:body use="literal" parts="PostXform_CCB2ToMDM2"/>
        </output>
        <fault name="fault">
            <soap:fault name="fault" use="literal"/>
        </fault>
    </operation>
    <operation name="PreXformMDM2toCCB2">
        <soap:operation style="document"
soapAction="http://xmlns.oracle.com/OUCCB2OUMDM2SSUsageOverviewEBF/OUCCB2OUMDM2SSUsageOvervie
wExtension/V1/PreXformMDM2toCCB2"/>
        <input>
            <soap:body use="literal" parts="PreXform_MDM2ToCCB2"/>
        </input>
        <output>
            <soap:body use="literal" parts="PreXform_MDM2ToCCB2"/>
        </output>
        <fault name="fault">
            <soap:fault name="fault" use="literal"/>
        </fault>
    </operation>
    <operation name="PostXformMDM2toCCB2">
        <soap:operation style="document"
soapAction="http://xmlns.oracle.com/OUCCB2OUMDM2SSUsageOverviewEBF/OUCCB2OUMDM2SSUsageOvervie
wExtension/V1/PostXformMDM2toCCB2"/>
        <input>
            <soap:body use="literal" parts="PostXform_MDM2ToCCB2"/>
        </input>
        <output>
            <soap:body use="literal" parts="PostXform_MDM2ToCCB2"/>
        </output>
        <fault name="fault">
            <soap:fault name="fault" use="literal"/>
        </fault>
    </operation>
</binding>
<service name="UsageOverviewExtensionService">

    <!-- Sample: Port name must match the port name used for the Extension Service in the
composite.xml of the main process -->
    <port name="OUCCB2OUMDM2SSUsageOverviewV1ExtensionService_pt"
binding="ccbext:OUCCB2OUMDM2SSUsageOverviewV1ExtensionServiceSOAP11Binding">

```

```
<soap12:address location="http://soaserver:8072/soa-
infra/services/default/CCBMDM2SSExtensionTest/UsageOverviewExtensionService"/>
</port>
</service>
```

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

Custom Transformations

To implement custom transformations:

1. Each process in the integration has its own xsd file. The messages have custom elements which can be used to pass additional data from one application to another or vice versa. Refer to the message mappings to see the location of customElements in each message.
2. Each process uses two XSD files, one for the Oracle Utilities Customer Care and Billing message and one for the Oracle Utilities Meter Data Management message.
3. Each XSD file has a corresponding CustomType XSD file in which the complexType elements for each customElements tag are defined.

4. Example:

The MDM schema file (XSD) for Usage Overview is: ***OUMDM2SSGetUsageOverview.xsd***.

The corresponding custom type schema file (Custom XSD) is : ***OUMDM2SSGetUsageOverviewCustomType.xsd***.

The custom XSD files are located in product install home under the following directories:

\$PRODUCT_HOME/MDS-Artifacts/CCB2-MDM2/AIAMetaData/AIAComponents/
ApplicationObjectLibrary/OUCCB2/V1/schemas

\$PRODUCT_HOME/MDS-Artifacts/CCB2-MDM2/AIAMetaData/AIAComponents/
ApplicationObjectLibrary/OUMDM2/V1/schemas

5. To pass additional elements in the customElements tag, the corresponding complexType in the customType xsd needs to be modified. Add the additional elements required in the complexType elements. See example below.
6. Each process has a main transformation which invokes custom templates. Each main transformation file has a corresponding Custom xsl and the custom templates are defined in the Custom xsl.

Example:

The transformation file (XSL) for Usage Overview request is:

Transformation_CCBtoMDM_UsageOverviewRequest.xsl.

The corresponding custom transformation file (custom XSL) is:

Transformation_CCBtoMDM_UsageOverviewRequest_Custom.xsl.

7. The custom XSL files are located in product install home under the following directories:
\$PRODUCT_HOME/ services/industry/Utilities/EBF/<Process Name>/xsl
8. These custom templates are invoked at the location where each customElements tag is present. The Custom xsl can be modified to add transformation for the newly added elements in the custom xsd files. See example below.
