Oracle® Process Integration Pack for Oracle® Utilities Field Work 2.5 - Implementation Guide

Release 2.5

Part No. E16999-01

February 2010

ORACLE

Oracle Process Integration Pack for Oracle Utilities Field Work 2.5 - Implementation Guide

Part No. E16999-01

Contents

Contents 3
Chapter 1: Participating Applications Overview 5
Oracle Utilities Customer Care and Billing 5
Oracle Utilities Mobile Workforce Management 5
Oracle Utilities Work and Asset Management 5
Chapter 2: Understanding the Oracle Integration Pack for Oracle Utilities Field Work 2.5 7
Business Process Overview 7
Terms 7
Prerequisites 9
Understanding the Integration Business Processes 9
Chapter 3: Data Synchronization 67
Synchronization between CC&B and WAM 67
Synchronization between WAM and MWM 73
Chapter 4: Configuration Guidelines 75
Choosing a Configuration Scenario for your Business 75
Setting Up Oracle Utilities Customer Care and Billing 78
Setting Up Oracle Utilities Work and Asset Management 99
Setting Up Oracle Utilities Mobile Workforce Management 112
Setting Up Field Work Process Integration Pack 119
Viewing EBO Implementation Maps (EIMs) 140
Chapter 5: Monitoring, Error Handling and Troubleshooting 141
Monitoring from Oracle Utilities Customer Care and Billing 141
Monitoring from Oracle Utilities Mobile Workforce Management 142
Monitoring from Oracle Utilities Work and Asset Management 144
Monitoring from the Integration 145
Managing Triggering Events and Retry Processing 148
Managing WorkOrder Failure Scenarios 151
Error Handling Summary 152
Chapter 6: Extensibility Options 157
Extending EBOs 157

Extending ABC Services 160
Appendix A: Data Mapping 161
Appendix B: Cross References 165

Chapter 1: Participating Applications Overview

The Oracle Integration Pack for Oracle Utilities Field Work is an integration involving the following products:

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

This chapter provides a general description of each of these applications.

Oracle Utilities Customer Care and Billing

Oracle Utilities Customer Care and Billing (CC&B) manages customer information associated to field activities and processes the associated billing. Typically processing begins when a customer logs a request, or field activity, to have work completed. CC&B communicates this field activity to MWM as a field order or to WAM as a service request.

Oracle Utilities Mobile Workforce Management

The Oracle Utilities Mobile Workforce Management (MWM) product comprises the following user applications:

- **Dispatch Workstation** - Dispatchers manage and monitor field orders and crews using the dispatch workstation. This application also includes the Admin Tool, which is used to maintain personnel, vehicles, and crews.
- **Mobile Workstation** - Mobile crew members receive work orders, record progress, and enter completion details using the mobile workstation. As orders are processed by the user, the statuses and completion information are returned by wireless communication or LAN connection.

Behind the scenes, the MWM server processes orders, crews, personnel, dispatch functions, and status transactions, and then communicates the status of orders and users to connected applications. The MWM Router converts and routes transactions between external applications, including CC&B.

Oracle Utilities Work and Asset Management

Oracle Utilities Work and Asset Management (WAM) 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 WAM, the systems continue to communicate to update statuses, create and sometimes bill charges, and to close out the work.

Chapter 2: Understanding the Oracle Integration Pack for Oracle Utilities Field Work 2.5

This chapter provides an overview of the Oracle Process Integration Pack for Oracle Utilities Field Work.

Business Process Overview

The Oracle Integration Pack for Oracle Utilities Field Work supports the creation and synchronization of field work records between CC&B, WAM, and MWM.

As an order is initiated within CC&B, WAM or MWM 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 the following:

- Order Creation
- Order Update, Cancel or Completion
- Appointment management
- Meter and Item validation
- Timesheet creation
- Billing
- Customer Update

Terms

The following terms and acronyms are used throughout this guide.

AIA Terms

ABCS	Application Business Connector Services
DVM	Domain Value Map
EBM	Enterprise Business Messages - Packets of data which the ESB 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
ESB	Enterprise Service Bus – The Oracle Enterprise Service Bus moves data among multiple endpoints. It uses open standards to connect, transform, and route business documents (as Extensible Markup Language (XML) messages), among disparate applications. It also enables monitoring and management of business

	data, with minimal impact on existing applications.
JMS	Java Message Service (JMS) The JMS producers are responsible for posting the message to the Provider AQ for the corresponding target application.
PIP	Process Integration Pack
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.

Application Names

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

General Terms

Orders are referred to in different terms in each of the applications involved in this integrated product. In each of the system an Order translates to:

Abbreviation	Order Name	Application
FA	Field Activity	CC&B
SR	Service Request	WAM
FO	Pickup Field Order	MWM

Other General terms to be aware of include:

CSR	Customer Service Representative
Edge applications	The applications that are involved in the integration - CC&B, MWM, and WAM.
MPL	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.
Participating Application	One of the three applications involved in the 3-way integration - CC&B, MWM, or WAM.
SOAP	Simple Object Access Protocol, is a protocol specification for exchanging structured information in the implementation of Web Services in computer networks.
SA	CC&B Service Agreement
SP	CC&B Service Point
Three Way Order	This is an order that is integrated in all three systems.
XAI	XML Application Integration. A CCB utility used to configure the system transfer information

	between CCB and external applications using XML. XAI exposes system business objects as a set of XML based web services. The service can be invoked via different methods, e.g., 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.

References

For more information on some of the terms and entities related to the integration, see Appendix B: Cross References.

Prerequisites

All participating applications: CC&B, WAM, MWM and Oracle SOA Suite must be installed, set up and working properly.

Understanding the Integration Business Processes

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

Work Order Processing

If you are using the complete integration between CC&B, MWM, and WAM, the most likely business process to follow is:

- Order initiated by an action in CC&B.
- Order created as a Field Order (FO) in MWM and/or as a Service Request (SR) in WAM. This is based on order type business rules.
- Order is worked and finished in MWM or if the order is not sent to MWM, it is worked and completed in WAM.
  If a WAM SR is part of the order WAM may send billing information back to CC&B when the SR is closed in WAM.

  WAM is used to capture billing information.

  MWM is used to manage work scheduling and appointments.

  CCB is used to manage the customer inquiry and initiate service.

The CC&B application 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 CC&B to automatically generate orders of various types based on the business rules established in the administrative tables within CC&B.

A field activity 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, CC&B sends the order information to the integration product once it is created. If an FA does require an appointment CC&B sends the order to the integration product once it is appointed. This is controlled by existing set up rules within CC&B.

While this is the most likely process to follow in using this integration, there are other scenarios and possibilities for how the integration can be used. The following sections provide an overview of all supported functionality:

Supported Functionality for Work Order Processing

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

- Create order
- Update or cancel order
- Complete order

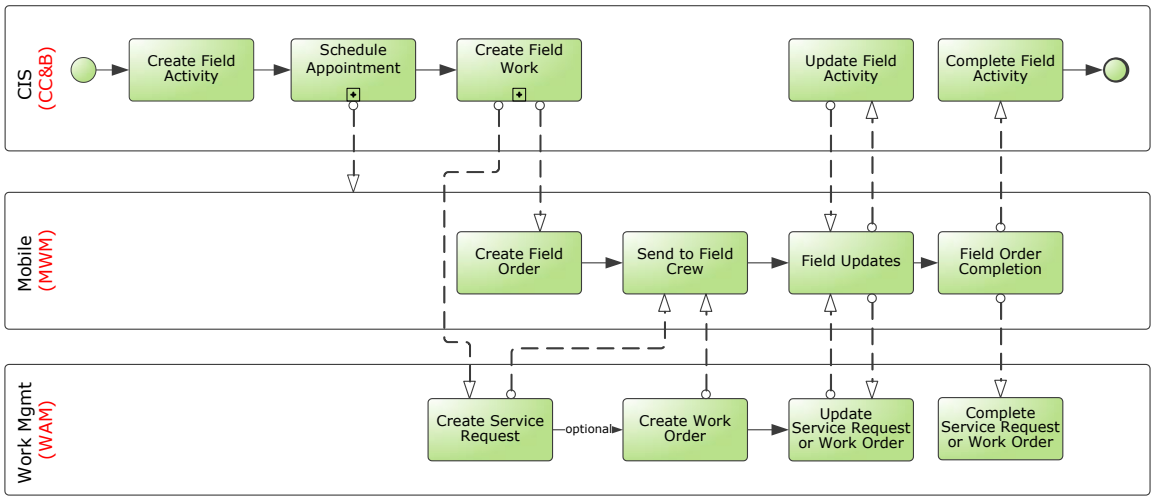
Create Order

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

Order Initiated from CC&B

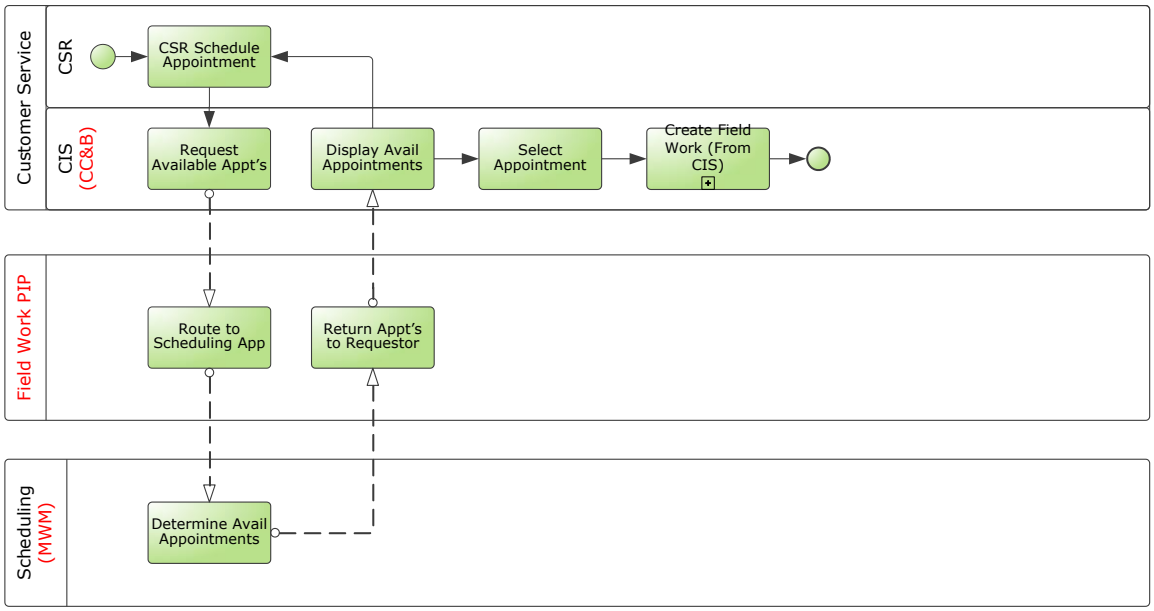
An order is initiated within CC&B and the order is created within WAM and/or MWM depending on the established rules for the type of order.

This diagram shows the high level flow when an order is created in CC&B.

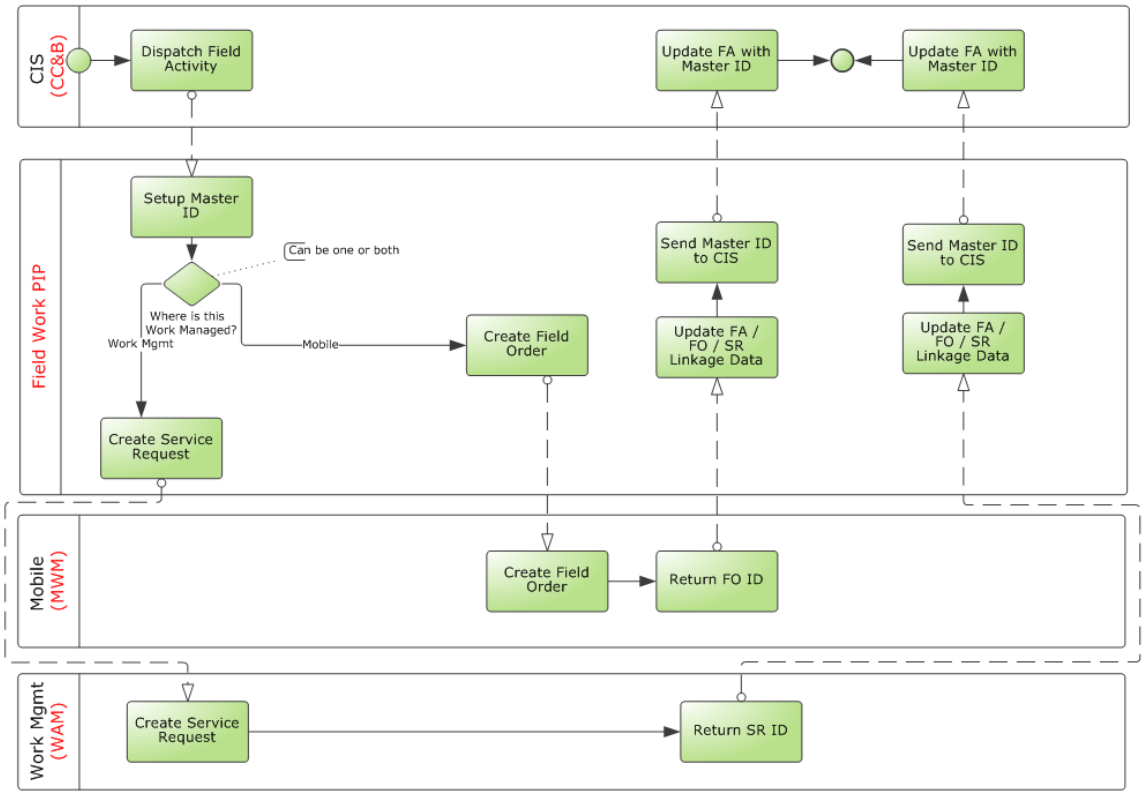


Process flow when an order is created within CC&B

This process is broken down into 2 separate process flows at the next level – Appointment Creation, and Field Work Creation:



Process flow for appointment creation

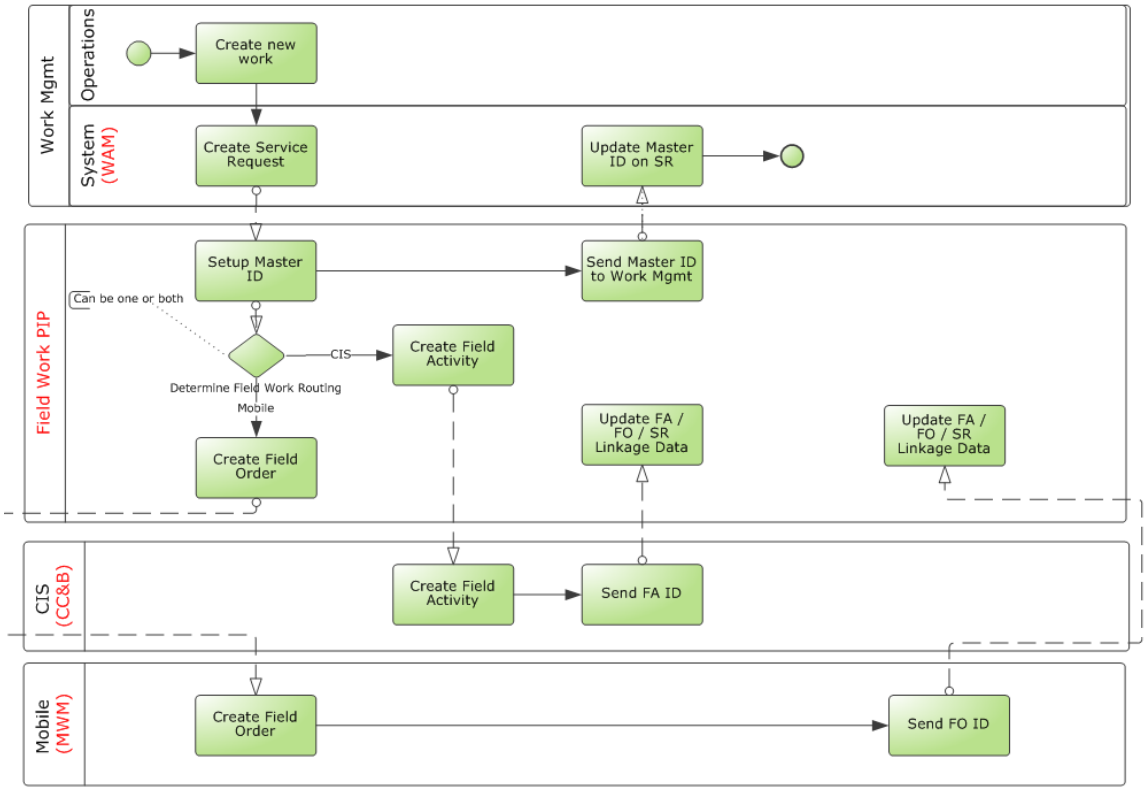


Process flow for field work creation in CC&B

Order Initiated in WAM

An order is initiated when a user creates a WAM service request and is propagated to the other systems to become a CC&B field activity and/or an MWM field order.

The following diagram shows the flow for when an order is initiated from a WAM Service Request.



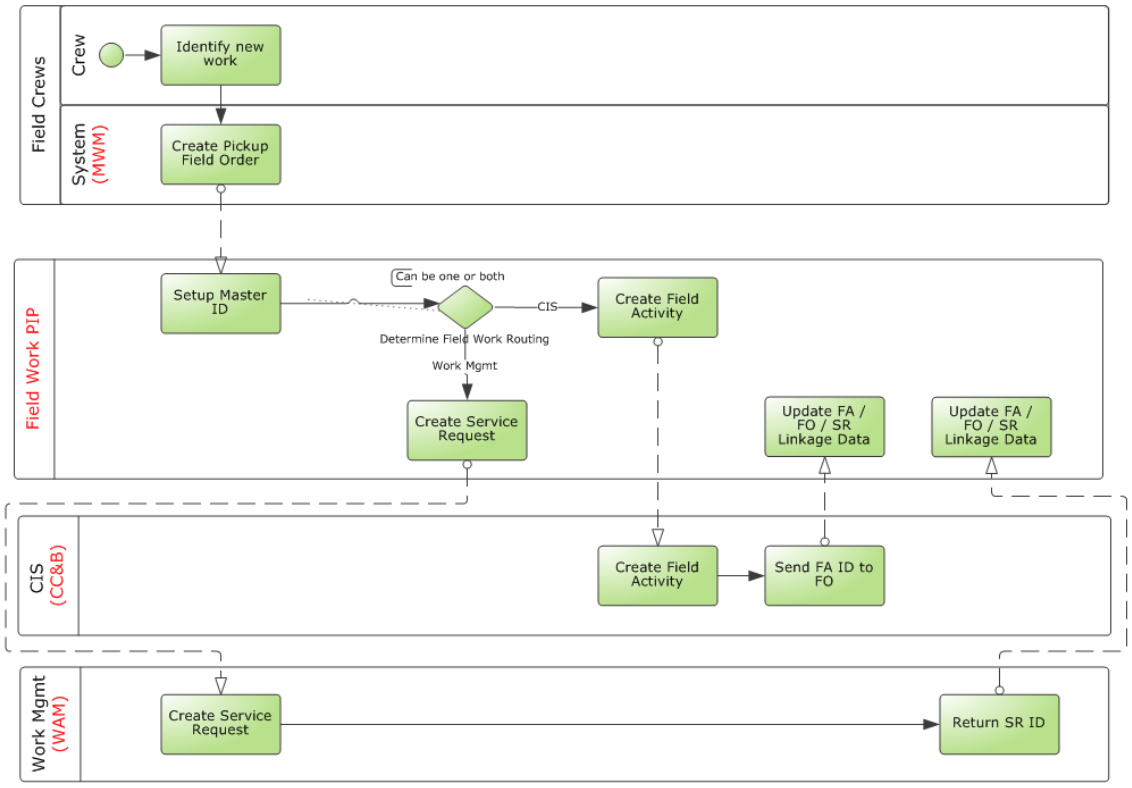
Process flow when a user creates a WAM Service Request

Order Initiated in MWM

An order is initiated by a user creating a MWM pickup field order that is related to an existing order they are working on at the same service point.

Business Process Diagram

The following diagram shows the flow for when an order is created from an MWM Pickup Field Order:



Process flow when an order is created from a MWM Pickup Field Order

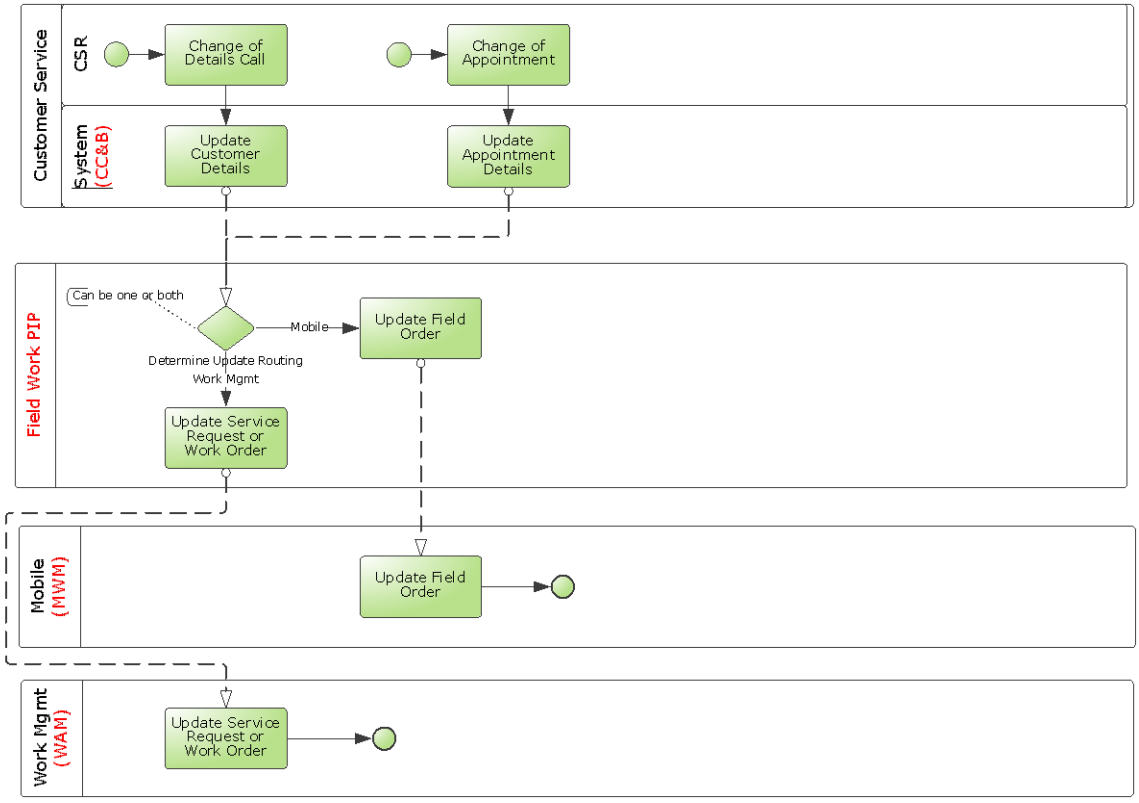
Update or Cancel Order

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

Update Order in CC&B

An existing order, regardless of where it was initiated, is updated or canceled by a customer service representative using CC&B. The changes are sent to linked orders in other systems.

This graphic shows the process of updating an order in CC&B:

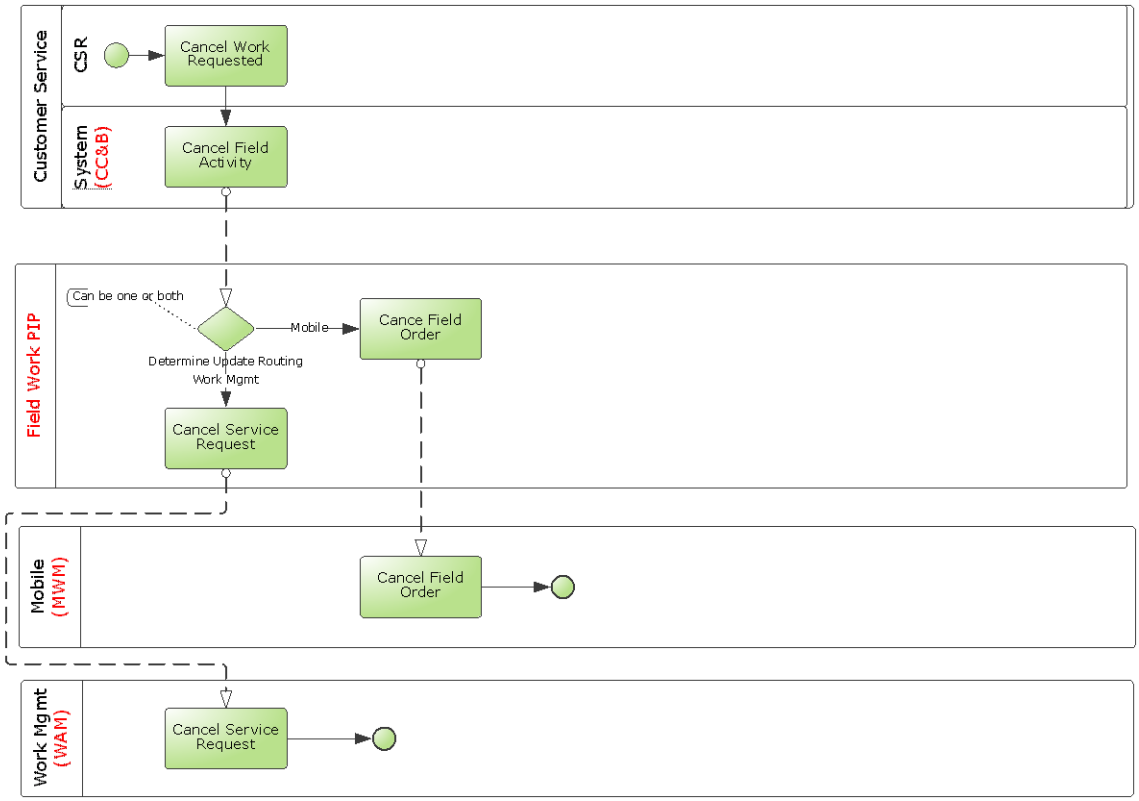


Process flow when an existing order is updated in CC&B

Cancel Order in CC&B

An existing order, regardless of where it was initiated canceled by a customer service representative using CC&B. The changes are sent to linked orders in other systems.

This diagram shows the process of canceling an order in CC&B:



Process flow when an existing order is canceled in CC&B

A CC&B 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 CC&B is for orders that are linked to either WAM or MWM.

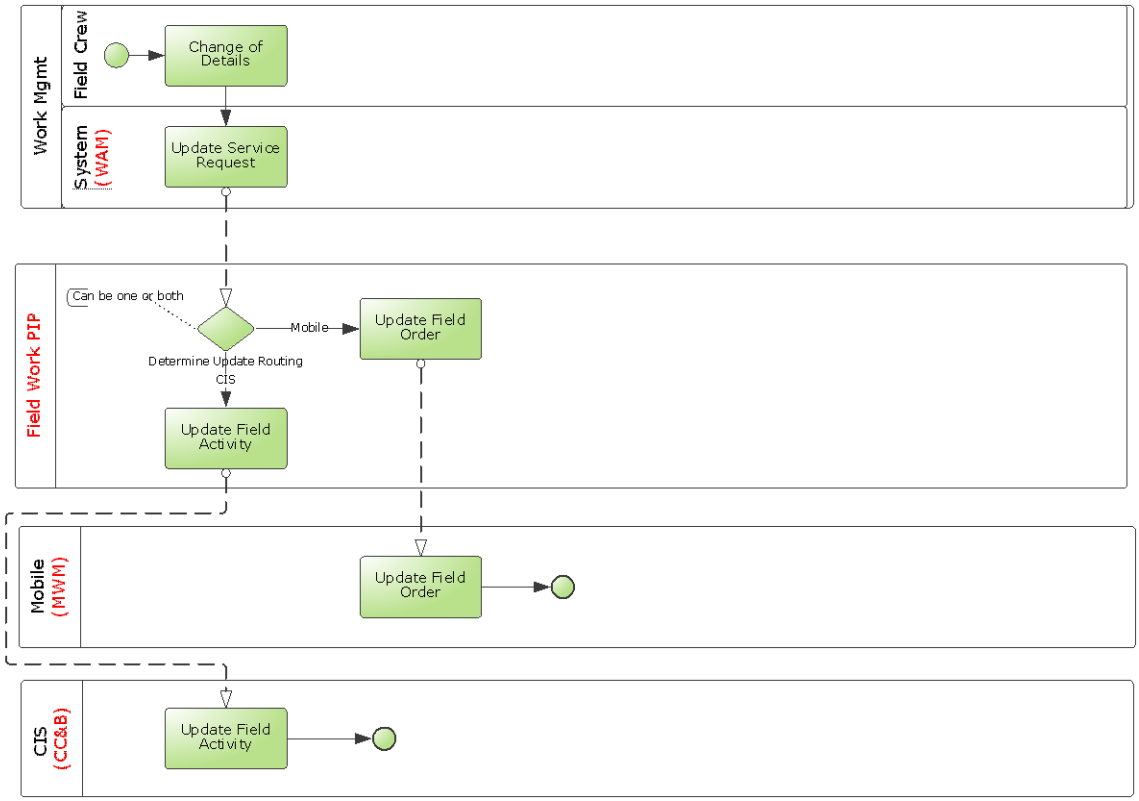
- If the Service Request is linked to MWM and not linked to WAM, MWM receives the updated Problem Description and Schedule Date.
- If the Service Request is linked to WAM and not linked to MWM, WAM receives the updated Problem Description and Schedule Date.
- If the Service Request is linked to both MWM and WAM, the update is not sent to either of the two applications.

Note. If a CC&B user completes as order, this too causes CC&B to send a cancel message out to the linked applications.

Update Order in WAM

An existing order, regardless of where it was initiated, is updated by a WAM representative. The changes are sent to linked orders in other systems.

This diagram shows the processing when an order is updated in WAM:

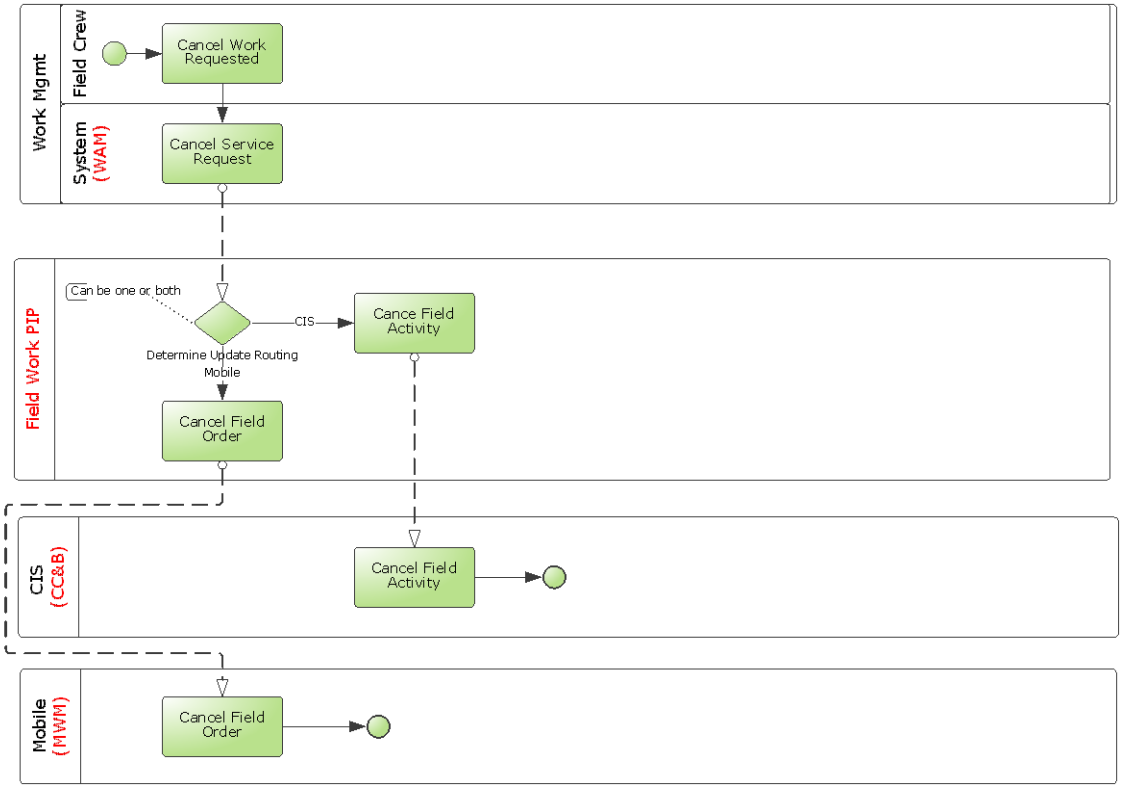


Process flow when an order is updated from WAM

Cancel Order in WAM

An existing order, regardless of where it was initiated, is canceled by a WAM representative. The changes are sent to linked orders in other systems.

