

Oracle Process Integration Pack for Oracle Utilities Field Work

Implementation Guide

Release 12.1.0

E64091-01

June 2015

Oracle Process Integration Pack for Oracle Utilities Field Work Implementation Guide, Release 12.1.0

E64091-01

Copyright © 2000, 2015, Oracle and/or its affiliates. All rights reserved.

Primary Author: Oracle Corporation

This software and related documentation are provided under a license agreement containing restrictions on use and disclosure and are protected by intellectual property laws. Except as expressly permitted in your license agreement or allowed by law, you may not use, copy, reproduce, translate, broadcast, modify, license, transmit, distribute, exhibit, perform, publish, or display any part, in any form, or by any means. Reverse engineering, disassembly, or decompilation of this software, unless required by law for interoperability, is prohibited.

The information contained herein is subject to change without notice and is not warranted to be error-free. If you find any errors, please report them to us in writing.

If this is software or related documentation that is delivered to the U.S. Government or anyone licensing it on behalf of the U.S. Government, then the following notice is applicable:

U.S. GOVERNMENT END USERS: Oracle programs, including any operating system, integrated software, any programs installed on the hardware, and/or documentation, delivered to U.S. Government end users are "commercial computer software" pursuant to the applicable Federal Acquisition Regulation and agency-specific supplemental regulations. As such, use, duplication, disclosure, modification, and adaptation of the programs, including any operating system, integrated software, any programs installed on the hardware, and/or documentation, shall be subject to license terms and license restrictions applicable to the programs. No other rights are granted to the U.S. Government.

This software or hardware is developed for general use in a variety of information management applications. It is not developed or intended for use in any inherently dangerous applications, including applications that may create a risk of personal injury. If you use this software or hardware in dangerous applications, then you shall be responsible to take all appropriate fail-safe, backup, redundancy, and other measures to ensure its safe use. Oracle Corporation and its affiliates disclaim any liability for any damages caused by use of this software or hardware in dangerous applications.

Oracle and Java are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

Intel and Intel Xeon are trademarks or registered trademarks of Intel Corporation. All SPARC trademarks are used under license and are trademarks or registered trademarks of SPARC International, Inc. AMD, Opteron, the AMD logo, and the AMD Opteron logo are trademarks or registered trademarks of Advanced Micro Devices. UNIX is a registered trademark of The Open Group.

This software or hardware and documentation may provide access to or information about content, products, and services from third parties. Oracle Corporation and its affiliates are not responsible for and expressly disclaim all warranties of any kind with respect to third-party content, products, and services unless otherwise set forth in an applicable agreement between you and Oracle. Oracle Corporation and its affiliates will not be responsible for any loss, costs, or damages incurred due to your access to or use of third-party content, products, or services, except as set forth in an applicable agreement between you and Oracle.

Contents

Preface	ix
Audience	ix
Documentation Accessibility	ix
Related Documents	x
Abbreviations and Terms	xi

Part 1 - About the Integration

Chapter 1 - Overview	1-1
Overview of Participating Applications	1-1
Oracle Utilities Customer Care and Billing	1-1
Oracle Utilities Mobile Workforce Management	1-2
Oracle Utilities Work and Asset Management	1-2
Chapter 2 - Work Order Process	2-1
Supported Functionality	2-1
Create Order	2-2
Update or Cancel Order	2-9
Complete Order	2-18
Integration Points for Work Order Processing	2-25
Orders Originating in CC&B	2-25
Orders Originating in WAM v1.9.1.x	2-27
Orders Originating in WAM v2.1.x	2-29
Orders Originating in MWM	2-31
Chapter 3 - Appointments Process	3-1
Supported Functionality	3-1
Integration Processing for Appointments	3-2
Appointment Processing	3-2
Chapter 4 - Meter or Item Validation Process	4-1
Meter or Item Validation Process Integration Overview	4-1
Meter Processing in WAM v1.9.1.x	4-1
Meter Processing in MWM	4-1
Supported Functionality	4-2
Integration Processing for Meter or Item Validation	4-3
Validation Processing Between WAM v1.9.1.x and CC&B	4-3
Validation Processing Between MWM and CC&B	4-5
Chapter 5 - Billing Process	5-1
Supported Functionality	5-1
Integration Processes for Billing	5-3
Billing an Order	5-3

Chapter 6 - Customer Update Process	6-1
Customer Update Process Integration Overview.....	6-1
Supported Functionality.....	6-2
Integration Processes for Customer Updates.....	6-3
Chapter 7 - Integration Interfaces and Components	7-1
Work Order Processing.....	7-1
Edge Application Interfaces for Work Order Processing.....	7-1
Core AIA Components and Services.....	7-4
Appointments Processing.....	7-6
Core AIA Components and Services.....	7-7
Meter or Item Validation Processing.....	7-7
Core AIA Components and Services.....	7-8
Billing Process.....	7-9
Core AIA Components and Services.....	7-10
Customer Update Process.....	7-10
Core AIA Components and Services.....	7-11

Part 2 - Implementing the Integration Product

Chapter 8 - Configuration Overview.....	8-1
Choosing a Configuration Scenario for your Business.....	8-1
Scenario 1: CC&B + MWM + WAM v1.9.1.x.....	8-2
Scenario 2: CC&B + MWM.....	8-2
Scenario 3: MWM + WAM v1.9.1.x.....	8-3
Scenario 4: CC&B + WAM v1.9.1.x.....	8-4
Scenario 5: MWM + WAM v2.1.x.....	8-4
Chapter 9 - Setting up Oracle Utilities Customer Care and Billing	9-1
Scenario 1: CC&B + MWM + WAM v1.9.1.x.....	9-1
Configuring Customer and Asset Data Synchronization.....	9-2
Mapping to Plant.....	9-2
Configure Admin Tables.....	9-4
Configure Notification Download and XAI.....	9-17
Scenario 2: CC&B + MWM.....	9-20
Scenario 3: MWM + WAM v1.9.1.x.....	9-20
Scenario 4: CC&B + WAM v1.9.1.x.....	9-20
Scenario 5: MWM + WAM v2.1.x.....	9-21
Chapter 10 - Setting up Oracle Utilities Mobile Workforce Management	10-1
Scenario 1: CC&B + MWM + WAM v1.9.1.x.....	10-1
Configure Administration Tables.....	10-2
Configure Extendable Lookups.....	10-3
Configure XAI.....	10-4
Scenario 2: CC&B + MWM.....	10-9
Scenario 3: MWM + WAM v1.9.1.x.....	10-9
Scenario 4: CC&B + WAM.....	10-9
Scenario 5: MWM + WAM v2.1.x.....	10-9
Chapter 11 - Setting up Oracle Utilities Work and Asset Management v1.9.1.x	11-1
Scenario 1: CC&B + MWM + WAM v1.9.1.x.....	11-1
Batch Processes.....	11-2
Business Rules.....	11-4

Code Tables.....	11-8
Department, Area and Account.....	11-9
Employee for Checkout Transactions	11-10
Responsibility Configuration for Control of Fields (Optional)	11-10
Sequence Numbers	11-11
Standard Notes	11-11
Scenario 2: CC&B + MWM.....	11-11
Scenario 3: MWM + WAM v1.9.1.x.....	11-11
Scenario 4: CC&B + WAM	11-11
Scenario 5: MWM + WAM v2.1.x.....	11-12
Chapter 12 - Setting up Oracle Utilities Work and Asset Management v2.1.x	12-1
Scenario 1: CC&B + MWM + WAM v1.9.1.x	12-1
Scenario 2: CC&B + MWM.....	12-1
Scenario 3: MWM + WAM v1.9.1.x.....	12-1
Scenario 4: CC&B + WAM v1.9.1.x	12-2
Scenario 5: MWM + WAM v2.1.x.....	12-2
Configure Administration Data	12-2
Configure Master Data	12-8
Configure Extendable Lookups.....	12-8
Configure XAI.....	12-9
Chapter 13 - Data Synchronization	13-1
Synchronization Between CC&B and WAM v1.9.1.x	13-1
Synchronizing Premises and Service Points.....	13-1
Synchronizing Account/Service Agreements and Customers	13-4
Tracking Data Changes	13-5
Chapter 14 - Setting up the Field Work Process Integration Pack.....	14-1
Scenario 1: CC&B – MWM - WAM v1.9.1.x.....	14-1
Setting AIA Configuration Properties	14-1
Settings for System Properties	14-2
Domain Value Maps	14-12
Cross-References.....	14-25
Updating MDS with AIA Meta Data.....	14-25
Update Configuration Properties.....	14-26
Deploying Individual Composites/Undeploying Composites and Updating MDS.....	14-26
Update MDS with AIAMetaData	14-26
Error Notification Setup	14-27
SOA Infrastructure Common Properties.....	14-27
Part 3 - Additional Information	
Chapter 15 - Monitoring, Error Handling and Troubleshooting.....	15-1
Monitoring in CC&B	15-1
Field Activity Creation.....	15-1
Connection Errors	15-1
Monitoring in MWM.....	15-2
Common Errors	15-2
Monitoring in WAM v1.9.1.x	15-2
Monitoring in WAM v2.1.x.....	15-2
Common Errors	15-3

Verification Steps in Oracle Enterprise Manager.....	15-3
Message Resubmission	15-3
Business Errors.....	15-4
Technical Errors.....	15-9
Managing Triggering Events and Retry Processing.....	15-9
CC&B Originated Messages.....	15-10
WAM v1.9.1.x Originated Messages	15-10
WAM v2.1.x Originated Messages	15-11
MWM Originated Messages	15-12
Managing Work Order Failure Scenarios	15-13
CC&B Originated Message - Requester Failure	15-13
CC&B Originated Message - Provider Failure	15-13
WAM v2.1.x Originated Message - Requester Failure	15-13
MWM Originated Message - Provider Failure.....	15-13
MWM Originated Message - Requester Failure	15-13
MWM Originated Message - Provider Failure.....	15-14
WAM v1.9.1.x Originated Message - Requester Failure	15-14
WAM v1.9.1.x Originated Message - Provider Failure.....	15-14
Error Handling Summary.....	15-15
Chapter 16 - General Extensibility Options	16-1
Extending EBOs	16-1
EBO Customization	16-2
Extending ABC Services	16-6
Pass Data without Extending the EBO.....	16-6
Invoke Customer Modified XAI Inbound Service	16-7
Chapter 17 - Custom Extensions.....	17-1
Passing Additional Information	17-1
Additional Information Related to Activities	17-2
Extending Oracle Utilities Mobile Workforce Management Business Objects	17-2
Obtaining the Data from Oracle Utilities Customer Care and Billing.....	17-3
Provide Oracle Utilities Customer Care and Billing with Additional Completion Information	17-5
Extending Oracle Utilities Mobile Workforce Management Business Objects	17-5
Extend the Field Activity Completion Process in Oracle Utilities Customer Care and Billing.....	17-6
Configure To Do Type/ To Do Role Related to the Extended Functionality	17-7
Configure Customer Contact Class and Type Related to the Extended Functionality.....	17-7
Additional Configuration Information.....	17-8
Chapter 18 - Security	18-1
Applied Security Policies	18-1
Global Service Policy.....	18-1
Global Client Policy.....	18-1
Local Client Policy	18-1
Local Service Policy	18-3
Local Client No Authentication Policy.....	18-3
Local Service No Authentication Policy.....	18-4

Chapter 19 - Processing CC&B NDS Records Using Middleware/BPEL	19-1
About Processing NDS Records Using Middleware	19-1
Middleware Composites for NDS Records Processing.....	19-1
Processing Details	19-1
Stopping and Starting NDS Polling.....	19-3
Customization Techniques.....	19-3
NDS Records Processing Setup.....	19-4
Performance Tuning	19-6
Monitoring and Troubleshooting	19-6
Appendix A - MPL	A-1
Configuring XAI for Use with Multi Purpose Listener (MPL).....	A-1
XSL Template in Oracle Utilities Customer Care and Billing when using MPL	A-3
CC&B MPL Error Logs	A-3

Preface

Audience

This document is intended for anyone implementing the Oracle Process Integration Pack for Oracle Utilities Field Work.

Documentation Accessibility

For information about Oracle's commitment to accessibility, visit the Oracle Accessibility Program website at:

<http://www.oracle.com/us/corporate/accessibility/index.html>

This site includes information on Oracle accessibility information and resources including accessible Oracle Support.

Related Documents

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

Topic	Description
Oracle Process Integration Pack for Oracle Utilities Field Work 12.1 Release Notes	
Oracle Process Integration Pack for Oracle Utilities Field Work 12.1 Installation Guide	Same folder as this document, with the distribution for this product or the OTN page:
Oracle Process Integration Pack for Oracle Utilities Field Work 12.1 Upgrade Guide	http://www.oracle.com/technetwork/apps-tech/utilities/documentation/index.html
Data Mapping Guides	
Edge application documentation:	
Oracle Utilities Work and Asset Management v2.1.x or v1.9.1.x documentation	Refer to the Oracle applications documentation page: http://www.oracle.com/technetwork/apps-tech/utilities/documentation/index.html
Oracle Utilities Customer Care and Billing documentation	
Oracle Utilities Mobile Workforce Management documentation	
SOA Suite 12c documentation	Refer to the SOA documentation at: http://www.oracle.com/technetwork/middleware/soasuite/documentation/index.html
Oracle Fusion Middleware 12c documentation	Refer to the Oracle applications documentation page: http://docs.oracle.com/en/middleware/
Oracle Support Visit regularly to stay up to date with the latest updates to this integration	https://support.oracle.com
Oracle University for training opportunities	http://education.oracle.com/

Data Mapping

Data mapping information for each integration point is provided in Excel spreadsheet format. Please refer to the .zip file included in the documentation package.

Abbreviations and Terms

The following terms and acronyms are used in documentation related to this media pack.

Applications

CC&B/CCB	Oracle Utilities Customer Care and Billing
MWM	Oracle Utilities Mobile Workforce Management
WAM	Oracle Utilities Work and Asset Management

Terms for Orders by Edge Application

Orders are referred to in different terms in each of the applications involved in this integrated product. In each of these systems, an order translates to:

Abbreviation	Order Name	Application
FA	Field Activity	CC&B
SR	Service Request	WAM v1.9.1.x
A	Activity	MWM and WAM v2.1.x

General Terms

ABCS	Application Business Connector Services
AOL	Application Object Library
CM	Customer Modification
CSR	Customer Service Representative
DB	Database
DVM	Domain Value Map
EBM	Enterprise Business Messages - Packets of data which the Mediator accepts from requesters and routes to providers. They carry the pieces of data needed for the requests to be understood and serviced.
EBO	Enterprise Business Object
EBSL	Enterprise Business Service Library
Edge Application	The applications that are involved in the integration - CC&B, MWM, and WAM
EM	Enterprise Manager
EOL	Enterprise Object Library
ESL	Extension Service Library
FP	Foundation Pack
JMS	Java Message Service - The JMS producers are responsible for posting the message to the Consumer JMS Queue for the corresponding target application.
MDS	Metadata Service
NDS	Notification Download Staging
Participating Application	One of the three applications involved this integration - CC&B, MWM, or WAM

PIP	Process Integration Pack
SA	CC&B Service Agreement
SCE	SOA Core Extensions
SOA	Service-Oriented Architecture - Software modules that are provided as services can be integrated or used by several applications using SOA, even if their respective architectures are substantially different. Rather than defining an API, SOA defines the interface in terms of protocols and functionality.
SOAP	Simple Object Access Protocol. It is a protocol specification for exchanging structured information in the implementation of Web Services in computer networks.
SP	CC&B Service Point
XAI	XML Application Integration. An Oracle Utilities Application Framework utility used to configure the system transfer information between CC&B/MWM/WAMv2.1.x and external applications using XML. XAI exposes system business objects as a set of XML based web services. The service can be invoked using different methods, for example, Hypertext Transfer Protocol (HTTP) or Java Message Service (JMS). Consequently, any application or tool that can send and receive XML documents can now access the rich set of system business objects.
XSD	A schema definition file
XSL	Extensible Style Language

For more information on AIA terms and concepts please refer to the *Oracle® Fusion Middleware Developer's Guide for Oracle SOA Core Extensions*.

Part 1

About the Integration

This section provides an overview of the participating applications and information regarding the business processes addressed by this integration.

This section contains the following chapters:

- [Chapter 1: Overview](#)
- [Chapter 2: Work Order Process](#)
- [Chapter 3: Appointments Process](#)
- [Chapter 4: Meter or Item Validation Process](#)
- [Chapter 5: Billing Process](#)
- [Chapter 6: Customer Update Process](#)
- [Chapter 7: Integration Interfaces and Components](#)

Chapter 1

Overview

The Process Integration Pack for Oracle Utilities Field Work supports the creation and synchronization of field work records between:

- Oracle Utilities Customer Care and Billing (CC&B)
- Oracle Utilities Mobile Workforce Management (MWM)
- Oracle Utilities Work and Asset Management (WAM)

As an order is initiated within one of the applications, it is propagated to one or both of the other two applications depending on the established rules for the type of order. As the order life cycle progresses, the integration manages:

- Order Creation
- Order Update, Cancel or Completion
- Appointment Management
- Meter and Item Validation
- Billing
- Customer Update

Overview of Participating Applications

This section provides a general description of each of the edge applications supported by the integration.

Oracle Utilities Customer Care and Billing

Oracle Utilities Customer Care and Billing (CC&B) manages customer information associated with field activities and processes the associated billing. Typically processing begins when a customer logs a request, or field activity, for work. Oracle Utilities Customer Care and Billing communicates this field activity to Oracle Utilities Mobile Workforce Management as an activity, or to Oracle Utilities Work and Asset Management v1.9.1.x as a service request.

Note: Oracle Utilities Customer Care and Billing does not integrate with Oracle Utilities Work and Asset Management v2.1.x as of this release.

Oracle Utilities Mobile Workforce Management

The Oracle Utilities Mobile Workforce Management product is comprised of three distinct functional components:

- **Resource Planning and Scheduling** - Supports resource planners and service managers in managing resources, planning shifts, and scheduling work. The system manages activity requests sent in from host systems as well as automatically generates shifts and optimizes the schedule based on business rules.
- **Common dispatching functionality** - Supports dispatchers as they handle exceptions throughout the day, and enables context-based decision making at the dispatcher level. The system can be configured to automatically dispatch all activities or limit auto-dispatching to certain activity types or shifts. The system maintains real-time communication with mobile resources, tracks the location of crews and vehicles, and enables dispatchers to monitor and manage activities, crews, alerts, and key performance indicators. Common dispatching functionality is provided through the Common Dispatching Interface (CDI) portal.
- **Mobile communications platform** - Supports mobile crews as they perform service work, facilitating communication with the dispatcher, providing GPS-based mapping services, and processing activity status updates and work completion details. The application runs on a Mobile Data Terminal (MDT) device.

Oracle Utilities Work and Asset Management

This integration supports two versions of Oracle Utilities Work and Asset Management. This section provides information on each version.

Oracle Utilities Work and Asset Management v1.9.1.x

Oracle Utilities Work and Asset Management v1.9.1.x manages work processes from the creation of a service request to the completion of work and processing work related charges. Once an order is translated from one of the other systems to become a service request in Oracle Utilities Work and Asset Management v1.9.1.x, the systems continue to communicate status updates, create bill charges when needed, and to close out the work.

Oracle Utilities Work and Asset Management v2.1.x

Oracle Utilities Work and Asset Management v2.1.x manages work processes from the creation work orders and activities to the completion of work and processing work related charges.

Within the integration, the system sends distributed work (e.g. item install, item remove, and item exchange) to Oracle Utilities Mobile Workforce Management by creating activities. Oracle Utilities Work and Asset Management v2.1.x may also create a questionnaire type of activity that is sent to Oracle Utilities Mobile Workforce Management to handle inspections, condition assessments or other types of asset related work.

Note: The work initiated from Oracle Utilities Work and Asset Management v2.1.x will not be routed to Oracle Customer Care and Billing as of this release.

Chapter 2

Work Order Process

This chapter provides an overview of Work Order process integration.

Supported Functionality

The following functions can be completed within the work order processing:

- Create order
- Update or cancel order
- Complete order

If you are using the complete integration between Oracle Utilities Customer Care and Billing, Oracle Utilities Mobile Workforce Management, and Oracle Utilities Work and Asset Management v1.9.1.x, the most likely business process includes the following:

- Oracle Utilities Customer Care and Billing is used to manage the customer inquiry and initiate service.
- Oracle Utilities Mobile Workforce Management is used to manage work scheduling and appointments.
- Oracle Utilities Work and Asset Management v1.9.1.x is used to capture billing information.
- An order can be initiated by an action in Oracle Utilities Customer Care and Billing or Oracle Utilities Work and Asset Management v1.9.1.x.
- Order created as:
 - an Activity (A) in Oracle Utilities Mobile Workforce Management
 - a Service Request (SR) in Oracle Utilities Work and Asset Management v1.9.1.x.

This is based on order type business rules.

- An order is worked and finished in Oracle Utilities Mobile Workforce Management or if the order is not sent to Oracle Utilities Mobile Workforce Management, it is worked and completed in Oracle Utilities Work and Asset Management v1.9.1.x.
- If an Oracle Utilities Work and Asset Management v1.9.1.x service request is part of the order, Oracle Utilities Work and Asset Management v1.9.1.x may send billing information back to Oracle Utilities Customer Care and Billing when the SR is closed in Oracle Utilities Work and Asset Management v1.9.1.x.

Oracle Utilities Customer Care and Billing can be used by customer service representatives (CSRs) to create fieldwork orders. A CSR can initiate orders of certain types manually and/or take actions to cause Oracle Utilities Customer Care and Billing to automatically generate orders of various

types based on the business rules established in the administrative tables within Oracle Utilities Customer Care and Billing.

A Field Activity (FA) may or may not have a related appointment date and time slot. This typically depends on the type of order and possibly the access available to installed products at a service point.

If a field activity does not require an appointment, Oracle Utilities Customer Care and Billing sends the order information to the integration product once it is created. If a field activity does require an appointment, Oracle Utilities Customer Care and Billing sends the order to the integration product once it is appointed. This is controlled by existing set up rules within Oracle Utilities Customer Care and Billing.

While this is the most likely process to follow in using this integration, please keep in mind that other scenarios and possibilities do exist when utilizing this integration. The following sections provide an overview of all supported functionality:

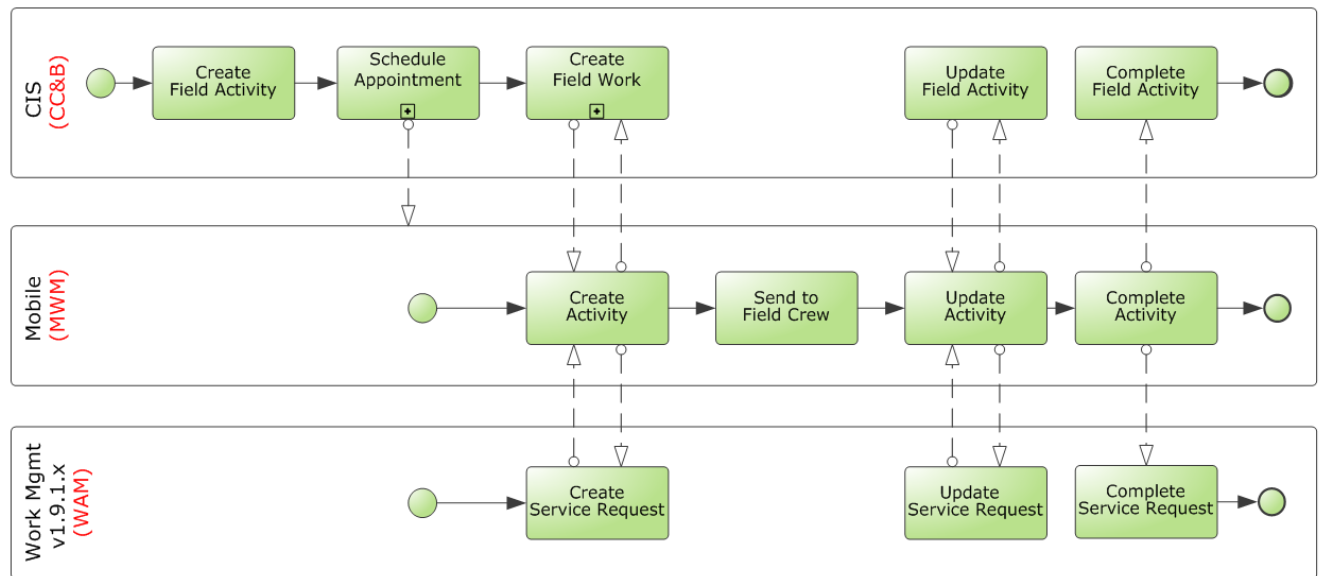
Create Order

The following scenarios apply to how an order might be created:

Order Initiated from CC&B

An order is initiated when a user creates a field activity in Oracle Utilities Customer Care and Billing and is propagated to the other systems to become a service request in Oracle Utilities Work and Asset Management v1.9.1.x and/or an activity in Oracle Utilities Mobile Workforce Management.

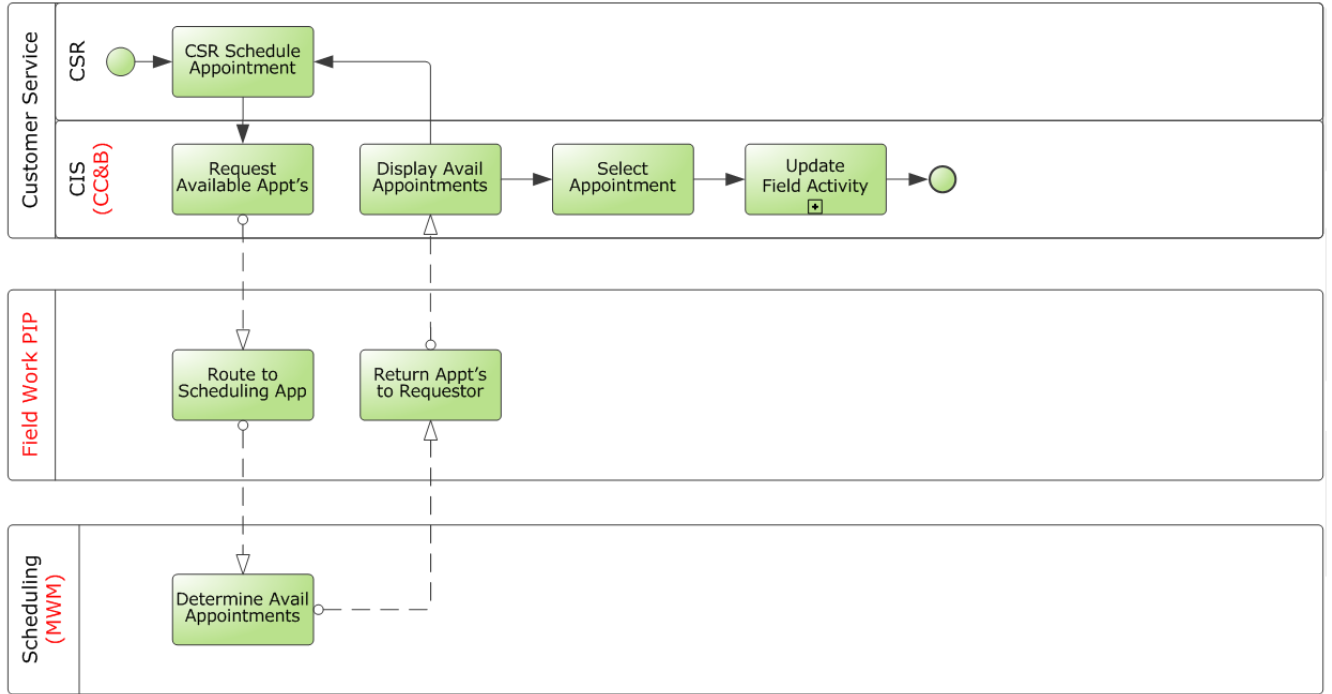
This diagram depicts processing when an order is initiated from an Oracle Utilities Customer Care and Billing field activity:



Field Activity Created in CC&B

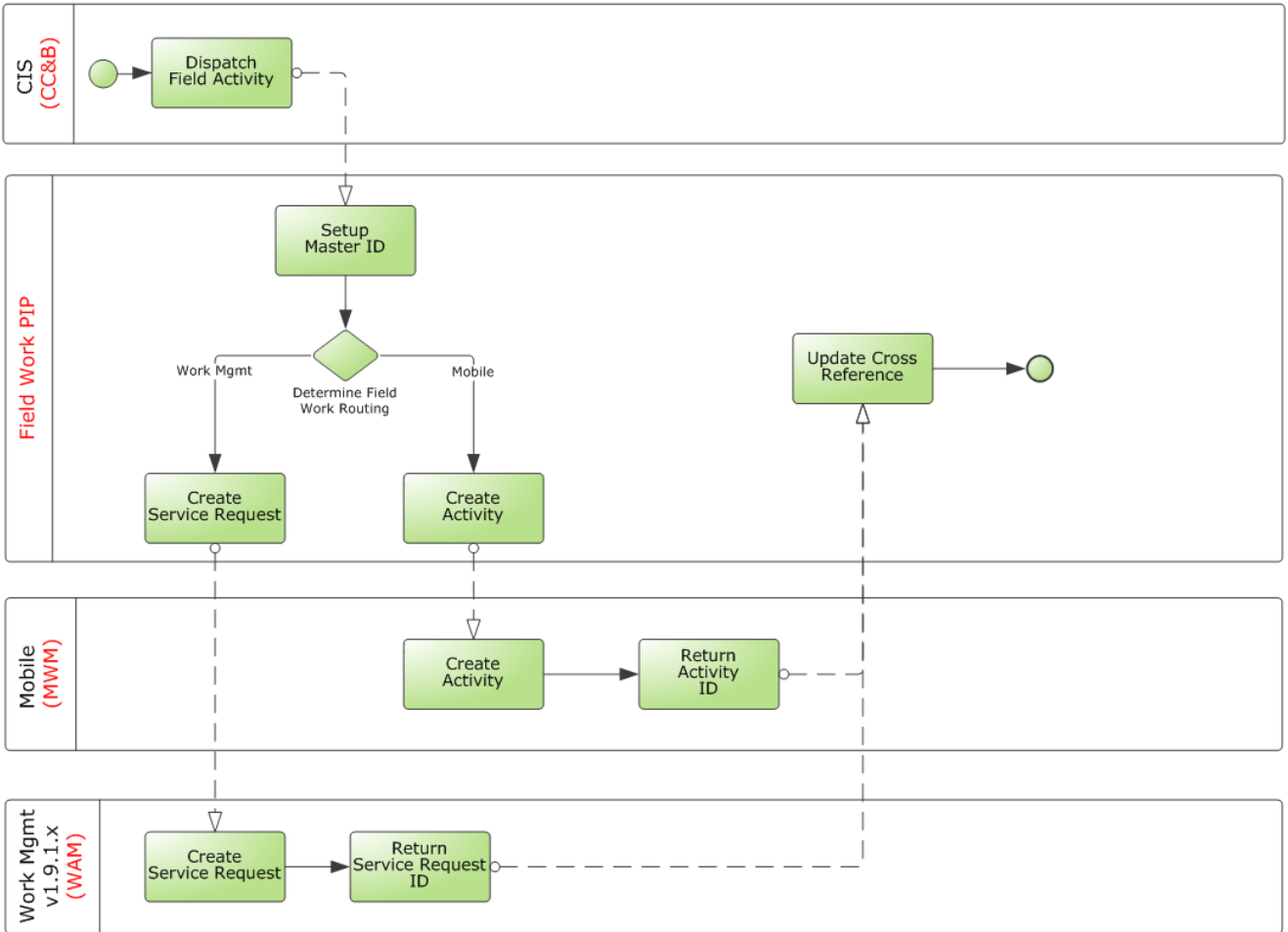
This process is broken down into 2 separate processes at the next level - Appointment Creation and Fieldwork Creation.

This diagram depicts processing when an appointment is created:



Appointment Creation

This diagram depicts processing when fieldwork is created:

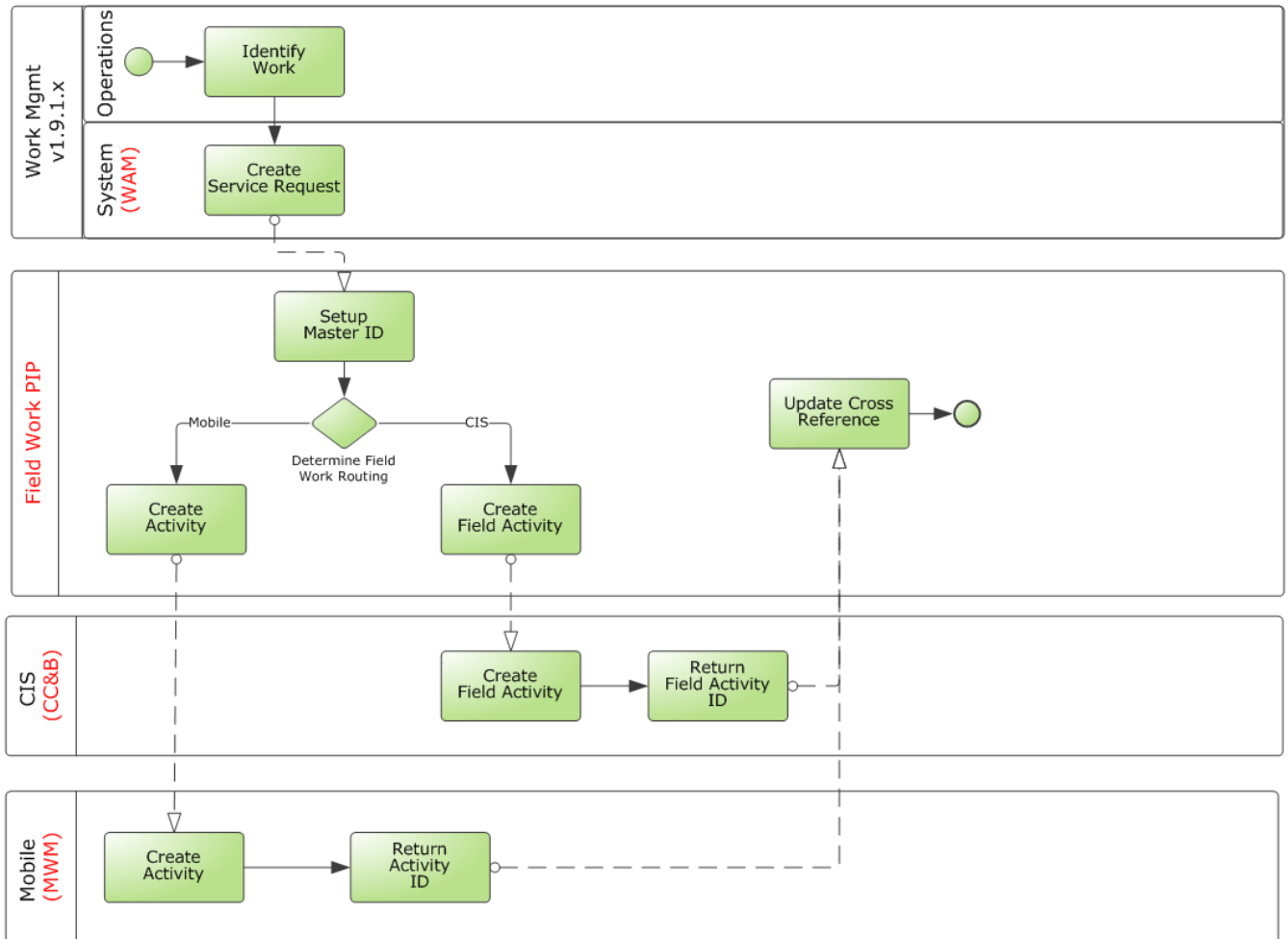


Fieldwork Creation

Order Initiated in WAM v1.9.1.x

An order is initiated when a user creates a service request in Oracle Utilities Work and Asset Management v1.9.1.x and is propagated to the other systems to become a field activity in Oracle Utilities Customer Care and Billing and/or an activity in Oracle Utilities Mobile Workforce Management.

The following diagram depicts processing when an order is initiated from an Oracle Utilities Work and Asset Management v1.9.1.x service request.

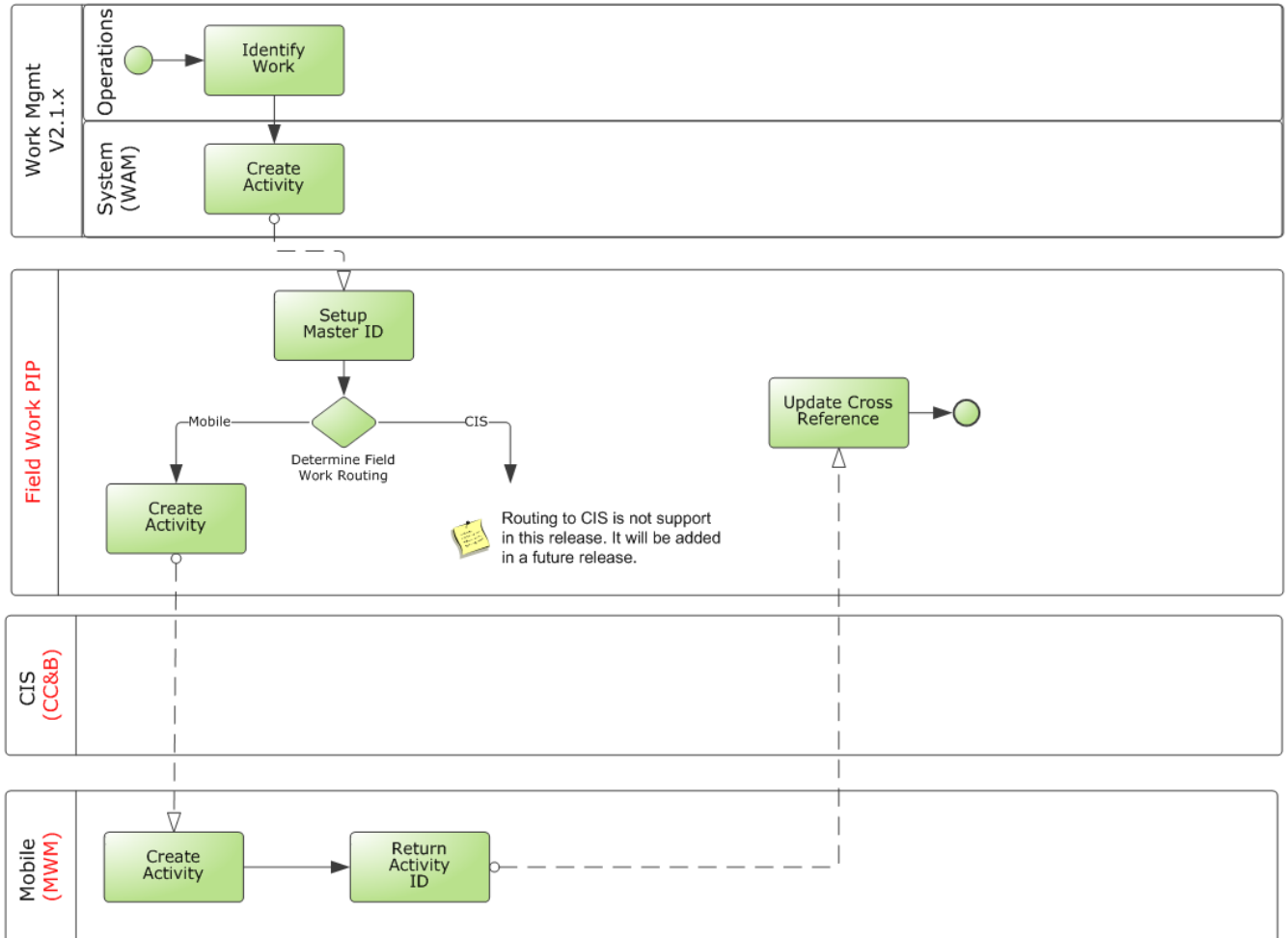


Service Request Created in WAM v1.9.1.x

Order Initiated in WAM v2.1.x

An order is initiated when a user creates an activity for distributed work in Oracle Utilities Work and Asset Management v2.1.x and is propagated to become an activity in Oracle Utilities Mobile Workforce Management.

The following diagram depicts processing when an order is initiated from an Oracle Utilities Work and Asset Management v2.1.x activity:



Activity Created in WAM v2.1.x

Order Initiated in MWM

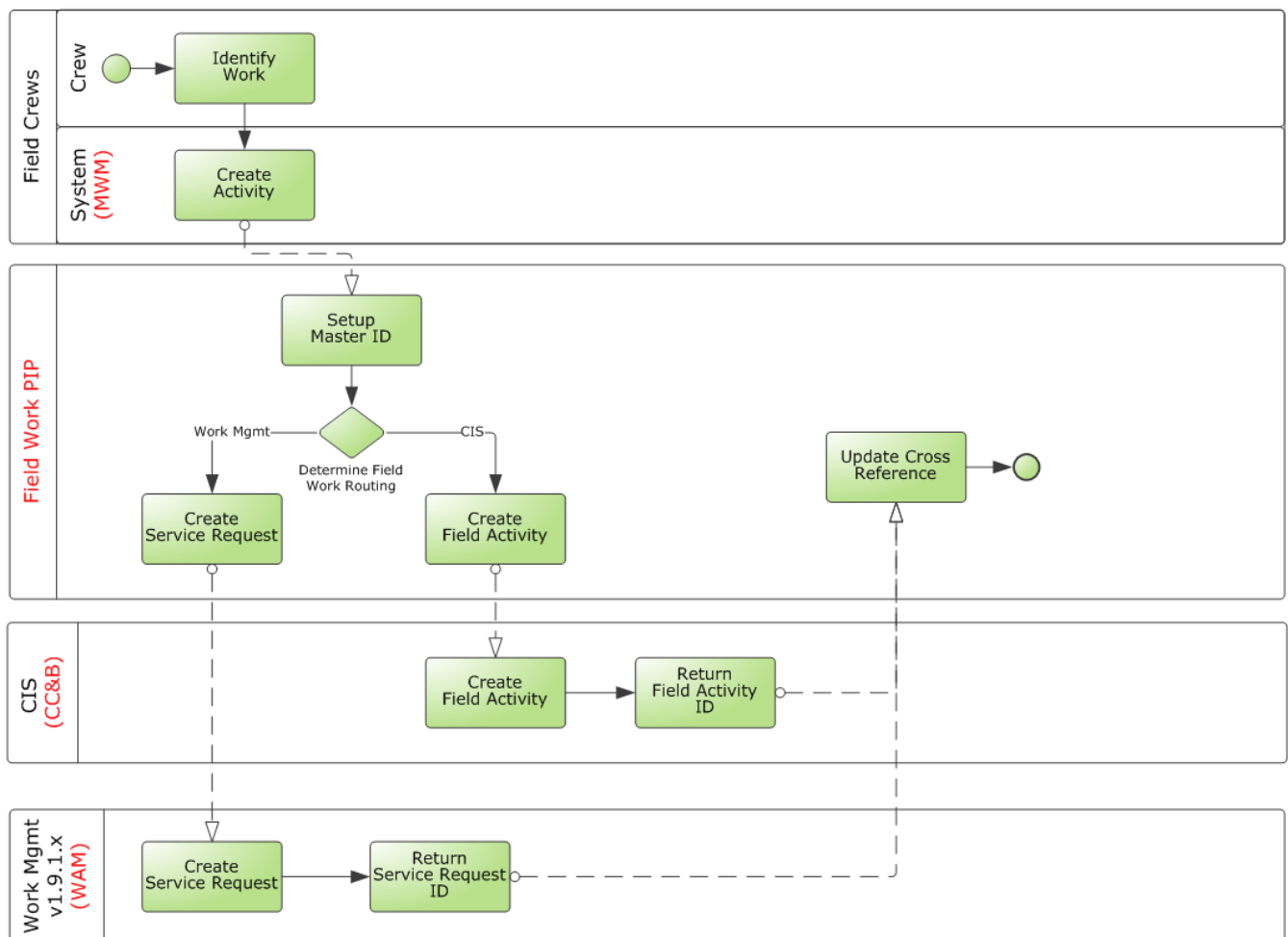
An order is initiated by a user creating an Oracle Utilities Mobile Workforce Management pickup activity that is related to an existing activity they are working on at the same service point.

If Oracle Utilities Work and Asset Management v1.9.1.x is part of the implemented solution, the pickup activity sent from Oracle Utilities Mobile Workforce Management is propagated to become a field activity in Oracle Utilities Customer Care and Billing and/or a service request in Oracle Utilities Work and Asset Management v1.9.1.x.

If Oracle Utilities Work and Asset Management v2.1.x is part of the implemented solution, the pickup activity sent from Oracle Utilities Mobile Workforce Management is propagated to become an activity in Oracle Utilities Work and Asset Management v2.1.x.

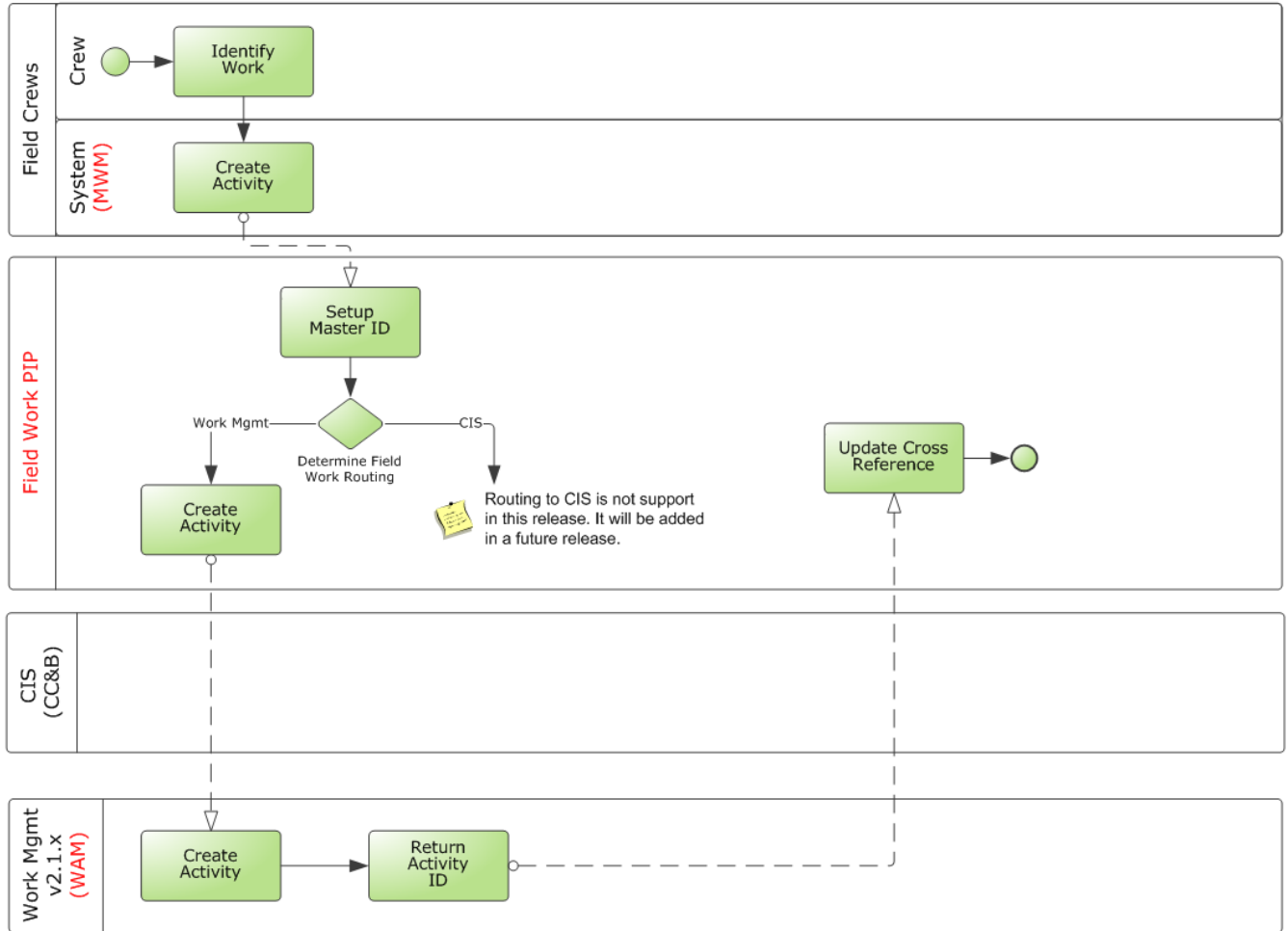
Note: Oracle Utilities Customer Care and Billing is not supported at this time for routing order types where Oracle Utilities Work and Asset Management v2.1.x is part of the implemented solution. It will be added in a future release.

The following diagram depicts processing when an order is created from an Oracle Utilities Mobile Workforce Management pickup activity, and Oracle Utilities Work and Asset Management v1.9.1.x is part of the implemented solution:



Pickup Activity Created in MWM with WAM v1.9.1.x

The following diagram depicts processing when an order is created from an Oracle Utilities Mobile Workforce Management pickup activity and Oracle Utilities Work and Asset Management v2.1.x is part of the implemented solution:



Pickup Activity Created in MWM with WAM v2.1.x

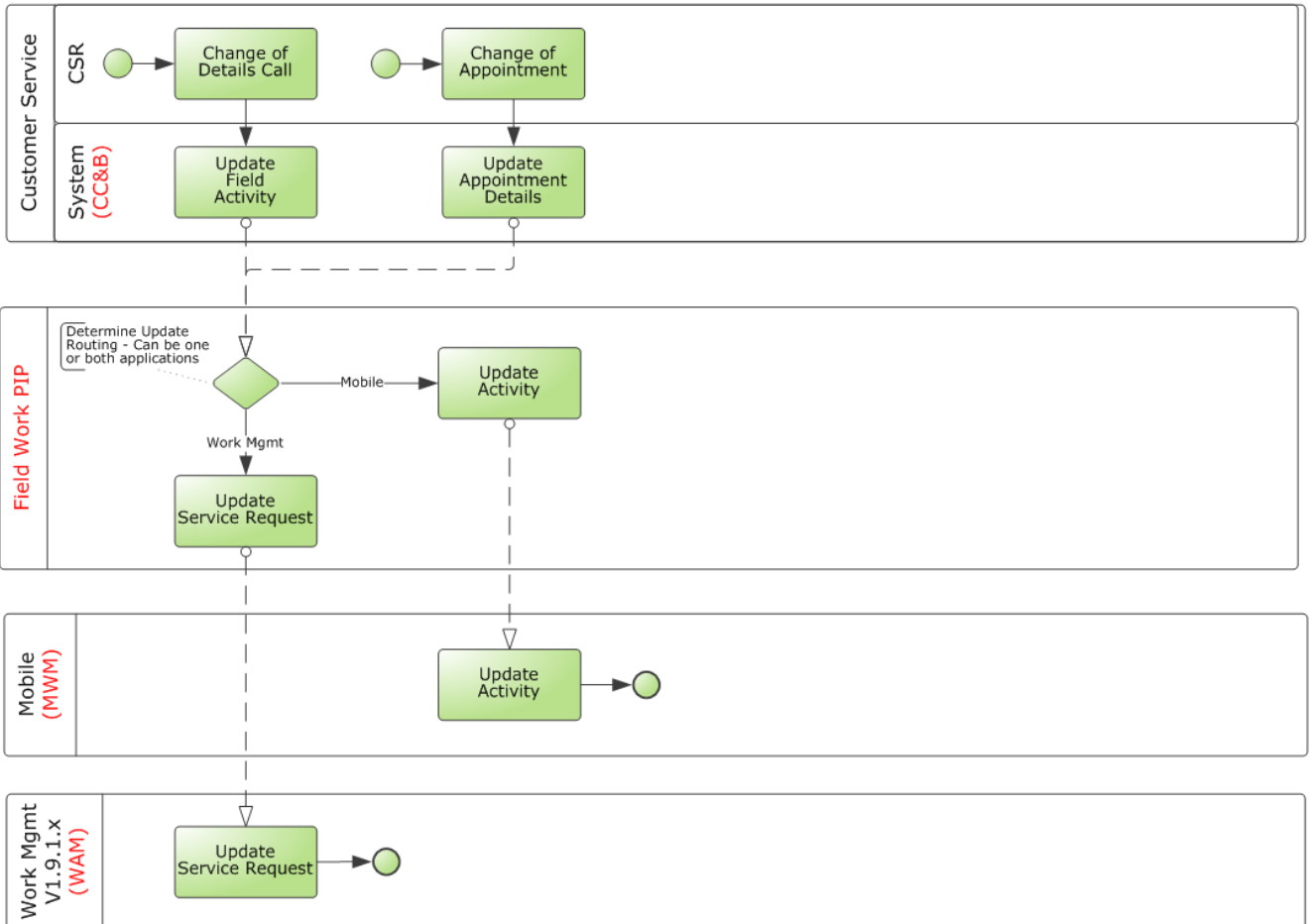
Update or Cancel Order

The following scenarios apply to how an order might be updated or canceled:

Update Order in CC&B

An existing field activity, regardless of where it was initiated, is updated by a customer service representative using Oracle Utilities Customer Care and Billing. The changes are sent to linked orders in other systems.

This diagram depicts processing when an order is updated from Oracle Utilities Customer Care and Billing field activity and Oracle Utilities Work and Asset Management v1.9.1.x is included as part of the implemented solution:

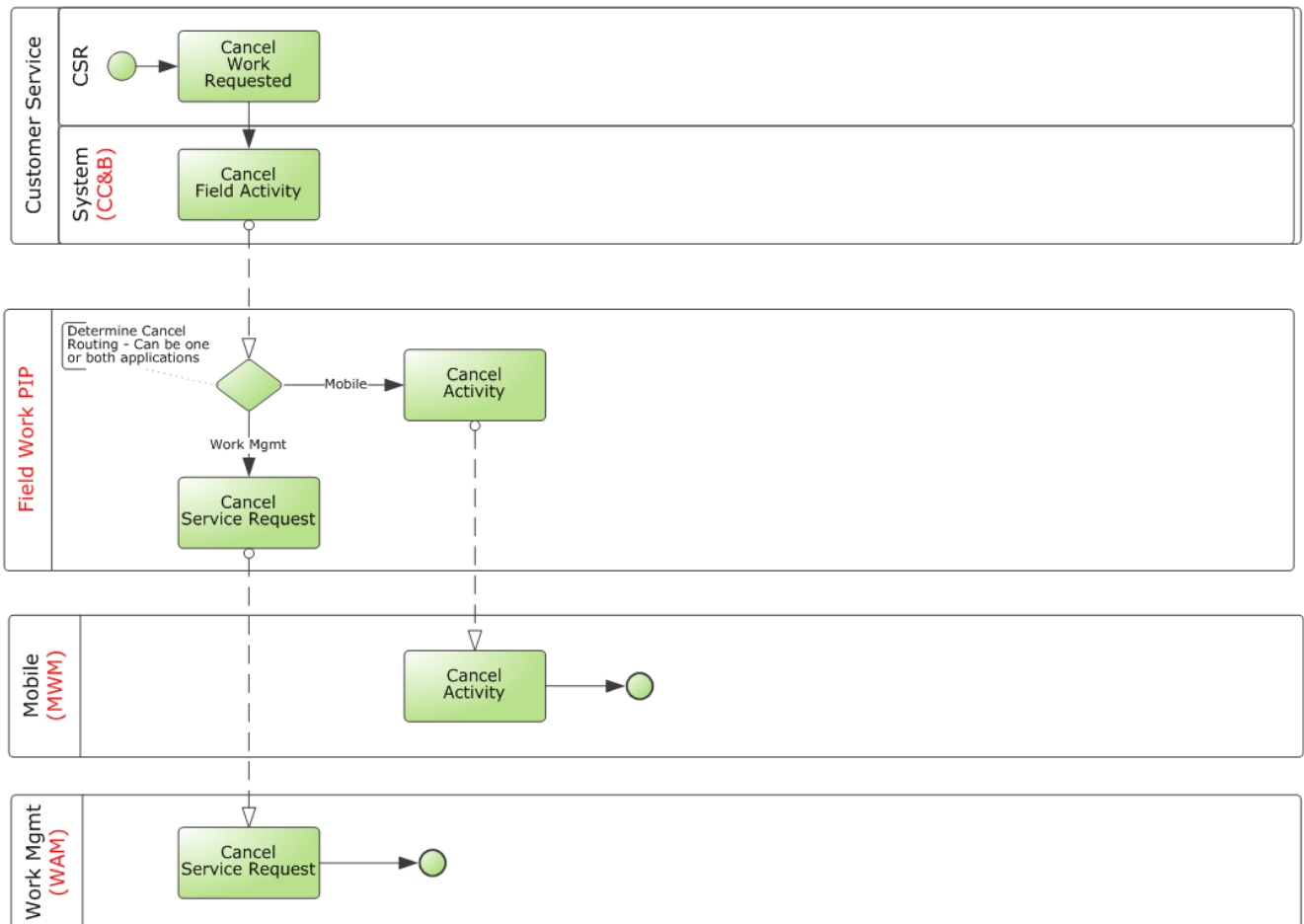


Existing Field Activity Updated in CC&B

Cancel Order in CC&B

When an existing field activity, regardless of where it was initiated, is canceled by a customer service representative using Oracle Utilities Customer Care and Billing the changes are sent to linked orders in other systems.

This diagram depicts processing when an order is canceled from Oracle Utilities Customer Care and Billing field activity and Oracle Utilities Work and Asset Management v1.9.1.x is included as part of the implemented solution:



Existing Field Activity Canceled in CC&B

An Oracle Utilities Customer Care and Billing user updates or cancels a field activity. Updates are sent to linked orders in other systems.

Generally, an update to the Schedule Date or Problem Description on the field activity triggers this update. This update from Oracle Utilities Customer Care and Billing is for orders that are linked to either Oracle Utilities Work and Asset Management v1.9.1.x or Oracle Utilities Mobile Workforce Management.

- If the Oracle Utilities Customer Care and Billing field activity is linked to Oracle Utilities Mobile Workforce Management and not linked to Oracle Utilities Work and Asset Management v1.9.1.x, Oracle Utilities Mobile Workforce Management receives the updated Problem Description and Schedule Date.
- If the field activity is linked to Oracle Utilities Work and Asset Management v1.9.1.x and not linked to Oracle Utilities Mobile Workforce Management, Oracle Utilities Work and Asset Management v1.9.1.x receives the updated Problem Description and Schedule Date.

- If the Oracle Utilities Customer Care and Billing field activity is linked to both Oracle Utilities Mobile Workforce Management and Oracle Utilities Work and Asset Management v1.9.1.x, the update is sent to both applications.

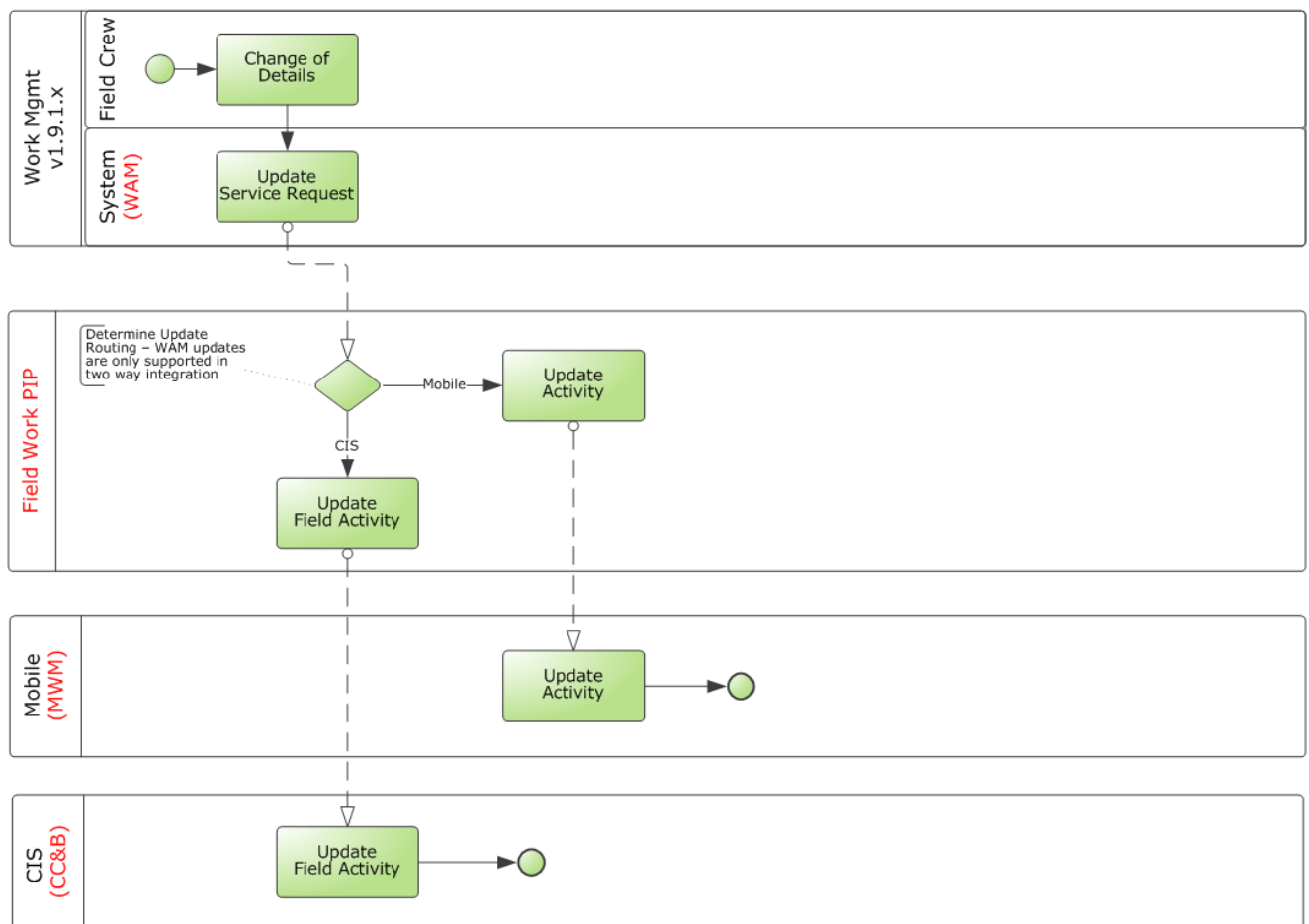
Note: If an Oracle Utilities Customer Care and Billing user completes an order, this too causes Oracle Utilities Customer Care and Billing to send a cancel message out to the linked applications.