9. After updating the XSD and XSL files in the product install home, update MDS using the ant deploy command for Deploying MDS folder.

For more information about the command to use to deploying to MDS, see the Oracle Utilities Customer Care and Billing Integration to Oracle Utilities Meter Data Management Release 3.1.1 Media Pack Installation Guide, under Deploying MDS Folder section.

10. After deploying the files to MDS, restart the SOA server.
11. After restarting the SOA server, the changes to the custom xsd and xsl will be reflected in the integration.
For example: In the Usage Overview process, to pass requestDetails → customElements → userId element in Oracle Utilities Customer Care and Billing to WX-GetUsageOverview → input → customElements → userId element in MDM, the following changes must be implemented:

- A. In *OUCCB2SSUsageOverviewCustomType.xsd*, add the `userId` element to the schema. This custom xsd file is located in `$PRODUCT_HOME/MDS-Artifacts/CCB2-MDM2/AIAMetaData/AIAComponents/ApplicationObjectLibrary/OUMDM2/V1/schemas` folder.

```
<xsd:complexType name="requestDetailsCustomType">
  <xsd:sequence>
    <xsd:element name="userId" type="xsd:string"/>
  </xsd:sequence>
</xsd:complexType>
```

- B. In *OUMDM2SSGetUsageOverviewCustomType.xsd*, add the `userId` element in the schema. This xsd file is located in `CCB2-MDM2/MDS-Artifacts/CCB2-MDM2/AIAMetaData/AIAComponents/ApplicationObjectLibrary/OUMDM2/V1/schemas` folder.

```
<xsd:complexType name="inputCustomType">
  <xsd:sequence>
    <xsd:element name="userId" type="xsd:string"/>
  </xsd:sequence>
</xsd:complexType>
```

- C. Transformation *Transformation_CCBtoMDM_UsageOverviewRequest_Custom.xsl*

```
<xsl:template name="input-customElements">
  <!-- this template is use for Xformation of //input/customElements in Request
  Message-->
  <userId xmlns="http://oracle.com/WX-GetUsageOverview.xsd">
    <xsl:value-of
    select="/ns0:requestDetails/ns0:customElements/ns0:userId"/>
  </userId>
</xsl:template>
```

Monitoring and Troubleshooting Integrated Flows

This section describes how to:

- Monitor from Oracle Utilities Customer Care and Billing
- Monitor from Oracle Utilities Meter Data Management
- Monitor from the Integration Layer
- Troubleshooting

Monitoring from Oracle Utilities Customer Care and Billing

Oracle Utilities Customer Care and Billing Error Logs

Errors related to the online integration invocation from CCB are stored in the `CCB_ENVIRONMENT_NAME/logs/system` folder (e.g., `V231_CCB_PERF_BLD10_LIN_ORA_WLS/logs/system`).

Note: For more information about errors and notifications see the Oracle Utilities Customer Care and Billing documentation.

Notifications

Errors in the Integration are communicated back to the Initiating application.

When Oracle Utilities Customer Care and Billing sends a request message out to Oracle Meter Data Management (MDM), it expects a response back.

When integration encounters an exception while processing the message or MDM sends an exception or fault back to the integration, integration will return a SOAP fault back to CCB. This will cause the outbound message to go to error status.

Connection Errors

Information can be found in the log file described above.