This diagram shows the processing when an order is canceled in WAM:



Process flow when an order is canceled from WAM

Status Update in WAM

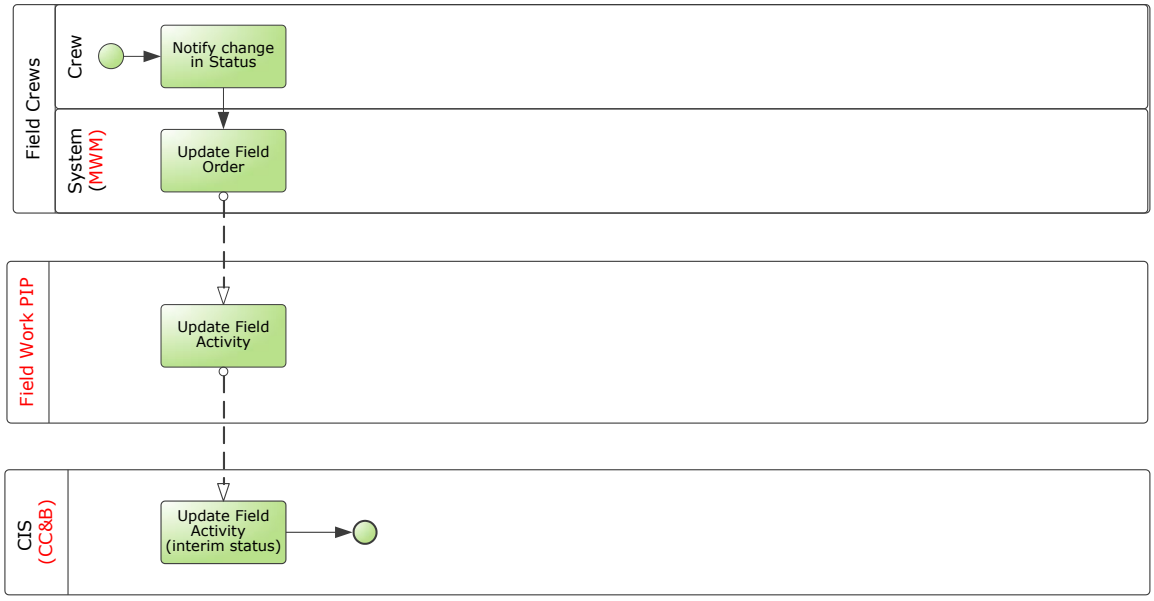
As the status of a Service Orders in WAM is changed from Active to one of the other eligible statuses, the new status information is sent to CC&B, if the order is linked only to CC&B. This new WAM status is reflected in CC&B as Intermediate status on the corresponding CC&B Field Activity.

The information about the status update in WAM is not sent to either of the other two applications when the order is linked to both CC&B and MWM. For orders that are linked to MWM as well, CC&B tracks the status of the order in MWM using the intermediate status and ignores the status of the order in WAM. Also, if the order is only linked to MWM and not linked to CC&B, status updates from WAM are not sent.

Update Order in MWM

A field service representative using MWM updates or cancels an order. The updates are sent to linked orders in other systems.

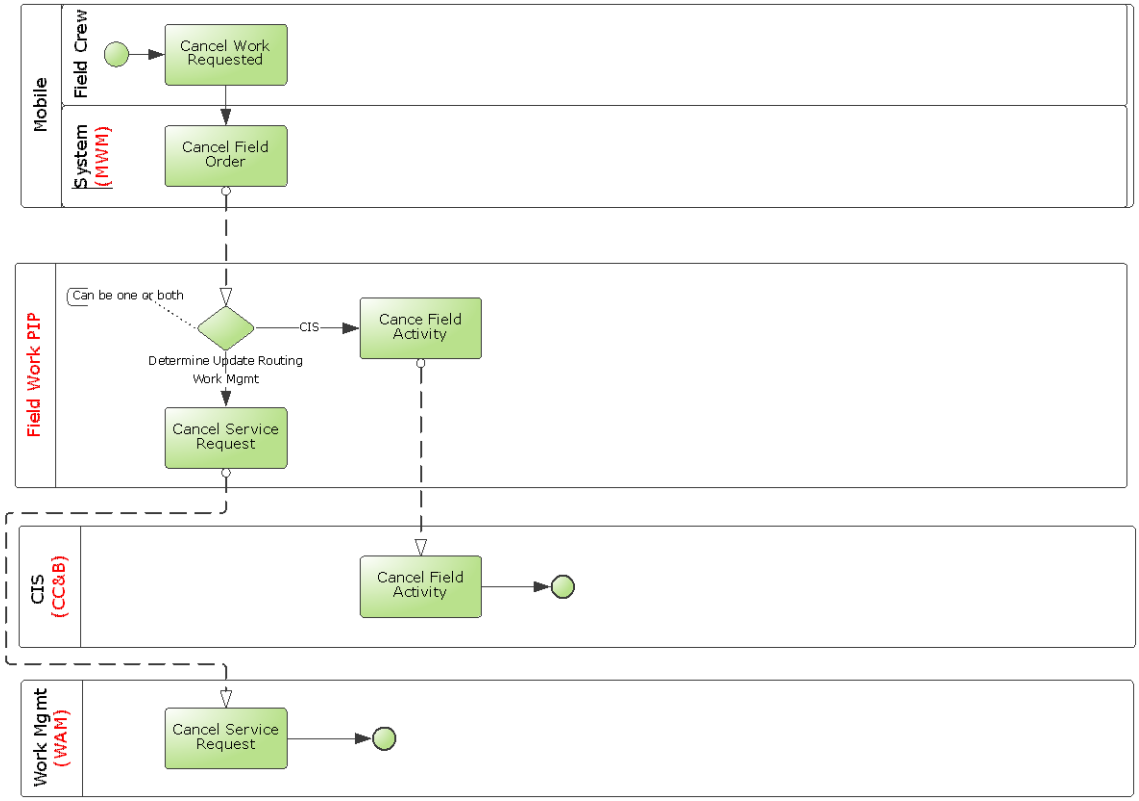
This diagram shows the processing when an order is updated in MWM:



Process flow when an order is updated in MWM

Cancel Order in MWM

This diagram shows the processing when an order is canceled in MWM:



Process flow when an order is canceled from MWM

Status Update in MWM

As the status of a Field Order in MWM is updated as the order is assigned to a Field Service Representative or re-assigned in MWM, the new status information is sent to CC&B, if the order is linked to CC&B. This new MWM status is reflected in CC&B as Intermediate status on the corresponding CC&B Field Activity.

The information about the status update in MWM is not sent to WAM. This information is only tracked in CC&B.

Other Notes Regarding Updates and Cancelations

- Only orders that are linked in the other systems are updated. Separate routing of updates is not supported.
- Since routing rules may change between the time an order is created as a two or three way order and the time of the update, the system cannot send an update to a system that never initially received the create command for an order.
- 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 CC&B and is only sent to WAM, it will not create a new order in MWM. This type of processing is not supported by the integration.

Complete an Order

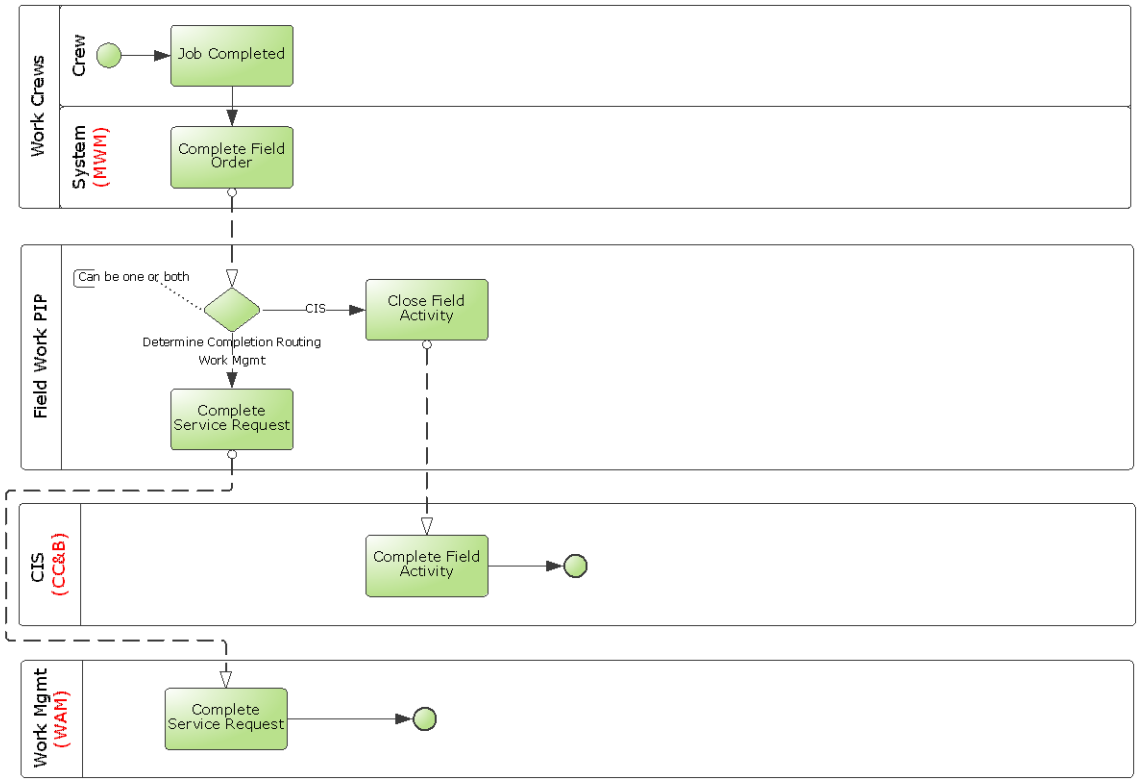
Regardless of where they were initiated, orders can be completed from MWM or WAM. Orders should not be completed from CC&B, if they are, the order is canceled in the other systems. The following describes the scenarios for order completion:

Order Completed in MWM

When a Field Service Representative completes an order in MWM a completion message is sent to CC&B, WAM or both depending on which applications the particular order was linked to during create. This results in the target application(s) completing the corresponding order and recording the information that was sent my MWM for the completed order. This may include information like meter readings recorded by the Field Service Representative during order completion, direct charges and materials used from inventory for completing the order, or other items.

Note that time entry for materials used to complete an order and direct charges associated with an order are sent by MWM to the WAM service request as part of the order completion message. This is often sent at end of shift and/or after the order is completed.

This diagram shows the processing when an order is completed in MWM:



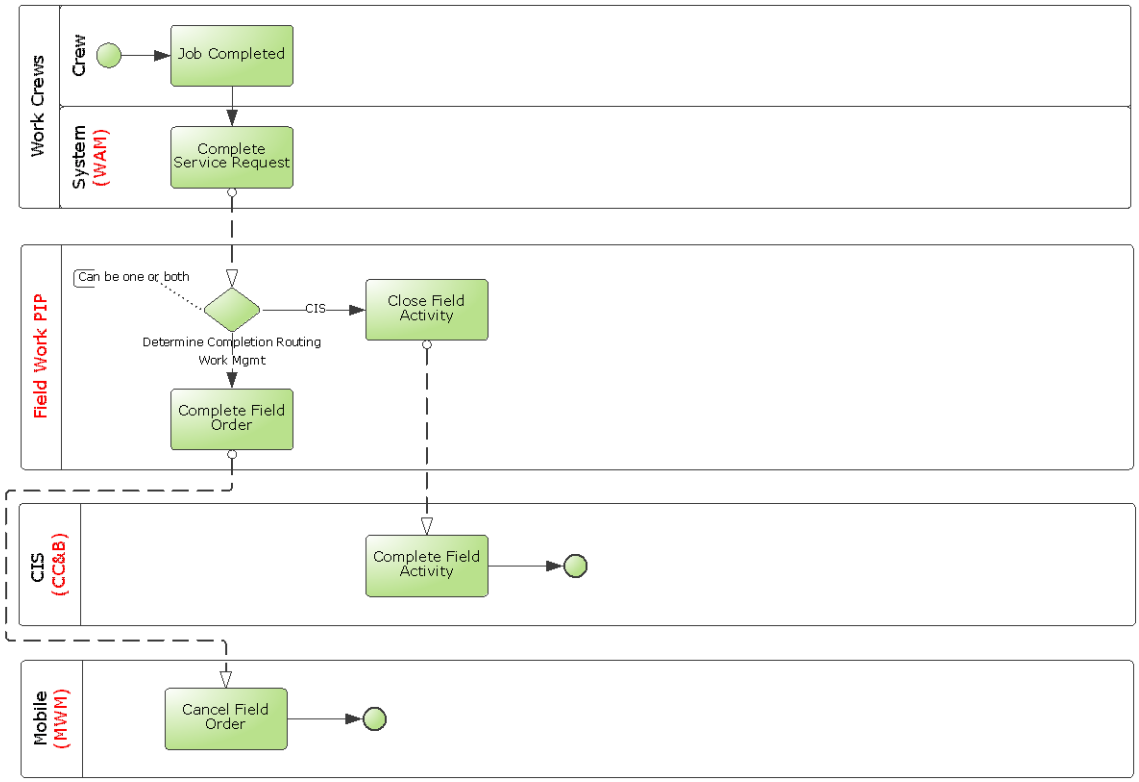
Process flow when an order is completed in MWM

The Field Service Representative may mark the Field Order as incomplete and record remarks on the order to indicate why the order was not completed. When this is done, a message is sent to CC&B and CC&B logs the information sent by MWM on the corresponding Field Activity.

Order Completed in WAM

A business flow where the order is completed in WAM is only common when MWM is not part of the suite of products used, however it is possible in a 3 way integration model under some rare circumstances.

This diagram shows the processing when an order is completed in WAM:



Process flow when an order is completed in WAM

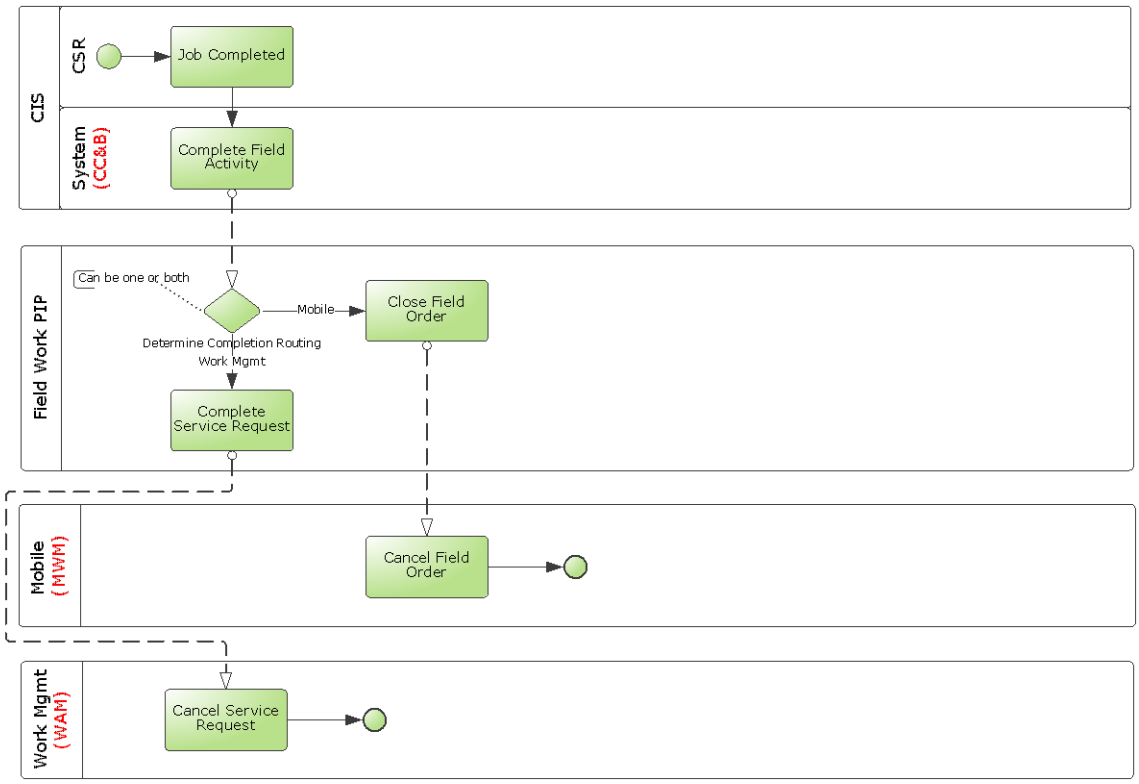
- If CC&B is linked to the order, CC&B completes the corresponding Field Activity and records any meter reading information sent by WAM.
- If MWM is linked to the order, the integration sends a cancelation request to MWM resulting in canceling the corresponding Field Order.

  This is done to prevent the Field Service Representative from working on this Field Order that has been completed in WAM.

Order Completed in CC&B

When an integrated order is completed in CC&B it is canceled in the linked systems. This is done to prevent further work being done on the order by a WAM or MWM user.

This diagram shows the processing when an order is completed in CC&B:



Process flow when an order is completed from CC&B

Assumptions and Constraints for Work Order Processing

This integration does not support the following:

- New orders cannot be added in MWM. Only MWM 'Pickup orders' are supported.
- Service requests cannot be transitioned to work orders in WAM while still sending information back CC&B and MWM. Only service requests are supported, however the work order task integration between WAM and MWM can still be used on top of the three way integration.
- Master data between CC&B and WAM is not automatically synchronized. The integration will not function properly without data synchronization.
- An update to the schedule date on a service request in WAM is not also updated in CC&B or MWM if the order being updated is a 3 way order (linked to CC&B, WAM and MWM). For three way order types in WAM, it is best to prevent WAM users from updating these fields.
- MWM and WAM does not provide an a-synchronous inbound web service to inform the application users if the outbound order messages from these applications fails in integration or fails because of a business error (for example invalid order type) with the order data on the

target applications.

When these errors occur, the integration provides email notification to a pre-determined email address(s) configured in the integration layer. A designated user for each application is responsible for monitoring emails and taking any corrective actions within the requesting application.

- For the order creates and updates sent from CC&B, CC&B has the ability to receive a-synchronous responses from the Field Activity Response service.

  These responses are posted to the CC&B notification download table. In notification download, CC&B can show only one response to a message, which is the first response received. Because this is a 3-way integration, these messages may be routed to both WAM and MWM. In this case acknowledgements are received from both the target applications, and even though two acknowledgements are sent to CC&B, the notification download only shows the first acknowledgement received. Once these acknowledgements are successfully processed by CC&B, both are visible on the CC&B Field Activity screen under the 'Log' tab

- For WAM generated orders this integration does not support orders that need to reference items installed at the service point for which the order is being raised.
- For MWM generated orders, the integration only supports Pickup Field Orders. New regular Field Orders created in MWM are not integrated by this integration.
- Field Activities coming to CC&B must have Service Point defined. WAM should create orders without service points only for order types that are two way to MWM.

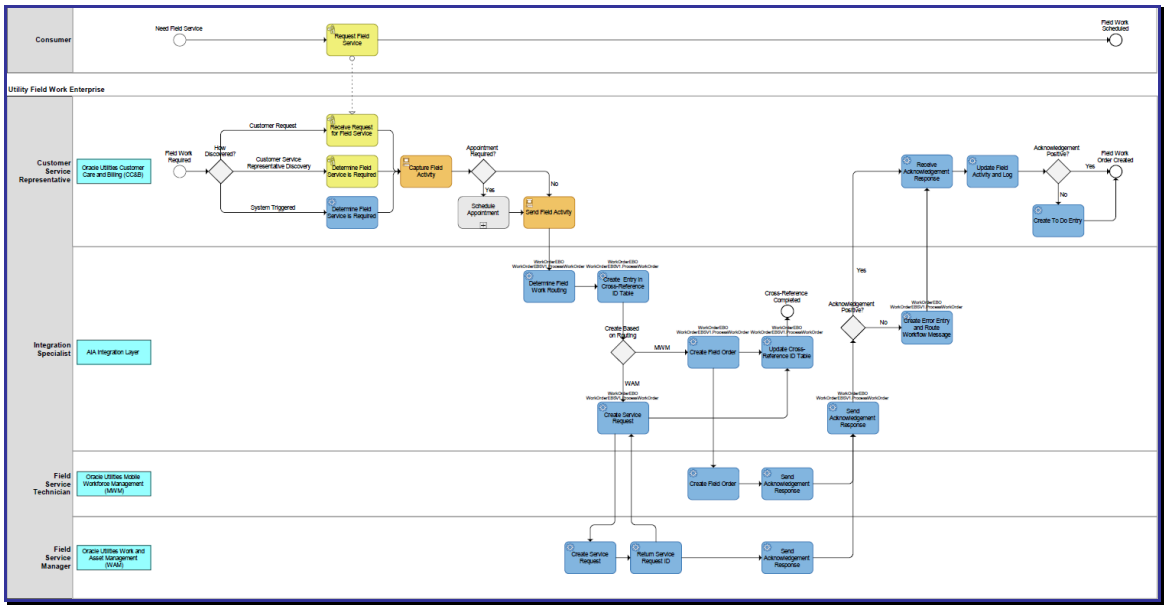
  For these order types, the routing in the Order Type DVM must also be set to not send these orders to CC&B. Also pickup order types for these order types in MWM should be configured to route to WAM only. They cannot route to CC&B as the pickups also do not have a service point.

Integration Process Flows for Work Order Processing

This integration flow supports origination of orders and order updates in CC&B, WAM and in MWM. The following diagrams outline some common process flows as the orders are created or updated/completed in one of the three applications.

Functional Diagram for Orders Originating in CC&B

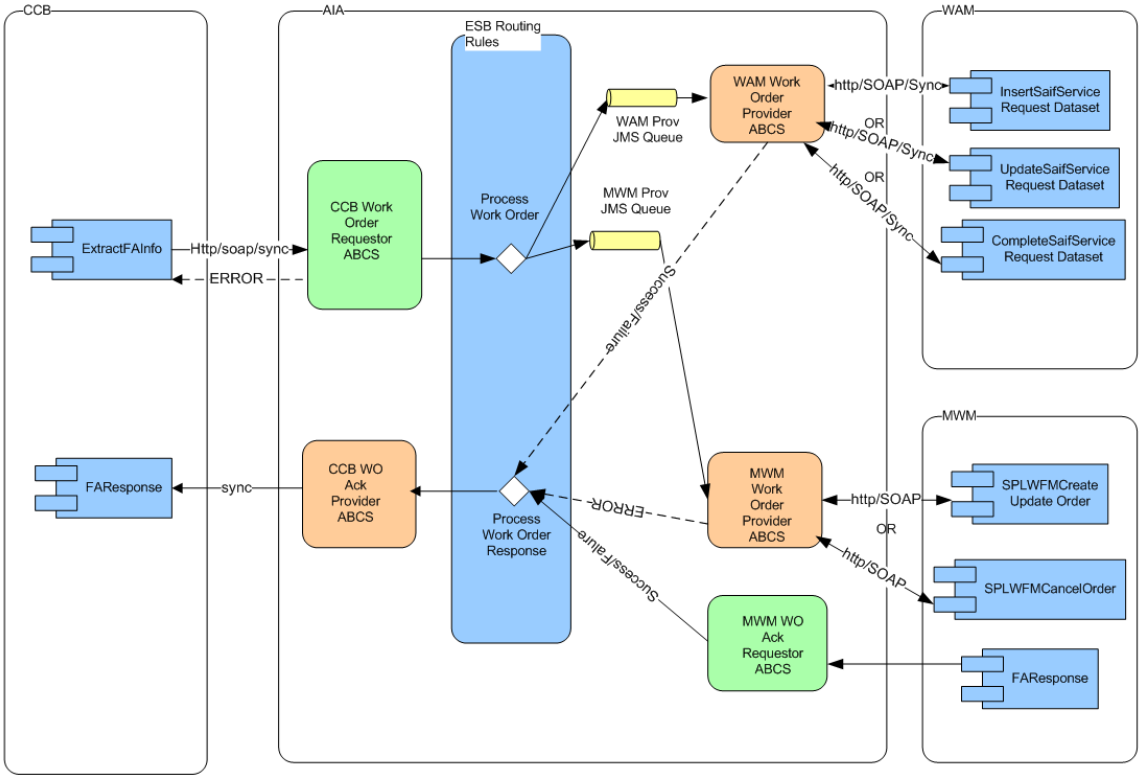
This diagram shows the functional processing of creating an order from CC&B:



Order Creation from CC&B

Technical Diagram for Orders Originating in CC&B

This diagram shows the technical process of creating, updating, or canceling an order originated in CC&B:



CC&B originated order messages routed to WAM and MWM

Processing Details

CC&B WO Requestor: As a Field Activity is created, updated, or canceled in CC&B, CC&B sends a message to the CC&B 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 CC&B Work Order Requestor ABCS after the message is mapped. The message is routed based on the routing rules to:

- WAM **JMS Producer** and/or MWM **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 that was linked when the create message was sent for the order.

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

JMS Consumer in ESB: Listens to the WAM or MWM provider AQ and invokes the Work Order Provider ABCS for each message received in either the WAM or MWM queue.

Work Order Provider ABCS: For both MWM and WAM, 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 MWM or WAM after mapping ProcessWorkOrderEBM to the corresponding inbound message schema.

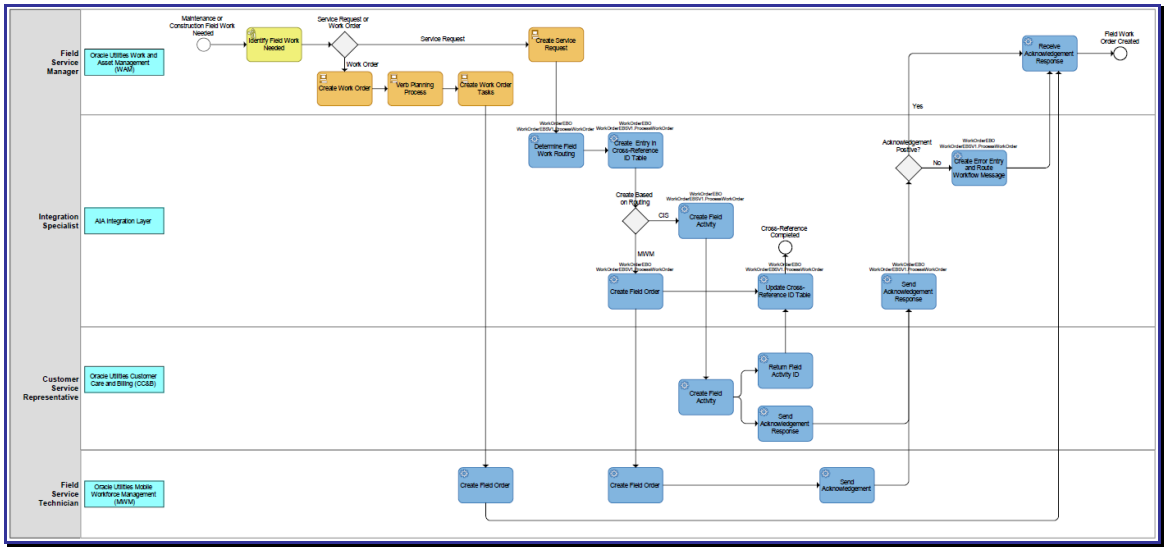
WAM **Work Order Provider ABCS:** This ABCS receives the synchronous response from WAM, maps it to the Sync Work ProcessWorkOrderResponseEBM (including any error information received from MWM) and invokes the Work Order Response EBS. This response/acknowledgement is routed back to CC&B using the CC&B Work Order Acknowledgement Provider ABCS.

MWM **Work Order Provider ABCS:** If the Operation in the EBM is for completion, this is treated as an order cancelation for MWM and the Field Order cancelation web service in MWM is invoked.

Acknowledgements: After MWM has processed the inbound message, MWM responds with an a-synchronous acknowledgement/response message sent to MWM Work Order Acknowledgement Requestor ABCS, indicating whether MWM successfully processed the message or found errors with the data. The MWM Work Order Acknowledgement Requestor ABCS maps the message received to the **ProcessWorkOrderResponseEBM** (including any error information received from MWM) and invokes the Work Order Response EBS. This response/acknowledgement is routed back to CC&B using the CC&B Work Order Acknowledgement Provider ABCS.

Functional Diagram for Orders Originating in WAM

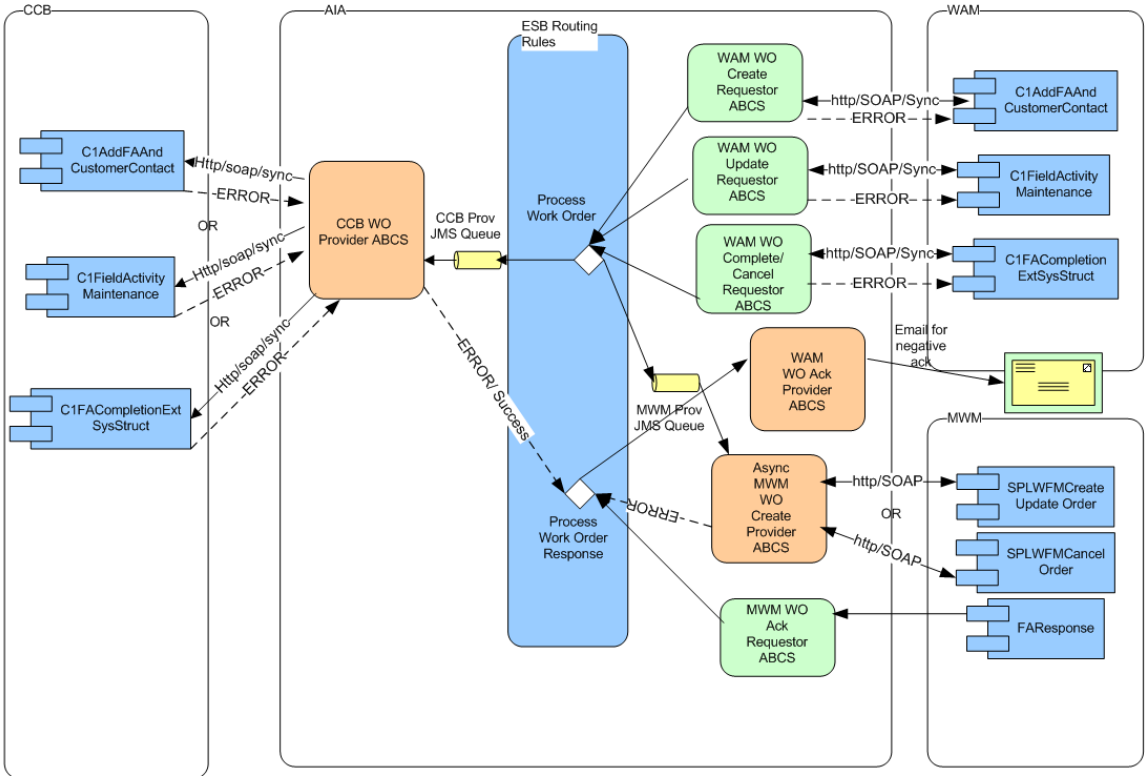
This diagram shows the functional processing of creating an order from WAM:



WAM originated Service Request is routed to CC&B and MWM

Technical Diagram for Orders Originating in WAM

The following diagram shows how an order message for Create, Update, Cancelation or Completion originating in WAM is integrated to CC&B and MWM.



WAM originated Service Request is routed to CC&B and MWM

Processing Details

WAM **WO Requestor:** As an order is created in WAM and activated or an active order is updated in WAM, WAM sends a message to the WAM Work Order Requestor ABCS:

- Create messages invokes WAM Work Order Create Requestor ABCS
- Update messages invokes WAM Work Order Update Requestor ABCS
- Cancel and Completion messages invoke WAM Work Order Complete(/cancel) Requestor ABCS

Mapping: The requestor ABCS maps the message sent by WAM 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

- **CC&B JMS Producer** and/or MWM **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 Provider AQ for the corresponding target application.

JMS Consumer in ESB: Listens to the CC&B or MWM provider AQ and invokes the Work Order Provider ABCS for each message received in either the CC&B or MWM queue.

Work Order Provider ABCS: For both MWM and CC&B, 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 MWM or CC&B after mapping ProcessWorkOrderEBM to the corresponding inbound message schema.

CC&B Work Order Provider ABCS: If CC&B 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 CC&B) and invokes the Work Order Response EBS. This response/acknowledgement is routed to WAM Work Order Acknowledgement Provider ABCS.