Update Order in WAM v1.9.1.x

An existing service request, regardless of where it was initiated, is updated by a representative using Oracle Utilities Work and Asset Management v1.9.1.x. The changes are sent to linked orders in other systems.

Oracle Utilities Work and Asset Management v1.9.1.x updates are supported only for two-way integration. If an order exists in Oracle Utilities Customer Care and Billing and in Oracle Utilities Mobile Workforce Management, then Oracle Utilities Work and Asset Management v1.9.1.x updates are not sent to either system.

This diagram depicts processing when an order is updated from Oracle Utilities Work and Asset Management v1.9.1.x service request:

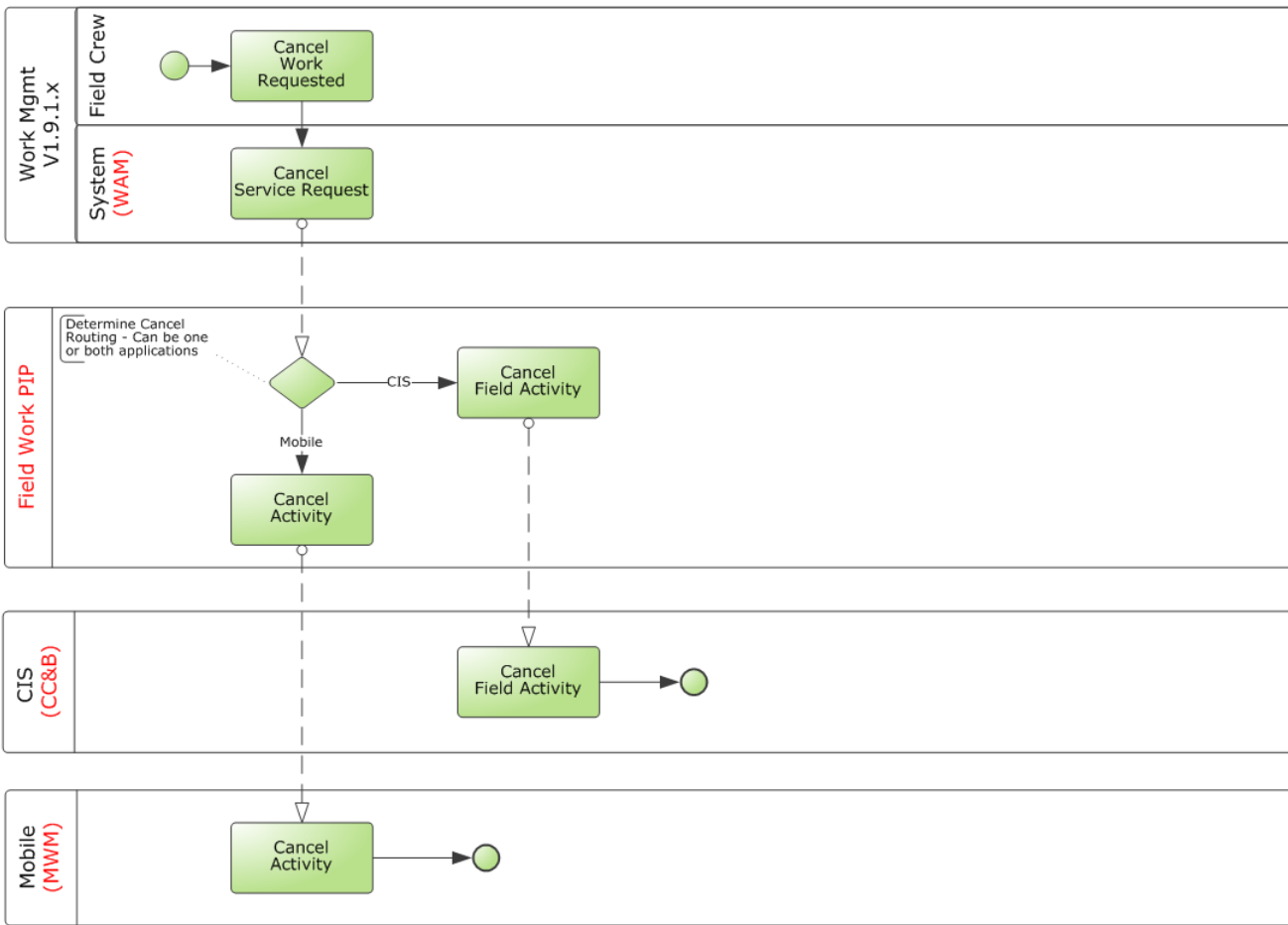


Service Request Updated from WAM v1.9.1.x

Cancel Order in WAM v1.9.1.x

An existing service request, regardless of where it was initiated, is canceled by a representative in Oracle Utilities Work and Asset Management v1.9.1.x. The changes are sent to linked orders in other systems.

This diagram depicts processing when an order is canceled from Oracle Utilities Work and Asset Management v1.9.1.x service request:



Service Request Canceled from WAM v1.9.1.x

Status Update in Oracle Utilities Work and Asset Management v1.9.1.x

As the status of a Service Orders in Oracle Utilities Work and Asset Management v1.9.1.x is changed from active to one of the other eligible statuses, the new status information is sent to Oracle Utilities Customer Care and Billing, if the order is linked only to Oracle Utilities Customer Care and Billing. This new Oracle Utilities Work and Asset Management v1.9.1.x status is reflected in Oracle Utilities Customer Care and Billing as Intermediate Status on the corresponding Oracle Utilities Customer Care and Billing field activity.

The information about the status update in Oracle Utilities Work and Asset Management v1.9.1.x is not sent to either of the other two applications when the order is linked to both Oracle Utilities Customer Care and Billing and Oracle Utilities Mobile Workforce Management.

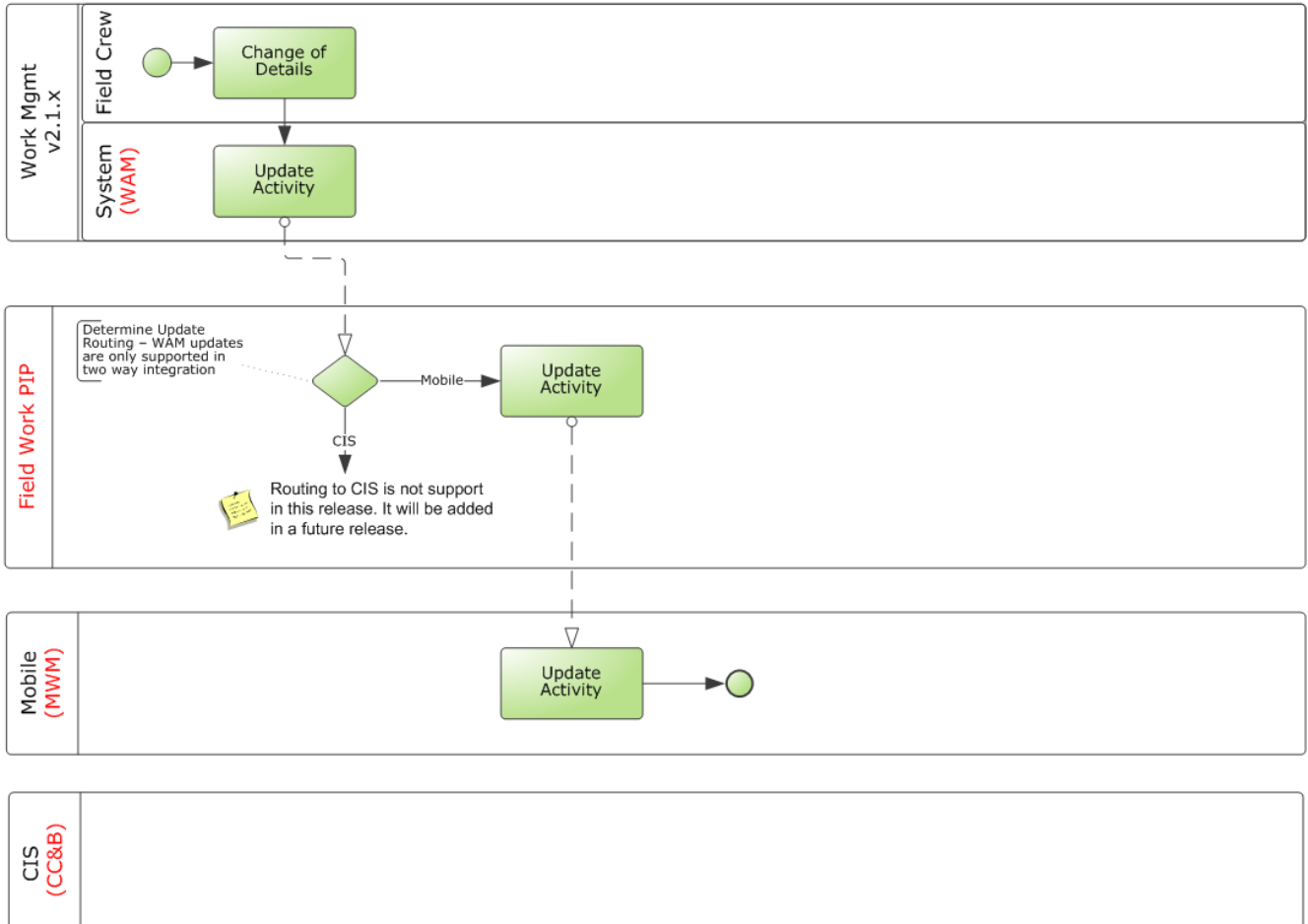
For orders that are linked to Oracle Utilities Mobile Workforce Management as well, Oracle Utilities Customer Care and Billing tracks the status of the order in Oracle Utilities Mobile Workforce Management using the intermediate status and ignores the status of the order in Oracle Utilities Work and Asset Management v1.9.1.x.

Also, if the order is linked only to Oracle Utilities Mobile Workforce Management and not linked to Oracle Utilities Customer Care and Billing, status updates from Oracle Utilities Work and Asset Management v1.9.1.x are not sent.

Update Order in WAM v2.1.x

An existing activity that originated in Oracle Utilities Work and Asset Management v2.1.x is updated by a representative and the changes are sent to Oracle Utilities Mobile Workforce Management. The updates are sent from Oracle Utilities Work and Asset Management v2.1.x only when a representative manually clicks the **Resend** button.

This diagram depicts processing when an order is updated from Oracle Utilities Work and Asset Management v2.1.x activity:



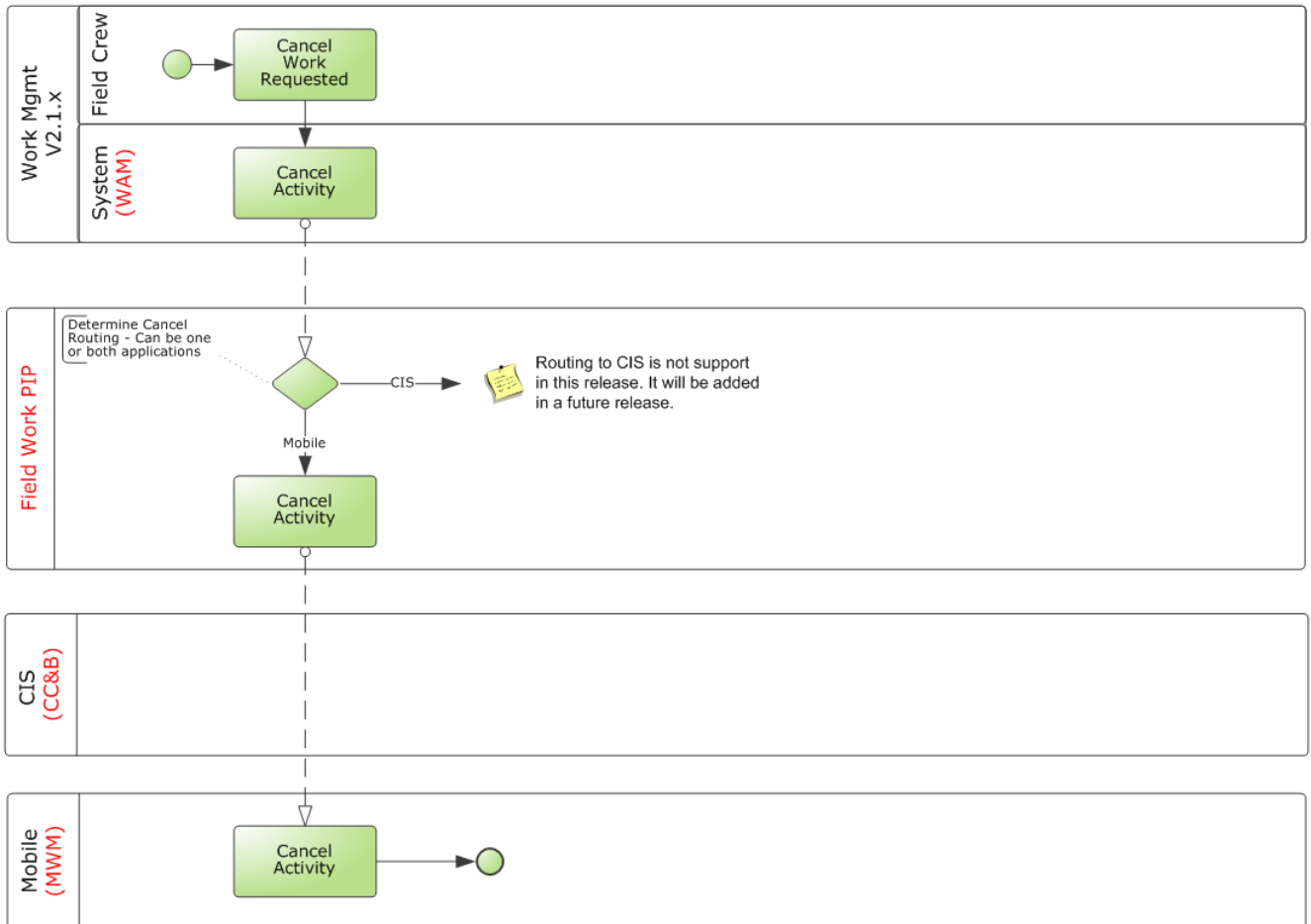
Activity Updated from WAM v2.1.x

Cancel Order in WAM v2.1.x

When an existing activity is canceled by an Oracle Utilities Work and Asset Management v2.1.x representative, the changes are sent to Oracle Utilities Mobile Workforce Management. If the activity is in sent state, it can be canceled by transitioning it to the discard state and a Cancel message is sent out.

If the activity has been completed within Oracle Utilities Work and Asset Management, when it enters the executed state, the system will create and send a Cancel message to Oracle Utilities Mobile Workforce Management.

This diagram depicts processing when an order is canceled from an Oracle Utilities Work and Asset Management v2.1.x activity:



Activity Updated from WAM v2.1.x

Update Order in MWM

If an existing activity is updated by a field service representative using Oracle Utilities Mobile Workforce Management, the status updates are sent only to Oracle Utilities Customer Care and Billing.

This diagram depicts processing when an order is updated from an Oracle Utilities Mobile Workforce Management activity:



Activity Updated in MWM

Status Update in Oracle Utilities Mobile Workforce Management

As the status of an activity in Oracle Utilities Mobile Workforce Management is updated, or the order is assigned to a Field Service Representative or re-assigned in Oracle Utilities Mobile Workforce Management, the new status information is sent to Oracle Utilities Customer Care and Billing, if the order is linked to Oracle Utilities Customer Care and Billing. This new status is reflected in Oracle Utilities Customer Care and Billing as Intermediate status on the corresponding Oracle Utilities Customer Care and Billing field activity.

The information about the status update in Oracle Utilities Mobile Workforce Management is not sent to Oracle Utilities Work and Asset Management v1.9.1.x. This information is only tracked in Oracle Utilities Customer Care and Billing.

Cancel Order in MWM

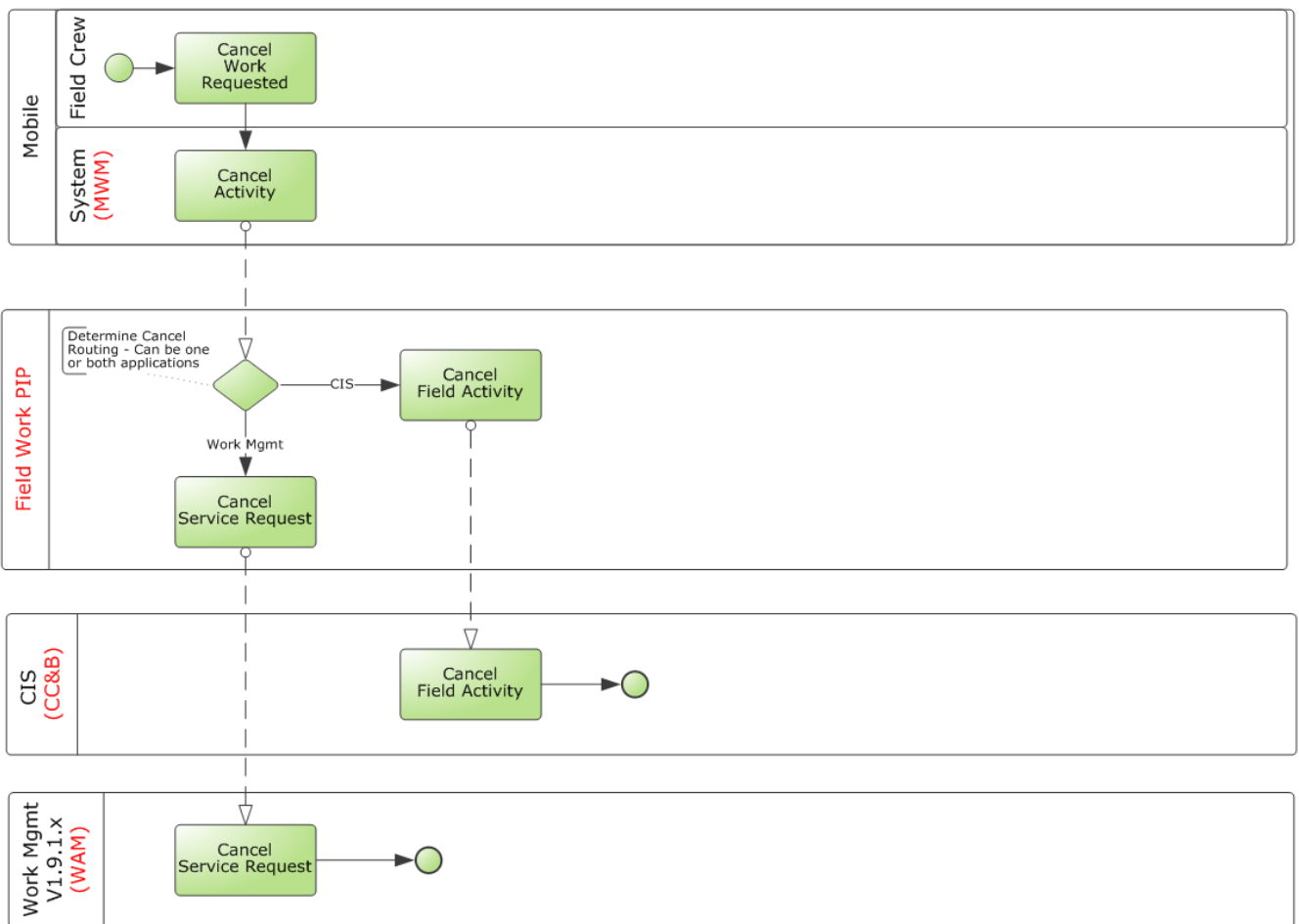
If an existing activity is canceled by a field service representative using Oracle Utilities Mobile Workforce Management, the cancel request is sent to linked orders in other systems.

If Oracle Utilities Work and Asset Management v1.9.1.x is part of the implemented solution, the cancel request sent from Oracle Utilities Mobile Workforce Management is propagated to Oracle Utilities Customer Care and Billing and/or Oracle Utilities Work and Asset Management v1.9.1.x.

If Oracle Utilities Work and Asset Management v2.1.x is part of the implemented solution, the cancel request sent from Oracle Utilities Mobile Workforce Management is propagated only to Oracle Utilities Work and Asset Management v2.1.x.

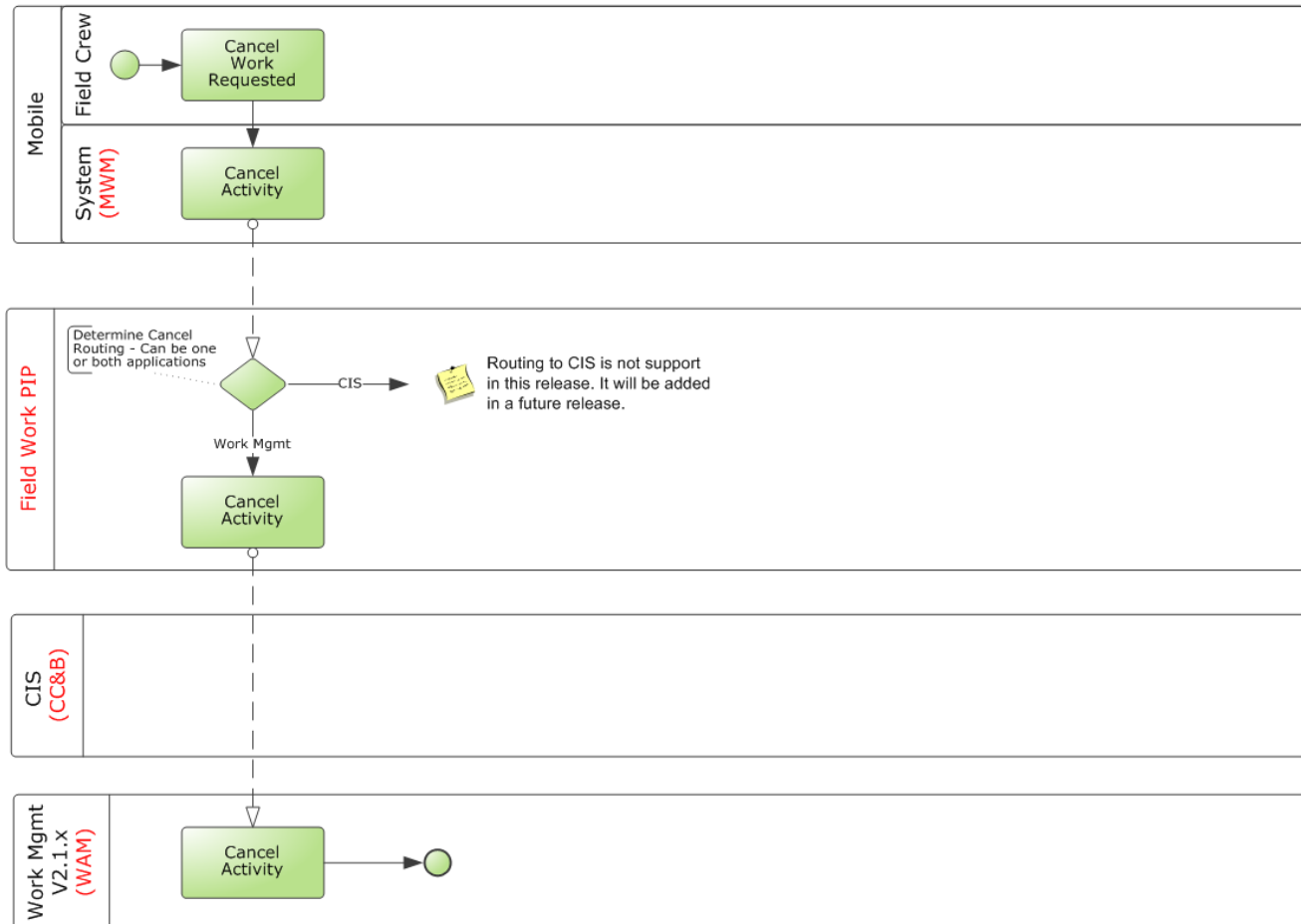
Note: Oracle Utilities Customer Care and Billing is not supported at this time for routing order types where Oracle Utilities Work and Asset Management v2.1.x is part of the implemented solution. It will be added in a future release.

This diagram depicts processing when an order is canceled from Oracle Utilities Mobile Workforce Management activity and Oracle Utilities Work and Asset Management v1.9.1.x is included as part of the implemented solution:



Activity Canceled from MWM with WAM v1.9.1.x

This diagram depicts processing when an order is canceled from Oracle Utilities Mobile Workforce Management activity and Oracle Utilities Work and Asset Management v2.1.x is included as part of the implemented solution:



Activity Canceled from MWM with WAM v2.1.x

Other Notes Regarding Updates and Cancellations

- Only orders that are linked in the other systems are updated. Separate routing of updates is not supported.
- If an order starts as a two-way order when it is created, it remains a two-way order throughout its life span until it is resolved and completed.

For instance, if the order is initiated in Oracle Utilities Customer Care and Billing and is only sent to Oracle Utilities Work and Asset Management v1.9.1.x, no new order is created in Oracle Utilities Mobile Workforce Management. This type of processing is not supported by the integration.

Complete Order

Regardless of where they were initiated, orders can be completed from Oracle Utilities Mobile Workforce Management or Oracle Utilities Work and Asset Management. Orders completed from Oracle Utilities Customer Care and Billing is canceled in the other systems; however, canceling orders directly in Oracle Utilities Customer Care and Billing is not recommended.

The following sections describe various scenarios for order completions:

Order Completed in MWM

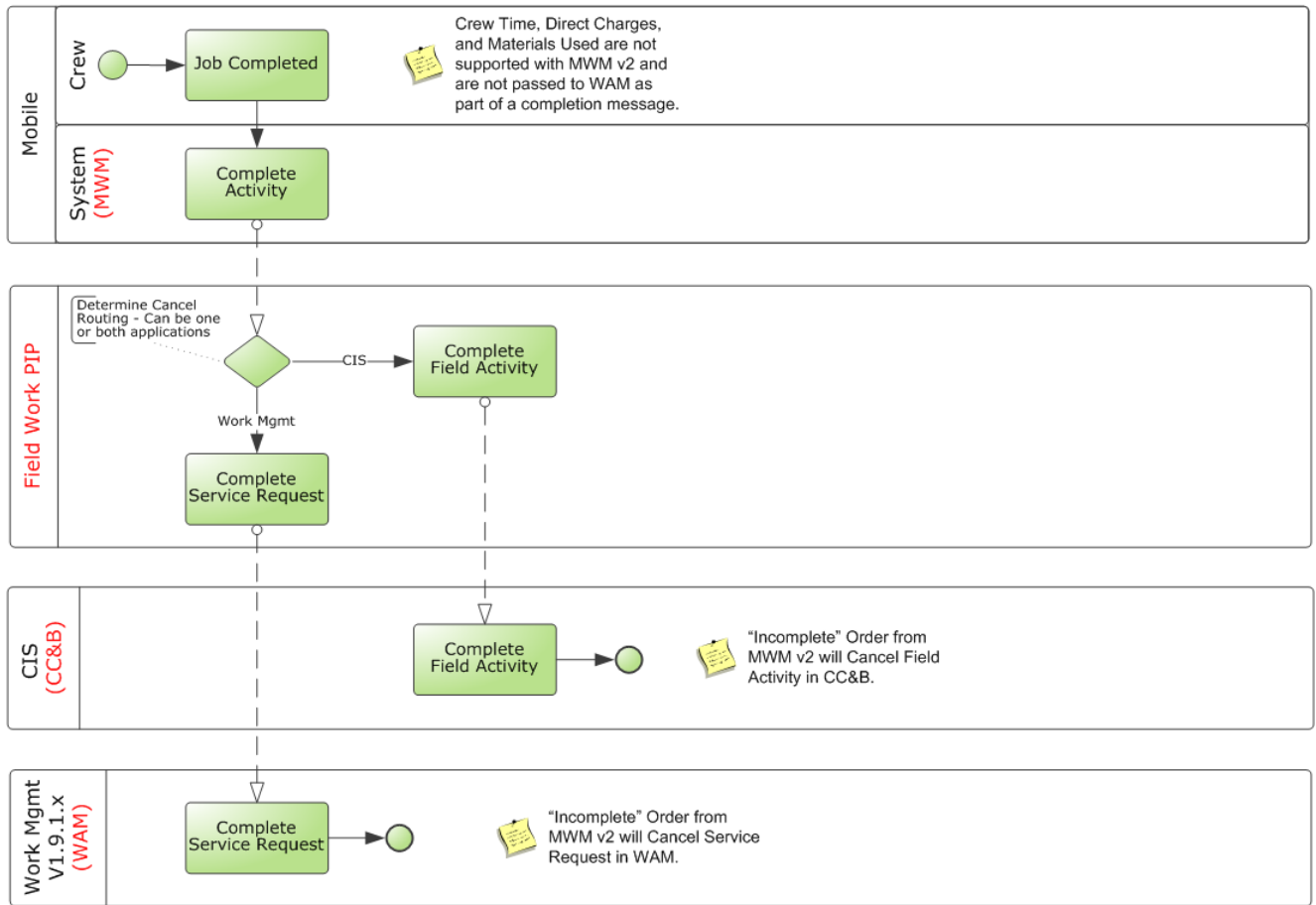
When a Field Service Representative completes an activity in Oracle Utilities Mobile Workforce Management, a completion message is sent to Oracle Utilities Customer Care and Billing and/or Oracle Utilities Work and Asset Management depending on which applications the particular order was linked to during order creation.

If Oracle Utilities Work and Asset Management v1.9.1.x is part of the implemented solution, the completion message from Oracle Utilities Mobile Workforce Management can be sent to Oracle Utilities Customer Care and Billing and/or Oracle Utilities Work and Asset Management v1.9.1.x.

If Oracle Utilities Work and Asset Management v2.1.x is part of the implemented solution, the completion message from Oracle Utilities Mobile Workforce Management will be sent to Oracle Utilities Work and Asset Management v2.1.x only.

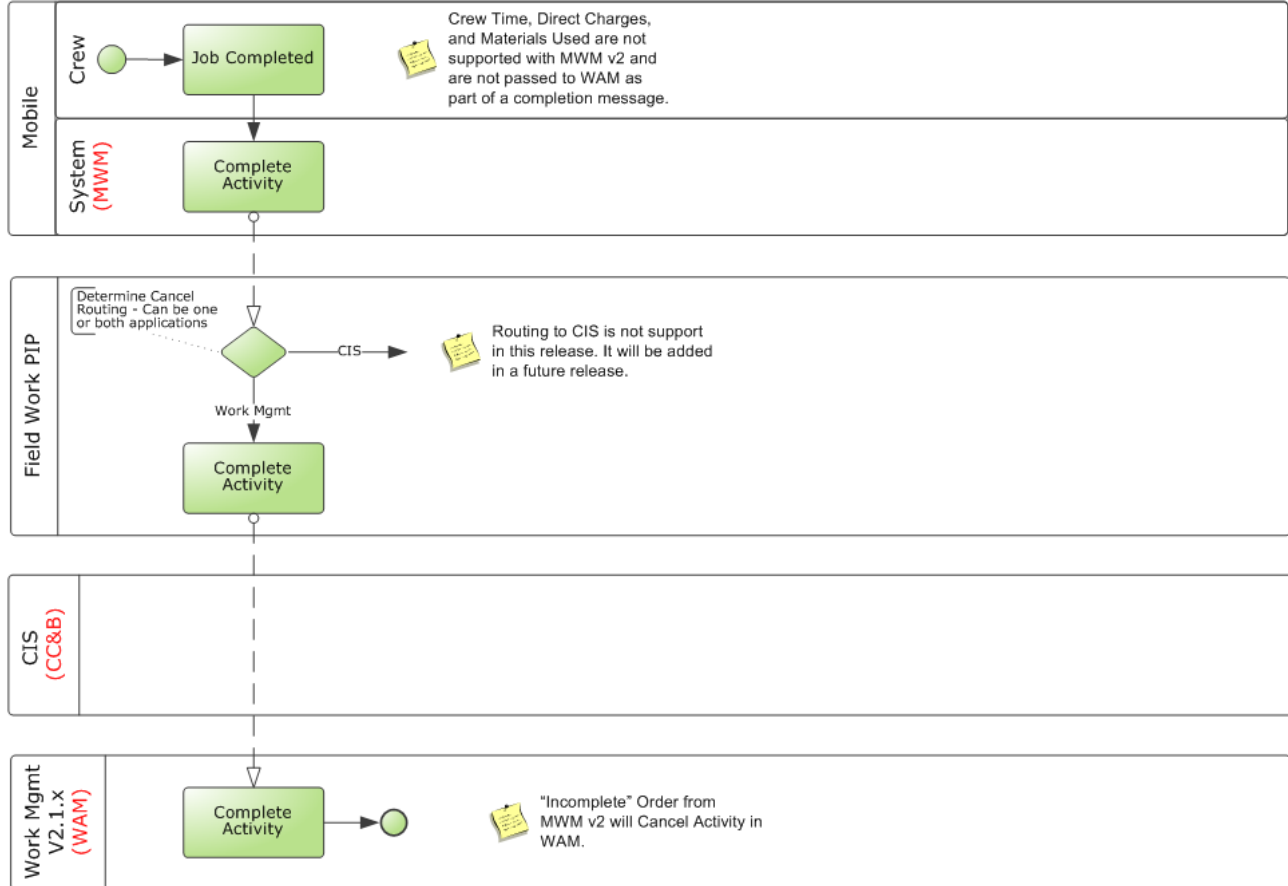
This results in the target application completing the corresponding order and recording the information that was sent by Oracle Utilities Mobile Workforce Management for the completed order.

This diagram depicts processing when an order is completed using Oracle Utilities Mobile Workforce Management activity and Oracle Utilities Work and Asset Management v1.9.1.x is included as part of the implemented solution:



Activity Completed in MWM with WAM v1.9.1.x

This diagram depicts processing when an order is completed using Oracle Utilities Mobile Workforce Management activity and Oracle Utilities Work and Asset Management v2.1.x is included as part of the implemented solution:



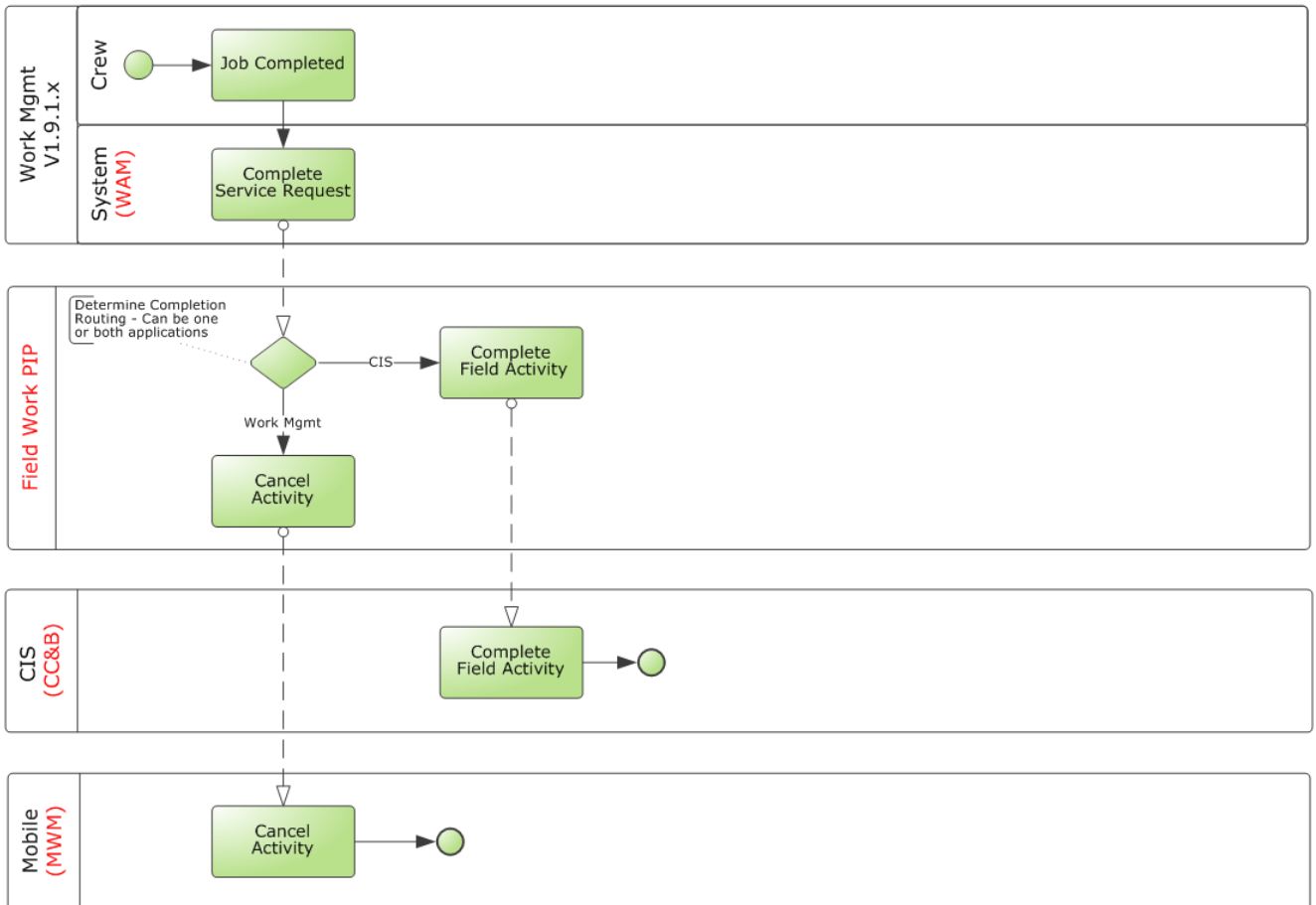
Activity Completed in MWM with WAM v2.1.x

In Oracle Utilities Mobile Workforce Management, the Field Service Representative can mark the activity as incomplete; however, it is sent as a cancellation to Oracle Utilities Customer Care and Billing and Oracle Utilities Work and Asset Management.

Order Completed in WAM v1.9.1.x

Orders being completed using a service request from Oracle Utilities Work and Asset Management v1.9.1.x is only common when Oracle Utilities Mobile Workforce Management is not part of the suite of products used; however, it is possible in a three-way integration model under some rare circumstances.

This diagram depicts processing when an order is completed using Oracle Utilities Work and Asset Management v1.9.1.x service request:



Service Request Completed in Oracle Utilities Work and Asset Management v1.9.1.x

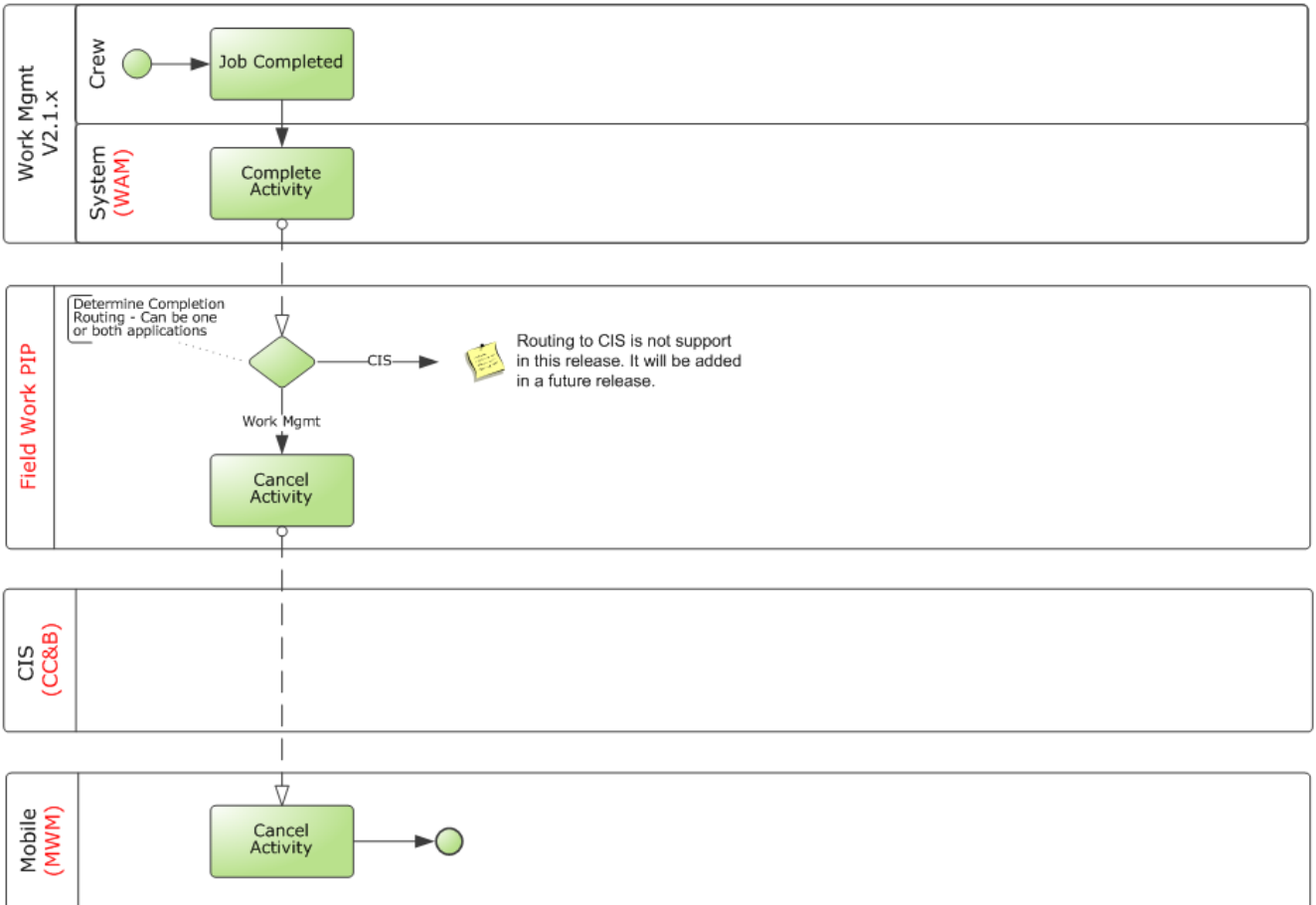
- If Oracle Utilities Customer Care and Billing is linked to the order, Oracle Utilities Customer Care and Billing completes the corresponding field activity and records any meter reading information sent by Oracle Utilities Work and Asset Management v1.9.1.x.
- If Oracle Utilities Mobile Workforce Management is linked to the order, the integration sends a cancellation request to Oracle Utilities Mobile Workforce Management resulting in canceling the corresponding field order or activity.

This is done to prevent the Field Service Representative from working on a field order or activity that has been completed in Oracle Utilities Work and Asset Management v1.9.1.x.

Order Completed in WAM v2.1.x

If an order is completed using an activity from Oracle Utilities Work and Asset Management v2.1.x, this will result in a cancellation message being sent to Oracle Utilities Mobile Workforce Management to cancel the corresponding activity. This is done to prevent the Field Service Representative from working on an activity in Oracle Utilities Mobile Workforce Management that has been completed in Oracle Utilities Work and Asset Management v2.1.x.

This diagram depicts processing when an order is completed using an Oracle Utilities Work and Asset Management v2.1.x activity:

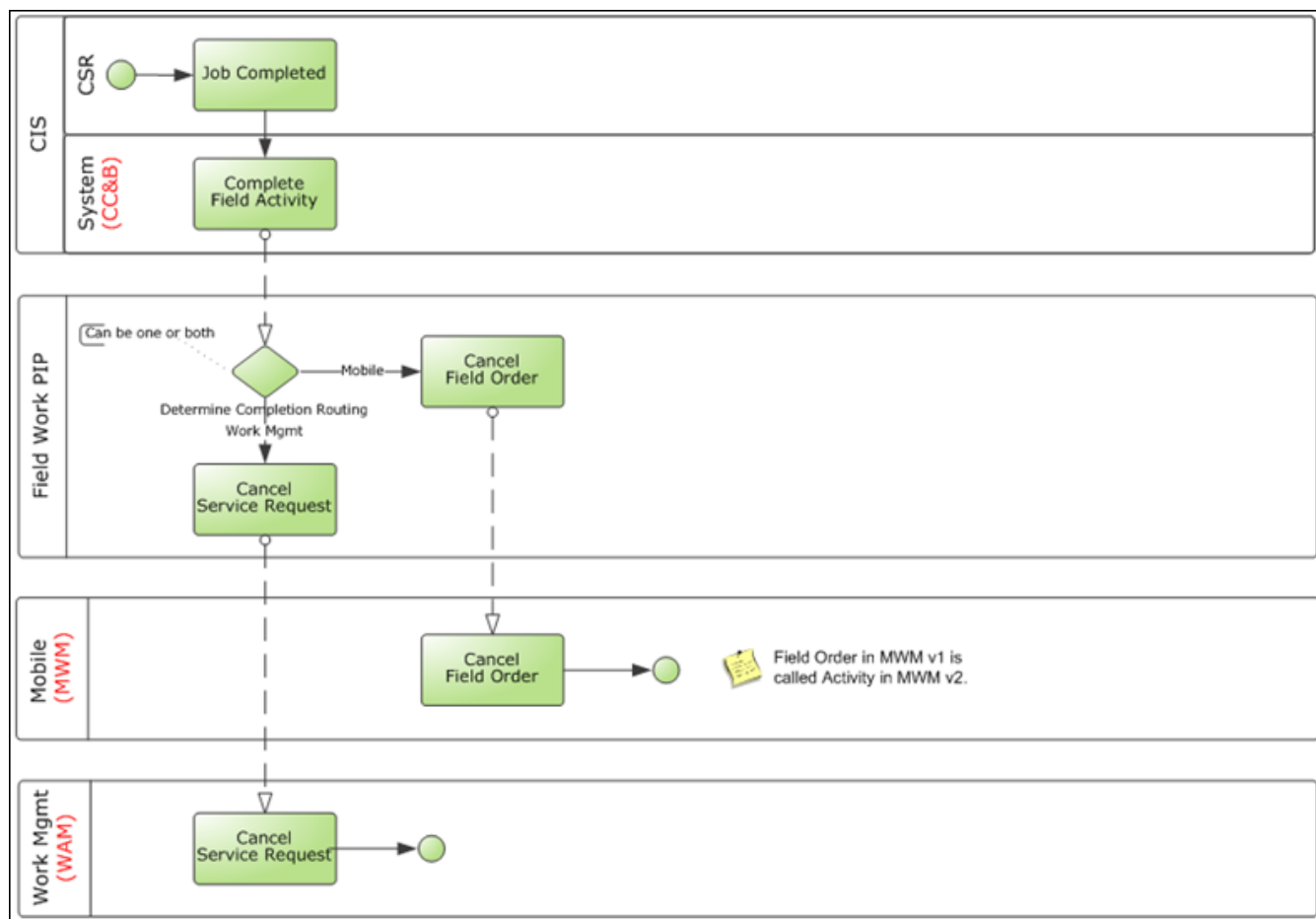


Activity Completed in WAM v2.1.x

Order Completed in CC&B

When an integrated order is completed using a field activity in Oracle Utilities Customer Care and Billing, a cancellation message is sent to Oracle Utilities Work and Asset Management v1.9.1.x, Oracle Utilities Mobile Workforce Management, or both, depending on which applications the particular order was linked to during order creation.. This is done to prevent further work on the order by users in either of the other systems.

This diagram depicts processing when an order is completed using an Oracle Utilities Customer Care and Billing field activity:



Field Activity Completed from Oracle Utilities Customer Care and Billing

Assumptions and Constraints for Work Order Processing

This integration does not support the following:

- New orders cannot be added in Oracle Utilities Mobile Workforce Management. Only Oracle Utilities Mobile Workforce Management Pickup Orders are supported.
- Oracle Utilities Work and Asset Management v2.1.x activity processes are supported in this integration with Oracle Utilities Mobile Workforce Management not with Oracle Utilities Customer Care and Billing.
- Only Oracle Utilities Work and Asset Management v1.9.1.x service requests are supported in this integration. Work orders and tasks are not supported with this release.
- Service requests cannot be transitioned to work orders in Oracle Utilities Work and Asset Management v1.9.1.x while still sending information to Oracle Utilities Customer Care and Billing and Oracle Utilities Mobile Workforce Management.

- When Oracle Utilities Work and Asset Management v1.9.1.x is used, master data between Oracle Utilities Customer Care and Billing and Oracle Utilities Work and Asset Management v1.9.1.x must be synchronized. Refer to [Synchronization Between CC&B and WAM](#) in [Chapter 14](#) for additional details.
- An update to the schedule date on a service request in Oracle Utilities Work and Asset Management v1.9.1.x is not also updated in Oracle Utilities Customer Care and Billing or Oracle Utilities Mobile Workforce Management if the order being updated is a three-way order. For three-way order types in Oracle Utilities Work and Asset Management v1.9.1.x, it is best to prevent Oracle Utilities Work and Asset Management v1.9.1.x users from updating these fields.
- Oracle Utilities Customer Care and Billing receives a synchronous response from Oracle Utilities Mobile Workforce Management.

These responses are posted to the Oracle Utilities Customer Care and Billing notification download table. Because this is a three-way integration, these messages may be routed to both Oracle Utilities Work and Asset Management v1.9.1.x and Oracle Utilities Mobile Workforce Management. In this case, acknowledgements are received from both the target applications, and even though two acknowledgements are sent to Oracle Utilities Customer Care and Billing, the XAI download staging table shows only the first received response. Once these acknowledgements are successfully processed by Oracle Utilities Customer Care and Billing, both are visible on the Oracle Utilities Customer Care and Billing field activity screen under the **Log** tab.

- The integration does not support equipment or badged items (for example, lamp, pole, transformers) in Oracle Utilities Work and Asset Management v1.9.1.x.
- For Oracle Utilities Mobile Workforce Management generated orders, the integration only supports pickup activities. New activities, unrelated pickup activities, or assist activities created in Oracle Utilities Mobile Workforce Management are not supported.
- Field activities coming to Oracle Utilities Customer Care and Billing must have a Service Point defined.

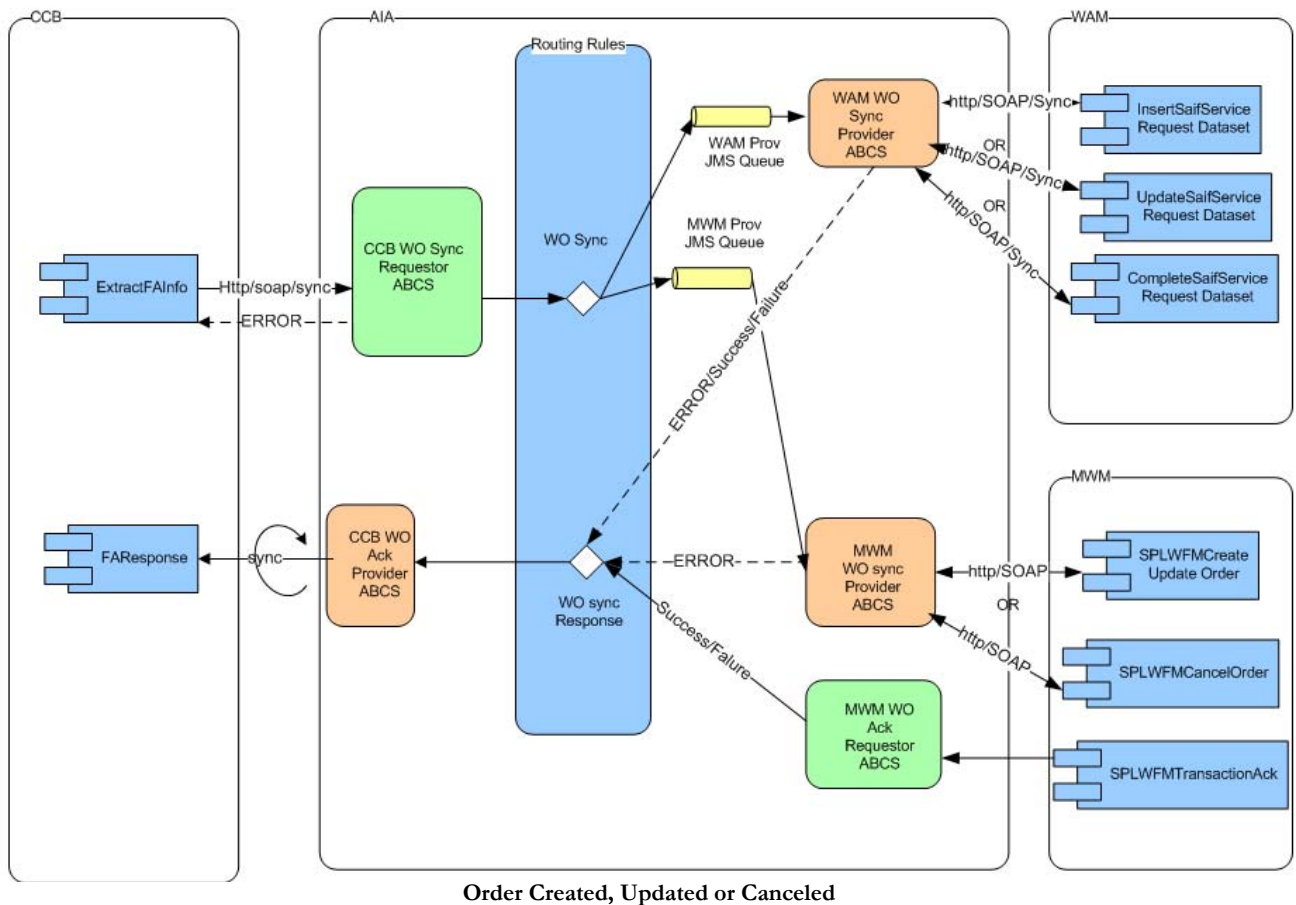
Orders created in Oracle Utilities Work and Asset Management v1.9.1.x without service points are only applicable to order types that are routed to and from Oracle Utilities Mobile Workforce Management. For these order types, the routing in the Order Type DVM must also be set to not send these orders to Oracle Utilities Customer Care and Billing. Pickup Orders for these order types in Oracle Utilities Mobile Workforce Management should be configured to route to Oracle Utilities Work and Asset Management v1.9.1.x only. They cannot route to Oracle Utilities Customer Care and Billing as the pickups also do not have a service point.

Integration Points for Work Order Processing

The following diagrams outline the key components used in processes where orders are created, updated, or completed in one of the three applications.

Orders Originating in CC&B

This diagram shows the technical process of creating, updating, or canceling an order originated in Oracle Utilities Customer Care and Billing and routed to Oracle Utilities Work and Asset Management v1.9.1.x and Oracle Utilities Mobile Workforce Management:



Processing Details

Oracle Utilities Customer Care and Billing WO Requester: As a field activity is created, updated, or canceled in Oracle Utilities Customer Care and Billing, Oracle Utilities Customer Care and Billing sends a message to the Oracle Utilities Customer Care and Billing WO Requester ABCS with the details of the field activity.

Action Code: The action code in these messages identifies whether the message is for create, update, or cancel.

Mapping: The message is mapped to **ProcessWorkOrderEBM**.

Work Order Request EBS: The request is invoked by the Oracle Utilities Customer Care and Billing Work Order Requester ABCS after the message is mapped. The message is routed based on the routing rules to: Oracle Utilities Work and Asset Management v1.9.1.x JMS Producer and/or Oracle Utilities Mobile Workforce Management JMS Producer.

New Orders: The JMS Producer routing rules are based on how the order type is associated to the specific order. This configuration is determined on the DVM map **FS_Order_TypeCode**.

Updates: The messages are routed based on the applications that the order was linked to when the create message was sent for the order.

JMS Producers: The JMS producers are responsible for posting the message to the Consumer JMS Queue for the corresponding target application.

JMS Consumer: Listens to the Oracle Utilities Work and Asset Management v1.9.1.x or Oracle Utilities Mobile Workforce Management producer JMS Queue and invokes the Work Order Provider ABCS for each message received in either the Oracle Utilities Work and Asset Management v1.9.1.x or Oracle Utilities Mobile Workforce Management queue.

Work Order Provider ABCS: For both Oracle Utilities Mobile Workforce Management and Oracle Utilities Work and Asset Management v1.9.1.x, the provider ABCS queries the Process/Operation attribute in **ProcessWorkOrderEBM** to determine the type of message (create, update, cancel, or complete). Depending on the operation, the ABCS invokes the appropriate web service in Oracle Utilities Mobile Workforce Management or Oracle Utilities Work and Asset Management v1.9.1.x after mapping ProcessWorkOrderEBM to the corresponding inbound message schema.

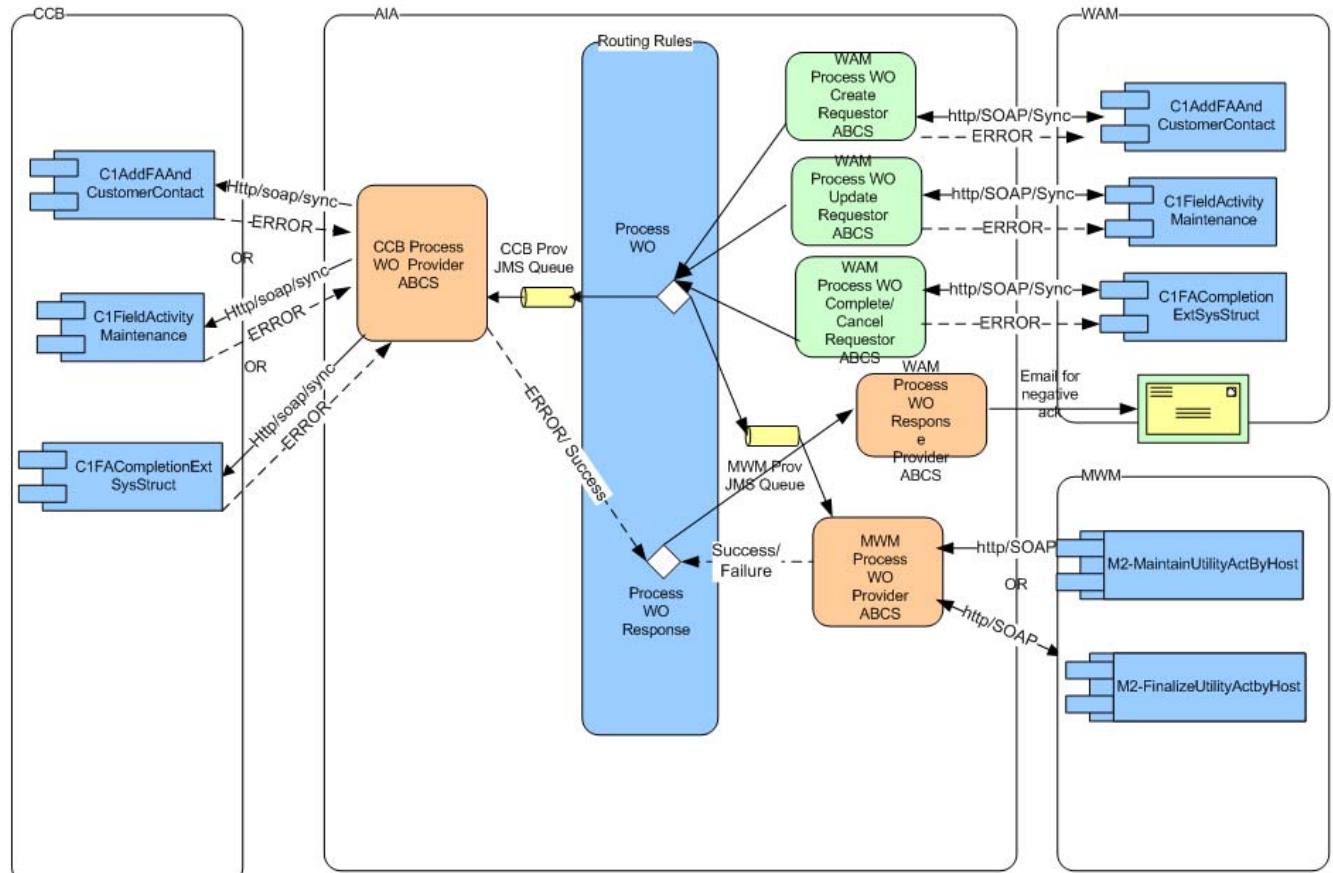
Oracle Utilities Work and Asset Management v1.9.1.x **Work Order Provider ABCS:** This ABCS receives the synchronous response from Oracle Utilities Work and Asset Management v1.9.1.x, maps it to the Sync Work ProcessWorkOrderResponseEBM (including any error information received from Oracle Utilities Mobile Workforce Management) and invokes the Work Order Response EBS. This response/acknowledgement is routed back to Oracle Utilities Customer Care and Billing using the Oracle Utilities Customer Care and Billing Work Order Acknowledgement Provider ABCS.

Oracle Utilities Mobile Workforce Management **Work Order Provider ABCS:** If the Operation in the EBM is for completion, this is treated as an order cancellation for Oracle Utilities Mobile Workforce Management and the field order or activity cancellation web service in Oracle Utilities Mobile Workforce Management is invoked.