Monitoring from Oracle Utilities Meter Data Management

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

For example: V201_MDM_LIN_ORA_WLS/logs/system

Monitoring from the Integration

To monitor the integration flow using the Integration:

1. Monitoring the composite instances using WebLogic SOA Enterprise Manager
2. Monitoring the WebLogic logs

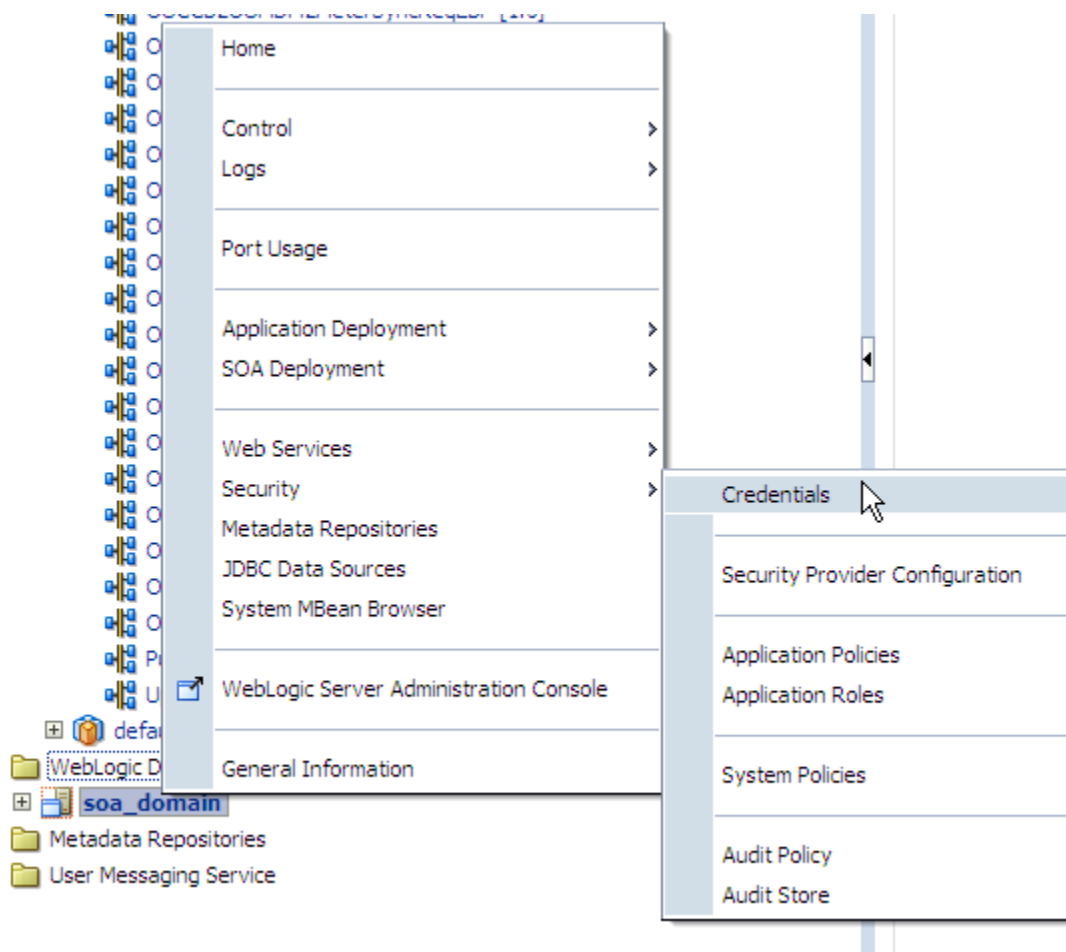
Steps to Follow to Monitor using WebLogic SOA Enterprise Manager

Check Process Instance

1. Login into the WebLogic SOA server Enterprise Manager
2. In the left menu navigate to SOA → soa-infra → CCB2-MDM2.
3. All the composite processes deployed for the integration are available under the partition CCB2-MDM2.
4. Select the appropriate process to list all the instances for the processes sorted by time of execution.
5. The instances also have the request ID as part of the display name.
6. Click the appropriate process instance and it will display the flow for the process.
The composite flow lists all the activities in the process instance.

Check Credential Key (csf-key) Attached to Policy

1. Login into the WebLogic SOA server Enterprise Manager
2. In the left menu navigate to WebLogic Domain → soa_domain.
3. Right click on soa_domain, click Security, and then click Credentials.



4. Expand oracle.wsm.security and OU_MDM2_01 key should be defined there.
5. Edit OU_MDM2_01 key and check that the User Name and Password defined are correct.

 The 'Edit Key' dialog box is shown. It contains the following fields:

- Select Map: oracle.wsm.security
- Key: OU_MDM2_01
- Type: Password
- * User Name: SYSUSER
- * Password: (masked with dots)
- * Confirm Password: (masked with dots)
- Description: MDM Credentials

 A tooltip on the right side of the dialog says 'You can enter a d'. At the bottom right, there are 'OK' and 'Cancel' buttons.

