Oracle® SDP Provisioning

Concepts and Procedures

Release 11i

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Oracle SDP Provisioning Concepts and Procedures, Release 11i

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Preface

Welcome to the Oracle Customer Relationship Management, Release 11i, suite of applications.

This Concepts and Procedures provides information and instructions to help you work effectively with Oracle Provisioning.

This preface explains how Concepts and Procedures is organized and introduces other sources of information that can help you.

Intended Audience

This guide is aimed at the following users:

- Technical Service Representatives (TSR)
- Customer Service Representatives (CSR)
- System Administrators (SAs), Database Administrators (DBAs), and others with similar responsibility.

This guide assumes you have the following prerequisites:

- An understanding of the company business processes
- A knowledge of products and services as defined by your marketing policies
- A basic understanding of Oracle and Developer/2000
- A background in SQL, PL/SQL, SQL* Plus programming

Structure

This manual contains the following chapters:

“Understanding Oracle Provisioning” provides overviews of the application and its components, explanations of key concepts, features, and functions, as well as the application’s relationships to other Oracle or third-party applications.

“Using Oracle Provisioning” provides process-oriented, task-based procedures for using the application to perform essential business tasks.

“Administering Oracle Provisioning” provides task-based procedures for required for ongoing system maintenance and includes information on administration tools and utilities.

Related Documents

For more information, see the following manuals:

- *Oracle SDP Provisioning Technical Reference Manual*
- *Oracle SDP Number Portability Concepts and Procedures*
- *Oracle SDP Number Portability Technical Reference Manual*

Conventions

The following conventions are also used in this manual:

Convention	Meaning
. . .	Vertical ellipsis points in an example mean that information not directly related to the example has been omitted.
. . .	Horizontal ellipsis points in statements or commands mean that parts of the statement or command not directly related to the example have been omitted
boldface text	Boldface type in text indicates a term defined in the text, the glossary, or in both locations.
< >	Angle brackets enclose user-supplied names.
[ ]	Brackets enclose optional clauses from which you can choose one or none.

Understanding Oracle Provisioning

This topic group provides overviews of the application and its components, explanations of key concepts, features, and functions, as well as the application's relationships to other Oracle or third-party applications.

Overview of Oracle Provisioning

One of the primary functions of the Oracle Service Delivery Platform is to supply telecommunication providers, ISPs (Internet Service Providers) and similar vendor companies with the ability to manage the critical business functions of order capture and order activation, network administration and operation.

The Benefits of Oracle Provisioning

Oracle Provisioning provides the following benefits:

- A fully automated, nearly real-time activation of services for multiple network elements in a multi-vendor network environment.
- A number of APIs (Application Program Interfaces) that you can use as building blocks in creating an interface to any Operational Support System (OSS) available on the service provider's network. For example, you can use these APIs to create an interface to an external order entry or customer care system.

Features of Oracle Provisioning

Oracle Provisioning is designed to be an integrated management system that acts as the coordinating link between different external systems. It supports the following features:

- The rapid deployment of new services by integrating the functions of service management with the network details (service attributes, provisioning algorithm, fulfillment element).
- The provisioning of multiple technologies (e.g., ATM, ADSL, Switch, Routers)
- The delivery of complex services requiring configuration of multiple fulfillment elements and OSS (Operational Support Systems) interfaces.
- The delivery of bundled services combining voice, data and video products.

Service Order Requests in Oracle Provisioning

Oracle Provisioning handles a typical service order request by performing the following tasks:

1. Capturing a service order request
2. Validating the order
3. Analyzing the order
4. Fulfilling the order
5. Completing the order

And, if necessary,

6. Managing order fallout

Capturing a Service Order Request

Initially, a customer places an order with the carrier for a telecommunication service. Examples of services could be one or a combination of phone lines, internet connections and wireless access.

Customer orders are captured from an external Order Entry (OE) system. If necessary, customer orders can also be input through the Provisioning screens. However, the primary capture process is through the Oracle Provisioning APIs.

Validating the Order

After the service order is captured by the system (or manually entered, as the case may be), it is examined for validity by the system. If an order fails validation, OP returns an appropriate message indicating such errors to the order originator. Failed orders due to validation errors are not processed further in Oracle Provisioning.

Order validation includes the following:

- Verifying the order syntax
- Verifying the inclusion of mandatory parameters
- Verify that necessary dependent information is also included
- Verify that the supplied dates are valid dates

Analyzing the Order

After an order is captured, Oracle Provisioning performs the following steps:

1. Analyzes the order.
2. Breaks it down into the required set of tasks needed to fulfill the order.
3. Orders the tasks so that they will be performed in the proper sequence.