Acknowledgements: In Oracle Utilities Mobile Workforce Management, the acknowledgement/response is sent synchronously. The Oracle Utilities Mobile Workforce Management Work Order Acknowledgement Requester ABCS maps the message received to the ProcessWorkOrderResponseEBM (including any error information received from Oracle Utilities Mobile Workforce Management) and invokes the Work Order Response EBS. This response/acknowledgement is routed back to Oracle Utilities Customer Care and Billing using the Oracle Utilities Customer Care and Billing Work Order Acknowledgement Provider ABCS.

Orders Originating in WAM v1.9.1.x

This diagram shows a service request originated in Oracle Utilities Work and Asset Management v1.9.1.x and routed to Oracle Utilities Customer Care and Billing and Oracle Utilities Mobile Workforce Management.



Order Created, Updated, Canceled or Completed

Processing Details

Oracle Utilities Work and Asset Management v1.9.1.x **WO Requester:** As an order is created in Oracle Utilities Work and Asset Management v1.9.1.x and activated, or an active order is updated, canceled, or completed in Oracle Utilities Work and Asset Management v1.9.1.x, Oracle Utilities Work and Asset Management v1.9.1.x sends a message to the Oracle Utilities Work and Asset Management v1.9.1.x Work Order Requester ABCS:

- Create messages invokes Oracle Utilities Work and Asset Management v1.9.1.x Work Order Create Requester ABCS
- Update messages invokes Oracle Utilities Work and Asset Management v1.9.1.x Work Order Update Requester ABCS
- Cancel and Completion messages invoke Oracle Utilities Work and Asset Management v1.9.1.x Work Order Complete(/cancel) Requester ABCS

Mapping: The requester ABCS maps the message sent by Oracle Utilities Work and Asset Management v1.9.1.x to **ProcessWorkOrderEBM** and invokes Work Order Request EBS. Create messages must undergo message enrichment first.

Work Order Request EBS: The message is routed based on the routing rules to Oracle Utilities Customer Care and Billing JMS Producer and/or Oracle Utilities Mobile Workforce Management JMS Producer

New Orders: The routing rules are based on how the order type and Problem Code are associated to on the specific order. This configuration is determined by the DVM map **FS_Order_TypeCode**.

Updates: The messages are routed based on the applications that the order was linked to when the create message was sent for the order.

JMS Producers: The JMS producers are responsible for posting the message to the Consumer JMS Queue for the corresponding target application.

JMS Consumer: Listens to the Oracle Utilities Customer Care and Billing or Oracle Utilities Mobile Workforce Management Producer JMS Queue and invokes the Work Order Provider ABCS for each message received in either the Oracle Utilities Customer Care and Billing or Oracle Utilities Mobile Workforce Management queue.

Work Order Provider ABCS: For both Oracle Utilities Mobile Workforce Management and Oracle Utilities Customer Care and Billing, the provider ABCS queries the Process/Operation attribute in ProcessWorkOrderEBM to determine the type of message (create, update, cancel, or complete). Depending on the operation, the ABCS invokes the appropriate web service in Oracle Utilities Mobile Workforce Management or Oracle Utilities Customer Care and Billing after mapping ProcessWorkOrderEBM to the corresponding inbound message schema.

CC&B Work Order Provider ABCS: If Oracle Utilities Customer Care and Billing fails to create/update the corresponding field activity and returns an error back to the ABCS, this ABCS maps the error response to **Sync Work ProcessWorkOrderResponseEBM** (including any error information received from Oracle Utilities Customer Care and Billing) and invokes the Work Order Response EBS. This response/acknowledgement is routed to Oracle Utilities Work and Asset Management v1.9.1.x Work Order Acknowledgement Provider ABCS.

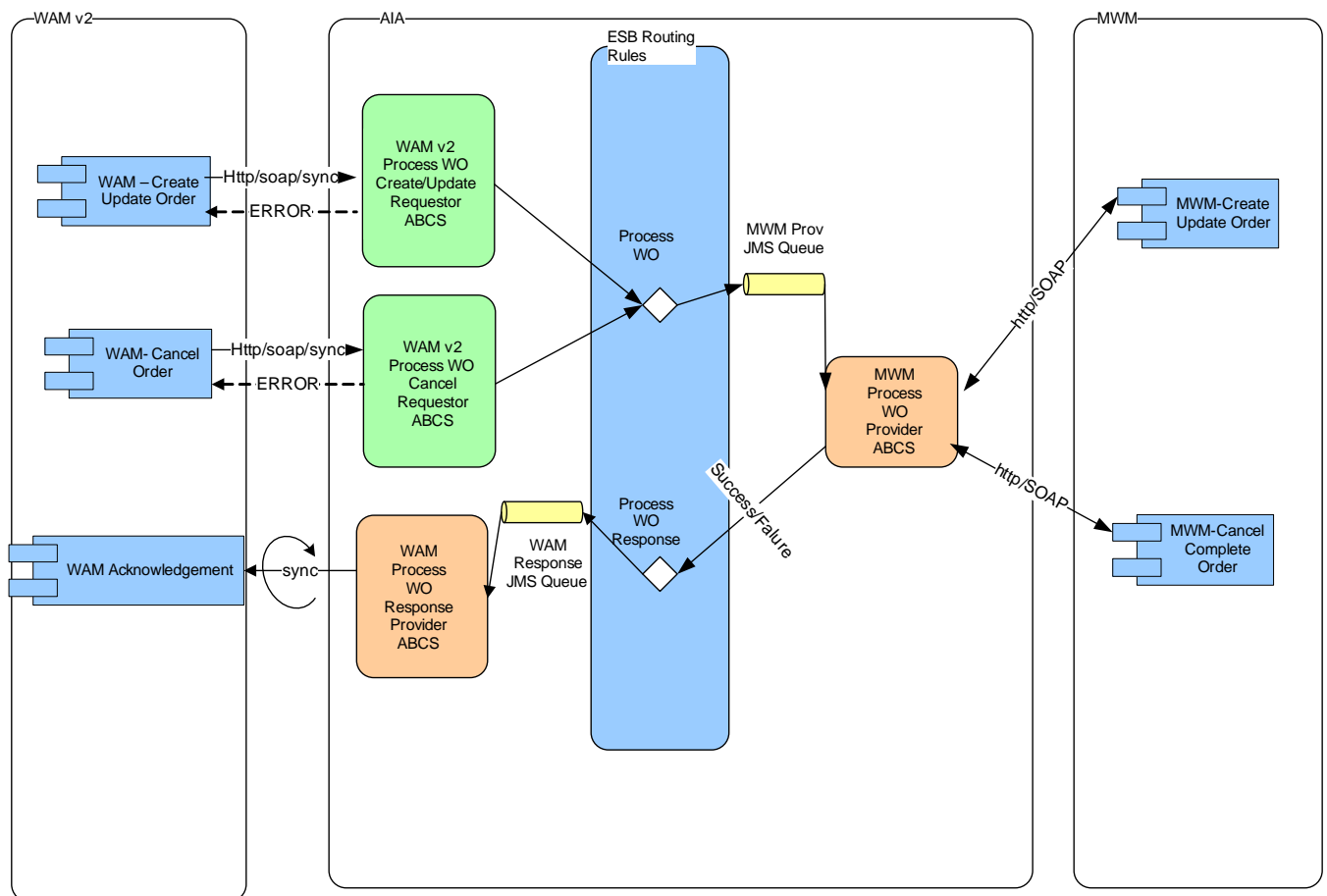
Order Completion: If the Operation in EBM is for completion, the Oracle Utilities Mobile Workforce Management field order or activity cancellation web service is invoked and the transaction is treated like an order cancellation.

Acknowledgements: In Oracle Utilities Mobile Workforce Management, the acknowledgement/response is sent synchronously. The Oracle Utilities Mobile Workforce Management Work Order Acknowledgement Requester ABCS maps the message received to the ProcessWorkOrderResponseEBM (including any error information received from Oracle Utilities Mobile Workforce Management) and invokes the Work Order Response EBS. This response/acknowledgement is routed back to the Oracle Utilities Work and Asset Management v1.9.1.x Work Order Acknowledgement Provider ABCS if the information received from Oracle Utilities Mobile Workforce Management indicates that Oracle Utilities Mobile Workforce Management had failed to process the message.

If the Oracle Utilities Work and Asset Management v1.9.1.x Work Order Acknowledgement Provider ABCS receives the message from Oracle Utilities Customer Care and Billing or Oracle Utilities Mobile Workforce Management, it sends an e-mail notification to the designated administrator and creates a work list entry.

Orders Originating in WAM v2.1.x

The following diagram shows how an order message for create, update, cancellation or completion originating in Oracle Utilities Work and Asset Management v2.1.x is integrated to Oracle Utilities Mobile Workforce Management.



Orders Originating in WAM v2.1.x

Processing Details

Oracle Utilities Work and Asset Management v2.1.x WO Requester: As an order is created in Oracle Utilities Work and Asset Management v2.1.x and activated, or an active order is updated, canceled, or completed in Oracle Utilities Work and Asset Management v2.1.x, Oracle Utilities Work and Asset Management sends a message to the Oracle Utilities Work and Asset Management v2.1.x Work Order Requester ABCS:

- Createmessages invokes Oracle Utilities Work and Asset Management v2.1.x Work Order Create Requester ABCS.
- Update messages invokes Oracle Utilities Work and Asset Management v2.1.x Work Order Update Requester ABCS. Updating the message in Oracle Utilities Work and Asset Management does not trigger a send automatically. Representative has to manually click on the **Resend** button.
- Cancel and Completion messages invoke Oracle Utilities Work and Asset Management v2.1.x Work Order Cancel Requester ABCS. Cancel message is sent out of WAM v2.1.x when the **Discard** button is clicked or activity is completed within Oracle Utilities Work and Asset Management by executing the completion events.

Mapping: The requester ABCS maps the message sent by Oracle Utilities Work and Asset Management to **ProcessWorkOrderEBM** and invokes Work Order Request EBS.

Work Order Request EBS: The message is routed based on the routing rules to Oracle Utilities Mobile Workforce Management JMS Producer

New Orders: The routing rules are based on the activity type of the activity. This configuration is determined by the DVM map **FS_Order_TypeCode**.

Updates: The messages are routed based on the applications that the on the activity type of the activity. This configuration is determined by the DVM map **FS_Order_TypeCode**. Note: Updates have to be manually sent out of WAM v2.1.x using the **Resend** button.

JMS Producers: The JMS producers are responsible for posting the message to the ConsumerJMS Queue for the corresponding target application.

JMS Consumer: Listens to the Oracle Utilities Mobile Workforce Management Producer JMS Queue and invokes the Work Order Provider ABCS for each message received in Oracle Utilities Mobile Workforce Management queue.

Work Order Provider ABCS: For Oracle Utilities Mobile Workforce Management, the provider ABCS queries the Process/Operation attribute in **ProcessWorkOrderEBM** to determine the type of message (create, update, cancel, or complete). Depending on the operation, the ABCS invokes the appropriate web service in Oracle Utilities Mobile Workforce Management after mapping **ProcessWorkOrderEBM** to the corresponding inbound message schema.

If Oracle Utilities Mobile Workforce Management fails to create/update the corresponding field activity and returns an error back to the ABCS, this ABCS maps the error response to **ProcessWorkOrderResponseEBM** (including any error information received from Oracle Utilities Mobile Workforce Management) and invokes the Work Order Response EBS. This response/acknowledgement is routed to Oracle Utilities Work and Asset Management v2.1.x Work Order Acknowledgement Provider ABCS which invokes the Oracle Utilities Work and Asset Management service to receive acknowledgement.

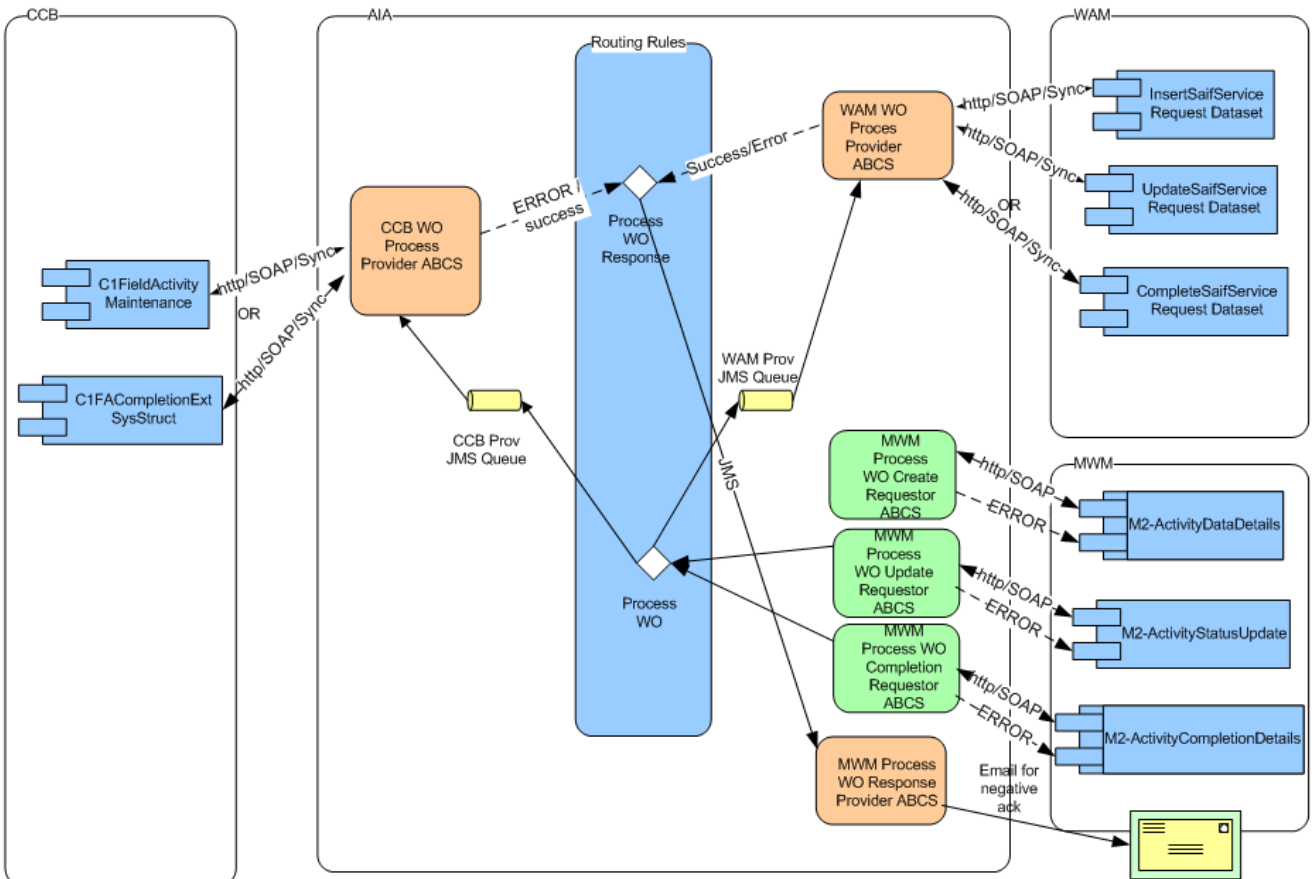
Order Cancel/Completion within Oracle Utilities Work and Asset Management: If the Operation in EBM is Cancel, the Oracle Utilities Mobile Workforce Management activity cancellation web service is invoked and the transaction is treated like an order cancellation.

Acknowledgements: After Oracle Utilities Mobile Workforce Management has processed the inbound message, the acknowledgement/response is sent synchronously. The Oracle Utilities Mobile Workforce Management Work Order Acknowledgement Requester ABCS maps the message received to the **ProcessWorkOrderResponseEBM** (including any error information received from Oracle Utilities Mobile Workforce Management) and invokes the Work Order Response EBS. This response/acknowledgement is routed back to the Oracle Utilities Work and Asset Management v2.1.x Work Order Acknowledgement Provider ABCS if the information received from Oracle Utilities Mobile Workforce Management indicates that Oracle Utilities Mobile Workforce Management had failed to process the message.

If the Oracle Utilities Work and Asset Management v2.1.x Work Order Acknowledgement Provider ABCS receives the message from Oracle Utilities Mobile Workforce Management, it invokes a Oracle Utilities Work and Asset Management v2.1.x web service to receive acknowledgements (both positive and negative acknowledgements) and sends an e-mail notification to the designated administrator and creates a work list entry (in case of negative acknowledgement only).

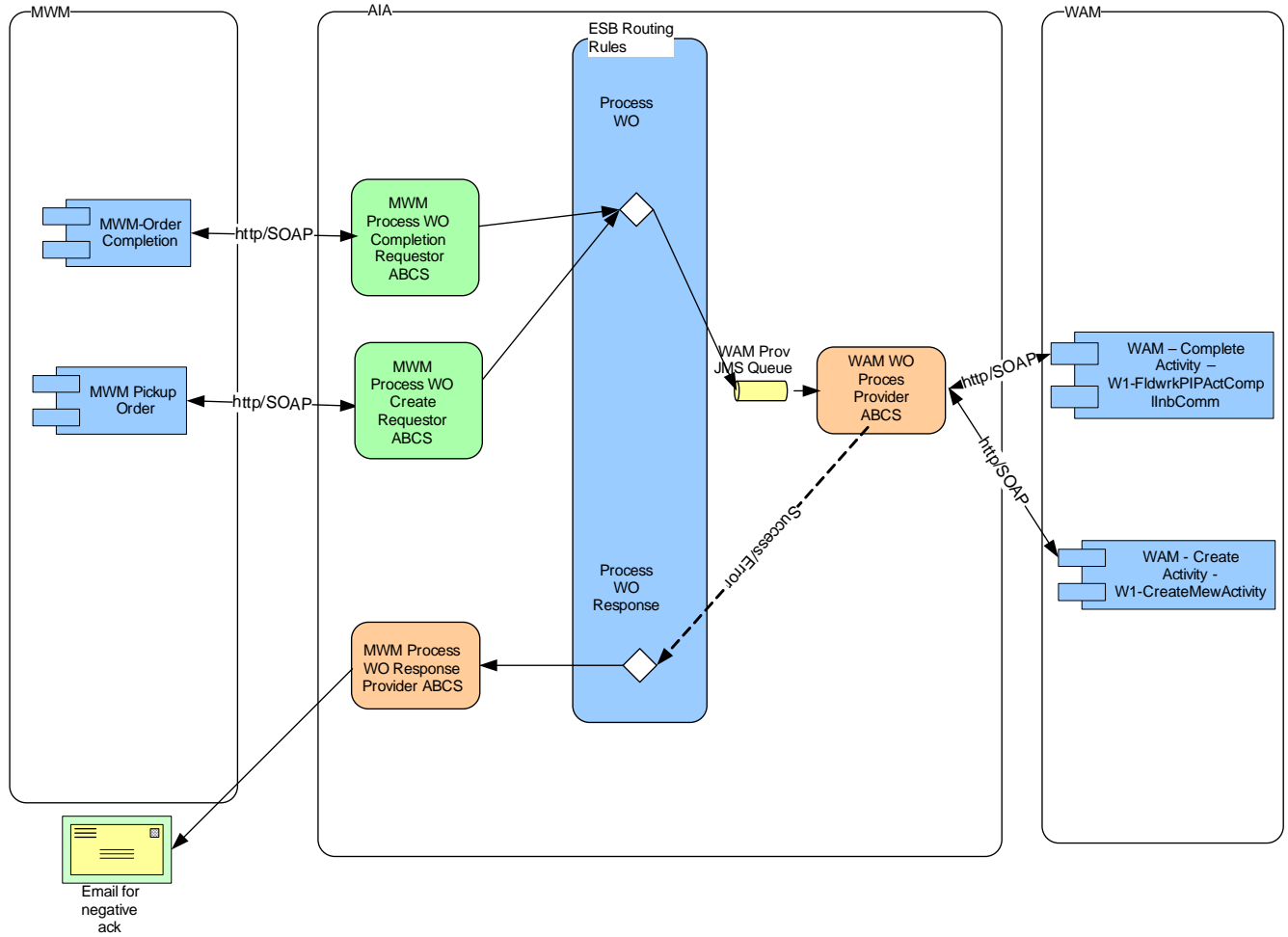
Orders Originating in MWM

The following diagram shows how a new Pickup Order originated and completed in Oracle Utilities Mobile Workforce Management , or a status update, cancellation or completion message for an existing order in Oracle Utilities Mobile Workforce Management is integrated to Oracle Utilities Work and Asset Management v1.9.1.x and Oracle Utilities Customer Care and Billing.



Order Created, Updated, Canceled or Completed WAM v1.9.1.x, MWM and CC&B

The next diagram shows how a new Pickup Order originated and completed in Oracle Utilities Mobile Workforce Management , or a status update, cancellation or completion message for an existing order in Oracle Utilities Mobile Workforce Management is integrated to Oracle Utilities Work and Asset Management v2.1.x.



Order Created or Completed from MWM to WAM v2.1.x

Processing Details

Oracle Utilities Mobile Workforce Management **WO Requester**: This process supports activity cancellations, status update, and completions from Oracle Utilities Mobile Workforce Management as well as related pickup activity creation and completion. Depending on whether the transaction is an update to an activity in Oracle Utilities Mobile Workforce Management, or is a related pickup activity created for an activity, Oracle Utilities Mobile Workforce Management sends a message to one of the Oracle Utilities Mobile Workforce Management Work Order Requester ABCS:

- Create messages invoke Oracle Utilities Mobile Workforce Management Work Order Create Requester ABCS
- Order Status change messages invoke Oracle Utilities Mobile Workforce Management Work Order Status Update Requester ABCS
- Cancel and Completion messages invoke Oracle Utilities Mobile Workforce Management Work Order Complete/Cancel Requester ABCS

Mapping: The requester ABCS maps the message sent by Oracle Utilities Mobile Workforce Management to **ProcessWorkOrderEBM** and invokes **Work Order Request EBS**.

Work Order Request EBS: The request is invoked by the Oracle Utilities Mobile Workforce Management Work Order Requester ABCS after the message is mapped. The message is routed

based on the routing rules to: Oracle Utilities Customer Care and Billing JMS Producer and/or Oracle Utilities Work and Asset Management v1.9.1.x JMS Producer

New Orders: The routing rules are based on how the order type and Problem Code are associated to the specific order. This configuration is determined on the DVM map **FS_Order_TypeCode**.

Updates: The messages are routed based on the applications that the order was linked to when the create message was sent for the order. (Status updates are only sent from MWM to CCB)

JMS Producers: The JMS producers are responsible for posting the message to the Consumer JMS Queue for the corresponding target application.

JMS Consumer: Listens to the Oracle Utilities Work and Asset Management (v1.9.1.x or v2.1.x) or Oracle Utilities Customer Care and Billing Producer JMS Queue and invokes the Work Order Provider ABCS for each message received in either the Oracle Utilities Work and Asset Management (v1.9.1.x or v2.1.x) or Oracle Utilities Customer Care and Billing queue.

Work Order Provider ABCS: For both Oracle Utilities Customer Care and Billing and Oracle Utilities Work and Asset Management (v1.9.1.x or v2.1.x), the provider ABCS queries the Process/Operation attribute in **ProcessWorkOrderEBM** to determine the type of message (create, update, cancel, or complete). Depending on the operation, the ABCS invoke the appropriate web service in Oracle Utilities Customer Care and Billing or Oracle Utilities Work and Asset Management (v1.9.1.x or v2.1.x) after mapping ProcessWorkOrderEBM to the corresponding inbound message schema.

Oracle Utilities Work and Asset Management v1.9.1.x Work Order Provider ABCS: This ABCS receives a synchronous response from Oracle Utilities Work and Asset Management v1.9.1.x, maps it to the Sync Work ProcessWorkOrderResponseEBM (including any error information received from Oracle Utilities Mobile Workforce Management) and invokes the Work Order Response EBS. This response/acknowledgement is routed back to Oracle Utilities Mobile Workforce Management using the Oracle Utilities Mobile Workforce Management Work Order Acknowledgement Provider ABCS.

Oracle Utilities Work and Asset Management v2.1.x Work Order Provider ABCS: This ABCS receives a synchronous response from WAM v2.1.x. If Oracle Utilities Work and Asset Management v2.1.x fails to create the corresponding activity or create an Inbound Communication for Completion messages and returns an error back to the ABCS, the ABCS maps the error response to the Sync Work ProcessWorkOrderResponseEBM and invokes the Work Order Response EBS. This response/acknowledgement is routed to Oracle Utilities Mobile Workforce Management Work Order Acknowledgement Provider ABCS.

CC&B Work Order Provider ABCS: If Oracle Utilities Customer Care and Billing fails to create/update the corresponding field activity and returns an error back to the ABCS, the ABCS maps the error response to the Sync Work ProcessWorkOrderResponseEBM (including any error information received from Oracle Utilities Customer Care and Billing) and invokes the Work Order Response EBS. This response/acknowledgement is routed to Oracle Utilities Mobile Workforce Management Work Order Acknowledgement Provider ABCS.

Acknowledgements: If the Oracle Utilities Mobile Workforce Management Work Order Acknowledgement Provider ABCS receives error messages from the other applications it sends and e-mail to the designated administrator and creates a work list entry. With Oracle Utilities Mobile Workforce Management, if there is pickup activity, the integration sends back the new common ID.

Order Acknowledgements for Work Order Processing

The acknowledgements described in this section provide information regarding the success or failure of transactions within the integration.

- If the request originated in Oracle Utilities Customer Care and Billing, an asynchronous acknowledgement confirming success or failure is sent back to Oracle Utilities Customer Care and Billing.

- If the request originated in Oracle Utilities Work and Asset Management v2.1.x, an asynchronous acknowledgement confirming success or failure is sent back to Oracle Utilities Work and Asset Management v2.1.x.
- If the transaction failed and the request originated in either Oracle Utilities Mobile Workforce Management or Oracle Utilities Work and Asset Management v1.9.1.x, the system sends an e-mail to a designated administrator and creates a work list entry.

Neither Oracle Utilities Work and Asset Management v1.9.1.x nor Oracle Utilities Mobile Workforce Management has the ability to receive an asynchronous response for sent messages.

Chapter 3

Appointments Process

This chapter provides an overview of Appointments process integration. If a customer changes an appointment time, the integration provides processing to support the process of finding a new appointment slot.

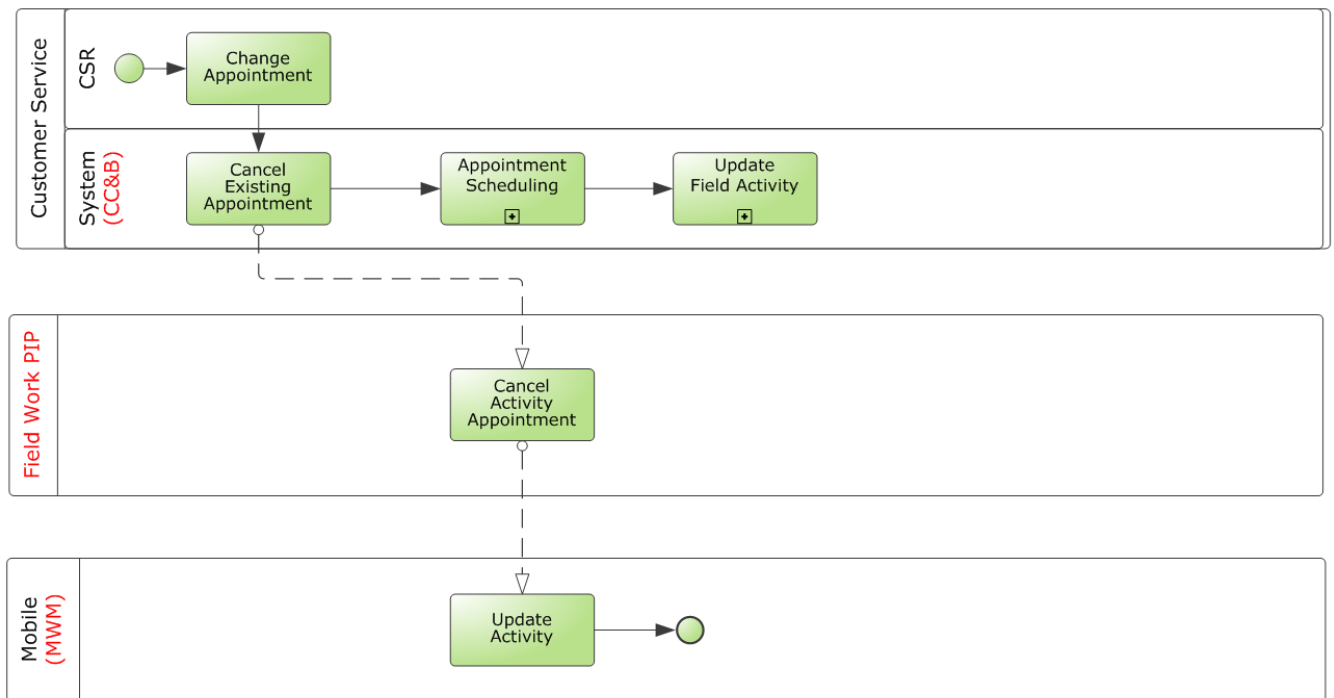
Supported Functionality

This section describes the functionality supported by this integration point.

Change the Appointment Time for an Order

If a customer changes the appointment time for an existing order, the CSR can use Oracle Utilities Customer Care and Billing to cancel the old appointment, request a new available appointment slot, and select an appropriate appointment time slot in consultation with the customer.

The following diagram depicts processing when an appointment is changed:



Change the Appointment Time for an Order

Assumptions and Constraints for Appointments Processing

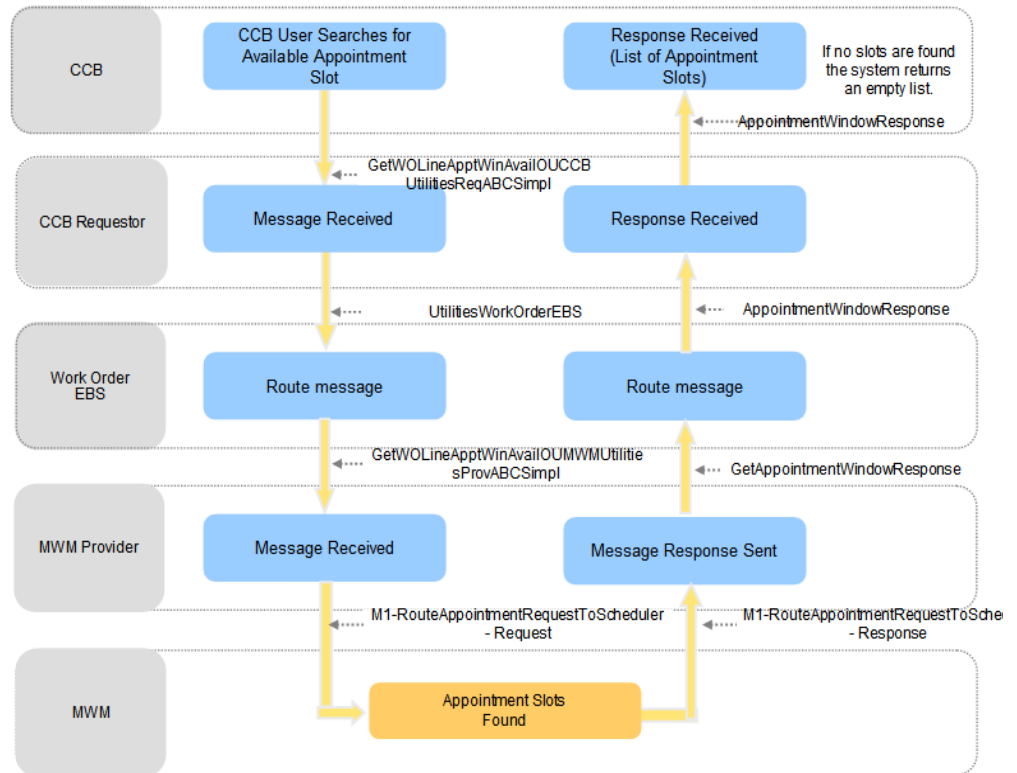
- You can search for available appointment slots for only one field activity at a time.
- Errors are displayed in the UI.

Integration Processing for Appointments

This section includes graphical descriptions of the functionality included for this integration point.

Appointment Processing

This diagram depicts appointment processing with Oracle Utilities Mobile Workforce Management



Get Appointment Slot Request

This integration process describes the path of an Oracle Utilities Customer Care and Billing Get Appointment Slot request. When an Oracle Utilities Customer Care and Billing user searches for available appointment slots from Oracle Utilities Mobile Workforce Management, they include the location where the work needs to be done, the order/task type, dispatch group/service area, slot group/appointment group code, and on/around date time to Oracle Utilities Mobile Workforce Management.

If the Oracle Utilities Customer Care and Billing user does not provide the dispatch group on or around the date and time, Oracle Utilities Customer Care and Billing provides the dispatch group of the selected field activity as the default for this information. The system uses the schedule date and time of the selected field activity for the On/ Around Date. If available appointment slots are found, Oracle Utilities Mobile Workforce Management sends a response containing the list of appointment slots. If no available slots are found, the response returns an empty list and a message is displayed on the Oracle Utilities Customer Care and Billing Appointment screen informing the user that no available appointments are found.

If an error is encountered while transforming the message, or the Mediator or Oracle Utilities Mobile Workforce Management is unreachable, the system synchronously responds to the requesting application with an error. An error message is displayed on the Oracle Utilities Customer Care and Billing Appointment screen informing the user that an error was encountered by the external system.

Chapter 4

Meter or Item Validation Process

This chapter provides an overview of Meter or Item Validation process integration.

Meter or Item Validation Process Integration Overview

If an Oracle Utilities Mobile Workforce Management or Oracle Utilities Work and Asset Management v1.9.1.x user requests validation for a meter or an item, the validation is always sent to Oracle Utilities Customer Care and Billing. Once Oracle Utilities Customer Care and Billing validates the meter or item (installed product), the response is routed to the correct edge application.

Meter configuration information is stored in Oracle Utilities Customer Care and Billing. If this information is needed in one of the other applications, a meter validation must occur. The validation is sent to Oracle Utilities Customer Care and Billing and Oracle Utilities Customer Care and Billing responds with meter information (including configuration and Register Information) as well as a valid or not valid indicator. For validation of an item, only the validity information is sent as response from Oracle Utilities Customer Care and Billing and no further information about the Item is sent in the response.

Meter Processing in WAM v1.9.1.x

When a field service representative is installing a meter or an item, Oracle Utilities Work and Asset Management v1.9.1.x provides the ability for this user to request real-time validation of the badge number for the meter or item being installed. This request sends a synchronous call to Oracle Utilities Customer Care and Billing. This means that Oracle Utilities Work and Asset Management v1.9.1.x waits for the response back for any request made to validate Meter/Item.

Meter Processing in MWM

When a field service representative is installing a meter or an item, Oracle Utilities Mobile Workforce Management provides the ability for this user to request real-time validation of the badge number for the meter or item being installed. Oracle Utilities Customer Care and Billing performs validation and sends back a Validation Response to Oracle Utilities Mobile Workforce Management.

In Oracle Utilities Mobile Workforce Management, the validation is done synchronously and the user must wait until a response is received or until the call times out. If a response is not returned, the user can continue with the completion without having the badge number validated.

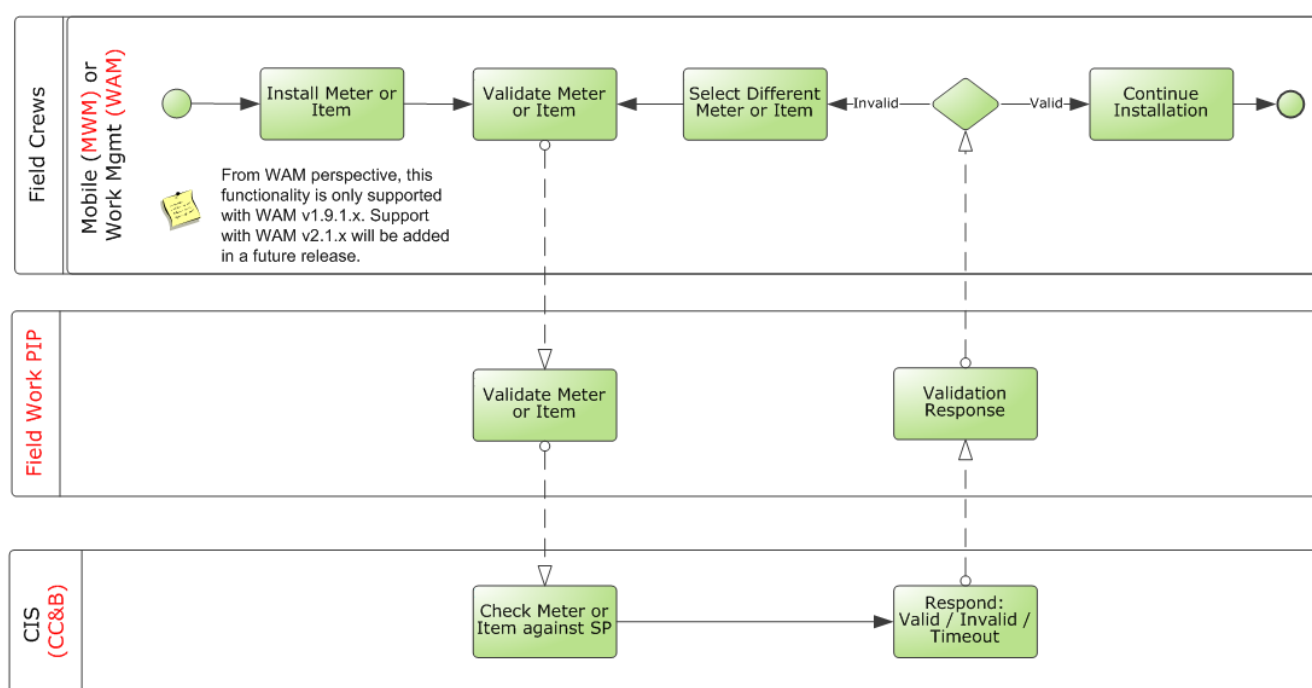
Supported Functionality

When a validation is requested two functions are performed:

- Oracle Utilities Customer Care and Billing responds with information indicating that the meter or item to be inserted at the service point linked to the order is valid for installation at that service point.
- Oracle Utilities Customer Care and Billing sends information about the meter and its configuration to the requester. No information about the item is returned to the requestor.

Whether the validation request is initiated within Oracle Utilities Work and Asset Management v1.9.1.x or Oracle Utilities Mobile Workforce Management, a request is sent to Oracle Utilities Customer Care and Billing and the system responds with the meter or item information as applicable.

This diagram depicts processing when meter validation is requested from Oracle Utilities Mobile Workforce Management or Oracle Utilities Work and Asset Management v1.9.1.x



Meter / Item Validation

Assumptions and Constraints for Meter or Item Validation Processing

- Either Oracle Utilities Work and Asset Management v1.9.1.x or Oracle Utilities Mobile Workforce Management can be the requester and Oracle Utilities Customer Care and Billing is always the provider.
- Oracle Utilities Customer Care and Billing requires a Field Activity ID or Service Point ID for the Meter/Item to be validated.
- Oracle Utilities Work and Asset Management v1.9.1.x stores the Common Cross-Reference ID as the External System ID and passes that information to Oracle Utilities Work and Asset Management v1.9.1.x Requester ABCS.
- Oracle Utilities Mobile Workforce Management stores the Common Cross Reference ID as the External System ID and passes that information to Oracle Utilities Mobile Workforce Management Requester ABCS.

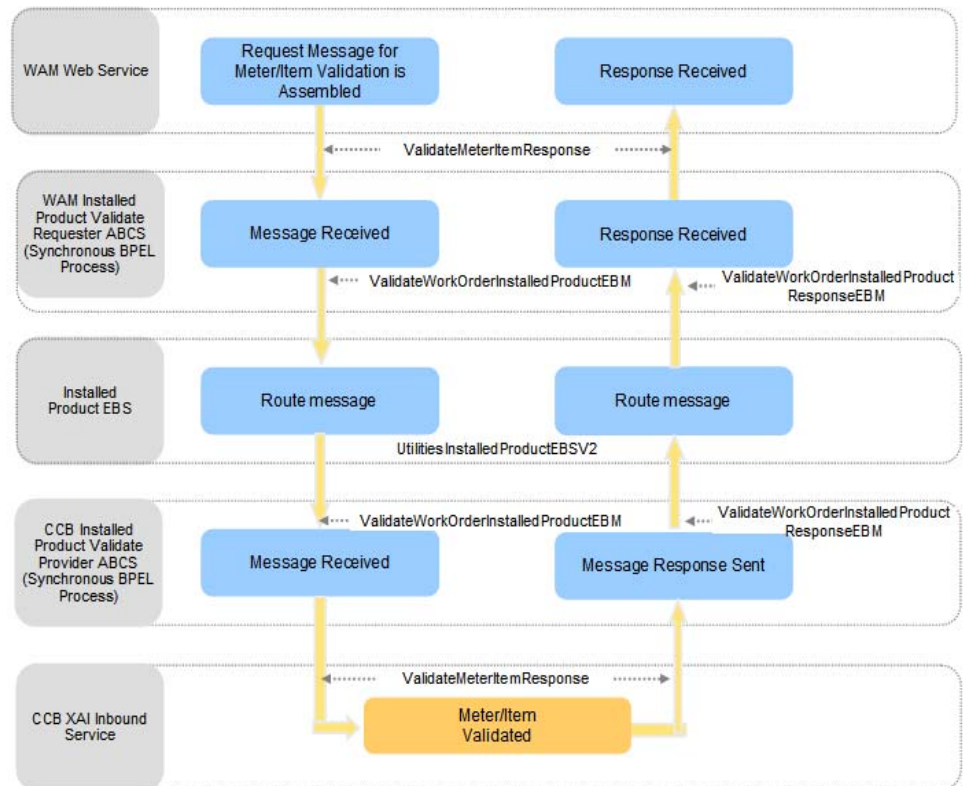
- Any Business Error messages returned by Oracle Utilities Customer Care and Billing are part of the response message and are sent back to Oracle Utilities Work and Asset Management v1.9.1.x/Oracle Utilities Mobile Workforce Management as part of the response message.

Integration Processing for Meter or Item Validation

This section includes graphical representations of the functionality included for this integration point.

Validation Processing Between WAM v1.9.1.x and CC&B

This technical diagram shows how validations are processed between Oracle Utilities Work and Asset Management v1.9.1.x and Oracle Utilities Customer Care and Billing:



Validate Installed Product WAM - CC&B

Processing Details

- Oracle Utilities Work and Asset Management v1.9.1.x assembles the request message for Meter/Item validation. This request message is sent to the Oracle Utilities Work and Asset Management v1.9.1.x Requester ABCS, which is a synchronous BPEL process where the message is transformed and enriched into Installed Product for Utilities EBO format.
- The message is routed through a Mediator process, UtilitiesInstalledProductEBSV2 to the provider ABCS (Oracle Utilities Customer Care and Billing).
- Once the message is correctly routed to the Oracle Utilities Customer Care and Billing provider ABCS (synchronous BPEL process), the message is transformed from Installed Product EBO format to a format that XAI Inbound Service (ValidateMeterItemResponse) requires in Oracle Utilities Customer Care and Billing.

- Oracle Utilities Customer Care and Billing validates the Installed Product (Meter/Item) and sends a response to the Oracle Utilities Customer Care and Billing Provider ABCS. The Provider ABCS transforms it back to the EBO format and the message is routed through the Mediator process to the Oracle Utilities Work and Asset Management v1.9.1.x Requester ABCS.
- The Requester ABCS transforms the message from EBO format into a format that Oracle Utilities Work and Asset Management v1.9.1.x understands.
- Any errors are handled in the integration layer.
- If an Item/Meter is invalid, the Error Code and Error Message information is sent back as part of the response. The Registers node in the response message are not present for an Item Validation or if the Meter/Item is invalid.

Validating Meter Numbers in Oracle Utilities Work and Asset Management v1.9.1.x

1. Open a service request that references an external order.

On the search options screen place a % in the External Order field to find all records that reference an external order.

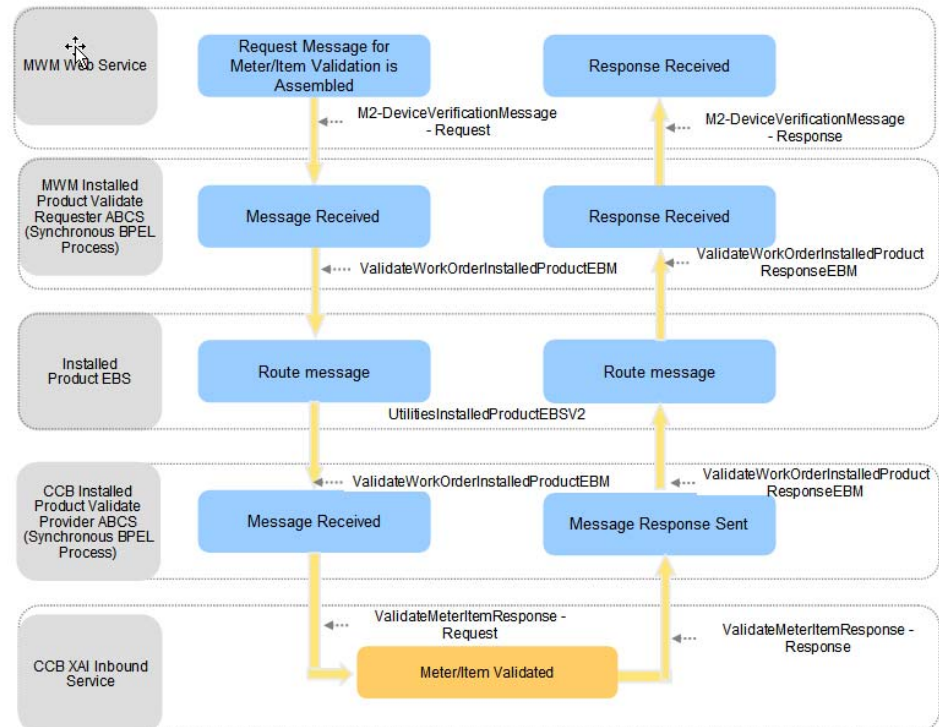
2. Select **Meter Information** from the **Views** list.
3. Enter a **Meter Badge Number** and click **Validate**.

The system initiates a request to Oracle Utilities Customer Care and Billing that verifies whether or not the badge number exists on the service point of the service request. If the badge number is valid and this meter can be installed on this service point, Oracle Utilities Customer Care and Billing returns register information to populate the Meter Information view.

After meter information is returned, the user can update the Read Date/Time, Status, Disconnect Location, and the actual reading.

Validation Processing Between MWM and CC&B

This technical diagram shows how validations are processed between Oracle Utilities Mobile Workforce Management and Oracle Utilities Customer Care and Billing:



Validate Installed Product MWM - CC&B

Processing Details

- The Oracle Utilities Mobile Workforce Management Requester ABCS is a synchronous BPEL process where the message is transformed and enriched into Installed Product for Utilities EBO format.
- The message is routed through a Mediator process, UtilitiesInstalledProductEBSV2 to the provider ABCS (Oracle Utilities Customer Care and Billing).
- Once the message is correctly routed to the Oracle Utilities Customer Care and Billing provider ABCS (synchronous BPEL process), the message is transformed from Installed Product EBO format to a format that XAI Inbound Service (ValidateMeterItemResponse) requires in Oracle Utilities Customer Care and Billing.
- Oracle Utilities Customer Care and Billing validates the Installed Product (Meter/Item) and sends back a response to the Oracle Utilities Customer Care and Billing Provider ABCS. The Provider ABCS transforms it back to the EBO format and the message is routed back through the Mediator process to the Oracle Utilities Mobile Workforce Management Requester ABCS.
- The Requester ABCS transforms the message from EBO format into a format that Oracle Utilities Mobile Workforce Management understands and invokes Oracle Utilities Mobile Workforce Management with the response message.
- Any errors are handled in the integration layer.

Validating a Meter in Oracle Utilities Mobile Workforce Management

1. In the Mobile Application, open an activity requiring a new device to be set that references a Host External ID and access the **New Meter/Item** map or fragment.
2. Enter the meter/item badge number and click **Verify**.
The map is locked (user input is not accepted).
3. Wait while the validation is processed by Oracle Utilities Customer Care and Billing.

Valid response: If a valid response is received, an **Override** check box is displayed. If the device being set is a meter, the information returned in the response is reflected on the map. The Meter Configuration Type is automatically selected and the reading details are displayed.

Invalid response: If an invalid response or error response is received, a message is displayed indicating the reason for the verification failure. An **Override** check box is displayed. The user can retry the verification by modifying the badge number and clicking **Verify** again. If the badge number is correct, the user can override the verification by selecting the **Override** check box, which allows the user to complete the activity without a valid verification. If the device being set is a meter, the user must select a Meter Configuration Type, which causes the application to build the reading details.

For more information about incoming and outgoing meter validation messages, see Oracle Utilities Customer Care and Billing documentation topic “Defining Field Order Options - Incoming Validate Meter / Item Message and Outgoing Validate Meter / Item Message”. Also refer to the Oracle Utilities Customer Care and Billing *User Guide* section on Meter Management.

Chapter 5

Billing Process

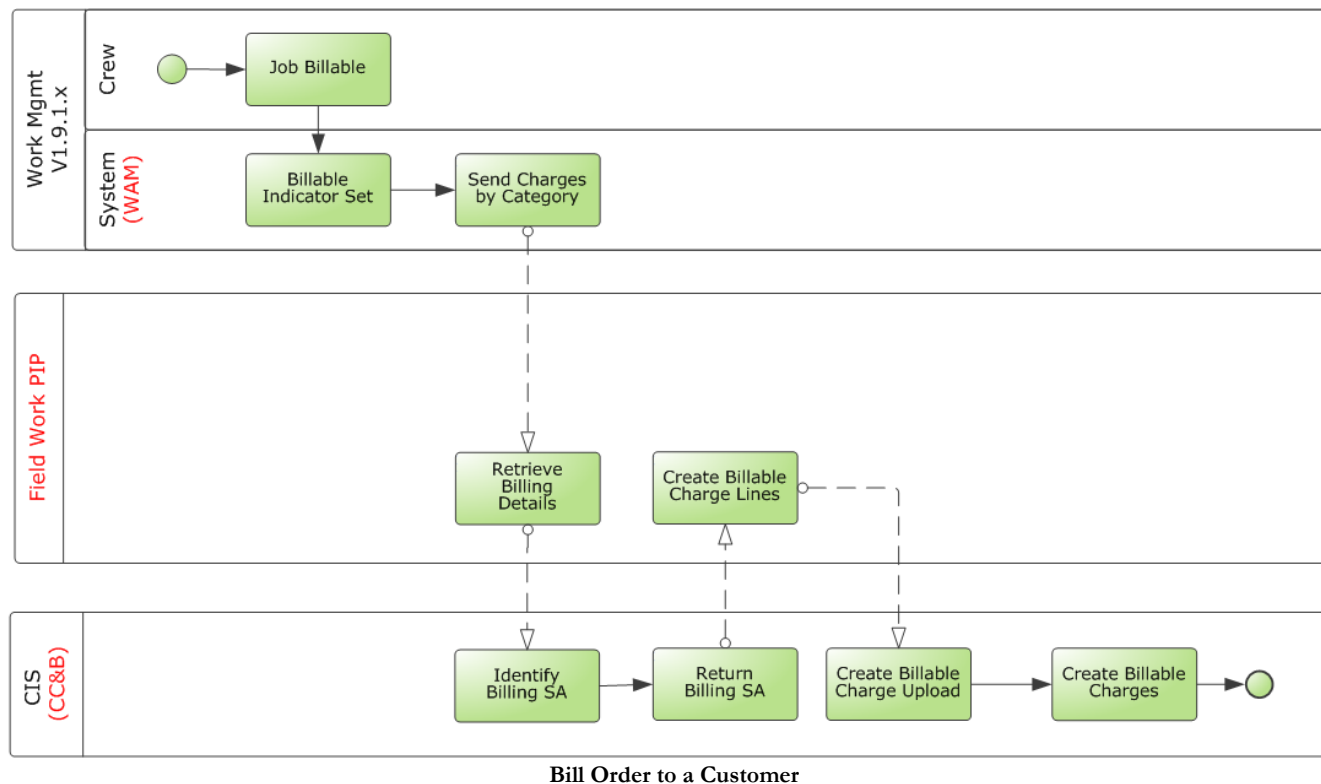
This chapter provides an overview of Billing Process integration. This integration process only applies to implementation using Oracle Utilities Work and Asset Management v1.9.1.x.

Supported Functionality

In some cases, a finished service request may require billing. This is indicated when the bill customer box is checked on the Oracle Utilities Work and Asset Management v1.9.1.x service request. In this way, Oracle Utilities Work and Asset Management v1.9.1.x controls which orders are to be billed as well as how much to bill for the order. If a Service Request contains billable charges and the indicator is checked when the Service Request is closed in Oracle Utilities Work and Asset Management v1.9.1.x, the billing information is sent to Oracle Utilities Customer Care and Billing. Billable charges include time, materials, and direct charges associated with the order to Oracle Utilities Customer Care and Billing.

In Oracle Utilities Work and Asset Management v1.9.1.x, the **Bill Customer** indicator is part of the **Service Request** screen.

This diagram depicts processing when an order is billed to a customer:



Bill Order to a Customer

Assumptions and Constraints for Billing Processing

- For this integration, an Oracle Utilities Work and Asset Management v1.9.1.x user can set the **Billable** indicator.
No configuration exists that automatically sets the Billable indicator to a certain value.
- When Oracle Utilities Work and Asset Management v1.9.1.x sends the billable charges to Oracle Utilities Customer Care and Billing, it always sends the Oracle Utilities Work and Asset Management v1.9.1.x Expense Category and amount.
Oracle Utilities Work and Asset Management v1.9.1.x Expense Category is mapped to Oracle Utilities Customer Care and Billing Bill Charge Line Type. For every Oracle Utilities Work and Asset Management v1.9.1.x Expense Category, an equivalent Oracle Utilities Customer Care and Billing Bill Charge Line Type is set up in Oracle Utilities Customer Care and Billing. The Oracle Utilities Customer Care and Billing Bill Charge Line Type contains the default values for accounts receivable distribution code, currency code, Show On Bill indicator, Appear In Summary indicator and the Memo Only indicator that is defaulted onto the line details associated with the uploaded billable charges. Oracle Utilities Work and Asset Management v1.9.1.x does not send individual billable charge information to Oracle Utilities Customer Care and Billing (for example, accounts receivable distribution code, currency code, the indicators).
- If the SA Type created for the Billable Charge SA has a start option, the start option should not turn on the Create Billable Charge switch. The user should create the Billable Charge manually by invoking the Oracle Utilities Customer Care and Billing XAI service - Create Billable Charge Upload Entry.
- Charges are created as part of closing the Oracle Utilities Work and Asset Management v1.9.1.x service request only if the External Order field is populated on the service request. The External Order field holds the equivalent Oracle Utilities Customer Care

and Billing field activity and/or Oracle Utilities Mobile Workforce Management field order.

- The Service Point and Customer link to the service request that needs to be billed must exist in Oracle Utilities Customer Care and Billing.

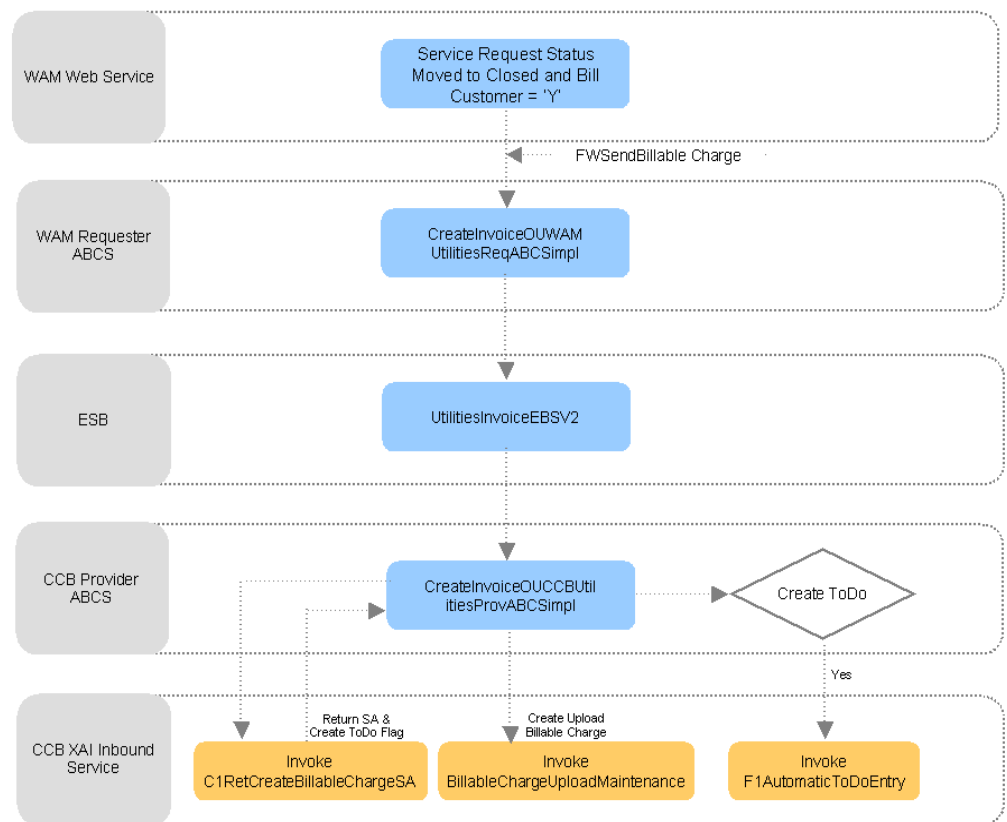
If an error is encountered and the message was not successfully sent to the integration layer, no resend action is available in Oracle Utilities Work and Asset Management v1.9.1.x to send the message again. The billable charge has to be manually created in Oracle Utilities Customer Care and Billing.

Integration Processes for Billing

This section includes graphical representations of the functionality included for this integration point.

Billing an Order

This diagram depicts how charges for an order coming from Oracle Utilities Work and Asset Management v1.9.1.x are integrated to Oracle Utilities Customer Care and Billing:



Bill Order to a Customer

Processing Details

This integration process shows how an order is billed to a customer. An Oracle Utilities Work and Asset Management v1.9.1.x user initiates this process when a service request is **Closed** and the Bill Customer Flag is set to true. This invokes the Send Billable Charge Web Service to send billable charge information for Time, Materials, and/or Direct Charges associated with the order to the integration layer.

The Oracle Utilities Work and Asset Management v1.9.1.x Requester ABCS accepts the ABM coming from Oracle Utilities Work and Asset Management v1.9.1.x in the integration layer. The

ABCS transforms the message into an EBM using the Invoice EBO format and initiates the EBS. The transformation also gets the common ID of the service request from the Cross-reference table and passes it to the EBM. The EBS, which is implemented as a Mediator process routes the message to the appropriated Oracle Utilities Customer Care and Billing Queue. An Oracle Utilities Customer Care and Billing provider JMS consumer listens to the provider queue in Oracle Utilities Customer Care and Billing and invokes the Oracle Utilities Customer Care and Billing Provider ABCS for each message received in the queue.

The Oracle Utilities Customer Care and Billing Provider ABCS calls the following services to create the billable charges:

C1RetCreateBillableChargeSA - This XAI Inbound Service retrieves a Billable Charge Service Agreement (SA) for a given Account or Service Point (SP). The status of the SA must be non-closed or non-canceled. If the Account or SP is not associated with a Billable Charge SA, it creates the SA using the CIS Division, SA Type, SA Start Option (if provided) defined in the AIA Configuration File. If only the SP is provided and the SP is linked to more than one account, it picks one of the accounts for the SP and use that to find or create the billable charge SA. Then, it sets the Create To Do Flag to true.

BillableChargeUploadMaintenance - This existing XAI Inbound Service creates a Billable Charge Upload record in Oracle Utilities Customer Care and Billing. The Order Common ID is stored as a Line Characteristic in the Billable Charge Line.

F1AutomaticToDoEntry - This existing XAI Inbound Service is only invoked if the Create To Do Flag coming from C1RetCreateBillableChargeSA service is true. If Create To Do Flag is true, the integration layer creates a To Do Entry using the To Do Type data defined in the AIA Configuration File after the Billable Charge Upload record has been added to Oracle Utilities Customer Care and Billing. This To Do reminds the user to verify if the billable charge has been created for the correct account because the SP provided is linked to more than one account. New To Do Type is also needed for this TO DO.

If an error is encountered when the message is sent from Oracle Utilities Work and Asset Management v1.9.1.x, the system synchronously responds to the requesting application with an error. The Oracle Utilities Work and Asset Management v1.9.1.x application does not include resend functionality for Create Billable Charge so there is no way to resend the message again. The Billable Charge has to be manually created in Oracle Utilities Customer Care and Billing.

In case of data or technical error in the ABCS like transformation failure or bind fault or some other internal error in the BPEL process, the standard AIA error processing generates an error e-mail notification and work list entry.

In case of remote exception (the target web service cannot be reached even after all the retry attempts configured in the fault policy file are exhausted), the standard AIA error processing generates an error e-mail notification and work list entry. The system rolls back the transaction so that the message stays in the Oracle Utilities Customer Care and Billing Queue and the JMS consumer stops processing the queue. When the target web service is available again, it processes the record from the queue again.

In case of business exceptions from the target application, the standard AIA error processing generates an error e-mail notification and work list entry. After fixing the error, this can be retrieved from BPEL.