Steps to Follow to Check the WebLogic Logs

1. Login into the machine where the SOA Server is installed.
2. The SOA logs are stored in: <WebLogic installation folder>/user_projects/domains/<SOA Domain name>/servers/<SOA Server name>/logs

For example: /slot/ems1234/oracle/Middleware/user_projects/domains/soa_domain/servers/soa_server1/logs

Data Purge

To maintain maximum system integrity the Oracle Fusion Middleware database should be purged periodically. Please refer to note 815896.1 on support.oracle.com for information on how to complete this task.

Troubleshooting

At times, Oracle Utilities Customer Care and Billing Integration to Oracle Utilities Meter Data Management might experience errors or issues with connection, processing, or sending or receiving messages. Following are the common scenarios which help you to troubleshoot error, if any, and find possible solutions.

Error 1: CCB sends out a message but the message does not reach the integration service. No instances found in SOA Enterprise Manager.

To resolve this error:

1. Check the source application logs to see if any errors are encountered while trying to send the message out. Refer to Oracle Utilities Customer Care and Billing Error Logs for more information on where to find the logs.
 2. Check the source application's XAI Configuration to ensure they are configured correctly. Refer to the Setting Up Oracle Utilities Customer Care and Billing – XAI Configuration for more information.
 3. Check if the BPEL processes are running. Refer to the [Monitoring using WebLogic SOA Enterprise Manager, Check Process Instance section](#) for more information.
- If WebLogic SOA Enterprise Manager is not accessible or the BPEL processes cannot be seen found in the WebLogic SOA Enterprise Manager, restart the SOA managed server. Refer to the Oracle Utilities Customer Care and Billing Integration to Oracle Utilities Meter Data Management Release 3.1.1 Media Pack Installation Guide, under Restarting SOA Managed Server or it can also be started from the WebLogic console.
 - If WebLogic SOA Enterprise Manager is accessible but the BPEL process is not active, activate or start up the process from the WebLogic SOA Enterprise Manager.

Error 2: CCB sends out a request message but the message does not reach MDM or encountered an error while processing in MDM.

To resolve this error:

Check the instance of the BPEL process ran, check if the message has faulted or encountered an error. Refer to the [Monitoring using WebLogic SOA Enterprise Manager, Check Process Instance section](#) for more information.

- From WebLogic SOA Enterprise Manager, check the appropriate process instance flow trace to see the error details.
- Check the logs. Refer to [Monitoring using WebLogic logs section](#) for more information.
- If the error encountered by the BPEL process is a runtime error stating that the MDM endpoint URL is not accessible, check the following:
 - Make sure in the MDM wsdl in MDS, the service's address location is pointing to the correct MDM URL.

Sample:

```
<wsdl:service name="WX-GetUsageOverviewService">
  <wsdl:documentation>WX-GetUsageOverview version 3: Get Usage
  Overview</wsdl:documentation>
  <wsdl:port name="WX-GetUsageOverviewPort" binding="xaixsd:WX-
  GetUsageOverviewSoapBinding">
    <soap:address location="https://mdm server:9999/ouaf/XAIApp/xaiserver/WX-
    GetUsageOverview"/>
  </wsdl:port>
</wsdl:service>
```

Note: The MDM wsdl is in \$PRODUCT_HOME/MDS-Artifacts/CCB2-MDM2/AIAMetaData/AIAComponents/ApplicationObjectLibrary/OUMDM2/V1/wsdl

To move the concrete wsdl to MDS, update the appropriate wsdl in the product install home. The directories to put the concrete wsdl in product install home are the following:

\$PRODUCT_HOME/MDS-Artifacts/CCB2-MDM2/AIAMetaData/AIAComponents/ExtensionServiceLibrary/OUCC

- From WebLogic SOA Enterprise Manager, check if the MDM web service called by the BPEL process has a policy and csf-key attached to it.

To check:

- Select the appropriate BPEL process to check from the CCB2-MDM2 partition.
- Scroll down to the bottom until you see the Services and References section.