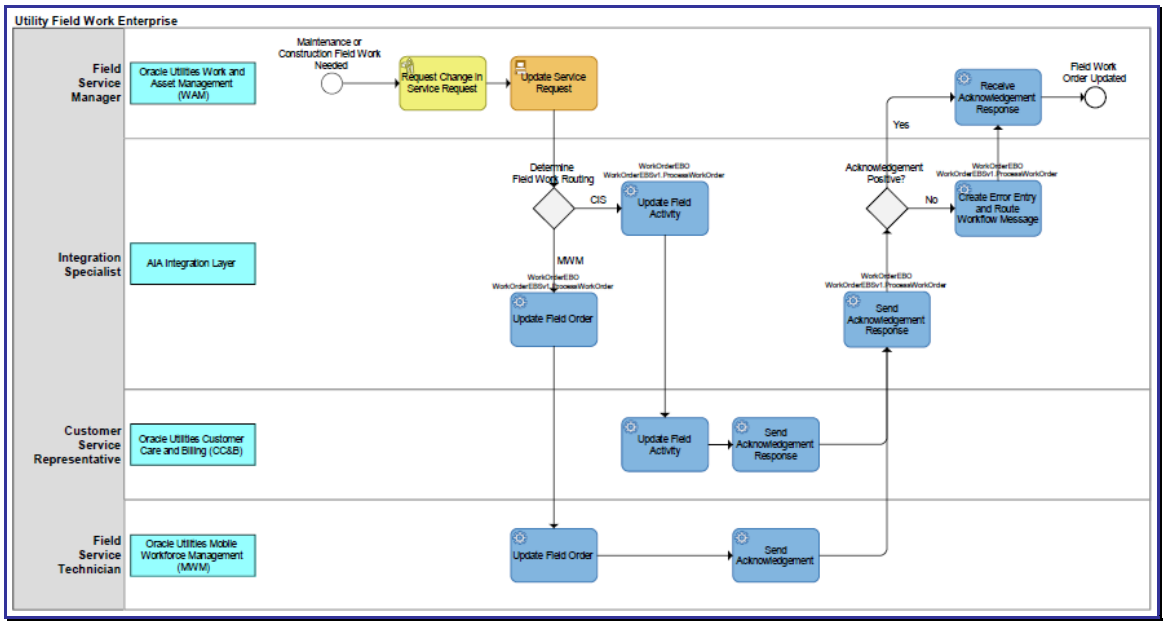
Order Completion: If the Operation in EBM is for completion, the MWM Field Order cancelation web service is invoked and the transaction is treated like an order cancelation.

Acknowledgements: After MWM has processed the inbound message, MWM responds with an a-synchronous acknowledgement/response message sent to MWM Work Order Acknowledgement Requestor ABCS, indicating whether MWM successfully processed the message or found errors with the data. The MWM Work Order Acknowledgement Requestor ABCS maps the message received to the **ProcessWorkOrderResponseEBM** (including any error information received from MWM) and invokes the Work Order Response EBS. This response/acknowledgement is routed back to the WAM Work Order Acknowledgement Provider ABCS if the information received from MWM indicates that MWM had failed to process the message.

If the WAM Work Order Acknowledgement Provider ABCS receives the message from CC&B or MWM, it responds by sending an email notification to the designated person and creates an AIA work list entry.

Functional Diagram for Orders Updates Originating in WAM

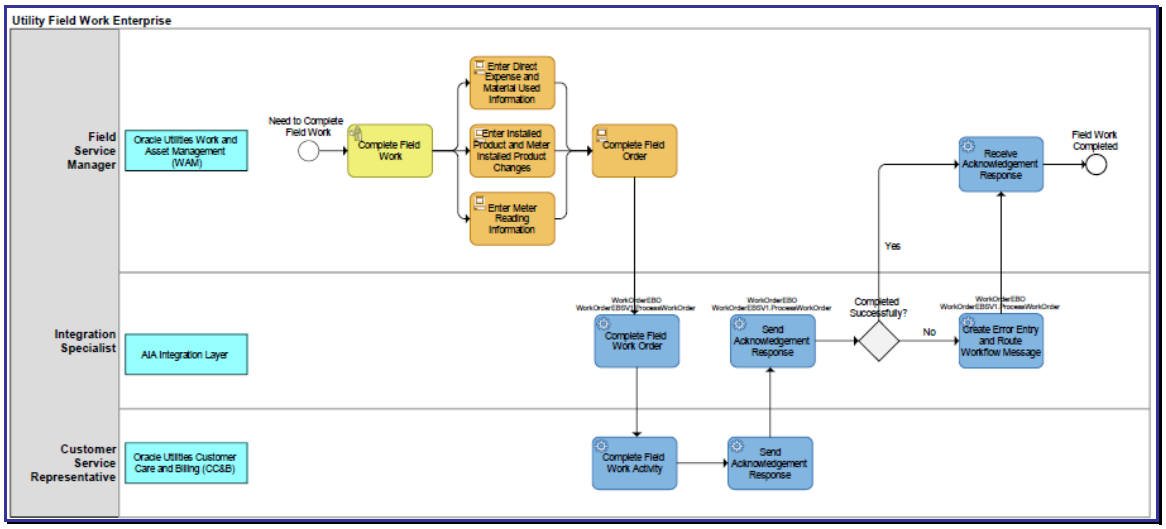
The following diagram outlines a WAM Field Service Manager Updating a service request.



WAM Field Service Manager Updating a service request

Functional Diagram for Orders Completions Originating in WAM

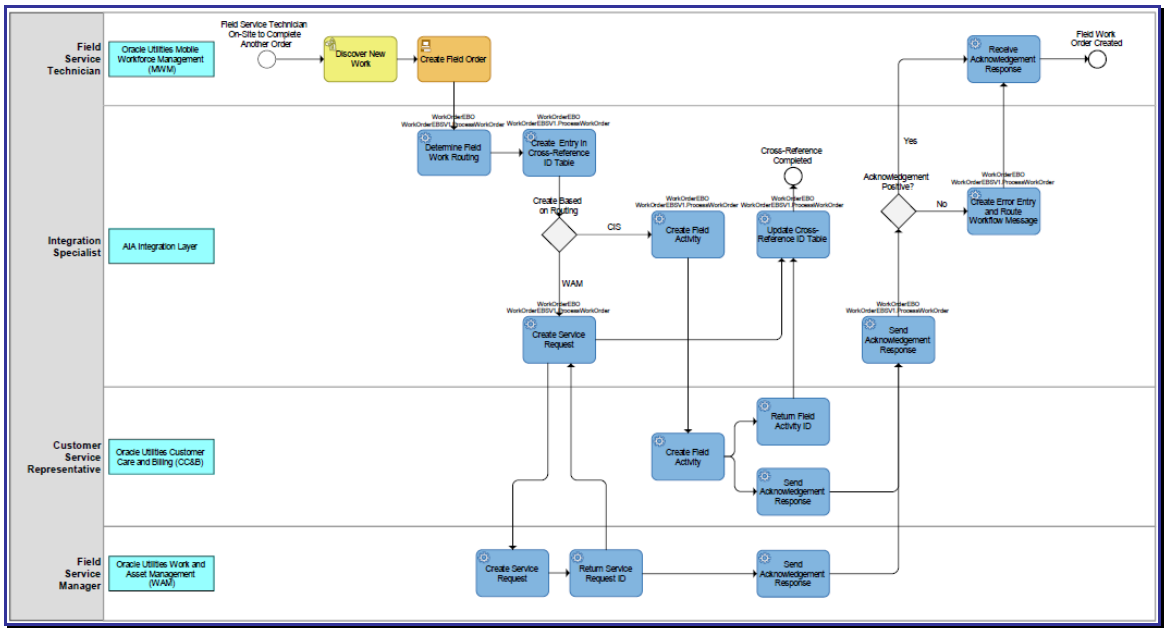
The following diagram outlines the business process flow as an order is completed in WAM and the completion information is routed to CC&B and MWM.



Order completed in WAM and the completion information is routed to CC&B and MWM

Functional Diagram for Orders Originating in MWM

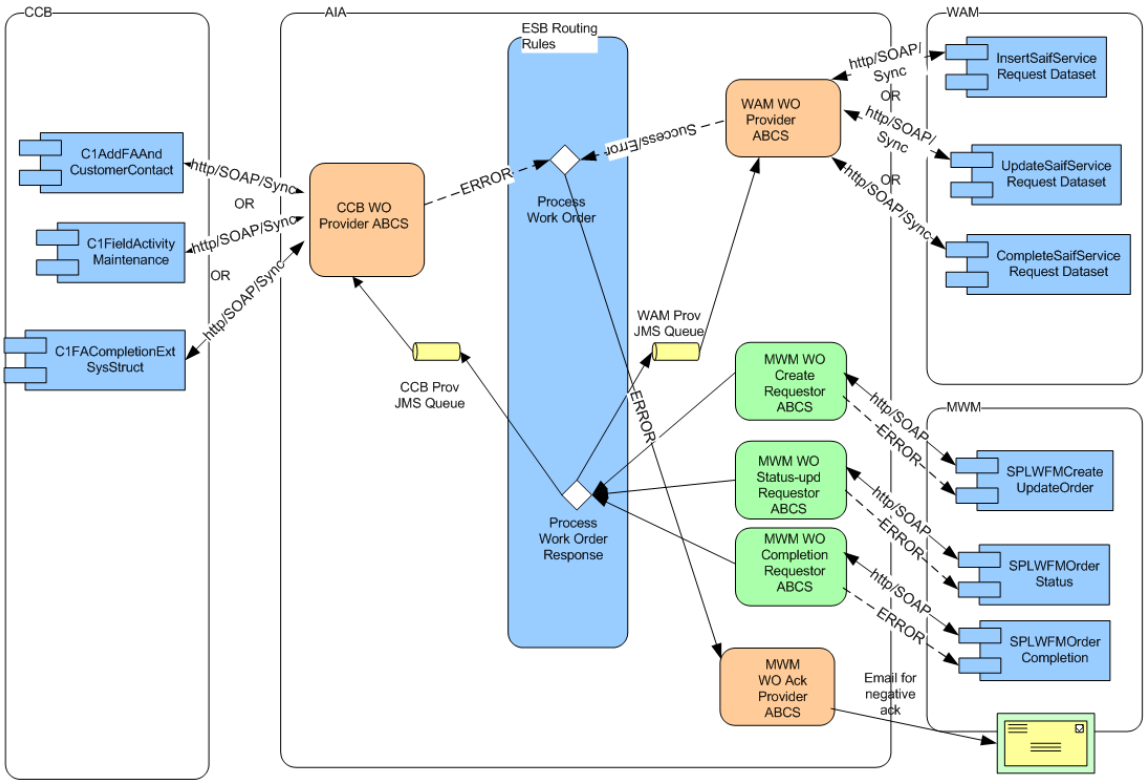
The following diagram outlines the business process flow as a Pick-up order is created in MWM and gets sent to WAM and CCB.



Pick-up order is created in MWM and gets sent to WAM and CCB

Technical Diagram for Orders Originating in MWM

The following diagram shows how an order Message for Create, Status Update, Cancelation or Completion originating in MWM is integrated to WAM and CC&B.



Pick-up order is created in MWM and gets sent to WAM and MWM

Processing Details

MWM **WO Requestor:** This flow supports Field Order cancelations, updates and completions from MWM as well as Pick-up Order Creation and Completion. Depending on whether the transaction is an update to a Field Order that MWM, or if the transaction is from a Pickup Order created for a Field Order, MWM sends a message to one of the MWM Work Order Requestor ABCS:

- Create messages invoke MWM Work Order Create Requestor ABCS
- Order Status change messages invoke MWM Work Order Status Update Requestor ABCS
- Cancel, Incomplete and Completion messages invoke MWM Work Order Complete/Cancel Requestor ABCS

Mapping: The requestor ABCS maps the message sent by MWM to **ProcessWorkOrderEBM** and invokes **Work Order Request EBS**.

Work Order Request EBS: The request is invoked by the MWM Work Order Requestor ABCS after the message is mapped. The message is routed based on the routing rules to:

- **CC&B JMS Producer** and/or WAM **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.

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

JMS Consumer in ESB: Listens to the WAM or CC&B provider AQ and invokes the Work Order Provider ABCS for each message received in either the WAM or CC&B queue.

Work Order Provider ABCS: For both CC&B and WAM, 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 CC&B or WAM after mapping ProcessWorkOrderEBM to the corresponding inbound message schema.

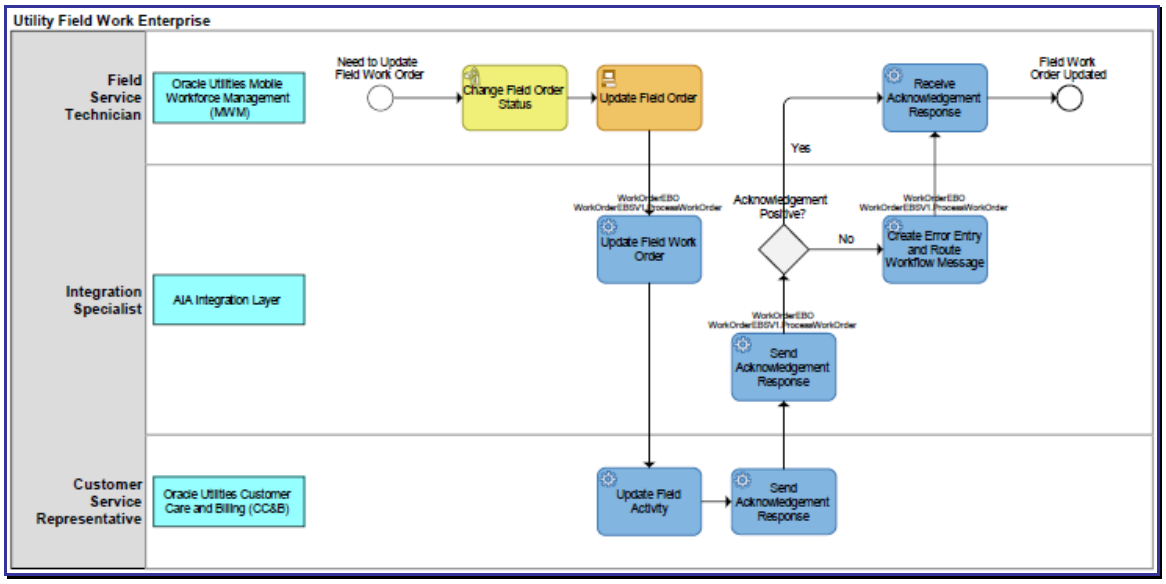
WAM **Work Order Provider ABCS:** This ABCS receives a synchronous response from WAM, maps it to the Sync Work ProcessWorkOrderResponseEBM (including any error information received from MWM) and invokes the Work Order Response EBS. This response/acknowledgement is routed back to MWM using the MWM Work Order Acknowledgement Provider ABCS.

CC&B Work Order Provider ABCS: If CC&B 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 CC&B) and invokes the Work Order Response EBS. This response/acknowledgement is routed to MWM Work Order Acknowledgement Provider ABCS.

Acknowledgements: If the MWM Work Order Acknowledgement Provider ABCS receives error messages from CC&B or WAM, it responds by sending an email notification to the designated person and creates an AIA work list entry.

Functional Diagram for Order Status Change Originating in MWM

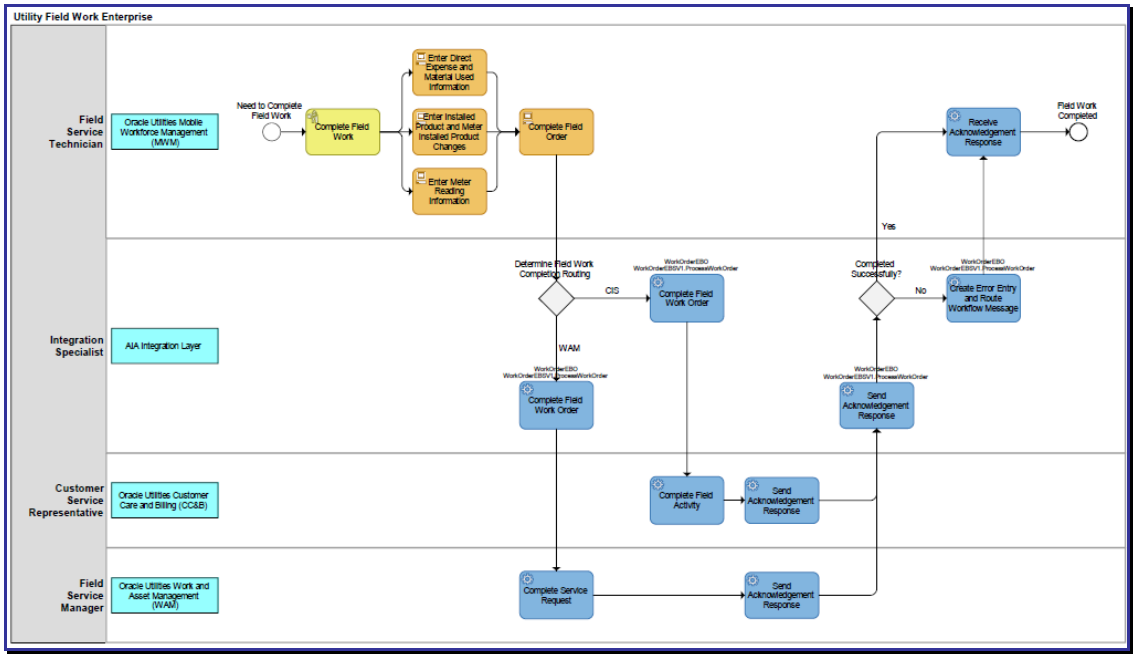
The following diagram shows how Status change of a Field Order in MWM is integrated to CC&B.



Status change of a Field Order in MWM is integrated to CC&B

Functional Diagram for Orders Completed in MWM

The following diagram outlines the business process flow when a Field Order or a Pick-up Order is completed in MWM and the completion information is routed to CC&B and WAM.



Field Order or a Pick-up Order completed in MWM and the completion information is routed to CC&B and WAM

Order Acknowledgements for Work Order Processing

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

CC&B Orders

The CC&B inbound web service responds with a success or fail for create, update, cancel and complete orders coming into CC&B.

WAM Orders

The WAM inbound web service responds with a success or fail for create, update, cancel and complete orders coming into WAM.

MWM Orders

MWM generates an outbound acknowledgement message indicating whether the transaction was successfully processed for create, update and cancel orders coming into MWM. This message is generated separately by MWM and is not a sync response to the inbound message.

- If the request originated in CC&B, an a-synchronous acknowledgement is sent back to CC&B. Depending on success or failure, CC&B receives a positive or a negative acknowledgement.
- If the response is failure and the request originated in either MWM or WAM, the system sends an email to a designated user and generates an AIA work list entry.

Neither WAM nor MWM has the ability to receive an a-synchronous response for the order messages sent out.

Edge Application Interfaces for Work Order Processing

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

Inbound CC&B Web Services

Web Service Name	Invoked By	Web service Description
C1AddFAandCustomerContact	CC&B Work Order Provider ABCS	Invoked to Create new Field Activities in CC&B.
C1FieldActivityMaintenance	CC&B Work Order Provider ABCS	Invoked to update Field Activities in CC&B for Instructions, Schedule date or for Intermediate status.
C1FACompletionExtSysStruct	CC&B Work Order Provider ABCS	Invoked for completing Field Activities, Canceling them or updating them with incomplete information.
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 could be acknowledgements with error information or success.
C1ExtractSPInfo	CC&B Get Meter Data	Invoked to get the Meter and register information for a Specific Service point as a part of Message

Web Service Name	Invoked By	Web service Description
	Provider Service	enrichment triggered by WAM Work Order Create Provider ABCS.

Outbound CC&B Messages

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

Inbound WAM Web Services

Web Service Name	Invoked By	Web service Description
ServiceRequestDatasetService	WAM Work Order Provider ABCS	Invoked for Creating, canceling and Updating Service Requests in WAM.
ServiceRequestCompletionDatasetService	WAM Work Order Provider ABCS	Invoked for Completing Service Requests in WAM.

Outbound WAM Messages

Message Name	Invokes	Web service Description
C1AddFAandCustomerContact	WAM Work Order Create Requestor ABCS	This message is used by WAM to send new Service Requests created in WAM.
C1FieldActivityMaintenance	WAM Work Order Update Requestor ABCS	This message is used by WAM to send Service Requests Updates and status updates.
C1FACompletionExtSysStruct	WAM Work Order Complete Requestor ABCS	This message is used by WAM to send Service Request Completions.

Inbound MWM Web Services

Web Service Name	Invoked By	Web service Description
SPLMWMService.wsdl	MWM Work Order Provider ABCS	Invoked for Creating, canceling and Updating Field Orders in MWM.

Outbound MWM Web Messages

Message Name	Invokes	Web service Description
C1AddFAandCustomerContact	MWM Work Order Create Requestor ABCS	This message is used by WAM to send new Service Requests created

Message Name	Invokes	Web service Description
		in WAM.
C1FieldActivityMaintenance	MWM Work Order Status Update Requestor ABCS	This message is used by WAM to send Service Requests Updates and status updates.
C1FACompletionExtSysStruct	MWM Work Order Complete Requestor ABCS	This message is used by WAM to send Service Request Completions.

Core AIA Components and Integration Services for Work Order Processing

The integration flow uses the following components:

EBO	EBM	File Locations
WorkOrderEBO	ProcessWorkOrderEBM - Used for Order messages ProcessWorkOrderResponseEBM - Used for Order Response/Acknowledgement message	The core EBO and EBM XSD files can be located by EBO within this parent folder: http://[HOST:PORT]/AIAComponents/EnterpriseObjectLibrary/Core/EBO/

Enterprise Business Services

EBS Name	Description
UtilitiesWorkOrderEBS	Receives the ProcessWorkOrderEBM and routes it to the appropriate JMS Producer.
UtilitiesWorkOrderResponseEBS	Receives the ProcessWorkOrderResponseEBM and routes it to the appropriate ABCS.
The core EBS WSDL files can be located by EBO within this parent folder: http://[HOST:PORT]/AIAComponents/EnterpriseBusinessServiceLibrary/Core/EBO/	

ABCS

These values are cross referenced in the configuration guidelines section for the integration.

ABCS Name	Description
ProcessWorkOrderOUCCBUtilitiesReqABCSImpl	CC&B Work Order Requestor ABCS
ProcessWorkOrderCreateOUWAMUtilitiesReqABCSImpl	WAM Work Order Create Requestor ABCS
ProcessWorkOrderUpdateOUWAMUtilitiesReqABCSImpl	WAM Work Order Update Requestor ABCS
ProcessWorkOrderCompleteOUWAMUtilitiesReqABCSImpl	WAM Work Order Completion/Cancel Requestor ABCS

ProcessWorkOrderCreateOUMWMUtilitiesReqABCSImpl	MWM Work Order Create Requestor ABCS
ProcessWorkOrderStatusOUMWMUtilitiesReqABCSImpl	MWM Work Order Status Update Requestor ABCS
ProcessWorkOrderCompleteOUMWMUtilitiesReqABCSImpl	MWM Work Order Completion/Cancel Requestor ABCS
ProcessWorkOrderOUCCBUtilitiesProvABCSImpl	CC&B Work Order Provider ABCS
ProcessWorkOrderOUWAMUtilitiesProvABCSImpl	WAM Work Order Provider ABCS
ProcessWorkOrderOUMWMUtilitiesProvABCSImpl	MWM Work Order Provider ABCS
ProcessWorkOrderResponseOUMWMUtilitiesReqABCSImpl	MWM Work Order Acknowledgement Requestor ABCS
ProcessWorkOrderResponseOUCCBUtilitiesProvABCSImpl	CC&B Work Order Acknowledgement Provider ABCS
ProcessWorkOrderResponseOUWAMUtilitiesProvABCSImpl	WAM Work Order Acknowledgement Provider ABCS
ProcessWorkOrderResponseOUMWMUtilitiesProvABCSImpl	MWM Work Order Acknowledgement Provider ABCS

You can use the Integration Scenario Summary page in the Oracle AIA Console to search for and view integration scenarios that use a particular ABC service.

For more information, see *Oracle Application Integration Architecture – Foundation Pack: Core Infrastructure Components Guide,* "Using the BSR UI to View Integration Scenarios."

Adapter Services

Adapter Service Name	Description
ProcessWorkOrderOUMWMUtilitiesJMSProducer	This is the JMS producer service in ESB that is invoked by the EBS when the message is to be routed to MWM. This service is responsible for posting the message to the Provider AQ for MWM.
ProcessWorkOrderOUMWMUtilitiesJMSConsumer	This is the JMS consumer service in ESB responsible for listening to the Provider AQ for MWM and sending the messages to MWM Work Order Provider ABCS.
ProcessWorkOrderOUCCBUtilitiesJMSProducer	This is the JMS producer service in ESB 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 Provider AQ in CC&B.
ProcessWorkOrderOUMWMUtilitiesJMSConsumer	This is the JMS consumer service in ESB responsible for listening to the Provider AQ in CC&B and sending the messages to CC&B Work Order Sync Provider ABCS.
ProcessWorkOrderOUWAMUtilitiesJMSProducer	This is the JMS producer service in ESB that is invoked by the EBS when the message is to be routed to WAM. This service is

Adapter Service Name	Description
	responsible for posting the message to the Provider AQ in WAM.
ProcessWorkOrderOUWAMUtilitiesJMSConsumer	This is the JMS consumer service in ESB responsible for listening to the Provider AQ in WAM and sending the messages to WAM Work Order Provider ABCS.

Message Enrichment Services

These services are used to enrich the Order Create message received from WAM with information about the Meter installed at the Service Point sent by WAM on the Create Request.

Message Enrichment Service Name	Description
WAMGetMeterDataReqService	This is an EBS service invoked by WAM Work Order Create Requestor 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.
CCBGetMeterDataProvService	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

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

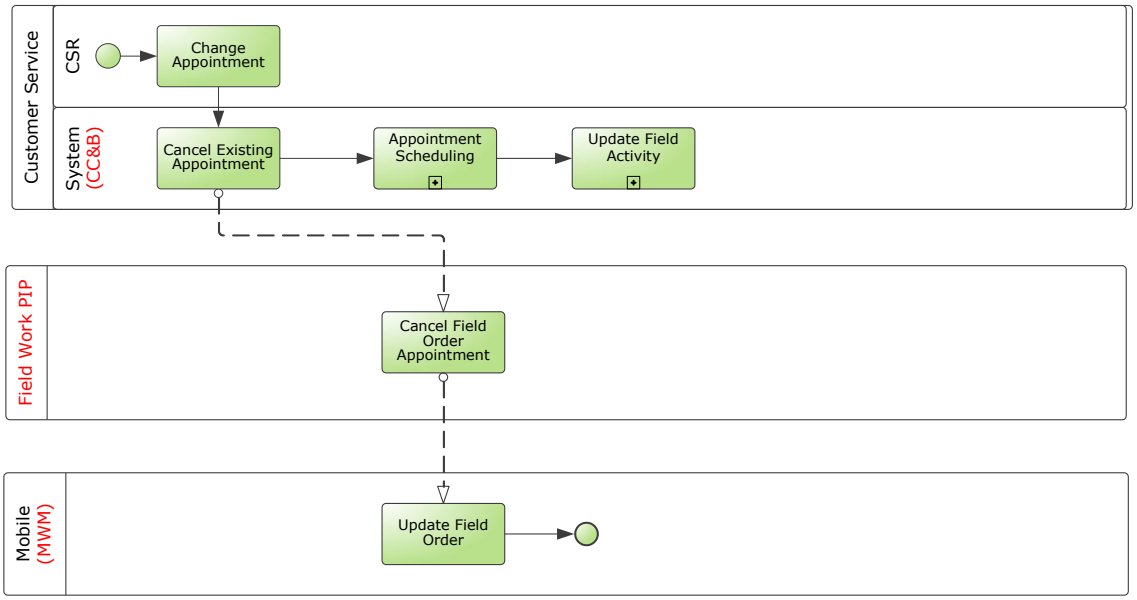
Supported Functionality for Appointments Processing

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 CC&B 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 shows the processing when an appointment is changed:



Process flow for changing the appointment time for an order

Assumptions and Constraints for Appointments Processing

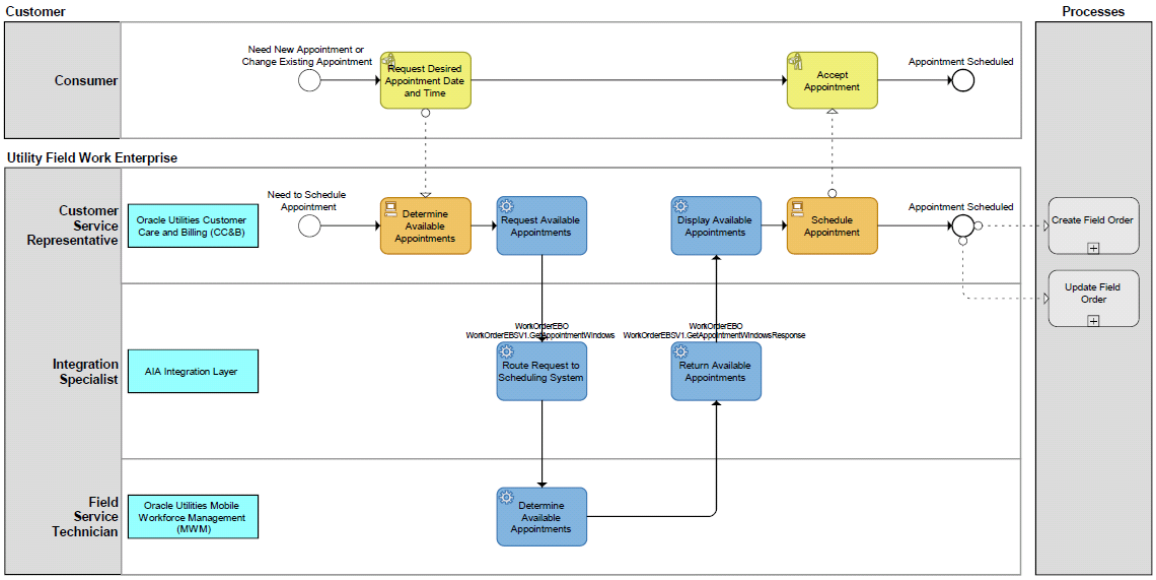
- You can only search for available appointment slots for one field activity at a time.
- For any errors encountered, the user will see the error message in the UI.

Integration Process Flows for Appointments Processing

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

Functional Diagram for Appointment Processing

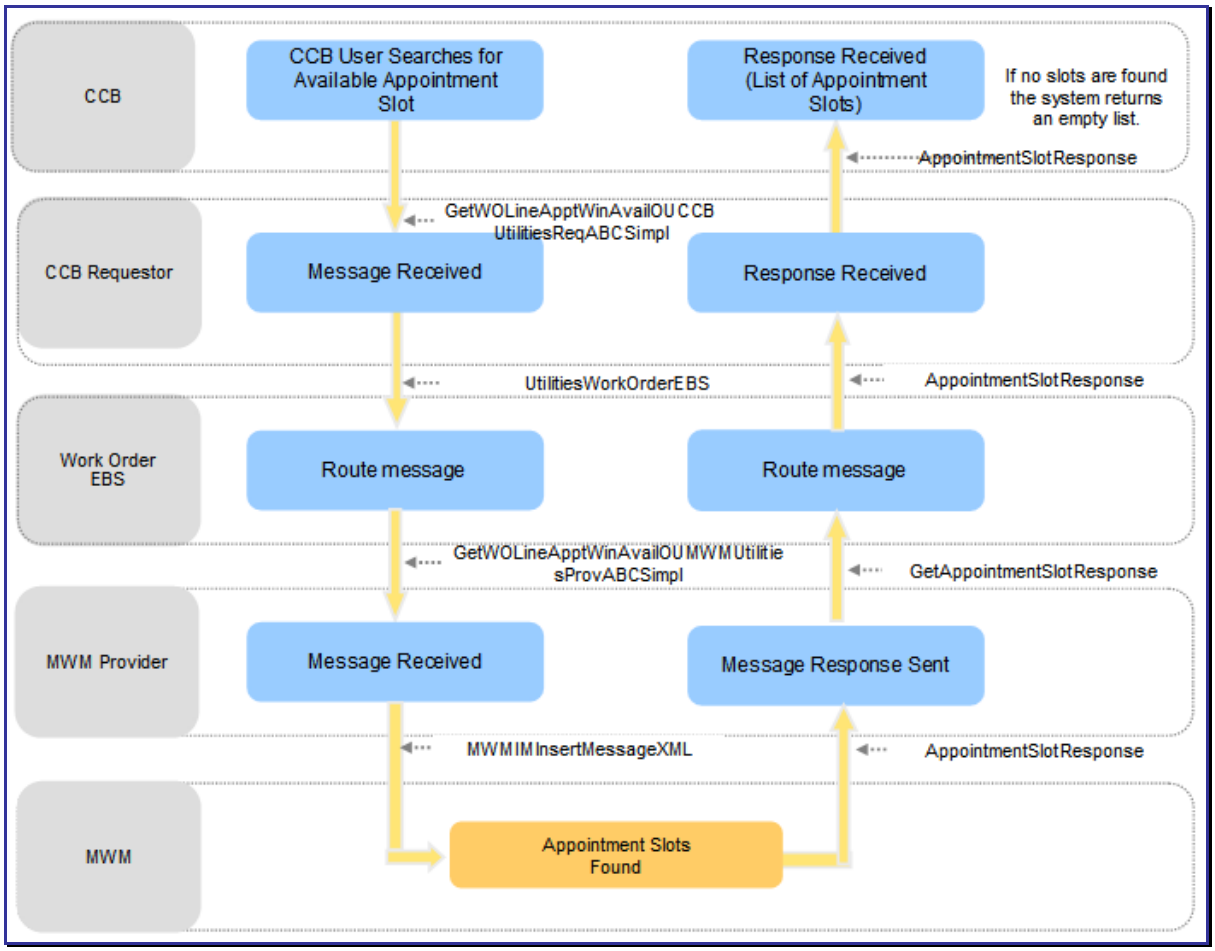
This diagram shows the processing for changing appointments.