Chapter 6

Customer Update Process

This chapter provides an overview of the Customer Update Process integration. This integration process only applies to implementation using Oracle Utilities Work and Asset Management v1.9.1.x.

Customer Update Process Integration Overview

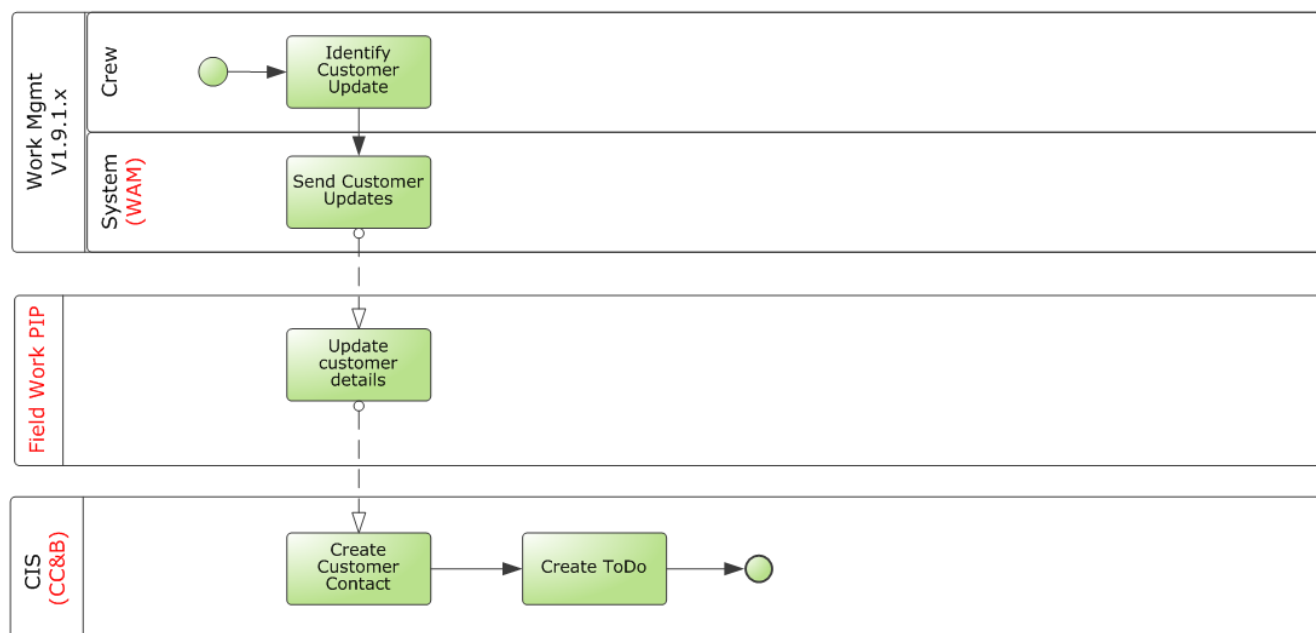
An Oracle Utilities Work and Asset Management v1.9.1.x user can pass updated Customer data collected in the field (such as a phone number or mailing address) to Oracle Utilities Customer Care and Billing. The information may be changed either online in the service request or from the Oracle Utilities Work and Asset Management v1.9.1.x mobile application. Information is stored in the SA_CREW_WORK_LOG table as changes to the service request prior to sending to Oracle Utilities Customer Care and Billing. This synchronous request creates Customer Contact and To Do records in Oracle Utilities Customer Care and Billing.

Crew log entry in SA_CREW_WORK_LOG table is created in Oracle Utilities Work and Asset Management v1.9.1.x when one or more of these fields change:

- Customer_ID
- Customer_last_name
- Customer_first_name
- Company
- Number_prefix
- Street_number_char
- Number_suffix
- Street_name
- Street_direction
- Suite
- City
- State_province
- Postal_code
- Post_office_box
- Customer_phone
- Customer_phone_ext
- Customer_home_phone

Supported Functionality

The following diagram depicts processing when customer information is updated in Oracle Utilities Work and Asset Management v1.9.1.x and passed to Oracle Utilities Customer Care and Billing:



Update Customer Information

When customer information is updated in Oracle Utilities Work and Asset Management v1.9.1.x, Oracle Utilities Work and Asset Management v1.9.1.x initiates an outbound message to Oracle Utilities Customer Care and Billing. This request creates a Customer Contact and To Do records in Oracle Utilities Customer Care and Billing.

Assumptions and Constraints for Customer Update Processing

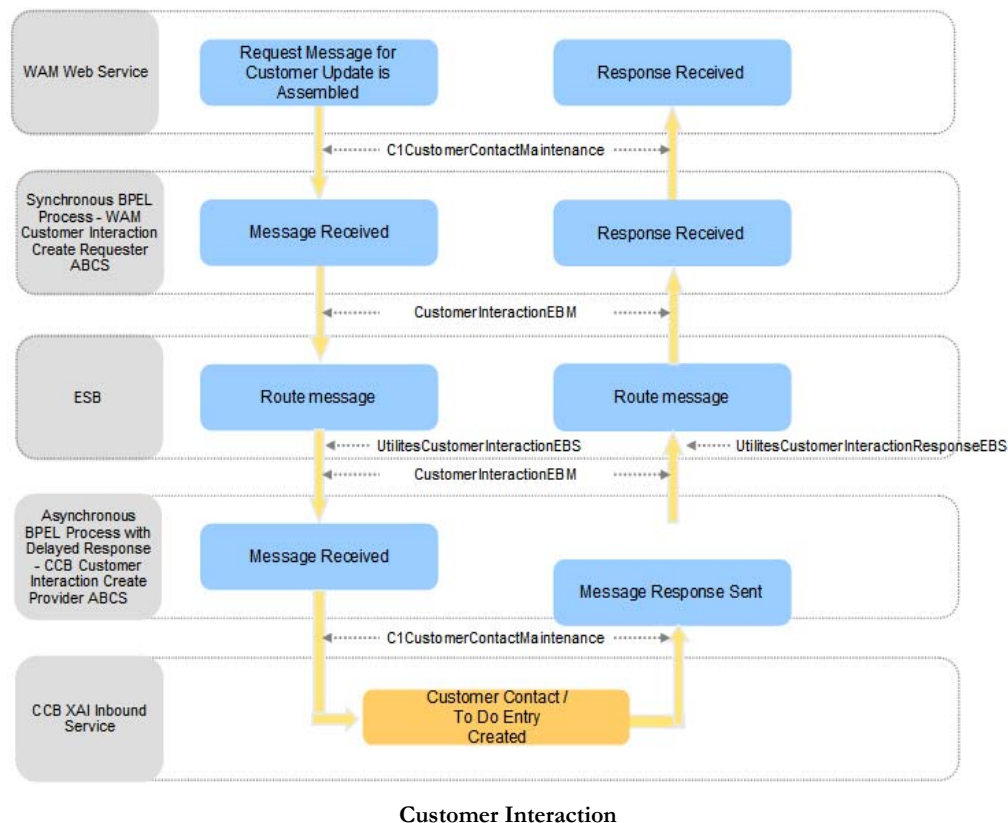
- Oracle Utilities Work and Asset Management v1.9.1.x is the requester and Oracle Utilities Customer Care and Billing is always the provider.
- Oracle Utilities Work and Asset Management v1.9.1.x must know when the customer data has changed and that this data is linked to an external system.
- Due to a design constraint where Oracle Utilities Work and Asset Management v1.9.1.x sends the request out asynchronously and waits for a response (Asynchronous with Delayed Response pattern), the Customer Update Process will not work properly in a clustered environment in the current integration.

Integration Processes for Customer Updates

This section includes graphical representations of the functionality included for this integration point and describes some of the processing details.

Customer Information Update

The following technical diagram depicts processing when customer information is updated between Oracle Utilities Work and Asset Management v1.9.1.x to Oracle Utilities Customer Care and Billing:



Processing Details

- Oracle Utilities Work and Asset Management v1.9.1.x assembles the request message for Customer Update. This request message is sent to the Oracle Utilities Work and Asset Management v1.9.1.x Requester ABCS (synchronous BPEL process) where the message is transformed and enriched into Customer Interaction for Utilities EBO format.
- The message is routed through a Mediator process, UtilitiesCustomerInteractionEBS to the provider ABCS (Oracle Utilities Customer Care and Billing).
- Once the message is correctly routed to the Oracle Utilities Customer Care and Billing provider ABCS (Asynchronous BPEL process with Delayed Response), the message is transformed from Customer Interaction EBO format to a format that XAI Inbound Service (C1CustomerContactMaintenance) requires in Oracle Utilities Customer Care and Billing.
- Oracle Utilities Customer Care and Billing creates the Customer Contact and a To Do entry and sends back a response to the Oracle Utilities Customer Care and Billing Provider ABCS. The Provider ABCS transforms it back to the EBO format and invokes the Mediator process UtilitiesCustomerInteractionResponseEBS that routes the response to the Oracle Utilities Work and Asset Management v1.9.1.x Requester ABCS that receives the response.

- The Requestor ABCS transforms the message from EBO format into a format that Oracle Utilities Work and Asset Management v1.9.1.x understands. Errors are handled in the integration layer.

Note: Correlation sets are used to correlate the instance ID of the outbound Invoke Request from Requester ABCS and the inbound receive on the Requester ABCS.

Updating Customer Contact Information

1. Open a service request that References an External Order ID either online or from the Oracle Utilities Work and Asset Management v1.9.1.x mobile application.
2. Change any updated Customer contact data collected (such as a phone number or mailing address), as needed.

Information is stored in the SA_CREW_WORK_LOG table as changes to the service request prior to sending to Oracle Utilities Customer Care and Billing.

The system initiates an outbound service to Oracle Utilities Customer Care and Billing that creates a Customer Contact and To Do records in Oracle Utilities Customer Care and Billing.

Chapter 7

Integration Interfaces and Components

This section provides further information regarding interfaces, messages, web services (inbound and outbound), AIA Components and integration services that are used in the integration. These entities do not require configuration; however, they can be helpful in understanding the integration as a whole.

The core ABCs values are cross-referenced in the configuration guidelines for each edge application.

Work Order Processing

This section describes the application interfaces and components relevant to the **work order processing** integration point.

Edge Application Interfaces for Work Order Processing

Inbound Oracle Utilities Customer Care and Billing Web Services

Web Service Name	Invoked By	Web service Description
C1AddFAandCustomer Contact	CC&B Work Order Provider ABCS	Invoked to create new field activities in CC&B.
C1FieldActivity Maintenance	CC&B Work Order Provider ABCS	Invoked to update field activities in CC&B for Instructions, Schedule date or for Intermediate status.
FAResponse	CC&B Work Order Acknowledgement Provider ABCS	Invoked to update CC&B with acknowledgements for the Order messages sent out by CC&B. These show either error information or success.

Web Service Name	Invoked By	Web service Description
C1ExtractSPIInfo	CC&B Get Meter Data Provider Service	Invoked to get the Meter and register information for a Specific Service point as a part of Message enrichment triggered by WAM Work Order Create Provider ABCS.
C1FACompletion FieldWork	CC&B Work Order Provider Service	<p>The FA Completion in Oracle Utilities Customer Care and Billing handles the following additional completion updates as well as support an easier extension to data and rules by implementation teams:</p> <ul style="list-style-type: none"> • Create customer contact <ul style="list-style-type: none"> • Customer contact class is assumed to be the same for all field initiated contacts and is designed to be specified as a schema constant. • Customer contact is designed as an extendable lookup in Oracle Utilities Mobile Workforce Management to reflect same exact values as defined in Oracle Utilities Customer Care and Billing. • Change SP -Allowed only for changing the existing SP details • Change Meter -Allowed only for the meter currently installed on the SP. • Change Item -Allowed only for the item currently installed on the SP. • Create a To Do Entry to notify a user with a message from the crew

Outbound CC&B Messages

Message Name	Invokes	Web service Description
ExtractFAInfo	CC&B Work Order Requester ABCS	Filed Activity Outbound (all actions from CC&B create, update, cancel)

Inbound Oracle Utilities Work and Asset Management v1.9.1.x Web Services

Web Service Name	Invoked By	Web service Description
ServiceRequestDatasetService: InsertSaifServiceRequest Dataset, UpdateSaifService RequestData,	WAM Work Order Provider ABCS	Invoked for Creating, canceling and updating service requests in WAM.
ServiceRequestCompletion DatasetService: CompleteServiceRequest	WAM Work Order Provider ABCS	Invoked for completing service requests in WAM.

Outbound Oracle Utilities Work and Asset Management v1.9.1.x Messages

Message Name	Invokes	Web service Description
C1AddFAandCustomer Contact	WAM Work Order Create Requester ABCS	This message is used by WAM to send new service requests created in WAM.
C1FieldActivity Maintenance	WAM Work Order Update Requester ABCS	This message is used by WAM to send service requests Updates and status updates.
C1FACompletion FieldWork	WAM Work Order Complete Requester ABCS	This message is used by WAM to send service request Completions.

Inbound Oracle Utilities Mobile Workforce Management Web Services

Web Service Name	Invoked By	Web service Description
M2-MaintainUtility ActByHost	MWM Work Order Provider ABCS	Invoked for creating and updating activities in MWM.
M2-FinalizeUtility ActByHost	MWM Work Order Provider ABCS	Invoked for completing and canceling activities in MWM.

Outbound Oracle Utilities Mobile Workforce Management Web Messages

Message Name	Invokes	Web Service Description
M2-ActivityDataDetails	MWM Work Order Create Requester ABCS	This message is used by MWM to send new activities created in MWM.
M2-ActivityStatusUpdate	MWM Work Order Status Update Requester ABCS	This message is used by MWM to send activity status updates.
M2-ActivityCompletionDetails	MWM Work Order Complete Requester ABCS	This message is used by MWM to send activity completions.

Inbound Oracle Utilities Work and Asset Management v2.1.x Web Services

Web Service Name	Invoked By	Web service Description
W1-CreateNewActivity	WAM Work Order Provider ABCS	Invoked for Creating Activities in WAM.
W1-FldwrkPIActComplInbComm	WAM Work Order Provider ABCS	Invoked for Completing Activities in WAM.
W1-FldwrkPILogActAck	WAM Work Order Response Provider ABCS	Invoked for sending positive and negative acknowledgements for activities previously sent of WAM

Outbound Oracle Utilities Work and Asset Management v2.1.x Messages

Message Name	Invokes	Web service Description
W1-FldwrkPIPAActMaint OutMsg-w1Activity	WAM Work Order Create Update Requester ABCS	This message is used by WAM to send activities creates and updates.
W1-FldwrkPIPAActFinal OutMsg -w1Activity	WAM Work Order Cancel Requester ABCS	This message is used by WAM to send activities cancelled or completed within WAM. Note both cancel and completed activities in WAM are sent out as cancellation messages.

Core AIA Components and Services

This section provides a listing of the core AIA components and integration services for Work Order processing.

Enterprise Business Object (EBO)	The core EBO XSD files are in: \$AIA_HOME/AIAMetaData/ AIAComponents/EnterpriseObjectLibrary/ Core/EBO/ parent folder.
WorkOrderEBO	
Enterprise Business Messages (EBM)	The core EBM XSD files are in: \$AIA_HOME/AIAMetaData/ AIAComponents/EnterpriseObjectLibrary/ Core/EBO/ parent folder.
ProcessWorkOrderEBM	Used for Order messages
ProcessWorkOrderResponseEBM	Used for Order Response/ Acknowledgement message
Enterprise Business Services (EBS)	The core EBS WSDL files are located in: \$AIA_HOME/AIAMetaData/ AIAComponents/ EnterpriseBusinessServiceLibrary/Core/EBO/ parent folder
UtilitiesWorkOrderEBS	Receives the ProcessWorkOrderEBM and routes it to the appropriate JMS Producer.
UtilitiesWorkOrderResponseEBS	Receives the ProcessWorkOrderResponseEBM and routes it to the appropriate ABCS.
Application Business Connector Services (ABCs)	
ProcessWorkOrderOUCCBUilities ReqABCImpl	CC&B Work Order Requester ABCS
ProcessWorkOrderCreateOUWAMUtilities ReqABCImpl	WAM v1.9.1.x Work Order Create Requester ABCS

ProcessWorkOrderUpdateOUWAMUtilitiesReqABCSEImpl	WAM v1.9.1.x Work Order Update Requester ABCS
ProcessWorkOrderCompleteOUWAMUtilitiesReqABCSEImpl	WAM v1.9.1.x Work Order Completion/Cancel Requester ABCS
ProcessWorkOrderCreateOUMWMUtilitiesReqABCSEImplV2	MWM Work Order Create Requester ABCS
ProcessWorkOrderStatusOUMWMUtilitiesReqABCSEImplV2	MWM Work Order Status Update Requester ABCS
ProcessWorkOrderCompleteOUMWMUtilitiesReqABCSEImplV2	MWM Work Order Completion/Cancel Requester ABCS
ProcessWorkOrderCreateUpdateOUWAMUtilitiesReqABCSEImplV2	WAM v2.1.x Work Order Create/Update Requester ABCS
ProcessWorkOrderCancelOUWAMUtilitiesReqABCSEImplV2	WAM v2.1.x Work Order Cancel Requester ABCS
ProcessWorkOrderOUCCBUtilitiesProvABCSEImpl	CC&B Work Order Provider ABCS
ProcessWorkOrderOUWAMUtilitiesProvABCSEImpl	WAM v1.9.1.x Work Order Provider ABCS
ProcessWorkOrderOUWAMUtilitiesProvABCSEImplV2	WAM v2.1.x Work Order Provider ABCS
ProcessWorkOrderResponseOUWAMUtilitiesProvABCSEImplV2	WAM v2.1.x Work Order Response Provider ABCS
ProcessWorkOrderOUMWMUtilitiesProvABCSEImplV2	MWM Work Order Provider ABCS
ProcessWorkOrderResponseOUCCBUtilitiesProvABCSEImpl	CC&B Work Order Acknowledgement Provider ABCS
ProcessWorkOrderResponseOUWAMUtilitiesProvABCSEImpl	WAM v1.9.1.x Work Order Acknowledgement Provider ABCS
ProcessWorkOrderResponseOUMWMUtilitiesProvABCSEImplV2	MWM Work Order Acknowledgement Provider ABCS

Adapter Services

ProcessWorkOrderOUMWMUtilitiesJMSProducer	This is the JMS producer service that is invoked when the EBM is routed to MWM. This service is responsible for posting the message to the Consumer JMS Queue for MWM.
ProcessWorkOrderOUCCBUtilitiesJMSProducer	This is the JMS producer service that is invoked by the EBS when the message is to be routed to CC&B. This service is responsible for posting the message to the Consumer JMS Queue in CC&B.
ProcessWorkOrderOUCCBUtilitiesJMSConsumer	This is the JMS consumer service responsible for listening to the Producer JMS Queue in CC&B and sending the messages to CC&B Work Order Sync Provider ABCS.

ProcessWorkOrderOUWAMUtilities JMSProducer	This is the JMS producer service that is invoked by the EBS when the message is to be routed to WAM. This service is responsible for posting the message to the Consumer JMS Queue in WAM.
ProcessWorkOrderOUWAMUtilities JMConsumer	This is the JMS consumer service responsible for listening to the Producer JMS Queue in WAM and sending the messages to WAM Work Order Provider ABCS.
ProcessWorkOrderOUWAMUtilitiesJMConsumerV2	This is the JMS consumer service responsible for listening to the Producer JMS Queue in WAM v2.1.x and sending the messages to WAM Work Order Provider ABCS V2
Message Enrichment Services	These services are used to enrich the order create message received from Oracle Utilities Work and Asset Management v1.9.1.x with information about the Meter installed at the Service Point sent by Oracle Utilities Work and Asset Management v1.9.1.x on the create request.
WAMGetMeterData ReqService	This is an EBS service invoked by WAM Work Order Create Requester ABCS to retrieve the meter and register information from CC&B for the Service Point sent by WAM in the create request. This service in turn invokes the BPEL service CCBGetMeterDataProvService to retrieve the Meter information.
CCBGetMeterData ProvService	This is a BPEL process that retrieves the meter information for the specified Service Point from CC&B. It invokes the CC&B service C1ExtractSPInfo to get the meter information.

Appointments Processing

Edge Application Interfaces for Appointments Processing

This section describes the application interfaces relevant to the **appointment processing** integration point.

Inbound Oracle Utilities Mobile Workforce Management Web Services

Web Service Name	Invoked By	Web service Description
M1-RouteAppointmentRequest ToScheduler	MWM Get Work Order Line Appointment Window Provider ABCS	Inbound Service to retrieve the available appointment window for a given date time and dispatch group.

Core AIA Components and Services

This section provides a listing of the core AIA components and integration services for Appointments processing.

Enterprise Business Object (EBO)	WorkOrderEBO	GetWorkOrderLineAppointment WindowAvailabilityEBM
		The core EBO and EBM XSD files are in: \$AIA_HOME/AIAMetaData/AIAComponents/ EnterpriseObjectLibrary/Core/EBO/ parent folder.
Enterprise Business Services (EBS)	UtilitiesWorkOrderEBS	Receives the GetWorkOrderLineAppointmentWindowAvailability EBM and routes it to the appropriate MWM Provider.
		The core EBS WSDL files are located in: \$AIA_HOME/AIAMetaData/ AIAComponents/EnterpriseBusinessServiceLibrary/ Core/EBO/ parent folder.
Application Business Connector Services (ABCs)		
	GetWOLineApptWinAvailOUCCB UtilitiesReqABCImpl	CC&B Get Work Order Line Appointment Window Requester ABCS
	GetWOLineApptWinAvailOUMWM UtilitiesProvABCImplV2	MWM Get Work Order Line Appointment Window Provider ABCS

Meter or Item Validation Processing

Edge Application Interfaces for Meter or Item Validation Processing

This section describes the application interfaces relevant to the **meter or item validation** integration point.

Inbound CC&B Web Services

Web Service Name	Invoked By	Web service Description
ValidateMeterItem Response	CC&B Work Order Installed Product Validate Provider ABCS	This message is used to send a meter/item Validation Request to CC&B and get the response back from CC&B.

Outbound Oracle Utilities Work and Asset Management v1.9.1.x Messages

Message Name	Invokes	Web service Description
ValidateMeterItem Response	WAM Work Order Installed Product Validate Requester ABCS	This message is used by WAM to send a meter/item Validation Request and get the response back.

Outbound Oracle Utilities Mobile Workforce Management Web Messages

Message Name	Invokes	Web service Description
M2-DeviceVerificationMessage	MWM Installed Product Validation Requester ABCS	This message is used by MWM to validate Meter/Item in CC&B.

Core AIA Components and Services

This section provides a listing of the core AIA components and integration services for Meter or Item Validation processing.

Enterprise Business Object (EBO)	InstalledProductEBO	The core EBO and EBM XSD files are in: \$AIA_HOME/AIAMetaData/AIAComponents/EnterpriseObjectLibrary/Core/EBO/ parent folder.
Enterprise Business Messages (EBM)		The core EBO and EBM XSD files are in: \$AIA_HOME/AIAMetaData/AIAComponents/EnterpriseObjectLibrary/Core/EBO/ parent folder.
	ValidateWorkOrderInstalledProductEBM	
	ValidateWorkOrderInstalledProductResponseEBM	
Enterprise Business Services (EBS)	UtilitiesInstalledProductEBSV2	The UtilitiesInstalledProductEBSV2 service is implemented as a Mediator process routing service. It provides the basic request operations that can be performed against the InstalledProductEBO. This service is invoked as part of the WAM-CC&B or MWM-CC&B Validate Installed Product process. It has routing rules set up for one operation: ValidateWorkOrderInstalledProduct. The core EBS WSDL files are located in: \$AIA_HOME/AIAMetaData/AIAComponents/EnterpriseBusinessServiceLibrary/Core/EBO/ parent folder
Application Business Connector Services (ABCs)		
	ValidateInstalledProductOUWAMUtilitiesReqABCImpl	WAM synchronously invokes the ValidateInstalledProductOUWAMUtilitiesReqABCImpl service when a field service representative tries to validate a Meter/Item for a particular service request. The call returns the validity of the Meter/Item along with Meter Configuration, Registers Information for a Meter.

ValidateInstalledProductOUMWM UtilitiesReqABCSEmplV2	MWM synchronously invokes the ValidateInstalledProductOUMWMUtilitiesReqABCSEmplV2 service when a field service representative tries to validate a Meter/Item for a particular Order. The call returns the validity of the Meter/Item along with Meter Configuration, Registers Information for a Meter.
ValidateInstalledProductOUCCB UtilitiesProvABCSEmpl	UtilitiesInstalledProductEBSV2 synchronously invokes the ValidateInstalledProductOUCCBUtilitiesProvABCSEmpl service when a request is sent by the Requester ABCS to validate a Meter/Item. The ValidateInstalledProductOUCCBUtilitiesProvABCSEmpl invokes the CC&B XAI Inbound Service ValidateMeterItemResponse and gets the response back and transforms it back to EBO form and sends it to EBS to route it to WAM/MWM Requester ABCS.

Billing Process

Edge Application Interfaces for Billing Processing

This section describes the application interfaces relevant to the **billing processing** integration point.

Inbound Oracle Utilities Customer Care and Billing Web Services

Web Service Name	Invoked By	Web service Description
C1RetCreate BillableChargeSA	CC&B Create Invoice Provider ABCS	Inbound Service to retrieve or create a Billable Charge SA
BillableCharge UploadMaintenance	CC&B Create Invoice Provider ABCS	Creates billable charge upload records.
F1Automatic ToDoEntry	CC&B Create Invoice Provider ABCS	Automatic To Do Entry use to create To Do Entry in CC&B

Outbound Oracle Utilities Work and Asset Management v1.9.1.x Messages

Message Name	Invokes	Web service Description
FWSendBillableCharge	WAM Create Invoice Requester ABCS	This message is used by WAM to send Billable Charges created in WAM.

Core AIA Components and Services

This section provides a listing of the core AIA components and integration services for Billing processing.

Enterprise Business Object (EBO)	InvoiceEBO	The core EBO and EBM XSD files are in: \$AIA_HOME/AIAMetaData/AIAComponents/EnterpriseObjectLibrary/Core/EBO/ parent folder.
Enterprise Business Messages (EBM)	CreateInvoiceEBM	The core EBO and EBM XSD files are in: \$AIA_HOME/AIAMetaData/AIAComponents/EnterpriseObjectLibrary/Core/EBO/ parent folder.
Enterprise Business Services (EBS)	UtilitiesInvoiceEBSV2	Receives the CreateInvoiceEBM and routes it to the appropriate JMS Producer. The core EBS WSDL files are located in: \$AIA_HOME/AIAMetaData/AIAComponents/EnterpriseBusinessServiceLibrary/Core/EBO/ parent folder
Application Business Connector Services (ABCs)		
	CreateInvoiceOUWAMUtilities ReqABCImpl	WAM Create Invoice Requester ABCS
	CreateInvoiceOUCCBUilities ProvABCImpl	CC&B Create Invoice Provider ABCS
Adapter Services		
	CreateInvoiceOUCCBUilities JMSProducer	This is the JMS producer service that is invoked when the EBM is routed to CC&B. This service is responsible for posting the message to the Create Invoice Consumer JMS Queue for CC&B.
	CreateInvoiceOUCCBUilities JMSConsumer	This is the JMS consumer service responsible for listening to the Producer JMS Queue in CC&B and sending the messages to the CC&B Create Invoice Provider ABCS

Customer Update Process

Edge Application Interfaces for Customer Update Processing

This section describes the application interfaces relevant to the **customer update processing** integration point.

Inbound CC&B Web Services

Message Name	Invoked By	Web service Description
C1CustomerContact Maintenance	CC&B Customer Interaction Create Provider ABCS	This message is used to create a customer contact and To Do in CC&B based on the customer update request received and a response is sent back from CC&B.

Outbound Oracle Utilities Work and Asset Management v1.9.1.x Messages

Message Name	Invokes	Web service Description
C1CustomerContact Maintenance	WAM Customer Interaction Create Requester ABCS	This message is used by WAM to send a customer update information to CC&B.

Core AIA Components and Services

This section provides a listing of the core AIA components and integration services for Customer Update processing.

Enterprise Business Object (EBO)	CustomerInteractionEBO	The core EBO XSD files are in: \$AIA_HOME/AIAMetaData/AIAComponents/EnterpriseObjectLibrary/Core/EBO/parent folder.
Enterprise Business Messages (EBM)	CustomerInteractionEBM	The core EBM XSD files are in: \$AIA_HOME/AIAMetaData/AIAComponents/EnterpriseObjectLibrary/Core/EBO/parent folder.
Enterprise Business Services (EBS)		The core EBS WSDL files are located in: \$AIA_HOME/AIAMetaData/AIAComponents/EnterpriseBusinessServiceLibrary/Core/EBO/parent folder
	UtilitiesCustomerInteractionEBS	The UtilitiesCustomerInteractionEBS service is implemented as a Mediator process routing service. It provides the basic request operations that can be performed against the CustomerInteractionEBO. This service is invoked as part of the WAM-CC&B Create Customer Interaction process. It has routing rules set up for one operation: CreateCustomerInteraction.
	UtilitiesCustomerInteractionResponseEBS	The UtilitiesCustomerInteractionResponseEBS service is implemented as a Mediator process routing service to route the response sent from ProviderABCS back to RequesterABCS. It has routing rules set up for one operation: CreateCustomerInteractionResponse. This service is invoked as part of the WAM-CC&B Create Customer Interaction process.
Application Business Connector Services (ABCs)		

<p>CreateCustomerInteractionOUWAM UtilitiesReqABCImpl</p>	<p>WAM synchronously invokes the CreateCustomerInteractionOUWAMUtilitiesReqABCImpl service when a field service representative tries to update Customer Information. The Provider ABCS retrieves the response from CC&B and invokes the MEDIATOR process UtilitiesCustomerInteractionResponseEBS that routes the response to the WAM v1.9.1.x Requester ABCS where a Pick activity receives the response and sends it to WAM. Note. Correlation sets are used to correlate the instance ID of the outbound Invoke Request from Requester ABCS and the inbound receive on the Requester ABCS.</p>
<p>CreateCustomerInteractionOUCCB UtilitiesProvABCImpl</p>	<p>UtilitiesCustomerInteractionEBS invokes the CreateCustomerInteractionOUCCBUtilitiesProvABCImpl service when a request is sent by the Requester ABCS to Create a Customer Contact. The CreateCustomerInteractionOUCCBUtilitiesProvABCImpl invokes the CC&B XAI Inbound Service C1CustomerContactMaintenance and gets the response back and transforms it back to EBO form and invokes the MEDIATOR process UtilitiesCustomerInteractionResponseEBS that routes the response to the WAM v1.9.1.x Requester ABCS.</p>

Part 2

Implementing the Integration Product

This section provides details on how to configure the participating applications and middleware layer for this AIA direct integration. It also includes information on error handling, monitoring, security and customization options.

This section contains the following chapters:

- [Chapter 8: Configuration Overview](#)
- [Chapter 9: Setting up Oracle Utilities Customer Care and Billing](#)
- [Chapter 10: Setting up Oracle Utilities Mobile Workforce Management](#)
- [Chapter 11: Setting up Oracle Utilities Work and Asset Management v1.9.1.x](#)
- [Chapter 12: Setting up Oracle Utilities Work and Asset Management v2.1.x](#)
- [Chapter 14: Setting up the Field Work Process Integration Pack](#)

Chapter 8

Configuration Overview

This chapter provides detail into the required configuration settings for the integration.

Note: This section includes post-install configuration instructions. For more information about installation and deployment of the integration, refer to the *Oracle Process Integration Pack for Oracle Utilities Field Work 12.1 Installation Guide*.

Choosing a Configuration Scenario for your Business

This integration supports several business models. The configuration of the product and its integration points is slightly different for each business model. This section is intended to help you decide which business model is likely to work best for your organization and which technical configuration is best suited to your chosen business model.

Every configuration scenario uses the integration layer to manage business processes and the flow of data between the applications.

Step by step configuration for each scenario is described in following sections.

Note: Some items are required for the general configuration of the participating application, but are not specifically required for the integration. You may already have these items configured if you use the application separately from the integration. Set these items according to the needs of your business and then populate the corresponding DVM accordingly.

Scenario 1: CC&B + MWM + WAM v1.9.1.x

Scenario 1: Integration + 3 edge applications are used to automate order to completion and billing.

- WAM v1.9.1.x Service Requests
- CC&B Field Activities
- MWM Activities

Application Product	Managed Functions	Notes
Oracle Utilities Customer Care and Billing	Field activities are created or updated by customer request, customer service representative action, automated process within the application, or from receiving integrated orders originated by other applications. These orders are sent to, or received from, the integration product as required by the business process.	Also configure customer and asset data synchronization - send.
Oracle Utilities Work and Asset Management v1.9.1.x	Service requests are created, updated, and in some cases completed. These orders are sent to, or received from, the integration product as required by the business process.	Also configure customer and asset data synchronization - receive.
Oracle Utilities Work and Asset Management v2.1.x	Not used.	
Oracle Utilities Mobile Workforce Management	Activities originating from other applications are updated and completed. Pickup orders, related to other orders, are created. These orders are sent to, or received from, the integration product as required by the business process.	
Oracle Process Integration Pack for Oracle Utilities Field Work	Order information and actions are received from the requester application. The orders are routed to the provider application(s) involved in the business process, based on the type of order and the action required. Information is enriched and transformed as needed by the participating applications. Error information is logged and communicated.	

Scenario 2: CC&B + MWM

Scenario 2: Integration + 2 edge applications are used to automate order to completion.

- CC&B Field Activities
- MWM Activities

Application Product	Managed Functions
Oracle Utilities Customer Care and Billing	Field activities are created or updated by customer request, customer service representative action, automated process within the application, or from receiving integrated orders originated by other applications. These orders are sent to, or received from, the integration product as required by the business process.
Oracle Utilities Mobile Workforce Management	Activities originating from other applications are updated and completed. 'Pickup' orders, related to other orders, are created. These orders are sent to, or received from, the integration product as required by the business process.
Oracle Utilities Work and Asset Management v1.9.1.x	Not used.

Application Product	Managed Functions
Oracle Utilities Work and Asset Management v2.1.x	Not used.
Oracle Process Integration Pack for Oracle Utilities Field Work	Order information and actions are received from the requester application. The orders are routed to the provider application(s) involved in the business process, based on the type of order and the action required. Information is enriched and transformed as needed by the participating applications. Error information is logged and communicated.

Scenario 3: MWM + WAM v1.9.1.x

Scenario 3: Integration + 2 edge applications are used to automate order to completion.

- MWM Activities
- WAMv1.9.1.x Service Requests

Application Product	Managed Functions
Oracle Utilities Customer Care and Billing	Not used.
Oracle Utilities Mobile Workforce Management	Activities originating from other applications are updated and completed. Pickup activities, related to other activities, are created. These orders are sent to, or received from, the integration product as required by the business process.
Oracle Utilities Work and Asset Management v1.9.1.x	Service requests are created, updated, and in some cases completed. These orders are sent to, or received from, the integration product as required by the business process.
Oracle Utilities Work and Asset Management v2.1.x	Not used.
Oracle Process Integration Pack for Oracle Utilities Field Work	Order information and actions are received from the requester application. The orders are routed to the provider application(s) involved in the business process, based on the type of order and the action required. Information is enriched and transformed as needed by the participating applications. Error information is logged and communicated.

Scenario 4: CC&B + WAM v1.9.1.x

Scenario 4: Integration + 2 edge applications are used to automate order to completion and billing:

- CC&B Field Activities
- WAM v1.9.1.x Service Requests

Application Product	Managed Functions	Notes
Oracle Utilities Customer Care and Billing	Field activities are created or updated by customer request, customer service representative action, automated process within the application, or from receiving integrated orders originated by other applications. These orders are sent to, or received from, the integration product as required by the business process.	Also configure customer and asset data synchronization - send.
Oracle Utilities Mobile Workforce Management	Not used.	
Oracle Utilities Work and Asset Management v1.9.1.x	Service requests are created, updated, and in some cases completed. These orders are sent to, or received from, the integration product as required by the business process.	Also configure customer and asset data synchronization - receive.
Oracle Utilities Work and Asset Management v2.1.x	Not used.	
Oracle Process Integration Pack for Oracle Utilities Field Work	Order information and actions are received from the requester application. The orders are routed to the provider application(s) involved in the business process, based on the type of order and the action required. Information is enriched and transformed as needed by the participating applications. Error information is logged and communicated.	

Scenario 5: MWM + WAM v2.1.x

Scenario 5: Integration + 2 edge applications are used to automate order to completion.

- MWM Activities
- WAM v2.1.x Activities

Application Product	Managed Functions
Oracle Utilities Customer Care and Billing	Not used.
Oracle Utilities Mobile Workforce Management	Activities originating from other applications are updated and completed. Pickup activities related to other Activities, are created. These orders are sent to, or received from, the integration product as required by the business process.
Oracle Utilities Work and Asset Management v1.9.1.x	Not used.

Application Product	Managed Functions
Oracle Utilities Work and Asset Management v2.1.x	Activities are created, updated, and in some cases completed for distributed work. These activities for distributed work are sent to, or received from, the integration product as required by the business process.
Oracle Process Integration Pack for Oracle Utilities Field Work	Order information and actions are received from the requester application. The orders are routed to the provider application(s) involved in the business process, based on the type of order and the action required. Information is enriched and transformed as needed by the participating applications. Error information is logged and communicated.

Chapter 9

Setting up Oracle Utilities Customer Care and Billing

The following sections provide details into the Oracle Utilities Customer Care and Billing configurations needed to facilitate the integration. Some configurations described may be required for general functionality and do not necessarily relate directly to the integration; however, these are called out as particularly significant configuration items. The inclusion of such items does not mean that other general items that are not mention do not need to be configured.

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

Scenario 1: CC&B + MWM + WAM v1.9.1.x

In this scenario, the integration product coordinates processing between three Oracle Utilities application products based on configuration settings described. All three application products and the integration product must be configured to enable this business scenario. This section of the document describes the configuration required for one of the application products.

In addition to the business processes orchestrated by the integration product, you must also configure customer and asset data synchronization between Oracle Utilities Customer Care and Billing and Oracle Utilities Work and Asset Management v1.9.1.x.

Complete the following general steps in Oracle Utilities Customer Care and Billing to configure the integration:

1. Set up a synchronization database link between Oracle Utilities Customer Care and Billing and Oracle Utilities Work and Asset Management v1.9.1.x to support synchronization of customer and asset data.
2. Configure the admin tables to support integration.
3. Configure XAI to pass messages with integration layer.

Configure Oracle Utilities Customer Care and Billing For Scenario 1

1. Configure customer and asset data synchronization.
 - Establish a database link
 - Create integration triggers
 - Set up and schedule background processes
2. Map to Plant.

3. Configure administrative menu tables.
 - Characteristic Type
 - Algorithm
 - Field Activity Type
 - To Do Roles
 - Slot Group
 - Customer Contact Type
 - Service Provider
 - Notification Download Type
 - XML Application Integration (XAI)
 - Notification Download Profile
 - Field Activity Integration Algorithm
 - Feature Configuration
 - Dispatch Group
 - Field Service Control
4. Configure main menu tables.
 - Stock Location

Configuring Customer and Asset Data Synchronization

You must synchronize all customer and service point data from Oracle Utilities Customer Care and Billing to Oracle Utilities Work and Asset Management v1.9.1.x in order for rest of the integration between these products to function correctly.

Set up **Feature Configuration** as described in this guide before you run data synchronization processes.

For more information on how to set up the processes involved in the data synchronization, please refer to [Synchronization Between CC&B and WAM](#) in [Chapter 14](#).

Synchronization Schedule

Schedule the processes so that the synchronization of data is done at regular intervals based on your business requirements. If the customer and service point data is not kept up to date you may experience errors within the integrated business processes included within the Oracle Process Integration Pack for Oracle Utilities Field Work product.

Mapping to Plant

One important decision to make about the integration and mapping is how to map Oracle Utilities Customer Care and Billing to Plant in Oracle Utilities Work and Asset Management v1.9.1.x.

Note: You cannot define multiple plants in Oracle Utilities Customer Care and Billing if Oracle Utilities Mobile Workforce Management is part of your integration.

Multiple Plants

The integration between Oracle Utilities Customer Care and Billing and Oracle Utilities Work and Asset Management v1.9.1.x is structured to support multiple plants in Oracle Utilities Work and

Asset Management v1.9.1.x (within one database schema). The integration between Oracle Utilities Work and Asset Management v1.9.1.x and Oracle Utilities Mobile Workforce Management does not support multiple plants.

The intent of setting up multiple plants is to segregate the data so that within a single database instance users signed into Plant 01 cannot see records in Plant 02 and so on. The plant column is a primary key on all Oracle Utilities Work and Asset Management v1.9.1.x database tables.

In most cases where multiple plants are used, the data is being segregated by organization or geographic location. For example, a client may use a single database instance for two maintenance organizations in different parts of a state - each location may be its own plant. In another example, a client in a single geographic region may segregate the gas and electric data into different plants. For the latter, a single Premise in Oracle Utilities Customer Care and Billing (with both gas and electric Service Points) must have two corresponding Asset records in Oracle Utilities Work and Asset Management v1.9.1.x - one for each Plant. The associated Service Point for gas only resides in the Oracle Utilities Work and Asset Management v1.9.1.x Plant for gas, and the Service Point for electric only resides in the Oracle Utilities Work and Asset Management v1.9.1.x Plant for electric.

Because a multiple plant configuration impacts whether one or more Asset records need to be created for a single Premise record, the value for Plant must be defined only at the Service Point in Oracle Utilities Customer Care and Billing. The Premise and Account records associated to the Service Point use the value for Plant designated on that Service Point.

Mapping in Oracle Utilities Customer Care and Billing

Oracle Utilities Customer Care and Billing supports several ways to define plant. Based on your business requirements, define the Plant Source and Plant Value option types in Feature Configuration according to the following:

Single Plant Configuration

Plant Source Option Type: Feature Configuration (FECO).

Plant is defined in the Plant Value option type in Feature Configuration.

Plant Value Option Type: Enter a value for the plant such as PL1 in the Value column.

Note: In Oracle Utilities Work and Asset Management v1.9.1.x, the Plant field is only 3 characters long.

Multiple Plant Configuration (Service Point)

Plant Source Option Type: Service Point Operations Area (OPAR)

Plant Value Option Type: Enter a Field Service Class in the Value column.

The defined Field Service Class is used to retrieve the Plant Value defined in the Operations Area on the Service Point.

Plant is defined in the Operations Area for the Service Point with Field Service Class = Plant Value defined in Feature Configuration. Use this configuration if you choose to use a separate plant for each Geographic Area or for each Service Type. This is an alternative to using SP Characteristic. Use one configuration or the other. Not both.

Note: Field Service Class and Operations Area must be defined in the CC&B Control Tables.

Configure Service Point for Multiple Plant

1. Navigate to **Admin > Operations Area**.
2. Define operations areas with values for each plant.
3. Navigate to Admin > Field Service Class.
4. Reference the plant Operations Areas defined in Step 2.

Multiple Plant Configuration

Plant Source Option Type: Service Point Characteristic (SPCH)

Plant Value Option Type: Enter a Characteristic Type in the Value column for the Plant Value Option Type.

The Characteristic Type is used to retrieve the Plant Value defined in the Characteristic on the Service Point. The Characteristic Type must also be defined in the CC&B Control Table and link to the SP Types to be used. Plant is defined in the Characteristic value for the Service Point with Characteristic Type = Plant Value defined in Feature Configuration. Use this configuration if you choose to use a separate plant for each. Service Point Type or another criteria on the service point. This is an alternative to using Operations Area. Use one configuration or the other. Not both.

Defining plant on the SP Characteristic allows for more flexibility. Here there is also space to specify latitude/longitude, SP Type, or any attribute on SP.

Configure Service Point Characteristic for Multiple Plant

1. Navigate to **Admin > Characteristic Type**.
2. Define a characteristic type with predefined value for plant.
For each plant, enter a predefined characteristic value.
3. Set the Characteristic Entity as Service Point.
4. Navigate to **Admin > SP Type > SP Characteristic**.
5. Define a SP Characteristic referencing the characteristic defined in Step 2.
6. Design and run a process that populates Plant Characteristic value on every Service Point.

For more information about creating these settings in Oracle Utilities Customer Care and Billing, refer to the Oracle Utilities Customer Care and Billing user documentation titled “Feature Configuration.”

Configure Admin Tables

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* section titled “Setting up the System to Enable FA Integration.”

CIS Division

A CIS division is associated with a jurisdiction. The definition of a jurisdiction is a geographic-oriented entity with unique business rules. For example, if you conduct business in California and Nevada, and each state has different collection rules, you will need a separate jurisdiction for each state. Set up a CIS division for each jurisdiction in which you conduct business.

The codes defined here must exactly match values in the DVM indicated.

Navigation	Guideline	Corresponding DVM
Admin Menu > CIS Division	Create the divisions required by your business and populate the necessary information if these records are not created yet.	FS_Order_Division

Characteristic Types

The following characteristic types must be defined to facilitate the integration.

Characteristic Type	Guideline	Characteristic Entity Collection	Comment
Field Activity ID	To capture the Field Activity ID for the NDS created for outbound messages, create a foreign key characteristic type (if you do not already have one defined for Field Activity ID).	Include Notification Download Staging in the characteristic entity collection.	Define this as a parameter in the algorithm used to create NDS records for outage calls.
Force Appointment	This characteristic can be used if you want to indicate if appointment was set manually on this field activity.	Include field activity in the characteristic entity collection.	Predefined characteristic type with all the values defined.
Phone Number	This characteristic is used to override when the PHON parameter is defined in Feature Config and a phone value is provided on the field activity.	Include field activity in the characteristic entity collection.	Adhoc characteristic type.
Service Request ID	Create the characteristic type CM-SOID used to store the common ID of an order associate with a Billable Charge Line. Also define the CC&B OrderIDCharacteristicType Code in the AIAConfigurationProperties.xml file to be the created Service Request ID Characteristic Type.	Include Billable Charge Line in the characteristic entity collection.	Adhoc characteristic type.

Note: CM-SOID is the code used when invoice information is sent from Oracle Utilities Work and Asset Management v1.9.1.x to Oracle Utilities Customer Care and Billing to create a billable charge. If you use a different characteristic type, change the reference for CC&B `.OrderIDCharacteristicTypeCode>CM-SOID</Property>` in the AIAConfigurationProperties.xml file as well.

Feature Configuration

Manage Feature Configuration

1. Navigate to **Admin > Feature Configuration**.
2. Create new feature configuration with **FA Integration** as the Feature Type and enter required option types and values for the service provider you have configured for this integration.
3. Populate entries for the applicable options.

Option	Notes
Account Relationship Type – Company Contact	This option type indicates the user defined account relationship type code for the contact person. This is an optional field. For this Option Type, the Option Value must be a valid Account Relationship Type defined in the Account Relationship Type Table. Applicable only if integration with WAM is available. No need to set it up for integration between CC&B and-MWM only.
Allow Forced Appointments	Set to Y if you use MWM appointment functionality.
Allow Manual Appointment	Set to Y if you use MWM appointment functionality.
Allow Manual Appointment Cancellation	Set to Y if you use MWM appointment functionality.
Allow Multiple Reservations	Set this to N .
Allow Narrowing Of Appointment Window	Set to Y if you use MWM appointment functionality.
Allow Slot group	Set to Y if you want to pass slot group to MWM for Appointments. If this value is not passed to MWM, Integration reads a default slot group from AIAConfigurationProperties.xml file. The lookup that controls the values of the slot group that is being passed from CC&B is C1_TIME_OF_DAY
Appointment Java Class Interface	The system provides the java class com.splwg.wfmi.workforce.SPLWFMSsystem for real-time appointment logic. Applicable if appointments functionality needed
Default Days Of Available Appointment	A number defined by the implementation.
Intermediate Status to Prevent FA Cancel	Create an entry in the option collection for any FA Intermediate Status value that is set to prevent the system from automatically canceling a field activity.
Intermediate Status To Skip Message	Populate FA Intermediate Status to indicate that field activity is created or updated by an external system. For the base product settings set this value to Created/ Changed by external system.
Message ID Database Sequence Name	Sequence field used in the database to generate message ID. The base application uses CI_WFM_MSGID_SEQ sequence.
Phone Characteristic	If the Override Phone option is defined, the system overrides the Account Phone Number with value defined as characteristic on the FA.

Option	Notes
Phone Number Type - Business	This option type indicates the user defined business phone number type code. This is an optional field. For this Option Type, the Option Value must be a valid Phone Number Type defined in the Phone Type Table. Applicable only if integration with WAM is available. No need to set it up for integration between CC&B and-MWM only.
Phone Number Type - Fax	This option type indicates the user defined fax phone number type code. This is an optional field. For this Option Type, the Option Value must be a valid Phone Number Type defined in the Phone Type Table. Applicable only if integration with WAM is available. No need to set it up for integration between CC&B and-MWM only.
Phone Number Type - Home	This option type indicates the user defined home phone number type code. This is an optional field. For this Option Type, the Option Value must be a valid Phone Number Type defined in the Phone Type Table. Applicable only if integration with WAM is available. No need to set it up for integration between CC&B and-MWM only.
Plant Source	Mapped to the Plant in WAM.
Plant Value	Mapped to the Plant in WAM.
Reservation Characteristic Type	This option is not applicable for this integration.
Review Hi-Low	If you do want to use invoke Hi/low review for meter reads passed from an external system, set this option to Y .
Service Provider	Service Provider defined for integration layer
To Do Type for Negative Acknowledgment	To Do Type used to create a To Do Entry when a negative acknowledgment is received. The example provided with the system - TD-FARSP To Do Type

Feature Configuration - Messages

If the feature exists to interface with an external system, define the mapping between error and warning codes in the external system and our system.

1. Navigate to **Admin, Feature Configuration** and open the **Messages** tab.
2. For each message that may be received from an external system, define the **External Message Category** and **External Message Code** to identify the message.
3. Map the exact contents of the ExternalMessageCode received from Oracle Utilities Mobile Workforce Management or Oracle Utilities Work and Asset Management v1.9.1.x to the External Message Code defined on the **Messages** tab in Feature Configuration.

A corresponding message must be defined in the system message tables. For each message, identify the Message Category and Message Number. The Message Category for new messages is 90000 *by default*. Numbers 90000 or higher are designated for custom use so as to avoid being overwritten in an upgrade.

FA Type

When you set up your field activity types, keep in mind that a field activity cannot have more than 7 steps if it will be completed by an external system.

Following is the list of supported FA Types:

Order Type Description	Oracle Utilities Customer Care and Billing Field Activity Type Configuration
Connect SP	Step 1: Connect SP
Install Meter	Step 1: Connect SP Step 2: Install Meter
Turn On Meter	Step 1: Turn On Meter
Turn Off Meter	Step 1: Turn Off Meter
Remove Meter	Step 1: Remove Meter Step 2: Disconnect SP
Disconnect SP	Step 1: Disconnect SP
Read Meter	Step 1: Read Meter
Install Item	Step 1: Connect SP Step 2: Install Item
Turn On Item	Step 1: Turn On Item
Turn Off Item	Step 1: Turn Off Item
Remove Item	Step 1: Remove Item Step 2: Disconnect SP
Replace Meter	Step 1: Remove Meter Step 2: Install Meter
Replace Item	Step 1: Remove Item Step 2: Install Item

Additional configuration maybe needed to support other order types.

Note that appointments are not supported in Oracle Utilities Work and Asset Management v1.9.1.x, so unless Oracle Utilities Mobile Workforce Management is part of the integration, Appointment Booking should not be set to **Required for Dispatch**.

Navigation	Guideline	Corresponding DVM
Admin Menu > Field Activity Type	Create the types required by your business and populate the necessary information to define your set of field activity types required for your business.	FS_Order_TypeCode.

To Do Type/ To Do Role

Create the To Do Type, To Do Role, and Error Message (as needed) to be used to create the following:

Warn the user when multiple accounts are linked to a Service Point (To Do Entry).

Appropriate To Do roles must be created to handle To Do entries created for this To Do Type coming from the external systems. Navigate to the To Do Type portal under the Admin menu to create this role.

Customer Contact Class and Type

Define the customer contact class and type to be used when Oracle Utilities Work and Asset Management v1.9.1.x sends a customer information creating customer contacts for the following events:

- Extracting customer data updates
- When service requests become field activities

Navigate to the Customer Contact Class and Customer Contact Type modules under the Admin menu to make these updates.

To Do Role for Customer Contact

Create an appropriate To Do role to receive To Do entries for incoming messages from the external system. Oracle Utilities Work and Asset Management v1.9.1.x sends Customer Contact and To Do information to Oracle Utilities Customer Care and Billing when customer or service point information is updated for the following events:

- Extracting customer data updates
- When service requests become field activities

The value of meter read source is controlled within the configuration file under the ABCS Name and Property Name ToDoRole.

Navigation	Value	ABCS Name
Admin Menu > To Do Role	Define To Do Role to use when assigning To Do Entries created as result of customer information updates sent from an external system.	CreateCustomerInteractionO UWAMUtilitiesReqABCImpl Property Name: ToDoRole

Bill Charge Line Type

Bill charge line types simplify the creation of billable charges in Oracle Utilities Customer Care and Billing. Each line type contains values that are defaulted onto the line details associated with the uploaded billable charges.

The codes defined here must exactly match values in the DVM for the invoice charge line type code indicated.

Navigation	Field	Description	Corresponding DVM
Admin Menu > Bill Charge Line Type	Bill Charge Line External Type	The code value for the type of bill charge line.	FS_Invoice_Charge LineTypeCode
	Description	An easily recognizable description of this bill charge line.	
	Currency Code	Define the currency to be defaulted onto billable charge upload lines that reference this line type.	
	Show on Bill	Define the value to be defaulted into the Show on Bill indicator on billable charge upload lines that reference this line type.	
	App in Summary	Define the value to be defaulted into the App in Summary indicator on billable charge upload lines that reference this line type. This determines the indenting, indicating summary information or not, of the line item on a bill.	
	Memo Only, No GL	Define the value to be defaulted into the Memo Only, No GL indicator on billable charge upload lines that reference this line type.	
	Distribution Code	Define the values to be defaulted into the Distribution Code field on billable charge upload lines that reference this line type.	

Item Type

Items are any type of equipment, other than meters. Every item has an item type that defines characteristics common to all items with this type.

The codes defined here must exactly match values in the DVM for item type code indicated.

Navigation	Guideline	Corresponding DVM
Admin Menu > Item Type	Define the item types that are used in the integration.	FS_Order_ItemTypeCode

Meter Configuration Type

Every meter configuration must reference a meter configuration type. The meter configuration type indicates the valid (required or optional) unit of measure and time of use registers for the configuration.

The codes defined here must exactly match values in the DVM for meter configuration type indicated.

Navigation	Guideline	Corresponding DVM
Admin Menu > Meter Configuration Type	Define your meter configuration types.	FS_Order_Meter ConfigurationType

Meter Type

Every meter references a meter type. The meter type defines the type of service and common characteristics shared by its meters. The codes defined here must exactly match values in the DVM for meter type code indicated.

Navigation	Guideline	Corresponding DVM
Admin Menu > Meter Type	Define your meter types.	FS_Order_MeterTypeCode

Operations Area

When you set up a service point, define the operation areas that manage its fieldwork.

The codes defined here must exactly match values in the DVM for disconnect location code indicated.

Navigation	Guideline	Corresponding DVM
Admin Menu > Operations Area	Define your operations area codes.	FS_Order_OperationsArea

Disconnect Location

When a service point is disconnected from the supply source, a disconnect location must be specified. This location defines where service was severed. It also controls the type of field activity generated to reconnect service.

The codes defined here must exactly match values in the DVM for disconnect location code indicated.

Navigation	Guideline	Corresponding DVM
Admin Menu > Disconnect Location	Define your disconnect location codes.	FS_Order_Disconnect LocationCode

Meter Read Source

The FA Completion process populates the Meter Read Source on meter reads passed from the workforce management system. In order to use the base product FA completion, create this meter read source.

The value of meter read source is controlled within the configuration file where:

ABCS Name = ProcessWorkOrderCompleteOUMWMUtilitiesReqABCImpl

Property name = Default.MeterReadSource

Navigation	Guideline	AIA Config File
Admin Menu > Meter Read Source	Define the Meter Read Source you want to use on meter reads added to CC&B from an external system.	Default.MeterReadSource

FA Integration Algorithm

To integrate with external systems, create an algorithm for FA Integration.

Set the first two parameters as per your business practice. Use FA ID Characteristic Type defined for this integration (see Characteristic Types section).

Navigation	Create Algorithm For	Parameters	Suggested Value
Admin Menu > Algorithm	FA-INT	Postpone FA Interface After Appointment is Booked	N (if MWM is not integrated) Y (if MWM is integrated)
		Appointment Processing Using Orders	Y (Appointments might be added and canceled by the workforce management system as part of order processing.)
		FA ID Characteristic Type	Use the same value as defined under Characteristic Type.

Information About this Algorithm Type

This FA integration algorithm creates XAI outbound messages (NDS records) to notify an external system if an FA is created, changed or canceled.

For each NDS record created

- The service provider (SP) on the external system for the dispatch group is used.
- The NDS type used is the one associated with the download condition flag value indicated in the details below.
- A context entry is created for the FA ID. This is needed to extract the FA details
- If you populate FA ID Char Type, (parm 1) the FA ID is also linked as a char, enabling you to easily navigate to the FA from the NDS
- A context entry is created for a unique outgoing Message ID for the external system. Message ID is calculated using a DB sequence whose name is referenced in the option Message ID Database Sequence Name on the external system feature config.
- The algorithm creates an NDS as follows:
- FA creation where the Intermediate Status is not in the option Intermediate Status to Skip Message on the external system feature config:
- If the Appt Booking flag on the FA type is *Req'd For Dispatch* and the Postpone FA Interface After Appt Is Booked (parm 3) is *Y* and the FA is not associated with an appointment, no message is created. It is interfaced when the appointment is booked. This is the recommended setup for FA Types that require appointment to be booked.
- If the FA type doesn't require an appt for dispatch, a record is created. The download condition is FA Creation.
- For FA cancellation, online or batch, the download condition is FA Cancellation. If the FA is has an appointment and the Appointment Processing using orders (parm 4) is *N*, a second NDS is created to cancel the appointment.

Certain FA Changes

- Changing the FA type from one that was not eligible to be interfaced to one that is eligible. The download condition is FA Creation.
- Changing the dispatch group on the FA to one that references a different external system sends an FA Cancel message to the previous external system and an FA Creation message to the new external system.
- Populating the appointment period when Postpone FA Interface After Appt Is Booked is *Y*. The download condition is FA Creation.
- Changing the schedule date. The download condition is FA Rescheduled.
- Completing an FA in Oracle Utilities Customer Care and Billing sends an FA Cancel message. Either the FA Cancellation or the Appointment Cancel using the FA Cancel download condition is used based on the cancel FA rules previously described.
- Other changes besides a change to External ID or Intermediate Status where the Intermediate Status is not in the option Intermediate Status to Skip Message on the external system feature configuration. The download condition is FA Changed.

Note: The external ID and intermediate status fields only change after info is received from the external system so our system does not need to send a message in this case.

- For the situation where many records are generated for the same FA in a short period of time, the algorithm attempts to manage the records. Before creating an FA Cancel or FA

Change, the algorithm checks for an existing NDS record for the same SPr and FA ID in Pending or Retry status

For FA Cancel

- If an FA Create message is found, it is canceled and no new message is created.
- If an FA Change message is found, it is canceled and a new FA Cancel record is created.
- If no other message is found, a new FA Cancel record is created.

For FA Change

- If an FA Create or an FA Change message is found, no new record is created.
- If no other message is found, a new FA Change record is created.
- If Create Log Entry (parm 2) is Y, an FA log record is created for the following events:
 - Status change; log type is FA Status Change
 - Intermediate status change; log type is FA Intermediate Status Change
 - External ID change; log type is FA External ID Change
 - Appt period change (and populated); log type is Appointment Booked
 - Appt period reset; log type is Appointment Canceled

Dispatch Group

A dispatch group is a logical group of representatives located at an operations area. When a field activity is created, the system assigns it to a dispatch group based on the type of activity, the type of service point, and the operations area that manages the service point.

Create a dispatch group to be used for field activities that are to be integrated with the other participating applications.

The codes defined here must exactly match values in the DVM for Dispatch Group indicated.

Navigation	Guideline	Corresponding DVM
Admin Menu > Dispatch Group	Reference the FA integration algorithm and Feature Configuration previously defined. Select the Allow Dispatch check box to mark the dispatch group as eligible for dispatch.	FS_Order_DispatchGroup

Representative

A representative is the individual (or equipment) that performs field activities. This is the Representative to be used when Oracle Utilities Mobile Workforce Management or Oracle Utilities Work and Asset Management v1.9.1.x sends an order completion message to Oracle Utilities Customer Care and Billing.

Add **Representative** to the **Dispatch Group** you are using for the integration layer.

Add this value to AIAConfigurationProperties.xml file according to the following example:

Navigation	Value	ABCS Name
Admin Menu > Representative	<Property name="CCB.Representative.FACompletion ">CREW1</Property>	ProcessWorkOrderOUCCB UtilitiesProvABCImpl

Only used if the **WAM.Pass.Representative.Information** property in **ProcessWorkOrderCompleteOUWAMUtilitiesReqABCImpl** is set to false and the Completion Request is coming from Oracle Utilities Work and Asset Management v1.9.1.x
Or

MWM.**Pass.Representative.Information** property in **ProcessWorkOrderCompleteOUMWMUtilitiesReqABCImpl** is set to false and the Completion Request is coming from Oracle Utilities Mobile Workforce Management.