- Click the MDM Web Service to see if a policy is attached to the MDM web service.
- Go to the Policies tab and under Directly Attached Policies section, the [oracle/wss_http_token_client_policy](#) must be attached and enabled.
- Click the oracle/wss_http_token_client_policy to check that [OU_MDM2-01](#) csf-key is linked to the policy.
- Also check that the csf-key has the correct user and password defined. Refer to the [Monitoring using WebLogic SOA Enterprise Manager, Check Credential Key Attached to Policy section](#) for more information.

Notes:

Example of error: Unable to access the following endpoint(s): http://mdmdapplication:port/ouaf/XAIApp/xaiserver/WX-GetUsageOverview

The policy and credential key (csf-key) is automatically attached to the BPEL processes when the BPEL processes are installed.

If MDM returns an error or exception to the integration, check the following:

- From WebLogic SOA Enterprise Manager, check the fault message coming from MDM.
- Check the MDM logs to get more information about the error. Refer to Oracle Utilities Meter Data Management Error Logs for more information on where to find the logs.

Data Mapping

Usage Request Mapping

CCB Usage Request Message			MDM Usage Request Message			DVM Mapping
Element Name	Parent Element	Type	Element Name	Parent Element	Type	DVM
requestDetails		Outermost Tag	D2-CalculateUsage MultipleRequests		Outermost Tag	
mode	requestDetails	Field	mode	D2-CalculateUsage MultipleRequests	Field	
language	requestDetails	Field				
			requests	D2-CalculateUsage MultipleRequests	Group	
request	requestDetails	List	requestsList	requests	List	
			usId	requestsList	Field	
sald	request	Field	externalId	requestsList	Field	
rateSchedule	request	Field	usageGroupExternalId	requestsList	Field	

			usageGroup	requestsList	Field	
billCondition	request	Field	billCondition	requestsList	Field	
intervalProcessing	request	Group	intervalMC	requestsList	Group	
startDateTime	intervalProcessing	Field	startDateTime	intervalMC	Field	
endDateTimeFrom	intervalProcessing	Field	endDateTimeFrom	intervalMC	Field	
endDateTimeTo	intervalProcessing	Field	endDateTimeTo	intervalMC	Field	
customElements	intervalProcessing	Group				
scalarProcessing	request	Group	scalarMC	requestsList	Group	
startDateTime	scalarProcessing	Field	startDateTime	scalarMC	Field	
endDateTime	scalarProcessing	Field	endDateTimeFrom	scalarMC	Field	
			endDateTimeTo	scalarMC	Field	
billingOption	scalarProcessing	Field	endRangeOption	scalarMC	Field	OUCCB2_OUMDM2_Billing Option
minDaysOffset	scalarProcessing	Field	minDaysOffset	scalarMC	Field	
maxDaysOffset	scalarProcessing	Field	maxDaysOffset	scalarMC	Field	
allowEstimate	scalarProcessing	Field	allowEstimate	scalarMC	Field	OUCCB2_OUMDM2_Allow Estimate
estimateDate	scalarProcessing	Field	estimateDate	scalarMC	Field	
customElements	scalarProcessing	Group				
			dateBreaks	requestsList	Group	
dateBreaks	request	List	dateBreaksList	dateBreaks	List	
breakDateTime	dateBreaks	Field	dateBreak	dateBreaksList	Field	
customElements	request	Group				
			customElements	requestsList	Group	
responseDetails		Outermost Tag				
			responses	D2-CalculateUsage MultipleRequests	Group	
response	responseDetails	List	responsesList	responses	List	
sald	response	Field	externalId	responsesList	Field	
rateSchedule	response	Field	usageGroupExternalId			
usagePeriod	response	Group				
startDateTime	usagePeriod	Field	startDateTime	responsesList	Field	
endDateTime	usagePeriod	Field	endDateTime	responsesList	Field	
customElements	usagePeriod	Group				
isSkipped	response	Field	skipped	responsesList	Field	

skipReasonDescription	response	Field	skipReasonDescription	responsesList	Field	
			skipReason	responsesList	Field	
			summaryUsagePeriods	responsesList	Group	
usagePeriods	response	List	summaryUsagePeriodsList	summaryUsagePeriods	List	