Appointment processing

Technical Diagram for Appointment Processing

This diagram shows the technical flow for appointment processing.



Process flow for Get Appointment Slot request

Processing Details

This integration flow describes the path of a CC&B Get Appointment Slot request. When a CC&B user searches for available appointment slots from MWM they include the location where the work needs to be done, the work order type (FO Type), dispatch group/service area and on/around date time to MWM.

If the CC&B user does not provide the dispatch group on or around the date and time, CC&B 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, MWM sends a response containing the list of appointment slots.

If no available appointment slots are found, the response returns an empty list and a message is displayed on the CC&B Appointment screen informing the user that no available appointments are found.

If an error is encountered while transforming the message, or ESB or MWM is unreachable, the system synchronously responds to the requesting application with an error. An error message is displayed on the CC&B Appointment screen informing the user that an error was encountered by the external system.

Edge Application Interfaces for Appointments Processing

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

Inbound MWM Web Services

Web Service Name	Invoked By	Web service Description
MWMIMInsertMessageXML	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 Integration Services for Appointments Processing

The integration flow uses the following components:

EBO	EBM	File Locations
WorkOrderEBO	GetWorkOrderLineAppointmentWindowAvailabilityEBM	The core EBO and EBM XSD files can be located by EBO within this parent folder: http://[HOST:PORT]/AIAComponents/EnterpriseObjectLibrary/Core/EBO/

For more information about EBOs, see Appendix B: Cross References.

Enterprise Business Services

EBS Name	Description
UtilitiesWorkOrderEBS	Receives the GetWorkOrderLineAppointmentWindowAvailability EBM and routes it to the appropriate MWM Provider. The core EBS WSDL files can be located by EBO within this parent folder: http://[HOST:PORT]/AIAComponents/EnterpriseBusinessServiceLibrary/Core/EBO/

ABCS

These values are cross referenced in the configuration guidelines section for the integration.

ABCS Name	Description
GetWOLineApptWinAvailOUCCB UtilitiesReqABCSImpl	CC&B Get Work Order Line Appointment Window Requestor ABCS

GetWOLineApptWinAvailOUMWM UtilitiesProvABCSImpl	MWM Get Work Order Line Appointment Window Provider ABCS

Meter or Item Validation Processing

If a MWM or WAM user requests validation for a meter or an item, the validation is always sent to CC&B. Once CC&B validates the Installed Product (Meter/Item) the response is routed to the correct edge application (MWM or WAM).

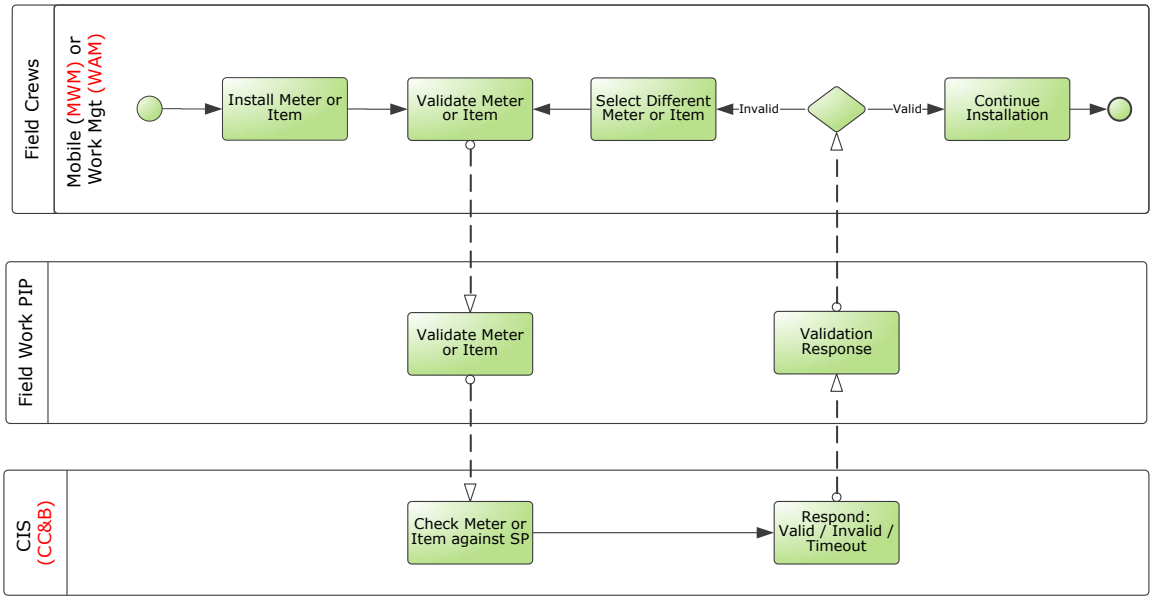
Meter configuration information is always stored in CC&B. If this information is needed in MWM or WAM, a meter validation must occur. The validation is always sent to CC&B and CC&B responds with meter information (including configuration and Register Information) as well as a valid or not valid indicator. For validation of an item only the validity information is sent as response from CC&B and no further information about the Item is sent in the response.

Supported Functionality for Meter or Item Validation Processing

When a validation is requested two functions are performed:

- CC&B 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.
- CC&B sends information about the meter and its configuration or the item to the requestor.

Whether the validation request is initiated within WAM or MWM, the system a request is sent to CC&B and the system responds with the meter or item information as applicable.



Process flow when meter validation is requested from MWM or WAM

Assumptions and Constraints for Meter or Item Validation Processing

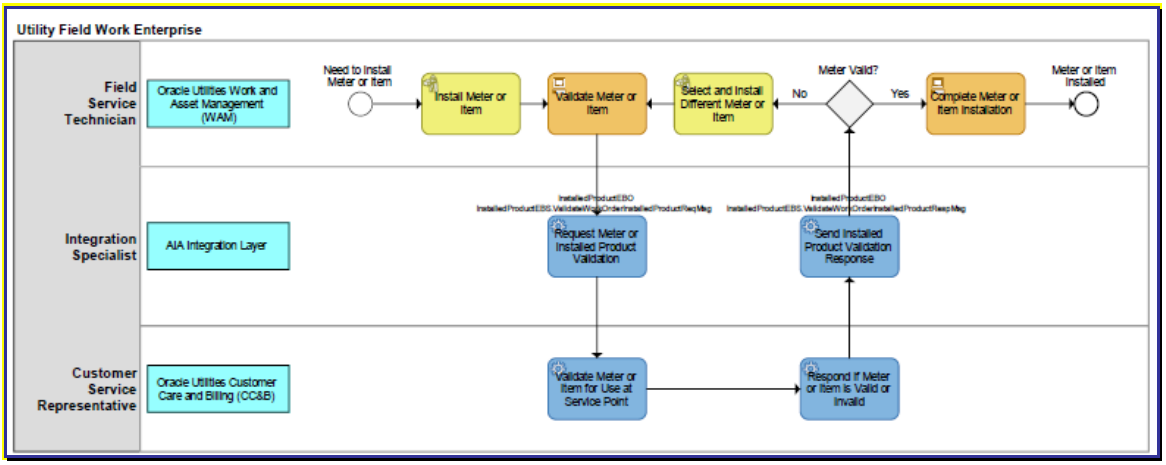
- CC&B is always the provider and either WAM or MWM can be the requestor.
- If a Service Request does not exist in CC&B, the Meter/Item cannot be validated.

- WAM stores the Common Cross Reference ID as the External System ID and passes that information to WAM Requester ABCS.
- MWM stores the Common Cross Reference ID as the External System ID and passes that information to MWM Requester ABCS.
- The XAI Inbound Service in CC&B requires an FA_ID as input; hence in CC&B ABCS, a Cross Reference lookup to get the FA_ID for the input Common Cross Reference ID is made.
- Any Business Error messages returned by CC&B are part of the response message and are sent back to WAM/MWM as part of the response message.

Integration Process Flows for Meter or Item Validation Processing

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

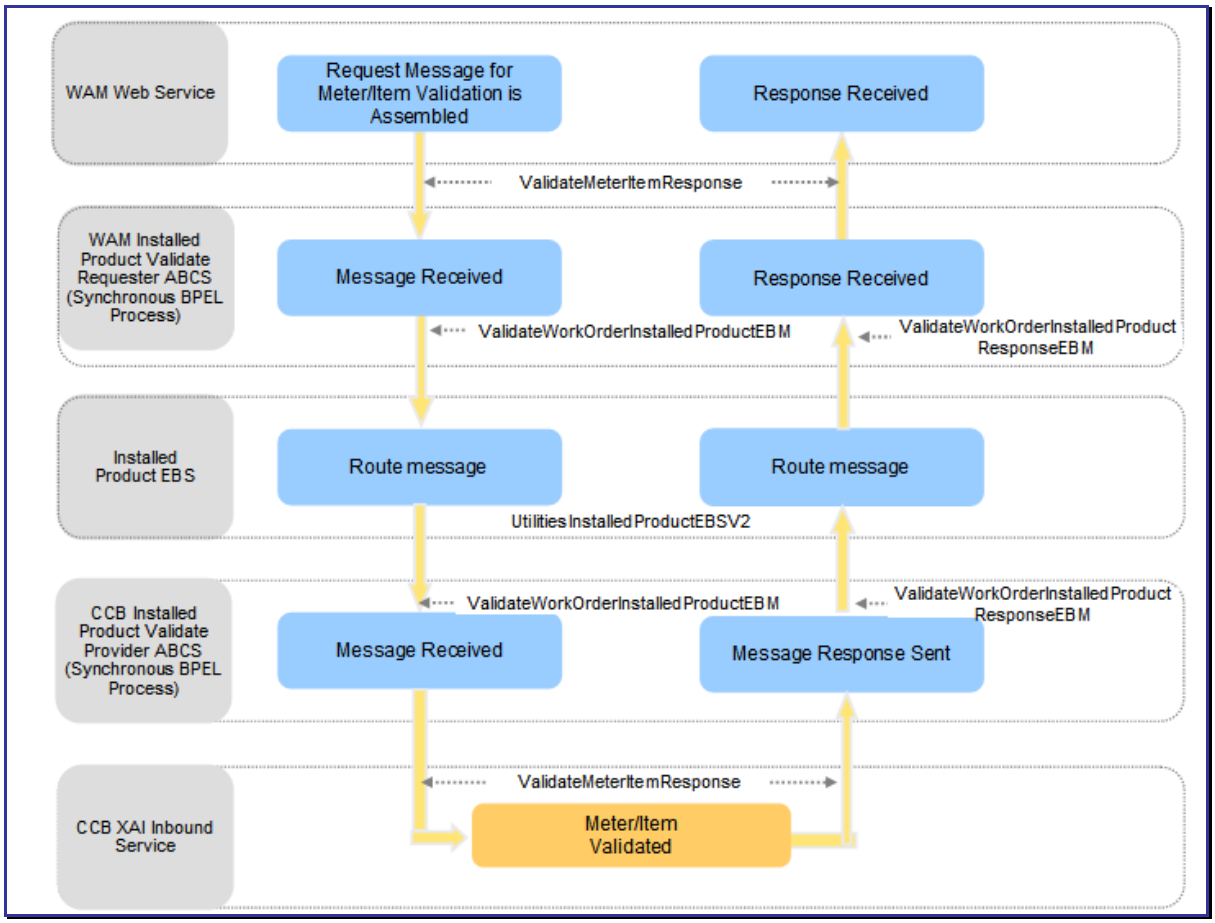
Functional Diagram for Validation Processing between WAM and CC&B



Validate meter or item from WAM to CC&B

The Installed Product Validate WAM-CC&B Integration flow specifies the flow for any Meter/Item Validation request made by WAM. When a field service representative is installing a meter or an item, WAM provides the ability for this user to request realtime validation of the badge number for the meter or item being installed. This request causes a message to be sent to CC&B. It is a blocked/synchronous call from WAM. This means that WAM waits for the response back for any request made to validate Meter/Item.

Technical Diagram for Validation Processing between WAM and CC&B



Installed Product Validate WAM – CC&B Integration Flow

Processing Details

- WAM assembles the request message for Meter/Item validation. This request message is sent to the WAM Requestor 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 an ESB process, UtilitiesInstalledProductEBSV2 to the provider ABCS (CC&B).
- Once the message is correctly routed to the CC&B provider ABCS (synchronous BPEL process), the message is transformed from Installed Product EBO format to a format that XAI Inbound Service (ValidateMeterItemResponse) requires in CC&B.
- CC&B validates the Installed Product (Meter/Item) and sends back a response to the CC&B Provider ABCS. The Provider ABCS transforms it back to the EBO format and the message is routed back through ESB to the WAM Requestor ABCS.
- The Requestor ABCS will transform the message from EBO format into a format that WAM understands.
- In addition the BPEL process will use the AIA framework provided error handling to handle

errors.

- 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 will not be present for an Item Validation or if the Meter/Item is invalid.

Validating Meter Numbers in WAM

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.

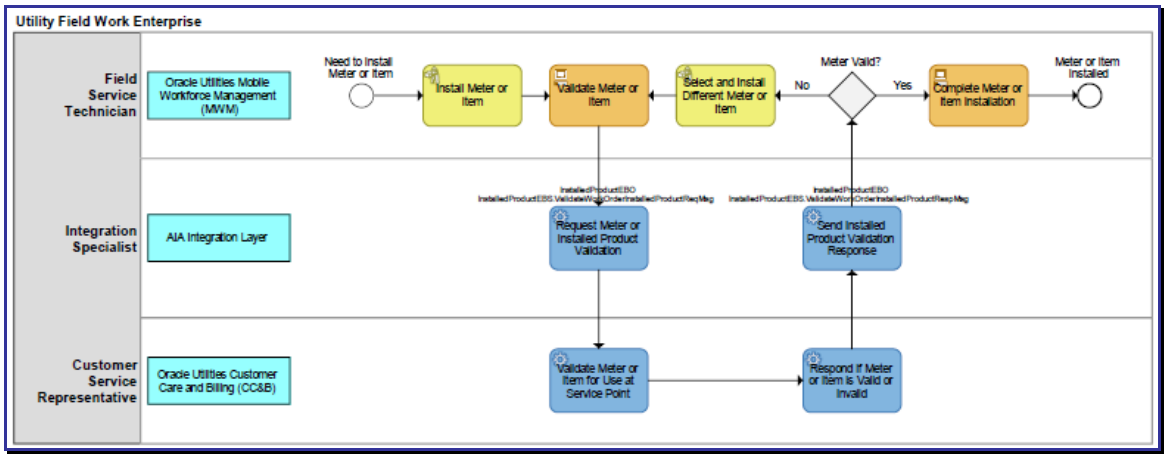
3. Enter a ***Meter Badge Number*** and click the ***Validate*** button.

   The system initiates a request to CC&B 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, CC&B 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.

Functional Diagram for Validation Processing between MWM and CC&B

The Installed Product Validate MWM-CC&B Integration flow specifies the flow for any Meter/Item Validation request made by MWM. The following diagram represents this processing.

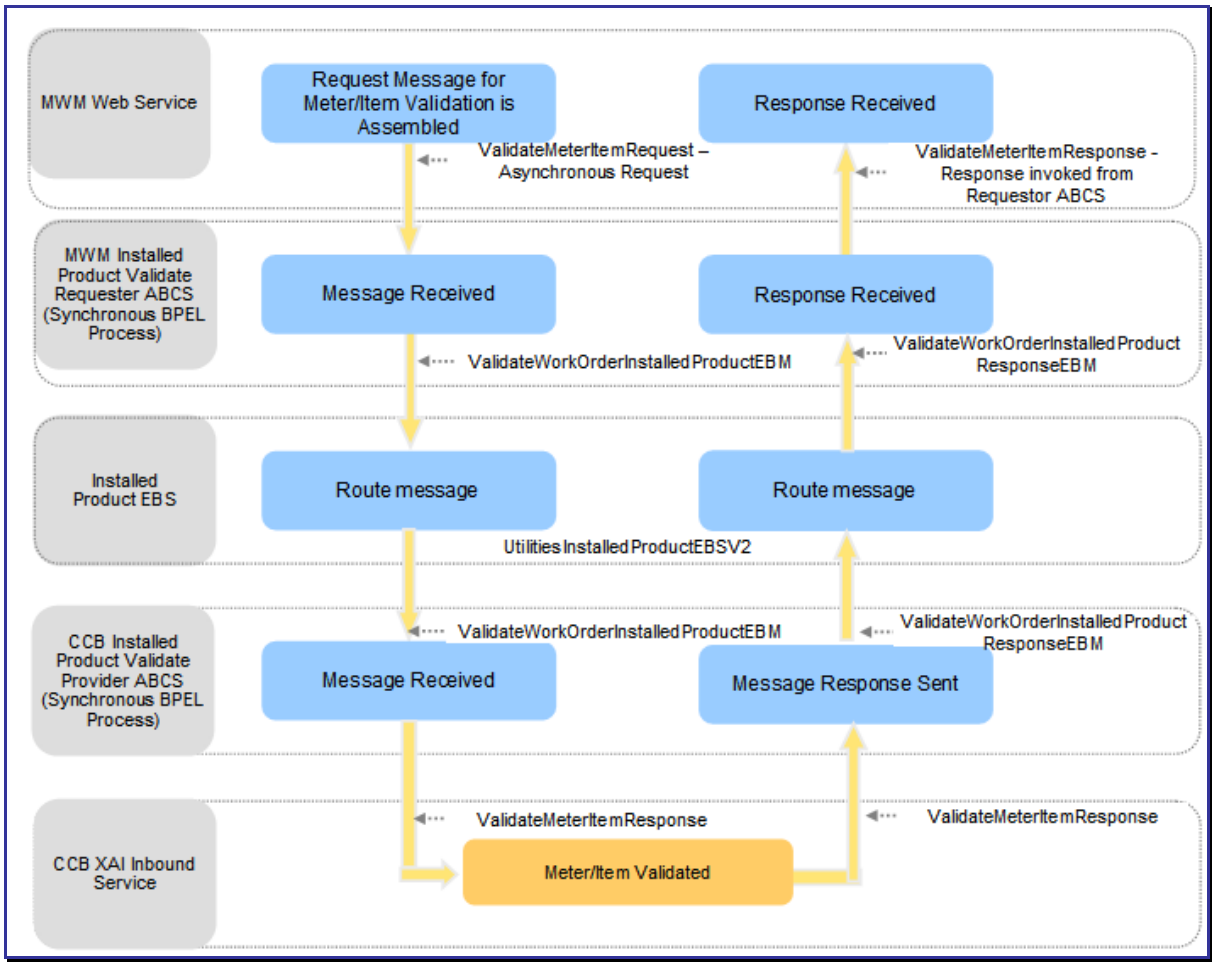


Validate meter or item from MWM to CC&B

When a field service representative is installing a meter or an item, MWM provides the ability for this user to request realtime validation of the badge number for the meter or item being installed. CC&B performs validation and sends back a Validation Response to MWM. This is done **asynchronously**. This means MWM does not wait for the response back for any request made to validate Meter/Item.

The MWM application displays a progress dialog to the user. If the response is not received within a configurable time, the user can continue with the completion without having the badge number validated.

Technical Diagram for Validation Processing between MWM and CC&B



Installed Product Validate MWM – CC&B Integration Flow

Processing Details

- MWM assembles the request message for Meter/Item validation and sends out the request as an Asynchronous call to the MWM Requestor ABCS. The MWM Requestor 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 an ESB process, UtilitiesInstalledProductEBSV2 to the provider ABCS (CC&B).
- Once the message is correctly routed to the CC&B provider ABCS (synchronous BPEL process), the message is transformed from Installed Product EBO format to a format that XAI Inbound Service (ValidateMeterItemResponse) requires in CC&B.
- CC&B validates the Installed Product (Meter/Item) and sends back a response to the CC&B

Provider ABCS. The Provider ABCS transforms it back to the EBO format and the message is routed back through ESB to the MWM Requestor ABCS.

- The Requestor ABCS will transform the message from EBO format into a format that MWM understands and invokes the MWM application with the response message.
- In addition the BPEL process will use the AIA framework provided error handling to handle errors.

To validate a meter in MWM

1. In MWM Mobile Workstation, open a Field Order that references an External Order ID and access the External System Order Types Primary Detail Completion screen.
2. Enter the meter/item badge number and click the Verify button.

   The system displays the Validation Progress screen showing a progress bar.
3. Wait while the validation is processed by CC&B.
4. When the response is received, the message on the screen will indicate whether or not the validation was successful.
5. Click OK to return to the Detail Completion screen.

   If the transaction is successful, the screen is updated with the data from the response. If unsuccessful, the user can enter a different badge number and try again.

   If the response is not received within a configurable time, the message on the screen will indicate the validation has timed out. Click the OK button to return to the Detail Completion screen where the user can enter the appropriate data and complete the order anyway.

For more information about incoming and outgoing meter validation messages, see CC&B documentation topic Defining Field Order Options - Incoming Validate Meter / Item Message and Outgoing Validate Meter / Item Message. Also see the CC&B User Guide Meter Management section.

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
ValidateMeterItemResponse	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 WAM Messages

Message Name	Invokes	Web service Description
ValidateMeterItemResponse	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 MWM Web Messages

Message Name	Invokes	Web service Description
ValidateMeterItemRequest	MWM Work Order Installed Product Validate Requester ABCS	This message is used to send Meter/Item Validation request.

Inbound MWM Web Services

Web Service Name	Invoked By	Web service Description
SPLMWMService.wsdl	MWM Work Order Installed Product Validate Requester ABCS	Invoked to send back the response for the Meter Validation to MWM

Core AIA Components and Integration Services for Meter or Item Validation Processing

The integration flow uses the following components:

EBO	EBM	File Locations
InstalledProductEBO	ValidateWorkOrderInstalledProductEBM ValidateWorkOrderInstalledProductResponseEBM	The core EBO and EBM XSD files can be located by EBO within this parent folder: http://[HOST:PORT]/AIAComponents/EnterpriseObjectLibrary/Core/EBO/.

For more information about EBOs, see Appendix B: Cross References.

Enterprise Business Services

EBS Name	Description
UtilitiesInstalledProductEBSV2	The UtilitiesInstalledProductEBSV2 service is implemented as an ESB 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 flow. It has routing rules set up for one operation: ValidateWorkOrderInstalledProduct. The core EBS WSDL files can be located by EBO within this parent folder: http://[HOST:PORT]/AIAComponents/EnterpriseBusinessServiceLibrary/Core/EBO/.

For more information about this EBS, see *Oracle Application Integration Architecture - Foundation Pack: Integration Developer's Guide,* "Designing and Developing EBSs" and *Oracle Application Integration Architecture - Foundation Pack: Concepts and Technologies Guide,* "Understanding EBSs"

ABCS

These values are cross referenced in the configuration guidelines section for the integration.

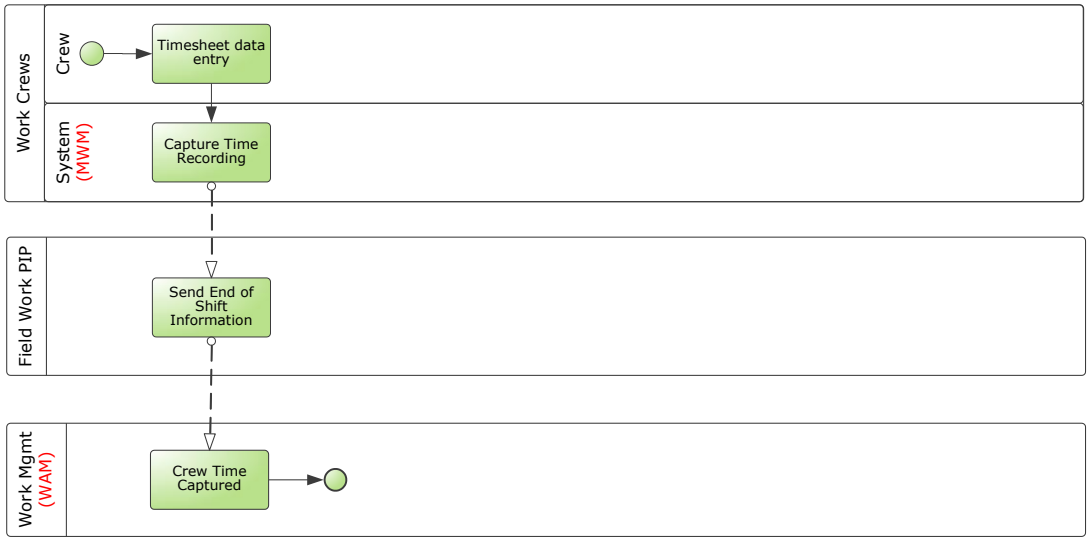
ABCS Name	Description
ValidateInstalledProductOUWAMUtilitiesReqABCSImpl	WAM synchronously invokes the ValidateInstalledProductOUWAMUtilitiesReqABCSImpl service when a field service representative tries to validate a Meter/Item for a particular Service Request. The call returns the validity of the Meter/Item along with Meter Configuration, Registers Information for a Meter.
ValidateInstalledProductOUMWMUtilitiesReqABCSImpl	MWM asynchronously invokes the ValidateInstalledProductOUMWMUtilitiesReqABCSImpl 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.
ValidateInstalledProductOUCCBUtilitiesProvABCSImpl	UtilitiesInstalledProductEBSV2 synchronously invokes the ValidateInstalledProductOUCCBUtilitiesProvABCSImpl service when a request is sent by the Requestor ABCS to validate a Meter/Item. The ValidateInstalledProductOUCCBUtilitiesProvABCSImpl 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 Requestor ABCS.

Timesheet Creation Process

Crew time hours recorded against orders is sent to WAM. Only MWM Field Orders that reference a CC&B Field Activity or a WAM Work Order Task or Service Request are supported. This is a one-way integration from MWM to WAM.

Supported Functionality for Timesheet Creation Processing

When workers or crews work on orders, they will often complete timesheets associated to the order. Timesheets can be entered directly in WAM or they can be sent from MWM to WAM.



Process flow when crew time is entered for an order

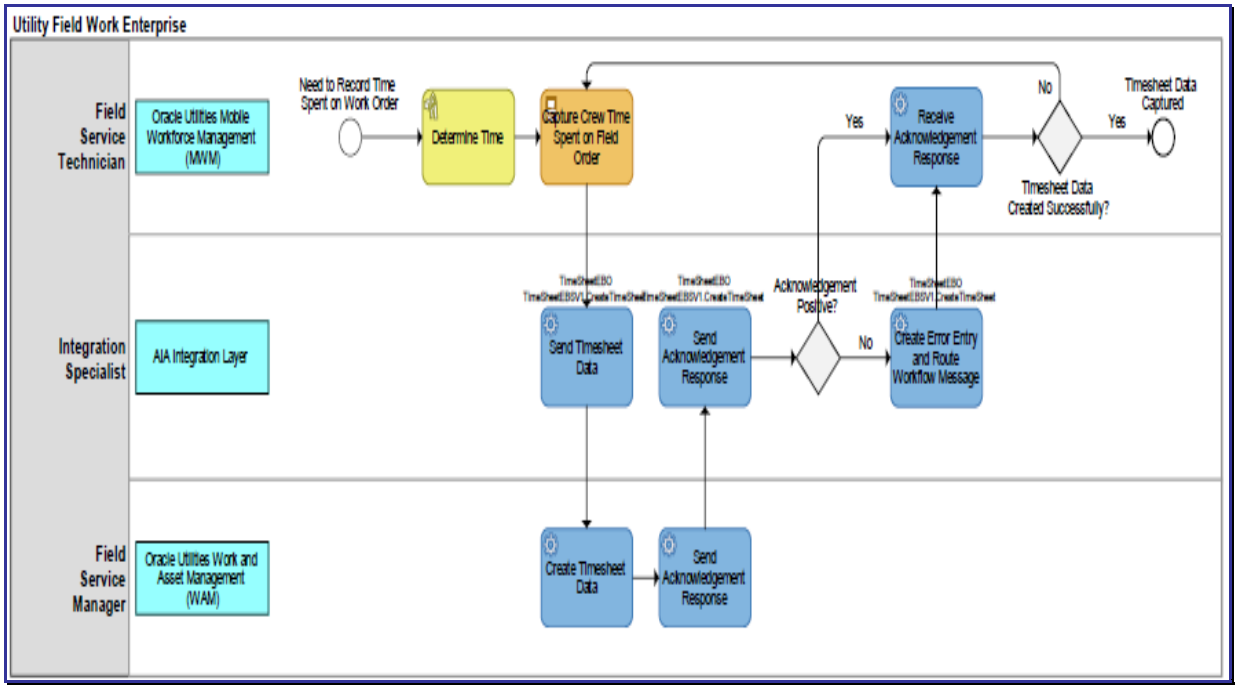
Assumptions and Constraints for Timesheet Creation Processing

- Any business errors that occur during import within WAM application will need to be handled manually. WAM sends an alert with the error message to the WAM home page of the designated employee.
- MWM stores the Common Cross Reference ID as the External System ID and passes that information to MWM Requester ABCS.
- There is a limitation on EBO where only one type of charge (for example, Either Regular or Premium) can be included on a single transaction. The workaround is to create a separate record for each Regular and Premium.
- Remember, a work order task cannot be created in WAM and then also created in CC&B or MWM, but when a crew reports time, they can include information about a service request or work order task that was worked.

Integration Process Flows for Timesheet Creation Processing

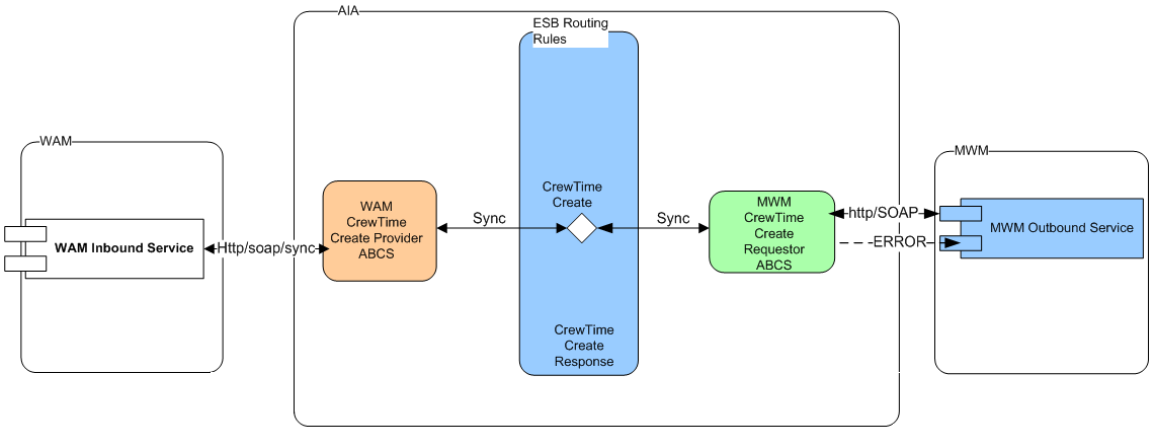
The integration flow specifies the path of a MWM Timesheet request. When a user enters time against a field order, the user will send this timesheet to WAM system where it is used to calculate the total cost of that field order. The request is asynchronous from MWM to WAM. Only technical errors are reported back to MWM application where it has the ability to resend the request. All business errors are handled within WAM.

Functional Diagram for the Creation of Timesheets



Functional flow of timesheet request

Technical Diagram for the Creation of Timesheets



Process flow of timesheet request

Processing Details

MWM assembles the request message for Timesheet(s). This request message is sent to the MWM Requestor ABCS, which is an asynchronous BPEL process where the message is transformed and enriched into TimeSheet EBO format.

The message is routed through an ESB process, TimeSheetEBSV1 to the provider ABCS.

Once the message is correctly routed to the WAM provider ABCS, the message is transformed from Installed Product EBO format to a format that WAM Inbound Service, MWMTimesheetDatasetService.

WAM validates the request and if there is a business error then the system sends an alert to the designated user.

In addition the BPEL process will use the AIA framework provided error handling to handle errors.

Edge Application Interfaces for Timesheet Creation Processing

This section describes the application interfaces relevant to the timesheet creation processing integration point.

This table shows the WAM web services.

Web Service Name	Direction	Invoked By	Web service Description
MWMTimesheetDatasetService	Inbound	WAM TimeSheet Provider ABCS	Invoked to Create new Timesheet(s) in WAM.
CreateTimeSheet	Outbound	MWM TimeSheet Create Requestor ABCS	This message is used by MWM to send new Timesheet record(s)

Core AIA Components and Integration Services for Timesheet Creation Processing

The integration flow uses the following components:

EBO	EBM	File Locations
TimeSheetEBO	TimeSheetEBM ValidateWorkOrderInstalledProductResponseEBM	The core EBO and EBM XSD files can be located by EBO within this parent folder: http://[HOST:PORT]/AIAComponents/EnterpriseObjectLibrary/Core/EBO/.

Enterprise Business Services

EBS Name	Description
TimeSheetEBSV1	The TimesheetEBSV1service is implemented as an ESB routing service. It provides the basic request operations that can be performed against the TimeSheetEBO. This service is invoked as part of the MWM-WAM Create TimeSheet flow. It has routing rules set up for one operation: Create TimeSheet. The core EBS WSDL files can be located by EBO within this parent folder: http://[HOST:PORT]/AIAComponents/EnterpriseBusinessServiceLibrary/Core/EBO/.