For example, say the new order requires two new lines to be activated at a customer residence, one an analog voice phone line, the other a digital ISDN line to be used for high-speed Internet access. In addition, each separate line is to have a different bundle of services associated with it. The analog line must have basic voice service, as well as the Caller ID and Call Waiting features. The digital line needs to have a connection established to the desired ISP (Internet Service Provider).

After order capture, Oracle Provisioning analyzes and validates the order, then puts the order steps into sequence. While some of the tasks involved in setting the customer order can be performed in parallel, others must be performed in a definite sequence. In this example, basic voice service must be established on the analog line before the additional features can be implemented.

Fulfilling the Order

Order fulfillment in Oracle Provisioning is accomplished through one of two ways:

- OP performs the requested tasks internally.
- OP directs external systems to perform the tasks involved in setting up the order.

Oracle Provisioning first translates these tasks into network language, and then activates the various network elements needed to complete the tasks.

For example, it can:

1. Request configuration and activation of services on specific switches. (Connections to the needed network elements are managed using the Connection Manager.)
2. Notify the OSS (Operational Support Systems) to commence service.

The tasks involved in setting up an order are managed via workflow. Workflow is either internal to Oracle Provisioning or external to it.

- Internal workflow is the default, or standard workflow delivered with the application.
- External workflow is created by the user, and is integrated with the standard workflow delivered with the application. For example, you write the business process logic (the executable code) to retrieve data from outside the Service Delivery Platform database. (This could be, for example, the telephone number function for a network switch.)

These workflows are user-configurable to match company specific business practices.

Note: Oracle Provisioning can also handle the results of the network elements through its generic fulfillment engine.

Completing the Order

If the service order completes:

- **Successfully**

  The system sends a notification message of success to the Event Manager that includes both the internal and external order IDs for the order as well as the services it provisioned. This includes all the subscriber details (service assignments, parameter values and product attributes). All activation information, updates and modifications performed on the service order request are captured.

  The Event Manager then publishes the event that the service order request completed successfully. The status of the order is changed to COMPLETED.

- **Unsuccessfully**

  Oracle Provisioning suspends the provisioning process after the first error occurs. It then creates a notification message with the error information and sends the message to the Notifications utility. The order remains open, but the status is changed to indicate that the order has been suspended. The provisioning process can not continue until the error is rectified.

To continue processing, you must modify the order via the Notifications utility interface and re-submit the order to the provisioning process where the error occurred.

Managing Order Fallout

Order fulfillment can fail during the provisioning process due to invalid activation information, or perhaps the unavailability of a needed network element.

Oracle Provisioning provides a number of ways to effectively manage the order fallout process through its Notifications utility.

You can, for example:

- Examine order details and drill down to error messages
- Track the progress of problem resolutions through the system
- Initiate action to reconfigure a service, if needed
- Generate a notification and forward the notification to the Trouble Ticket system and/or Work Force Managements
- Confirm that the order trouble has been cleared

Why Provisioning Orders Fail

Order fulfillment can fail during the provisioning process due to the following factors:

- **Invalid orders:** Orders that fail the order validation process may require escalation to the order entry or customer service groups. In such cases, the Notifications utility serves as a tracking and notification mechanism.
- **Bad or missing data:** Incorrect or missing data can cause order fallout.
- **Fulfillment action problems:** Fulfillment elements may not function properly, or be too busy, or unavailable, so the system rejects the service activation command.
- **Time-outs on orders:** The connection session between the application and the fulfillment elements may time-out due to either application or external errors. Orders that have timed out may have been partially completed prior to the time-out.

- **Network element or service configuration problems:** The new service order may conflict with the current subscriber configuration. This may be the result of invalid orders. However, there may be other reasons, such as improper configuration of the customer.

Ways to Resolve Failed Orders

You use the Notifications utility to track, monitor and resolve failed orders.

The table following details some of those ways that you can resolve failed orders.

Ways to Resolve Failed Orders

Action	Description
Retry Failed Orders	You can re-send failed orders in one of the following ways: ■ Modify parameters in the failed order and re-send the order down to where the failure occurred, and then continue processing. ■ Re-send unchanged order down to where the failure occurred in the provisioning process. (Failure may have been due merely to network problems.) ■ Restart the provisioning workflow from the point where it failed or stopped.
Stop Processing Failed Orders	You can stop the workflow processing of an order that is due for provisioning. This is useful in the case of identified network outages and order processing backlog.
Terminate Failed Workflows	You can completely terminate processing an order if an exception state is encountered.
Resolve Failed Workflows	You can correct the error in the order provisioning workflow (from within the Notifications utility).
Escalate Failed Workflows	You can escalate a failed order notification by forwarding it to another user or group in order to troubleshoot the order.
Re-assign Failed Workflows	You can reassign a failed order to another user or group for resolution.