startDateTime	usagePeriods	Field	startDateTime	summaryUsagePeriodsList	Field	
endDateTime	usagePeriods	Field	endDateTime	summaryUsagePeriodsList	Field	
usageRequestType	usagePeriods	Field	usageType	summaryUsagePeriodsList	Field	OUMDM2_OUCCB2_UsageType
			SQs	summaryUsagePeriodsList	Group	
serviceQty	usagePeriods	List	SQsList	SQs	List	
seq	serviceQty	Field	sqSequence	SQsList	Field	
uom	serviceQty	Field	Uom	SQsList	Field	OUMDM2_OUCCB2_UOM
tou	serviceQty	Field	Tou	SQsList	Field	OUMDM2_OUCCB2_TOU
sqi	serviceQty	Field	Sqi	SQsList	Field	OUMDM2_OUCCB2_SQI
qty	serviceQty	Field	quantity	SQsList	Field	
customElements	usagePeriods	Group				
spUsagePeriod	response	List	summaryUsagePeriodsList	summaryUsagePeriods	List	
startDateTime	spUsagePeriod	Field	startDateTime	summaryUsagePeriodsList	Field	
endDateTime	spUsagePeriod	Field	endDateTime	summaryUsagePeriodsList	Field	
			spSQs	summaryUsagePeriodsList	Group	
serviceQty	spUsagePeriod	List	spSQsList	spSQs	List	
seq	serviceQty	Field	spSQsequence	spSQsList	Field	
spId	serviceQty	Field	spId	spSQsList	Field	
uom	serviceQty	Field	Uom	spSQsList	Field	OUMDM2_OUCCB2_UOM
tou	serviceQty	Field	Tou	spSQsList	Field	OUMDM2_OUCCB2_TOU
sqi	serviceQty	Field	Sqi	spSQsList	Field	OUMDM2_OUCCB2_SQI
qty	serviceQty	Field	quantity	spSQsList	Field	
customElements	spUsagePeriod	Group				
			customElements	summaryUsagePeriodsList	Group	
scalarProcessing	response	Group	scalarDetails	responsesList	Group	

isEstimate	scalarProcessing	Field	isEstimate	scalarDetails	Field	OUMDM2_OUCCB2_IsEstimate
reads	response	List	scalarDetailsList	scalarDetails	List	
readSeq	reads	Field	sequence	scalarDetailsList	Field	
spld	reads	Field	spld	scalarDetailsList	Field	
startReadDateTime	reads	Field	startDateTime	scalarDetailsList	Field	
endReadDateTime	reads	Field	endDateTime	scalarDetailsList	Field	
uom	reads	Field	uom	scalarDetailsList	Field	OUMDM2_OUCCB2_UOM
tou	reads	Field	tou	scalarDetailsList	Field	OUMDM2_OUCCB2_TOU
sqi	reads	Field	sqi	scalarDetailsList	Field	OUMDM2_OUCCB2_SQI
startReading	reads	Field	startMeasurement	scalarDetailsList	Field	
endReading	reads	Field	endMeasurement	scalarDetailsList	Field	
measuredQty	reads	Field	quantity	scalarDetailsList	Field	
finalQty	reads	Field	finalQuantity		Field	
finalUom	reads	Field	finalUom	scalarDetailsList	Field	
finalTou	reads	Field	finalTou	scalarDetailsList	Field	
finalSqi	reads	Field	finalSqi	scalarDetailsList	Field	
sphowToUse	reads	Field	spHowToUse	scalarDetailsList	Field	OUMDM2_OUCCB2_SPHowToUse
reghowToUse	reads	Field	mcHowToUse	scalarDetailsList	Field	
constant	reads	Field	appliedMultiplier	scalarDetailsList	Field	
measuresPeakQuantity	reads	Field	measuresPeakQuantity	scalarDetailsList	Field	OUMDM2_OUCCB2_MeasuresPeakQuantity
usePercent	reads	Field	usePercent	scalarDetailsList	Field	
customElements	reads	Group				
			customElements	scalarDetailsList	Group	
			exceptions	responsesList	Group	
exceptionInfo	response	List	exceptionsList	exceptions	List	
sequence	exceptionInfo	Field	sequence	exceptionsList	Field	
messageCategory	exceptionInfo	Field	messageCategory	exceptionsList	Field	
messageNumber	exceptionInfo	Field	messageNumber	exceptionsList	Field	
comments	exceptionInfo	Field	comments	exceptionsList	Field	
			messageParameters	exceptionsList	Group	
messageParameters	exceptionInfo	List	messageParametersList	messageParameters	List	
parameterSequence	messageParameters	Field	sequence	messageParametersList	Field	
messageParameterValue	messageParameters	Field	parameter	messageParametersList	Field	

		parameterType	messageParameters	Field
			List	
customElements	response	Group		
		customElements	responsesList	Group

Notes:

DVMs used in the transformation are existing DVMs used in CCB-MDM2 Integration. No new DVMs are introduced for this flow.