ABCS

These values are cross referenced in the configuration guidelines section for the integration.

ABCS Name	Description
CreateTimeSheetOUMWMUtilityReqABCSImpl	MWM synchronously invokes the CreateTimeSheetOUMWMUtilityReqABCSImpl service when a field service representative enters a Timesheet for a particular Service Request.
CreateTimeSheetOUWAMUtilitiesProvABCSImpl	TimeSheetEBSV1 synchronously invokes the CreateTimeSheetOUWAMUtilitiesProvABCSImpl service when a request is sent by the Requestor ABCS

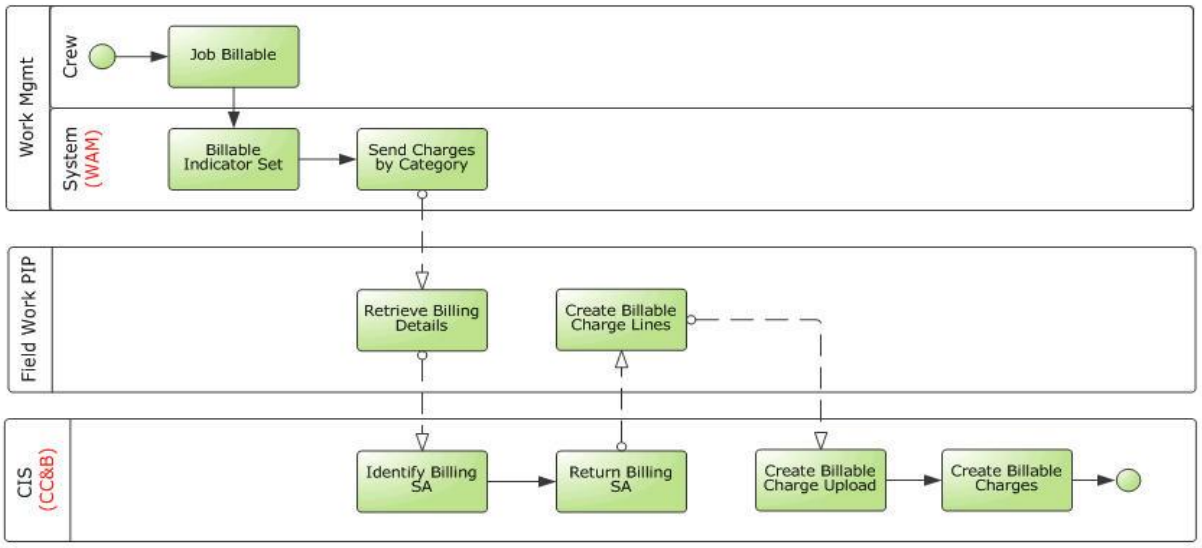
Billing Process

In some cases, a finished service request may require billing. This is indicated when the bill customer box is checked on the WAM service request. In this way, WAM 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 WAM, the billing information is sent to CC&B. Billable charges include time, materials, and direct charges associated with the order to CC&B.

Supported Functionality for Billing Processing

The Bill Customer Indicator can also be set from MWM. When MWM sends cost and materials as part of order completion to WAM, it can also indicate if the order is billable by setting the Bill Customer Indicator to true. This can be overridden in WAM.

In WAM, this Bill Customer Indicator is part of the Service Request Screen. In MWM, this indicator is part of the Field Order Screen. An MWM or WAM user should set the value of this field.



Process flow when an order is billed to a customer

Assumptions and Constraints for Billing Processing

- For this integration, a MWM or WAM user sets the Billable Indicator.

There is no configuration available to automatically set the Billable Indicator to a certain value.

- When WAM sends the billable charges to CC&B, it will always send the WAM Expense Category and amount.

  WAM Expense Category is mapped to CC&B Bill Charge Line Type. For every WAM Expense Category an equivalent CC&B Bill Charge Line Type is set up in CC&B. The CC&B 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 will be defaulted onto the line details associated with the uploaded billable charges. WAM does not send individual billable charge information to CC&B (for example, accounts receivable distribution code, currency code, the indicators).

- If the SA Type created for Billable Charge SA has a start option, the start option should not turn on the Create Billable Charge switch which will automatically create a billable charge when a service agreement is created using this start option.

  The Billable Charge should be created manually by invoking the CC&B XAI service - Create Billable Charge Upload Entry.

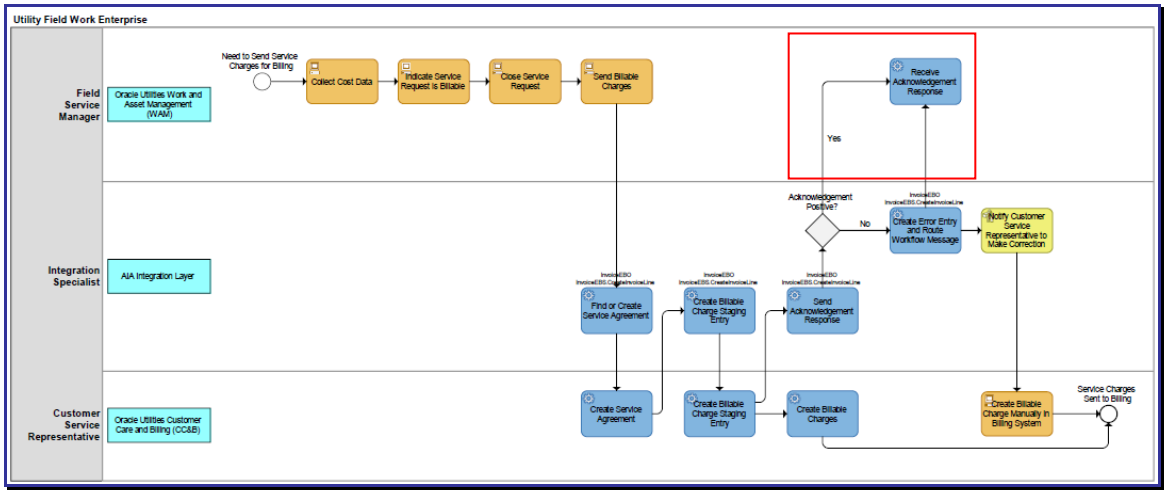
- Charges are created as part of closing the WAM Service Request only if the External Order field is populated on the service request. The External Order field holds the equivalent CC&B field activity and/or MWM service order.
- The Service Point and Customer link to the Service Request that needs to be billed must exist in CC&B.
- No Resend functionality is available in WAM. If an error is encountered and the message was not successfully sent to the integration layer, no resend action is available in the WAM application to send the message again. The Billable Charge has to be manually created in CC&B.

Integration Process Flows for Billing Processing

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

Functional Diagram for Billing an Order to a Customer

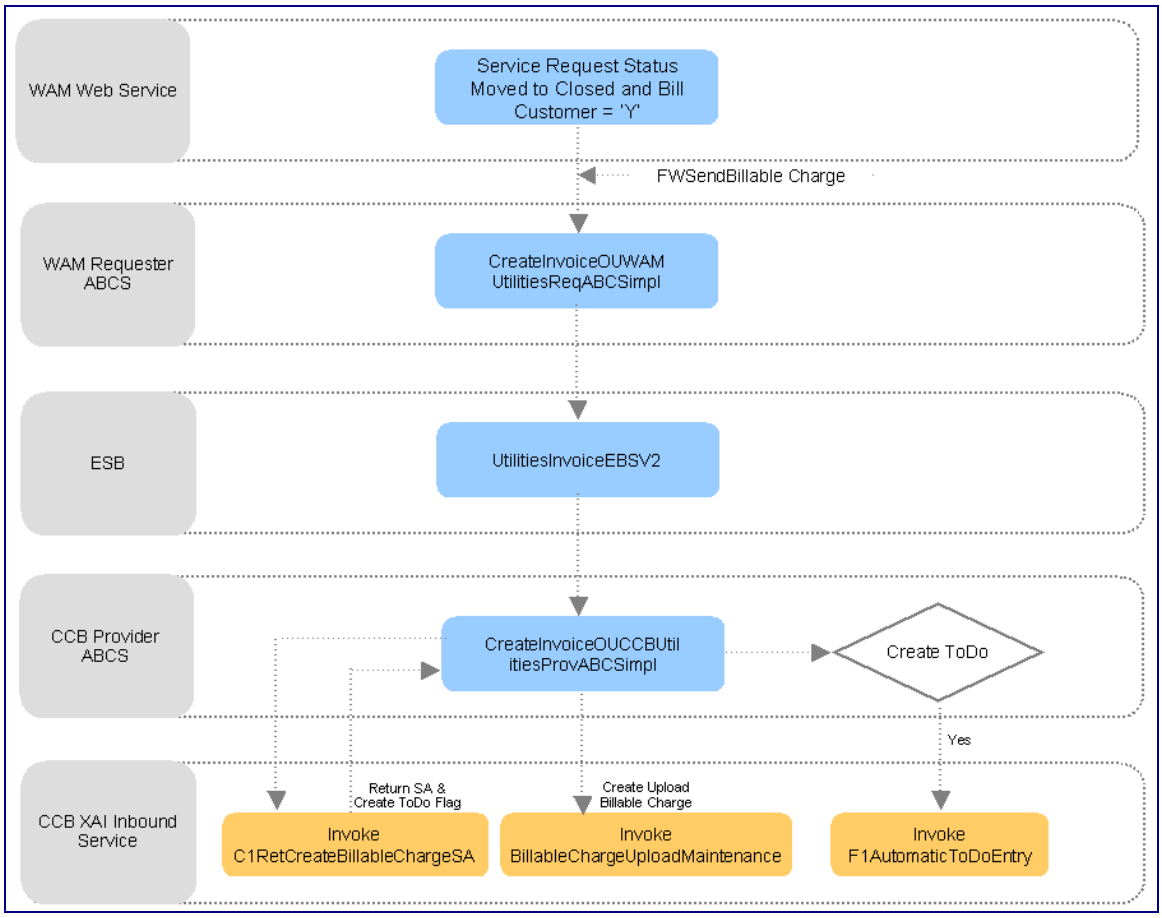
This integration flow shows how an order is billed to a customer. It describes how WAM sends the charges related to an order to CC&B.



Order billing to a customer

Technical Flow Diagram for Billing an Order

This diagram shows how charges for an order coming from WAM are integrated to CC&B.



Process Flow for Billing an Order to a Customer

Processing Details

This integration flow shows how an order is billed to a customer. A WAM User initiates this flow when a Service Request is **Closed** and the Bill Customer Flag is set to true. This will invoke the Send Billable Charge Web Service to send billable charge information for Time, Materials, and/or Direct Charges associated with the order to the AIA layer.

In the AIA layer, the WAM Requestor ABCS will accept the ABM coming from WAM. It will transform the message into an EBM using the Invoice EBO format and initiates the EBS. The transformation will also get the common ID of the Service Request from the Cross-reference table and pass it to the EBM. The EBS, which is implemented as a lightweight service in Oracle Enterprise Service Bus (ESB), will route the message to the appropriated CC&B Queue. A CC&B provider JMS consumer in ESB listens to the provider queue in CC&B and invokes the CC&B Provider ABCS for each message received in the queue.

The CC&B Provider ABCS will orchestrate a series of calls to the CC&B application to create the billable charge. It will call the following CC&B services:

C1RetCreateBillableChargeSA - This new 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 will create 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 will pick one of the accounts for the SP and use that to find or create the billable charge SA. Then, it will set the Create To Do Flag to true.

BillableChargeUploadMaintenance - This existing XAI Inbound Service creates a Billable Charge Upload record in CC&B. 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 will create 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 CC&B. This To Do will remind the user to verify if the billable charge has been created for the correct account since 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 WAM is sending the message to the integration layer (AIA), the system synchronously responds to the requesting application with an error. The WAM application does not have ‘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 CC&B.

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 will generating an error email 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 will generating an error email notification and work list entry. The system rolls back the transaction so that the message stays in the CC&B Queue and the JMS consumer stops processing the queue. When the target web service is available again, it will process the record from the queue again.

In case of business exceptions from the target application, the standard AIA error processing will generating an error email notification and work list entry. After fixing the error, this can be retried from BPEL.

Edge Application Interfaces for Billing Processing

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

Inbound CC&B Web Services

Web Service Name	Invoked By	Web service Description
C1RetCreateBillableChargeSA	CC&B Create Invoice Provider ABCS	Inbound Service to retrieve or create a Billable Charge SA
BillableChargeUploadMaintenance	CC&B Create Invoice Provider ABCS	Creates billable charge upload records.
F1AutomaticToDoEntry	CC&B Create Invoice Provider ABCS	Automatic To Do Entry use to create To Do Entry in CC&B

Outbound WAM Messages

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

Core AIA Components and Integration Services for Billing Processing

The integration flow uses the following components:

EBO	EBM	File Locations
InvoiceEBO	CreateInvoiceEBM	The core EBO and EBM XSD files can be located by EBO within this parent folder: http://[HOST:PORT]/AIAComponents/EnterpriseObjectLibrary/Core/EBO/

For more information about EBOs, see Appendix B: Cross References.

Enterprise Business Services

EBS Name	Description
UtilitiesInvoiceEBSV2	Receives the CreateInvoiceEBM and routes it to the appropriate JMS Producer. The core EBS WSDL files can be located by EBO within this parent folder: http://[HOST:PORT]/AIAComponents/EnterpriseBusinessServiceLibrary/Core/EBO/.

ABCS

These values are cross referenced in the configuration guidelines section for the integration.

ABCS Name	Description
CreateInvoiceOUWAMUtilitiesReqABCSImpl	WAM Create Invoice Requestor ABCS
CreateInvoiceOUCCBUtilitiesProvABCSImpl	CC&B Create Invoice Provider ABCS

Adapter Services

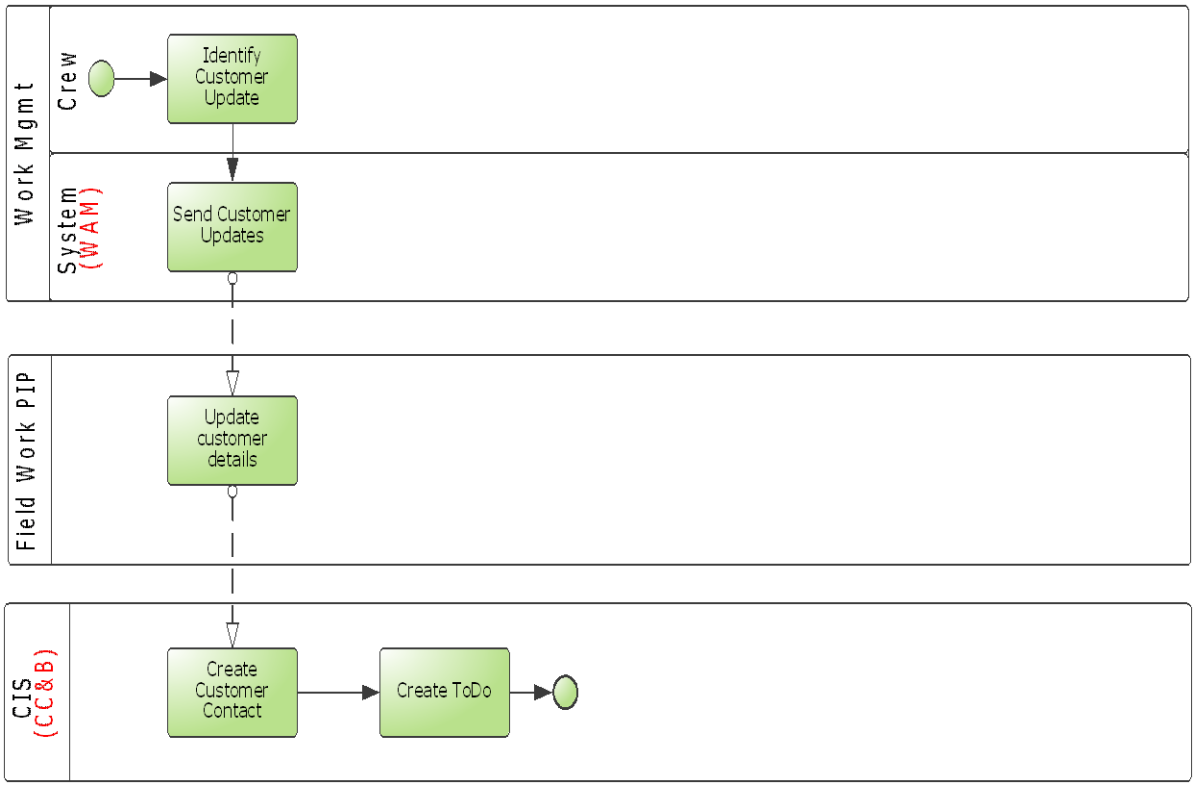
Adapter Service Name	Description
CreateInvoiceOUCCBUtilitiesJMSProducer	This is the JMS consumer service in ESB responsible for listening to the Provider AQ in CC&B and sending the messages to the CC&B Create Invoice Provider ABCS

Customer Update Process

A WAM user can pass updated Customer data collected in the field (such as a phone number or mailing address) to CC&B. The information may be changed either online in the service request or from the WAM mobile application. Information is stored in the SA_CREW_WORK_LOG table as changes to the service request prior to sending to CC&B.

Supported Functionality for Customer Update Processing

The following diagram shows the process of updating a customer from WAM to CC&B.



Customer Updated in CC&B from WAM

When customer information is updated in WAM, WAM initiates an outbound message to CC&B. This request creates a Customer Contact and To Do records in CC&B.

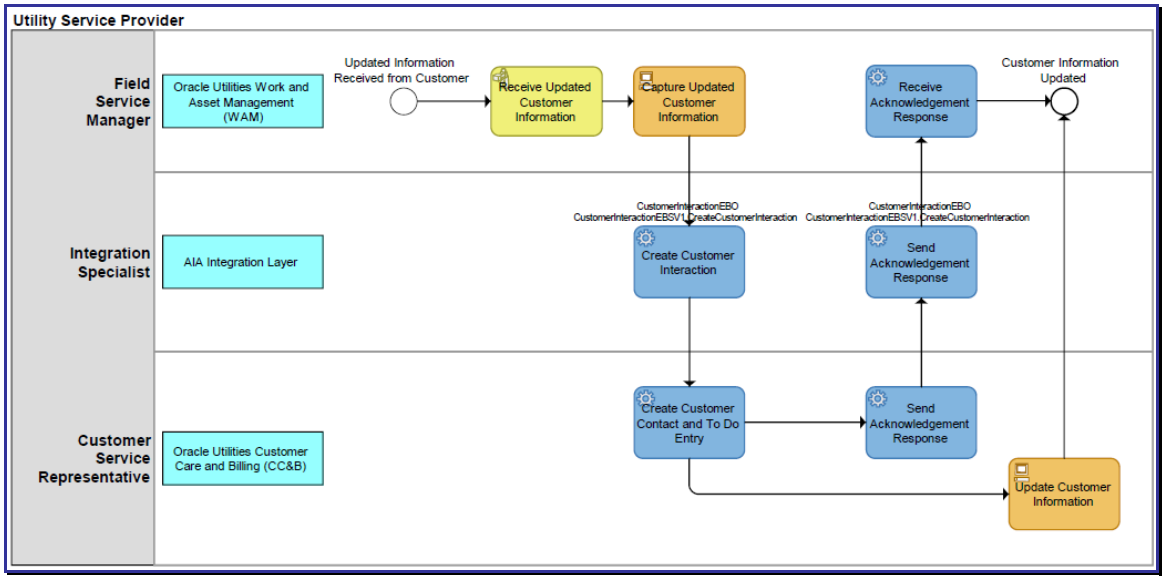
Assumptions and Constraints for Customer Update Processing

- CC&B is always the provider and WAM is the requestor.
- It is the WAM systems responsibility to know that Customer data has changes and that this data is linked to an external system.

Integration Process Flows for Customer Update Processing

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

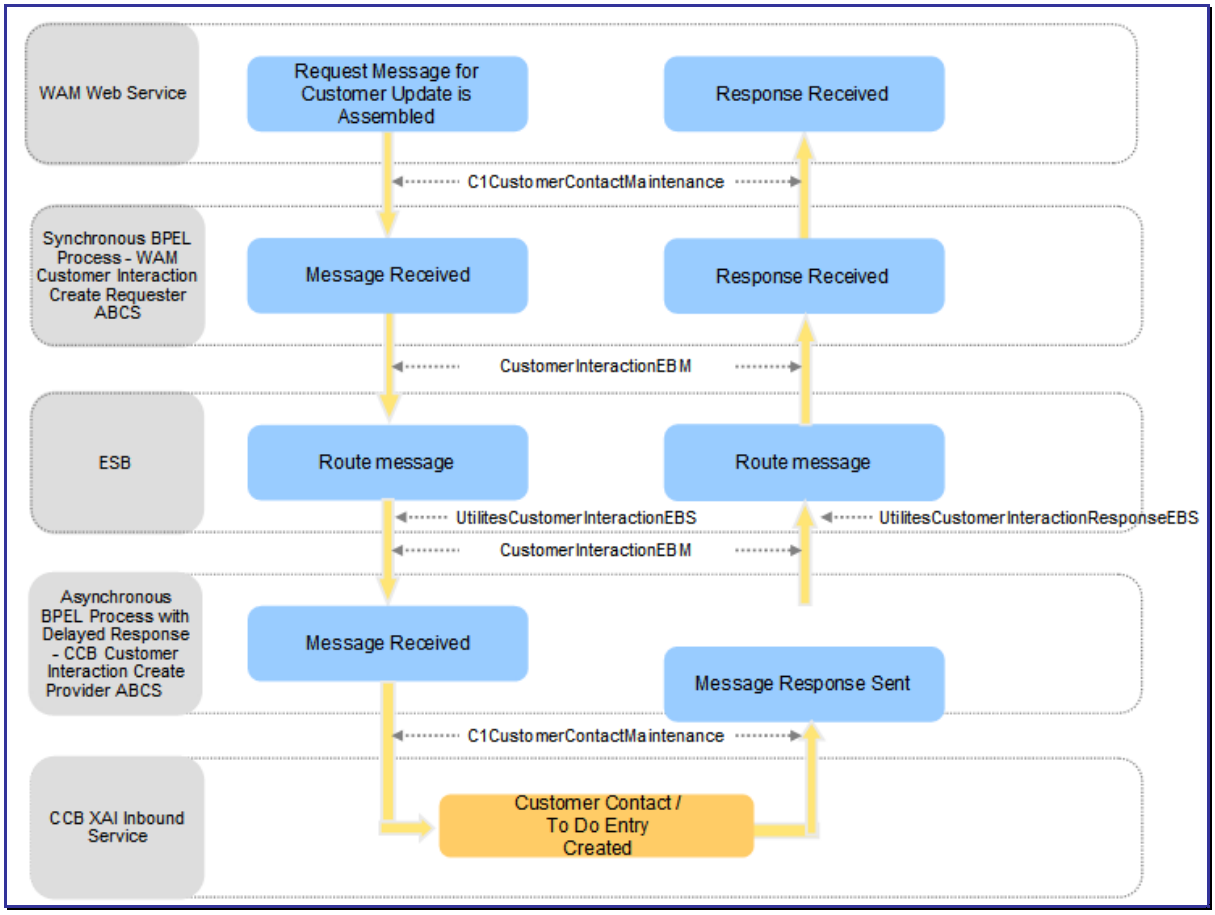
Functional Diagram for the Update of Customer Information



WAM – CC&B Create Customer Interaction Flow

The WAM-CC&B Create Customer Interaction Integration flow specifies the flow for any Customer Update Request made by WAM. A WAM user can pass updated Customer contact data collected in the field (such as a phone number or mailing address) to CC&B. This request causes a message to be sent to CC&B that creates a Customer Contact and To Do records. It is a **synchronous** call from WAM.

Technical Diagram for the Update of Customer Information



Customer Interaction Create WAM – CC&B Integration Flow

Processing Details

- WAM assembles the request message for Customer Update. This request message is sent to the WAM Requestor ABCS (synchronous BPEL process) where the message is transformed and enriched into Customer Interaction for Utilities EBO format.
- The message is routed through an ESB process, UtilitiesCustomerInteractionEBS to the provider ABCS (CC&B).
- Once the message is correctly routed to the CC&B 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 CC&B.
- CC&B creates the Customer Contact and a To Do entry and sends back a response to the CC&B Provider ABCS. The Provider ABCS transforms it back to the EBO format and invokes the ESB process UtilitiesCustomerInteractionResponseEBS that routes the response to the WAM Requestor ABCS that receives the response.

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

The Requestor ABCS will transform the message from EBO format into a format that WAM understands.

- In addition the BPEL process will use the AIA framework provided error handling to handle errors.

To update Customer Contact Information

1. Open a Service Request that References an External Order ID either online or from the WAM mobile application
2. Any updated Customer contact data collected (such as a phone number or mailing address) may be changed. Information is stored in the SA_CREW_WORK_LOG table as changes to the service request prior to sending to CC&B.

The system initiates an outbound service to CC&B that creates a Customer Contact and To Do records in CC&B.

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
C1CustomerContactMaintenance	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 WAM Messages

Message Name	Invokes	Web service Description
C1CustomerContactMaintenance	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 Integration Services for Customer Update Processing

The integration flow uses the following components:

EBO	EBM	File Locations
CustomerInteractionEBO	CustomerInteractionEBM	The core EBO and EBM XSD files can be located by EBO within this parent folder: http://[HOST:PORT]/AIAComponents/EnterpriseObjectLibrary/Core/EBO/

For more information about EBOs, see Appendix B: Cross References.

Enterprise Business Services

EBS Name	Description
UtilitiesCustomerInteractionEBS	The UtilitiesCustomerInteractionEBS service is implemented as an ESB 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 flow. It has routing rules set up for one operation: CreateCustomerInteraction.
UtilitiesCustomerInteractionResponseEBS	The UtilitiesCustomerInteractionResponseEBS service is implemented as an ESB routing service to route the response sent from ProviderABCS back to RequestorABCS. It has routing rules set up for one operation: CreateCustomerInteractionResponse. This service is invoked as part of the WAM-CC&B Create Customer Interaction flow.
The core EBS WSDL files can be located by EBO within this parent folder: http://[HOST:PORT]/AIAComponents/EnterpriseBusinessServiceLibrary/Core/EBO/.	

For more information about this EBS, see *Oracle Application Integration Architecture - Foundation Pack: Integration Developer's Guide,* "Designing and Developing EBSs" and *Oracle Application Integration Architecture - Foundation Pack: Concepts and Technologies Guide,* "Understanding EBSs"

ABCS

These values are cross referenced in the configuration guidelines section for the integration.

ABCS Name	Description
CreateCustomerInteractionOUWAMUtilitiesReqABCSImpl	WAM synchronously invokes the CreateCustomerInteractionOUWAMUtilitiesReqABCSImpl service when a field service representative tries to update Customer Information. The Provider ABCS retrieves the response from CC&B and invokes the ESB process UtilitiesCustomerInteractionResponseEBS that routes the response to the WAM Requestor ABCS where a Pick activity will receive the response and send it to WAM. **Note.** Correlation sets are used to correlate the instance ID of the outbound Invoke Request from Requestor ABCS and the inbound receive on the Requestor ABCS.
CreateCustomerInteractionOUCCBUtilitiesProvABCSImpl	UtilitiesCustomerInteractionEBS invokes the CreateCustomerInteractionOUCCBUtilitiesProvABCSImpl service when a request is sent by the Requestor ABCS to Create a Customer Contact. The CreateCustomerInteractionOUCCBUtilitiesProvABCSImpl invokes the

ABCS Name	Description
	CC&B XAI Inbound Service C1CustomerContactMaintenance and gets the response back and transforms it back to EBO form and invokes the ESB process UtilitiesCustomerInteractionResponseEBS that routes the response to the WAM Requestor ABCS.

Chapter 3: Data Synchronization

Data Synchronization processes are required to support integrated functionality between CC&B, MWM and WAM. CC&B Premises and Service Points translate to WAM Assets. CC&B Accounts with valid Service Agreements translate to WAM 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.

This chapter provides an overview of the synchronization requirements for the integration, and discusses how to:

- Synchronize CC&B and WAM
- Synchronize WAM and MWM

Synchronization between CC&B and WAM

This section provides details on the required synchronization between CC&B and WAM, and discusses how to complete these synchronizations.

Synchronization between CC&B Premises and Service Points with WAM

The integration supports synchronizing CC&B premise and service point information so that a corresponding asset is created in WAM. As premises and service points are added or changed, database triggers capture these actions and write information to a change log table.

Warning. **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 CM triggers to capture different premise and service point changes.

Processing Details

- When users update WAM Asset records that originated from CC&B, WAM does not send updates back to CC&B and Asset fields are not restricted from update in WAM.
- Records can be downloaded from CC&B in two modes - initial load and incremental update.
- The integration extracts records from CC&B and uploads them into the WAM Asset Interface table. At the scheduled run time, the WAM 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 a Oracle Utilities Customer Care and Billing Premise or assigns a SP Asset record Type when an Asset is created from a Oracle Utilities Customer Care and Billing Service Point. The Asset record types are defined in code table 29. The CCB Premise Types and Asset Types are defined in the WAM Asset Type Table (Code Table 29).

- An Asset record is not created for a Premise until a Service Point has also been created for the Premise. The system does not transfer information for a Premise or Account without an open Service Point.
- When users create or update customer records in CC&B, the integration populates related information in WAM. This information can be found in the CC&B Account Information section on the WAM Customer module header. The WAM Customer ID is equivalent to the CC&B Account Number.

  Related Service Agreement information is displayed in the WAM Customer module Address (Detail) view in the CC&B Service Agreements section. The Premise ID is populated in the CC&B Premise ID field on the same screen. The account may have multiple addresses, so the Contact Info flag is set on the CC&B mailing address record.

Updating Information

When an existing Premise and/or Service Point are updated in CC&B, the integration records are changed in the WAM Interface Table and uploaded into WAM.

Premise Alternate Addresses and Non-Badged items associated to Service Points are not created or updated on the WAM Asset record.

Before running CC&B Background Download Process

Before you run the CC&B background download process, complete the following configurations, data backup, and create a database link.

WAM Configurations to Complete

- Manual Configuration of WAM Code Table 29 (Asset Type Codes)

  Manually synchronize the Asset Type between WAM and CC&B applications in order 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
CCB Entity	SP_TYPE or PREMISE_TYPE
WAM Entity	Code Table 29 - 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 WAM Batch Processes
- Configure the following WAM 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 CC&B Background Download Process.

Create Database Link

Create a database link called “WAM” from the CC&B database to the WAM database before running the CC&B Background Download Process. This database link should have access to synergen objects in WAM database.

Copy and unzip the file WAM.zip to a local drive on the desktop. This zip file is shipped with CC&B and can be located on the CCB shipment. After the file is unzipped, follow the steps to complete the synchronization:

To create a database link:

1. Navigate to the Scripts sub-folder. This sub-folder contains the SQL files that will 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. The integration requires that you have triggers defined in the CC&B database, Logon to the CC&B database as application owner (CISADM) using SQLPlus and execute 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_SP.SQL
   - C1_CCB_WAM_PREM_AST.SQL
   - C1_CCB_WAM_PREM_CUST.SQL

   Logon to the CC&B database as SYSTEM and execute the sql script :

C1_CCB_WAM_SYNON.SQL

CC&B 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.

WAM Upload Process

Run WIFP_ASSET_INTERFACE to update the WAM application tables with the Asset information extracted from CC&B into WAIF_ASSET. WIFP_ASSET_INTERFACE was set up as part of configurations.

WAM Interface Table	WAIF_ASSET
WAM Batch Process	WIFP_ASSET_INTERFACE

Synchronization between CC&B Account/Service Agreements with WAM Customers

A customer in CC&B 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 CC&B users create new Accounts and Service Agreements, batch processing automatically creates a Customer record in WAM. Additions and changes to CC&B Accounts are also synchronized with Customer records in WAM as needed.

Processing Details

- Records are extracted and uploaded into the WAM Customer Interface table. At the scheduled run time, the WAM 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 WAM based on whether a currently active Service Agreement/Service Point relationship exists (SA start/stop). WAM uses the Account ID assigned in CC&B as the Customer ID.
- A Customer record is not created until a service agreement has been created for the Account in CC&B.

Updating Information

As customer information are 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.

CC&B Background Download Process

CCB 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.

WAM Upload Process

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

Tracking Oracle Utilities CC&B Data Changes

A change in some of the Premise, Service Point and Customer data will populate the Change Log Table using database triggers. The Change Log Table will track changes to the source data that must be reflected in the asset management system. The database triggers enabled on the affected tables populate the CC&B 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 CC&B to the WAM 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 table shows a summary of the triggers used for batch control C1-WAMAS. The trigger set up required in the CC&B database to track the asset changes in the source data (CC&B tables) that are relevant to the WAM system and how it is stored in the change log table is indicated here.

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

The following table shows a summary of the triggers used for batch control C1-WAMEX. The trigger configuration required in the CC&B database to track the customer changes in the source data (CC&B tables) that are relevant to the WAM system and how it is stored in the change log table is indicated here.

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_TYPE_CD BILL_ADDR_SRCE_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 WAM 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 will not track changes to PLANT because this field will rarely be changed. Plant is only synchronized to WAM when the batch process is run on initial load.