Service Point Type

Every service point must reference a service point (SP) type. The SP type controls almost all aspects of the service point behavior (for example, the type of field activity that may be dispatched to it, the type of service agreement that may be linked to it, the type of meter that may be installed at it).

Create the service point types required by your business and populate the necessary information.

Navigation	Guideline	Corresponding DVM
Admin Menu > SP Type	Define valid service point types.	FS_Order_ServicePointTypeCode

Billable Charge SA Types

Create a SA Type to be used for the creation of a Billable Charge SA if the account does not have an existing billable Charge SA.

The codes defined here must exactly match values in the AIAConfigurationProperties.xml file indicated.

Navigation	Value	AIAConfigurationProperties.xml
Admin Menu > SA Type	<Property name="CCB.BillableChargeSATypeCode ">ZZONEOFF </Property> <Property name="CCB.SAStartOption "></Property>	CreateInvoiceOUCCBUilities ProvABCImpl

Billable Charge SA Start Option

If a SA Start Option is needed to create a Billable Charge SA, make sure this is also created in Oracle Utilities Customer Care and Billing.

The code defined here must exactly match values in the AIAConfigurationProperties.xml file indicated. This is an optional value. If your implementation does not use SA Start option, leave it blank.

Navigation	Value	AIAConfigurationProperties.xml
Admin Menu >SA Type	<Property name="CCB.SAStartOption"></Property>	CCB.SAStartOption

Field Service Control

In order to ensure that the appropriate dispatch group is referenced on the appropriate field activities, set up field service control records to indicate the default dispatch group. A record must be created for every combination of operations area, SP type and the previously defined field activity type(s).

Stock Locations

A stock location is a physical or logical location at which meters and/or items are stored while they are not installed at a service point.

The codes defined here must exactly match values in the AIA configuration file for the Item and/or Meter Stock Location Codes indicated.

Navigation	Value	Corresponding DVM
Main Menu > Meter > Stock Location	Define stock location codes.	FS_ItemStockLocationCode FS_MeterStockLocationCode

Note: Mixed case, hyphens and spaces cannot be used in Oracle Utilities Mobile Workforce Management code tables. This limitation affects the Oracle Utilities Customer Care and Billing values passed to Oracle Utilities Mobile Workforce Management such as meter badge numbers. Make sure your implementation is using all capital letters for badge numbers in Oracle Utilities Customer Care and Billing.

Slot Group

The slot group in Oracle Utilities Customer Care and Billing application is used to indicate the time of day for which the appointment is needed. This maps to the Appointment Booking Group in Oracle Utilities Mobile Workforce Management . It is controlled by lookup C1_TIME_OF_DAY.

Geographic Type

If your company uses geographic coordinates, you may setup a geographic type for each type of geographic coordinate you capture on service points. This information is extracted from Oracle Utilities Customer Care and Billing when a field activity is created or updated and passed to Oracle Utilities Mobile Workforce Management.

The codes defined here and used on service points must exactly match values in the AIA configuration file for the geographic coordinates.

Navigation	Value	AIAConfigurationProperties.xml
Admin Menu > Meter > Geographic Type	Define geo types used for geographic coordinates	OUCCB.GeoCodeLatitude OUCCB.GeoCodeLongitude

Configure Notification Download and XAI

Note: Implementations using Oracle Utilities Customer Care and Billing v2.3.x or earlier may require instructions for MPL processing. Refer to [Chapter 9: Setting up Oracle Utilities Customer Care and Billing](#) for information on using MPL.

Configuring XAI to Process Activities Using Middleware

The following provides information for processing activities using middleware.

Integration between Oracle Utilities Customer Care and Billing and the Field Work Process Integration Pack is provided by processing for NDS records in Oracle Utilities Customer Care and Billing.

XAI Senders and XAI Route Types specified in Oracle Utilities Customer Care and Billing are not used in the integration. Instead, XSL transformations are performed in the integration layer. The C1FAIntExtOrderCreateUpdateCancel.xsl is directly called by the ProcessNDSRecordOUCCBUilitiesEBF integration composite.

Configure NDS Records Processing

To configure this processing in Oracle Utilities Customer Care and Billing:

1. Navigate to **Admin > Notification Download Profile**.
2. Search for and select **Fieldwork PIP External System (SOA)**.
3. Set the **Processing Method** field to SOA for Create/Update/Cancel entries.
Leave the **XAI Route Type** section blank.

Additionally, the XAI Download Staging (XDS) table is not used to store messages. The FA Response sent to Oracle Utilities Customer Care and Billing from Oracle Utilities Mobile Workforce Management or Oracle Utilities Work and Asset Management v1.9.1.x (asynchronous business response) was formerly recorded on the XDS table as a response. Now, responses are not stored in the table, but they can be viewed from the SOA Enterprise Manager.

Please refer to [Chapter 19: Processing CC&B NDS Records Using Middleware/BPEL](#) for more information, performance tuning details and customization details. Methods of using alternative transformations are described in the [Customization Techniques](#) section.

Configuring XAI (All Processing)

Configuring XAI involves the following:

Create an HTTP XAI Sender for Appointments

Create a new XAI Sender for appointments which points to the CC&B Requester ABCS for the Appointments integration point.

1. Navigate to **Admin, XAI Sender**.
2. Enter a unique **XAI Sender** and **Description**.
3. Populate values as follows:
 - Invocation Type = *MPL*
 - XAI Class = *HTTPSNDR*. This is the class for Real-time sender to route messages using HTTP.
 - MSG Encoding = *UTF-8 message encoding*
4. Select the **Active** check box.
5. Navigate to the **Context** tab and set the 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: "GetWOLineApptWinAvail"*
 - **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** (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 Query Appointment Requester ABCS
 - For example: `http://soa-server:soa-port/soa-infra/services/default/GetWOLineApptWinAvailOUCCBUilitiesReqABCSEmpl/GetWOLineApptWinAvailOUCCBUilitiesReqABCSEmpl`
 - **Character Encoding** – *UTF-8*

Create an External System

Create a new External System for the integration layer.

1. Navigate to **Admin, External System**.
2. Enter a unique External System and Description.
3. Set **Our Name in Their System** to *CC&B*.

The values set in the AIA Configuration properties `Default.Notification.External.ID` and `Default.Reply.To.Message.Source` must match the External System name created in Oracle Utilities Customer Care and Billing.

Create a Service Provider

Create a new Service Provider to be used for the integration layer.

1. Navigate to **Admin, Service Provider**.
2. Enter a unique Service Provider and Description.
3. Set External System to the External System created for the integration layer.
4. Set Notification DL Profile to the Notification Download Profile created for the integration layer.
5. Set Person ID to the Person representing this service provider (If not exist, create one in Person Page)

Notification Download Type

Only the following download conditions identified in Setting up Outbound Messages are applicable to this integration.

- FA Cancellations
- FA Creation
- FA Change
- FA Reschedule
- Get Available Appointments

Get Available Appointments NDS Type - reference CDxProcessXDS XAI inbound service and no context types.

NDS Types **FA Cancellation/FA Creation/FA Change/FA Reschedule** - reference ExtractFAInfo XAI Inbound service and the following context types:

Context type	xpath
FA ID	//ExtractFAInfoService/ExtractFAInfoHeader@FieldActivityID
Message ID	//ExtractFAInfoService/ExtractFAInfoDetails@MessageID

Refer to the demonstration data for an example of NDS Types and Context Type/XPATH settings.

Notification Download Profile

Create a notification download profile for the service provider previously created.

Define a Notification Download Profile

1. Navigate to **Admin > Notification Download Profile**.
2. Enter a unique **Notification Download Profile** and **Description**.
Include an entry in the profile for each NDS type created previously in the NDS collection.

3. Enter the Processing Method for each NDS type with values according to the following:

NDS Type	Description	Processing Method
Get Available Appointments	Point to the Find Available Appointments Route type created previously	XAI
FA Cancellation	Point to the Canceled Order route type created previously	SOA
FA Creation	Point to the Created Order route type created previously	SOA
FA Changed	Point to the Order Update route type created previously	SOA
FA Rescheduled	Point to the Order Update route type created previously	SOA

Scenario 2: CC&B + MWM

In this scenario, the integration product coordinates processing between:

- Oracle Utilities Customer Care and Billing
- Oracle Utilities Mobile Workforce Management

Follow the guidelines to configure Oracle Utilities Customer Care and Billing for Scenario 1 with the following exceptions:

- Billable Charge is not used.
- Customer Interactions are not used
- No customer and asset data synchronization processing is available in this scenario.
- Feature Configuration options related to data synchronization do not need to be configured
- To Type and To Do Roles for Billable Charge SA, Customer Contacts are created as result of customer information change or creation of are not in use.

Scenario 3: MWM + WAM v1.9.1.x

In this scenario, the integration product coordinates processing between:

- Oracle Utilities Mobile Workforce Management
- Oracle Utilities Work and Asset Management v1.9.1.x

Oracle Utilities Customer Care and Billing is not configured for Scenario 3.

Scenario 4: CC&B + WAM v1.9.1.x

In this scenario, the integration product coordinates processing between:

- Oracle Utilities Customer Care and Billing
- Oracle Utilities Work and Asset Management v1.9.1.x

Follow the guidelines to configure Oracle Utilities Customer Care and Billing for Scenario 1 with the following exception:

- Data configurations needed for the Appointments integration points are not used in this scenario.

Scenario 5: MWM + WAM v2.1.x

In this scenario, the integration product coordinates processing between:

- Oracle Utilities Mobile Workforce Management
- Oracle Utilities Work and Asset Management v2.1.x

Oracle Utilities Customer Care and Billing is not configured for Scenario 5.

Chapter 10

Setting up Oracle Utilities Mobile Workforce Management

The following sections provide details into the Oracle Utilities Mobile Workforce Management configurations needed to facilitate the integration. Some configurations described may be required for general functionality and do not necessarily relate directly to the integration; however, these are called out as particularly significant configuration items. The inclusion of such items does not mean that other general items that are not mentioned do not need to be configured.

For more information on configuring and working with Oracle Utilities Mobile Workforce Management, see the Oracle Utilities Mobile Workforce Management *User Guide and Configuration Guide*.

Scenario 1: CC&B + MWM + WAM v1.9.1.x

In this scenario, the integration product coordinates processing between three Oracle Utilities application products based on the configuration settings described. All three application products and the integration product must be configured to enable this business scenario. This section of the document describes the configuration required for one of the application products.

Configure Oracle Utilities Mobile Workforce Management for Scenario 1

At a high-level, you must complete the following steps in Oracle Utilities Mobile Workforce Management to configure the integration:

1. Configure the admin tables to support the integration:
 - Activity Types
 - Batch Processes
 - Service Areas
 - Appointment Booking Group
2. Configure the extendable lookup tables to support the integration:
 - Device Manufacturer
 - Disconnect Location
 - Meter Configuration Type
 - Meter Location
 - Payment Cancellation Reason
 - Service Instructions

- Service Warnings
 - Stock Locations
 - Time Of Use
 - Unit Of Measure
3. Configure XAI to pass messages with the integration layer.

Configure Administration Tables

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

Activity Type

The codes defined here must exactly match values in the DVM for Order Type indicated. Refer to the section on FA Type for information on supported activity types.

Navigation	Guideline	Corresponding DVM
Admin Menu > Task Types	Create the activity types required by your business and populate the necessary information to define your set of activity types required for your business.	FS_Order_TypeCode.

Batch Processes

Batch jobs need to run to facilitate the transactions moving between the applications.

Navigation	Guideline
Admin Menu > Batch Control	Configure F1-SYNRQ to run every 5 - 10 minutes or at whatever time interval is appropriate. This is a Framework owned batch process but MWM uses it to send messages to the host system. It needs to run as often as these messages need to be sent.

Service Areas

The codes defined here must exactly match values in the DVM for Dispatch Group indicated.

Navigation	Guideline	Corresponding DVM
Admin Menu > Service Area	In Oracle Utilities Mobile Workforce Management the Service Areas are used to indicate areas where crews work on activities.	FS_Order_DispatchGroup

Appointment Booking Group

The codes defined here must exactly match values in the DVM for Slot Group indicated. Refer to the section on Slot Group for information on supported Appointment Booking Groups.

Navigation	Guideline	Corresponding DVM
Admin Menu > Appointment Booking Group	Create the Appointment Booking Groups required by your business and populate the necessary information to define your set of Appointment Booking Groups required for your business.	FS_Order_ SlotGroup.

Configure Extendable Lookups

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

Disconnect Location

When a service point is disconnected from the supply source, a disconnect location must be specified. This location defines where service was severed. It also controls the type of field activity generated to reconnect service.

The codes defined here must exactly match values in the DVM for disconnect location code indicated

Navigation	Guideline	Corresponding DVM
Admin Menu > Extendable Lookup > Disconnect Location	Define your disconnect location codes.	FS_Order_Disconnect LocationCode

Meter Configuration Type

Every meter configuration must reference a meter configuration type. The meter configuration type indicates the valid (required or optional) unit of measure and time of use registers for the configuration.

The codes defined here must exactly match values in the DVM for meter configuration type indicated.

Navigation	Guideline	Corresponding DVM
Admin Menu > Extendable Lookup > Meter Configuration Type	Define your meter configuration types.	FS_Order_Meter ConfigurationType

Meter Location

A meter can be associated with the on-site installation location.

Navigation	Guideline	Corresponding DVM
Admin Menu > Extendable Lookup > Meter Location	Define your meter location codes.	FS_Order_Meter LocationCode

Stock Locations

A stock location is a physical or logical location at which meters and/or items are stored while they are not installed at a service point.

The codes defined here must exactly match values in the AIA configuration file for the Item and/or Meter Stock Location Codes indicated.

Navigation	Guideline	AIAConfigurationProperties.xml
Admin Menu > Extendable Lookup > Stock Location	Define stock location codes.	FS_ItemStockLocationCode FS_MeterStockLocationCode

Time of Use

Every meter register can be associated with a time of use code.

The codes defined here must exactly match values in the DVM for Register time of use indicated.

Navigation	Guideline	Corresponding DVM
Admin Menu > Extendable Lookup > Time Of use	Define your time of use codes.	FS_Order_RegisterTimeOfUseCode

Unit of Measure

Every meter register must be associated with a unit of measure (read type) code.

The codes defined here must exactly match values in the DVM for Read type indicated.

Navigation	Guideline	Corresponding DVM
Admin Menu > Extendable Lookup > Unit Of Measure	Define your unit of measure codes.	FS_Order_RegisterReadUnitCode

Configure XAI

The following sections identify settings required to communicate using XAI.

Create the Outbound Message Type Used to Send Activity Status Updates to the Integration

Create a new Outbound Message Type which maps to the appropriate business object.

1. Navigate to **Admin, Outbound Message Type**, and select plus.
2. Enter a unique **Outbound Message Type** and **Description** (for example, CM-ACTSTATUS).
3. Populate values as follows:

Business Object = M2-ActivityStatusUpdate

Priority = 50. You can set this to any other value as needed.

Create the Outbound Message Type Used to Send Activity Completion Details to the Integration

Create a new outbound message type which maps to the appropriate business object.

1. Navigate to **Admin, Outbound Message Type**, and select plus.
2. Enter a unique **Outbound Message Type** and **Description**
For example, CM-ACTCOMPLT.
3. Populate values as follows:

Business Object = M2-ActivityCompletionDetails

Priority = 50. You can set this to any other value.

Create the Outbound Message Type Used to Send Pickup Order (New Activity) Details to the Integration

Create a new outbound message type which maps to the appropriate business object.

1. Navigate to **Admin, Outbound Message Type**, and select plus.
2. Enter a unique Outbound Message Type and Description (for example, CM-NEWACTVTY).
3. Populate values as follows:

Business Object = M2-ActivityDataDetails

Priority = 50. You can set this to any other value.

Create the Outbound Message Type Used to Request Device Verification from the Integration

Create a new outbound message type which maps to the appropriate business object.

1. Navigate to **Admin, Outbound Message Type**, and select plus.
2. Enter a unique Outbound Message Type and Description (for example CM-DEVVERIFY).
3. Populate values as follows:

Business Object = *M2-DeviceVerificationMessage*

Priority = 50. You can set this to any other value.

Create an HTTP Sender for Pickup Orders

Create a new XAI sender which points to the Oracle Utilities Mobile Workforce Management Requester ABCS for the **Create Field Order** integration point.

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

Invocation Type = *Real-time*

XAI Class = *RTHHTPSNDR*. This is the class for real-time sender to route messages using HTTP.

MSG Encoding = *UTF-8 message encoding*

4. Select the **Active** check box.
5. Select the **Context** tab and set values for the following **Context Types**:
 - **Character Encoding** – *UTF-8*
 - **HTTP Login User** – User ID for the url to be accessed

- **HTTP Login Password** – Password for the url to be accessed
- **HTTP Header** – *SOAPAction: "ProcessOrderCreate"*
- **HTTP Method (POST/GET)** – *POST*
- **HTTP Transport Method** – *SendReceive*
- **HTTP Timeout: 60** (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 Order Create Requester ABCS.

For example: `http://[server]/services/default/
ProcessWorkOrderCreateOUMWMUtilitiesReqABCSEnv2/
ProcessWorkOrderCreateOUMWMUtilitiesReqABCSEnv2`

Create an HTTP Sender for Activity Status Updates

Create a new XAI Sender which points to the Oracle Utilities Mobile Workforce Management Requester ABCS for the **Field Order Status Update** integration point.

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

Invocation Type = Real-time

XAI Class = RTHTTPSNDR. This is the class for real-time sender to route messages using HTTP.

MSG Encoding = UTF-8 message encoding

4. Select the **Active** check box.
5. Select the **Context** tab and set values for the following **Context Types**:

- **Character Encoding** – *UTF-8*
- **HTTP Login User** – User ID for the url to be accessed
- **HTTP Login Password** – Password for the url to be accessed
- **HTTP Header** – *SOAPAction: "ProcessOrderStatus"*
- **HTTP Method (POST/GET)** – *POST*
- **HTTP Transport Method** – *SendReceive*
- **HTTP Timeout: 60** (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 Order Status Requester ABCS.

For example: `http://sdc60017sems.us.oracle.com:8095/soa-infra/services/default/
ProcessWorkOrderStatusOUMWMUtilitiesReqABCSEnv2/
ProcessWorkOrderStatusOUMWMUtilitiesReqABCSEnv2`

Create an HTTP Sender for Activity Completion Details

Create a new XAI Sender which points to the Oracle Utilities Mobile Workforce Management Requester ABCS for the **Field Order Completion** integration point.

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

Invocation Type = *Real-time*

XAI Class = *RTHTTPSNDR*. This is the class for real-time sender to route messages using HTTP.

MSG Encoding = *UTF-8 message encoding*
4. Select the **Active** check box.
5. Select the **Context** tab and set values for the following **Context Types**:
 - **Character Encoding** – *UTF-8*
 - **HTTP Login User** – User ID for the url to be accessed
 - **HTTP Login Password** – Password for the url to be accessed
 - **HTTP Header** – *SOAPAction: "ProcessOrderComplete"*
 - **HTTP Method (POST/GET)** – *POST*
 - **HTTP Transport Method** – *SendReceive*
 - **HTTP Timeout**: 60 (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 **Order Complete Requester ABCS**.

For example: http://[server]/services/default/
ProcessWorkOrderCompleteOUMWMUtilitiesReqABCSEnv2/
ProcessWorkOrderCompleteOUMWMUtilitiesReqABCSEnv2

Create an HTTP Sender for Device Verification Messages

Create a new XAI Sender which points to the Oracle Utilities Mobile Workforce Management Requester ABCS for the **Validate Installed Product** integration point.

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

Invocation Type = *Real-time*

XAI Class = *RTHTTPSNDR*. This is the class for real-time sender to route messages using HTTP.

MSG Encoding = *UTF-8 message encoding*

Select the **Active** check box.
4. Select the **Context** tab and set values for the following **Context Types**:
 - **Character Encoding** – *UTF-8*
 - **HTTP Login User** – User ID for the url to be accessed
 - **HTTP Login Password** – Password for the url to be accessed

- **HTTP Header** – *SOAPAction: "ValidateInstalledProduct"*
- **HTTP Method (POST/GET)** – *POST*
- **HTTP Transport Method** – *SendReceive*
- **HTTP Timeout: 60** (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 Validate Installed Product Requester ABCS.

For example: `http://[server]/services/default/ValidateInstalledProductOUMWMUtilitiesReqABCSImplV2/ValidateInstalledProductOUMWMUtilitiesReqABCSImplV2`

Create an External System

Create a new External System for the integration layer.

1. Navigate to **Admin, External System**.
2. Enter a unique **External System** and **Description**.
3. Set Our Name in Their System to *MWM*.
4. Add the four outbound message types created above.
 - Activity Data Details Outbound Message Type - created above
 - Processing method - Real-time
 - XAI Sender - new XAI Sender for New Activities created above
 - Date/Time Format - XSD
 - Message XSL - AddSOAPEnvelopeAndNamespace.xsl
 - Response XSL - M2DataDetails_Response.xsl
 - Activity Status Update Outbound Message Type - created above
 - Processing method - Real-time
 - XAI Sender - new XAI Sender for Activity Status Updates created above
 - Date/Time Format - XSD
 - Message XSL - AddSOAPEnvelopeAndNamespace.xsl
 - Activity Completion Details Outbound Message Type - created above
 - Processing method - Real-time
 - XAI Sender - new XAI Sender for Activity Completion Details created above
 - Date/Time Format - XSD
 - Message XSL - AddSOAPEnvelopeAndNamespace.xsl
 - Device Verification Outbound Message Type - created above
 - Processing method - Real-time
 - XAI Sender - new XAI Sender for Device Verification Messages created above
 - Date/Time Format - XSD
 - Message XSL - AddSOAPEnvelopeAndNamespace.xsl
 - Response XSL - M2DeviceVerification_Response.xsl

Manage Feature Configuration

1. Navigate to **Admin > Feature Configuration**.
2. Create new feature configuration with *Schema Constants* as the Feature Type and enter required values for the outbound message types you have created for this integration.

Option	Notes
Activity Status Outbound Message Type	Enter name of Activity Status Outbound Message Type created
Activity Completion Outbound Message Type	Enter name of Activity Completion Outbound Message Type created
New Activity Outbound Message Type	Enter name of New Activity Outbound Message Type created
Device Verification Outbound Message Type	Enter name of Device Verification Outbound Message Type created

Scenario 2: CC&B + MWM

In this scenario, the integration product coordinates processing between:

- Oracle Utilities Customer Care and Billing
- Oracle Utilities Mobile Workforce Management

Scenario 3: MWM + WAM v1.9.1.x

In this scenario, the integration product coordinates processing between:

- Oracle Utilities Mobile Workforce Management
- Oracle Utilities Work and Asset Management v1.9.1.x

Note: Oracle Utilities Mobile Workforce Management does not support passing Timesheet, Direct Charges, and Stock Charges to Oracle Utilities Work and Asset Management v1.9.1.x.

Scenario 4: CC&B + WAM

In this scenario, the integration product coordinates processing between:

- Oracle Utilities Customer Care and Billing
- Oracle Utilities Work and Asset Management v1.9.1.x

Oracle Utilities Mobile Workforce Management is not configured for Scenario 4.

Scenario 5: MWM + WAM v2.1.x

In this scenario, the integration product coordinates processing between:

- Oracle Utilities Mobile Workforce Management
- Oracle Utilities Work and Asset Management v2.1.x

Follow the guidelines to configure Oracle Utilities Mobile Workforce Management for Scenario 1.

Chapter 11

Setting up Oracle Utilities Work and Asset Management v1.9.1.x

The following sections provide details into the Oracle Utilities Work and Asset Management v1.9.1.x configurations needed to facilitate the integration. Some configurations described may be required for general functionality and do not necessarily relate directly to the integration; however, these are called out as particularly significant configuration items. The inclusion of such items does not mean that other general items that are not mention do not need to be configured.

For more information on configuring and working with Oracle Utilities Work and Asset Management v1.9.1.x, see the Oracle Utilities Work and Asset Management v1.9.1.x *User Guide and Configuration Guide*.

In addition to the business processing orchestrated by the integration product, configure customer and asset data synchronization between Oracle Utilities Customer Care and Billing and Oracle Utilities Work and Asset Management v1.9.1.x.

For more information on synchronizing data, please refer to [Synchronization Between CC&B and WAM](#) in [Chapter 14](#).

Scenario 1: CC&B + MWM + WAM v1.9.1.x

In this scenario, the integration product coordinates processing between three Oracle Utilities application products based on the configuration settings described. All three application products and the integration product must be configured to enable this business scenario. This section of the document describes the configuration required for one of the application products.

Configure the following in Oracle Utilities Work and Asset Management v1.9.1.x:

- Code Tables
- Batch Processes
- Sequence Numbers
- Employees
- Storeroom/Stock Code
- Business Rules
- Accounts

Batch Processes

Open the Job Manager module in the Administration subsystem to add the following batch jobs for processing records sent from the integration layer. Integration processes populate the tables that provide the input to these jobs.

In the Oracle Utilities Work and Asset Management v1.9.1.x application, navigate to App Map > Administration subsystem > *Job Manager* to access these batch processes.

For more information, see the Oracle Utilities Work and Asset Management v1.9.1.x *Interfaces Guide*.

Description for Common Keywords and Parameters

Job_in - The job number assigned by the Oracle Utilities Work and Asset Management v1.9.1.x application Job Manager.

Plant_in – Character string that identifies Oracle Utilities Work and Asset Management v1.9.1.x plant code.

Direction_in - Single character that identifies Inbound (I) or Outbound (O) processing.

Pre_in - Character string that identifies the custom stored procedure to call **before** the interface procedure begins.

Post_in - Character string that identifies the custom stored procedure to call **after** the interface procedure finishes.

Batch Processes Used for Data Synchronization

Configuration of these processes is required before data synchronization can be completed.

For more information on synchronizing these properties with Oracle Utilities Customer Care and Billing, see [Synchronization Between CC&B and WAM](#) in [Chapter 14](#).

Procedure Name	Batch Process	Setting	Notes
Asset Standard Interface Procedure	WIFP_ASSET_INTERFACE(job_in, plant_in, direction_in, purge_in, option_in, pre_in, post_in);	Example of Job Manager Procedure set up: WIFP_ASSET_INTERFACE(26, '01', 'I', 'Y', null, null, null);	This process is used for import of Asset data (Service Point and Premise) from CC&B to WAM. The process is run manually.
Customer Standard Interface Procedure	WIFP_CUSTOMER_INTERFACE (job_in, plant_in, direction_in, purge_in, option_in, pre_in, post_in);	Example of Job Manager Procedure set up: WIFP_CUSTOMER_INTER FACE(43, '01', 'I', 'Y', null, null, null);	This process is used for import of Customer from CC&B to WAM. The process is run manually.
CCB Service Request Interface	sdbp_ccb_service_request.ccb_servi ce_request_interface(job_in, plant_in, purge_in, pre_in, post_in);	Example of Job Manager Procedure set up: WIFP_ASSET_INTERFACE(55, '01', 'Y', null, null, null);	This should be included in run_all_batch to run after customer and asset interfaces.

Batch Processes Called by Web Services

Procedure Name	Batch Process	Setting	Notes
Service Request Interface Procedure The Standard Service Request interface is NOT used for this integration.	SDBP_CCB_SERVICE_REQ_INTERFACE (job_in, plant_in, direction_in, purge_in, pre_in, post_in, addr_in, sr_no_in, message_id_in, dbms_activity, error_no, error_message);	Example of Job Manager Procedure set up: declare in_out1 varchar2(2000); in_out2 number :=0; in_out3 varchar2(2000); begin SDBP_CCB_SERVICE_REQ_INTERF ACE('103','01','T','Y',NULL,NULL,'sdbp_ CCB_parse_address',NULL,NULL,in_out 1,in_out2,in_out3); end;	This job is used to log error messages generated from inbound Service Requests sent from CC&B. If you want to see a log of errors, look for this batch job number in the Job Manager module.

Batch Processes Used to Post Costs

The following procedures are not called in any of the web service classes, but they are needed to post the costs of the respective expense they process (only posted costs can be sent as billable charges). It is likely that these processes are already configured for Oracle Utilities Work and Asset Management v1.9.1.x. The corresponding log messages can be viewed under the sdbp_run_all_batch.

Procedure Name	Batch Process	Setting	Notes
Stock Cost Interface Procedure	sdbp_cost_stock.cost_stock(job_in, plant_in);	Enter Interval – sysdate + 999	Processes costs for stock transactions which have not yet been posted. Information is selected from the table SA_INVENTORY_LOG and posted throughout the system. Once a stock cost transaction is successfully processed, it is marked as posted.

Special Batch Process for Error Logging

In addition to logging of errors in tables and logs, there is pl/sql called from java web services code that logs errors. These pl/sql routines require a batch job to be created so that log messages can be generated to the job manager log message table.

Immediately suspend the created batch job after it is created creation so that it is never run. The easiest and safest way to create the batch job is to enter **null**; in the Procedure field.

Create a Batch Job For Error Logging

To complete this task, you must create three separate batch jobs.

1. Open the Job Manager module in the Oracle Utilities Work and Asset Management v1.9.1.x application.
2. Click New.
3. Select the **Suspended or Broken** check box.
4. Populate fields according to the following:

```
Procedure = null; /* SDBP_CCB_SERVICE_REQ_INTERFACE*/  
Interval = sysdate+1 (the system defaults to this value)
```

5. Click Save.

6. Repeat from step 2 to create two more jobs where:

```
Procedure = null; /*SDBP_FIELD_WORK.FW_WEB_SERVICE_LOGGING*/
```

and

```
Procedure = null; /* SDBP_MWM_INTEGRATION.MWM_WEB_SERVICE_LOGGING */
```

Business Rules

Configure a Business Rule

1. In Oracle Utilities Work and Asset Management v1.9.1.x, navigate to Application Map > Administration subsystem > *Business Rules* module.
2. Search for and select the appropriate Rule indicated in the following sections.
3. Enter the relevant information indicated in the following sections.
4. Click Save.

Default Accts for Interfaces Rule

This rule is used while syncing Premise and Service Point information from Oracle Utilities Customer Care and Billing to Oracle Utilities Work and Asset Management v1.9.1.x. It establishes default account values that are used according to the zip code appearing on the Premise or Service Point which creates a new Asset record. Enter **DEFAULT** in the Zip Code column to establish default values that are used when no zip is present or there are no settings entered on the business rule for a particular zip code.

For example Department/Area/Account combinations could be entered to use zip codes 94596 and 97123 respectively. When a Service Point with any other zip code or no zip code is imported from Oracle Utilities Customer Care and Billing, the values next to DEFAULT is used.

Expense Codes Rule

When costs are sent to Oracle Utilities Customer Care and Billing, they are summarized by the Oracle Utilities Customer Care and Billing Expense code defined in this rule. These expense codes and categories are defined on Expense Codes Rule in Oracle Utilities Work and Asset Management v1.9.1.x. Values for the Oracle Utilities Customer Care and Billing Expense column do not need to be populated.

Note the DVM that must also be set up to create a cross-reference between the Oracle Utilities Work and Asset Management v1.9.1.x values you create for this rule, and the values used by the other applications.

Corresponding DVM - FS_Invoice_ChargeLineTypeCode

Interface Parameters Rule

Configure the Interface Parameters rule to set the parameters that drive business logic in the interface.

Asset Address Parser and Customer Address Parser

Oracle Utilities Work and Asset Management v1.9.1.x stores parts of an address (Street Number, Street Name, Street Suffix and Apartment Number) in individual fields. Oracle Utilities Customer Care and Billing does not store addresses in such detail, rather it stores entire lines of addresses in Address 1, Address 2, and so on.

The parameter entered for these rule keys controls how address parsing occurs when the system processes customers, premises & service points. You can replace the standard batch job procedure with a custom procedure that uses the same parameters. The provided parameter parses out street number and name.

Interface Rules

Configure the Interface business rules to designate which fields should be updated with information from the integration business processes when data is passed between the applications.

You must configure the interface rules for the following modules:

- Asset Interface Rule
- Customer Interface Rule
- Customer Address Interface Rule
- Customer SA Interface Rule
- Standard Service Req Interface Rule

If you set all of the values in the Update column to NO, the system does not update any fields when updated records are passed from the integration processes.

Set the Update column to YES for fields that must be updated when data is transferred from the integration processes.

For more information, see the Oracle Utilities Work and Asset Management v1.9.1.x *Interfaces Guide*.

Product Integration Rule

This rule defines the integration between Oracle Utilities Work and Asset Management v1.9.1.x and other Oracle Utility products.

- *INTEGRATION TYPE* – Enter **FIELD WORK** to set the type required for the three-way integration.

Product Integration MWM Rule

This rule is used to define default values used for fields integrated with Oracle Utilities Mobile Workforce Management.

- *WORK ORDER ALERT USER* - Enter the Oracle Utilities Work and Asset Management v1.9.1.x user who must be alerted about any errors or warnings that occur during the processing of work orders that are inbound to Oracle Utilities Work and Asset Management v1.9.1.x through the web service.

Product Integration Field Work Rule

This rule is used in place of Product Integration Oracle Utilities Customer Care and Billing and Product Integration Oracle Utilities Mobile Workforce Management rules that are used for point-to-point integrations.

- *BILLABLE CHARGES* – This includes the rule to determine whether to send billing information as billable charges to Oracle Utilities Customer Care and Billing.
- With this value set to ON, Oracle Utilities Mobile Workforce Management sends a completion to Oracle Utilities Work and Asset Management v1.9.1.x and Oracle Utilities Work and Asset Management v1.9.1.x passes the charges to Oracle Utilities Customer Care and Billing as billable charges.
- *COUNTRY CODE* – Enter the applicable country code. Values are validated by code table 15 which uses ISO codes for countries.
- *PROCESS USER* - Enter the Oracle Utilities Work and Asset Management v1.9.1.x user who must be alerted about any errors or warnings that occur during the completion of service requests that are inbound to Oracle Utilities Work and Asset Management v1.9.1.x through the web service.
- *SERVICE REQUEST ALERT USER* - Enter the Oracle Utilities Work and Asset Management v1.9.1.x user who must be alerted about any errors or warnings that occur during the completion of service requests that are inbound to Oracle Utilities Work and Asset Management v1.9.1.x through the web service.
- *TIMEZONE* – Enter the applicable time zone in a valid Java Time zone ID (for example **America/Los_Angeles**)

Web Services Gateway Rule

This rule is used to define the web services that the Oracle Utilities Work and Asset Management v1.9.1.x application must interface with.

Web Service Gateway Key (do not modify) - The values in this column reference the Requester ABCS that the Oracle Utilities Work and Asset Management v1.9.1.x application must interface with. This is for internal use by Oracle Utilities Work and Asset Management v1.9.1.x and must not be modified.

This table lists Web Service Gateway Keys that are used for this integration pack:

Web Service Gateway Key	Description
CCB CREATE CUST CONTACT	Used for sending a Customer Update outbound message from WAM.
CCB ORDER STATUS	Used for sending a Service Request Status Update outbound message from WAM. This controls the service request status. The service request status change request is invoked for all statuses except the COMPLETION (FINISHED/ CLOSED) status change.
FW COMPLETE SERVICE ORDER	Used for sending a service request Completion outbound message from WAM.
FW CREATE SERVICE ORDER	Used for sending a service request Creation outbound message from WAM.
FW SEND BILLABLE CHARGE	Used for sending Billable Charges from WAM.
FW UPDATE SERVICE ORDER	Used for sending a service request Update outbound message from WAM. This controls service request details such as the description and other information.

Username & Password - The username and password needed to access the Requester ABCS on BPEL.

Dataset ID (do not modify) - These values indicate to Oracle Utilities Work and Asset Management v1.9.1.x which table to retrieve information from, and provide the keys to use from that table. This is for internal use by Oracle Utilities Work and Asset Management v1.9.1.x and must not be modified.

Consumer Class (do not modify) - The Java class name called by Oracle Utilities Work and Asset Management v1.9.1.x. This is for internal use by Oracle Utilities Work and Asset Management v1.9.1.x and must not be modified.

Service URL - The URL that the consumer class indicated in the previous column uses to call the Requester ABCS on BPEL. Set this to the endpoint URL of the corresponding Requester ABCS BPEL Process. This URL is typically in this format `http://<SOA Server name>:<port>/soa-infra/default/<Requester ABCS Name>/<Requester ABCS Name>`.

Gateway URL - The Gateway URL path to Oracle Utilities Work and Asset Management v1.9.1.x. The Consumer Class is physically stored on this server. Verify that you have the correct IP address and Port set for these.

Below is a sample table of details that go into the Business Rule – Web Services Gateway:

Web Service Gateway Key	Username	Password	Dataset ID	Consumer Class	Service URL	GateWay URL	Log Level
CCB CREATE CUST CONTACT	Weblogic username	Weblogic password	Do not modify	Do not modify	http://soaserver:port/soa-infra/services/default/CreateCustomerInteraction OUWAMUtilitiesReqABC SImpl/ CreateCustomerInteraction OUWAMUtilitiesReq ABCImpl	http://wamappserver:port/synergen/ WebGateWay	
CCB ORDER STATUS	Weblogic username	Weblogic password	Do not modify	Do not modify	http://soaserver:port/soa-infra/services/default/ProcessWorkOrderUpdate OUWAMUtilitiesReq ABCImpl/ ProcessWorkOrderUpdate OUWAMUtilitiesReq ABCImpl	http://wamappserver:port/synergen/ WebGateWay	
FW COMPLETE SERVICE ORDER	Weblogic username	Weblogic password	Do not modify	Do not modify	http://soaserver:port/soa-infra/services/default/ProcessWorkOrder Complete OUWAMUtilitiesReq ABCImpl/ ProcessWorkOrder Complete OUWAMUtilitiesReq ABCImpl	http://wamappserver:port/synergen/ WebGateWay	ALL
FW CREATE SERVICE ORDER	Weblogic username	Weblogic password	Do not modify	Do not modify	http://soaserver:port/soa-infra/services/default/ProcessWorkOrderCreate OUWAMUtilitiesReq ABCImpl/ ProcessWorkOrderCreate OUWAMUtilitiesReq ABCImpl	http://wamappserver:port/synergen/ WebGateWay	ALL

Web Service Gateway Key	Username	Password	Dataset ID	Consumer Class	Service URL	GateWay URL	Log Level
FW SEND BILLABLE CHARGE	Weblogic username	Weblogic password	Do not modify	Do not modify	http://soaserver:port/soa-infra/services/default/ CreateInvoiceOUWAM UtilitiesReqABCImpl/ CreateInvoiceOUWAM UtilitiesReqABCImpl	http:// wamappserver:port/synergen/ WebGateWay	ALL
FW UPDATE SERVICE ORDER	Weblogic username	Weblogic password	Do not modify	Do not modify	http://soaserver:port/soa-infra/services/default/ ProcessWorkOrderUpdate OUWAMUtilitiesReqABC SImpl/ ProcessWorkOrderUpdate OUWAMUtilitiesReqABC SImpl	http:// wamappserver:port/synergen/ WebGateWay	ALL
CCB METER VALIDATION	Weblogic username	Weblogic password	Do not modify	Do not modify	http://soaserver:port/soa-infra/services/default/ ValidateInstalledProductOUWAM UtilitiesReqABCImpl/ ValidateInstalledProductOUWAM UtilitiesReqABCImpl	http:// wamappserver:port/synergen/ WebGateWay	
CCB TRANSACTION ACK	Weblogic username	Weblogic password	Do not modify	Do not modify	http://soaserver:port/soa-infra/services/default/ ProcessWorkOrderResponseOUWAMUtilitiesProv ABCSImpl/ ProcessWorkOrderResponseOUWAMUtilitiesProv ABCSImpl	http:// wamappserver:port/synergen/ WebGateWay	
CCB TRANSACTION NACK	Weblogic username	Weblogic password	Do not modify	Do not modify	http://soaserver:port/soa-infra/services/default/ ProcessWorkOrderResponseOUWAMUtilitiesProv ABCSImpl/ ProcessWorkOrderResponseOUWAMUtilitiesProv ABCSImpl	http:// wamappserver:port/synergen/ WebGateWay	

Code Tables

Configure Code Tables

1. In Oracle Utilities Work and Asset Management v1.9.1.x, navigate to Application Map > Administration subsystem > Code Tables module.
2. Search for and select the appropriate Code Table as indicated in the following sections.
3. Enter the relevant information as indicated in the following sections.
4. Click Save.

5. Define values in the code tables described in this section.

If you have already defined codes you do not need to change them for integration as long as you populate them in the correct DVM so that they properly integrate with the codes used by other integrated application products. The DVM for each code table is indicated with the code table description.

Code Table	Description	Corresponding DVM
Code Table 19: Country Codes	Standard ISO codes already populated.	FS_Country_Code
Asset Type Codes Code Table	Define Asset Type codes to be used. This code table must be set up before synchronizing Premise and Service point information from CC&B to WAM.	FS_Order_ServicePoint TypeCode
Code Table 241: Service Request Problem Codes	Define problem codes to be used.	FS_Order_TypeCode.
Code Table 240: Service Request Type	Define SR Type codes to be used.	FS_Order_TypeCode
Code Table 246: Disconnect Location	Define codes for disconnect locations. The code is used for the <i>Disconnect Location</i> field in the Service Request module Meter Information view.	FS_Order_Disconnect LocationCode
Code Table 251: Personal ID (Account Segement 1)	Configure this code table based on the account that is configured for the integration.	n/a

For more information on configuring accounts, see the section on configuration for [Department, Area and Account](#).

Department, Area and Account

In Oracle Utilities Work and Asset Management v1.9.1.x, the combination of Department, Area, and Account constitutes an Account. Account configuration is required for any usage of the Oracle Utilities Work and Asset Management v1.9.1.x application, and is not specific to the integration. However, you may want to establish accounts that are specific to field work activities.

Navigation	Guideline	Corresponding DVM
App Map > Resource subsystem > Department	Populate Departments based on your business requirements.	FS_Order_OperationsArea
App Map > Resource subsystem > Area module	Populate Areas linked to the created departments based on your business requirements.	In addition to mapping codes, this DVM is used to specify a default WAM account code to be used on the service request.
App Map > Resource subsystem > Account module	Populate Accounts linked to the created departments and areas based on your business requirements.	

Employee for Checkout Transactions

A default Oracle Utilities Work and Asset Management v1.9.1.x employee is referenced on all checkout transactions received from Oracle Utilities Mobile Workforce Management with service request completions. This employee must be set up or identified in Oracle Utilities Work and Asset Management v1.9.1.x and then referenced in the AIA configuration file. Use the following steps if you decide to create a new employee for this purpose.

Note that the values used here are just samples. You can choose appropriate values for your installation.

1. In the Oracle Utilities Work and Asset Management v1.9.1.x application, navigate to App Map > Resource subsystem > *Employee* module
2. Click New.
 - Enter Employee No – FWI001
 - Enter Last Name – FWI
 - Enter First Name – 001
 - Crew – FWI01
 - Craft – FMIINV
3. Click Save.

Responsibility Configuration for Control of Fields (Optional)

It is recommended that you restrict the user's ability to update the schedule date and problem description on the service request once the SR has been activated. In three-way integration, fields being updated in Oracle Utilities Work and Asset Management v1.9.1.x do not update the other two applications. For orders integrated two-way these updates however are carried to the other application containing the order.

Configure the Application for Control of the Schedule Date and Problem Code Fields

1. In Oracle Utilities Work and Asset Management v1.9.1.x, navigate to **App Map** > **Administration** subsystem > **Responsibility**
2. Open the appropriate **Responsibility** record.
3. Select **Service Request** as the module in the **Modules** list.
4. Click **Fields**.
5. Select the **SCHEDULE_DATE** field from the list of values.
6. Select the boxes to set the level of ability for the first selected block and/or field.
7. Click **Save**.
8. Repeat for the **PROBLEM_CODE** field.

For more information about restricting fields, refer to the Oracle Utilities Work and Asset Management v1.9.1.x *User Guide*, under “Responsibility.”

Sequence Numbers

1. In the Oracle Utilities Work and Asset Management v1.9.1.x application navigate to App Map > Administration subsystem > Sequence Numbers module.
Search for and select the table name – SA_SERVICE_REQUEST.
2. Enter the following values:
Sequence No – leave as is, do not change
Prefix – You can choose to use a prefix if required by your organization. Or you may leave it blank.
Length – 7 (do not change)
System – True (this setting is required for system generated service request numbers in Oracle Utilities Work and Asset Management v1.9.1.x).
3. Click Save.

Standard Notes

Users have the option to enter remarks when completing work. Remarks are displayed on the Service Request module Closeout view and must be defined in the Standard Notes module with a note type of CIS Remark.

Scenario 2: CC&B + MWM

In this scenario, the integration product coordinates processing between:

- Oracle Utilities Customer Care and Billing
- Oracle Utilities Mobile Workforce Management

Oracle Utilities Work and Asset Management v1.9.1.x is not configured for Scenario 2.

Scenario 3: MWM + WAM v1.9.1.x

In this scenario, the integration product coordinates processing between:

- Oracle Utilities Mobile Workforce Management
- Oracle Utilities Work and Asset Management v1.9.1.x

Follow the guidelines to configure Oracle Utilities Work and Asset Management v1.9.1.x for Scenario 1 with the following exceptions:

- Customer Interaction is not used
- Billable Charge is not used
- Install Product is not used

Scenario 4: CC&B + WAM

In this scenario, the integration product coordinates processing between:

- Oracle Utilities Customer Care and Billing
- Oracle Utilities Work and Asset Management v1.9.1.x

Follow the guidelines to configure Oracle Utilities Work and Asset Management v1.9.1.x for Scenario 1.

Scenario 5: MWM + WAM v2.1.x

In this scenario, the integration product coordinates processing between:

- Oracle Utilities Mobile Workforce Management
- Oracle Utilities Work and Asset Management v2.1.x

Oracle Utilities Work and Asset Management v1.9.1.x is not configured for Scenario 5.

Chapter 12

Setting up Oracle Utilities Work and Asset Management v2.1.x

The following sections provide details into the Oracle Utilities Work and Asset Management v2.1.x configurations needed to facilitate the integration. Some configurations described may be required for general functionality and do not necessarily relate directly to the integration; however, these are called out as particularly significant configuration items. The inclusion of such items does not mean that other general items that are not mentioned do not need to be configured.

For more information on configuring and working with Oracle Utilities Work and Asset Management, refer to the Oracle Utilities Work and Asset Management v2.1.x User Guide and Configuration Guide.

Scenario 1: CC&B + MWM + WAM v1.9.1.x

In this scenario, the integration product coordinates processing between:

- Oracle Utilities Customer Care and Billing
- Oracle Utilities Work and Asset Management v1.9.1.x
- Oracle Utilities Mobile Workforce Management

Oracle Utilities Work and Asset Management v2.1.x is not configured for Scenario 1.

Scenario 2: CC&B + MWM

In this scenario, the integration product coordinates processing between:

- Oracle Utilities Customer Care and Billing
- Oracle Utilities Mobile Workforce Management

Oracle Utilities Work and Asset Management v2.1.x is not configured for Scenario 2.

Scenario 3: MWM + WAM v1.9.1.x

In this scenario, the integration product coordinates processing between:

- Oracle Utilities Mobile Workforce Management
- Oracle Utilities Work and Asset Management v1.9.1.x

Oracle Utilities Work and Asset Management v2.1.x is not configured for Scenario 3.

Scenario 4: CC&B + WAM v1.9.1.x

In this scenario, the integration product coordinates processing between:

- Oracle Utilities Customer Care and Billing
- Oracle Utilities Work and Asset Management v1.9.1.x

Oracle Utilities Work and Asset Management v2.1.x is not configured for Scenario 4.

Scenario 5: MWM + WAM v2.1.x

In this scenario, the integration product coordinates processing between:

- Oracle Utilities Mobile Workforce Management
- Oracle Utilities Work and Asset Management v2.1.x

You must complete the following steps in Oracle Utilities Work and Asset Management v2.1.x to configure the integration:

1. Configure the admin data to support the integration:
 - Service Area
 - Asset Location Type
 - Storage Location Type
 - Manufacturer
 - TimeZone
 - Activity Type
 - Service History Type
2. Configure Master Data
3. Configure Extendable Lookups
4. Configure XAI to pass messages with the integration layer

Configure Administration Data

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

Configure Service Area

The codes defined here must exactly match values in the DVM for Dispatch Group Code indicated.

- **Navigation:** Admin Menu > Service Area > Add
- **Corresponding DVM:** FS_Order_DispatchGroup
- **Guideline:** Create the Service Area required by your business.

Configure Asset Location Type (Service Point Type)

The codes defined here must exactly match values in the DVM for Service Point Type Code indicated.

- **Navigation:** Admin Menu > Asset Location Type > Add
- **Corresponding DVM:** FS_Order_ServicePointTypeCode
- **Guideline:** Create the Asset Location Type required by your business.

Configure Manufacturer

The codes defined here must exactly match values in the DVM for Manufacturer Type Code indicated.

- **Navigation:** Menu > Asset Management > Manufacturer > Add
- **Corresponding DVM:** FS_Order_ManufacturerCode
- **Guideline:** Create the Manufacturer Codes required by your business.

Configure Storage Location Type

This storage location type is required to be configured in Oracle Utilities Work and Asset Management to later specify the Storage Location that is mapped to edge application.

Note: Separate Stock Location Types need to be created for Stock Location and Vehicles in Oracle Utilities Work and Asset Management.

- **Navigation:** Admin Menu > Storage Location Type > Add
- **Guideline:** Create the Storage Location Type required by your business for storage location and for Vehicles

Configure Time Zone

The codes defined here must exactly match values in the DVM for Time Zone Code indicated.

- **Navigation:** Admin Menu > Time Zone > Add
- **Corresponding DVM:** FS_Order_TimeZone
- **Guideline:** Create the Time Zone required by your business.

Configure Activity Types

The codes defined here must exactly match values in the DVM for Order Type indicated. Refer to the section on FA Type for information on supported activity types..

Note: For the item install, item exchange activity types, Oracle Utilities Work and Asset Management does not force passing existing device details. This is because the recorded asset/device data in Oracle Utilities Work and Asset Management may or may not be accurate as it relates to what is in Oracle Utilities Mobile Workforce Management.

If a message that does not contain the badge number of the existing device is sent to Oracle Utilities Mobile Workforce Management to pass device details, the message will fail. This is caused because base package activity and assignment business objects being used for remove or exchange activity types have business rules that require the badge number of the existing device to be passed in.

In order for the integration to work properly end to end, it is important to pass in the existing asset information from WAM to MWM, otherwise MWM will respond with a negative Acknowledgement ("Badge Number is required") for such an activity.

- **Navigation:** Admin Menu > Activity Type > Add
- **Corresponding DVM:** FS_Order_TypeCode.
- **Guideline:** Create the activity types required by your business and populate the necessary information to define your set of activity types required for your business.

The activity types in this section are used to create activities to send distributed work to Oracle Utilities Mobile Workforce Management. After Oracle Utilities Mobile Workforce Management completes the work, they send activity completion detail message back to Oracle Utilities Work and Asset Management. The message contains information for

new/existing item depending on what work was requested/done. It may also contain information about the device's manufacturer/model and SP details. Completion event types on the activity types are used to process this information and update Oracle Utilities Work and Asset Management database with work completed in the field.

Notes About MWM Activity Completion Messages

- The activity completion message from Oracle Utilities Mobile Workforce Management will contain information for the item.
- Device Manufacturer and Device Model for new item will only be populated if the crew populates them in the field.
- Existing item details (manufacturer and model) will only be populated if different than what Oracle Utilities Work and Asset Management had sent to Oracle Utilities Mobile Workforce Management.

Note: You should configure each activity type with an outbound message type for each usage (Add, Update, Cancel) and external system as specified in the [Setting up the Field Work Process Integration Pack](#) section.

Item Install Activity Type

This activity type is used for item installs. Oracle Utilities Work and Asset Management receives an Oracle Utilities Mobile Workforce Management activity completion message containing:

- New item details + reading
- Optional: Item manufacturer and model of the new item, only if the crew populates them
- Optional: Service Point Details if different from what Oracle Utilities Work and Asset Management sent Oracle Utilities Mobile Workforce Management

Note: Install always assumes there is no existing item otherwise it is an exchange. Crew would cancel the activity and request for an item exchange activity.

Main

Field	Value
Activity Type BO	Outbound Activity Type
Activity BO	Replace Asset Outbound
Category	Field Activity

Completion Event Types

Completion Event Type	Event Relationship Type	Sequence
Install New Meter or Item	Required	10
Record New Meter or Item Specification	Optional	20
Update Service Point Warning	Optional	30
Update Service Point Instruction	Optional	40
Update Service Point Instruction Detail	Optional	50

Item Remove Activity Type

This activity type is used for item remove. Oracle Utilities Work and Asset Management receives Oracle Utilities Mobile Workforce Management activity completion message containing:

- Existing item details + reading before remove
- Optional: Updates to existing item manufacturer and model
- Optional: Service Point Details if different from what Oracle Utilities Work and Asset Management sent Oracle Utilities Mobile Workforce Management

Main

Field	Value
Activity Type BO	Outbound Activity Type
Activity BO	Outbound Activity Core
Category	Field Activity

Completion Event Types

Completion Event Type	Event Relationship Type	Sequence
Remove Existing Meter or Item	Required	10
Update Existing Meter or Item Specification	Optional	20
Update Service Point Warning	Optional	30
Update Service Point Instruction	Optional	40
Update Service Point Instruction Detail	Optional	50

Item Exchange Activity Type

This activity type is used for item exchanges. An item exchange is like an item remove + item install. Oracle Utilities Work and Asset Management receives Oracle Utilities Mobile Workforce Management activity completion message containing:

- Existing item details + reading before remove
- Optional: Updates to existing item manufacturer and model
- New item details + reading
- Optional: Item manufacturer and model of the new item, only if the crew populates them
- Optional: Service Point Details if different from what Oracle Utilities Work and Asset Management sent Oracle Utilities Mobile Workforce Management

Main

Field	Value
Activity Type BO	Outbound Activity Type
Activity BO	Replace Asset Outbound
Category	Field Activity

Completion Event Types

Completion Event Type	Event Relationship Type	Sequence
Remove Existing Meter or Item - Exchange	Required	10
Update Existing Meter or Item Specification	Optional	20
Install New Meter or Item – Exchange	Required	30
Record New Meter or Item Specification	Optional	40
Update Service Point Warning	Optional	50
Update Service Point Instruction	Optional	60
Update Service Point Instruction Detail	Optional	70

Inspection Activity Type

This inspection activity type is used to send a questionnaire to Oracle Utilities Mobile Workforce Management and process questions/answers received back from Oracle Utilities Mobile Workforce Management.

Main

Property	Value
Activity Type BO	Outbound Activity Type
Activity BO	Outbound Activity Core
Category	Field Activity

Completion Event Types

Completion Event Type	Event Relationship Type	Sequence
Create Questionnaire	Required	10
Update Existing Item Specification	Optional	20
Update Service Point Warning	Optional	40
Update Service Point Instruction	Optional	50
Update Service Point Instruction Detail	Optional	60

Service History Type

Your implementation may require that Oracle Utilities Work and Asset Management sends Questionnaires to Oracle Utilities Mobile Workforce Management. A questionnaire is a set of questions for the crew to fill out. The question may be in a form of a check box, text input or radio buttons. Answering of questions is all optional. For example, questions may be about the asset, environment, where the work is being done, etc.

A questionnaire may be sent out alone or may be a part of the distributed work to Oracle Utilities Mobile Workforce Management. When an integration activity maintenance outbound message is created in an activity's sent state, it will be populated with questions and if applicable, possible answers to choose from (e.g. radio buttons). These questions/answers are taken from Questionnaire Service History Type configured on the activity type of the activity.

Configure a service history type with a set of questions and answers as specified below.

To send this questionnaire to Oracle Utilities Mobile Workforce Management in the Oracle Utilities Work and Asset Management integration Activity Maintenance Outbound Message, there are two recommended options:

Option 1 (preferred): Send Questionnaire Only

- Create an activity using the [Inspection Activity Type](#).
- Transition the activity to send state if not already automatically transitioned upon saving.

Option 2: Send Questionnaire as Part of Distributed Work

- Configure the service history type on any of the device activity types.
- Include a product owned create questionnaire completion event type on the activity type.
- Create an activity using the activity type.
- Transition the activity to send state.

Note: Option 2 requires additional setup in Oracle Utilities Mobile Workforce Management.

Oracle Utilities Mobile Workforce Management can receive a questionnaire as part of distributed work, but must be set up accordingly. In Oracle Utilities Mobile Workforce Management, questionnaires are designed as a separate set of data areas so that they can be included in other business objects. However, but not all customers that use the other business objects work with such questionnaires. Given this, the questionnaire is delivered on its own standalone activity business object. Your implementation has the option to extend base business objects and include this as needed.

When the activity is transitioned to the send state, a Fieldwork integration Activity Maintenance Outbound Message is created. The outbound message business object has a pre-processing script, populate questionnaire, to fill out the questionnaire group in the outbound message.

Main

Field	Value
Service History Type BO	Questionnaire Service History Type
Service History BO	Questionnaire Service History
Category	<Your choice>

Questions

Questions need to be set up in the system prior to adding them onto service history type. Create questions relevant to information needed/desired to be collected in the field. Questions can be in the form of:

- A question with check box answer
- A question with text input answer
- A question with multiple radio button answers

When adding questions onto service history type, each question can be marked as repeatable if desired.

Configure Master Data

Storage Location (Stock Location)

A storage location is a physical or logical location at which assets are stored while they are not installed at a service point. The Storage location should be created using the Storage Location types created using details specified in the Admin data setup above.

The codes defined here must exactly match values in the AIA configuration file for the Item and/or Meter Stock Location Codes indicated.

- **Navigation:** Menu > Location> Storage Location > Add
- **DVM:** FS_ItemStockLocationCode
- **Guideline:** Define storage location codes.

Vehicle (Completed By Crew)

When Oracle Utilities Mobile Workforce Management removes an item/meter/ERT from a SP, they can optionally populate stock location. (Stock Location is equivalent to Storage Location in Oracle Utilities Work and Asset Management.) Oracle Utilities Work and Asset Management uses the stock location to remove the asset to, but if it's not populated, then completedByCrew is used instead. This field is always populated on Oracle Utilities Mobile Workforce Management side by the crew performing the work. The Crew is tied to the vehicle in Oracle Utilities Work and Asset Management via identifier.

The Storage location should be created using the Storage Location types created using details specified in the Admin data setup above.

- **Navigation:** Menu > Location> Storage Location > Add
- **Corresponding DVMFF:** FS_Order_Worker
- **Guideline:** Define storage location codes for vehicle and specify the Crew Contact

Configure Extendable Lookups

This section describes extendable lookups that can be configured for your implementation. Note the term in parenthesis indicates the Oracle Utilities Work and Asset Management terminology where the first indicates the Oracle Utilities Mobile Workforce Management term.

Service Instructions (SP Instructions)

Service Instructions to be sent to other applications

- **Navigation:** Admin Menu > Extendable Lookup > W2-ServicePointInstruction
- **Corresponding DVM:** CodeFS_Order_ServiceInstructionsCode
- **Guideline:** Define your service point instruction

Service Warnings (SP Warnings)

Service Warnings to be sent to other applications

- **Navigation:** Admin Menu > Extendable Lookup > W2-ServicePointWarning
- **Corresponding DVM:** CodeFS_Order_ServiceWarningsCode
- **Guideline:** Define your service point Warning

Configure XAI

The following sections identify settings required to communicate using XAI.

Create the Activity Maintenance Outbound Message Type

This outbound message type will be used to send the activity maintenance message. Add details for distributed work to the integration. Create a new Outbound Message Type which maps to the appropriate business object.

1. Navigate to **Admin, Outbound Message Type**, and select **Add**.
2. Enter a unique **Outbound Message Type** and **Description**.
For example, CM- ACTMAINTADD.
3. Populate values as follows:
 - **Business Object** = W1-FldwrkPIPActMaintOutMsg (Fieldwork PIP Act Maintenance Outbound Msg)
 - **Priority** = 50. You can set this to any other value as needed.

Create the Send Activity Maintenance Outbound Message Type

Used to Send Activity Maintenance Message - Update Details for Distributed Work to the **Integration**

Create a new outbound message type which maps to the appropriate business object.

1. Navigate to **Admin, Outbound Message Type**, and select **Add**.
2. Enter a unique **Outbound Message Type** and **Description**.
For example, CM-ACTMAINTUPD.
3. Populate values as follows:
 - **Business Object** = W1-FldwrkPIPActMaintOutMsg
Fieldwork PIP Act Maintenance Outbound Msg
 - **Priority** = 50. You can set this to any other value.

Create the Send Activity Final Details for Distributed Work Outbound Message Type

Create a new outbound message type which maps to the appropriate business object.. This is used to send the final details of the activity for distributed work to the integration layer.

1. Navigate to **Admin, Outbound Message Type**, and select **Add**.
2. Enter a unique **Outbound Message Type** and **Description** (for example, CM- ACTFINAL).
3. Populate values as follows:
 - **Business Object** = W1-FldwrkPIPActFinalOutMsg (Fieldwork PIP Act Final Outbound Msg)
 - **Priority** = 50. You can set this to any other value.

Create an HTTP Sender for Activity Maintenance –Create/Update Message

Create a new XAI sender which points to the Oracle Utilities Work and Asset Management Create/Update Requester ABCS for the **Create/Update Field Order** integration point.