Language coming from CCB will be passed to MDM through the SOAP Header when invoking the MDM service.

MDM //scalarMC/endTimeFrom and //scalarMC/endTimeTo are populated accordingly:

- //scalarMC/endTimeFrom - concatenate CCB endTime and 12am
/requestDetails/request/scalarProcessing/endTime and -00.00.00
- //scalarMC/endTimeTo endTimeTo - concatenate CCB endTime and 11:59pm
/requestDetails/request/scalarProcessing/endTime and -23.59.59

Usage Overview Mapping

CCB Usage Overview Message			MDM Usage Overview Message		
Element Name	Parent Element	Type	Element Name	Parent Element	Type
requestDetails		OutermostTag	WX-GetUsageOverview		OutermostTag
			input	WX-GetUsageOverview	Group
language	requestDetails	Field			
usageDays	requestDetails	Field	usageHistory	input	Field
referenceDateTime	requestDetails	Field	referenceDateTime	input	Field
			usageSubscriptions	input	Group
serviceAgreements	requestDetails	List	usList	usageSubscriptions	List
			usId	usList	Field
said	serviceAgreements	Field	externalId	usList	Field
qtyToDateStartDateTime	serviceAgreements	Field	qtyToDateStartDateTime	usList	Field
customElements	requestDetails	Group	customElements	input	Group
responseDetails		OutermostTag			
			output	WX-GetUsageOverview	Group
results	responseDetails	List	results	output	List
			usId	results	Field
said	results	Field	externalId	results	Field
isSkipped	results	Field	skipped	results	Field
skipReasonDescription	results	Field	skipReasonDescription	results	Field
			skipReason	results	Field

startDateTime	results	Field	startDateTime	results	Field
endDateTime	results	Field	endDateTime	results	Field
Uom	results	Field	uom	results	Field
uomDescription	results	Field	shortDescription	results	Field
Spi	results	Field	secondsPerInterval	results	Field
latestMeasurementDateTime	results	Field	latestMeasurementDateTime	results	Field
qtyToDateStartDateTime	results	Field	qtyToDateStartDateTime	results	Field
qtyToDate	results	Field	qtyToDate	results	Field
			msrs	results	Group
measurements	results	List	mList	msrs	List
sequence	measurements	Field	s	mList	Field
quantity	measurements	Field	q	mList	Field
customElements	results	Group			
customElements	responseDetails	Group			
			customElements	results	Group
			customElements	output	Group

Notes:

No DVMs are used in the transformation.

Language coming from CCB will be passed to MDM through the SOAP Header when invoking the MDM service.