For more information on data mapping between CC&B and WAM tables, see Appendix A.

Synchronization between WAM and MWM

In order for this integration to work correctly, some entities must be manually synchronized between WAM and MWM.

Synchronizing Employees

WAM Employee records correspond to MWM User records, so users in MWM must be defined as Employees in WAM. Employee synchronization is needed for MWM User records as well as for Timesheet functionality.

Manually synchronize the employee data between the WAM and MWM applications in order to use these employees as part of the integration business processes.

Description	Employee Codes. You may also need to configure user profiles for these employees in WAM so that for these employees can log in to WAM.
Used by Integration Point	Time Sheet
MWM Database table	DHTWAMEMPL
WAM Entity	SA_EMPLOYEE (Employee module)
Required Mapping	DHTWAMEMPL .EMPL_CD == SA_EMPLOYEE .EMPLOYEE_NO
	DHTWAMEMPL .EMPL_DESC == SA_EMPLOYEE. NAME_LAST + ‘, ‘ + SA_EMPLOYEE. NAME_FIRST
ABCS Name	ProcessWorkOrderOUWAMUtilitiesProvABCSImpl

Storeroom, Stock Code

Manually synchronize the storeroom and Stock Codes between the WAM and MWM applications in order to use this data as part of the integration business processes. It is important to note that MWM does not support special characters such as “-“ in stock codes or Storeroom values. When creating these codes in WAM do not use special characters.

Description	Stock Code and Storeroom.
Used by Integration Point	Work Order
MWM Database table	DHTWAMSTOCK
WAM Entity	SA_CATALOG (Master Catalog records) and SA_STOREROOM
Required Mapping	DHTWAMSTOCK.stock_cd == SA_STOREROOM.stock_code

	DHTWAMSTOCK.stock_desc == SA_CATALOG.stock_desc
	DHTWAMSTOCK.storeroom == SA_STOREROOM.storeroom
	DHTWAMSTOCK.catalog == SA_CATALOG.unit_of_issue

Vendor

Manually synchronize the Vendor between the WAM and MWM applications in order to use this data as part of the integration business processes.

Description	Vendor Codes
Used by Integration Point	Work Order
MWM Database table	DHTWAMVENDOR
WAM Entity	SA_VENDOR (Vendor module)
Required Mapping	DHTWAMVENDOR.vendor_cd == SA_VENDOR.vendor_code
	DHTWAMVENDOR.vendor_desc == SA_VENDOR.vendor_name

Chapter 4: Configuration Guidelines

This chapter provides detail into the required configuration settings for the integration, and discusses how to:

- Choose a configuration scenario for your business
- Set up CC&B.
- Set up WAM
- Set up MWM
- Set up the Field Work Process Integration Pack
- View EBO Implementation Maps

Choosing a Configuration Scenario for your Business

Oracle Integration Pack for Oracle Utilities Field Work 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 you employ and therefore which technical configuration you should utilize for your organization.

Every configuration scenario uses Oracle Integration Pack for Oracle Utilities Field Work 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. There are some items that 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.

For more information about populating the DVMs, see Working with Domain Value Maps.

Scenario 1: Integration + CC&B, MWM & WAM

Scenario 1: Integration + 3 edge applications are used to automate order to completion and billing.
WAM Service Requests
CC&B Field Activities
MWM Field Orders

Application Product	Managed Functions	Notes

Scenario 1: Integration + 3 edge applications are used to automate order to completion and billing.
WAM Service Requests
CC&B Field Activities
MWM Field Orders

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	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 Mobile Workforce Management	Field Orders originating from other applications are updated and completed. 'Pickup' field 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 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: Integration + CC&B & MWM

Scenario 2: Integration + 2 edge applications are used to automate order to completion
CC&B Field Activities
MWM Field Orders

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	Field Orders originating from other applications are updated and completed. 'Pickup' field orders, related to other orders, are created. These orders are sent to, or received from, the integration product as required by the business process.

Scenario 2: Integration + 2 edge applications are used to automate order to completion
CC&B Field Activities
MWM Field Orders

Application Product	Managed Functions
Oracle Utilities Work and Asset Management	Not Used.
Oracle 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: Integration + WAM & MWM

Scenario 3: Integration + 2 edge applications are used to automate order to completion
MWM Field Orders
WAM Service Requests

Application Product	Managed Functions
Oracle Utilities Customer Care and Billing	Not Used.
Oracle Utilities Mobile Workforce Management	Field Orders originating from other applications are updated and completed. 'Pickup' field 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	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 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: Integration + WAM & CC&B

Scenario 4: Integration + 2 edge applications are used to automate order to completion and billing
CC&B Field Activities
WAM Service Requests

Application Product	Managed Functions	Notes

Scenario 4: Integration + 2 edge applications are used to automate order to completion and billing
CC&B Field Activities
WAM 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.
MWM	Not Used.	
Oracle Utilities Work and Asset Management	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 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.	

Setting Up Oracle Utilities Customer Care and Billing

The following sections provide details into the CC&B configurations needed to facilitate the integration. Some configurations described my 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

In this scenario, the integration product coordinates the flow of information 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.

Reminder: In addition to the business process information flows orchestrated by the integration product you must also configure customer and asset data synchronization between CC&B and WAM.

At a high-level, you will complete the following steps in CC&B to configure the integration:

1. Set up a synchronization database link between CC&B and WAM 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.
4. Start the Multi-Purpose Listener (MPL) and insure message exchange between systems.

To configure CC&B for Scenario 1:

1. Configure customer and asset data synchronization.

- Establish a database link
- Create integration triggers
- Setup and schedule background processes

2. Map to Plant.

3. Configure administrative menu tables.

- Characteristic Type
- Algorithm
- Field Activity Type
- To Do Roles
- 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

It is essential that you synchronize all customer and service point data from CC&B to WAM 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, see Chapter 3: Data Synchronization.

You should 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 Integration Pack for Oracle Utilities Field Work Integration product.

Mapping to Plant

One important decision to make about the integration and mapping is how to map CC&B to Plant in WAM.

Note. You cannot define multiple plants in CC&B if MWM is part of your integration.

Multiple Plants

The integration between CC&B and WAM is structured to support multiple plants in WAM (within one database schema). The integration between WAM and MWM 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 Plant02 and so on. The plant column is a primary key on all WAM 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 CC&B (with both gas and electric Service Points) must have two corresponding Asset records in WAM - one for each Plant. The associated Service Point for gas only resides in the WAM Plant for gas, and the Service Point for electric only resided in the WAM Plant for electric.

Since 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 CC&B. The Premise and Account records associated to the Service Point use the value for Plant designated on that Service Point.

Mapping in CC&B

CC&B 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:

Plant Configuration (Single or Multiple)	Plant Source Option Type	Plant Value Option Type	Comments
Single	Feature Configuration (FECO)	Enter a value for the plant such as 'PL1' in the Value column for the Plant Value Option Type. Note: In WAM, Plant field is only 3 characters long.	Plant is defined in the Plant Value option type in Feature Configuration.
Multiple	Service Point Operations Area (OPAR)	Enter a Field Service Class in the Value column for the Plant Value Option Type. The defined Field Service Class will be used to retrieve the Plant Value defined in the Service Point's Operations Area. Note: Field Service Class and Operations Area must be defined in the CCB Control Tables. - Step 1: Navigate to Admin Menu > Operations Area and define operations areas with values for each plant. - Step 2: Navigate to Admin> Field Service Class and reference the plant Operations Areas defined in Step 1.	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.
Multiple	Service Point Characteristic (SPCH)	Enter a Characteristic Type in the Value column for the Plant Value Option Type. The defined Characteristic Type will be used to retrieve the Plant Value defined in the Service Point's Characteristic. Note: Characteristic Type must be defined in the CCB Control Table and link to the SP Types to be used. - Step 1: Navigate to Admin Menu > Characteristic Type and define a characteristic type with predefined value for plant. For each plant, enter a predefined characteristic value . The Characteristic Entity should be Service Point - Step 2: Navigate to Admin Menu > SP Type > SP Characteristic and define a SP Characteristic referencing the characteristic defined in Step 1. - Step 3: Your implementation should design and run a process that populates Plant	Plant will be 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 SP level 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.

Plant Configuration (Single or Multiple)	Plant Source Option Type	Plant Value Option Type	Comments
		Characteristic value on every Service Point.	

For more information about creating these settings in CC&B, see the Oracle Utilities Customer Care and Billing User documentation “Feature Configuration.”

Note. The Plant information sent to WAM from CC&B does not use the plant information stored in the AIA Configuration Properties file. Only the Timesheet integration uses the plant information in this file.

Configure Admin Tables

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

For more information about configuring CC&B, 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	If you would like 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.

Characteristic Type	Guideline	Characteristic Entity Collection	Comment
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 whenever PHON parameter is defined in Feature Config and phone value is provided in 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 CCB OrderIDCharacteristicTypeCode 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 WAM to CC&B 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

To manage feature configuration:

1. Navigate to Admin Menu > 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
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 Cancelation	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.
Reservation Characteristic Type	This option is not applicable for this integration.

Option	Notes
Service Provider	Service Provider defined for Oracle Integration Pack for Oracle Utilities Field Work
Appointment Java Class Interface	The system provides the java class com.splwg.wfmi.workforce.SPLWFMSystem for realtime appointment logic. Applicable if appointments functionality needed
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.
Plant Source	Mapped to the Plant in WAM.
Plant Value	Mapped to the Plant in WAM.
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 an integration between CC&B and-MWM only.
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 an 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 an integration between CC&B and-MWM only.
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 an integration between CC&B and-MWM only.
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".
Intermediate Status to Prevent FA Cancel	Create an entry in the option collection for any FA Intermediate Status value that should prevent the system from automatically canceling a Field Activity.
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
Message ID Database Sequence Name	Sequence field used in the database to generate message ID. The base application uses CI_WFM_MSGID_SEQ sequence.
Default Days Of Available Appointment	A number defined by the implementation.
Phone Characteristic	If the Override Phone option is defined, the system overrides the Account Phone Number with value defined as characteristic on the FA.

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.

Navigate to **Admin Menu, Feature Configuration** and open the **Messages** tab.

For each message that may be received from an external system, define the **External Message Category** and **External Message Code** to identify the message.

Note: A corresponding message must be defined in the **system message** tables. For each message identify the Message Category and Message Number. For each new message, the Message Category defaults to *90000* (because an implementation's messages should be added into this category or greater so as to avoid collisions during upgrades).

FA Type

When you set up your Field Activity Types, keep in mind that a Field Activity cannot have more than 3 steps if it will be completed by an external system. Also note that appointments are not supported in the asset management, so unless MWM 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 to be used to create the To Do Entry which will warn the user if Multiple Accounts are linked to a Service Point.

Appropriate To Do roles must be created to handle To Do entries created for this To Do Type coming from the external systems.

Configure the AIAConfigurationProperties.xml file for the To Do Type, To Do Role and Message to be used by the integration layer when creating a To Do Entry to warn the user if Multiple Accounts are linked to a Service Point

Navigation	Value	ABCS Name
Admin Menu > To Do Type	To Do Type and To Do Role <Property name="CCB.ToDOTypeCode">CM-WRNMU</Property> <Property name="CCB.ToDoRole"/> Messages defined for this To Do <Property name="CCB.ToDoMessageCategory">90000</Property>	CreateInvoiceOUCCBUtilitiesProvABCSImpl

Navigation	Value	ABCS Name
	<Property name="CCB.ToDOMessageNumber">5010</Property>	

Customer Contact Class and Type

Define customer contact types for the conditions that create customer contacts for the following events:

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

The customer contact class and type to be used when WAM sends a customer information change customer contact to Oracle Utilities must also be configured in the AIAConfigurationProperties.xml file as in the following example:

Navigation	Value	ABCS Name
Admin Menu > Customer Contact Class	<Property name="ContactClass">SVC</Property>	CreateCustomerInteractionOUWAMUtilitiesReqABCSImpl
Admin Menu > Customer Contact Type	<Property name="ContactType">MISC</Property>	CreateCustomerInteractionOUWAMUtilitiesReqABCSImpl

To Do Role for Customer Contact

Create an appropriate To Do role to receive To Do entries for incoming messages from the external system. WAM sends Customer Contact and To Do information to CC&B 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.	CreateCustomerInteractionOUWAMUtilitiesReqABCSImpl Property Name: ToDoRole

Bill Charge Line Type

Bill charge line types simplify the creation of billable charges in CC&B. Each line type contains values that will be 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_ChargeLineTypeCode
	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 will be 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_MeterConfigurationType

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_DisconnectLocationCode

Meter Read Source

The FA Completion process populates the Meter Read Source on meter reads passed from the workforce management system with a default value of ***SPL*** MWM. 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 = ProcessWorkOrderCompleteOUMWMUtilitiesReqABCSImpl

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 (SPr) 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. It 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.

  If the FA type doesn't require an appt for dispatch, a record is created. The download condition is FA Creation.

  For FA cancelation, online or batch, the download condition is FA Cancelation. 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 CC&B sends an FA Cancel message. Either the FA Cancelation 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 config. 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 order activities. This is the Representative to be used when MWM or WAM sends an order completion message to CC&B.

Add Representative to the Dispatch Group you are using for the Oracle Integration Pack for Oracle Utilities Field Work.

This value should be added to AIAConfigurationProperties.xml file as in the following example:

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

The above property will be used only if the ***WAM.Pass.Representative.Information*** property in ***ProcessWorkOrderCompleteOUWAMUtilitiesReqABCSImpl*** is set to false and the Completion Request is coming from WAM.

The above property will be used only if the ***MWM.Pass.Representative.Information*** property in ***ProcessWorkOrderCompleteOUMWMUtilitiesReqABCSImpl*** is set to false and the Completion Request is coming from MWM.

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>	CreateInvoiceOUCCBUtilitiesProvABCSImpl

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 CC&B.

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	AIAConfigurationProperties.xml
Main Menu > Meter > Stock Location	Define stock location codes.	FS_ItemStockLocationCode FS_MeterStockLocationCode

Note. Mixed case, hyphens and spaces cannot be used in MWM code tables. This limitation affects the CC&B values passed to MWM such as meter badge numbers. Make sure your implementation is using all capital letters for badge numbers in CC&B.

Configure Notification Download and XAI

The following sections identify settings required to communicate using XAI.

XAI Sender for Service Order

To create an HTTP sender configured to communicate with integration layer:

Create a new XAI Sender which points to the CC&B Requestor 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 follow:

   Invocation Type = ***MPL***

   XAI Class = ***HTTPSNDR***. This is the class for Realtime 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:

   - **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 (put timeout in seconds)
   - **HTTP URL 1** – Set the URL to be accessed. If the URL value does not fit, use the additional HTTP URL types to set the complete URL. This should point to the Query Appointment Requester ABCS.
   - **For example**: http://demo1/orabpel/default/ProcessWorkOrderOUCCBUtilitiesReqABCSImpl/1.0

XAI Sender for Appointments

To create an HTTP sender configured to communicate with integration layer:

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

5. Navigate to Admin Menu, XAI Sender.
6. Enter a unique XAI Sender and Description.
7. Populate values as follow:

   Invocation Type = ***MPL***

   XAI Class = ***HTTPSNDR***. This is the class for Realtime sender to route messages using HTTP.

   MSG Encoding = ***UTF-8 message encoding***

   Select the ***Active*** check box.

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 (put timeout in seconds)
- **HTTP URL 1** – Set the URL to be accessed. If the URL value does not fit, use the additional HTTP URL types to set the complete URL. This should point to the Query Appointment Requester ABCS For example: http://demo1:9876/orabpel/default/GetWOLineApptWinAvailOUCCBUtilitiesReqABCSImpl/3.0

XAI Route Type

Create the following route types for communicating with integration layer referencing XAI senders previously created for Field Activity and Appointment.

To create an HTTP sender configured to communicate with integration layer:

Create a new XAI Route Type which points to the CC&B Requestor ABCS for Appointments integration point.

1. Navigate to Admin Menu, XAI Route Type.
2. Enter a unique XAI Route Type and Description.
3. Populate values as follow:

   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 include:

XAI Route Type	XAI Sender	XSL Request	Post Response
Created Order	Reference XAI Sender – Service Order defined in the previous step	C1FieldServiceIntOrderCreate.xsl	Checked
Canceled Order	Reference XAI Sender – Service Order defined in the previous step	C1FieldServiceIntOrderUpdate.xsl	Checked
Order Update	Reference XAI Sender – Service Order defined in the previous step	C1FieldServiceIntOrderCancel.xsl	Checked
Find Available Appointments		C1FieldWorkIntQueryAppointmentSlotsRequest.xsl C1FieldWorkIntQueryAppointmentSlotsResponse.xsl	Unchecked

Note. Default XSL transformation scripts that perform the data filter and initial mapping between CC&B 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.

External System

Create a new External System for the Oracle Integration Pack for Oracle Utilities Field Work.

- To define an External System, open **Admin Menu, External System**.
- Enter a unique **External System** and **Description**.
- Set **Our Name in Their System** to CC&B
- Set **W/F Process Profile** to ***ESP REQUEST*** (This is an existing Workflow Process Profile)

Service Provider

Create a new Service Provider to be used for the Oracle Integration Pack for Oracle Utilities Field Work.

- To define a Service Provider, open **Admin Menu, Service Provider**.
- Enter a unique **Service Provider** and **Description**.
- Set **External System** to the External System created for the Oracle Integration Pack for Oracle Utilities Field Work.
- Set **Notification DL Profile** to the Notification Download Profile created for the Oracle Integration Pack for Oracle Utilities Field Work.
- 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 Cancelation
- FA Creation
- FA Change
- FA Reschedule
- Get Available Appointments

NDS Types FA Cancelation/FA Creation/FA Change/FA Reschedule should reference ExtractFAInfo XAI Inbound service and the following context types:

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

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

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.

To define a Notification Download Profile:

1. Navigate to Admin Menu > Notification Download Profile.

2. Enter a unique Notification Download Profile and Description.

   The profile should contain an entry in the NDS collection for each NDS type created previously. This NDS type should be flagged with a processing method of XAI.

3. Enter values according to the following:

NDS Type	Description
Get Available Appointments	Point to the Find Available Appointments Route type created previously.
FA Cancelation	Point to the Canceled Order route type created previously.
FA Creation	Point to the Created Order route type created previously.
FA Changed	Point to the Order Update route type created previously.
FA Rescheduled	Point to the Order Update route type created previously.

Scenario 2: CC&B - MWM

In this scenario, the integration product coordinates the flow of information between:

- CC&B
- MWM

Configuration Considerations for Scenario 2

Follow the guidelines to configure CC&B for Scenario 1 with the following exceptions:

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

Scenario 3: MWM – WAM

In this scenario, the integration product coordinates the flow of information between:

- MWM
- WAM

Configuration Considerations for Scenario 3

CC&B is not configured for Scenario 3.

Scenario 4: CC&B - WAM

In this scenario, the integration product coordinates the flow of information between:

- CC&B
- WAM

Configuration Considerations for Scenario 4

Follow the guidelines to configure CC&B for Scenario 1 with the following exception:

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

Setting Up Oracle Utilities Work and Asset Management

The following sections provide details into the WAM configurations needed to facilitate the integration. Some configurations described my 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, see the Oracle Utilities Work and Asset Management User Guide and Configuration Guide.

In addition to the business process information flows orchestrated by the integration product, configure customer and asset data synchronization between CC&B and WAM.

For more information on synchronizing data, see Chapter 3: Data Synchronization.

Scenario 1: CC&B – MWM - WAM

In this scenario, the integration product coordinates the flow of information 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 WAM:

- 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 Oracle Integration Pack for Oracle Utilities Field Work Integration. Integration processes populate the tables that provide the input to these jobs.

In the WAM 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 Interfaces Guide.

Descriptioin for Common Keywords and Parameters:

Job_in - The job number assigned by the WAM application Job Manager.

Plant_in – Character string that identifies WAM 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 CC&B, see Synchronization between CC&B and WAM.

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_INTERFACE(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.

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_INTERFACE('103','01','I','Y',NULL,NULL,'sdbp_CCB_parse_address',NULL,NULL,in_out1,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). These processes should already be configured for WAM. The corresponding log messages can be viewed under the sdbp_run_all_batch.

Procedure Name	Batch Process	Setting	Notes
Direct Charges Interface Procedure	sdbp_direct_charges.direct_charges(job_in, plant_in);	Enter Interval – sysdate + 999	Processes approved direct charges which have not yet been posted and creates new entries in the Direct Charges Log.
Labor Cost Interface Procedure	sdbp_cost_labor.cost_labor(job_in, plant_in);	Enter Interval – sysdate + 999	Processes approved labor costs (from timesheets) which have not yet been posted.
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.

The created batch job should be suspended after creation so that it is never executed. The easiest and safest way to create the batch job is to enter "null;" in the Procedure field.

To create the batch job for error logging:

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

1. Open the Job Manager module in the WAM 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

1. In WAM 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.

Craft Rate Rule

Business Rule	Guideline	ABCS
Craft Rate Rule	Populate rule keys based on your business requirements. A default craft must be added to the AIA configuration file. Timesheet integration uses this default Craft for all incoming timesheets.	CreateTimeSheetOUWAMUtilitiesProvABCSImpl

Product Integration CCB Rule

This rule is used to define default values used for fields integrated with Oracle Utilities Customer Care and Billing.
PREMISE ASSET RECORD TYPE - Indicates the Asset Record Type used for syncing up Premise records from CC&B to WAM.

SP ASSET RECORD TYPE - Indicates the Asset Record Type used for syncing up Service Point records from CC&B to WAM.

Note: Make sure that the premise Asset Record Type and SP Asset Record Type are both different
from each other and that they are not already used as regular Asset IDs.

Default Accts for Interfaces Rule

This Rule is used while syncing Premise and Service Point information from CC&B to WAM. It establishes default account values that will be 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 will be 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 CC&B, the values next to “DEFAULT” is used.

Direct Charge Types Rule

Note the DVM that must also be set up to create a cross reference between the WAM values you create for this rule, and the values used by the other applications.

Business Rule	Guidelines	Corresponding DVM
Direct Charge Types Rule	Configure rule keys according to your business requirements.	FS_Order_ExpenseTypeCode

Expense Codes Rule

When costs are sent to CC&B, they are summarized by the CC&B Expense code defined in this rule. These expense codes and categories are defined on Expense Codes Rule in WAM. Values for the CC&B Expense column do not need to be populated.

Note the DVM that must also be set up to create a cross reference between the WAM values you create for this rule, and the values used by the other applications.

Business Rule	Guidelines	Corresponding DVM
Expense Codes Rule	Configure rule keys according to your business requirements.	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

In WAM parts of an address (Street Number, Street Name, Street Suffix and Apartment Number) are stored in individual fields. CC&B does not store addresses in such detail, rather it stores entire lines of addresses in Address 1, Address 2, and so on. In this integration, address fields are sent to WAM without any parsing. The logic for parsing the general address fields into constituents is performed in WAM.

The parameters in this rule control how address parsing occurs when the system processes customers, premises & service points. Replace the standard batch job procedure with a custom procedure that uses the same parameters. Set the parameter name in these rule keys, and that procedure will be used instead of the one provided. 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.

The following module Interface rules must be configured:

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

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

Set the Update column to YES for any field that should receive an update when data is transferred from the integration processes.

For more information, see the Oracle Utilities Work and Asset Management Interfaces guide.

Product Integration Rule

This rule defines the integration between WAM 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 MWM.

TIMEKEEPING ALERT USER – This value identifies the WAM user that should be alerted to any errors or warnings that occur during processing of timesheets that are inbound to WAM through the web service.

WORK ORDER ALERT USER - This value identifies the WAM user that should be alerted to any errors or warnings that occur during the processing of work orders that are inbound to WAM through the web service.

Product Integration Field Work Rule

This rule is used in place of Product Integration CC&B and Product Integration MWM 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 CC&B.

With this value set to ON, MWM sends a completion to WAM and WAM passes the charges to CC&B as billable charges.

SERVICE REQUEST ALERT USER - Enter the WAM user that should be alerted to any errors or warnings that occur during the completion of service requests that are inbound to WAM through the web service.

Shift Differential Rates Rule

This information is used for establishing the shift differential rates to be used for cost accounting.

Note the DVM that must also be set up to create a cross reference between the WAM values you create for this rule, and the values used by the other applications. This DVM maps shift codes between MWM and WAM.

Business Rule	Guidelines	Corresponding DVM
Timekeeping Charge Types	Configure rule keys according to your business requirements.	FS_TimeSheet_ShiftCode

Timekeeping Charge Types Rule

Set up a timekeeping charge types rule to be used for charges being sent from MWM. This rule should have the settings indicated by the guidelines here.

Note the DVM that must also be set up to create a cross reference between the WAM values you create for this rule, and the values used by the other applications.

Business Rule	Guidelines	Corresponding DVM
Timekeeping Charge Types	**Charge Type**: Select a value to be used for this purpose. Example: R **Status**: Allow **Lookup**: Service Request **Reference ID**: Leave blank	FS_Order_ChargeType

Timekeeping Labor Earning Type Code Rule

Business Rule	Guidelines	Corresponding DVM
Timekeeping Labor Earning Type Code Rule	Create the data required based on your business requirements	FS_TimeSheet_LaborEarningType

Web Services Gateway Rule

This rule is used to define the web services that the WAM application must interface with.

Web Service Gateway Key (do not modify) - The values in this column reference the Requester ABCS that the WAM application must interface with. This is for internal use by WAM and must not be modified.

This table shows a list of Web Service Gateway Keys that are used for this integration pack:

Web Service Gateway Key	Description
CCB CREATE CUST CONTACT	Used for sending Customer Update outbound message from WAM.
CCB ORDER STATUS	Used for sending Service Request Status Update outbound message from WAM.
FW COMPLETE SERVICE ORDER	Used for sending Service Request Completion outbound message from WAM.
FW CREATE SERVICE ORDER	Used for sending 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 Service Request Update outbound message from WAM.

Username & Password - This is the username and password needed to access the Requestor ABCS on BPEL.

Dataset ID (do not modify) - These values tell the WAM application which table to retrieve information from, and provides the keys to use from that table. This is for internal use by WAM and must not be modified.

Consumer Class (do not modify) - The values in the Consumer Class column indicate the java class name called by the WAM application. This is for internal use by WAM and must not be modified.

Service URL - The values in the Service URL column indicate the URL that the consumer class indicated in the previous column uses to call the Requestor ABCS on BPEL. Set this to the endpoint URL of the corresponding Requestor ABCS BPEL Process. This URL will typically be in this format http://<BPEL Server name>:<port>/orabpel/default/<Requestor ABCS Name>/1.0.

Gateway URL - The Gateway URL path to WAM. The Consumer Class should be physically stored on this server. Verify that you have the correct IP address and Port set for these.

Code Tables

To configure the code tables:

1. In WAM navigate to Application Map -> Administration subsystem -> **Code Tables module**
2. Search for and Select the appropriate Code Table indicated in the following sections
3. Enter the relevant information indicated in the following sections
4. Click Save.

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 will 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 29: Asset Type Codes	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_ServicePointTypeCode
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.	FS_Order_DisconnectLocationCode

Code Table	Description	Corresponding DVM
	The code is used for the ***Disconnect Location*** field in the Service Request module Meter Information view.	
Code Table 251: Personal ID (Account Segement 1)	This code table should be configured based on the Account that is configured for the integration. **For more information** on configuring accounts, see Configuration for Department, Area, and Account.	n/a

Crew Codes for Timesheet

Navigation	Guideline	Corresponding DVM
Crew module in the Maintenance subsystem	Populate crew codes based on your business requirements.	FS_TimeSheet_CrewCode

Department, Area and Account

In WAM, the combination of Department, Area, and Account constitutes an Account. Account configuration is required for any usage of the WAM 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 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 -> **Area module**	Populate Areas linked to the created departments based on your business requirements.	
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 WAM employee is referenced on all checkout transactions received from MWM with Service Request completions. This employee must be set up or identified in WAM and then referenced in the AIA configuration file. The following steps can be used 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 WAM 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 user's ability to update the schedule date and problem description on the service request once the SR has been activated. In a three way integration, these fields being updated in WAM will not update the other two applications. For orders integrated two way (WAM-CCB or WAM-MWM) these updates will however be carried to the other application having the order.

To Configure the Application for Control of the Schedule Date and Problem Code fields:

1. In the WAM application, 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 the ***Fields*** button.
5. Select ***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, see Oracle Utilities Work and Asset Management User Guide, "Responsibility."

Sequence Numbers

1. In the WAM application navigate to App Map -> Administration subsystem -> **Sequence Numbers module**

   Search and Select 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 this field can be left blank.

Length – 7 (do not change)

System – True (this setting is required for system generated service request numbers in WAM).

3. Click Save.

Items Configured for Synchronization

The following WAM modules should have already been configured and synchronized with MWM in the steps detailed in Chapter 3.

- Vendor
- Storeroom
- Stock Code
- Employee

Scenario 2: CC&B - MWM

In this scenario, the integration product coordinates the flow of information between:

- CC&B
- Oracle Utilities Mobile Workforce Management

Configuration Considerations for Scenario 2

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

Scenario 3: MWM – WAM

In this scenario, the integration product coordinates the flow of information between:

- MWM
- WAM

Configuration Considerations for Scenario 2

Follow the guidelines to configure WAM 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 the flow of information between:

- CC&B
- WAM

Configuration Considerations for Scenario 4

Follow the guidelines to configure WAM for Scenario 1 with the following exception:

- Data configuration needed for the Timesheet integration point is not applicable for this scenario.

Setting Up Oracle Utilities Mobile Workforce Management

The following sections provide details into the MWM configurations needed to facilitate the integration. Some configurations described my 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 Mobile Workforce Management, see the Oracle Utilities Mobile Workforce Management User Guide and Configuration Guide.

Scenario 1: CC&B – MWM - WAM

In this scenario, the integration product coordinates the flow of information 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 MWM for Scenario 1:

- Router settings
- Transaction processing table
- Web service definition table
- Other database tables

The MWM Router converts and routes transactions between external applications. Router configuration settings are defined in the Router.INI file.

Note. Modification of the router settings should not be required during initial system configuration.

Router.INI

The Router.INI file is located in the Router subdirectory within the MWM installation directory. Router.INI is divided into sections with each section starting with the section name in square brackets.

[Connections] - This section identifies the connection number and connection type to use for each configured connection. The installation wizard automatically sets the connection type to WEB; otherwise, the connection type is FILE and selects the integration component.

For each connection listed in the [Connections] section, there is a section containing the configuration parameters for that connection. The name of the section is a combination of the connection type and connection number, such as [WEB1] or [FILE1].

Note. The connection section must be named appropriately or the Router application will not be able to apply the INI parameters. If the connection type is changed, the name of the connection section must be changed to match the new type.

The following router settings affect the operation of the interfaces to external systems:

Parameter	Description
HeartBeatSecs	The frequency (in seconds) at which MWM sends heartbeat transactions to external applications. Default: 0
SendHeartBeatTransNo	Not used for this integration. Default: 1999
RcvdHeartBeatTransNo	Not used for this integration. Default: 1099
CheckSecs	The frequency (in seconds) at which MWM checks the InputDirectory for new transactions. Default: 30
MaxThreadPoolSize	The maximum number of permanent web service threads in the thread pool for this connection. These threads are used to send transactions to external web service. The threads in the thread pool are permanent threads and are not deleted until the Router application is shut down. The Router can create more threads than specified in this parameter, but those threads are temporary and are deleted when they are IDLE. Typically, a large pool of threads is not necessary. If the volume of transactions from MWM is high, then you might want to increase the size of this parameter. Default: 10
MaxNumberOfThreads	The maximum number of web service threads that can be created for this connection. This includes the number of permanent threads in the thread pool and all temporary threads. This value should be greater than or equal to the value of MaxThreadPoolSize. Default: 100

Note. If you modify any of the entries in this INI file, restart the MWM Router in order for the new values to be used.

Admin Database Tables

This section identifies and describes the MWM tables that contain data codes used by the Oracle Integration Pack for Oracle Utilities Field Work Integration product.

The Admin tables must be populated with the same entries as exist in the DVMs for MWM. If you have already established values based on your business practices for the tables below, you should populate the DVM with the values you have used within MWM.

For more information about populating the DVMs, see Working with Domain Value Maps.

To add or modify these tables

1. Navigate to the Admin Tool within MWM.

   This is found within the Dispatch Station application.

2. Modify settings as needed.

Timesheet Menu Options

Access to Time Sheet menu options in the MWM Mobile Workstation application is controlled by the following configuration parameters:

Database Table	Config Code	Section	Parameter	Default Value *	Description
DHTMWINI	DBM_DEF	37146	EnableWnd	[App]Dispatcher=F	Enables the Time Sheet option on the Control Menu for Mobile Workstation users only. The option is disabled for Dispatch Workstation users.
DHTMWINI	FO_DEF	37145	EnableWnd	STATION.INI::App::Dispatcher=F	Enables the Add to Time Sheet option on the Field Order Actions Menu for Mobile Workstation users only. The option is disabled for Dispatch Workstation users.

* If the WAM component is not selected during installation of MWM, the default value for both of these parameters is set to False, which disables the option for all users.