1. Navigate to **Admin, Message Sender, Add**.
2. Enter a unique **XAI Sender** and **Description**.
3. Populate values as follows:
 - **Invocation Type** = Real-time

- **XAI Class** = RTHHTTPSNDR.
This is the class for real-time sender to route messages using HTTP.MSG Encoding = UTF-8 message encoding
4. Select the **Active** check box.
 5. Select the **Context** tab and set values for the following context types:
 - **Character Encoding** – UTF-8
 - **HTTP Login User** – User ID for the url to be accessed
 - **HTTP Login Password** – Password for the url to be accessed
 - **HTTP Header** – SOAPAction: "ProcessWAMWorkOrder"
 - **HTTP Method (POST/GET)** – POST
 - **HTTP Transport Method** – SendReceive
 - **HTTP Timeout: 60** (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 Order Create Update Requester ABCS.

For example: http://[soa server: port]/services/default/
ProcessWorkOrderCreateUpdateOUWAMUtilitiesReqABCSEnv2/
ProcessWorkOrderCreateUpdateOUWAMUtilitiesReqABCSEnv2

Create an HTTP Sender for Activity Final Message

Create a new XAI sender which points to the Oracle Utilities Work and Asset Management Cancel Requester ABCS for the **Cancel Field Order** integration point.

1. Navigate to **Admin, Message Sender, Add**.
2. Enter a unique **XAI Sender** and **Description**.
3. Populate values as follows:
 - **Invocation Type** = Real-time
 - **XAI Class** = RTHHTTPSNDR.
This is the class for real-time sender to route messages using HTTPMSG Encoding = UTF-8 message encoding
4. Select the **Active** check box.
5. Select the **Context** tab and set values for the following context types:
 - **Character Encoding:** UTF-8
 - **HTTP Login User:** User ID for the url to be accessed
 - **HTTP Login Password:** Password for the url to be accessed
 - **HTTP Header:** SOAPAction: "W1-FldwrkPIPActFinalOutMsg"
 - **HTTP Method (POST/GET):** POST
 - **HTTP Transport Method:** SendReceive
 - **HTTP Timeout:** 60 (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 Order Cancel Requester ABCS.

For example: http://[soa-server: port]/services/default/

ProcessWorkOrderCancelOUWAMUtilitiesReqABCImplV2/
ProcessWorkOrderCancelOUWAMUtilitiesReqABCImplV2

Create an External System

Create a new External System for the integration layer.

1. Navigate to **Admin, External System, Add**.
2. Enter a unique **External System** and **Description**.
3. Set **Our Name in Their System** to **WAM**.
4. Add the four outbound message types created above.
 - **Activity Maintenance Message:** Add Outbound Message Type (created above)
 - **Processing method:** Real-time
 - **XAI Sender:** new XAI Sender for Activity Maintenance Message created above
 - **Date/Time Format:** XSD
 - **Message XSL:** W1-AddSOAPEnvMessage.xml
 - **Response XSL:** W1-FldwrkPIPActResponse.xml
 - **Activity Maintenance Message:** Update Outbound Message Type (created above)
 - **Processing method:** Real-time
 - **XAI Sender:** new XAI Sender for Activity Maintenance Message created above
 - **Date/Time Format:** XSD
 - **Message XSL:** W1-AddSOAPEnvMessage.xml
 - **Response XSL:** W1-FldwrkPIPActResponse.xml
 - **Activity Final Message -** Outbound Message Type (created above)
 - **Processing method:** Real-time
 - **XAI Sender:** new XAI Sender for Activity Final Message (created above)
 - **Date/Time Format:** XSD
 - **Message XSL:** W1-AddSOAPEnvMessage.xml
 - **Response XSL:** W1-FldwrkPIPActResponse.xml

Chapter 13

Data Synchronization

Synchronization Between CC&B and WAM v1.9.1.x

This section provides details on the required synchronization between Oracle Utilities Customer Care and Billing and Oracle Utilities Work and Asset Management v1.9.1.x, and discusses how to complete these synchronizations.

Premises and Service Points translate to Oracle Utilities Work and Asset Management v1.9.1.x Assets. Oracle Utilities Customer Care and Billing Accounts with valid Service Agreements translate to Oracle Utilities Work and Asset Management v1.9.1.x Customers. The synchronization of this data is done by batch processing in an initial load. The system then keeps the data in sync using periodic incremental updates. No user action is required to complete these updates.

Both participating applications must be installed, set up and working properly to complete the tasks described in this section.

Synchronizing Premises and Service Points

The integration supports synchronizing Oracle Utilities Customer Care and Billing premise and service point information so that a corresponding asset is created in Oracle Utilities Work and Asset Management v1.9.1.x. As premises and service points are added or changed, database triggers capture these actions and write information to a change log table.

Important: Database configuration is required. Be sure that your system administrator has performed all set up requirements to configure the database for the integration.

Note: If the functionality provided by the base integration does not meet your business requirements, you can create your own batch processes for synchronizing data and/or create Customer Modification (CM) triggers to capture different premise and service point changes.

Processing Details

- When users update Oracle Utilities Work and Asset Management v1.9.1.x Asset records that originated from Oracle Utilities Customer Care and Billing, Oracle Utilities Work and Asset Management v1.9.1.x does not send updates back to Oracle Utilities Customer Care and Billing and Asset fields are not restricted from update in Oracle Utilities Work and Asset Management v1.9.1.x.
- Records can be downloaded from Oracle Utilities Customer Care and Billing in two modes - initial load and incremental update.
- The integration extracts records from Oracle Utilities Customer Care and Billing and uploads them into the Oracle Utilities Work and Asset Management v1.9.1.x Asset

Interface table. At the scheduled run time, the Oracle Utilities Work and Asset Management v1.9.1.x batch job creates new Asset records or updates existing Asset records with data from the Asset Interface Table and the defaults from the business rules.

- The system assigns a Premise Asset Record Type when an Asset is created from an Oracle Utilities Customer Care and Billing Premise or assigns a SP Asset record Type when an Asset is created from an Oracle Utilities Customer Care and Billing Service Point. The Asset record types are defined in code table 230. The Oracle Utilities Customer Care and Billing Premise Types and Asset Types are defined in the Oracle Utilities Work and Asset Management v1.9.1.x Asset Type Table (Code Table 29).
- An Asset record is not created for a Premise until a Service Point has also been created in Oracle Utilities Customer Care and Billing for the Premise. The system does not transfer information for a Premise or Account without a Service Point in Oracle Utilities Customer Care and Billing.
- When users create or update customer records in Oracle Utilities Customer Care and Billing, the integration populates related information in Oracle Utilities Work and Asset Management v1.9.1.x. This information can be found in the Oracle Utilities Customer Care and Billing Account Information section on the Oracle Utilities Work and Asset Management v1.9.1.x Customer module header. The Oracle Utilities Work and Asset Management v1.9.1.x Customer ID is equivalent to the Oracle Utilities Customer Care and Billing Account Number.
- Related Service Agreement information is displayed in the Oracle Utilities Work and Asset Management v1.9.1.x Customer module Address (Detail) view in the Oracle Utilities Customer Care and Billing Service Agreements section. The Premise ID is populated in the Oracle Utilities Customer Care and Billing Premise ID field on the same screen. The account may have multiple addresses, so the Contact Info flag is set on the Oracle Utilities Customer Care and Billing mailing address record.

Updating Information

When an existing Premise and/or Service Point are updated in Oracle Utilities Customer Care and Billing, the integration records are changed in the Oracle Utilities Work and Asset Management v1.9.1.x Interface Table and uploaded into Oracle Utilities Work and Asset Management v1.9.1.x.

Premise Alternate Addresses and Non-Badged items associated to Service Points are not created or updated on the Oracle Utilities Work and Asset Management v1.9.1.x Asset record.

Before Running CC&B Background Download Process

Before you run the Oracle Utilities Customer Care and Billing background download process, complete the following configurations, data backup, and create a database link.

WAM v1.9.1.x Configurations to Complete

Manually configure Oracle Utilities Work and Asset Management v1.9.1.x Asset Type Codes Code Table.

Synchronize asset types between Oracle Utilities Work and Asset Management v1.9.1.x and Oracle Utilities Customer Care and Billing to use this data as part of the integration business processes.

Description	Asset Type Codes
Used by Integration Point	Work Order and Asset Data Synchronization
CC&B Entity	SP_TYPE or PREMISE_TYPE
WAM Entity	Asset Type Codes Code Table

Description	Asset Type Codes
Required Mapping	Asset Type Code == SP_TYPE Code (if Asset is an SP) Asset Type Code == PREMISE_TYPE Code (if Asset is a Premise)

- Configure Oracle Utilities Work and Asset Management v1.9.1.x Batch Processes.
- Configure the following Oracle Utilities Work and Asset Management v1.9.1.x Business Rules.
- Default Accts for Interfaces Business Rule
- Interface Parameters Rule
- Interfaces Rules
- Product Integration CCB Rule

Data Backup

Ensure that you have created a backup of the database prior to running the Oracle Utilities Customer Care and Billing background download process.

Create Database Link

Create a database link called WAM from the Oracle Utilities Customer Care and Billing database to the Oracle Utilities Work and Asset Management v1.9.1.x database before running the Oracle Utilities Customer Care and Billing Background Download Process. This database link should have access to synergen objects in Oracle Utilities Work and Asset Management v1.9.1.x database.

Copy and unzip the file WAM.zip to a local drive on the desktop. This zip file is shipped with Oracle Utilities Customer Care and Billing and can be located on the Oracle Utilities Customer Care and Billing shipment. After the file is unzipped, follow the steps to complete the synchronization:

Create A Database Link

1. Navigate to the Scripts sub-folder.

This sub-folder contains the SQL files that update your database for this installation. Some of the SQL files in this folder may contain DDL (data definition language) statements that may change the object definition or create new objects in your database. You may customize these DDL statements to match your storage requirements.

2. Logon to the Oracle Utilities Customer Care and Billing database as application owner (CISADM) using SQLPlus.

The integration requires that you have triggers defined in the Oracle Utilities Customer Care and Billing database.

3. Run the following sql scripts to generate the triggers:

- C1_CCB_WAM_ACCT.SQL
- C1_CCB_WAM_ACCTPER.SQL
- C1_CCB_WAM_PER.SQL
- C1_CCB_WAM_PERN.SQL
- C1_CCB_WAM_PERP.SQL
- C1_CCB_WAM_SA.SQL

- C1_CCB_WAM_SPSQL
 - C1_CCB_WAM_PREM_AST.SQL
 - C1_CCB_WAM_PREM_CUST.SQL
4. Log in to the Oracle Utilities Customer Care and Billing database as SYSTEM and run the sql script :
- C1_CCB_WAM_SYNON.SQL

Oracle Utilities Customer Care and Billing Background Download Process

Run the download batch process as an initial sync or as an incremental update. Run this process for your initial synchronization.

Process	C1-WAMAS
WAM Interface Table	WAIF_ASSET
Description	C1-WAMAS is responsible for extracting the information for the integration and updating WAIF_ASSET.

Oracle Utilities Work and Asset Management v1.9.1.x Upload Process

Run WIFP_ASSET_INTERFACE to update the Oracle Utilities Work and Asset Management v1.9.1.x application tables with the Asset information extracted from Oracle Utilities Customer Care and Billing into WAIF_ASSET. WIFP_ASSET_INTERFACE was set up as part of configurations.

WAM Interface Table	WAIF_ASSET
WAM Batch Process	WIFP_ASSET_INTERFACE

Synchronizing Account/Service Agreements and Customers

A customer in Oracle Utilities Customer Care and Billing is defined as the main person on an account with an active service agreement (Pending Start, Active or Pending Stop statuses) with a Service Agreement / Service Point relationship.

When Oracle Utilities Customer Care and Billing users create new Accounts and Service Agreements, batch processing automatically creates a Customer record in Oracle Utilities Work and Asset Management v1.9.1.x. Additions and changes to Oracle Utilities Customer Care and Billing Accounts are also synchronized with Customer records in Oracle Utilities Work and Asset Management v1.9.1.x as needed.

Processing Details

- Records are extracted and uploaded into the Oracle Utilities Work and Asset Management v1.9.1.x Customer Interface table. At the scheduled run time, the Oracle Utilities Work and Asset Management v1.9.1.x batch job manager creates new Customer records containing the Customer's name and ID and associated Premise Address data and Service Agreements for the Account.
- Customer records become Active or Inactive in Oracle Utilities Work and Asset Management v1.9.1.x based on whether a currently active Service Agreement/Service Point relationship exists (SA start/stop). Oracle Utilities Work and Asset Management v1.9.1.x uses the Account ID assigned in Oracle Utilities Customer Care and Billing as the Customer ID.

- A Customer record is not created until a service agreement has been created for the Account in Oracle Utilities Customer Care and Billing.

Updating Information

As customer information is added or changed in the integration, database triggers capture these actions and write information to a change log table. The same processing as is used for new records updates fields in the Customer records.

Oracle Utilities Customer Care and Billing Background Download Process

CC&B Background Process	C1-WAMEX
WAM Interface Table	WAIF_CUSTOMER
WAM Batch Process	WIFP_ASSET_INTERFACE
Guideline	C1-WAMEX extracts information from CC&B and updates WAIF_CUSTOMER through a database link. Run the download batch process as an initial sync or as an incremental update.

Oracle Utilities Work and Asset Management v1.9.1.x Upload Process

WAM Interface Table	WAIF_CUSTOMER
WAM Batch Process	WIFP_CUSTOMER_INTERFACE
Guideline	In order to upload the Customer information extracted from CC&B into WAM application tables, run WIFP_CUSTOMER_INTERFACE.

Tracking Data Changes

A change in some of the Premise, Service Point and Customer data in Oracle Utilities Customer Care and Billing populates the Change Log Table using database triggers. The Change Log Table tracks changes to the source data that must be reflected in the asset management system. The database triggers enabled on the affected tables populate the Oracle Utilities Customer Care and Billing Change Log Table with the following fields:

- **Batch Control** - Responsible for extracting the changes made to records on the Table and moving the data from Oracle Utilities Customer Care and Billing to the Oracle Utilities Work and Asset Management v1.9.1.x Integration tables using db link.
- **Table** – The table where the data has been manipulated.
- **Primary Key Value** – The value of the extract driver.
- **Change Type** – The type of change. Possible values include Insert, Update and Delete.
- **Date/Time** – The date and time that the change occurred.

Triggers

The following tables show a summary of the triggers used for the batch control indicated. The trigger is required in the Oracle Utilities Customer Care and Billing database to track the indicated changes.

Batch Control: C1-Oracle Utilities Work and Asset Management v1.9.1.xAS

Changes Tracked: Asset

Trigger Name	Table	Action Monitored	PK Values Stored	Fields Monitored
C1_CCB_WAM_SP	CI_SP	Insert/ Update	SP_ID	PREM_ID SP_TYPE_CD SP_STATUS_FLG INSTALL_DT
C1_CCB_WAM_PREM_AST	CI_PREM	Update	PREM_ID	PREM_TYPE_CD PARENT_PREM_ID ADDRESS1 ADDRESS2 CITY STATE POSTAL

Batch Control: C1-Oracle Utilities Work and Asset Management v1.9.1.xEX

Changes Tracked: Customer

Trigger Name	Table	Action Monitored	Filter Condition	PK Values Stored	Fields Monitored
C1_CCB_WAM_ACCT	Account	Update		ACCT_ID	MAILING_PREM_ID BILL_CYC_CD SETUP_DT
C1_CCB_WAM_ACCTPER	Account Person	Insert/Update		ACCT_ID, PER_ID	MAIN_CUST_SW ACCT_REL_TYP E_CD BILL_ADDR_SRC E_FLG PER_ID
C1_CCB_WAM_PER	Person	Update		PER_ID	EMAILID
C1_CCB_WAM_PERN	Person Name	Insert/Update	new.PRIM_NAME _SW = 'Y'	PER_ID	ENTITY_NAME PRIM_NAME_SW
C1_CCB_WAM_PERP	Person Phone	Insert/Update		PER_ID, SEQ_NUM	PHONE EXTENSION
C1_CCB_WAM_PREM_CUST	Premise	Update		PREM_ID	PREM_TYPE_CD PARENT_PREM_ID ADDRESS1 ADDRESS2 CITY STATE POSTAL
C1_CCB_WAM_SA	SA	Update		SA_ID	SA_STATUS_FLG SA_TYPE_CD START_DT
C1_CCB_WAM_SASP	SASP	Insert		ACCT_ID, SA_ID, SA_SP_ID	

Normally, the PK Values contain the Prime Key of the table being monitored; however, to reduce duplicate records from being inserted in the Oracle Utilities Work and Asset Management v1.9.1.x interface tables, some of the tables have the ACCT ID in the prime key.

Note: The PLANT can be defined in 3 different places in the system. The triggers do not track changes to PLANT because this field is rarely changed. Plant is synchronized only to Oracle Utilities Work and Asset Management v1.9.1.x when the batch process is run on initial load.

Chapter 14

Setting up the Field Work Process Integration Pack

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

Scenario 1: CC&B – MWM - WAM v1.9.1.x

In this scenario, the integration product coordinates processing between three Oracle Utilities application products based on the configuration settings described. All three application products and the integration product must be configured to enable this business scenario. This section of the document describes the configuration required for one of the application products.

To configure the integration layer for Scenario 1:

- AIAConfigurationProperties.xml
- Domain Value Maps
- Error Handling

Setting AIA Configuration Properties

Various configurations that apply to the entire Oracle AIA system, Core Infrastructure Components, and specific process integration services are stored in the AIAConfigurationProperties.xml file which is stored in MDS.

This section lists the configurations in this file that are used by the integration layer. These configurations hold several configurable values that are picked up by the integration at runtime to:

- Default some business entity value sent to the target edge applications when the data is moved from one system to another. These configuration values may need to be updated to your implementation specific values for the integration to work correctly. These properties are described in this section in detail.
- Activate custom implemented extension points available inside the ABCS. By default these properties are set not to invoke any of the extension points as the extension points need to be implemented using the AIA ABCS Extension guidelines before being activated. These properties need to be changed only if you decide to extend the core functionality provided by this Process integration Pack, using the predefined ABCS extension points. These properties are not listed in this section but can be identified in the AIAConfigurationProperties.xml file as the name of these Service Configuration properties start with ABCSExtension and are available in the file under each ABCS Name.

For more information on extending the ABCS using extension points, see [Chapter 16: General Extensibility Options](#).

- Get the endpoint URLs for Provider ABCS. These properties are set to appropriate values during the installation of Process Integration Pack, based on the information specified during the installation. You should not have to modify the values.

Settings for System Properties

Two sets of configuration properties are described in this section:

- Module Configurations are the properties that are shared by multiple integration processes within the integration layer.
- Service Configurations are the properties that are used by a specific ABCS.

Module Configurations

Module Name	Property Name	Default / Shipped Value	Integration Point	Description
OUFieldWorkPIP WorkOrderAction Codes	WorkOrder.ActionCode. CREATE	CREATE	Work Order	This is internally used by the integration to identify the messages sent for Work order creation. Do not change the value of this property.
OUFieldWorkPIP WorkOrderAction Codes	WorkOrder.ActionCode. UPDATE	UPDATE	Work Order	This is internally used by the integration to identify the messages sent for Work order updates. Do not change the value of this property.
OUFieldWorkPIP WorkOrderAction Codes	WorkOrder.ActionCode. COMPLETE	COMPLETE	Work Order	This is internally used by the integration to identify the messages sent for Work order completion. Do not change the value of this property.
OUFieldWorkPIP WorkOrderAction Codes	WorkOrder.ActionCode. CANCEL	CANCEL	Work Order	This is internally used by the integration to identify the messages sent for Work order cancellation. Do not change the value of this property.
OUFieldWorkPIPWo rkOrderActionCodes	WorkOrder.ActionCode. INCOMPLETE	IN-COMPLETE	Work Order	This is internally used by the integration to identify the messages sent for Work order incomplete transactions. Do not change the value of this property.
OUFieldWorkPIPWo rkOrderActionCodes	WorkOrder.ActionCode. STATUSUPDATE	STATUSUPDATE	Work Order	This is internally used by the integration to identify the messages sent for Work order status updates. Do not change the value of this property.

Module Name	Property Name	Default / Shipped Value	Integration Point	Description
Ouwam	WAM.WorkOrder.Default.MessageID	0000000000	Work Order	This is a default message ID used for Work Order messages sent from WAM. Do not change the value of this property.
OUMWM	OUMWM.Transaction Code.CREATE	M2AD	Work Order	The MWM transaction code set on the Work Order Create messages inbound to MWM. Do not change.
OUMWM	OUMWM.Transaction Code.UPDATE	M2UP	Work Order	The MWM transaction code set on the Work Order Update messages inbound to MWM. Do not change.
OUMWM	OUMWM.Transaction Code.CANCEL	M2CA	Work Order	The MWM transaction code set on the Work Order Cancel messages inbound to MWM. Do not change.
OUMWM	OUMWM.Transaction Code.COMPLETE	M2CO	Work Order	The MWM transaction code set on the Work Order Cancel messages inbound to MWM. Do not change.
OUMWM	OUMWM.timeUsage Window	M1EF	Work Order	This specifies the timeUsageWindow in MWM. Do not change.
OUMWM	OUMWM.Plant	FWI	ALL IPs	This specifies the WAM plant that MWM is integrated with.
OUMWM	OUMWM.External System	FWI-PIP	ALL IPs	This is the external system configured in the MWM.
Ouwam	Ouwam.Transaction Code.CREATE	W1AD	WorkOrder	The WAM Transaction code set on the Work Order Create messages inbound/outbound for WAM v2.1.x. Do not change.
Ouwam	Ouwam.Transaction Code.UPDATE	W1UP	WorkOrder	The WAM transaction code set on the Work Order Update messages coming from WAM v2.1.x. Do not change the value of this property for WAM v2.1.x.
Ouwam	Ouwam.Transaction Code.CANCEL	W1CA	WorkOrder	The WAM Transaction code set on the Work Order Cancel messages coming from/to WAM v2.1.x. Do not change the value of this property for WAM v2.1.x.

Module Name	Property Name	Default / Shipped Value	Integration Point	Description
OUWAM	OUWAM.IdentifierType. PIPActivity	W1FA	WorkOrder	The Identifier Type is used by WAM 2.x to determine the types of identifiers being passed in. This identifier type is used to identify the PIP Id. Do not change the value of this property for WAM v2.1.x.
OUWAM	OUWAM.IdentifierType. MWMActivity	W1MT	WorkOrder	The Identifier Type is used by WAM 2.x to determine the types of identifiers being passed in. This identifier type is used to identify the MWM Activity ID. Do not change the value of this property for WAM v2.1.x.
OUWAM	OUWAM.IdentifierType. RelatedActivity	W1RA	WorkOrder	The Identifier Type is used by WAM 2.x to determine the types of identifiers being passed in. This identifier type is used to identify the parent WAM Activity ID. Do not change the value of this property for WAM v2.1.x.

ABCS Configurations

ABCS Name	Property Name	Default / Shipped Value	Description
CreateCustomerInteraction OUWAMUtilitiesReqABC SI mpl	ContactClass	SVC	Used by the customer interaction process to specify an CC&B Contact Class to be used when a customer contact is created in CC&B by this process. Specify the contact class created above for this property. Refer to Customer Contact Class and Type for configuration details.
CreateCustomerInteraction OUWAMUtilitiesReqABC SI mpl	ContactType	MISC	Used by the customer interaction process to specify an CC&B Contact Type to be used when a customer contact is created in CC&B by this process. Specify the contact type created above for this property. Refer to Customer Contact Class and Type for configuration details.
CreateCustomerInteraction OUWAMUtilitiesReqABC SI mpl	Description	Added with WAM Requester ABCS to create Customer Contact in CC&B	This is the Description that is specified on the Customer Contact when it is created in CC&B by the customer interaction. You can change this to the text that you wish to have on these customer contacts.
CreateCustomerInteraction OUWAMUtilitiesReqABC SI mpl	ToDoRole	SUPPORT	Used by the customer interaction process to specify a CC&B ToDORole to be used when a ToDo is created in CC&B by this process. Set this property to the created/ identified To Do Role for this purpose. Refer to To Do Type/ To Do Role for configuration details.
CreateCustomerInteraction OUWAMUtilitiesReqABC SI mpl	TriggerDay	20	This property is for future use. Do not modify.
CreateCustomerInteraction OUWAMUtilitiesReqABC SI mpl	TriggerToDo	YES	This property is for future use. Do not modify.
CreateInvoiceOUCCBUt ilitiesProvABC SI Impl	CCB.BillableChargeSA Type Code	MI-SUBCH	This is the CC&B SA Type used by Billable Charge Integration process for finding or creating a Billable Charge SA. Set this to the appropriate CC&B SA Type that you use for this purpose.

ABCS Name	Property Name	Default / Shipped Value	Description
CreateInvoiceOUCCBUtilitiesProvABCImpl	CCB.CisDivisionCode	OH	This is the default CIS Division to use for finding or creating a Billable Charge SA in CC&B. This is only used when CC&B cannot find the CIS Division for the input Account or SP. Set this to the appropriate CC&B CIS Division that you use for this purpose.
CreateInvoiceOUCCBUtilitiesProvABCImpl	CCB.OrderIDCharacteristicTypeCode	CI_SOLID	This is the Characteristic Type to use for storing the common Work Order ID in the Billable Charge Upload Line Characteristics.
CreateInvoiceOUCCBUtilitiesProvABCImpl	CCB.SAStartOption	<blank>	This is the SA Start Option used for finding or creating a Billable Charge SA. This is an optional field. You can specify a valid CC&B SA Start Option to be used for this purpose.
CreateInvoiceOUCCBUtilitiesProvABCImpl	CCB.ToDoMessageCategory	90000	Set this to a valid CC&B Message Category that you want to be used for To Do entries created by the Billable Charge process. Set this property to the created/identified To Do Message Category for this purpose. Refer to To Do Type/ To Do Role for configuration details.
CreateInvoiceOUCCBUtilitiesProvABCImpl	CCB.ToDOMessageNumber	5010	Set this to a valid CC&B Message Number that you want to be used for To Do entries created by the Billable Charge process. Set this property to the created/identified To Do Message Number for this purpose. Refer to To Do Type/ To Do Role for configuration details.
CreateInvoiceOUCCBUtilitiesProvABCImpl	CCB.ToDoRole	<blank>	CC&B To Do Role to be used by Billable Charge process, for the creation of a To Do Entry when multiple accounts are linked to an SP. This is an optional field. Set this property to the created/identified To Do Role for this purpose if needed. Refer to To Do Type/ To Do Role for configuration details.
CreateInvoiceOUCCBUtilitiesProvABCImpl	CCB.ToDOTypeCode	CI_WRNMU	CC&B To Do Type to use by Billable Charge process, for the creation of a To Do Entry when multiple accounts are linked to an SP. Set this property to the created/identified To Do Type for this purpose.

ABCS Name	Property Name	Default / Shipped Value	Description
CreateInvoiceOUCCBUtilitiesProvABCImpl	CCB.BillableChargeDescriptionOnBill	Field Work Charges	This property is used to default the Billable Charge Description on Bill.
GetWOLineApptWinAvailOUCCBUtilitiesReqABCImpl	CCB.ResponseCodeForErrorAppointment	100	This is the response code used by Appointments when there is an error retrieving the appointment slots. For internal use only. Do not modify.
GetWOLineApptWinAvailOUCCBUtilitiesReqABCImpl	CCB.ResponseCodeForSuccessWithoutAvailableAppointment	101	This is the response code used by Appointments when no appointment slots were found for the search criteria specified. For internal use only. Do not modify.
GetWOLineApptWinAvailOUCCBUtilitiesReqABCImpl	GeoCodeLatitude GeoCodeLongitude	LAT LONG	Specify the value for the CC&B Geo Types used on service point to indicate geographic coordinates. Refer to Geographic Type for configuration details.
GetWOLineApptWinAvailOUMWMUtilitiesProvABCImpl	24hours.Default.Value	2400	This value is for internal use by this integration. Do not modify.
GetWOLineApptWinAvailOUMWMUtilitiesProvABCImpl	destination.Default.Value	RTS	This value is for scheduler system use for routing appointment request to end MWM application. This value is for internal use. Do not modify.
GetWOLineApptWinAvailOUMWMUtilitiesProvABCImpl	FONumber.Default.Value	00000	This is the default Field Order Number used by the Appointments when the order number is missing in the Request for appointment slots sent from CC&B. For internal use only. Do not modify.
GetWOLineApptWinAvailOUMWMUtilitiesProvABCImplV2	MaxApptWinCount.Default.Value	1000	Default value of Max Appointment Window Count
GetWOLineApptWinAvailOUMWMUtilitiesProvABCImplV2	MaxCostUnits.Default.Value	1e99	Default value of Max Cost Units.
GetWOLineApptWinAvailOUMWMUtilitiesProvABCImplV2	SlotGroup.Default.Value	<blank>	Default value of SlotGroup. It is empty by default.
ProcessWorkOrderCompleteOUMWMUtilitiesReqABCImplV2	Default.Cancel.Reason	Canceled/ Completed in WAM	This is the cancellation reason text sent to WAM when MWM cancels a Work Order. You can change this to the text that you wish to use for this purpose.
ProcessWorkOrderCompleteOUMWMUtilitiesReqABCImplV2	Default.Plant	FWI	This is the default Plant Information sent from MWM to WAM

ABCS Name	Property Name	Default / Shipped Value	Description
ProcessWorkOrderCompleteOUMWMUtilitiesReqABC SImplV2	Default.MeterReadSource	FWI	This is the default meter read source.
ProcessWorkOrderCompleteOUMWMUtilitiesReqABC SImpl	MWM.Pass.Representative.Information	true	<p>This is used to indicate whether or not the representative ID is to be passed to CC&B.</p> <p>If the property is false indicating that the representative ID should not be passed to CC&B, then the CC&B Provider uses the generic representative configured in the AIA Configuration.</p> <p>If the property is true indicating that the representative ID should be passed, the MWM requester passes the representative ID to the Integration layer. The integration layer looks up the new DVM and passes the value configured in the DVM.</p> <p>If the Crew Data is synchronized between CC&B and MWM, this DVM can be left empty. When DVM is left empty, integration layer passes the CrewID coming from MWM directly to CC&B without any transformation.</p>
ProcessWorkOrderCompleteOUMWMUtilitiesReqABC SImplV2	MWM.Pass.Representative.Information	false	<p>This is used to indicate whether or not the representative ID is to be passed to CC&B.</p> <p>If the property is false indicating that the representative ID should not be passed to CC&B, then the CC&B Provider uses the generic representative configured in the AIA Configuration.</p> <p>If the property is true indicating that the representative ID should be passed, the MWM requester passes the representative ID to the Integration layer. The integration layer looks up the new DVM and passes the value configured in the DVM.</p> <p>If the Crew Data is synchronized between CC&B and MWM, this DVM can be left empty. When DVM is left empty, integration layer passes the CrewID coming from MWM directly to CC&B without any transformation.</p>
ProcessWorkOrderCompleteOUWAMUtilitiesReqABC SImpl	WAM.Pass.Representative.Information	true	This is the WAM Pass Representative Information
ProcessWorkOrderCreateOUMWMUtilitiesReqABC SImplV2	MWM.SPValidation.MessageCategory	11503	Message Category populated for SP Validation

ABCS Name	Property Name	Default / Shipped Value	Description
ProcessWorkOrderCreateOUMWMUtilitiesReqABCImplV2	MWM.SPValidation.MessageNumber	11214	Message Number populated for SP Validation
ProcessWorkOrderOUCCBUtilitiesReqABCImpl	OUCCB.PhoneType.Value	HOME	Default Phone Type value passed from C&B.
ProcessWorkOrderCreateOUMWMUtilitiesReqABCImplV2	CreateCustomerContact.Flag	false	Set to either True or False to indicate whether a customer contact is to be created in CC&B along with field activities that are created by the integration. This property is used by Work Order process, when an Order Create request is sent from MWM to CC&B.
ProcessWorkOrderOUCCBUtilitiesReqABCImpl	OUCCB.GeoCode Latitude OUCCB.GeoCode Longitude	GRID_X GRID_Y	Specify the value for the CC&B Geo Types used on service point to indicate geographic coordinates. Refer to Geographic Type for configuration details.
ProcessWorkOrderCreateOUWAMUtilitiesReqABCImpl	Default.Dispatch.Group	FWIUSER	This is the dispatch group used by Work Order process for all Order Creates sent from WAM to CC&B. Set this value to match with one of the values in the DVM FS_Order_DispatchGroup under column OU_WAM_01.
ProcessWorkOrderCreateOUWAMUtilitiesReqABCImpl	Default.Enrichment.For.Meter.SystemID	OU_CCB_01	This is used by the Work Order process to identify the application used for retrieving meter and register information for Order Create messages sent from WAM. Do not modify.
ProcessWorkOrderOUCCBUtilitiesProvABCImpl	CCB.CustomerContact.Class	CC	This is the CC&B Customer Contact Class that is used by Work Order process when this process creates a new field activity in CC&B as a result of Order Create Request from WAM or MWM. Set this property to the created/identified Customer Contact Class for this purpose. Refer to Customer Contact Class and Type for configuration details.
ProcessWorkOrderOUCCBUtilitiesProvABCImpl	CCB.CustomerContact.Desc	New SR created from Field Work Integration.	This is the Description that is specified on the Customer Contact when it is created in CC&B by the Work Order process when this process creates a new field activity in CC&B as a result of Order Create Request from WAM or MWM. You can change this to the text that you wish to have on customer contacts.

ABCS Name	Property Name	Default / Shipped Value	Description
ProcessWorkOrderOUCCB UtilitiesProvABCSEImpl	CCB.CustomerContact. Type	INQUIRE	This is the CC&B Customer Contact Type that is used by Work Order process when this process creates a new field activity in CC&B as a result of Order Create Request from WAM or MWM. Set this property to the created/ identified Customer Contact Type for this purpose. Refer to Customer Contact Class and Type for configuration details.
ProcessWorkOrderOUCCB UtilitiesProvABCSEImpl	CCB.Representative. FACompletion	MWMCR1	The representative to be used when MWM or WAM sends an order completion message to CC&B. Must be valid in CC&B for the CC&B Dispatch Group(s) used for sending orders.
ProcessWorkOrderOUCCB UtilitiesProvABCSEImpl	CCB.ToDoRole	CIACTIV	Specify the value for the CC&B user role that the To DoEntry created by the Work Order process should be assigned to. Set this property to the created/ identified To Do Role for this purpose. Refer to To Do Type/ To Do Role for configuration details.
ProcessWorkOrder OUWAMUtilitiesProv ABCSEImpl	Default.Employee.For. InventoryLog	MWM, INTEGRATION	This is the default WAM checkout employee used by the Work Order process for the inventory log transactions sent from MWM to WAM with the Order Completion message. All the inventory log transactions are created for this WAM employee. Set this to a valid WAM employee name to be used for this purpose. The name is to be specified in the format <Employee Last Name>, <Space><Employee First Name>. Refer to Employee for Checkout Transactions .
ProcessWorkOrderRespon seOUCCBUtilitiesProvABC SEImpl	Default.Create.FA.Log	true	Values are true and false. This is used by Work Order Integration process while sending positive or negative acknowledgements back into CC&B and determines if a FA Log entry is to be created in CC&B on the receipt of the acknowledgement.

ABCS Name	Property Name	Default / Shipped Value	Description
ProcessWorkOrderResponseOUCCBUtilitiesProvABCSEImpl	Default.Notification.External.ID	AIA-FS	This is the CC&B Notification External ID used by the Work Order integration process while sending positive or negative acknowledgements back into CC&B for Order messages sent out by CC&B. Set this to a valid External System. See Setting Up CC&B > Configure Download and XAI section for more information.
ProcessWorkOrderResponseOUCCBUtilitiesProvABCSEImpl	Default.Reply.To.Message.Source	AIA-FS	This is the CC&B Reply To Message Source used by the Work Order integration process while sending positive or negative acknowledgements back into CC&B for Order messages sent out by CC&B. Set this to a valid External System. See Setting Up CC&B > Configure Download and XAI section for more information.
ProcessWorkOrderUpdateOUWAMUtilitiesReqABCSEImpl	Default.Dispatch.Group	FWIUSER	This is the dispatch group used by Work Order flow for all Order Creates sent from WAM to CC&B. This value must match the value of the Default.Dispatch.Group, which was set for Create messages in a previous step.
ProcessWorkOrderUpdateOUWAMUtilitiesReqABCSEImpl	IntermediateStatus	CREX	This is used to identify the intermediate status code sent by WAM for Work Order Update messages. Do not modify.
ProcessWorkOrderCompleteOUWAMUtilitiesReqABCSEImpl	WAM.Pass.Representative.Information	true	This is used to indicate whether or not the representative ID is to be passed to CC&B. If the property is false indicating that the representative ID should not be passed to CC&B, then the CC&B Provider uses the generic representative configured in the AIA Configuration. If the property is true indicating that the representative ID should be passed, the WAM requester passes the representative ID to the Integration layer. The integration layer looks up the new DVM and passes the value configured in the DVM. If the Crew Data is synchronized between CC&B and WAM, this DVM can be left empty. When DVM is left empty, integration layer passes the CrewID coming from WAM directly to CC&B without any transformation.

ABCS Name	Property Name	Default / Shipped Value	Description
ProcessWorkOrder CompleteOUWAMUtilities ReqABC SImpl	Default.Cancel.Reason	Canceled in WAM	This is the cancellation reason text sent to CC&B/MWM with the cancellation request, when WAM cancels a Work Order. You can change this to the text that you wish to use for this purpose.
ValidateInstalledProduct OUMWMUtilitiesReq ABCImplV2	Transaction.Code	Read	Default value of Transaction Code. Do not change this property value

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. The DVMs are stored in MDS. For example, **FOOT** and **FT** or **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.

Maintain the Information within Domain Value Maps

1. Open a browser and access the SOA Composer (<http://soa-server:soa-port/soa/composer>) for your installation.
2. On the SOA Composer application open DVM.
3. Search and select the relevant DVM you wish to maintain.
4. Set up the required values for each integrated application.

The Oracle Process Integration Pack for Oracle Utilities Field Work work includes the following DVMs:

DVM	Integration Points	Description
FS_Invoice_ChargeLineTypeCode	BillableCharge	DVM mapping for charge line type code
FS_Order_DisconnectLocationCode	WorkOrder	DVM mapping for disconnect location code
FS_Order_DispatchGroup	WorkOrder, AvailableAppointment	DVM mapping for dispatch group
FS_Order_Division	WorkOrder, AvailableAppointment	DVM mapping for division
FS_Order_ExpenseTypeCode	WorkOrder	DVM mapping for expense type code.
FS_Order_ItemStatusCode	WorkOrder	DVM mapping for item status code
FS_Order_ItemStockLocationCode	WorkOrder	DVM mapping for item stock location code
FS_Order_ItemTypeCode	WorkOrder	DVM mapping for item type code

DVM	Integration Points	Description
FS_Order_MeterConfigurationType	WorkOrder, InstalledProduct	DVM mapping for meter configuration type
FS_Order_MeterStatusCode	WorkOrder	DVM mapping for meter status code
FS_Order_MeterStockLocationCode	WorkOrder	DVM mapping for meter stock location code
FS_Order_MeterTypeCode	WorkOrder	DVM mapping for meter type code
FS_Order_OperationsArea	WorkOrder, AvailableAppointment	DVM mapping for operations area. For WAM, this is set up as Dept**Area
FS_Order_ReadTypeCode	WorkOrder	DVM mapping for meter read type code
FS_Order_RegisterReadUnitCode	WorkOrder, InstalledProduct	DVM mapping for register read unit code
FS_Order_RegisterTimeOfUseCode	WorkOrder, InstalledProduct	DVM mapping for register read time of use code
FS_Order_ServicePointTypeCode	WorkOrder, AvailableAppointment	DVM mapping for service point type code
FS_Order_Status	WorkOrder	DVM mapping for order status
FS_Order_SubStatus	WorkOrder	DVM mapping for order sub status
FS_Order_TypeCode	WorkOrder, AvailableAppointment	DVM mapping for order type code. For WAM, this is set up as Service Request Type**Problem Code
FS_Order_Worker	WorkOrder	DVM mapping for Representative ID values
FS_Order_RemarksCode	WorkOrder	DVM mapping for Remarks Code values
FS_Order_StepType	WorkOrder	DVM mapping for Step Type values
FS_Order_SlotGroup	AvailableAppointment	DVM mapping for Slot group for an Appointment values
FS_Order_MeterLocationCode	WorkOrder	DVM mapping for Meter Location Code values
FS_Order_PriorityCode	WorkOrder	DVM mapping for Priority Code values

DVM	Integration Points	Description
FS_Order_TimeZone	WorkOrder	DVM mapping for passing Time Zone Code values
FS_Country_Code	WorkOrder	DVM mapping to pass Country Codes
FS_Language_Code	InstalledProduct	DVM mapping to pass Language Codes
FS_Order_TypeCode_Use ReadingOnBill	WorkOrder	DVM mapping to map UseOnBill Indicator based on Order Type Code
FS_Order_ManufacturerCode	WorkOrder	DVM mapping to map Manufacturer code of Meter/Item.
FS_Order_ServiceWarnings	WorkOrder	DVM mapping to map service warnings
FS_Order_ServiceInstructions	WorkOrder	DVM mapping to map service instructions
FS_Order_PremiseTypeCode	WorkOrder	DVM mapping to map Premise Type
FS_Order_ServiceTypeCode	WorkOrder	DVM mapping to map Service Type

For more information about DVMs, refer to *Oracle Fusion Middleware Developing SOA Applications with Oracle SOA Suite* section titled "Working with Domain Value Maps".

For information on matching values for each DVM, refer to the applicable section in [Setting up Oracle Utilities Customer Care and Billing](#) for OU_CCB_01, [Setting up Oracle Utilities Work and Asset Management v1.9.1.x](#) for OU_WAM_01, [Setting up Oracle Utilities Work and Asset Management v2.1.x](#) for OU_WAM_01 and to [Setting up Oracle Utilities Mobile Workforce Management](#) for OU_MWM_01.

FS_Invoice_ChargeLineTypeCode

Bill charge line types simplify the creation of billable charges in Oracle Utilities Customer Care and Billing. Each line type contains values that are defaulted onto the line details associated with the uploaded billable charges.

When billing information is sent from Oracle Utilities Work and Asset Management v1.9.1.x to Oracle Utilities Customer Care and Billing, using the **Invoice** integration point, this DVM is used

to populate the appropriate value for the bill charge line type. This bill charge line type is then used within Oracle Utilities Customer Care and Billing to control the behavior of the billable charge.

Common	OU_CCB_01	OU_WAM_01	OU_CCB_SHOW_ON_BILL
AIA common value: Describes the type of charge line. Must be unique for each DVM row.	Must match values for Bill Charge Line Type .	Must match values for Category in the EXPENSE CODE Business Rule.	This information is used to populate the Description on Bill information for the Billable Charge Upload Staging Line. This is the description of the charge line that appears on the customer's bill in CC&B.

Note that since MWM is not involved in the **Invoice** integration point that uses this DVM, the OU_MWM_01 column is not used and should be left blank.

FS_Order_DisconnectLocationCode

When a service point is disconnected from the supply source, a disconnect location must be specified. This location defines where service was severed.

Common	OU_CCB_01	OU_WAM_01	OU_MWM_01
AIA common value: Describes the disconnect location. Must be unique for each DVM row.	Must match values for Disconnect Location	Must match values for Disconnect Location in Code Table 246.	Must match values for Disconnect Location Code. MWM uses the Disconnect Location Extendable Lookup

FS_Order_DispatchGroup

A dispatch group is a logical group of representatives located at an operations area. When a field activity is created, the system assigns it to a dispatch group based on the type of activity, the type of service point, and the operations area that manages the service point.

Each of the edge applications in use may refer to a dispatch group differently. To account for these differences, create the mapping between the dispatch groups in each application using this DVM.

Common	OU_CCB_01	OU_WAM_01	OU_MWM_01
AIA common value: Describes the dispatch group. Must be unique for each DVM row.	Must match values for Dispatch Group	WAM does not store a Dispatch Group. This column can be blank except for one row where the value is set to the default WAM Dispatch Group as specified in the AIA Configuration Properties. The property is Default.Dispatch.Group for WAM create and update requester.	Must match values for Service Area.

FS_Order_ItemStatusCode

Maps Item Status code from Oracle Utilities Mobile Workforce Management to Oracle Utilities Customer Care and Billing when Oracle Utilities Mobile Workforce Management sends Order Completion to Oracle Utilities Customer Care and Billing with Item information.

Common	OU_CCB_01	OU_WAM_01	OU_MWM_01
AIA common value: Describes the Status. Must be unique for each DVM row.	Must match with valid On-Off Status in CC&B related to Items. The values in CC&B are 0 for OFF and 1 for ON.	Leave blank.	MWM uses the M2_DEVICE_STATUS_FLG Lookup.

FS_Order_ItemStockLocationCode

A stock location is a physical or logical location at which items are stored while they are not installed at a service point. When an item is removed from a service point the stock location must be entered. Each edge application involve may have different codes for the various stock locations.

Common	OU_CCB_01	OU_WAM_01	OU_MWM_01
AIA common value: Describes the item stock location. Must be unique for each DVM row.	Must match values for 'Stock Location'.	Leave blank.	MWM uses the Stock Location Extendable Lookup

FS_Order_ItemTypeCode

Items are any type of equipment, other than meters. Every item has an item type that defines characteristics common to all items with this type. Each edge application involve may have different codes for the item types.

Common	OU_CCB_01	OU_WAM_01	OU_MWM_01
AIA common value: Describes the item type. Must be unique for each DVM row.	Must match values for Item Type .	Leave blank.	Leave blank.

FS_Order_MeterConfigurationType

Every meter configuration must reference a meter configuration type. Each edge application involve may have different codes for the meter configuration types.

Common	OU_CCB_01	OU_WAM_01	OU_MWM_01
AIA common value: Describes the meter configuration type. Must be unique for each DVM row.	Must match values for Meter Configuration Type .	Must match the CC&B value on the corresponding rows.	MWM uses the Meter Configuration Type Extendable Lookup

FS_Order_MeterStatusCode

Maps the Meter Status code between Oracle Utilities Mobile Workforce Management, Oracle Utilities Work and Asset Management v1.9.1.x and Oracle Utilities Customer Care and Billing when Oracle Utilities Mobile Workforce Management or Oracle Utilities Work and Asset Management v1.9.1.x sends Order Completion to Oracle Utilities Customer Care and Billing with Meter information.

Common	OU_CCB_01	OU_WAM_01	OU_MWM_01
AIA common value: Describes the Status. Must be unique for each DVM row.	Must match valid Meter On-Off Status in CC&B. The values in CC&B are 0 for OFF and 1 for ON.	Must match valid Meter Status in WAM. The values in WAM are 0 for OFF and 1 for ON.	MWM uses the M2_DEVICE_STATUS_FLG Lookup.

FS_Order_MeterStockLocationCode

A stock location is a physical or logical location at which meters are stored while they are not installed at a service point. When a meter is removed from a service point its stock location must be input. Each edge application involve may have different codes for the various stock locations.

Common	OU_CCB_01	OU_WAM_01	OU_MWM_01
AIA common value: Describes the meter stock location. Must be unique for each DVM row.	Must match values for Stock Location	Must match the MWM value on the corresponding rows.	MWM uses the Stock Location Extendable Lookup

FS_Order_MeterTypeCode

Every meter references a meter type. The meter type defines the type of service and common characteristics shared by its meters. Each edge application involved may have different codes for the various meter types.

Common	OU_CCB_01	OU_WAM_01	OU_MWM_01
AIA common value: Describes the meter type. Must be unique for each DVM row.	Must match values for Meter Type	Must match the CC&B value on the corresponding rows.	Must match the CC&B value on the corresponding rows.

FS_Order_OperationsArea

When a service point is set up, the operation areas that manage its fieldwork are defined. Each edge application involved may have different codes for the various operation areas. v1.9.1.x.

Common	OU_CCB_01	OU_WAM_01	OU_MWM_01	OU_WAM_05
AIA common value: Describes the operation area. Must be unique for each DVM row.	Must match values for Operation Area	Set to a combination of valid WAM department code and area code. Use the format: <department_code>** <area_code>.	Must match values in the MWM configuration table DHTDIST, column DISTRICT.	Specify a valid WAM account code to be used as the default account for each combination of WAM department and area, to be used on the SR.

FS_Order_ReadTypeCode

Read type indicates who read a meter and how it was read. This information accompanies meter register reading data. Each edge application involved may have different codes for read types.

This DVM is shipped with required values populated. You should not need to change these values.

Common	OU_CCB_01	OU_WAM_01	OU_MWM_01
AIA common value: Describes the read type code. Must be unique for each DVM row.	CC&B values for this column are 60 and 70.	CC&B values for this column are 60 and 70.	CC&B values for this column are 60 and 70.

FS_Order_RegisterReadUnitCode

Register read unit code indicates the units of measure of the register reading. This information accompanies meter register reading data. Each edge application involved may have different codes for units of measure.

Common	OU_CCB_01	OU_WAM_01	OU_MWM_01
AIA common value: Describes the register read unit code. Must be unique for each DVM row.	Specify a list of Unit of measure valid in CC&B.	Must match the CC&B value on the corresponding rows.	MWM uses the Unit Of Measure Extendable Lookup

FS_Order_RegisterTimeOfUseCode

Maps register time of use (TOU) codes between Oracle Utilities Customer Care and Billing, Oracle Utilities Work and Asset Management v1.9.1.x and Oracle Utilities Mobile Workforce Management.

Common	OU_CCB_01	OU_WAM_01	OU_MWM_01
AIA common value: Describes the register TOU. Must be unique for each DVM row.	Specify a list Time Of Use Codes valid in CC&B.	Must match the CC&B value on the corresponding rows.	MWM uses the Time Of Use Extendable Lookup

FS_Order_ServicePointTypeCode

Every service point must reference a service point (SP) type. The SP type controls almost all aspects of the service point behavior (for example, the type of field activity that may be dispatched to it, the type of service agreement that may be linked to it, the type of meter that may be installed at it). Each edge application involved may have different codes for SP Type.

Common	OU_CCB_01	OU_WAM_01	OU_MWM_01
AIA common value: Describes the service point type. Must be unique for each DVM row.	Specify a list of Service Point Types valid in CC&B.	Must match values for Asset Type Codes Code Table. The Asset Type codes in this code table that correspond to the CC&B Service Point type codes need to be listed in this DVM.	n/a

FS_Order_Status

Order status indicates the current state or status of the order such as Active, Held, or Finished. Each edge application involved may have different codes for Status.

This DVM is shipped with required values predefined. You should not need to change these values.

Common	OU_CCB_01	OU_WAM_01	OU_MWM_01	OU_WAM_01_CANCELED
AIA common value: Describes the order status. Must be unique for each DVM row.	A list of valid CC&B FA Statuses has been specified in this column.	A list of valid WAM SR Statuses has been specified in this column.	A list of valid MWM FO Statuses has been specified in this column.	A list of valid WAM statuses for canceled messages in WAM.

FS_Order_SubStatus

For status updates from Oracle Utilities Work and Asset Management v1.9.1.x to Oracle Utilities Customer Care and Billing, this maps Oracle Utilities Work and Asset Management v1.9.1.x status codes to Oracle Utilities Customer Care and Billing Intermediate Status Codes. For status updates from Oracle Utilities Mobile Workforce Management to Oracle Utilities Customer Care and Billing, this maps Oracle Utilities Mobile Workforce Management Transaction codes to Oracle Utilities Customer Care and Billing Intermediate Statuses.

Common	OU_CCB_01	OU_WAM_01	OU_MWM_01
AIA common value: Describes the intermediate status. Must be unique for each DVM row.	Specify a list of valid CC&B intermediate statuses.	Must match values for WAM service request status and must contain a row with the value CREX in this column with the corresponding CC&B value also specified as CREX.	Specify MWM transaction IDs corresponding to the intermediate status in CC&B. A list of values is shipped for this DVM.

FS_Order_TypeCode

The order type code is used for two important functions:

- Mapping field activity type values, **Service Request Type** and **Problem Code** values, and Field Order Type values between the edge applications involved in the integration,
- Determining which applications an order is routed to when it is created.

Column	Description
COMMON	AIA common value: Describes the order type. Must be unique for each DVM row.
OU_CCB_01	Must match values for field activity types
OU_WAM_01	This holds a concatenation of two values: Service Request Type (WAM Code table 240) Problem Code (WAM Code table 241) These are separated by “**” for example in the format: <WAM SR Type>**<WAM Problem Code>.
OU_MWM_01	Must match values for activity types in MWM.
ROUTE_TO_CCB	When this value is set to Y orders of this type are routed to CC&B when they are created by either WAM or MWM. When set to N orders are not routed.
ROUTE_TO_WAM	When this value is set to Y orders of this type are routed to WAM when they are created by either CC&B or MWM.
ROUTE_TO_MWM	When this value is set to Y orders of this type are routed to MWM when they are created by either WAM or CC&B. When set to N orders are not routed.

FS_Order_Worker

This indicates the Representative ID of the person who worked on the Order. This information is used for identifying the exact Crew who worked on any particular Order. This is an optional setup and required only if the crews are not synchronized between the edge applications.

Common	OU_CCB_01	OU_WAM_01	OU_MWM_01
AIA common value: Describes the representative ID. Must be unique for each DVM row.	CC&B Representative ID value	Must match Crew ID	Must match WorkedBy Field

FS_Order_RemarksCode

This indicates the Remarks Codes associated with an Order. Remarks codes are mapped from Oracle Utilities Mobile Workforce Management and/or Oracle Utilities Work and Asset Management v1.9.1.x into Oracle Utilities Customer Care and Billing.

Oracle Utilities Mobile Workforce Management and Oracle Utilities Work and Asset Management v1.9.1.x send a list of codes to Oracle Utilities Customer Care and Billing.

Common	OU_CCB_01	OU_WAM_01	OU_MWM_01
AIA common value: Describes the remarks code. Must be unique for each DVM row.	CC&B Remarks Code value	WAM Remarks code value	MWM Remarks Code value

FS_Order_StepType

This indicates the Step Types associated with an Order sent from Oracle Utilities Customer Care and Billing. Step Types are mapped between Oracle Utilities Customer Care and Billing, Oracle Utilities Mobile Workforce Management and Oracle Utilities Work and Asset Management v1.9.1.x.

This DVM only maps Oracle Utilities Customer Care and Billing Step type to Common Step type. Oracle Utilities Mobile Workforce Management or Oracle Utilities Work and Asset Management v1.9.1.x step types are not mapped. The implementation can customize and use this DVM to map to Oracle Utilities Work and Asset Management v1.9.1.x or Oracle Utilities Mobile Workforce Management step types if needed.

Common	OU_CCB_01	OU_WAM_01	OU_MWM_01
AIA common value: Describes the step type. Must be unique for each DVM row.	CC&B Step Type value	WAM Step Type value	MWM Step Type value

FS_Order_SlotGroup

This indicates the Slot Group associated with an Appointment.

Common	OU_CCB_01	OU_WAM_01	OU_MWM_01
AIA common value: Describes the slot group. Must be unique for each DVM row.	CC&B Slot Group value		MWM Slot Group value

FS_Order_MeterLocationCode

This indicates the Location of a Meter. This DVM is applicable only to Oracle Utilities Customer Care and Billing and Oracle Utilities Mobile Workforce Management.

Common	OU_CCB_01	OU_WAM_01	OU_MWM_01
AIA common value: Describes the meter location. Must be unique for each DVM row.	CC&B Meter Location Code value		MWM Meter Location Code value

FS_Order_PriorityCode

This indicates the Priority Code of Orders. This DVM is used to map Priority Codes between Oracle Utilities Customer Care and Billing, Oracle Utilities Work and Asset Management v1.9.1.x and Oracle Utilities Mobile Workforce Management.

Note: In Oracle Utilities Mobile Workforce Management the Priority Code is mapped to the Queue.

Common	OU_CCB_01	OU_WAM_01	OU_MWM_01
AIA common value: Describes the Priority Code. Must be unique for each DVM row.	CC&B Priority Code value	WAM Priority Code value	MWM PriorityCode value

FS_Order_TimeZone

This DVM is used to map Time Zones between Oracle Utilities Customer Care and Billing, Oracle Utilities Work and Asset Management v1.9.1.x and Oracle Utilities Mobile Workforce Management.

Common	OU_CCB_01	OU_WAM_01	OU_MWM_01
AIA common value: Describes the Time Zone. Must be unique for each DVM row.	CC&B Time Zone value	WAM Time Zone value	MWM Time Zone value

FS_Country_Code

This DVM is used to map Country Codes between Oracle Utilities Customer Care and Billing, Oracle Utilities Work and Asset Management v1.9.1.x and Oracle Utilities Mobile Workforce Management.

Common	OU_CCB_01	OU_WAM_01	OU_MWM_01
AIA common value: Describes the Country Code. Must be unique for each DVM row.	CC&B Country Code value	WAM Country Code value	MWM Country Code value

FS_Language_Code

This DVM is used to map Language Codes between Oracle Utilities Customer Care and Billing, Oracle Utilities Work and Asset Management v1.9.1.x and Oracle Utilities Mobile Workforce Management. Currently the language code is only passed from Oracle Utilities Mobile Workforce Management to Oracle Utilities Customer Care and Billing for Installed Product.

Common	OU_CCB_01	OU_WAM_01	OU_MWM_01
AIA common value: Describes the Language Code. Must be unique for each DVM row.	CC&B Language Code value	WAM Language Code value	MWM Language Code value

FS_Order_TypeCode_UseReadingOnBill

This DVM is used to map the Use on Bill Indicator on a Reading depending on the Order Type. The Use on Bill Indicator can be either true or false.

OU_CCB_ORDER_TYPE_CODE	USE_READING_ON_BILL
CC&B Order Type Code value	Use On Bill Indicator.

FS_Order_ManufacturerCode

This indicates the Manufacturer of a Meter or Item. This DVM is applicable only to Oracle Utilities Customer Care and Billing and Oracle Utilities Mobile Workforce Management.

Common	OU_CCB_01	OU_WAM_01	OU_MWM_01
AIA common value: Describes the meter/item manufacturer. Must be unique for each DVM row.	CC&B Meter/Item Manufacturer Code value		MWM uses the Meter/Item Manufacturer Code value stored as extendable lookup

FS_Order_ServiceWarningsCode

This indicates the Service Warnings associated with a Service Point. This DVM is applicable only to Oracle Utilities Customer Care and Billing and Oracle Utilities Mobile Workforce Management.

Common	OU_CCB_01	OU_WAM_01	OU_MWM_01
AIA common value: Describes the service warnings code associated with a service point. Must be unique for each DVM row.	CC&B Service Warnings Code value		MWM uses the Service Warnings Code value stored as an extendable lookup

FS_Order_ServiceInstructionsCode

This indicates the Service Instructions associated with a Service Point. This DVM is applicable only to Oracle Utilities Customer Care and Billing and Oracle Utilities Mobile Workforce Management.

Common	OU_CCB_01	OU_WAM_01	OU_MWM_01
AIA common value: Describes the service instructions code associated with a service point. Must be unique for each DVM row.	CC&B Service Instructions Code value		MWM uses the Service Instructions Code value stored as an extendable lookup

FS_Order_PremiseTypeCode

This indicates the Premise Type. This DVM is applicable only to Oracle Utilities Customer Care and Billing and Oracle Utilities Mobile Workforce Management.

Common	OU_CCB_01	OU_WAM_01	OU_MWM_01
AIA common value: Describes the premise type code.	CC&B Premise Type Code value		MWM uses the Premise Type Code value stored as the M2-PremiseType extendable lookup

FS_Order_ServiceTypeCode

This indicates the Service Type. This DVM is applicable only to Oracle Utilities Customer Care and Billing and Oracle Utilities Mobile Workforce Management.

Common	OU_CCB_01	OU_WAM_01	OU_MWM_01
AIA common value: Describes the Service Type code.	CC&B Service Type Code value		MWM Service Point Type Code value stored as extendable lookup M2-ServicePointType

Cross-References

Cross-references map and connect the records within the application network, and enable these applications to communicate in the same language. The integration server stores the relationship in a persistent way so that others can refer to it.

These are the cross-references for the integration layer:

Note: During implementation you do not need to do anything with this table. This table is populated by the integration processes as orders are created.

XREFTABLENAME	COLUMN NAME	DESCR	USAGE
FS_ORDER_ID	OU_CCB_01	CC&B FA ID	Populated by work order create business flow for orders that involve CC&B
	COMMON		Populated by work order create business flow
	OU_MWM_01	MWM FO ID	Populated by work order create business flow for orders that involve MWM
	OU_WAM_01	WAM SR ID	Populated by work order create business flow for orders that involve WAM
	ROUTED_TO_CCB		Populated by work order create business flow for orders that are routed to CC&B
	ROUTED_TO_WAM		Populated by work order create business flow for orders that are routed to WAM
	ROUTED_TO_MWM		Populated by work order create business flow for orders that are routed to MWM

For more information about cross-references, refer to the *Oracle Fusion Middleware Developer's Guide for Oracle SOA Core Extension* under "Understanding Message Transformation, Enrichment, and Configuration" and "Creating Cross-References."

Updating MDS with AIA Meta Data

You must upload artifacts to MDS if any of the following occurs:

- New artifacts are created
- Extensions or customizations are made on artifacts
- DVM changes are made in AIAMetaData
- AIAConfigurationProperties.xml is changed

Oracle MDS repository contains all metadata. The contents under <AIA_HOME>/AIAMetaData are uploaded to SOA-MDS > apps/AIAMetaData. This includes specific schemas, WSDLs, DVMs, Cross Reference metadata, default faultPolicies, AIAConfigurationProperties.xml and AIAEHNotification.xml

For more information about updating MDS, see *Oracle Application Integration Architecture – Foundation Pack: Integration Developers Guide*, "Updating MDS."

Note: You may need to bounce the SOA managed server to activate the changes uploaded to the MDS.