System Notification Types

Notifications are generated by various events and at various stages in the provisioning process. Example events are:

- Recovery daemons

- Service provisioning process failure
- Internal exceptions

Notification types

The workflow produces two distinct types of notifications:

- Informative notifications

  The system generates these notifications if the Service Delivery Platform system detects a stopped fulfillment element manager process and starts it up automatically. Also, the system generates a notification if an internal problem occurs that requires a system administrator's attention.

- Order fallout notifications

  The system generates these notification for failed orders.

The Order Resubmission Utility

You use the Resubmission Utility to force the system to re-run an order on a particular fulfillment element. However, only those orders which have either completed, or have been previously submitted, on the fulfillment element in question, can be resubmitted. This is useful, for example, in the event that a network switch fails or experiences a service disruption, causing a provisioning order to fail.

Through this utility, you specify a particular fulfillment element and the time window during which is was unavailable. After entering the required information, fulfillment elements re-execute the fulfillment actions as scheduled. A Job ID is generated and the progress of the re-submission can be tracked.

Re-submitted Orders and Fulfillment Actions

Successful re-execution of the fulfillment action requires that the adapters run in this mode.

- If there are no available adapters and the fulfillment element adapter maximum has **not** been reached, then an error message is generated.
- If no adapters can be started, all re-submission requests are queued.
- Re-submitted fulfillment actions can be identified in the Order Flowthrough window using the Resubmitted check-box.

Re-submitted Orders and Notifications

Re-submitted orders execute the same fulfillment procedure as the original orders.

- These re-submitted orders can generate notifications based on the fulfillment procedure logic.
- Any generated notification message includes the Job ID.

The Event Manager

The Event Manager handles incoming and outgoing messages within the Oracle Service Delivery Platform. The Event Manager provides a set of APIs that are used by both internal and external systems to register for messages.

- Incoming messages are frequently a response to a previously initiated message from an external or internal system
- Outgoing message are frequently user-defined notifications informing an external or internal system of an event occurrence.

Message Registration

External applications can send request messages to the Event Manager, if they are registered for that message. External applications can also register for response messages.

Inbound Messages

The Event Manager identifies the subscriber and delivers an incoming message to the registered applications. The following sequence of steps is performed automatically. The Service Delivery Platform:

- Picks up the message from the Incoming Queue
- Pulls the message out of the Incoming Queue and into the Event Manager
- Validates the message structure via the Event Manager
- Verifies if any internal or external subscribers are registered for this message
- Executes the user-defined logic
- Delivers the message to all registered application systems

Processing Logic

External systems can define their own processing logic at the time when validation and processing logic are defined. If no application has registered for a message, the application uses the default processing logic after message validation.

Queues in Oracle Provisioning

In Oracle Provisioning, a service order request is often queued in one of the many internal system queues between different stages in its processing.

As the provisioning of an order progresses, the order moves sequentially through the various system queues as part of the fulfillment process. For example:

- Incoming orders are moved to the Orders Pending queue if scheduled for later provisioning
- Orders are transferred from the Orders Pending queue to the Orders Ready queue as the provisioning date occurs.

The table following describes the queues in use in the Oracle Provisioning system.

Oracle Provisioning Queues

Queue	Contains
Orders Pending	Orders waiting for a provisioning date to occur
Orders Ready	Orders that are ready to be provisioned immediately
Work Item	Work items for orders currently being processed (Work items are a logical grouping of fulfillment actions.)
Fulfillment Actions	Fulfillment actions that are ready for execution These can be either: ■ Conditional fulfillment actions ■ Fulfillment procedures ■ User-defined workflows (Fulfillment actions execute fulfillment procedures on fulfillment elements.)
Wait for FE Channel	Fulfillment actions waiting for one of the channels configured for the fulfillment elements to becomes available
FE Ready	Fulfillment actions associated with each fulfillment element that are ready to be executed

Oracle Provisioning Queues

Queue	Contains
Outbound Messages	Messages sent by Oracle provisioning
Inbound Messages	Messages received by Oracle Provisioning
Event Manager	Events which occur internally in Oracle Provisioning Example events: ■ FA_done ■ Work Item_done ■ Lineitem_done

The Oracle Provisioning System Queues

As an order moves through the system, it progresses from queue to queue in a sequential manner. Typically, this progression moves through the system queues in the following order.

- Order Pending Queue
- Order Ready Queue
- Work Item Queue
- FA Queue

And additionally, the following queues are used as necessary

- Outbound, Inbound and Event Queues
- FE Ready Queue
- Wait for FE Channel Queue

Order Pending Queue

The Process Order API moves the order into the Order Pending queue. The order stays in the pending queue until the date set for provisioning. This date can be passed to the Service Delivery Platform as part of the order.