Additional Admin Tables

Table	Description	Corresponding DVM
DisconnectLocationCode From the Admin Tool select the Service Point Disconnect Location table and enter or modify the necessary data.	When a service point is disconnected from the supply source, a disconnect location must be specified. This location defines where service was severed.	FS_Order_DisconnectLocationCode

Table	Description	Corresponding DVM
Service Area / Dispatch Group	A dispatch group is a logical group of representatives located at an operations area. In Oracle Utilities Mobile Workforce the Service Areas are used to indicate areas where crews work on field orders. Database Table in MWM: DHTSERV Column Name: Service_Area	FS_Order_DispatchGroup
Division	Database Table in MWM: DHTDIV Column Name: Division	FS_Order_Division
Direct Expense Type Code	When direct charge expenses are sent from MWM an expense type code must be associated with the information.	FS_Order_ExpenseTypeCode
Database Table in MWM	DHTWAMDIRCHRG Column Name: Charge_Type	
Meter/Item Status Code	Database Table in MWM: DHTMTRST Column Name: Meter_Status_Cd	FS_Order_MeterStatusCode
Labor Earning Type	Database Table for Regular Earning Type Code: DHTWAMREGEARN Column Name: Earn_CD Database Table for Premium Earning Type Code: DHTWAMPREMEARN Column Name: Earn_CD	FS_TimeSheet_LaborEarningType
Meter Configuration Type	Database Table in MWM : DHTPRGID Column Name: Program_ID	FS_Order_MeterConfigurationType
Meter/Item Stock Location Codes	Database Table in MWM : DHTSTKLO Column Name: Stock_Loc_CD	FS_Order_MeterStockLocationCode
Operations Area	Database Table in MWM: DHTDIST Column Name: District	FS_Order_OperationsArea
Read Type Code		FS_Order_ReadTypeCode
Register Time of Use Code	Database Table in MWM: DHTRDUCD Column Name: Read_Use_CD	FS_Order_RegisterTimeOfUseCode
Service Point Type Code	Database Table in MWM: DHTSPTYP Column Name: SPT_TYPE_CD	FS_Order_ServicePointTypeCode
Order Type	Database Table in MWM: DHTFOTYP Column Name: FO_TYPE	FS_Order_TypeCode
Shift Code	Database Table in MWM: DHTWAMSHIFTDIFF Column Name: SHIFTDIFF_CD	FS_TimeSheet_ShiftCode
Crew Code	Database Table in MWM: DHTCREW	FS_TimeSheet_CrewCode

Table	Description	Corresponding DVM
	Column Name: CREW	

Transaction Processing Tables

Transaction processing information for the MWM interface component is stored in two database tables:

Note. The transaction processing tables are pre-loaded with entries for all transactions supported by the integration and should not need modification. The tables and their contents are described here for informational purposes only.

Database Table	Description
DHTTXNCD	This table maps external transaction codes (EXTTXND) to internal transaction IDs (INTTXNID) for processing purposes. If there is no entry in this table for a particular transaction or ICD, the external transaction ID is used for the internal transaction ID. See the following table for ICDs and transaction codes used in this integration. **Note.** Transactions in MWM are also referred to as ICDs. An ICD is an Interface Control Document that uses an MWM proprietary transaction format.
DHTTXNPR	This table describes which transactions are processed for each connection. The columns in the table are: INPUT_CONNECTION: The name of the connection that generated the transaction/ICD. INTERNAL_TXN_ID: This ID is derived from the DHTTXNCD table. If no internal transaction ID entry exists in the table for a transaction, the Router uses the external transaction ID (transaction code of the ICD ID) as the internal transaction ID. SEQUENCE_NBR: This sequence number is used to ensure that multiple entries for the same INPUT_CONNECTION/INTERNAL_TXN_ID are unique. This sequence number is part of the key for this table. OUTPUT_CONNECTION: The name of the connection that will receive this transaction. FUNCTION_ID: The ID for the internal function within the Router application that will process the transaction.

ICDs used for outbound services

ICD	Description
11/53	Order completions (converts to transaction code 1003)
93	Validation Requests (converts to transaction code 1016)
98	Transaction Acknowledgement (converts to transaction code 1013)
132	Order status (converts to transaction codes 1004, 1006, 1007, 1008)
158	TimeSheet

ICDs used for inbound services:

ICD	Description

ICD	Description
0001	Order creation
0002	Order update
0003	Order cancelation/completion
0016	Validation Response

Transactions sent from WAM:

Description	External Transaction Code (EXTTXNID)	Internal Transaction ID (INTTXNID)
Order creation	0001	1000
Order update	0002	1002
Order cancelation/completion	0003	1003

Message Priority Table

Database Table: DHTICDPR

This table defines the priority associated with each ICD. All ICDs sent from the mobile station that affect the event status or crew status should have the same priority. This ensures that they will be sent in the order in which they are created. This is especially important when a crew is out of range and ICDs are queued up for delivery once communication is re-established.

Although default values are provided for the Message Priority table, it is important that you verify the values to ensure they are accurate for your system.

ICDs affecting event status

ICD	Description
8	Enroute
9	Onsite
11	Completion
20	Cancel status

ICDs affecting crew status:

ICD	Description
18	Out of Service
19	Return to Service

Web Service Definition Table

Table Name: DHTWBCNG

This table contains an entry for each transaction sent to the integration layer web service.

This table should not need to be updated unless the integration web service information (for example, IP address/port) was unknown when MWM was installed or has changed since the installation.

The table includes many additional columns which are not used in this integration. The columns related to the integration are described here:

Field	Description
TRANSACTION_ID	The ID of the input transaction/ICD being processed (DHTTXNPR.INTERNAL_TXN_ID not DHTTXNPR_FUNCTION_ID). This is a required field. This column should not need to be modified. This is a required field. The value is defaulted to FWI if Oracle Integration Pack for Oracle Utilities Field Work option was selected when MWM was installed.
TRANSACTION_NAME	The name of the transaction. This is for informational purposes only. This column should not need to be modified. This is a required field.
HOST_SYSTEM	The name of the external connection to receive the transaction. This is a required entry for Oracle Integration Pack for Oracle Utilities Field Work. The value should match name of the external system defined on the router and user for the Oracle Integration Pack for Oracle Utilities Field Work. This is a required field.
XSL_PATH	n/a
ENDPOINT_URL	The end-point URL where the transaction is sent. The URL is composed of the IP address/machine name where the external web service is installed, the port used to communicate with the web service, and the name of the web service. The name of the web service should not need to be changed, but the IP address/port might need to be configured. This parameter is set during the MWM installation if the IP address and port are specified. This is a required entry for this integration. This is a required field.
NAMESPACE_URL	The target namespace from the WSDL file for the web service. This is required and should never need to be modified. This is a required field.
RESPONSE_XSL_PATH	n/a
SEQUENCE_TAG	n/a
VALIDATE_RESPONSE_XSL_PATH	n/a
RETRY_MESSAGE	Indicates whether or not the message should be retried following a failure to send. This column should not need to be modified by the installation team. This is a required field.

Example of set up for Web Service definition:

```
DHTWBCNG_table_e
   Xport_Example
```

Scenario 2: CC&B - MWM

In this scenario, the integration product coordinates the flow of information between:

- CC&B
- MWM

Configuration Considerations for Scenario 2

Follow the guidelines to configure MWM for Scenario 1 with the following exception:

- Data configuration needed for the Timesheet integration point is not applicable for this scenario.

Scenario 3: MWM – WAM

In this scenario, the integration product coordinates the flow of information between:

- MWM
- WAM

WAM Configuration Considerations for Scenario 3

Follow the guidelines to configure MWM for Scenario 1 with the following exceptions:

- Appointments
- Install Product

Scenario 4: CC&B - WAM

In this scenario, the integration product coordinates the flow of information between:

- CC&B
- WAM

Configuration Considerations for Scenario 4

MWM is not configured for Scenario 4.

Setting Up Field Work Process Integration Pack

The following sections describe how to configure the integration pack to meet the requirements for the 3-way integration.

Scenario 1: CC&B – MWM - WAM

In this scenario, the integration product coordinates the flow of information 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 Oracle Integration Pack for Oracle Utilities Field Work Integration 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 located in <AIA.HOME>/CONFIG/.

This section lists the configurations in this file that are used by the Utilities Field Work Process Integration Pack. 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 will 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 6: Extensibility for the Field Work Process Integration Pack.

Activate routing to CAVS. These properties are by default set to not route the messages to CAVS. CAVS related properties need to be changed only if you decide to use CAVS for testing. 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 ends with either RouteToCAVS or CAVS.EndpointURI, and are available in the file under each ABCS Name.

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.

Note. Whenever the AIAConfigurationProperties.xml file is updated, the file must be reloaded for updates to be reflected in the applications or services that use the updated properties. Click the Reload button on the Configuration page in the Oracle AIAConsole to perform this action. Alternatively, you can perform the reload by rebooting the server.

For more information, see the Oracle Application Integration Architecture Core Components Guide, “Working with the BSR,” Loading Oracle AIA Configuration Properties File Updates.

Settings for System Properties

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

- Module Configurations are the properties that are shared by multiple integration flows within this Oracle Integration Pack for Oracle Utilities Field Work.
- Service Configurations are the properties that are used by a specific ABCS.

Module Configurations

Module Name	Property Name	Default / Shipped Value	Integration Point	Description
OUFieldWorkPIPWorkOrderActionCodes	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.
OUFieldWorkPIPWorkOrderActionCodes	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.
OUFieldWorkPIPWorkOrderActionCodes	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.
OUFieldWorkPIPWorkOrderActionCodes	WorkOrder.ActionCode.CANCEL	CANCEL	Work Order	This is internally used by the integration to identify the messages sent for Work order cancelation. Do not change the value of this property.
OUFieldWorkPIPWorkOrderActionCodes	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.
OUFieldWorkPIPWorkOrderActionCodes	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.
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.
OUWAM	WAM.Default.PLANT	FWI	Timesheet	Default Plant on the Timesheets sent from MWM to WAM. Change this value to the appropriate WAM plant code. Refer to Mapping to Plant for configuration details.
OUMWM	OUMWM.TransactionC	0001	Work Order	The MWM transaction code set on the

Module Name	Property Name	Default / Shipped Value	Integration Point	Description
	ode.CREATE			Work Order Create messages inbound to MWM. Do not change the value of this property.
OUMWM	OUMWM.TransactionCode.UPDATE	0002	Work Order	The MWM transaction code set on the Work Order Update messages inbound to MWM. Do not change the value of this property.
OUMWM	OUMWM.TransactionCode.CANCEL	0003	Work Order	The MWM transaction code set on the Work Order Cancel messages inbound to MWM. Do not change the value of this property.
OUMWM	OUMWM.ExternalSystem	FWI	ALL IPs	This is the external system configured in the MWM router. Refer to Transaction Processing Tables for configuration details

ABCS Configurations

ABCS Name	Property Name	Default / Shipped Value	Description
CreateCustomerInteractionOUWAMUtilitiesReqABCSImpl	ContactClass	SVC	Used by the customer interaction flow to specify a CC&B Contact Class to be used when a customer contact is created in CC&B by this flow. The contact class created above should be specified for this property. Refer to Customer Contact for configuration details.
CreateCustomerInteractionOUWAMUtilitiesReqABCSImpl	ContactType	MISC	Used by the customer interaction flow to specify a CC&B Contact Type to be used when a customer contact is created in CC&B by this flow. The contact type creates should be specified for this property. Refer to Customer Contact for configuration details.
CreateCustomerInteractionOUWAMUtilitiesReqABCSImpl	Description	Added with WAM Requestor ABCS to create Customer Contact in CC&B	This is the Description that will be 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.

ABCS Name	Property Name	Default / Shipped Value	Description
CreateCustomerInteractionOUWAMUtilitiesReqABCSImpl	ToDoRole	SUPPORT	Used by the customer interaction flow to specify a CC&B ToDORole to be used when a ToDo is created in CC&B by this flow. Set this property to the created/identified To Do Role for this purpose. Refer to To Do Type/ To Do Role for configuration details.
CreateCustomerInteractionOUWAMUtilitiesReqABCSImpl	TriggerDay	20	This property is for future use. Do not modify.
CreateCustomerInteractionOUWAMUtilitiesReqABCSImpl	TriggerToDo	YES	This property is for future use. Do not modify.
CreateInvoiceOUCCBUtilitiesProvABCSImpl	CCB.BillableChargeSATypeCode	ZZONEOFF	This is the CC&B SA Type used by Billable Charge Integration flow for finding or creating a Billable Charge SA. Set this to the appropriate CC&B SA Type that you will use for this purpose.
CreateInvoiceOUCCBUtilitiesProvABCSImpl	CCB.CisDivisionCode	CA	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 will use for this purpose.
CreateInvoiceOUCCBUtilitiesProvABCSImpl	CCB.OrderIDCharacteristicTypeCode	CM-SOID	This is the Characteristic Type to use for storing the common Work Order ID in the Billable Charge Upload Line Characteristics.
CreateInvoiceOUCCBUtilitiesProvABCSImpl	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.
CreateInvoiceOUCCBUtilitiesProvABCSImpl	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 flow. 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.
CreateInvoiceOUCCBUtilitiesProvABCSImpl	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 flow. Set this property to the created/identified To

ABCS Name	Property Name	Default / Shipped Value	Description
			Do Message Number for this purpose. Refer to To Do Type/ To Do Role for configuration details.
CreateInvoiceOUCCBUtilitiesProvABCSImpl	CCB.ToDoRole	<blank>	CC&B To Do Role to be used by Billable Charge flow, 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.
CreateInvoiceOUCCBUtilitiesProvABCSImpl	CCB.ToDOTypeCode	ZZ-WARMA	CC&B To Do Type to use by Billable Charge flow, 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.
CreateTimeSheetOUWAMUtilitiesProvABCSImpl	WAM.Default.Craft.Code	ADMN	This property is used by the Timesheet flow to default a WAM Craft code to be used for all timesheets sent from MWM to WAM. The Craft code specified here should be one of the valid craft codes specified on WAM Craft Rates Business rule.
CreateTimeSheetOUWAMUtilitiesProvABCSImpl	WAM.ServiceRequestCharge.Type	R	This is used by the Timesheet flow to specify the WAM Charge Type to be used for a Timesheet row that corresponds to Service Request in WAM. The default value used by WAM for Service Request is R. This value should match the appropriate value from the WAM Timekeeping Charge Types business rule.
CreateTimeSheetOUWAMUtilitiesProvABCSImpl	WAM.WorkOrderCharge.Type	W	This is used by the Timesheet flow to specify the WAM Charge Type to be used for a Timesheet row that corresponds to Work Order in WAM. The default value used by WAM for Work Order is W. This value should match the appropriate value from the WAM TIMEKEEPING CHARGE TYPES business rule.
GetWOLineApptWinAvailOUCCBUtilitiesReqABCSImpl	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.
GetWOLineApptWinAvailOUCCBUtilitiesReqABC	CCB.ResponseCodeForSuccessWithoutAvailabl	101	This is the response code used by Appointments when no appointment slots were

ABCS Name	Property Name	Default / Shipped Value	Description
SImpl	eAppointment		found for the search criteria specified. For internal use only. Do not modify.
GetWOLineApptWinAvailOUMWMUtilitiesProvABCSImpl	24hours.Default.Value	2400	This value is for internal use by this integration, Do not modify.
GetWOLineApptWinAvailOUMWMUtilitiesProvABCSImpl	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.
GetWOLineApptWinAvailOUMWMUtilitiesProvABCSImpl	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.
GetWOLineApptWinAvailOUMWMUtilitiesProvABCSImpl	MaxUnits.Default.Value	1000000	This is the maximum unit count sent to MWM for retrieving the appointment slots. It is not needed to change this value.
GetWOLineApptWinAvailOUMWMUtilitiesProvABCSImpl	SlotGroup.Default.Value	2	Default slot group used when the request is sent to MWM for appointment slots. It is not needed to change this value.
GetWOLineApptWinAvailOUMWMUtilitiesProvABCSImpl	SlotMaxCount.Default.Value	10	This is used to specify the maximum number of slots to be retrieved from MWM by the Appointments flow. Set this value to a desired value or you may just use the default of 10.
GetWOLineApptWinAvailOUMWMUtilitiesProvABCSImpl	SlotStartTime.Default.Value	0001	This is the default Slot Start Time sent to MWM for retrieving the appointment slots. It is not needed to change this value.
GetWOLineApptWinAvailOUMWMUtilitiesProvABCSImpl	zerohours.Default.Value	000	This value is for internal use by this integration, Do not modify.
ProcessWorkOrderCompleteOUMWMUtilitiesReqABCSImpl	Default.MeterReadSource	SPL MWM	This property is used by Work Order Flow, when meter readings are sent from WAM to CC&B for completed orders. Set this value to a valid meter read source code in CC&B. Refer to Meter Read Source for configuration details.
ProcessWorkOrderCompleteOUWAMUtilitiesReqABCSImpl	Default.Cancel.Reason	Canceled/Completed in WAM	This is the cancelation reason text sent to CC&B/MWM with the cancelation request, when WAM cancels a Work Order. You can change this to the text that you wish to use for this purpose.
ProcessWorkOrderCreateOUMWMUtilitiesReqA	CreateCustomerContact.Flag	false	Set to either True or False to indicate whether a customer contact is to be created in CC&B

ABCS Name	Property Name	Default / Shipped Value	Description
BCSImpl			along with field activities that are created by the integration. This property is used by Work Order Flow, when an Order Create request is sent from MWM to CC&B.
ProcessWorkOrderCreateOUWAMUtilitiesReqABCSImpl	Default.Dispatch.Group	S-E-RC-S	This is the dispatch group used by Work Order flow for all Order Creates sent from WAM to CC&B. This value should match with one of the values in the DVM FS_Order_DispatchGroup under column OU_WAM_01.
ProcessWorkOrderCreateOUWAMUtilitiesReqABCSImpl	Default.Enrichment.For.Meter.SystemID	OU_CCB_01	This is used by the Work Order flow to identify the application used for retrieving meter and register information for Order Create messages sent from WAM. Do not modify.
ProcessWorkOrderOUCCBUtilitiesProvABCSImpl	CCB.CustomerContact.Class	CC	This is the CC&B Customer Contact Class that is used by Work Order Flow when this flow 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 for configuration details.
ProcessWorkOrderOUCCBUtilitiesProvABCSImpl	CCB.CustomerContact.Desc	New SR created from Field Work Integration.	This is the Description that will be specified on the Customer Contact when it is created in CC&B by the Work Order Flow when this flow 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.
ProcessWorkOrderOUCCBUtilitiesProvABCSImpl	CCB.CustomerContact.Type	INQUIRE	This is the CC&B Customer Contact Type that is used by Work Order Flow when this flow 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 for configuration details.
ProcessWorkOrderOUCCBUtilitiesProvABCSImpl	CCB.Representative.FACompletion	SYSM	The Representative to be used when MWM or WAM send an order completion message to CC&B. Must be valid in CC&B for the CC&B Dispatch Group(s) used for sending orders to WAM and MWM.

ABCS Name	Property Name	Default / Shipped Value	Description
ProcessWorkOrderOUCCBUtilitiesProvABCSImpl	CCB.ToDoRole	CIACTIV	Specify the value for the CC&B user role that the To Do Entry created by the Work Order flow 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.
ProcessWorkOrderOUWAMUtilitiesProvABCSImpl	Default.Employee.For.InventoryLog	MWM, INTEGRATION	This is the default WAM checkout employee used by the Work Order flow 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 Employees for Checkout Transactions
ProcessWorkOrderResponseOUCCBUtilitiesProvABCSImpl	Default.Create.FA.Log	true	Values are true and false. This is used by Work Order Integration flow 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.
ProcessWorkOrderResponseOUCCBUtilitiesProvABCSImpl	Default.Notification.External.ID	FS_PIP	This is the CC&B Notification External ID used by the Work Order Integration flow 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.
ProcessWorkOrderResponseOUCCBUtilitiesProvABCSImpl	Default.Reply.To.Message.Source	FS_PIP	This is the CC&B Reply To Message Source used by the Work Order Integration flow 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.
ProcessWorkOrderUpdateOUWAMUtilitiesReqABCSImpl	Default.Dispatch.Group	S-E-RC-S	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

ABCS Name	Property Name	Default / Shipped Value	Description
			Create messages in a previous step.
ProcessWorkOrderUpdateOUWAMUtilitiesReqABCSImpl	IntermediateStatus	CREX	This is used to identify the intermediate status code sent by WAM for Work Order Update messages. Do not modify.
ProcessWorkOrderCompleteOUWAMUtilitiesReqABCSImpl	WAM.Pass.Representative.Information	false	This is used to indicate if the representative id is to be passed to CCB. If the property is false indicating that the representative id should not be passed to CCB, then the CCB Provider will use the generic representative configured in the AIA Configuration. If the property is true indicating that the representative id should be passed, the WAM requestor will pass 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 will pass the CrewId coming from WAM directly to CC&B without any transformation.
ProcessWorkOrderCompleteOUMWMUtilitiesReqABCSImpl	MWM.Pass.Representative.Information	false	This is used to indicate if the representative id is to be passed to CCB. If the property is false indicating that the representative id should not be passed to CCB, then the CCB Provider will use the generic representative configured in the AIA Configuration. If the property is true indicating that the representative id should be passed, the MWM requestor will pass 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 MWM, this DVM can be left empty. When DVM is left empty, integration layer will pass the CrewId coming from MWM directly to CC&B without any transformation.

Domain Value Maps

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

To maintain the information within the domain value maps:

1. Open a browser and access the ESB application for your installation
2. On the ESB application navigate to Maps.
3. Search and Select the relevant DVM you wish to maintain.
4. Setup the required values for each integrated application.

These are the DVMs for the Oracle Integration Pack for Oracle Utilities Field Work:

DVM	Integration Points	Description
FS_Invoice_ChargeLineTypeCode	BillableCharge	DVM mapping for charge line type code
FS_Order_ChargeType	WorkOrder	DVM mapping for charge type
FS_Order_DisconnnectLocationCode	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
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”

DVM	Integration Points	Description
FS_Order_ReadTypeCode	WorkOrder	DVM mapping for meter read type code
FS_Order_RegisterReadUnitCode	WorkOrder	DVM mapping for register read unit code
FS_Order_RegisterTimeOfUseCode	WorkOrder	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_TimeSheet_CrewCode	Timesheet	DVM mapping for timesheet crew code
FS_TimeSheet_LaborEarningType	Timesheet	DVM mapping for labor earning type
FS_TimeSheet_ShiftCode	Timesheet	DVM mapping for shift code
FS_Order_Worker	WorkOrder	DVM mapping for Representative ID values

For more information about DVMs, see *Oracle Application Integration Architecture – Foundation Pack - Integration Developer’s Guide,* "Understanding Message Transformation, Enrichment, and Configuration," Domain Value Maps.

For more 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 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 CC&B. Each line type contains values that will be defaulted onto the line details associated with the uploaded billable charges.

When billing information is sent from WAM to CC&B, 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 CC&B to control the behavior of the billable charge.

Common	OU_CCB_01	OU_WAM_01	OU_CCB_SHOW_ON_BILL
This is the AIA	Must match values for	Must match values for	This information is used to

Common	OU_CCB_01	OU_WAM_01	OU_CCB_SHOW_ON_BILL
common value which describes the type of charge line. This must be a unique value for each row within this DVM.	'Bill Charge Line Type'.	'Category' in the EXPENSE CODE Business Rule.	populate the 'Description on Bill' information for the Billable Charge Upload Staging Line. This is the description of the charge line that will appear on the customer's bill in CC&B.

Note that the OU_MWM_01 column is not used, and should be left blank, because MWM is not involved in the Invoice integration point that uses this DVM.

FS_Order_ChargeType

This DVM is used to map the Charge Type between MWM and WAM for Direct Charge transactions when MWM to WAM orders are completed.

Common	OU_CCB_01	OU_WAM_01	OU_MWM_01
This is the AIA common value, which describes the type of charge. This must be a unique value for each row within this DVM.	Leave blank.	Must match the Charge Type value on the WAM business rule TIMEKEEPING CHARGE TYPES that corresponds to Service Request on the business rule. By default the value is R	MWM only supports a W value for Charge Type. There must be one row in the DVM where this column is set to W. The corresponding WAM value is set in the Timekeeping Charge Types business rule.

FS_Order_DisconnnectLocationCode

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
This is the AIA common value which describes the disconnect location. This must be a unique value for each row within this DVM.	Must match values for 'Disconnect Location'.	Must match values for Disconnect Location in Code Table 246.	Must match values for Disconnect Location Code.

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
This is the AIA common	Must match values for	WAM does not store a Dispatch	Must match values for

Common	OU_CCB_01	OU_WAM_01	OU_MWM_01
value which describes the dispatch group. This must be a unique value for each row within this DVM.	'Dispatch Group.	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 requestor.	Service Area.

FS_Order_Division

This DVM is used to map CIS Division in CC&B to Division in MWM. It also maps WAM Plant to MWM Division when Work Orders are sent from WAM to MWM.

Common	OU_CCB_01	OU_WAM_01	OU_MWM_01
This is the AIA common value, which describes the Division. This must be a unique value for each row within this DVM.	Must match values for 'CIS Division'.	Must match value for WAM Plant. For each valid WAM Plant there must be one row in the DVM where the value in the column is the WAM Plant code with corresponding MWM column containing valid MWM Division code.	Must match values for Division.

FS_Order_ExpenseTypeCode

This DVM is used to map ODC codes while sending direct charge expense information from MWM to WAM.

Common	OU_CCB_01	OU_WAM_01	OU_MWM_01
This is the AIA common value which describes the type of direct charge expense. This must be a unique value for each row within this DVM.	Leave blank.	Must match values for 'Direct Charge Types' in the DIRECT CHARGE TYPES Business Rule.	Must match values for WAM Direct Charge Type Codes.

FS_Order_ItemStatusCode

This DVM is used to map Item Status code from MWM to CC&B when MWM sends Order Completion to CC&B with Item information.

Common	OU_CCB_01	OU_WAM_01	OU_MWM_01
This is the AIA common value which describes the Status. This must be a unique value for each row within this DVM.	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.	Specify values from the MWM configuration table DHTMTRST, column METER_STATUS_CD that corresponds to ON and OFF values in CC&B.

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
This is the AIA common value which describes the item stock location. This must be a unique value for each row within this DVM.	Must match values for 'Stock Location'.	Leave blank.	Must match values in the MWM configuration table DHTSTKLO, column STOCK_LOC_CD.

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
This is the AIA common value which describes the item type. This must be a unique value for each row within this DVM.	Must match values for 'Item Type'.	Leave blank.	Must match values in the MWM configuration table DHTITTYP, column ITEM_TYPE_CD.

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
This is the AIA common value which describes the meter configuration type. This must be a unique value for each row within this DVM.	Must match values for 'Meter Configuration Type'.	Must match the CC&B value on the corresponding rows.	Must match values in the MWM configuration table. DHTPRGID, column PROGRAM_ID.

FS_Order_MeterStatusCode

This DVM is used to map the Meter Status code between MWM, WAM and CC&B when MWM or WAM sends Order Completion to CC&B with Meter information.

Common	OU_CCB_01	OU_WAM_01	OU_MWM_01
This is the AIA common value which describes the Status. This must be a unique value for each row within this DVM.	Must match valid Meter On-Off Status in. 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.	Specify values from the MWM configuration table DHTMTRST, column METER_STATUS_CD that corresponds to ON and OFF values in CC&B.

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
This is the AIA common value which describes the meter stock location. This must be a unique value for each row within this DVM.	Must match values for 'Stock Location'.	Must match the MWM value on the corresponding rows.	Must match values in the MWM configuration table DHTSTKLO, column STOCK_LOC_CD.

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
This is the AIA common value which describes the meter type. This must be a unique value for each row within this DVM.	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. In addition to mapping codes, this DVM is used to specify a default WAM account code to be used on the service request.

Common	OU_CCB_01	OU_WAM_01	OU_MWM_01	OU_WAM_05
This is the AIA common value which describes the operation area. This must be a unique value for each row within this DVM.	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
This is the AIA common value which describes the read type code. This must be a unique value for each row within this DVM.	Valid CC&B values for this column are 60 and 70.	Valid CC&B values for this column are 60 and 70.	Valid 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
This is the AIA common value which describes the register read unit code. This must be a unique value for each row within this DVM.	Specify a list of Unit of measure valid in CC&B.	Must match the CC&B value on the corresponding rows.	Must match values in the MWM configuration table DHTRTYPC, column READ_TYPE_CD.

FS_Order_RegisterTimeOfUseCode

It maps register time of use (TOU) codes between CC&B, WAM and MWM.

Common	OU_CCB_01	OU_WAM_01	OU_MWM_01
This is the AIA common value which describes the register TOU. This must be a unique value for each row within this DVM.	Specify a list Time Of Use Codes valid in CC&B.	Must match the CC&B value on the corresponding rows.	Must match values in the MWM configuration table DHTRDUCD, column READ_USE_CD.

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
This is the AIA common value which describes the service point type. This must be a unique value for each row within this DVM.	Specify a list of Service Point Types valid in CC&B.	Must match values for Asset Type Code in Code Table 29. 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.	Must match values in the MWM configuration table DHTSPTYP, Column SPT_TYPE_CD.

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
This is the AIA common value which describes the order status. This must be a unique value for each row within this DVM.	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.

FS_Order_SubStatus

For status updates from WAM to CC&B, this maps WAM status codes to CC&B Intermediate Status Codes. For status updates from MWM to CC&B, this maps MWM Transaction codes to CC&B Intermediate Statuses.

Common	OU_CCB_01	OU_WAM_01	OU_MWM_01
This is the AIA common value which describes the intermediate status. This must be a unique value for each row within this DVM.	Specify a list of valid CC&B intermediate statuses.	Must match values for WAM Service Request status. Additionally should have a row containing value 'CREX' in this column with 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	This is the AIA common value which describes the order type. This must be a unique value for each row within this DVM.
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 Order Type.
ROUTE_TO_CCB	Set the value to Y if you wish orders of this type to be routed to CC&B when they are created by either WAM or MWM. Otherwise set the value to N if orders of this type should not be routed to CC&B.
ROUTE_TO_WAM	Set the value to Y if you wish orders of this type to be routed to WAM when they are created by either CC&B or MWM. Otherwise, set the value to N if orders of this type should not be routed to WAM.
ROUTE_TO_MWM	Set the value to Y if you wish orders of this type to be routed to MWM when they are created by either WAM or CC&B. Otherwise, set the value to N if orders of this type should not be routed to MWM.

FS_TimeSheet_CrewCode

Crew code indicates the crew associated with a timesheet entry. Each edge application involved may have different codes for Crew Code.

Common	OU_CCB_01	OU_WAM_01	OU_MWM_01
This is the AIA common value which describes the crew code. This must be a unique value for each row within this DVM.	Leave blank. CC&B is not involved in the timesheet integration.	Must match values for WAM Crew codes.	Must match values in the MWM configuration table DHTCREW, column CREW.

FS_TimeSheet_LaborEarningType

This indicates the Earning Code associated with a timesheet entry. Each edge application involved may have different codes for Earning Code.

Common	OU_CCB_01	OU_WAM_01	OU_MWM_01
This is the AIA common value which describes the labor earning code. This must be a unique value for each row within this DVM.	Leave blank. CC&B is not involved in the timesheet integration.	Must match values for 'Earning Code' in the TIMEKEEPING LABOR EARNING TYPE Business Rule.	Must match values in the MWM configuration tables DHTWAMREGEARN and DHTWAMPREMEARN, column EARN_CD.

FS_TimeSheet_ShiftCode

This indicates the Shift Code associated with a timesheet entry. This information is used for establishing the shift differential rates to be used for cost accounting. Each edge application involved may have different codes for Shift Code.

Common	OU_CCB_01	OU_WAM_01	OU_MWM_01
This is the AIA common value which should describe the shift code. This must be a unique value for each row within this DVM.	Leave blank. CC&B is not involved in the timesheet integration.	Must match values for 'Shift Code' in the SHIFT DIFFERENTIAL RATES Business Rule.	Must match values in the MWM configuration table DHTWAMSHIFTDIFF, column SHIFTDIFF_CD.

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
This is the AIA common value which should describe the representative Id. This must be a unique value for each row within this	CC&B Representative Id value	Must match Crew Id	Must match WorkedBy Field

Common	OU_CCB_01	OU_WAM_01	OU_MWM_01
DVM.			

Cross-References

Cross-references map and connect the records within the application network, and allow 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 Oracle Integration Pack for Oracle Utilities Field Work:

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

Note. During implementation you will not need to do anything with this table. This table is populated by the integration processes as orders are created.

For more information about cross-references, see *Oracle Application Integration Architecture – Foundation Pack - Integration Developer's Guide,* "Understanding Message Transformation, Enrichment, and Configuration," Cross-References and the *Oracle Enterprise Service Bus Developer's Guide,* "Creating Cross References."

Error Notification Setup

This section discusses notification setup for BPEL and Enterprise Service Bus (ESB) processes available for this Process Integration Pack.

For more information on AIA standard email notification setup, see *Oracle Application Integration Architecture – Foundation Pack: Core Infrastructure Components Guide,* "Setting Up and Using Error Handling and Logging."

By default, AIA provides a role that can be used for notification and to access the worklist application. This role 'AIAIntegrationAdmin' will already be available in system-jazn-data.xml and user-properties.xml. By default all error email notifications are sent out to 'AIAIntegrationAdmin' role. Once you have decided on which users should be notified in case of errors during integration transactions and have access to the worklist application, these users along with the corresponding email addresses can be added to system-jazn-data.xml and user-properties.xml; and associated to role AIAIntegrationAdmin.