Update Configuration Properties

There are two steps to update the configuration:

- Download the configuration properties file from MDS using GetFieldWorkConfigFileDP.xml

Linux:

```
ant -f $SOA_HOME/aiAFP/Install/AID/AIAInstallDriver.xml -
DDeploymentPlan=$AIA_HOME/pips/FieldWork/DeploymentPlans/
GetFieldWorkConfigFileDP.xml
```

Windows:

```
ant -f %SOA_HOME%\aiAFP\Install\AID\AIAInstallDriver.xml -
DDeploymentPlan=%AIA_HOME%\pips\FieldWork\DeploymentPlans\GetFieldWo
rkConfigFileDP.xml
```

It will prompt for admin host, port, user name and password. Pass the details.

- Edit the downloaded file in \$AIA_HOME/config folder and make the changes that needs to updated and run the UpdateFieldWorkConfigFileDP.xml utility provided.

Linux:

```
ant -f $SOA_HOME/aiAFP/Install/AID/AIAInstallDriver.xml -
DDeploymentPlan=$AIA_HOME/pips/FieldWork/DeploymentPlans/
UpdateFieldWorkConfigFileDP.xml
```

Windows:

```
ant -f %SOA_HOME%\aiAFP\Install\AID\AIAInstallDriver.xml -
DDeploymentPlan=%AIA_HOME%\pips\FieldWork\DeploymentPlans\UpdateField
WorkConfigFileDP.xml
```

Deploying Individual Composites/Undeploying Composites and Updating MDS

FieldWorkCustomDP.xml utility is provided for this purpose. Edit the file. Add as per the comments in the file and run the command accordingly.

Linux:

```
ant -f $SOA_HOME/aiAFP/Install/AID/AIAInstallDriver.xml -
DDeploymentPlan=$AIA_HOME/pips/FieldWork/DeploymentPlans/
FieldWorkCustomDP.xml
```

Windows:

```
ant -f %SOA_HOME%\aiAFP\Install\AID\AIAInstallDriver.xml -
DDeploymentPlan=%AIA_HOME%\pips\FieldWork\DeploymentPlans\FieldWorkC
ustomDP.xml
```

It will prompt for admin host, port, user name and password. Pass the details

Update MDS with AIAMetaData

Update the appropriate WSDL/DVM files in AIAMetData under \$AIA_HOME. SOA Core Extensions for 12.1.3 provides UpdateMetaDataDP.xml utility for updating MDS.

- "Source the file aiaenv.sh (located at Middleware Home/user_projects/domains/soa_domain/soa/aia/bin) by executing the following command

```
source aiaenv.sh
```

- "Browse to the folder at \$DOMAIN_LOCATION/soa/aia/MDSUtils/UpdateMetaDataDP.xml and open the deployment plan file, UpdateMetaDataDP.xml.
- Update the file UpdateMetaDataDP.xml by inserting include tags for each resource group that you want to add to the MDS:

Example to update DVM:

```
<fileset dir="${env.SERVICES_LOCATION}/AIAMetaData">
<include name="dvm/FS_Order_ServiceTypeCode.dvm" />
</fileset>
```

Example to update wsdl file:

```
<fileset dir="${env.SERVICES_LOCATION}/AIAMetaData">
  <include name="AIAComponents/ApplicationConnectorServiceLibrary/
OUWAM/V2/RequestorABCS/
ProcessWorkOrderCancelOUWAMUtilitiesReqABCSImplV2.wsdl" />
</fileset>
```

Run the update utility.

Linux:

```
ant -f $SOA_HOME/aiafp/Install/AID/AIAInstallDriver.xml -
DDeploymentPlan=$DOMAIN_LOCATION/soa/aia/MDSUtils/
UpdateMetaDataDP.xml
```

Windows:

```
ant -f %SOA_HOME%\aiafp\Install\AID\AIAInstallDriver.xml -
DDeploymentPlan=
%DOMAIN_LOCATION%\soa\ai\MDSUtils\UpdateMetaDataDP.xml
```

It will prompt for admin host, port, user name and password. Pass the details

Error Notification Setup

Based on the roles defined for the services, email notifications are sent if a service errors out.

For more information about error handling and error notifications; refer to the Oracle Fusion Middleware Developer's Guide for Oracle SOA Core Extension, "Configuring Oracle AIA Processes for Error Handling and Trace Logging".

SOA Infrastructure Common Properties

Payload Validation property defined in SOA Infrastructure should be turned off.

This property is defined on SOA level under Common Properties and can be overridden for each process.

Make sure your implementation always has Payload Validation disabled.

Part 3

Additional Information

This section includes the following chapters:

- [Chapter 15: Monitoring, Error Handling and Troubleshooting](#)
- [Chapter 16: General Extensibility Options](#)
- [Chapter 17: Custom Extensions](#)
- [Chapter 18: Security](#)
- [Chapter 19: Processing CC&B NDS Records Using Middleware/BPEL](#)
- [Appendix A: MPL](#)

Chapter 15

Monitoring, Error Handling and Troubleshooting

This chapter provides detail into monitoring, error handling, and troubleshooting, and discusses how to:

- Monitor from Oracle Utilities Customer Care and Billing
- Monitor from Oracle Utilities Mobile Workforce Management
- Monitor from Oracle Utilities Work and Asset Management v1.9.1.x
- Monitor from the Integration Layer
- Manage Failure Scenarios

Monitoring in CC&B

Errors related to online integration are logged into XAI logs. Outgoing Messages in error can be found and resubmitted using Notification Download Staging and XAI Download Staging pages. Log files are written to the file designated during installation.

- spl.log - used to log errors in Oracle Utilities Customer Care and Billing
- xai.trc - used to log request messages received by XAI and responses to these messages
- xai.log - used to log any activities performed by XAI

For more information about errors and notifications refer to the Oracle Utilities Customer Care and Billing documentation.

Field Activity Creation

Use the Notification Download Staging table to check the message status for created or updated field activities.

- When a field activity is successfully created, the NDS record is in Complete status.
- An XDS file is also created and stored in Complete status.
- If the NDS record indicates an error, check xai log files for error details.
- If the NDS record is not created, verify whether you have an FA Integration algorithm defined on the dispatch group for the field activity.

Connection Errors

Verify whether or not the middleware is polling for NDS records properly to locate errors on outgoing messages. Refer to xai.trc for incoming messages.

Monitoring in MWM

Errors related to XAI integration are logged into XAI logs. Log files are written to the file designated during installation. spl.log - used to log errors in Oracle Utilities Mobile Workforce Management.

- xai.trc - used to log request messages received by XAI and responses to these messages
- xai.log - used to log any activities performed by XAI.

Sync Request records are created for sending new activity, status update, and activity completion outbound messages. The F1-SYNRQ batch process monitors these records and will resend the messages until successful.

For more information about errors and notifications see the Oracle Mobile Workforce Management documentation.

Common Errors

Activity Not Received

Verify whether the activity was sent to Oracle Utilities Mobile Workforce Management.

When an activity is sent to Oracle Utilities Mobile Workforce Management, a response is returned to the integration layer indicating success or failure. If the transaction failed, the response contains an error message indicating the reason for the failure. If the activity was successful, the task ID is returned in the response.

1. Search for and select the appropriate activity in the **Activity** portal and verify the details.
2. Check the **Log** tab and look for Log Type of External System to see acknowledgements received.

Connection Errors

If the connection is not successful, check the following settings:

- Verify that the urls specified in the XAI Senders are correct for the environment.
- Verify that the Oracle Application server with AIA installation is up and running.

Monitoring in WAM v1.9.1.x

Errors related to Oracle Utilities Work and Asset Management v1.9.1.x are processed as follows:

Database Procedure – Errors are written to the Oracle Utilities Work and Asset Management v1.9.1.x Job Manager Log. This log can be viewed from within Oracle Utilities Work and Asset Management v1.9.1.x.

Inbound messages - Errors are logged in **xt_web_services_inbound_log**.

Detailed errors are logged to the Oracle Utilities Work and Asset Management v1.9.1.x **OC4J** instance in the redirected output/errors log (default pathname is <oracle-home>).

Monitoring in WAM v2.1.x

Errors related to XAI integration are logged into XAI logs. Log files are written to the file designated during installation. spl.log - used to log errors in Oracle Utilities Work and Asset Management v2.1.x.

- xai.trc - used to log request messages received by XAI and responses to these messages
- xai.log - used to log any activities performed by XAI

Errors in sending activity create/update/cancel outbound messages result in Outbound messages being in error and hence the activity is in Error state. Messages can be Resend from the **Activity** page in case of previous errors.

For more information about errors and notifications see the Oracle Work and Asset Management documentation.

Common Errors

Activity Not Received

Verify whether the activity was sent to Oracle Utilities Work and Asset Management.

When an activity is sent from Oracle Utilities Work and Asset Management to Oracle Utilities Mobile Workforce Management, a response is returned to the integration layer indicating success or failure. If the transaction failed, an acknowledgement containing an error message indicating the reason for the failure is sent back to WAM. If the activity was successful, the MWM Task Id and PIP Common Id is returned as an acknowledgement to WAM.

1. Search for and select the appropriate activity in the **Activity** portal.
2. Check the **Identification** section and look for the MWM Task ID and the Fieldwork PIP Activity ID.
3. Check the **Log** tab and look for Log Type of External System to see acknowledgements received.

Connection Errors

If the connection is not successful, check the following settings:

- Verify that the urls specified in the XAI Senders are correct for the environment.
- Verify that the Oracle SOA Server is up and running

Verification Steps in Oracle Enterprise Manager

1. The Administrator user receives a notification e-mail for any failures in integration processes.
2. The notification e-mail includes an error text and description and a link to the failed instance of the composite on Oracle EM console.
3. On logging into the Enterprise Manager Console, the user can see more details about the instance.
4. The status of the ABCS instance, payload and child processes can be monitored form the EM Console.
5. If the composite is a BPEL process, the BPEL process indicates which step the failure has occurred on and also gives the error details.

For more information about error notifications, refer to the Oracle Fusion Middleware Developer's Guide for Oracle SOA Core Extension under "Configuring Oracle AIA Processes for Error Handling and Trace Logging".

Message Resubmission

This section explains the actions that users can take to fix transactions failing in the edge applications. Also if there are any errors then this section explains how the failed messages can be resubmitted.

The error scenarios are divided into two categories

1. Business Errors

These are errors which occur in the Edge applications or in the Integration layer because of incorrect data setup. For these errors the message has to be resubmitted after the data has been corrected.

For example, Oracle Utilities Customer Care and Billing initiated FA and Order Type missing in the FS_Order_TypeCode DVM for Oracle Utilities Work and Asset Management v1.9.1.x column.

2. Technical Errors

These errors are usually connection failures. This occurs when one of the three systems is unreachable. These messages are moved to the Exception Queue and can be resubmitted from the exception queue once the edge application is reachable.

For example, Oracle Utilities Customer Care and Billing initiated Order and Oracle Utilities Work and Asset Management v1.9.1.x server is down.

In case of Oracle Utilities Customer Care and Billing if the message reaches Oracle Utilities Customer Care and Billing and fails a ToDo is created. For Oracle Utilities Work and Asset Management v1.9.1.x and Oracle Utilities Mobile Workforce Management e-mail is sent out to the administrator and an Oracle Worklist application task is created.

Note: If the customer configures the fault policies for providers with retries then the messages will not roll back into the error queue in case of errors.OOB delivered local fault policy files do not have any retries specified

Business Errors

The business errors in the edge applications can be handled as follows:

#	Initiating Application	Failure in Application	Resubmitting the message
1	CC&B	WAM	Resend the message from Oracle Utilities Customer Care and Billing.
2	CC&B	MWM	Resend the message from Oracle Utilities Customer Care and Billing.
3	WAM v1.9.1.x	CC&B	Submit the message in Oracle Utilities Customer Care and Billing using XAI Upload Staging.
4	WAWAM v1.9.1.xM	MWM	Submit the message from BPEL.
5	WAM v2.1.x	MWM	Resend the message from Oracle Utilities Work and Asset Management from the Activity page.
6	MWM	CC&B	Submit the message in Oracle Utilities Customer Care and Billing using XAI Upload Staging.
7	MWM	WAM v1.9.1.x	Submit the message from BPEL or upload the message from WAM interface table .
8	MWM	WAM v2.1.x	Resubmit the message from BPEL.

Outgoing Messages Resend

CC&B Outgoing Messages Resend

Oracle Utilities Customer Care and Billing has message resend ability for outgoing messages.

Triggering Event

Creation, Update, or Cancellation of a field activity in Oracle Utilities Customer Care and Billing with a Dispatch Group that is associated to an external system (this is controlled by an algorithm on Dispatch Group).

Retry for Business Errors

If any of the target applications returns a business error while processing the inbound message, a negative acknowledgement is returned to Oracle Utilities Customer Care and Billing. The application can be configured to create a To Do Entry on negative acknowledgements.

- If the error is caused because of missing configuration information, the user can add or revise the configuration information and resend the original message by changing the status of the message back to Pending. This is done on the Oracle Utilities Customer Care and Billing Notification Download Staging page (using the Oracle Utilities Customer Care and Billing user interface). This sends another create, update or cancel message.
- If the error requires that something is changed on the field activity, the user can make updates to the data on the field activity in Oracle Utilities Customer Care and Billing to fix the business error. The update causes another outbound message (this time update) to be sent from Oracle Utilities Customer Care and Billing to the target application(s).

Oracle Utilities Work and Asset Management v2.1.x Outgoing Messages Resend

Oracle Utilities Work and Asset Management v2.1.x has message resend ability for outgoing messages.

Triggering Event

Creation, Update, or Cancellation of a Activity in Oracle Utilities Work and Asset Management for distributed work based on the activity type that is associated with an External system. Message is resent using the **Resend** button on the **Activity** page.

Retry for Business Errors

If the target application returns a business error while processing the inbound message, a negative acknowledgement is returned to Oracle Utilities Work and Asset Management

- If the error is caused because of missing configuration information, the user can add or revise the configuration information and resend the original message by clicking the **Resend** button on the **Activity** page. This sends another create, update or cancel message.
- If the error requires that something is changed on the Activity, the user can make updates to the data on the Activity in Oracle Utilities Work and Asset Management to fix the business error and click on the **Resend** button. The Resend causes another outbound message (this time update) to be sent from Oracle Utilities Work and Asset Management to the target application.

Incoming Messages Upload

Currently Oracle Utilities Customer Care and Billing and Oracle Utilities Work and Asset Management v1.9.1.x have ability to reload the messages which reach the Oracle Utilities Customer Care and Billing and Oracle Utilities Work and Asset Management v1.9.1.x staging tables but are not able to get into the application because of some configuration or data issues.

CC&B Message Upload

If an incoming field activity fails in Oracle Utilities Customer Care and Billing then an Oracle Utilities Customer Care and Billing ToDo is created and the message is stored in the XAI Upload staging.

- Navigate in Oracle Utilities Customer Care and Billing to the **Main Menu > XAI > > XAI Upload Staging**. Search for messages where XAI Upload Staging Status is in **Error**
- If there is a configuration issue in Oracle Utilities Customer Care and Billing, the configuration in Oracle Utilities Customer Care and Billing can be fixed and the message can be uploaded from the XAI Upload staging in Oracle Utilities Customer Care and Billing.

- If there is a data issue in the message, the xml message can be corrected in Oracle Utilities Customer Care and Billing XAI Upload staging and message uploaded from there.
- To upload the message, change the XAI Upload Staging status to **Pending** and save the message. This way XAI tries to upload the message again in Oracle Utilities Customer Care and Billing.
- For XAI Upload Staging to store the incoming error the Post Error flag has to be set on the XAI Inbound Service **C1AddFAandCustomerContact** (This service is used for adding field activity in Oracle Utilities Customer Care and Billing).
- The list of XAI Inbound Services for which the Post Error Flag has to be set on is as follows
 - C1RetCreateBillableChargeSA
 - BillableChargeUploadMaintenance
 - F1AutomaticToDoEntry
 - C1CustomerContactMaintenance
 - C1AddFAandCustomerContact
 - C1FieldActivityMaintenance
 - C1FACompletionFieldWork
 -
 - FAResponse

Oracle Utilities Work and Asset Management v1.9.1.x Message Upload

If an incoming service request fails in Oracle Utilities Work and Asset Management v1.9.1.x then an Oracle worklist task is created and e-mail sent out to the administrator. The message is also stored in the Oracle Utilities Work and Asset Management v1.9.1.x Interface tables.

Once the data is corrected the messages can be uploaded from the interface tables to the application tables in Oracle Utilities Work and Asset Management v1.9.1.x by running the batch program `sdbp_ccb_service_req_interface`.

Edge Application Errors – Resubmit from Integration

The BPEL Provider processes directly invoke the Edge application web services. If the Work Order calls fail in any of the edge applications then a ToDo is created in Oracle Utilities Customer Care and Billing and an e-mail notification and a worklist application entry is created for Oracle Utilities Mobile Workforce Management or Oracle Utilities Work and Asset Management v1.9.1.x.

Oracle Utilities Customer Care and Billing has failed messages upload capability using the XAI Staging Upload table. For Oracle Utilities Work and Asset Management v1.9.1.x and Oracle Utilities Mobile Workforce Management the message can be resubmitted from BPEL.

Note: The message in the Provider is already converted to the EBO model and has the COMMON column values where DVMs are used. If the data correction is addition of a new row in the DVM then the COMMON column value needs to be set in the Provider request xml.

Oracle Utilities Work and Asset Management v1.9.1.x Resubmit from Enterprise Manager

The error notification e-mail includes a link to the worklist task. The worklist task shows the Instance ID of the Oracle Utilities Work and Asset Management v1.9.1.x Provider in failure.

Resubmit a Message to Oracle Utilities Work and Asset Management v1.9.1.x from the Enterprise Manager

1. Log in into the EM console.
2. Go to SOA, soa-infra and click the **Instances** tab and search for the instance ID in failure.
3. Click the instance and go to Oracle Utilities Work and Asset Management v1.9.1.x Provider link.
4. Click the Oracle Utilities Work and Asset Management v1.9.1.x **Provider Flow** tab. The flow of the BPEL process is displayed.
5. Click the first activity in ReceiveWorkOrder and copy the xml displayed in the activity to notepad or any other text editor.
6. Remove the ProcessWorkOrderReqMsg and part tag from the beginning and the end of the xml.
7. Add soap envelope tags at the beginning and the end of the remaining message as noted below:
8. *Add:* <soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/">
Add: <soap:Body>
Remove: <ProcessWorkOrderReqMsg><part xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" name="ProcessWorkOrder">
Do not change: <ProcessWorkOrderEBM xmlns:aia="http://www.oracle.com/XSL/Transform/java/oracle.apps.aia.core.xpath.AIAFunctions" xmlns:hashmap="http://www.oracle.com/XSL/Transform/java/oracle.util.HashMap" xmlns:xref="http://www.oracle.com/XSL/Transform/java/oracle.tip.xref.xpath.XRefXPathFunctions" xmlns:UtilityWorkOrder="http://xmlns.oracle.com/EnterpriseObjects/Core/EBO/WorkOrder/V1" xmlns="http://xmlns.oracle.com/EnterpriseObjects/Core/EBO/WorkOrder/V1">

Do not change: </ProcessWorkOrderEBM>
Remove: </part></ProcessWorkOrderReqMsg>
Add: </soap:Body>
Add: </soap:Envelope>
9. Correct any data which needs to be corrected, if applicable. Now the corrected data can be submitted from the EM Console.
10. On the EM Console, go to SOA, soa-infra, default and select the process for the Oracle Utilities Work and Asset Management v1.9.1.x Provider named ProcessWorkOrderOUWAMUtilitiesProvABCSImpl.
11. Click the **Test** tab, enter security credentials and select the **Input Arguments - XML View** from the drop down.
12. Click Post XML Message at the bottom of the screen. Completing this action causes the Oracle Utilities Work and Asset Management v1.9.1.x Provider to resubmit the message to the Oracle Utilities Work and Asset Management v1.9.1.x system.

Oracle Utilities Mobile Workforce Management Resubmit from Enterprise Manager

The error notification e-mail contains a link to the worklist task. The worklist task has the Instance ID of the Oracle Utilities Mobile Workforce Management Provider in failure.

Resubmit a message to Oracle Utilities Mobile Workforce Management from the EM Console

1. Log in into the EM console.
2. Go to SOA, soa-infra and click the **Instances** tab and search for the instance ID in failure.
3. Click on the instance and go to the Oracle Utilities Mobile Workforce Management Provider link. Then click the Oracle Utilities Mobile Workforce Management **Provider Flow** tab. The flow of the BPEL process is displayed.
4. Click on the first activity in the flow ReceiveOrder and copy the xml displayed in the activity to notepad or any other editor.
5. Remove the ProcessOrderReqMsg and part tag from the beginning and the end of the xml.
6. Add soap envelope tags at the beginning and the end of the remaining message as noted below:
7. Make the following modifications:


```

Add: <soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/">
Add: <soap:Body>
Remove: <ProcessOrderReqMsg><part xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" name="ProcessOrder">
Do not change: <ProcessWorkOrderEBM xmlns:aia="http://www.oracle.com/XSL/Transform/java/oracle.apps.aia.core.xpath.AIAFunctions" xmlns:hashmap="http://www.oracle.com/XSL/Transform/java/java.util.HashMap" xmlns:xref="http://www.oracle.com/XSL/Transform/java/oracle.tip.xref.xpath.XRefXPathFunctions" xmlns:UtilityWorkOrder="http://xmlns.oracle.com/EnterpriseObjects/Core/EBO/WorkOrder/V1" xmlns="http://xmlns.oracle.com/EnterpriseObjects/Core/EBO/WorkOrder/V1">
Do not change: <corecom:EBMHeader xmlns:Orderabo="http://splwg.com/ExtractFAInfo.xsd" xmlns:corecom="http://xmlns.oracle.com/EnterpriseObjects/Core/Common/V2">
...
...
...
Do not change: </ProcessWorkOrderEBM>
Remove: </part></ProcessOrderReqMsg>
Add: </soap:Body>
Add: </soap:Envelope>

```
8. Correct any data which needs to be corrected, if applicable. Now the corrected data can be submitted from the EM Console.
9. On the EM Console, go to SOA, soa-infra, default and select the process for the Oracle Utilities Work and Asset Management v1.9.1.x Provider named ProcessWorkOrderOUMWMUtilitiesProvABCSImplV2.
10. Click the **Test** tab, enter security credentials and select the Input Arguments - XML View from the drop down.
11. Click Post XML Message at the bottom of the screen.
Completing this action causes the Oracle Utilities Mobile Workforce Management Provider to resubmit the message to the Oracle Utilities Mobile Workforce Management system.

Technical Errors

Resubmit from JMS Error Queue

If there is a connection failure on the provider end, transactions are moved to a JMS Error queue per application. Log on to the Weblogic Console to monitor the JMS Queues and move messages from the Error Queue to the Main Queue once the reason for failure is resolved.

Queue	Error Queue	JMS Module
Customer Care and Billing		
Invoice	AIA_OUCCBInvoice JMSQueue	AIA_OUCCBInvoice JMSQueue_ErrorQ
Work Order	AIA_OUCCBWorkOrder JMSQueue	AIA_OUCCBWorkOrder JMSQueue_ErrorQ
	AIA_OUCCBFAResponse JMSQueue	AIA_OUCCBFAResponse JMSQueue_ErrorQ
Work and Asset Management		
Work Order	AIA_OUWAMWorkOrder JMSQueue	AIA_OUWAMWorkOrder JMSQueue_ErrorQ
	AIA_OUWAMAckResponse JMSQueue	AIA_OUWAMAckResponse JMSQueue_ErrorQ
Mobile Workforce Management		
Work Order	AIA_OUMWMWorkOrder JMSQueue	AIA_OUMWMWorkOrder JMSQueue_ErrorQ

Note: If the customer configures the fault policies for providers with retries then the messages will not roll back into the error queue in case of errors.OOB delivered local fault policy files do not have any retries specified

Managing Triggering Events and Retry Processing

This section explains the events in the edge applications that cause messages to be sent to the integration, and the actions required to fix issues.

In general, if any of the target applications returns an error while processing the inbound message the integration layer sends an e-mail notification is sent to the designated user and creates a work list entry.

The following sections describe possible error scenarios and how to resolve them.

CC&B Originated Messages

Order Create, Update or Cancel from Oracle Utilities Customer Care and Billing	
Triggering Event	Creation, Update, or Cancellation of a field activity in CC&B with a Dispatch Group that is associated to an external system (this is controlled by an algorithm on Dispatch Group).
Retry for Business errors	<p>If any of the target applications returns a business error while processing the inbound message, a negative acknowledgement is returned to CC&B. CC&B can be configured to create a To Do Entry on negative acknowledgements.</p> <ul style="list-style-type: none"> • If the error is caused because of missing configuration information, the user can fix the issue then resend the original message by changing the status of the message back to Pending. This is done on the Oracle Utilities Customer Care and Billing Notification Download table (using the Oracle Utilities Customer Care and Billing user interface). This sends another create, update or cancel message. • If the error requires that something is changed on the field activity, the user can make updates to the data on the field activity in Oracle Utilities Customer Care and Billing to fix the business error. The update causes another outbound message (this time update) to be sent from Oracle Utilities Customer Care and Billing to the target application(s).

WAM v1.9.1.x Originated Messages

Oracle Utilities Work and Asset Management v1.9.1.x does not provide a mechanism to re-send failed messages.

Order Created from WAM v1.9.1.x

Triggering Event	Creation of a service request in WAM and the status of the service request changed to active.
Retry for Business errors	The WAM user must cancel the service request and create a new one once the root cause of the issue has been fixed.

Order Updated from WAM v1.9.1.x

Triggering Event	WAM user updates either schedule date or problem description on the service request that was previously sent to the other application(s). This action sends send an update message.
Retry for Business errors	WAM user can try resending the Update by making additional changes to the Problem Description on the service request after the root cause of the issue has been fixed.

Status Update From WAM v1.9.1.x

Triggering Event	The status is changed on a service request that was previously sent to the other application(s). This sends a status update from WAM.
Retry for Business errors	Once the root cause of the issue has been fixed, additional Status updates sent from WAM for the same order are sent successfully.

Order Cancellation From WAM v1.9.1.x

Triggering Event	The status on a WAM service request is changed to canceled.
Retry for Business errors	The corresponding orders can be canceled manually in CC&B and/or MWM.

Order Completion From WAM v1.9.1.x

Triggering Event	The status on a WAM service request is changed to Finished.
Retry for Business errors	There is no corresponding update required in CC&B or MWM.

Charge Create From WAM v1.9.1.x

Triggering Event	A WAM service request status changed to Closed and Billable Indicator is true.
Retry for Business errors	The message can be resent from BPEL or it can manually be created in CC&B.

WAM v2.1.x Originated Messages

Oracle Utilities Work and Asset Management v2.1.x does provide a mechanism to re-send failed messages.

Order Create, Update or Cancel from WAM v2.1.x

Triggering Event	Creation, Update, or Cancellation of a Activity in WAM with an activity type that is associated to an external system.
Retry for Business errors	<p>If the target application returns a business error while processing the inbound message, a negative acknowledgement is returned to WAM.</p> <p>If the error is caused because of missing configuration information, the user can fix the issue then resend the original message by clicking on the Resend button on the Activity page. This sends another create, update or cancel outbound message.</p> <p>If the error requires that something is changed on the Activity, the user can make updates to the data on the Activity in Oracle Utilities Work and Asset Management to fix the business error. The user then clicks on the Resend button that causes another outbound message (this time update) to be sent from Oracle Utilities Work and Asset Management to the target application(s).</p>

MWM Originated Messages

Pick-up Order Create From MWM

Triggering Event	Creation of Pick-Up Field Order in MWM for a Field Order that was earlier received from the integration.
Retry for Business errors	If the Order failed in CC&B, the CC&B user can re-process the inbound order from the CC&B upload staging table after resolving the issue that caused it to fail. If the order failed in WAM, it can be re-imported in WAM from the WAM interface table. This requires running an SQL in the WAM database.

Order Status Update From MWM

Triggering Event	Field Order status change in MWM send an update to CC&B.
Retry for Business errors	The CC&B user can re-process the inbound order from the CC&B upload staging table after resolving the issue that caused it to fail.

Order Cancel From MWM

Triggering Event	Field Order cancellation in MWM and the integration sends an update.
Retry for Business errors	If the transaction failed in CC&B, the CC&B user can re-process the inbound order from the CC&B upload staging table, after resolving the issue that caused it to fail. If the transaction failed in WAM, it can be re-imported in WAM from the WAM interface table. This requires running SQL in the WAM database.

Order Completion From MWM

Triggering Event	Field Order is completed in MWM and the integration sends an update. The same update is triggered when a Pickup Order is completed.
Retry for Business errors	If the transaction failed in CC&B, the CC&B user can re-process the inbound order completion from the CC&B upload staging table after resolving the issue that caused it to fail. If the transaction failed in WAM, it can be re-imported in WAM from the WAM interface table. This requires running SQL in the WAM database.

Managing Work Order Failure Scenarios

The following section describes failure scenarios and possible resolutions.

CC&B Originated Message - Requester Failure

The Oracle Utilities Customer Care and Billing create message can fail before getting to the target queue(s) because of the following

- Failure in Oracle Utilities Customer Care and Billing requester.
- EBS is not reachable.
- One of the target queues is down.

The NDS Record is in error. User can set the NDS record to retry after the issue is resolved. This causes the message to go out again from Oracle Utilities Customer Care and Billing.

CC&B Originated Message - Provider Failure

If the Oracle Utilities Customer Care and Billing message reaches the target queue(s) and then it either fails in Oracle Utilities Work and Asset Management v1.9.1.x or Oracle Utilities Mobile Workforce Management provider or there is a business error, Oracle Utilities Customer Care and Billing receives the acknowledgement. The –acknowledgement is visible in the FA log UI and the NDS record is in Completed state. The same message can be sent again after resolving the issue by setting the status in NDS back to pending. If the resolution of the issue requires the FA to be updated then Oracle Utilities Customer Care and Billing user can update the FA and save the changes, which triggers an outbound update message.

In case of any provider error also standard AIA error notification framework is invoked - e-mail sent and work list entry created to notify users of the failure.

WAM v2.1.x Originated Message - Requester Failure

The Oracle Utilities Mobile Workforce Management create message can fail before getting to the target queue(s) because of the following

- Failure in Oracle Utilities Work and Asset Management v2.1.x requester
- EBS is not reachable
- One of the target queues is down

The Activity record is in error. User can resend the activity from the **Activity** page by clicking on the **Resend** button after the issue is resolved. This causes the message to go out again from Oracle Utilities Work and Asset Management.

MWM Originated Message - Provider Failure

If the Oracle Utilities Work and Asset Management v2.1.x message reaches the target queue(s) and then it either fails in Oracle Utilities Mobile Workforce Management provider or there is a business error, Oracle Utilities Work and Asset Management v2.1.x does receive an acknowledgement. In addition to sending an ack back to Oracle Utilities Work and Asset Management, standard AIA error notification framework is invoked - e-mail sent and work list entry created to notify users of the failure.

MWM Originated Message - Requester Failure

The Oracle Utilities Mobile Workforce Management create message can fail before getting to the target queue(s) because of the following

- Failure in Oracle Utilities Mobile Workforce Management requester
- EBS is not reachable
- One of the target queue is down

The Outbound message is in error. Oracle Utilities Mobile Workforce Management created a Sync Request record for the new activity, status update, or activity completion outbound message that failed. The F1-SYNRQ batch process executes a monitor algorithm that regenerates and sends the outbound message back to the integration layer.

The monitor will retry the Sync Request record until the outbound message is successful.

MWM Originated Message - Provider Failure

If the Oracle Utilities Mobile Workforce Management message reaches the target queue(s) and then it either fails in Oracle Utilities Work and Asset Management v1.9.1.x or CCCB provider or there is a business error, Oracle Utilities Mobile Workforce Management does not receive any acknowledgement. Standard AIA error notification framework is invoked - e-mail sent and work list entry created to notify users of the failure.

WAM v1.9.1.x Originated Message - Requester Failure

When Oracle Utilities Work and Asset Management v1.9.1.x creates a service request and the message fails before getting to the target queue(s). Oracle Utilities Work and Asset Management v1.9.1.x user receives an error on the Oracle Utilities Work and Asset Management v1.9.1.x UI. After resolving the root cause of the failure the user can try re-sending the message by setting the status of the service request to **Created** and back to **Active**. This sends another create message from Oracle Utilities Work and Asset Management v1.9.1.x.

WAM v1.9.1.x Originated Message - Provider Failure

If the Oracle Utilities Work and Asset Management v1.9.1.x message reaches the target queue(s) and then it either fails in Oracle Utilities Customer Care and Billing or Oracle Utilities Mobile Workforce Management provider or there is a business error from one or both the applications. The Oracle Utilities Work and Asset Management v1.9.1.x service request can be populated with an external ID. An e-mail notification is sent to the e-mail address indicated during configuration to notify users of the failure. The Oracle Utilities Work and Asset Management v1.9.1.x user can cancel the service request in Oracle Utilities Work and Asset Management v1.9.1.x and re-create the service request after ensuring that the root cause of the error has been fixed.

Provider Application Connection Failure - Resend from Queue

If the message reaches the target queue(s) and then it fails to reach the Provider because either of the two applications is down the message stays in the error queue of the provider. The message in the error queue can be resent from that queue to the application once the application comes up by the Administrator by running AIA provided Message Resubmission Utility script as explained in the previous section.

Error Handling Summary

S.No	Integration Process	Type of error	Action	Notification Type	Retry
A1	Order Process from CC&B	CC&B cannot reach Req ABCS	Process error response to CC&B	The Notification Download Staging table is marked with an error and CC&B creates a To Do Entry.	Resend the message by changing the status in the CC&B Notification Download table.
A2		Internal failure in Req ABCS	Process error response to CC&B	The Notification Download Staging table is marked with an error and CC&B creates a To Do Entry.	Resend the message by changing the status in the CC&B Notification Download table.
A3		Requester ABCS cannot reach Mediator Process for routing	Process error response to CC&B	The Notification Download Staging table is marked with an error and CC&B creates a To Do Entry.	Resend the message by changing the status in the CC&B Notification Download table.
A4		Mediator cannot communicate to the JMS Queue	Process error response to CC&B	The Notification Download Staging table is marked with an error and CC&B creates a To Do Entry.	Resend the message by changing the status in the CC&B Notification Download table.
A5		JMS consumer is down	Messages queue up		Start JMS consumer
A6		Provider ABCS cannot be reached	Message goes from the queue to the corresponding error queue. + AIA error handling.	E-mail notification and worklist entry	After ensuring that the prov ABCS is up again, the admin must restore the messages from the error to the main queue and then re-start the consumption from the queue.
A7		Internal failure in Provider ABCS	Negative acknowledgement back to CC&B	CC&B To do, E-mail notification and worklist entry	Fix the issue, Resend the original message by changing the status in the CC&B Notification Download table.
A8		Provider ABCS cannot reach target web service endpoint	Message goes from the queue to the corresponding error queue. + AIA error handling.	E-mail notification and worklist entry	After ensuring that the web service end-point is up again, the admin must restore the messages from error to the main queue and then re-start the consumption from the queue.
A9		Error response from target (valid business response)	Negative acknowledgement back to CC&B	CC&B creates a To Do Entry.	Fix the data, Resend the original message by changing the status in the CC&B Notification Download table.

S.No	Integration Process	Type of error	Action	Notification Type	Retry
A10		The CC&B Ack ABCS cannot be reached.	Message goes to error queue & AIA error handling	E-mail notification and worklist entry	
A11		CC&B Ack web service (FA Response) cannot be reached or returns a server error	Message goes from the queue to the corresponding error queue. + AIA error handling.	E-mail notification and worklist entry	
A12		CC&B Ack web service(FA Response) returns a Client Error	AIA Error Handling	E-mail notification and worklist entry	
B1	Order Process from WAM v1.9.1.x	WAM cannot reach Req ABCS	Process error response to WAM	An on screen error is displayed.	Resend the message by selecting the appropriate action on the WAM service request. (This works for create, update, cancel messages. Not for completions). When the resend link is selected a create message is sent to ABCS.
B2		Internal failure in Req ABCS	Process error response to WAM	An on screen error is displayed.	
B3		Requester ABCS cannot reach the Mediator process for Routing	Process error response to WAM	An on screen error is displayed.	
B4		Mediator cannot communicate to the JMS Queue	Process error response to WAM	An on screen error is displayed.	
B5		JMS consumer is down	Messages queue up		Start JMS consumer
B6		Provider ABCS cannot be reached	Message goes from the queue to the corresponding error queue. + AIA error handling.	E-mail notification and worklist entry	After ensuring that the prov ABCS is up again, the admin must restore the messages from error to the main queue and then re-start the consumption from the queue.
B7		Internal failure in Provider ABCS	Negative acknowledgement to the WAM ABCS.	E-mail notification and worklist entry	Resend the message by selecting the appropriate action on the WAM service request. (This action works for create, update, cancel messages, but not for completions). When the resend link is clicked a create message is sent to ABCS.

S.No	Integration Process	Type of error	Action	Notification Type	Retry
B8		Provider ABCS cannot reach target web service endpoint	Message goes from the queue to the corresponding error queue. + AIA error handling.	E-mail notification and worklist entry	After ensuring that the web service end-point is up again, the admin must restore the messages from error to the main queue and then re-start the consumption from the queue.
B9		Error response from target	Negative acknowledgement to the WAM ABCS.	E-mail notification and worklist entry	Resend the message by selecting the appropriate action on the WAM service request. (This action works for create, update, cancel messages, but not for completions). When the resend link is clicked a create message is sent to ABCS.
B10		Ack ABCS for WAM cannot be reached.	AIA error handling.	E-mail notification and worklist entry	
B11		Internal failure in Ack ABCS for WAM	AIA error handling	E-mail notification and worklist entry	
C1	Order Process from WAM v2.1.x	WAM v2.1.x cannot reach Req ABCS	Process error response to WAM v2.1.x		The activity is marked with an error.
C2		Internal failure in Req ABCS	Process error response to WAM v2.1.x		The activity is marked with an error.
C3		Requester ABCS cannot reach the Mediator Process for routing	Process error response to WAM v2.1.x		The activity is marked with an error.
C4		Mediator cannot communicate to the JMS Queue	Process error response to WAM v2.1.x		The activity is marked with an error.
C5		JMS consumer is down	Messages queue up		Restart the JMS consumer
C6		Provider ABCS cannot be reached	Message goes from the queue to the corresponding error queue. + AIA error handling.	E-mail notification and worklist entry	After ensuring that the prov ABCS is up again, the admin must restore the messages from error to the main queue and then re-start the consumption from the queue.

S.No	Integration Process	Type of error	Action	Notification Type	Retry
C7		Internal failure in Provider ABCS	Negative acknowledgement back to WAM v2.1.x	E-mail notification and worklist entry	WAM Log shows error message, E-mail notification and worklist entry
C8		Provider ABCS cannot reach target web service endpoint	Message goes from the queue to the corresponding error queue. + AIA error handling.	E-mail notification and worklist entry	After ensuring that the web service end-point is up again, the admin must restore the messages from error to the main queue and then re-start the consumption from the queue.
C9		Error response from target business	Negative acknowledgement to WAM v2.1.x.	WAM Activity shows the error.	Fix the data and click the Resend button in WAM.
C10		The WAM v2.1.x Ack ABCS cannot be reached.	Message goes from the queue to the error queue + AIA error handling.	E-mail notification and worklist entry.	
C11		WAM v2.1.x Ack web service (FA Response) cannot be reached or server error.	Message goes from the queue to the corresponding error queue. + AIA error handling.		
C12		WAM v2.1.x Ack web service returns a client error	AIA Error Handling	E-mail notification and worklist entry.	
D1	Order Process from MWM	MWM cannot reach Req ABCS	Process error response to MWM		For any order processing error, verification is synchronous, and the user must retry. All other actions create a sync request record to generate the outbound message. These sync request records are retried automatically by the F1-SYNRQ batch process until they are successful. This applies for any error (business or technical).
D2		Internal failure in Req ABCS	Process error response to MWM		
D3		Requester ABCS cannot reach the Mediator Process for Routing	Process error response to MWM		
D4		Mediator cannot communicate to the JMS Queue	Process error response to MWM		
D5		JMS consumer is down	Messages queue up		

S.No	Integration Process	Type of error	Action	Notification Type	Retry
D6		Provider ABCS cannot be reached	Message goes from the queue to the corresponding error queue. + AIA error handling.	E-mail notification and worklist entry	After ensuring that the prov ABCS is up again, the admin must restore the messages from error to the main queue and then re-start the consumption from the queue.
D7		Internal failure in Provider ABCS	Negative acknowledgement to the MWM ABCS.	E-mail notification and worklist entry	
D8		Provider ABCS cannot reach target web service endpoint	Message goes from the queue to the corresponding error queue. + AIA error handling.	E-mail notification and worklist entry	After ensuring that the web service end-point is up again, the admin must restore the messages from error to the main queue and then re-start the consumption from the queue.
D9		Error response from target	Negative acknowledgement to the MWM ABCS.	E-mail notification and worklist entry	
D10		Ack ABCS for MWM cannot be reached.	AIA error handling.	E-mail notification and worklist entry	
D11		Internal failure in the MWM Ack ABCS	AIA error handling	E-mail notification and worklist entry	

Chapter 16

General Extensibility Options

One of the key principles for the design of Application Integration Architecture (AIA) is its extensibility model. AIA offers extensibility in different shapes.

EBOs - The design of the enterprise business objects (EBOs) includes mechanisms to extend generic objects in an upgrade-safe manner by providing hooks to plug in additional industry-specific or customer specific information.

XSLs/ABCS - The transformations (XSLs) provided with ABCS have custom transformation templates available to map to/from customer specific elements. The ABCS also provide extension points to extend their own functionality.

This chapter provides guidelines on extending the Field Work Process Integration Pack, and discusses how to:

- Extend an EBO
- Extend ABC Services
- Pass Data without customizing the EBO
- Invoke Customer Modified XAI Inbound Services

Extending EBOs

The EBOs provided with the integration were carefully defined to represent a typical business process; however, these definitions do not contain any attributes that are customer specific. To meet the needs of customers with more tailored processing, the integration pack provides the means to extend EBOs in a nonintrusive way.

For example, if your business process requires more information when creating a work order, you can extend EBOs to include the additional information.

XSDs

A custom schema definition file (XSD) is provided for every EBO that is shipped with the integration. The EBO can be modified by changing these custom files. The XSDs are incorporated into the EBOs so that any custom extensions that are added to the EBOs are protected when patches or upgrades are applied.

EBO Customization

The following sections describe a sample scenario of when and how to customize EBOs. To extend EBOs, add custom elements to the EBO then complete custom mapping for the requester and for the provider.

Add Custom Elements to the EBO

1. From the Work Order EBO, identify which section or EBO Type needs to be extended.
2. Add the custom elements to the correct custom EBO Type section in the custom Work Order xsd file.

```
targetNamespace="http://xmlns.oracle.com/EnterpriseObjects/Core/Custom/EBO/WorkOrder/V1" elementFormDefault="qualified"
attributeFormDefault="unqualified" version="1.0.00" >
<!-- ===== Imports and Includes ===== -->
<!-- ===== Imports and Includes ===== -->
<!-- ===== Imports and Includes ===== -->
<xsd:import namespace="http://xmlns.oracle.com/EnterpriseObjects/Core/Common/V2" schemaLocation="../../../../Common/V2/CommonComponents.xsd"/>
<xsd:import namespace="http://xmlns.oracle.com/EnterpriseObjects/Core/Common/V2" schemaLocation="../../../../Common/V2/CodeLists.xsd"/>
<xsd:import namespace="http://xmlns.oracle.com/EnterpriseObjects/Core/Common/V2" schemaLocation="../../../../Common/V2/DataTypes.xsd"/>
<!-- ===== Imports and Includes ===== -->
<!-- ===== Imports and Includes ===== -->
<!-- ===== Imports and Includes ===== -->
<xsd:complexType name="CustomWorkOrderEBOType">
  <xsd:sequence>
    <xsd:element name="WorkOrderInstructions" type="xsd:string"/>
    <xsd:element name="WorkOrderPriority" type="xsd:string"/>
  </xsd:sequence>
</xsd:complexType>

<!--
<xsd:complexType name="CustomWorkOrderEBOType"/>
-->
<xsd:complexType name="CustomWorkOrderActualMaterialType" />
<xsd:complexType name="CustomWorkOrderDirectChargeExpenseType" />
<xsd:complexType name="CustomWorkOrderDirectChargeExpenseLineType" />
```

For more information about Extending EBOs, refer to the *Oracle Fusion Middleware Developer's Guide for Oracle SOA Core Extension* under "AIA Assets Extensibility Patterns- Extending Existing Schemas in AIA".

Map the EBO to the Requester

Continuing the example from the previous section:

1. Navigate to the Oracle Utilities Customer Care and Billing Work Order Requester process BPEL composite ProcessWorkOrderOUCCBUilitiesReqABCSImpl and open the custom ABM to EBM transformation. (For example, Xform_OrderABMReqMsg_to_WorkOrderEBMReqMsg_Custom.xml)
2. Map the elements from Oracle Utilities Customer Care and Billing to the custom EBO elements.

3. Make sure the elements are added to the correct section or extension type that needs to be extended.

```
<xsl:stylesheet version="2.0"
  xmlns:UtilityWorkOrder="http://xmlns.oracle.com/EnterpriseObjects/Core/EBO/WorkOrder/V1"
  xmlns:corecomcust="http://xmlns.oracle.com/EnterpriseObjects/Core/Custom/Common/V2"
  xmlns:Orderabo="http://splwg.com/ExtractFAInfo.xsd"
  xmlns:aia="http://www.oracle.com/XSL/Transform/java/oracle.apps.aia.core.xpath.AIAFunctions"
  xmlns:corecom="http://xmlns.oracle.com/EnterpriseObjects/Core/Common/V2"
  xmlns:xacml="urn:oasis:names:tc:xacml:2.0:context:schema:cd:04"
  xmlns:xref="http://www.oracle.com/XSL/Transform/java/oracle.tip.xref.xpath.XRefXPathFunctions"
  xmlns:xp20="http://www.oracle.com/XSL/Transform/java/oracle.tip.pc.services.functions.XPath20"
  xmlns:bpws="http://schemas.xmlsoap.org/ws/2003/03/business-process/"
  xmlns:xsl="http://www.w3.org/1999/XSL/Transform"
  xmlns:ora="http://schemas.oracle.com/xpath/extension"
  xmlns:ehdr="http://www.oracle.com/XSL/Transform/java/oracle.tip.esb.server.headers.ESBHeaderFunctions"
  xmlns:orcl="http://www.oracle.com/XSL/Transform/java/oracle.tip.pc.services.functions.ExtFunc"
  xmlns:ids="http://xmlns.oracle.com/bpel/services/IdentityService/xpath"
  xmlns:hwf="http://xmlns.oracle.com/bpel/workflow/xpath"
  xmlns:wsa="http://schemas.xmlsoap.org/ws/2003/03/addressing"
  xmlns:hashmap="http://www.oracle.com/XSL/Transform/java/java.util.HashMap"
  exclude-result-prefixes="xsl xref xp20 bpws ora ehdr orcl ids hwf sbldata xacmlctx coresalesorder corecom hashmap wsa aia">

<xsl:template name="ProcessWorkOrderType_ext">
  <!-- Customers add transformations here -->
  <UtilityWorkOrder:Custom>
    <corecomcust:WorkOrderInstructions>
      <xsl:value-of select="/Orderabo:ExtractFAInfo/Orderabo:ExtractFAInfoService/Orderabo:ExtractFAInfoDetails/Instructions"/>
    </corecomcust:WorkOrderInstructions>
    <corecomcust:WorkOrderPriority>
      <xsl:value-of select="/Orderabo:ExtractFAInfo/Orderabo:ExtractFAInfoService/Orderabo:ExtractFAInfoDetails/FieldActivityPriority"/>
    </corecomcust:WorkOrderPriority>
  </UtilityWorkOrder:Custom>
</xsl:template>
```

Note: This will vary from integration point to integration point. The sample snippet is given above. It is recommended to use the custom transformation file as available in the BPEL composite business process in order to get the correct Xpath.

Map the EBO to the Provider

1. Navigate to the Oracle Utilities Mobile Workforce Management Work Order Provider BPEL composite ProcessWorkOrderOUMWMUtilitiesProvABCImplV2 and open the custom EBM to ABM transformation under xsl folder. (For example, Xform_WorkOrder_To_FieldOrder_Create_Update_Custom.xml)
2. Map the elements from the custom EBO elements to the ABM.

3. Make sure the elements are added to the correct section or extension type that needs to be extended. Example snippet is given below.

```
<xsl:stylesheet version="2.0"
  xmlns:bpws="http://schemas.xmlsoap.org/ws/2003/03/business-process/"
  xmlns:ehdr="http://www.oracle.com/XSL/Transform/java/oracle.tip.esb.server.headers.ESBHeaderFunctions"
  xmlns:aia="http://www.oracle.com/XSL/Transform/java/oracle.apps.aia.core.xpath.AIAFunctions"
  xmlns:corecomcust="http://xmlns.oracle.com/EnterpriseObjects/Core/Custom/Common/V2"
  xmlns:ebocontext="http://xmlns.oracle.com/EBO/BusinessContext/V1"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema"
  xmlns:corecomEBO="http://xmlns.oracle.com/EnterpriseObjects/Core/CommonEBO/V1"
  xmlns:svcdoc="http://xmlns.oracle.com/Services/Documentation/V1"
  xmlns:wsa="http://schemas.xmlsoap.org/ws/2003/03/addressing"
  xmlns:hwf="http://xmlns.oracle.com/bpel/workflow/xpath"
  xmlns:xp20="http://www.oracle.com/XSL/Transform/java/oracle.tip.pc.services.functions.Xpath20"
  xmlns:xref="http://www.oracle.com/XSL/Transform/java/oracle.tip.xref.xpath.XRefXPathFunctions"
  xmlns:xacml-context="urn:oasis:names:tc:xacml:2.0:context:schema:cd:04"
  xmlns:ns1="http://www.splwg.com/WebServices/"
  xmlns:corecomcust="http://xmlns.oracle.com/EnterpriseObjects/Core/Custom/Common/V2"
  xmlns:xsl="http://www.w3.org/1999/XSL/Transform"
  xmlns:ora="http://schemas.oracle.com/xpath/extension"
  xmlns:ns0="http://xmlns.oracle.com/EnterpriseObjects/Core/EBO/WorkOrder/V1"
  xmlns:ids="http://xmlns.oracle.com/bpel/services/IdentityService/xpath"
  xmlns:orcl="http://www.oracle.com/XSL/Transform/java/oracle.tip.pc.services.functions.ExtFunc"
  xmlns:xacml="urn:oasis:names:tc:xacml:2.0:policy:schema:cd:04"
  xmlns:corecom="http://xmlns.oracle.com/EnterpriseObjects/Core/Common/V2"
  exclude-result-prefixes="xsl coreservicerequestcust ebocontext xsd corecomEBO svcdoc wsa xacml-context corecomcust ns0 xacml corecom
  ora ids orcl"/>

<!-- User Defined Templates -->

<xsl:template name="HeaderDataType_ext"/>

<xsl:template name="CommonDataType_ext">
  <!-- <ns1:ExternalPriority>
    <xsl:value-of select="/ns0:ProcessWorkOrderEBM/ns0:DataArea/ns0:ProcessWorkOrder/ns0:Custom/coreservicerequestcust:WorkOrderPriority"/>
  </ns1:ExternalPriority> -->
</xsl:template>

<xsl:template name="ExtendedDataType_ext">
  <ns1:RequestDescription>
    <xsl:value-of select="/ns0:ProcessWorkOrderEBM/ns0:DataArea/ns0:ProcessWorkOrder/ns0:Custom/coreservicerequestcust:WorkOrderInstructions"/>
  </ns1:RequestDescription>
</xsl:template>

<xsl:template name="SPLWFMCreateUpdateOrderType_ext"/>
</xsl:stylesheet>
```

Note: This will vary from integration point to integration point. The sample snippet is given above. It is recommended to use the appropriate custom transformation file as available in the BPEL Composite business process for getting the correct Xpath.

Note: The namespace used in the requester and provider must match.

4. Copy the modified EBO xsd file(s) to the correct location on the application server. Ex:
<AIA_HOME>/AIAMetaData/AIAComponents/EnterpriseObjectLibrary/
<Path_to_xsd>
5. Update the modified xsd in the above step to the MDS Repository for the changes to take effect.
6. Follow the steps below to deploy the modified Requester and Provider BPEL processes:
 - a. Run the Middleware Home/user_projects/domains/soa_domain/soa/aia/bin aiaenv.bat or aiaenv.sh depending on the operating system.

This sets the environment variables required by the build process.

- b. Update Metadata using the following steps:
 - "Browse to the folder at \$DOMAIN_LOCATION/soa/aia/MDSUtils/UpdateMetaDataDP.xml and open the deployment plan file, UpdateMetaDataDP.xml.
 - "Update the file UpdateMetaDataDP.xml by inserting include tags for each resource group that you want to add to the MDS:

Example to update DVM:

```
<DeploymentPlan component="FieldWork" version="3.0">
<Configurations>
<UpdateMetadata wserver="pips.FieldWork">
  <fileset dir="${env.SERVICES_LOCATION}/AIAMetaData">
    <include name="dvm/FS_Order_ServiceTypeCode.dvm" />
  </fileset>
</UpdateMetadata>
</Configurations>
</DeploymentPlan>
```

Example to update wsdl file:

```
<fileset dir="${env.SERVICES_LOCATION}/AIAMetaData">
  <include name="AIAComponents/ApplicationConnectorServiceLibrary/
OUWAM/V2/RequestorABCS/
ProcessWorkOrderCancelOUWAMUtilitiesReqABCSImplV2.wsdl" />
</fileset>
</UpdateMetadata>
</Configurations>
</DeploymentPlan>
```

"Run the update utility.

Linux:

```
ant -f $SOA_HOME/aiafp/Install/AID/AIAInstallDriver.xml -
DDeploymentPlan=$DOMAIN_LOCATION/soa/aia/MDSUtils/
UpdateMetaDataDP.xml
```

Windows:

```
ant -f %SOA_HOME%\aiafp\Install\AID\AIAInstallDriver.xml -
DDeploymentPlan=
%DOMAIN_LOCATION%\soa\ai\MDSUtils\UpdateMetaDataDP.xml
```

This prompts for admin host, port, user name and password. Enter the details accordingly.

3. The custom DP script for deployment is as follows. An example of FieldWorkCustomDP.xml file to deploy and undeploy composite files is found in \$AIA_HOME/pips/FieldWork/DeploymentPlans/FieldWorkCustomDP.xml.

```
<DeploymentPlan component="FieldWork" version="3.0">
<Deployments>
  <Composite compositeName="<processname>" compositedir="${AIA_HOME}/
services/industry/Utilities/OUCCB/RequestorABCS/<processname>" revision="1.0"
wserver="pips.FieldWork" action="deploy" />
</Composite>
</Deployments>
</DeploymentPlan>
```

4. Once the custom script is ready execute the custom script using the following command:

Linux:

```
ant -f $SOA_HOME/aiafp/Install/AID/AIAInstallDriver.xml -
DDeploymentPlan=$AIA_HOME/pips/FieldWork/DeploymentPlans/
FieldWorkCustomDP.xml
```

Windows:

```
ant -f %SOA_HOME%\aiafp\Install\AID\AIAInstallDriver.xml -
DDeploymentPlan=%AIA_HOME%\pips\FieldWork\DeploymentPlans\Field
WorkCustomDP.xml
```

This process prompts for the admin host, port, user name and password. Enter these details to complete the process.

Extending ABC Services

All Requester and Provider ABC Services provided with this integration pack have extension points available to extend the functionality. For example extension points can be used for additional data enrichment, if required.

There exist two or more extension points in each ABCS depending on the number of services it invokes and the message exchange pattern for those services.

In addition to the extension points, extensible scopes have been provided in the processes wherever customizations are allowed.

Customers can develop add-ins and have them hooked to these extensibility points. These customer-developed services behave as an extension to the delivered ABC service.

For more information about Extending ABCS, refer to the *Oracle Fusion Middleware Developer's Guide for Oracle SOA Core Extension* under "Extensibility for Oracle AIA Artifacts - Extending AIA Services". Also refer to *Oracle Fusion Middleware Developing SOA Applications with Oracle SOA Suite* documentation under "Customizing SOA Composite Applications".

Pass Data without Extending the EBO

In some cases it is necessary to pass a number of fields from one application to another without using the integration layer transformation.

For example, the Oracle Utilities Mobile Workforce Management task completion process can be customized to pass information to Oracle Utilities Customer Care and Billing to be stored in Oracle Utilities Customer Care and Billing as characteristics or in a CLOB field. If this information does not need to be translated using DVMs, it can simply pass through the integration layer.

In this case Oracle Utilities Mobile Workforce Management uses a custom BO to pass additional information on completion.

Refer to the Oracle Utilities Mobile Workforce Management Configuration Guide for information of custom extensions.

Pass Data without Customizing the EBO

1. Configure the source application to pass the new custom element in escaped xml format.
This can be done using XSL on the outbound message in the source application.
2. Configure a custom xsl in the integration layer Requester ABCS (for example, Oracle Utilities Mobile Workforce Management Requester ABCS) to map the source data (for example, Oracle Utilities Mobile Workforce Management ABM element) to a custom element in EBM (for example, custom area on Work Order EBM)

This data can then be passed across to the target.

- Configure a custom xsl in the integration layer Provider ABCS (for example, CCB Provider ABCS) to map the custom element in EBM to the Oracle Utilities Customer Care and Billing service ABM.

The target application is now able to receive the escaped xml in a custom element and process it.

Invoke Customer Modified XAI Inbound Service

It is possible to invoke Customer Modified XAI Inbound Services using OUAF framework from the integration layer.

Invoke a Customer Modified XAI Inbound Service

- Make sure the new Customer Modified XAI Inbound Service is available on the edge application.
- Change the soapAction of the wsdl of the Inbound Service to be invoked to the Customer Modified XAI Inbound Service. The wsdl is located at `<AIA_HOME>/ /AIAMetaData/AIAComponents/ApplicationObjectLibrary/OUXXX/Vx/wsdl/xxx.wsdl`

Eg: In `<AIA_HOME>/ /AIAMetaData/AIAComponents/ApplicationObjectLibrary/OUCCB/V1/wsdl/FAResponse.wsdl` change SOAPAction

- Change from

```
<soap:operation soapAction="http://ouaf.oracle.com/spl/XAIXapp/xaiserver/FAResponse"/>
```

To

```
<soap:operation soapAction="http://ouaf.oracle.com/spl/XAIXapp/xaiserver/CM-FAResponse"/>
```

- Upload the modified wsdl to MDS as described in the Updating MDS section.
- Change the appropriate Service Configuration property of End Point URI in the AIAConfigurationProperties.xml

Example: AIAConfigurationProperties.xml change property from:

```
<Property name="Routing.FAResponsePortType.OU_CCB_01.EndpointURI">http://sf-ugbu-22.us.oracle.com:9000/spl/XAIApp/xaiserver/FAResponse</Property>
```

to:

```
<Property name="Routing.FAResponsePortType.OU_CCB_01.EndpointURI">http://sf-ugbu-22.us.oracle.com:9000/spl/XAIApp/xaiserver/CM-FAResponse</Property>
```

- Upload the modified AIAConfigurationProperties.xml to MDS.
- Redeploy the modified service.

When XAI Inbound Service is now invoked, XAI will redirect the call to the Customer Modified XAI Inbound service on the target application based on the modified SOAP Action.

Framework Bug# 10219423 - PASS SERVICE NAME TO XAI INBOUND SERVICE TO ALLOW REDIRECT THE CALL for further details.

Your implementation will need to provide an xsl on the custom XAI Inbound Service to map the message schema of the original XAI Inbound Service with the Customer Modified XAI Inbound, otherwise the invocation will fail.

Chapter 17

Custom Extensions

This chapter provides information on custom Extensions for Oracle Utilities Customer Care and Billing and Oracle Utilities Mobile Workforce Management.

The integration can be extended further to support the following functionality:

- Provide Oracle Utilities Mobile Workforce Management with additional information related to activities.
- Provide Oracle Utilities Customer Care and Billing with additional completion information. This can be updates to service point, meter or item information as well as any other information captured by the crew.

As an example, if a crew needs to correct the badge number for an item or update a meter configuration, the information cannot be updated automatically since this may affect billing or other areas which need to be monitored. Instead the system creates a ToDo Entry to prompt user intervention and manually update the data.

This section provides steps on how to configure the extensions in both applications followed by additional information to help explain those configurations.

Passing Additional Information

Passing additional information related to activities from Oracle Utilities Customer Care and Billing through Middleware can be accomplished via the following process:

The middleware has been coded out of the box to pass through the additional information between Oracle Utilities Customer Care and Billing and Oracle Utilities Mobile Workforce Management without having to make any additional changes to the Application Business Connector Services (ABCS). The additional information is passed between the two applications using the WorkOrderLineAttachment component that is part of the WorkOrder EBO. There are no transformations performed in the middleware for this additional information.

Additional Information Related to Activities

Follow this procedure to extend the information provided from Oracle Utilities Customer Care and Billing to Oracle Utilities Mobile Workforce Management for an activity.

The process describes how to extend Oracle Utilities Mobile Workforce Management business objects and their user interface as well as the integration XAI Inbound Service with your custom elements.

If elements already exist in the FA Extract then follow the steps to extend Oracle Utilities Customer Care and Billing to forward them to Oracle Utilities Mobile Workforce Management.

If they are not part of the extract then follow the steps on how to request them using a callback from Oracle Utilities Mobile Workforce Management to Oracle Utilities Customer Care and Billing.