Usage Details Mapping

CCB Usage Detail Message			MDM Usage Detail Message		
Element Name	Parent Element	Type	Element Name	Parent Element	Type
requestDetails		OutermostTag	WX-RETWSSTOUMappingService		Outermost Tag
			input	WX-RETWSSTOUMappingService	Group
language	requestDetails	Field			
displayMode	requestDetails	Field	displayMode	input	Field
previousNext	requestDetails	Field	previousNext	input	Field
overlayMode	requestDetails	Field	overlayMode	input	Field
referenceDateTime	requestDetails	Field	referenceDateTime	input	Field
serviceAgreements	requestDetails	List	usageSubscriptions	input	List
			usld	usageSubscriptions	Field
sald	serviceAgreements	Field	usExternalId	usageSubscriptions	Field
customElements	requestDetails	Group	customElements	input	Group

responseDetails			OutermostTag		
			output	WX-RETWSSTOUMappingService	Group
results	responseDetails	List	results	output	List
			usId	results	Field
sald	results	Field	usExternalId	results	Field
isSkipped	results	Field	isSkipped	results	Field
skipReasonDescription	results	Field	skipReasonDescription	results	Field
			skipReason	results	Field
usageUom	results	Field	usageUom	results	Field
usageUomDescription	results	Field	usageUomDescription	results	Field
usageSqi	results	Field	usageSqi	results	Field
usageSqiDescription	results	Field	usageSqiDescription	results	Field
overlayUom	results	Field	overlayUom	results	Field
overlayUomDescription	results	Field	overlayUomDescription	results	Field
latestMeasurementDateTime	results	Field	latestMeasurementDateTime	results	Field
periods	results	List	periods	results	List
dateTime	periods	Field	dateTime	periods	Field
touQuantities	periods	List	touUsages	periods	List
tou	touQuantities	Field	tou	touUsages	Field
touDescription	touQuantities	Field	touDescription	touUsages	Field
quantity	touQuantities	Field	quantity	touUsages	Field
overlayQuantities	periods	List	overlayQuantities	periods	List
quantity	overlayQuantities	Field	quantity	overlayQuantities	Field
customElements	results	Group			
customElements	responseDetails	Group			
			customElements	results	Group
			customElements	output	Group

Notes:

No DVMs are used in the transformation.

Language coming from CCB will be passed to MDM through the SOAP Header when invoking the MDM service.

Appendix A

Additional Resources

Resource	Location
Oracle WebCenter documentation	http://download.oracle.com/docs/cd/E21764_01/webcenter.htm Specific functionality relating to OUCSS implementation: Manage Group Spaces: http://download.oracle.com/docs/cd/E17904_01/webcenter.1111/e10277/create_space.htm#CACEBBFA Modifying group space permissions: http://download.oracle.com/docs/cd/E14571_01/webcenter.1111/e12405/wcadm_wcs_users.htm#BCFHIIJA Designing Navigation Model: http://download.oracle.com/docs/cd/E17904_01/webcenter.1111/e10277/create_navmod.htm#CIHFJEJJ Designing Page Template: http://download.oracle.com/docs/cd/E17904_01/webcenter.1111/e10277/edit_template.htm#CIAFDIJB Creating and managing Pages: http://download.oracle.com/docs/cd/E17904_01/webcenter.1111/e10277/create_page.htm#CHDFEFJD Oracle Fusion Middleware guide for WebCenter Users: http://download.oracle.com/docs/cd/E17904_01/webcenter.1111/e10148/toc.htm Oracle Fusion Middleware guide for WebCenter Administrator: http://download.oracle.com/docs/cd/E14571_01/webcenter.1111/e12405/toc.htm Maintaining WebCenter Spaces http://download.oracle.com/docs/cd/E14571_01/webcenter.1111/e12405/wcadm_maintain_wcs.htm#CIHHBAJC Managing User and Roles: http://download.oracle.com/docs/cd/E14571_01/webcenter.1111/e12405/wcadm_wcs_users.htm#BCFHIIJA
Oracle Utilities Customer Care and Billing Integration to Oracle Utilities Meter Data Management Release 3.1.1 Media Pack Install Guide and Implementation Guide	Refer to Oracle Utilities Customer Care and Billing Integration to Oracle Utilities Meter Data Management Release 3.1.1 Media Pack documentation located on edelivery.

Oracle Utilities Meter Data Management Installation Guide for Release v2.0.1	Refer to Oracle Utilities Meter Data Management installation documentation located on edelivery.
Oracle Utilities Customer Care and Billing Installation Guide for Release v2.3.1	Refer to Oracle Utilities Customer Care and Billing installation documentation located on edelivery.oracle.com.
Oracle SOA Suite documentation	http://www.oracle.com/technetwork/middleware/soasuite/documentation/index.html