For more information on Oracle Worklist Application**,** see *Oracle Application Integration Architecture – Foundation Pack: Core Infrastructure Components Guide,* "Using the Error Console."

The default role of AIAIntegration Admin also comes with a default user AIAIntegrationAdminUser. If only one user need to be notified in case of error in integration, the email address on this user can be changed to the email to be notified. The password for AIAIntegrationAdminUser is set to welcome1 by default. This user will also be able to login into the Worklist Application using the username/password as AIAIntegrationAdminUser/welcome1.

Describing Delivered Error Notification Roles and Users

The following roles and users are delivered as default values for issuing error notifications for the integration.

Actor Roles and Users

Role: AIAIntegrationAdmin. User: AIAIntegrationAdminUser

- The default password for AIAIntegrationAdminUser is set to welcome1. Users can login into the Worklist Application and view the error details using the AIAIntegrationAdminUser.
- Implementation team can to add additional roles and users for access to specific service errors in the Worklist Application.

For more information about setting up error notifications using these values, see *Oracle Application Integration Architecture – Foundation Pack: Core Infrastructure Components Guide,* "Setting Up Error Notifications and Trace Logging."

Viewing EBO Implementation Maps (EIMs)

For more information about how services are mapped, see the Metalink document: EBO Implementation Maps (EIMs) 881022.1.

Chapter 5: Monitoring, Error Handling and Troubleshooting

This chapter provides detail into monitoring, error handling, and troubleshooting, and discusses how to:

- Monitor from CC&B
- Monitor from MWM
- Monitor from WAM
- Monitor from the Integration Layer
- Manage Failure Scenarios

Monitoring from Oracle Utilities Customer Care and Billing

Oracle Utilities Customer Care and Billing 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.

- spl.log - used to log errors in the CC&B application
- 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
- 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 see 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 is in Pending status this indicates that MPL is not started.
- If the NDS record indicates an error, check xai and mpl 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

If the connection is not successful, make sure that MPL is running and then verify that the mpl.log exists in CC&B. Use mpl.log to locate errors on outgoing messages. Refer to xai.trc for incoming messages.

Monitoring from Oracle Utilities Mobile Workforce Management

MWM processing errors are logged to and displayed in the appropriate MWM applications:

- Server
- Router
- Dispatch Workstation
- Mobile Workstation

User notifications are displayed to logged-on Dispatch Workstation and Mobile Workstation users. No new error messages or notifications were added for this integration.

For more information about errors and notifications see the Oracle Utilities Mobile Workforce Management Dispatcher Workstation and Mobile Workstation documentation

Steps to follow from Oracle Utilities Mobile Workforce Management

The MWM Router application logs all transactions sent to the external application web service, and all responses received from it, in the Router trace log file (MfTraceLog@.txt). Trace log files are located in the Router\MfLogs subdirectory within the MWM installation directory.

The trace log file is the first place to look for web service errors on transactions to CC&B. If the response indicates a failure, the transaction is retried based on the value of the DHTWBCNG.RETRY_MESSAGE column. If the transaction receives an error and returns a SOAP fault, the transaction is not retried; instead, the SOAP fault is written to the trace log.

Verify whether the order was received by the Router

Look for a "*Successfully received*" message in the Audit list box on the Router dialog.

This message indicates that the Router received the transaction from the Web Service. If this message is not present, then the Router did not receive the transaction. Either it was not sent to MWM or the data was in error. Any error messages are returned in the SOAP fault.

Verify whether the order was processed by the Router

Look for a "Sent ICD[##] to connection…" message in the Audit list box on the Router dialog

This message indicates that the Router received the transaction and sent it to the Server for processing. If this message is not present, the Router failed to process the transaction. Check for any error messages in the list box on the Router dialog. Open the full message by selecting the item in the list.

Verify whether the order was processed by the Server

Look for the following message in the Audit list box on the Router dialog:

"*Successfully wrote transaction [#####] to OutputDirectory for connection FWI."*

(This may vary depending on the MWM *configuration)***.**

This indicates that the Server processed the order transaction and has sent a transaction acknowledgement to the Router for delivery back to CC&B. The order transaction may have files to process, but this validates that the MWM components and Integration layer are communicating properly

Notifications

If MWM can successfully send a transaction to the integration web service AND successfully received a transaction from the integration, the Router dialog displays the text 'FWI Connected' and the indicator light is green. Otherwise, the light is red and the word 'Disconnected' appears next to the indicator light.

If communication cannot be established or fails at any time, notifications are sent from the Router application to the Server application and forwarded to all logged on Dispatch Workstation users. Log entries are also written to the router trace log file.

Notifications:

Notification	Description
Router and FWI connected	Indicates that a transaction was successfully sent to the integration web service.
Router and FWI disconnected	Indicates that an error occurred sending a transaction to the integration web service.
FWI connected to Router listener	Indicates that a transaction has been received from the integration connection.

Connection Errors

If the connection is not successful, check the following settings:

- Verify that the Oracle Application server with AIA installation is up and running.
- Verify that a value in the router.ini file is set to 'FWI, WEB.'
- Verify that the external URLs in the web service definition table - DHTWBCNG are configured correctly for the transaction ID having a connection problem.
- Check the Router and Server dialogs in MWM to locate errors in processing. You can also check the Router and Server log files directly.

Monitoring from Oracle Utilities Work and Asset Management

Errors related to WAM are processed as follows:

Database Procedure – Errors are written to the WAM Job Manager Log. This log can be viewed from within the WAM application.

Inbound messages - Errors are logged in **xt_web_services_inbound_log**.

Detailed errors are logged to the WAM **OC4J** instance in the "redirected output/errors" log (default pathname is <oracle-home>\opmn\logs\OC4J~OC4J_<instance name>~default_island~1).

Outbound messages – Errors are logged in the **xt_web_services_outbound_log** table as well as in the Job Manager Log module. Detailed errors are logged in the same way as inbound errors.

For more information about errors and notifications see the Oracle Utilities Work and Asset Management Job Manager Log documentation.

Service Request Creation

To monitor processing related to the creation of service requests from field activities, you should consider the following:

1. If a service request is successfully created, the service request table, SA_SERVICE_REQUEST, will show the newly created record.
2. You can also look at the interface table, SAIF_SERVICE_REQUEST, to see if a record related to the FA has been sent from CC&B.

   If the field activity is not found in the SAIF_SERVICE_REQUEST table, check the SIA logs found on the WAM application server.WAM. Check this file for error messages related to the FA_ID or Service Request ID in question.

3. The XT_WEB_SERVICE_INBOUND_LOG table will also show a record related to the field activity in question. The FA_MSG_ID indicated in the SAIF table can be used to find a record in the XT log table where:

   EXTERNAL_MSG_ID = FA_MSG_ID

   Evaluate the STATUS field for the EXTERNAL_MSG_ID.

   - If the status = ERROR

     Review the message text in this record and follow the instructions.

     Check the Job Manage Log related to the Service Request Interface database procedure. Obtain the SR number from the SAIF table related to the FA in question. Check the job manager log for errors related to this service request.

   - If the status = COMPLETED

     An SR should have been successfully created. If you still cannot find the record in any of the tables indicated in this section, contact the WAM system administrator.

   - If the status is not ERROR or COMPLETED, contact WAM system administrator.

Connection Errors

If the connection is not successful then check the following:

- Verify that the urls specified in the Web services gateway business rule are correct for the environment.
- Check the Job Manager Log in WAM to locate errors in batch processing. You can also check xt_web_services_inbound_log and xt_web_services_outbound_log for error information.

Monitoring from the Integration

The components of the integration layer which may require unique procedures to troubleshoot include:

- ESB - Oracle Enterprise Service Bus
- AQ - Advanced Queue
- BPEL - Oracle BPEL Process Manager

For more information about email notifications and worklist configuration, see Chapter 4: Configuration Guidelines.

Steps to follow for BPEL

1. The Administrator user receives a notification email for any failures in BPEL.
2. The notification email includes a link to the Oracle BPM Worklist application.
3. On logging into the Worklist application the user can see more details about the process failure in BPEL.
4. The details of the failure in BPEL also have the Faulting ServiceInstance ID that is the BPEL instance ID.
5. The user can log into the BPEL console and lookup the BPEL process using the instance ID.
6. The BPEL process flow indicates which step the failure has occurred on and also gives the error details.

Steps to follow for ESB

1. The Administrator user receives notification email for any failure in ESB.
2. The notification email includes a link to the Oracle BPM Worklist application.
3. On logging into the Worklist application the user can see more details about the failure in ESB.
4. The details of the failure in ESB also have the Faulting ServiceInstance ID which corresponds to the ESB instance ID.
5. The user can log into the ESB console and lookup the ESB instance using the instance ID.
6. The ESB flow indicates how the transaction was processed, and the error tab shows details about the error.

AQ Exception Queue

If there is a connection failure on the provider end, transactions are moved to an AQ exception queue per application, and place in Expired status.

	Queue	Error Queue	Queue Table
Customer Care and Billing			
Invoice	AIA_INVOICEOUCCB_AQ	AQ$_AIA_INVOICEOUCCB_AQTAB_E	AIA_INVOICEOUCCB_AQTAB
Work Order	AIA_WORKORDEROUCCB_AQ	AQ$_AIA_WORKORDEROUCCB_AQTAB_E	AIA_WORKORDEROUCCB_AQTAB
Work and Asset Management			
Work Order	AIA_WORKORDEROUWAM_AQ	AQ$_ AIA_WORKORDEROUWAM_AQTAB_E	AIA_WORKORDEROUWAM_AQTAB
Mobile Workforce Management			
Work Order	AIA_WORKORDEROUMWM_AQ	AQ$_ AIA_WORKORDEROUMWM_AQTAB_E	AIA_WORKORDEROUMWM_AQTAB

Querying the AQ Exception Queues

Use SQL to verify whether there are any messages in the error queue.

Example:

```
SELECT a.owner, a.name, a.queue_type, a.queue_table, a.retention,
a.enqueue_enabled, a.dequeue_enabled, b.waiting, b.ready, b.expired,
b.total_wait, b.average_wait FROM dba_queues a, v$aq b WHERE a.qid =
b.qid AND a.name IN ('<Error Queue Name>', '<Queue Name>')
```

The count under the Expired column of the error queue indicates the number of messages in the error queue.

Resubmitting Transactions

Transactions can be resubmitted once the root cause of the failure has been fixed.

The integration provides an ant script which serves as a resubmission utility. The script moves one transaction at a time to the main queue for processing. The files used are:

- <AIAHOME>/Infrastructure/ErrorHandling/MessageResubmitUtil/MessageResubmit.xml
- <AIAHOME>/Infrastructure/ErrorHandling/MessageResubmitUtil/ResubmitBuild.properties

To resubmit transactions:

1. Use the following query to retrieve the queue message IDs:

```
SELECT rawtohex (msgid), enq_time from <Queue Table Name> order by
```

```
enq_time
```

2. Modify the ***ResubmitBuild.properties*** file to set the queue details and the message ID from the queue table.

   Transactions must be resubmitted in FIFO sequence.

For more information about running the Message Resubmission Utility, see *Oracle Application Integration Architecture – Foundation Pack: Core Infrastructure Components Guide,* "Using the Message Resubmission Utility."

General ABCS Error

While running this process integration pack you may encounter one particular error in the ABCS:

Error in ABCS - exception on JaxRpc invoke: HTTP transport error: javax.xml.soap.SOAPException: java.security.PrivilegedActionException: javax.xml.soap.SOAPException: Message send failed: Premature EOF encountered.

To resolve this ABCS error:

1. Sign on to Oracle Enterprise Manager.
2. Select the OC4J instance name where SOA Suite hosting AIA is installed.
3. Select the 'Administration' tab.
4. Navigate to Administration Tasks > Properties > Server Properties.
5. Under start parameters: Java Options, add or modify the option -DHTTPClient.disableKeepAlives=true.
6. Save.
7. Re-start SOA Suite.

Managing Triggering Events and Retry Processing

This section explains the events in the edge applications that would lead to messages being sent from the application to the integration and the actions that users can take to fix issues.

CC&B Originated Messages

	Order Create, Update or Cancel from CC&B.
Triggering Event	Creation, Update, or Cancelation 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	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. • 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 CC&B Notification Download table (using the CC&B user interface). This will send 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 CC&B to fix the business error. The update will cause another outbound message (this time update) to be sent from CC&B to the target application(s).

WAM Originated Messages

The following scenarios describe possible errors and how to resolve them. In general, if any of the target applications returns an error while processing the inbound message to WAM, an email notification is sent to a pre-configured email address and an AIA work list entry is created. WAM does not provide a mechanism to re-send failed messages.

	Order Create From WAM.
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 Update From WAM.
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.
Triggering Event	The status is changed on a Service Request that was previously sent to the other application(s). This will send 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 will be sent successfully.

	Order Cancelation From WAM.
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.
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.
Triggering Event	A WAM Service Request status changed to Closed and Billable Indicator is true.
Retry for Business errors	If the target application returns a business error while processing the inbound create billable charge message, an email notification is sent to a pre-configured email address and an AIA work list entry is created. The message can be resend from BPEL or it can manually be created in the CC&B application.

MWM Originated Messages

If any of the target applications returns an error while processing the inbound message from MWM, an email notification is sent to a pre-configured email address and an AIA work list entry is created.

	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 cancelation 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 In-completion From MWM
Triggering Event	Field Order is marked as incomplete in MWM and the integration sends an update.

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 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 Field 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.

	Timesheet Create From MWM
Triggering Event	An MWM worker enters crew time for an order and sends it.
Retry for Business errors	If a business error occurs while processing the inbound create message, WAM will handle this with in the application and will send out an alert notification to an internal WAM user. Business errors will need to be handled with in the WAM application.
Retry for Technical errors	If the integration encounters any Technical errors (for example, Communication problems), the source application (MWM) will receive a notification and MWM will use its own functionality for auto retries.

Managing WorkOrder Failure Scenarios

The following section describes failure scenarios and possible resolutions.

CC&B Originated message - Requestor Failure

The CC&B create message can fail before getting to the target queue(s) because of the following

- Failure in CC&B requestor
- EBS is not reachable
- One of the target queue 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 CC&B.

CC&B Originated message - Provider Failure

If the CC&B message reaches the target queue(s) and then it either fails in WAM or MWM provider or there is a business error, CC&B 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 CC&B user can update the FA and save the changes, which triggers an outbound update message.

WAM Originated message - Requestor Failure

When WAM creates a Service Request and the message fails before getting to the target queue(s). WAM user receives an error on the WAM 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 WAM.

WAM Originated Message - Provider Failure

If the WAM message reaches the target queue(s) and then it either fails in CC&B or MWM provider or there is a business error from one or both the applications. The WAM Service Request can be populated with an external ID. An email notification is sent to the email address indicated during configuration to notify users of the failure. The WAM user can cancel the Service Request in WAM 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 Flow	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		Requestor ABCS cannot reach ESB	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		ESB cannot communicate to the AQ	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	Message goes from	AIA email notification and	After ensuring that the

S.No	Integration Flow	Type of error	Action	Notification Type	Retry
		ABCS cannot be reached	the queue to the corresponding error queue. + AIA error handling.	worklist	prov ABCS is up again, the admin must run a script to 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	Resend the 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.	AIA email notification and worklist	After ensuring that the web service end-point is up again, the admin must run a script to restore the messages from error to the main queue and then re-start the consumption from the queue.
A9		Error response from target	Negative acknowledgement back 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.
A10		The CC&B Ack ABCS cannot be reached.	AIA error handling.	AIA email notification and worklist	
A11		CC&B Ack web service (FA Response) cannot be reached or returns an error	AIA error handling	AIA email notification and worklist	
B1	Order Process from WAM	WAM cannot reach Req ABCS	Process error response to WAM	WAM user should see an on screen error.	Resend the message by selecting the appropriate action on the WAM service request. (This will work for create, update, cancel
B2		Internal failure in Req ABCS	Process error response to WAM	WAM user should see an on screen error.	

S.No	Integration Flow	Type of error	Action	Notification Type	Retry
B3		Requestor ABCS cannot reach ESB	Process error response to WAM	WAM user should see an on screen error.	messages. Not for completions). When the resend link is selected a create message is sent to ABCS.
B4		ESB cannot communicate to the AQ	Process error response to WAM	WAM user should see an on screen error.	
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.	AIA email notification and worklist	After ensuring that the prov ABCS is up again, the admin must run a script to 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.	AIA email notification and worklist	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.
B8		Provider ABCS cannot reach target web service endpoint	Message goes from the queue to the corresponding error queue. + AIA error handling.	AIA email notification and worklist	After ensuring that the web service end-point is up again, the admin must run a script to 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.	AIA email notification and worklist	Resend the message by selecting the appropriate action on the WAM service request. (This action works for create, update, cancel

S.No	Integration Flow	Type of error	Action	Notification Type	Retry
					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.	AIA email notification and worklist	
B11		Internal failure in Ack ABCS for WAM	AIA error handling	AIA email notification and worklist	
C1	Order Process from MWM	MWM cannot reach Req ABCS	Process error response to MWM		MWM automatically tries resending
C2		Internal failure in Req ABCS	Process error response to MWM		MWM automatically tries resending
C3		Requestor ABCS cannot reach ESB	Process error response to MWM		MWM automatically tries resending
C4		ESB cannot communicate to the AQ	Process error response to MWM		MWM automatically tries resending
C5		JMS consumer is down	Messages queue up		Start JMS consumer
C6		Provider ABCS cannot be reached	Message goes from the queue to the corresponding error queue. + AIA error handling.	AIA email notification and worklist	After ensuring that the prov ABCS is up again, the admin must run a script to restore the messages from error to the main queue and then re-start the consumption from the queue.
C7		Internal failure in Provider ABCS	Negative acknowledgement to the MWM ABCS.	AIA email notification and worklist	
C8		Provider ABCS cannot reach	Message goes from the queue to the corresponding error	AIA email notification and worklist	After ensuring that the web service end-point is up again, the admin

S.No	Integration Flow	Type of error	Action	Notification Type	Retry
		target web service endpoint	queue. + AIA error handling.		must run a script to restore the messages from error to the main queue and then re-start the consumption from the queue.
C9		Error response from target	Negative acknowledgement to the MWM ABCS.	AIA email notification and worklist	
C10		Ack ABCS for MWM cannot be reached.	AIA error handling.	AIA email notification and worklist	
C11		Internal failure in the MWM Ack ABCS	AIA error handling	AIA email notification and worklist	

Chapter 6: 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 enterprise business object
- Extend ABC 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.

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. For instance, if your business process required more information when creating a work order, EBOs would be extended during implementation to achieve this end.

To extend EBOs, you must first add custom elements to the EBO. The next step is to complete custom mapping for the requestor and for the provider.

To add custom elements to the EBO:

1. From the Work Order EBO, identify which section or EBO Type needs to be extended.
2. Modify the Work Order xsd to include a local element named “Custom” at the end of the EBO Type that needs to be extended. .

You must modify the xsd before you can add custom elements to the EBO.

```
<xsd:element name="Custom" type="coreworkordercust:CustomWorkOrderEBOType" minOccurs="0"/>
```

3. 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   ============================ -->
<!-- ================================================================== -->
<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"/>
<!-- ================================================================== -->
<!-- ==============  WorkOrder Custom Components ================ -->
<!-- ================================================================== -->

<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, see *Oracle Application Integration Architecture – Foundation Pack: Integration Developer's Guide,* "Extensibility for Oracle AIA Artifacts – Extending EBOs".

To map the EBO to the requestor:

Continuing the example from the previous section:

1. Navigate to the CC&B Work Order Requestor BPEL folder and open the custom ABM to EBM transformation. (For example, Xform_OrderABMReqMsg_to_WorkOrderEBMReqMsg_Custom.xsl)
2. Map the elements from CC&B 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 tranformations 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>
```

To map the EBO to the provider:

1. Navigate to the MWM Work Order Provider BPEL folder and open the custom EBM to ABM transformation. (For example, Xform_WorkOrder_To_FieldOrder_Cancel_Custom.xsl)
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.

```
<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:nsl="http://mwm.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">
   <!-- <nsl:ExternalPriority>
      <xsl:value-of select="/ns0:ProcessWorkOrderEBM/ns0:DataArea/ns0:ProcessWorkOrder/ns0:Custom/coreservicerequestcust:WorkOrderPriority"/>
    </nsl:ExternalPriority> -->
  </xsl:template>

  <xsl:template name="ExtendedDataType_ext">
     <nsl:RequestDescription>
        <xsl:value-of select="/ns0:ProcessWorkOrderEBM/ns0:DataArea/ns0:ProcessWorkOrder/ns0:Custom/coreservicerequestcust:WorkOrderInstructions"/>
     </nsl:RequestDescription>
  </xsl:template>

  <xsl:template name="SPLWFMCreateUpdateOrderType_ext"/>
</xsl:stylesheet>
```

Note. The namespace used in the requestor and provider must match.

4. Test to make sure the mapping is correct and the information is passed from one application to the other.

Extending ABC Services

All Requestor 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 are two or more extension points in each ABCS depending on the number of services it invokes and the message exchange pattern for those services.

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, see *Oracle Application Integration Architecture – Foundation Pack: Integration Developer's Guide,* "Extensibility for Oracle AIA Artifacts – Extending ABC Services".

Appendix A: Data Mapping

In order to view data mapping for online transactions, you need to view XSL files created for BPEL processes.

This chapter provides data mapping information for each integration point.

WAM Asset Module to CC&B Premise/Service Point

WAM Asset Module Field	Column Type	CC&B Table	CC&B Premise/Service Point Field	Comments
PLANT	VARCHAR2(3)	CI_WFM_OPT or CI_SP_OP_AREA or CI_SP_CHAR	Option Value or Operation Area Code or Char Value	The PLANT SOURCE Option Type defined in the Feature Configuration determines where the value is obtained
ASSET_RECORD_TYPE	VARCHAR(1)	Default value		
ASSET_ID	VARCHAR2(15)	CI_SP or CI_PREM	SP_ID or PREM_ID	
ASSET_TYPE	VARCHAR2(10)	CI_SP or CI_PREM	SP_TYPE_CD or PREM_TYPE_CD	
ASSET_DESC	VARCHAR2(2000)	Premise or SP Info Routine	Info Description	
LAST_UPDATE_DATE	DATE	Default value	System Date	
ASSET_STATUS	VARCHAR2(20)	Default Value		For Premise, the value of 'ACTIVE' should be used. For Service Point, if the Service Point Status is 'In Service', then use 'ACTIVE'. If the Service Point status is 'Abolished', then use 'INACTIVE'. The CC&B batch job assigns the ASSET_STATUS based on the stated criteria.
PARENT_ASSET_ID	VARCHAR2(15)	CI_SP or CI_PREM		For Premise, if Premise Management module is being used, then use Par ent Premise ID. Otherwise this field is empty for a Premise. For Service Point, use Premise ID linked to the SP.
PARENT_ ASSET_RECORD_TYPE	VARCHAR2(1)			This field is empty. WAM inbound service to retrieve from Premise business rule.
CREATION_DATE	DATE	Default value	System Date	
LAST_UPDATE_USER	VARCHAR2(30)	Default value		'CCB_INTEGRATION'
CREATED_BY	VARCHAR2(30)	Default value		'CCB_INTEGRATION'

WAM Asset Module Field	Column Type	CC&B Table	CC&B Premise/Service Point Field	Comments
LOCATION_BASIS	VARCHAR2(20)	Default value		'ADDRESS'
STREET_NAME	VARCHAR2(40)	CI_PREM	ADDRESS1	
CROSS_STREET	VARCHAR2(40)	CI_PREM	ADDRESS2	
CITY	VARCHAR2(40)	CI_PREM	CITY	
STATE_PROVINCE	VARCHAR2(4)	CI_PREM	STATE	
POSTAL_CODE	VARCHAR2(10)	CI_PREM	POSTAL	
CCB_SOURCE	VARCHAR2(15)	Default value		'PREMISE' or 'SERVICE POINT'
PARSE_ADDRESS	VARCHAR2(1)	Default value		'Y'
DEPARTMENT	VARCHAR2(10)	Default value		Based on setting of Default Accounts for Interfaces Business Rule.
AREA	VARCHAR2(10)	Default value		
ACCOUNT	VARCHAR2(75)	Default value		

WAM Customer Module to CC&B Account

WAM Customer Header Field	Column Type	CC&B Table	CC&B Account Field	Comments
RECORD_TYPE	CHAR(1)	Default Value	H	H is a customer record L is a customer address record A is a customer address SA record
PLANT	VARCHAR2(3)	CI_WFM_OPT or CI_SP_OP_AREA or CI_SP_CHAR	Option Value or Operation Area Code or Char Value	The PLANT SOURCE Option Type defined in the Feature Configuration determines from where the value is obtained
CUSTOMER_ID	VARCHAR2(20)	CI_ACCT	ACCT_ID	
COMPANY	VARCHAR2(60)	CI_PER_NAME	ENTITY_NAME	Person/Business flag = 'Business'
CUSTOMER_LAST_NAME	VARCHAR2(30)	CI_PER_NAME	Last Name of Entity Name	Person/Business flag = 'Person' parsing rules is applied to Person Name - a comma separating the last and first name – ***Smith,Patricia***

WAM Customer Header Field	Column Type	CC&B Table	CC&B Account Field	Comments
CUSTOMER_FIRST_NAME	VARCHAR2(30)	CI_PER_NAME	First Name of Entity Name	Person/Business flag = 'Person' parsing rules is applied to Person Name - a comma separating the last and first name – ***Smith,Patricia***
CUSTOMER_STATUS	VARCHAR2(20)	Default value		'ACTIVE'
LAST_UPDATE_DATE	DATE	Default Value	SYSTEM DATE	
CREATED_DATE	DATE	Default value	SYSTEM DATE	This is only populated for new records.
LAST_UPDATE_USER	VARCHAR2(30)	Default value		'CCB_INTEGRATION'
CREATED_BY	VARCHAR2(30)	Default value		'CCB_INTEGRATION'
CCB_ACCT_SETUP_DATE	DATE	CI_ACCT	SETUP_DT	
CCB_ACCT_BILL_CYCLE	VARCHAR2(30)	CI_ACCT	BILL_CYCLE_CD	
CCB_ACCT_MAIN_PERSON_ID	VARCHAR2(10)	CI_ACCT_PER	PER_ID	Primary Customer on the Account
CCB_ACCT_ADDRESS_SOURCE	VARCHAR2(10)	CI_ACCT_PER	BILL_ADDR_SRCE_FLG	Primary Customer Address Source on the Account

WAM Customer Address View to CC&B Account

WAM Customer Address Field	Column Type	Source	CC&B Account Field	Comments
RECORD_TYPE	CHAR(1)	Default Value	L	H is a customer record L is a customer address record A is a customer address SA record
PLANT	VARCHAR2(3)	CI_WFM_OPT or CI_SP_OP_AREA or CI_SP_CHAR	Option Value or Operation Area Code or Char Value	The PLANT SOURCE Option Type defined in the Feature Con figuration determines from where the value is obtained
CUSTOMER_ID	VARCHAR2(20)	CI_ACCT	ACCT_ID	
STREET_NAME	VARCHAR2(40)	CI_PREM	ADDRESS1	
CROSS_STREET	VARCHAR2(40)	CI_PREM	ADDRESS2	
CITY	VARCHAR2(40)	CI_PREM	CITY	
STATE_PROVINCE	VARCHAR2(4)	CI_PREM	STATE	

WAM Customer Address Field	Column Type	Source	CC&B Account Field	Comments
POSTAL_CODE	VARCHAR2(10)	CI_PREM	POSTAL	
CONTACT_INFO_IND	VARCHAR2(1)	Default Value		Set to 'Y' for Mailing Address
PHONE_NO_HOME	VARCHAR2(30)	CI_PER_PHONE	PHONE	Phone Type Code = Home
PHONE_NO_WORK	VARCHAR2(30)	CI_PER_PHONE	PHONE	Phone Type Code = Business
PHONE_NO_WORK_EXT	VARCHAR2(5)	CI_PER_PHONE	EXTENSION	
FAX_NO	VARCHAR2(30)	CI_PER_PHONE	PHONE	Phone Type Code = Fax
EMAIL_ADDRESS	VARCHAR2(100)	CI_PREM	EMAIL	
CCB_ACCT_PREMISE_ID	VARCHAR2(10)	CI_PREM	PREM_ID	
PARSE_ADDRESS	VARCHAR2(1)	Default Value		'Y'
LAST_UPDATE_DATE	DATE	Default Value		SYSTEM DATE
CREATION_DATE	DATE	Default value		SYSTEM DATE
LAST_UPDATE_USER	VARCHAR2(30)	Default value		'CCB_INTEGRATION'
CREATED_BY	VARCHAR2(30)	Default value		'CCB_INTEGRATION'

WAM Customer Address to CC&B Service Agreement

WAM Customer Address Service Agreement Field	Column Type	Source	CC&B Service Agreement Field	Comments
RECORD_TYPE	CHAR(1)	Default Value	A	H is a customer record L is a customer address record A is a customer address SA record
PLANT	VARCHAR2(3)	CI_WFM_OPT or CI_SP_OP_AREA or CI_SP_CHAR	Option Value or Operation Area Code or Char Value	The PLANT SOURCE Option Type defined in the Feature Configuration determines from where the value is obtained
CUSTOMER_ID	VARCHAR2(20)	CI_ACCT	ACCT_ID	
CCB_ACCT_PREMISE_ID	VARCHAR2(10)	CI_PREM	PREM_ID	
CCB_SA_ID		CI_SA	SA_ID	
CCB_SA_STATUS		CI_SA	SA_STATUS_FLG	
CCB_SA_TYPE_DESC		CI_SA_TYPE_L	SA_TYPE_CD DESCR	
CCB_SA_START_DATE	DATE	CI_SA	START_DT	

Appendix B: Cross References

The following sections provide references for where you can find more information on some of the terms and entities related to this integration.

Integration Services

You can use the Integration Scenario Summary page in the Oracle AIA Console to search for and view integration scenarios that use a particular service.

For more information, see *Oracle Application Integration Architecture – Foundation Pack: Core Infrastructure Components Guide,* "Using the BSR UI to View Integration Scenarios."

ABCs

For more information see *Oracle Application Integration Architecture – Foundation Pack: Integration Developer's Guide,* "Designing and Constructing ABC Services" and *Oracle Application Integration Architecture - Foundation Pack: Concepts and Technologies Guide,* "Understanding ABC Services"

JMS Adapters (Producers and Consumers)

For more information see *Oracle Application Integration Architecture – Foundation Pack: Integration Developer's Guide,* "Designing and Constructing JMS Adapter Services"

EBSs

For more information see *Oracle Application Integration Architecture – Foundation Pack: Integration Developer's Guide,* "Designing and Developing EBSs" and *Oracle Application Integration Architecture - Foundation Pack: Concepts and Technologies Guide,* "Understanding EBSs"

EBFs

For more information see *Oracle Application Integration Architecture – Foundation Pack: Integration Developer's Guide,* "Designing and Constructing EBFs" and *Oracle Application Integration Architecture – Foundation Pack: Concepts and Technologies Guide,* "Understanding EBSs," Enterprise Business Flow Processes

EBOs

For detailed documentation of individual EBOs, click the EBO Name link on the Integration Scenario Summary page in the Oracle AIA Console. You can also use the Integration Scenario Summary page to search for and view integration scenarios that use a particular EBO or EBS.

EBOs can be extended, for instance, to add new data elements. These extensions are protected, and will remain intact after a patch or an upgrade.

For more information about EBOs, see *Oracle Application Integration Architecture – Foundation Pack: Integration Developer's Guide,* "Extensibility for AIA Artifacts" or *Oracle Application Integration Architecture - Foundation Pack: Core Infrastructure Components Guide,* "Using the BSR."

AggregatorAdapters

For more information see *Oracle Application Integration Architecture – Foundation Pack: Integration Developer's Guide,* "Describing the Event Aggregation Programming Model"

DVMs

For more information: on domain value maps shipped with this product, see Working with Domain Value Maps.

For more information see *Oracle Application Integration Architecture – Foundation Pack - Integration Developer's Guide,* "Understanding Message Transformation, Enrichment, and Configuration," Domain Value Maps

Cross-References

For more information see *Oracle Application Integration Architecture – Foundation Pack – Integration Developer's Guide,* "Understanding Message Transformation, Enrichment, and Configuration," Cross-References and the *Oracle Enterprise Service Bus Developer's Guide,* "Creating Cross References"

Error Handling

For more information about the errors thrown by Siebel CRM or Oracle EBS, see that product's documentation. **For more information** about AIA error handling, see the *Oracle Application Integration Architecture – Foundation Pack: Core Infrastructure Components Guide,* "Setting Up and Using Error Handling and Logging."

Error Roles

For more information about setting up error notifications using these values, see *Oracle Application Integration Architecture – Foundation Pack: Core Infrastructure Components Guide,* "Setting Up Error Notifications and Trace Logging."

Setting Config Properties

For more information see the *Oracle Application Integration Architecture – Foundation Pack: Core Infrastructure Components Guide,* "Using the BSR," Loading Oracle AIA Configuration File Updates.