Extending Oracle Utilities Mobile Workforce Management Business Objects

Extending the Oracle Utilities Mobile Workforce Management business objects involves extending the data structures and extending the user interface to receive the additional elements passed from Oracle Utilities Customer Care and Billing.

Extending the Data Structures

Create customer modification (CM) data areas and use them to extend the corresponding Oracle Utilities Mobile Workforce Management data areas. After this is done, implement the relevant CM UI Map Fragments.

Refer to the [List of Available CM Extended UI Map Fragments in Oracle Utilities Mobile Workforce Management](#) for the exact fragment names.

Type of Information	How to Extend
Common Activity Details	<p>For read only details common to any type of activity, extend the base M2-CommonActivityDetails data area.</p> <p>The base data area is already included in all base activity and assignment business objects so extending it automatically extends all these business objects. It is also included in the XAI Inbound Service maintaining an activity so the service is automatically extended as well.</p> <p>Notice that this information is not sent back as completion details.</p>
Service Point, Meter or Item Details	<p>For service points, meter or item information extend the respective corresponding data area:</p> <ul style="list-style-type: none"> Service Point Details (M2-SPDataDetails) Meter Details (M2-MeterDataDetails) Item Details (M2-ItemDataDetails) <p>These data areas are already included in relevant base activity and assignment business objects so extending them automatically extends all these business objects. It is also included in the XAI Inbound Service maintaining an activity so the service is automatically extended as well.</p> <p>The data areas are also included in the completion part of the assignments and outbound messages so extending them also allows these details to be sent back as part of completion.</p> <p>When designing your custom UI map fragments choose which details to display and what to allow the crew to update.</p>

Type of Information How to Extend

Custom Activity Business Object Details	<p>If the details are relevant to a specific type of activity that is not provided with the base product you need to design and configure custom activity and assignment business objects to handle such an activity. Use custom data areas to describe the details sent from the host for this type of activity and include them in your business objects.</p> <p>the Oracle Utilities Mobile Workforce Management configuration guide for more information on how to design new custom activity business objects.</p> <p>Once custom business objects are configured you need to extend the XAI Inbound Service to accommodate your custom details. To do that you need to extend the M2-DataDetails data area with your custom data area.</p> <p>Notice that this information is not sent back as completion details.</p>
--	--

Extending the User Interface

To extend the Implement activity and assignment CM UI Map Fragments to display your custom details as needed. Refer to the [List of Available CM Extended UI Map Fragments in Oracle Utilities Mobile Workforce Management](#) for the exact fragment names.

Obtaining the Data from Oracle Utilities Customer Care and Billing

To obtain data from Oracle Utilities Customer Care and Billing you must first send field activity extract details to Oracle Utilities Mobile Workforce Management then pull the data from Oracle Utilities Customer Care and Billing.

Sending Field Activity Extract Details to Oracle Utilities Mobile Workforce Management

Follow this procedure to send additional details that already exist on the field activity extract service schema to Oracle Utilities Mobile Workforce Management.

Note. This procedure assumes that all details which will be forwarded to Oracle Utilities Mobile Workforce Management are already extracted by the base field activity extract service.

Use an XSL on the field activity extract message Route Type to transform these details to corresponding Oracle Utilities Mobile Workforce Management element names under a Custom Schema Data group node:

- FA Type Characteristics
- FA Characteristics
- SP Type Characteristics
- SP Characteristics
- Premise Characteristics
- Meter Characteristics
- Item Characteristics
- Service Point Geographic Value
- Premise Geographic Value

Refer to [XSL Template in Oracle Utilities Customer Care and Billing](#) for information on how to configure custom elements of these types.

For other types of elements, use a custom XSL to transform the elements from their source location to the corresponding XPath below the Custom Schema Data node in the target Oracle Utilities Mobile Workforce Management message of the element. This should include the element name.

Obtain Additional Information from Oracle Utilities Customer Care and Billing

There are several options available for your implementation to obtain additional information from Oracle Utilities Customer Care and Billing to send to Oracle Utilities Mobile Workforce Management:

Create a callback from Oracle Utilities Customer Care and Billing Work Order Requestor or Oracle Utilities Mobile Workforce Management Work Order Provider process using extension points to invoke a new implementation created XAI Inbound Service in Oracle Utilities Customer Care and Billing and pass the additional information over to Oracle Utilities Mobile Workforce Management.

Directly obtain the additional information from Oracle Utilities Customer Care and Billing in Oracle Utilities Mobile Workforce Management.

Below is the procedure to directly obtain additional details from Oracle Utilities Customer Care and Billing that do not exist on the field activity extract service schema using a callback from Oracle Utilities Mobile Workforce Management.

Note: This process of obtaining Additional Information does not invoke the process integration pack. It is the responsibility of the implementation team to configure and test the edge applications to communicate with each other.

Configuration in Oracle Utilities Customer Care and Billing

- Create a service script that extracts the additional information.
- Expose the service script as an XAI Inbound Service.

Configuration in Oracle Utilities Mobile Workforce Management

- Set up an outbound message:
 - Define an outbound message business object to match the XAI Inbound Service created in Oracle Utilities Customer Care and Billing.
 - Define an outbound message type which references the outbound message business object.
 - Set up a real time XAI Sender to communicate with the external system, if one does not already exist.
 - Invocation Type = Real Time
 - XAI Class = Sender routes messages via HTTP real-time (RTHTTPSNDR)
 - Context = set up the link to the external system
 - Set up an External System record for the external system, if one does not already exist.
- Add the outbound message type to the External System list of messages.
 - Reference the XAI Sender
 - Use Real Time Processing Method
 - Add xsl to add the SOAP envelope to the message being sent out
- Create an Activity business object Pre-Processing plug-in as follows:

- Populate the outbound message business object and call the outbound message dispatcher service to send it to the external system
- Populate the activity business object with the information returned

Use the steps mentioned in option 2 to configure Oracle Utilities Customer Care and Billing and Oracle Utilities Mobile Workforce Management and create a new Integration process (using BPEL/ mediator) to pass the additional information between Oracle Utilities Customer Care and Billing and Oracle Utilities Mobile Workforce Management.

Provide Oracle Utilities Customer Care and Billing with Additional Completion Information

Follow this procedure to extend the activity completion information captured by the crew and sent from Oracle Utilities Mobile Workforce Management to Oracle Utilities Customer Care and Billing.

The process describes how to extend Oracle Utilities Mobile Workforce Management business objects and their user interface as well as the integration outbound messages with your custom elements.

If the information is not already processed by the FA Completion logic in Oracle Utilities Customer Care and Billing the procedure describes how to extend the FA Completion business object to handle such logic.

Extending Oracle Utilities Mobile Workforce Management Business Objects

To extend the Oracle Utilities Mobile Workforce Management business objects you must first extend the data structures by creating CM data areas, and then extend the user interface.

Extending the Data Structures

Create CM data areas and use them to extend the corresponding Oracle Utilities Mobile Workforce Management data areas. After this is done, implement the relevant CM UI Map Fragments.

Refer to the [List of Available CM Extended UI Map Fragments in Oracle Utilities Mobile Workforce Management](#) for the exact fragment names.

Type of Information	How to Extend
Common Completion Details	<p>For completion details common to all activity types extend the base M1-CommonActivityIntCmplDtls data area.</p> <p>The base data area is already included in all base assignment business objects so extending it automatically extends all these business objects. It is also included in the outbound message sending completion information to the host system so the service is automatically extended as well.</p>
Service Point, Meter or Item Details	<p>For service points, meter or item completion information extend the respective corresponding data area:</p> <ul style="list-style-type: none"> • Service Point (M2-SPDataDetails) • Meter (M2-MeterDataDetails) • Item (M2-ItemDataDetails) <p>These data areas are already included in relevant base activity and assignment business objects so extending them automatically extends all these business objects. These data areas describe the entity. They are included once on the activity and assignment business objects to describe information as sent from the host.</p>

Type of Information	How to Extend
	They are included once more in the assignment completion group of information to capture modifications to these details made by the crew. Information as sent from host is assumed to be displayed as read only whereas the modifiable copy of the details may be presented as editable as needed. When designing your custom UI map fragments choose which completion details are editable.
Custom Assignment Business Object Completion Details	<p>If certain completion details are relevant to a specific type of activity that is not provided with the base product you need to design and configure custom activity and assignment business objects to handle such an activity. Use custom data areas to describe the details captured by the crew for this type of activity and include them in your assignment business object.</p> <p>the Oracle Utilities Mobile Workforce Management configuration guide for more information on how to design new custom activity business objects.</p> <p>Once custom business objects are configured you need to extend the activity completion outbound message to accommodate your custom completion details. To do that you need to extend the M2-CompletionDetails data area with your custom data area.</p>

Extending the User Interface

Implement assignment CM UI Map Fragments to display your custom details as needed. Refer to the [List of Available CM Extended UI Map Fragments in Oracle Utilities Mobile Workforce Management](#) for the exact fragment names.

Extend the Field Activity Completion Process in Oracle Utilities Customer Care and Billing

To extend the field activity completion process in Oracle Utilities Customer Care and Billing you must first extend the field activity completion message then extend the field activity completion rules.

Extending the Field Activity Completion Message

Type of Information	How to Extend
Service Point, Meter or Item Details	<p>Create a CM service point, meter or item data area with the same details as the corresponding Oracle Utilities Mobile Workforce Management CM data area and use it to extend these data areas:</p> <p>SP(C1-FWSPBODetails) Meter(C1-FWMeterBODetails) Item(C1-FWItemBODetails)</p> <p>These data areas are included in a corresponding business object used to update the entity. By extending these base data areas you automatically extend the entity business object and hence when the object is updated so are the custom details.</p>
	<p>Create another service point, meter or item interface data area and include in it the corresponding CM data area you have just created for the business object update. Use this to extend the interface data areas:</p> <p>Service Point (C1-FWSPInterfaceDetails) Meter (C1-FWMeterInterfaceDetails) Item (C1-FWItemInterfaceDetails)</p> <p>The interface data area includes the business object data area to ensure they have same elements allowing each to extend another data area.</p>

Type of Information	How to Extend
Other Completion Details	<p>For completion details common to all activity types create a custom data area and use it to extend the base data area: C1-FACompletionCommonDetails</p> <p>For activity type specific details create a activity specific custom data area and use it to extend the base data area: C1-FACompletionActSpecDetails</p> <p>Refer to Extending Field Activity Completion Rules for more information on how to process this additional information.</p>

Note. You must use the same element names as in both Oracle Utilities Customer Care and Billing and Oracle Utilities Mobile Workforce Management. If element names are different, implementations will be able to pass data between applications using the standard PIP implementation approach, but not the simplified bypass approach.

Extending Field Activity Completion Rules

The FA Completion message is stored as a Sync Request record and processed by the FA Completion business object (C1-FieldActivityCompletion).

If you have extended the FA Completion message with other completion details extend the FA Completion business object with a custom "Enter" plug-in on the Process Message state to process these details as needed.

Since the completion process is managed by a business object you may leverage other extension techniques to replace base rules with your own custom rules as needed.

To process the additional information, extend the FA Completion business object rules on: C1-FieldActivityCompletion

For example, add an "Enter" plug-in on the Process Message state to process your custom information as needed.

Configure To Do Type/ To Do Role Related to the Extended Functionality

Create the To Do Type, To Do Role, and Error Message (as needed) to be used to create the following:

Crew follow up request (To Do type)

FA completion error (To Do type)

Appropriate To Do roles must be created to handle To Do entries created for these To Do Types coming from the external systems. Navigate to the To Do Type portal under the Admin menu to create these roles.

Configure Customer Contact Class and Type Related to the Extended Functionality

Define customer contact types in Oracle Utilities Mobile Workforce Management for the conditions that create customer contacts for the following:

When a crew completes an activity and needs to record contact they made with the customer

When crews complete activities, they have the option to record contact that they made with customers. This information is set to Oracle Utilities Customer Care and Billing as part of the field activity completion process. The system creates a Customer Contact record for the person associated with the field activity.

Since Oracle Utilities Mobile Workforce Management does not send the customer contact class with the contact update, Oracle Utilities Customer Care and Billing needs to be configured to default the customer class. To implement this connection:

Set up a customer contact class to represent contacts made in the field.

Navigate to Feature Configuration and select the Schema Constant record and reference that customer contact class as the value for the customer contact class option.

The system uses the value referenced on the schema constant feature configuration as the default customer contact class when creating customer contacts.

Additional Configuration Information

This section provides:

- Lists of available customer modification (CM) Extended UI Map Fragments in Oracle Utilities Mobile Workforce Management on the server and for mobile.
- Information on the characteristics and geographic values XSL Template

List of Available CM Extended UI Map Fragments in Oracle Utilities Mobile Workforce Management

The following is a list of the CM extended UI map fragments that can be created to extend base maps in Oracle Utilities Mobile Workforce Management.

Note. Unless otherwise specified all CM Fragments are included at the end of the base map.

The examples below show how to extend M2-SPDataDetails with the following elements in a new custom Service Point Data Area:

```
<cmAdd1SPDataDetails type="group" mapXML="BO_DATA_AREA">
<serialNumber mdField="CM_SERIAL_NUMBER"/> -- activity detail that can
be modified
<condition mdField="CM_CONDITION"/>-- completion detail only
</cmAdd1SPDataDetails>
```

Oracle Utilities Mobile Workforce Management Server - Activity

Note. These maps are used to maintain and display activity information as sent by the host system. Completion information to be sent back to the host is recorded on the assignment only.

Base UI Map Fragment	CM Extended UI Map Fragment
Activity Maintenance (M2-ActivityMaint)	End of Customer Information section CM-CustomerInfoMaint_ext
	End of Map CM-ActivityMaint_ext
Activity Display (M2-ActivityMainDisplay)	End of Customer Information section CM-CustomerInfoDisp_ext
	End of Map CM-ActivityDisplay_ext

Base UI Map Fragment	CM Extended UI Map Fragment
Service Point Details Maintenance (M2-SPDetailsMaint)	CM-SPDetailsMaint_ext Refer to the example below.
Service Point Details Display (M2-SPDetailsDisp)	CM-SPDetailsDisp_ext Refer to the example below.
Meter Details Maintenance (M2-MeterDetailsMaint)	CM-MeterDetailsMaint_ext
Meter Details Display (M2-MeterDetailsDisp)	CM-MeterDetailsDisp_ext
Item Details Maintenance (M2-ItemDetailsMaint)	CM-ItemDetailsMaint_ext
Item Details Display (M2-ItemDetailsDisp)	CM-ItemDetailsDisp_ext
Collection Details Maintenance (M2-CollectionDetailsMaint)	CM-CollectionDetailsMaint_ext
Collection Details Display (M2-CollectionDetailsDisp)	CM-CollectionDetailsDisp_ext

Example - Service Point Activity Display Map Fragment

CM Service Point Activity Details Display Map Fragment

CM-SPDetailsDisp_ext.

This fragment will contain a row for every activity detail element:

```
<div oraLoad="oraDisplayNone(item, 'boGroup/cmAddlSPDataDetails/serialNumber', '')">
  <label oraLabel="boGroup/cmAddlSPDataDetails/serialNumber"></label>
  <span oraField="boGroup/cmAddlSPDataDetails/serialNumber" ></span>
</div>
```

Example - Service Point Activity Maintenance Map Fragment

CM Service Point Activity Details Maintenance Map Fragment

CM-SPDetailsMaint_ext

This fragment will contain a row for every activity detail element:

```
<tr>
  <td oraLabel="boGroup/cmAddlSPDataDetails/serialNumber"></td>
  <td><input class="oraInput" oraField="boGroup/cmAddlSPDataDetails/serialNumber"></td>
</tr>
```

Oracle Utilities Mobile Workforce Management Server - Assignment

Some of the following completion fragments allow the crew to modify details sent from the host. These are designed to have the original values sent from the host displayed on the left column of the map and modifiable details on the right column.

The original values should be read only. This only includes the details that the crew is allowed to modify in the modifiable section. A separate CM fragment is provided on the left and right columns.

Base logic initializes the modifiable values with the original values. Details that were not changed by the crew and displayed in a different font than those that were changed.

Examples in the base maps you extend follow these display patterns:

Base UI Map Fragment	CM Extended UI Map Fragment
Service Point Completion Details Maintenance (M2-SPCmplDetailsMaint)	End of Values As Sent from Host on Left Column. CM-SPCmplDetailsMaint_ext End of Values As Modified by Crew on Right Column. CM-SPCmplModifiedMaint_ext Refer to the example below.
Service Point Completion Details Display (M2-SPCmplDetailsDisp)	End of Values As Sent from Host on Left Column CM-SPCmplDetails_ext End of Values As Modified by Crew on Right Column CM-SPCmplModified_ext Refer to the example below.
Meter Completion Details Maintenance (M2-MeterCmplDetailsMaint)	End of Values As Sent from Host on Left Column CM-MeterCmplDetailsMaint_ext End of Values As Modified by Crew on Right Column CM-MeterCmplModifiedMaint_ext
Meter Completion Details Display (M2-MeterCmplDetailsDisp)	End of Values As Sent from Host on Left Column CM-MeterCmplDetailsDisp_ext End of Values As Modified by Crew on Right Column CM-MeterCmplModifiedDisp_ext
New Meter Completion Details Maintenance (M2-NewMeterCmplDetailsMaint)	CM-NewMeterDetailsMaint_ext
New Meter Completion Details Display (M2-NewMeterCmplDetailsDisp)	CM-NewMeterDetailsDisp_ext
Item Completion Details Maintenance (M2-ItemCmplDetailsMaint)	End of Values As Sent from Host on Left Column CM-ItemCmplDetailsMaint_ext End of Values As Modified by Crew on Right Column CM-ItemCmplModifiedMaint_ext
Item Completion Details Display (M2-ItemCmplDetailsDisp)	End of Values As Sent from Host on Left Column CM-ItemCmplDetailsDisp_ext End of Values As Modified by Crew on Right Column CM-ItemCmplModifiedDisp_ext
New Item Completion Details Maintenance (M2-NewItemCmplDetailsMaint)	CM-NewItemDetailsMaint_ext
New Item Completion Details Display (M2-NewItemCmplDetailsDisp)	CM-NewItemDetailsDisp_ext
Common Completion Maintenance (M1-AssignmentCmnCmplMaint)	CM-AssignmentCmnCmplMaint_ext
Common Completion Display (M1-AssignmentCmnCmplDisplay)	CM-AssignmentCmnCmplDisp_ext

Example - Service Point Completion Display Map Fragments

CM Service Point Completion Activity Details Map Fragment

CM-SPCmplDetails_ext

This fragment should look very similar to the html in the browse division of the laptop fragment (CM-MCPSPDetails_ext). The fields are the same, but the server display uses different html elements.

(`<div>`,`<label>`,`` instead of `<tr>`, `<td>`)

We recommend that the CM fragment has the activity detail fields first followed by completion only fields.

```
<div>
  <label oraLabel="boGroup/cmAddlSPDataDetails/serialNumber"></label>
  <span oraField="boGroup/cmAddlSPDataDetails/serialNumber"></span>
</div>
<div>
  <label oraLabel="boGroup/utilityCompletionInformation/
servicePointCompletionDetails/cmAddlSPDataDetails/condition"></label>
  <span oraField="boGroup/utilityCompletionInformation/
servicePointCompletionDetails/cmAddlSPDataDetails/condition"></span>
</div>
```

CM Service Point Completion Modified Details Map Fragment

CM-SPCmplModified_ext

This fragment should look very similar to the html in the browse division of the laptop fragment (CM-MCPSPModified_ext). The fields are the same, but the server display uses different html elements

(`<div>`,`<label>`,`` instead of `<tr>`, `<td>`)

- Each activity detail field that can be modified, should have a row in this fragment.
- Each row should contain a `<label>`, a `` for the modified detail field, and a `` for the activity detail field.
 - The `` for the modified detail field must have an id (e.g. `id="CMNewSerialNumber"`)
 - The `` for the activity detail field should have a style so that it will not be displayed (e.g. `style="display:none"`)
 - The `` for the activity detail field should call `grayOutUnmodifiedDetails()` in an `oraLoad`, passing to it the id of the modified detail field (e.g. `oraLoad="grayOutUnmodifiedDetails('CMNewSerialNumber')"`)

```
<div>
  <label oraLabel="boGroup/utilityCompletionInformation/
servicePointCompletionDetails/cmAddlSPDataDetails/serialNumber"></
label>
  <span oraField="boGroup/utilityCompletionInformation/
servicePointCompletionDetails/cmAddlSPDataDetails/serialNumber"
id="CMNewSerialNumber"></span>
  <span style="display:none" oraField="boGroup/cmAddlSPDataDetails/
serialNumber"
oraLoad="grayOutUnmodifiedDetails('CMNewSerialNumber')"></span>
</div>
```

Example - Service Point Completion Maintenance Map Fragments

CM Service Point Completion Details Maintenance Map Fragment

CM-SPCmplDetailsMaint_ext

This fragment can contain the same html as the in the completion division of the laptop fragment (CM-MCPSPDetails_ext).

```
<tr>
  <td><span oraLabel="boGroup/cmAddlSPDataDetails/serialNumber"></span></td>
  <td><span oraField="boGroup/cmAddlSPDataDetails/serialNumber"></span></td>
</tr>
<tr>
  <td oraLabel="boGroup/utilityCompletionInformation/servicePointCompletionDetails/cmAddlSPDataDetails/condition"></td>
  <td><input class="oraInput" oraField="boGroup/utilityCompletionInformation/servicePointCompletionDetails/cmAddlSPDataDetails/condition"/></td>
</tr>
```

CM Service Point Completion Modified Map Fragment

CM-SPCmplModifiedMaint_ext

This fragment can contain the same html as the in the completion division of the laptop fragment (CM-MCPSPModified_ext).

```
<tr>
  <td oraLabel="boGroup/utilityCompletionInformation/servicePointCompletionDetails/cmAddlSPDataDetails/serialNumber"></td>
  <td><input class="oraInput" oraField="boGroup/utilityCompletionInformation/servicePointCompletionDetails/cmAddlSPDataDetails/serialNumber"/></td>
</tr>
```

Oracle Utilities Mobile Workforce Management Mobile Application – Laptop

Some of the following completion fragments allow the crew to modify details sent from the host. These are designed to have the original values sent from the host displayed on the left column of the map and modifiable details on the right column.

The original values should be read only. This only includes the details that the crew is allowed to modify in the modifiable section. A separate CM fragment is provided on the left and right columns.

Base logic initializes the modifiable values with the original values. Details that were not changed by the crew and displayed in a different font than those that were changed.

Refer to examples in the base maps you extend to follow these display patterns.

Base UI Map Fragment	CM Extended UI Map Fragment
Activity Details Fragment (M2-MCPActivityMainDispFrag)	End of Customer Information section CM-MCPCustomerInfo_ext End of Map CM-MCPActivityMain_ext
Collections Details Fragment (M2-MCPCollectionsInfoDispFrag)	CM-MCPCollectionDetails_ext

Base UI Map Fragment	CM Extended UI Map Fragment
Service Point Details Fragment (M2-MCPSPDetailsMaintFrag)	End of Values As Sent from Host on Left Column CM-MCPSPDetails_ext End of Values As Modified by Crew on Right Column CM-MCPSPModified_ext Refer to the example below.
Meter Details Fragment (M2-MCPExistingMeterMaintFrag)	End of Values As Sent from Host on Left Column CM-MCPMeterDetails_ext End of Values As Modified by Crew on Right Column CM-MCPMeterModified_ext
New Meter Details Fragment (M2-MCPNewMeterMaintFrag)	CM-MCPNewMeterDetails_ext
Item Details Fragment (M2-MCPExistingItemMaintFrag)	End of Values As Sent from Host on Left Column CM-MCPItemDetails_ext End of Values As Modified by Crew on Right Column CM-MCPItemModified_ext
New Item Details Fragment (M2-MCPNewItemMaintFrag)	CM-MCPNewItemDetails_ext
Common Completion Fragment (M2-MCPCommonCmplMaintFrag)	CM-MCPCommonCompletion_ext

Example -Service Point Laptop Maintenance Map Fragment

CM Service Point Activity Details Map Fragment

CM-MCPSPDetails_ext

The map fragment should contain 2 groups of elements; one to be displayed in *Completion* mode and one to be displayed in *Browse* mode.

We recommend that the CM fragment has the activity detail fields first, followed by completion only fields.

```

<!-- Browse section -->
<tr oraLoad="oraDisplayNone(item,'common/mode','Completion');">
  <td><span oraLabel="boGroup/cmAddlSPDataDetails/serialNumber"></span></td>
  <td><span oraField="boGroup/cmAddlSPDataDetails/serialNumber"></span></td>
</tr>
<tr oraLoad="oraDisplayNone(item,'common/mode','Completion');">
  <td><span oraLabel="boGroup/utilityCompletionInformation/servicePointCompletionDetails/cmAddlSPDataDetails/condition"></span></td>
  <td><span oraField="boGroup/utilityCompletionInformation/servicePointCompletionDetails/cmAddlSPDataDetails/condition"></span></td>
</tr>
<!-- completion section -->
<tr oraLoad="oraDisplayNone(item,'common/mode','Browse');">
  <td><span oraLabel="boGroup/cmAddlSPDataDetails/serialNumber"></span></td>
  <td><span oraField="boGroup/cmAddlSPDataDetails/serialNumber"></span></td>
</tr>

```

```

<tr oraLoad="oraDisplayNone(item,'common/mode', 'Browse');">
  <td oraLabel="boGroup/utilityCompletionInformation/
servicePointCompletionDetails/cmAddlSPDataDetails/condition"></td>
  <td><input class="oraInput" oraField="boGroup/
utilityCompletionInformation/servicePointCompletionDetails/
cmAddlSPDataDetails/condition"/></td>
</tr>

```

CM Service Point Modified Activity Details Map Fragment

CM-MCPSPModified_ext

The map fragment should contain 2 <div>; one to be displayed in completion mode and one to be displayed in browse mode.

- Each activity detail field that can be modified, should have a row in this fragment.
- In the Browse division:
 - Each row should contain an oraLabel <td>, an oraField <td> for the modified detail field, and an oraField <td> for the activity detail field.
 - The oraField <td> for the activity detail field should have a class of mcpHidden since it will not be displayed (e.g. class="mcpHidden")

```

<!-- Browse section -->
<tr oraLoad="oraDisplayNone(item,'common/mode', 'Completion');">
  <td><span oraLabel="boGroup/utilityCompletionInformation/
servicePointCompletionDetails/cmAddlSPDataDetails/serialNumber"></
span></td>
  <td><span oraField="boGroup/utilityCompletionInformation/
servicePointCompletionDetails/cmAddlSPDataDetails/serialNumber"></
span></td>
  <td class="mcpHidden" oraField="boGroup/cmAddlSPDataDetails/
serialNumber"></td>
</tr>
<!--Completion section -->
<tr oraLoad="oraDisplayNone(item,'common/mode', 'Browse');">
  <td oraLabel="boGroup/utilityCompletionInformation/
servicePointCompletionDetails/cmAddlSPDataDetails/serialNumber"></td>
  <td><input class="oraInput" oraField="boGroup/
utilityCompletionInformation/servicePointCompletionDetails/
cmAddlSPDataDetails/serialNumber" /></td>
</tr>

```

Oracle Utilities Mobile Workforce Management Mobile Application – Handheld

Some of the following completion maps allow the crew to modify details sent from the host. Because of real estate considerations on the handheld these maps are designed to have a **Modify** button on them that when clicked by the crew it opens up an editable element below each field that is allowed to be modified. The same map in browse mode would only display the modified value if it is different from the original value.

examples in the base maps you extend to follow these display patterns.

Base UI Map Fragment	CM Extended UI Map Fragment
Customer Information (M2-MCPCustomerInfoDisp)	CM-MCPWMCustomerInfo_ext
Collections Details (M2-MCPCollectionsDetailsDisp)	CM-MCPWMCollectionsDetails_ext

Base UI Map Fragment	CM Extended UI Map Fragment
Service Point Details (M2-MCPSPDetailsMaint)	CM-MCPWMSPDetails_ext This map supports the Modify button. Refer to the example below.
Meter Details (M2-MCPExistMeterDetailsMaint)	CM-MCPWMMeterDetails_ext This map supports the Modify button.
New Meter Details (M2-MCPNewMeterDetailsMaint)	CM-MCPWMNewMeterDetails_ext
Item Details Maintenance (M2-MCPExistItemDetailsMaint)	CM-MCPWMItemDetails_ext This map supports the Modify button.
New Item Details Maintenance (M2-MCPNewItemDetailsMaint)	CM-MCPWMNewItemDetails_ext
Common Completion (M1-MCPCommonCompletionMaint)	CM-MCPWMCommonCompletion_ext

Example - Service Point Handheld Maintenance Map

CM MCP WM Service Point Details Map Fragment

CM-MCPWMSPDetails_ext

The map fragment should contain 2 groups of elements; one to be displayed in *Completion* mode and one to be displayed in *Browse* mode.

We recommend that the CM fragment has the activity detail fields first, followed by completion only fields. Each activity detail field that can be modified, should be immediately followed by a modified detail row.

- In the *Browse* section:
 - The oraField <td> in each activity detail row must have an id (e.g. id="CMOrigSerialNumber")
 - The oraField <td> in each modified detail row must have an id (e.g. id="CMNewSerialNumber")
 - The oraField <td> in each modified detail row will call mcpHideUnmodifiedDetails() in an oraLoad, passing to it the id of the modified detail field and the id of the activity detail field (e.g. oraLoad="mcpHideUnmodifiedDetails('CMNewSerialNumber','CMOrigSerialNumber')")

```
<!-- Browse section-->
<tr oraLoad="oraDisplayNone(item,'common/mode','Completion');">
  <td class="oraLabel oraTableLabel"><span oraLabel="boGroup/cmAddlSPDataDetails/serialNumber"></span></td>
  <td class="oraNormal oraTableData"><span oraField="boGroup/cmAddlSPDataDetails/serialNumber" id="CMOrigSerialNumber"></span></td>
</tr>

<tr oraLoad="oraDisplayNone(item,'common/mode','Completion');">
  <td> </td>
  <td class="oraNormal oraTableData"><span oraField="boGroup/utilityCompletionInformation/servicePointCompletionDetails/cmAddlSPDataDetails/serialNumber" id="CMNewSerialNumber">
```

```

oraLoad="mcpHideUnmodifiedDetails('CMNewSerialNumber','CMAOrigSerialNumber')"></span></td>
</tr>

<tr oraLoad="oraDisplayNone(item,'common/mode','Completion');">
  <td class="oraLabel oraTableLabel"><span oraLabel="boGroup/utilityCompletionInformation/servicePointCompletionDetails/cmAddlSPDataDetails/condition"></span></td>
  <td class="oraNormal oraTableData"><span oraField="boGroup/utilityCompletionInformation/servicePointCompletionDetails/cmAddlSPDataDetails/condition"></span></td>
</tr>

```

- In the *Completion* section:
 - Each modified detail row should call oraDisplayNone in an oraLoad to not display the row if the modifyButtonClicked is false (e.g. oraLoad="oraDisplayNone(item,'boGroup/utilityCompletionInformation/servicePointCompletionDetails/modifyButtonClicked','false');")

```

<!-- Completion division -->
<tr oraLoad="oraDisplayNone(item,'common/mode','Browse');">
  <td class="oraLabel oraTableLabel"><span id="CMlblSerialNumber" oraLabel="boGroup/cmAddlSPDataDetails/serialNumber"></span></td>
  <td class="oraNormal oraTableData"><span id="CMSerialNumber" oraField="boGroup/cmAddlSPDataDetails/serialNumber"></span></td>
</tr>

<tr oraLoad=" oraDisplayNone(item,'common/mode','Browse');oraDisplayNone(item,'boGroup/utilityCompletionInformation/servicePointCompletionDetails/modifyButtonClicked','false');">
  <td> </td>
  <td><input class="oraInput" id="CModSerialNumber" oraField="boGroup/utilityCompletionInformation/servicePointCompletionDetails/cmAddlSPDataDetails/serialNumber"/></td>
</tr>

<tr oraLoad="oraDisplayNone(item,'common/mode','Browse');">
  <td class="oraLabel oraTableLabel"><span id="CMlblCondition" oraLabel="boGroup/utilityCompletionInformation/servicePointCompletionDetails/cmAddlSPDataDetails/condition"></span></td>
  <td><input class="oraInput" id="CMCondition" oraField="boGroup/utilityCompletionInformation/servicePointCompletionDetails/cmAddlSPDataDetails/condition"/></td>
</tr>

```

XSL Template in Oracle Utilities Customer Care and Billing

This section provides information about the XSL Template and how to use the template to pass characteristic and geographic values from Oracle Utilities Customer Care and Billing to Oracle Utilities Mobile Workforce Management.

About the XSL Template

The XSL Template is located in MDS on the framework SOA server. Please refer to [Processing CC&B NDS Records Using Middleware/BPEL](#) for more information.

All custom elements should be sent to Oracle Utilities Mobile Workforce Management under a **customSchemaData** node. Within that node the element must be placed at the same XPath location as defined on the activity business object.

The base product provides an XSL template that facilitates the mapping of characteristics and geographic values of a given entity to corresponding locations in the Oracle Utilities Mobile Workforce Management target schema.

The calling XSL should establish the surrounding group node structure starting from the **customSchemaData** node and then call the XSL template to handle all the characteristics and geographic values for a specific entity.

The list of characteristic types and geographic value types and corresponding element names in Oracle Utilities Mobile Workforce Management is defined in an input file **CM-InputCharacteristicsGeoCodesCollection.xml**.

For example, if you have extended the service point details in Oracle Utilities Mobile Workforce Management with characteristics and geographic types, call the XSL Template once for the "Service Point Characteristics" entity and once for the "Service Point Geographic Value" entity.

```
<customSchemaData>
  <yourCMgroupForSPDetailsAsDefinedInMWM>
    <xsl:call-template name="C1FieldWorkExtensionTemplate">
      <xsl:with-param name="entityName" select="'SPCharacteristics'"/>
    </xsl:call-template>
    <xsl:call-template name="C1FieldWorkExtensionTemplate">
      <xsl:with-param name="entityName" select="'ServicepointGeo'"/>
    </xsl:call-template>
    <someSPfield>
      </xsl...>
    </someSPfield>
  </yourCMgroupForSPDetailsAsDefinedInMWM>
</customSchemaData>
```

If all custom elements of all entities are just characteristics and geographic values the surrounding group node structure may be defined as part of the element name in the input file allowing you to make a single call to the template:

```
<customSchemaData>
  <xsl:call-template name="C1FieldWorkExtensionTemplate"/>
</customSchemaData>
```

Using the XSL Template

1. Locate the template file: **CM-InputCharacteristicsGeoCodesCollection.xml**.
2. Use the following XML format to update the file with an entry for each custom characteristic and geographic value to be forwarded to Oracle Utilities Mobile Workforce Management.

```
<CharacteristicsGeoCodesCollection>
  <CharacteristicGeoCode>
    <entityName>SPCharacteristics</entityName>
    <charType>PLANT</charType>
    <charTypeNode>CM-SPDetails/plant</charTypeNode>
  </CharacteristicGeoCode>
  ...
  <CharacteristicGeoCode>
    <entityName>ServicepointGeo</entityName>
    <geoType>DVCE</geoType>
    <geoTypeNode>CM-ServicePointGeo/geoCodeDevice</
    geoTypeNode>
  </CharacteristicGeocode>
  ...
</CharacteristicsGeoCodesCollection>
```

- **Entity Name.** Refers to different characteristics or geo type entity collections.

Valid values:

FA Type Characteristics (FatyCharacteristic)

FA Characteristics (FACharacteristics)

SP Type Characteristics (ServicepointTypeCharacteristic)

SP Characteristics (SPCharacteristics)

Premise Characteristics (PremiseCharacteristics)

Meter Characteristics (MeterCharacteristics)

Item Characteristics (ItemCharacteristics)

Service Point Geo Code (ServicepointGeo)

Premise Geographic Value (PremiseGeoTypes)

- **Characteristic Type** uniquely identifies the characteristic value in the source collection.
- **Characteristic Type Node** If the template is called within an already established group node structure for a specific entity this is the element name only. If the template is called once for all entities this is the full XPath below the Custom Schema Data node in the target Oracle Utilities Mobile Workforce Management message.
- **Geo Type** uniquely identifies the geographic value in the source collection.
- **Geo Type Node** If the template is called within an already established group node structure for a specific entity this is the element name only. If the template is called once for all entities this is the full XPath below the Custom Schema Data node in the target Oracle Utilities Mobile Workforce Management message of the element, including the element name.

Chapter 18

Security

This chapter describes the various security policies used for various services.

The Oracle Process Integration Pack for Oracle Utilities Field Work uses Oracle Web Services Manager (OWSM) to provide the following security features:

- Attach security policies to services
- Pass username/password information through csf-keys
- Define and store declarative policies from a central location
- Enforce security and management policies through configurable agents

Applied Security Policies

This section identifies the security policies used for various services.

Global Service Policy

By default all AIA Services - Application Business Connector Services (ABCS), Enterprise Business Services (EBS) and Transport Adapter Services are secured with the following Global Service Policy:

```
oracle/aia_wss_saml_or_username_token_service_policy_OPT_ON
```

Applications invoking secured AIA Web Services need to send credentials.

Global Client Policy

Inter-AIA communication is handled by Global Client Policy. By default all Client services are secured with the Global Client Policy:

```
oracle/aia_wss_saml_or_username_token_client_policy_OPT_ON
```

Local Client Policy

All Client services to access edge applications have overridden the above mentioned Global Client policy with a local security policy:

```
oracle/wss_http_token_client_policy
```

This enables the credentials to be passed to the edge applications as part of the http header.

Following csf-keys have been created to enter credentials for the three edge applications as part of Install:

- OU_CCB_01 for CCB

- OU_MWM_01 for MWM
- OU_WAM_01 for WAM

Upon install, the above mentioned csf-keys get created. Passwords can be changed in the Oracle Enterprise Manager.

The following table shows the **oracle/wss_http_token_client_policy** client policy attached to composites.

SOA Composite	Attached To	Csf-key
CCBGetMeterDataProvService	C1ExtractSPIInfo	OU_CCB_01
CreateCustomerInteractionOUCCBUilitiesProvABCSImpl	C1CustomerContactMaintenancePortType	OU_CCB_01
CreateInvoiceOUCCBUilitiesProvABCSImpl	C1RetCreateBillableChargeSAPortType	OU_CCB_01
CreateInvoiceOUCCBUilitiesProvABCSImpl	F1AutomaticToDoEntryPortType	OU_CCB_01
CreateInvoiceOUCCBUilitiesProvABCSImpl	BillableChargeUploadMaintenancePortType	OU_CCB_01
ProcessWorkOrderResponseOUCCBUilitiesProvABCSImpl	FAResponsePortType	OU_CCB_01
ValidateInstalledProductOUCCBUilitiesProvABCSImpl	ValidateMeterItemResponsePortType	OU_CCB_01
ProcessWorkOrderOUCCBUilitiesProvABCSImpl	C1FACompletionExtSysStructPortType	OU_CCB_01
ProcessWorkOrderOUCCBUilitiesProvABCSImpl	C1FieldActivityMaintenancePortType	OU_CCB_01
ProcessWorkOrderOUCCBUilitiesProvABCSImpl	C1AddFAandCustomerContactPortType	OU_CCB_01
GetWOLineApptWinAvailOUMWMUilitiesProvABCSImplV2	M1-RouteAppointmentRequestToSchedulerPortType	OU_MWM_01
ProcessWorkOrderOUMWMUilitiesProvABCSImplV2	M2-MaintainUtilityActByHost	OU_MWM_01
ProcessWorkOrderOUMWMUilitiesProvABCSImplV2	M2-FinalizeUtilityActByHost	OU_MWM_01
ProcessWorkOrderOUWAMUilitiesProvABCSImpl	ServiceRequestCompletionDatasetService	OU_WAM_01
ProcessWorkOrderOUWAMUilitiesProvABCSImpl	ServiceRequestDatasetService	OU_WAM_01
ProcessWorkOrderOUWAMUilitiesProvABCSImplV2	W1-CreateNewActivity	OU_WAM_01
ProcessWorkOrderOUWAMUilitiesProvABCSImplV2	W1-FldwrkPIPAcctComplInbComm	OU_WAM_01
ProcessWorkOrderResponseOUWAMUilitiesProvABCSImplV2	W1-FldwrkPIPILogActAck	OU_WAM_01

Local Service Policy

All edge applications invoking the integration (i.e. Requestor ABCS) override the global service policy with a local security policy:

oracle/wss_http_token_service_policy

The following table shows the **oracle/wss_http_token_service_policy** service policy attached to composites.

SOA Composite

- ProcessWorkOrderOUCCBUilitiesReqABCImpl
- GetWOLineApptWinAvailOUCCBUilitiesReqABCImpl
- ProcessWorkOrderCompleteOUMWMUtilitiesReqABCImplV2
- ProcessWorkOrderCreateOUMWMUtilitiesReqABCImplV2
- ProcessWorkOrderStatusOUMWMUtilitiesReqABCImplV2
- ValidateInstalledProductOUMWMUtilitiesReqABCImplV2
- ProcessWorkOrderCreateOUWAMUtilitiesReqABCImpl
- ProcessWorkOrderUpdateOUWAMUtilitiesReqABCImpl
- ProcessWorkOrderCompleteOUWAMUtilitiesReqABCImpl
- CreateInvoiceOUWAMUtilitiesReqABCImpl
- ValidateInstalledProductOUWAMUtilitiesReqABCImpl
- ProcessWorkOrderCancelOUWAMUtilitiesReqABCImplV2
- ProcessWorkOrderCreateUpdateOUWAMUtilitiesReqABCImplV2

Local Client No Authentication Policy

Some client services override the global client policy with a no authentication local security policy:

oracle/no_authentication_client_policy

The following table shows the **oracle/ no_authentication_client_policy** client policy attached to composites.

SOA Composite	Attached To
UtilitiesCustomerInteractionResponseEBS	CreateCustomerInteractionOUWAMUtilitiesReqABCImpl_1_0
ProcessWorkOrderCreateOUWAMUtilitiesReqABCImpl	WAMGetMeterDataReqService

Local Service No Authentication Policy

Some services override the global service policy with a no authentication local security policy:

oracle/no_authentication_service_policy

The following table shows the **oracle/ no_authentication_service_policy** service policy attached to composites.

SOA Composite	Attached To
ProcessWorkOrderCreate OUWAMUtilitiesReqABCImpl	ProcessWorkOrderCreateOUWAMUtilitiesReqABCImpl
CreateCustomerInteraction OUWAMUtilitiesReqABCImpl	CreateCustomerInteractionOUWAMUtilitiesReqABCImpl

For more information about security validation and csf-key, refer to the *Oracle Fusion Middleware Developer's Guide for Oracle SOA Core Extension* under "Working with Security".

Chapter 19

Processing CC&B NDS Records Using Middleware/BPEL

This chapter provides an overview of the Processing NDS Records Using Middleware, which facilitates the integration between Oracle Utilities Customer Care and Billing and the Fieldwork integration.

About Processing NDS Records Using Middleware

This utility provides the following functionality:

- Periodic database polling
- Querying the Oracle Utilities Customer Care and Billing database to get records from Notification Download Staging (NDS) with pending or retry status
- Obtaining enrichment information about the corresponding field activity for each NDS record
- Submitting the FA to Process Order service in the integration layer
- Updating NDS record status based on the record processing and sending outcome

Middleware Composites for NDS Records Processing

The utility is delivered as patch 18362634.zip and is comprised of the following components and parts:

- GetNDSRecordsOUCCBUilitiesEBF composite code
- ProcessNDSRecordOUCCBUilitiesEBF composite code
- ManageNDSRecordsUtilityEBF

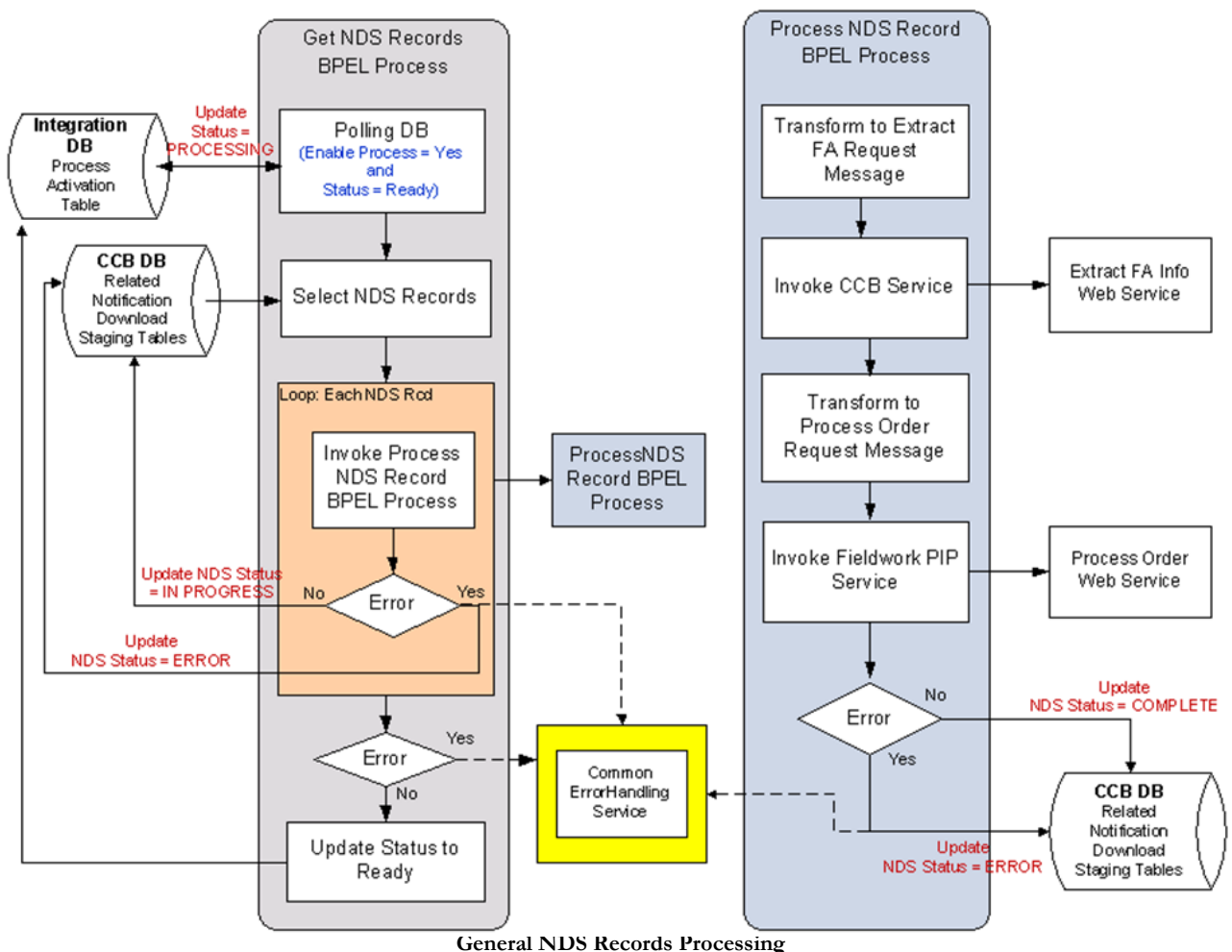
Processing Details

Currently NDS records processing supports Create/Update/Reschedule/Cancel operations only. Additional processing includes the following:

- GetNDSRecordsOUCCBUilitiesEBF is a singleton, which polls the OUCCB_NDS_PROCESS_ACTIVATION table according to the predefined polling frequency. Once this BPEL process is activated, it queries the Oracle Utilities Customer Care and Billing database and extracts NDS records that are ready to be delivered to the integration layer. The query picks up the records in batches, and the batch size is defined in the configuration properties.

- For each field activity record found, status is updated to ‘Processing’ in the NDS table and the ProcessNDSRecordOUCCBUilitiesEBF processing is invoked, specifying the field activity details as parameters.
- ProcessNDSRecordOUCCBUilitiesEBF makes field activity details enrichment by calling the Oracle Utilities Customer Care and Billing web service, ExtractFAInfo .
- Next the field activity record is transformed to match the field activity representation in the integration layer.
If the transformation is successful, it invokes the ProcessWorkOrderOUCCBUilitiesReqABCImpl process. This process completed the field activity processing. It is possible to specify a delay between each field activity record being processed in the configuration properties if necessary.
- When the operation is completed successfully, the field activity status is set to ‘Completed’ in the NDS table. If it is not completed successfully the status is set to ‘Error’.
- If there is an error, a standard error message is created (message number 9805, category number 11011). This is displayed in Oracle Utilities Customer Care and Billing via the NDS record user interface.
- Both BPEL processes detect errors and report them via the AIAASyncErrorHandlingBPELProcess.

The following diagram provides a graphical representation of the general NDS records processing:



Stopping and Starting NDS Polling

By default upon install, the field activities from Oracle Utilities Customer Care and Billing will not be picked up. The polling composite, `GetNDSRecordsOUCCBUilitiesEBF`, does not poll the NDS records since `<flagname>` in the table `OUCCB_NDS_PROCESS_ACTIVATION` is set to `Stopped`.

Once all the integration configurations are completed, the polling can be started by running the composite `ManageNDSRecordsUtilityEBF`.

Using the `ManageNDSRecordsUtilityEBF`:

This composite is used to Start/Stop or check the status of the polling. Enter Details as needed:

- **Start:** Starts the NDS processing
- **Stop:** Stops NDS processing
- **Status:** Gives status of Status and enableProcess (Ex: Status:Stopped::Flag:Yes)

Customization Techniques

The following customization points are provided with this integration:

- The user can define additional transformation code in `CM-InputCharacteristicsGeoCodesCollection.xml` which is called from `C1FieldWorkExtensionTemplate.xml`.

`C1FieldWorkExtensionTemplate.xml` is used to execute this. This applies the `CM-InputCharacteristicsGeoCodesCollection.xml` import.

An example of `CM-InputCharacteristicsGeoCodesCollection.xml` content is provided in the [Custom Extensions](#) section under [XSL Template in Oracle Utilities Customer Care and Billing](#). Please also refer to [Setting up Oracle Utilities Customer Care and Billing](#) for more information.

- `PreInvokeExtractFAInfo` operation on `ExtractFAExtensionService` implementation.
- `PostInvokeExtractFAInfo` operation on `ExtractFAExtensionService` implementation.
- Three dedicated override templates can be used to alter the default Process Work Order request transformation after the `PostInvoke` step.

There are three `C1FAIntExtOrder***_Override.xml` files for `Create/Update/Reschedule/Cancel` operations. Currently these XSLs contain the code to copy all elements and attributes of the original message. The code from existing custom XSL needs to be placed inside, and if the `Override.XForm.ProcessWorkOrderOUCCBUilitiesReqABCImpl` property in `AIAConfigurationProperties.xml` is set to 'true', the corresponding override XSL is invoked instead of the default.

If it is necessary to call a custom service instead of `ExtractFAInfo`:

- Update the `Routing.ExtractFAInfo.OU_CCB_01.EndpointURI` property in `AIAConfigurationProperties.xml` to point to this custom service endpoint .

This service has to comply with the interface rules defined in `ExtractFAInfo.wsdl` located in MDS in `../apps/AIAMetaData/AIAComponents/ApplicationObjectLibrary/OUCCB/V1/wsdls` folder.

- To alter the request to `ExtractFAInfo` (or its substitute) you can activate the `PreInvoke` call.

- To alter the response from ExtractFAInfo, you can activate the PostInvoke call. To execute this, implement the ExtractFAExtensionService. “

The interface to the service is specified in ProcessNDSRecordOUCCBUilitiesEBFExtensionConcrete.wsdl in ../apps/AIAMetaData/AIAComponents/ExtensionServiceLibrary/OUCCB folder. This wsdl also specifies the binding to the concrete service location.

The service must provide two operations:

- PreInvokeExtractFAInfo
- PostInvokeExtractFAInfo

Activate Extensions

Set properties in AIAConfigurationProperties.xml should be set to ‘true’ to activate the extensions: ABCSExtension.PreInvokeExtractFAInfo and/or ABCSExtension.PostInvokeExtractFAInfo.

NDS Records Processing Setup

There are two sections in AIAConfigurationProperties.xml that describe NDS Records Processing section describing BPEL composites settings:

GetNDSRecordsOUCCBUilitiesEBF Configuration

Property Name	Default / Shipped	Description
Routing.ProcessNDSRecordOUCCBUilities.EndPointURI		Points to Process NDS Record composite.
OU_CCB_01.ServiceProviderCD	AIA-FS	Service provider ID as defined in CC&B
OU_CCB_01.MaxRecordsPerQuery	100	Maximum records in the portion returned by the query to NDS table
OU_CCB_01.ProcessingDelay	0	The delay in seconds between each record processing
Default.SystemID	OU_CCB_01	System ID

ProcessNDSRecordOUCCBUilitiesEBF Configuration

Property Name	Default / Shipped Value	Description
Routing.ExtractFAInfo.OU_CCB_01.EndpointURI		Points to Process ExtractFAInfo web service in CC&B
Routing.ProcessWorkOrderOUCCBUilitiesReqABCImpl.EndpointURI		Points to 'Process Work Order' FW PIP composite
ABCSExtension.PreInvokeExtractFAInfo	false	Customization – pre-invoke service ON/OFF switch. The actual endpoint is defined in ProcessNDSRecordOUCCBUilitiesEBFExtension.wsdl.
ABCSExtension.PostInvokeExtractFAInfo	false	
Override.CreateXForm.ProcessWorkOrderOUCCBUilitiesReqABCImpl	false	Customization – override 'Create' FA XSL transformation ON/OFF switch. The override XSL is C1FAIntExtOrderCreate_Override.xsl in the composite source. Default is 'false'.
Override.UpdateXForm.ProcessWorkOrderOUCCBUilitiesReqABCImpl	false	Customization – override 'Update' FA XSL transformation ON/OFF switch. The override XSL is C1FAIntExtOrderUpdate_Override.xsl in the composite source.
Override.CancelXForm.ProcessWorkOrderOUCCBUilitiesReqABCImpl	false	Customization – override 'Cancel' FA XSL transformation ON/OFF switch. The override XSL is C1FAIntExtOrderCancel_Override.xsl in the composite source. Default is 'false'
FAType_Create	FA-CRE	Create a Field Activity Type as defined in CC&B
FAType_Update	FA-CHG	Update Field Activity Type as defined in CC&B
FAType_Cancel	FA-CAN	Cancel Field Activity Type as defined in CC&B
Default.SystemID	OU_CCB_01	System ID

Performance Tuning

Note the following parameters which control performance for NDS records processing.

Defaults

Default settings provide reasonable values to start using the NDS records processing integration:

- PI = 60 sec
- D = 0 sec
- RP = 100

Parameter Definitions

- PI - Polling interval (the interval between the subsequent polling composite start times)
 - To change, update properties using the Enterprise Manager.
 1. Right click on GetNDSRecordsOUCCBUtilitiesEBF composite entry
 2. Open Service/Reference Properties.
 3. Select GetProcessActivationRecord adapter settings and update the 'Polling Interval' property.
 - Increasing the PI value causes the system response to slow down, but less polling composite instances are created. You can set a proper polling interval value with Enterprise Manager depending on your current needs (a small one for better FA processing response or a bigger one suitable for FA bulk processing).
- D - Processing delay (the delay between each NDS record processing)
 - Defined in AIAConfigurationProperties.xml.
 - Increasing the D value slows down NDS record processing, but may make the other applications running on the same SOA server to operate more smoothly.
- RP - NDS Records portion size (how many records are extracted during each polling attempt)
 - Defined in AIAConfigurationProperties.xml.
 - Increasing the RP value affects polling composite memory consumption, but it may be effectively used in combination with the PI setting to improve the overall performance.

Monitoring and Troubleshooting

NDS records processing is activated by the database polling composite GetNDSRecordsOUCCBUtilitiesEBF (see the [Processing Details](#) section above) which periodically checks the status field of the activation record in the OUCCB_NDS_PROCESS_ACTIVATION table.

The **Ready** status triggers the start of the polling process. Immediately after the composite starts, the status is changed to **Processing**. After the polling process completes successfully, it changes the status back to **Ready**.

If any error occurs, regular error handling actions are performed, and the administrator is notified. The status of the activation record is not changed back to **Ready** and remains as **Processing**. This is done to prevent possible duplicating of error notifications.

When any error report from the polling process is detected, it is recommended that you review the activation record status. After fixing the issue, revert the status back to **Ready**.

During bulk NDS records processing, the polling composite may take a significant amount of time to finish. If the SOA server goes down unexpectedly or the composite was stopped from the **Enterprise Manager** console before the polling composite completed processing, the process may not complete the normal status reset and the status will be stuck in **Processing**. In this case, the administrator needs to manually revert the status manually back to **Ready**.

When processing an error, a standard error message is created (message number 9805, category number 11011). This message contains one parameter - faulted BPEL process ID. This information is inserted into CI_NT_DWN_EXC, CI_NT_DWN_EXP tables and is displayed in Oracle Utilities Customer Care and Billing via the NDS record user interface.

Appendix A

MPL

This chapter provides an overview of MPL processing for implementations which use Oracle Utilities Customer Care and Billing v2.3.x or earlier.

Multi Purpose Listener. The Multi Purpose Listener is a multi-threaded Java server that reads XML requests from various external and internal data sources, such as a Java Message Service (JMS) message queue, a JMS topic or system staging tables.

The MPL can be used to process inbound messages (those sent by an external application to invoke a system service), or outgoing messages (those sent by your product to external applications). The MPL uses different receivers to process messages from different data sources.

Configuring XAI for Use with Multi Purpose Listener (MPL)

Create an HTTP XAI Sender for Service Orders

Create a new XAI Sender for service orders which points to the Oracle Utilities Customer Care and Billing Requester ABCS for the Field Order integration point.

1. Navigate to Admin Menu, XAI Sender.
2. Enter a unique XAI Sender and Description.
3. Populate values as follows:
 - Invocation Type = **MPL**
 - XAI Class = **HTTPSNDR**. This is the class for Real-time sender to route messages using HTTP
 - MSG Encoding = **UTF-8 message encoding**
4. Select the **Active** check box.
5. 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: "ProcessOrder"**
 - **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 (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 Query Appointment Requester ABCS.

For example:

```
http://soa-server:soa-port/soa-infra/services/default/
ProcessWorkOrderOUCCBUilitiesReqABCImpl/
ProcessWorkOrderOUCCBUilitiesReqABCImpl
```

- **Character Encoding** – UTF-8
- **HTTP Header** – Content-Type:text/xml;charset=UTF-8

Create an HTTP XAI Sender for Route Type

Create the following route types for communicating with integration layer referencing XAI senders previously created for Field Activity and Appointment.

1. Navigate to Admin Menu > XAI Route Type.
2. Enter a unique XAI Route Type and Description.
3. Populate values as follows:

Select the **Receive Acknowledge** check box if the system expects to receive a synchronous response to outgoing messages of this type.

Select the **Post Response** check box if a synchronous response to an outgoing message requires something to occur in the system. If the box is checked, a response to a message of this type causes an XAI upload staging record to be created. That record is processed along with other uploaded messages, to invoke an appropriate service.

Configuration Values for XAI Route Type

XAI Route Type	XAI Sender	XSL Request	XSL Response	Post Response
Created Order	Reference XAI Sender - Service Order defined in the previous step	C1FAIntExtOrderCreate.xml (invokes C1FAIntExtOrderCreateUpdateCancel.xml)		Checked
Canceled Order	Reference XAI Sender – Service Order defined in the previous step	C1FAIntExtOrderCancel.xml (invokes C1FAIntExtOrderCreateUpdateCancel.xml)		Checked
Order Update	Reference XAI Sender – Service Order defined in the previous step	C1FAIntExtOrderUpdate.xml (invokes C1FAIntExtOrderCreateUpdateCancel.xml)		Checked
Find Available Appointments		C1FieldWorkIntQueryAppointmentSlotsRequest.xml	C1FieldWorkIntQueryAppointmentSlotsResponse.xml	Unchecked

Note: Default XSL transformation scripts that perform the data filter and initial mapping between Oracle Utilities Customer Care and Billing outbound message and the integration layer have been provided by the product. If your implementation has different requirements, create your own XSL transformation scripts and reference your new XSLs on the appropriate XAI Route Types.

To provide Oracle Utilities Mobile Workforce Management with additional information related to activities, Oracle Utilities Customer Care and Billing can be configured with additional XAI Route types.

XSL Template in Oracle Utilities Customer Care and Billing when using MPL

This section provides information about the XSL Template to pass characteristic and geographic values from Oracle Utilities Customer Care and Billing to Oracle Utilities Mobile Workforce Management when using MPL.

The XSL Template is located within Oracle Utilities Customer Care and Billing in the same directory where the Route Type XSL files are located.

The Route type XSLs invoke another XSL called C1FAIntExtOrderCreateUpdateCancel.xsl which in turn calls an XSL Template once to handle all characteristics and geographic values you have defined in the template input file.

You can also enhance your existing custom XSL to call the XSL template as needed. Use either separate calls for each entity or one call for all entities.

Refer to [Chapter 17: Custom Extensions](#) in the section titled [XSL Template in Oracle Utilities Customer Care and Billing](#) for information on how to use the template.

CC&B MPL Error Logs

Errors related to online integration are logged into XAI and MPL logs. Outgoing Messages in error can be found and resubmitted using Notification Download Staging and XAI Download Staging pages. Log files are written to the file designated during installation.

- mpl.trc - used to log to log request messages received by MPL and responses to these messages
- mpl.log - used to log any activities performed by MPL. It is very important to verify that this log does not show any errors after MPL is started.

For more information about errors and notifications refer to the Oracle Utilities Customer Care and Billing documentation.