On the provisioning date the order is moved to the Order Ready queue. If an order does not contain a provisioning date, the default date becomes the current date and the order is moved immediately to the Order Ready queue.

Order Ready Queue

The Order Ready queue holds orders that are ready to be provisioned immediately. The order is dequeued from the Order Ready queue and the work items generated by the work-plan are placed on the work item queue.

Work Item Queue

The work item queue is used to manage the execution of work items.

Processing the work item involves the following:

- Checking the configurator for existence of fulfillment actions mapped to the work items.
- Determining if the work item is a regular Service Delivery Platform work item or a user-defined workflow.

The following then occurs:

- In the case of regular work items, the fulfillment actions are enqueued into the FA Queue in the sequence specified.
- For user-defined workflows, the execution of the fulfillment actions is determined by the user-defined workflow. (Users can drag and drop EXECUTE_FA activities into their workflows based on the business process being implemented.)

> **Note:** At this point, the Service Delivery Platform does not know which fulfillment elements need to be provisioned.

FA Queue

The FA Queue is used to manage the execution of fulfillment actions for regular (on user-defined) work items.

Processing the fulfillment actions involves the following:

- Checking the configuration to determine to which fulfillment element the fulfillment procedure must be sent.
- Checking for the availability of an adapter for the fulfillment element.

The following then occurs:

- If an adapter is available, then it is immediately used to send the fulfillment element commands specified in the fulfillment procedure.

- If all adapters for the fulfillment element are busy or none are immediately available, the fulfillment action is put into the Wait for FE channel queue.

Wait for FE Channel Queue

When an adapter becomes available, the fulfillment action waiting in the queue is moved to the FE Ready queue.

FE Ready Queue

This is a temporary holder for all fulfillment actions that are waiting for a free fulfillment element adapter. As an adapter becomes available, the fulfillment action is immediately dequeued and its fulfillment procedure executed.

Outbound, Inbound and Event Queues

These queues are used by the Service Delivery Platform to communicate with asynchronous XML message based systems. They use the File and TCP/IP Java adapters to accomplish the messaging.

The Queue Console

The Queue Console provides a set of screens that display specialized information about each internal system queue. It can also be used to track down an order and to take corrective actions to expedite the order fulfillment process.

The Queue Console provides the following information about each queue:

- State Information
- Process Information
- Entry Information

State Information

The Queue Console displays information on the state or status of each Oracle Provisioning queue.

- **Enabled:** The processors are up and running and processing orders.
- **Disabled:** The processors are running, but an error condition has occurred. No order is being processed.
- **Suspended:** The processes have been suspended manually.
- **Shutdown:** The processors have been shutdown manually.

Process Information

The Queue Console displays information on the processes that are registered or running for a queue.

- **Processors Registered:** The actual number of processors pulling or processing orders out of a queue.
- **Processors Running:** The actual number of orders running in a queue.

Entry Information

The Queue Console displays information the number and date of the entries in a queue.

- **No. of Entries:** The number of entries in the queue.
- **Last Entry Date:** The date when the last order entered this queue.

Understanding Network Adapters

A network adapter mediates the communication between Oracle Provisioning and the fulfillment elements.

- An adapter is a runtime instance of a fulfillment element.
- Messages to be sent and received are specified by the fulfillment element and the connection procedures executed by Oracle Provisioning workflow.
- The provisioning workflow executes connect procedures for each new fulfillment element connection (provided a procedure has been defined for the particular fulfillment element).
- The Connection Manager interacts with fulfillment element connections through adapters.

Adapter Usage

The following table lists the ways that adapters are used in the Service Delivery Platform, and describes each:

Adapters Usage in the Service Delivery Platform

Usage	Description
Provisioning Mode	■ Usual mode of operation ■ Required mode for executing a fulfillment action or fulfillment procedure. ■ Only one fulfillment action or fulfillment procedure can be processed through an adapter execution. ■ An adapter using this mode can service only one request at any given time.
Messaging Mode	■ The available message types are File, TCP/IP, and JScript. ■ These adapters work by sending and receiving messages. ■ An adapter using this mode can service multiple requests from multiple sources at any given time.
Test Mode	■ Used for synchronous provisioning of services. ■ Used for the DRC order types. ■ One fulfillment action can use only a single adapter at any one time.
Order Resubmission	■ Orders for a certain fulfillment element are re-submitted using the Order Resubmission Utility. ■ When processing is done, adapters run in this mode.

The Network Adapter Types

Network adapters mediate communications between the Oracle Service Delivery Platform and the fulfillment elements in the system.

- Oracle Workflow executes connect, disconnect, and provisioning procedures for each new fulfillment element connection. (This is, provided procedures are defined for those particular fulfillment elements.)
- The Connection Manager interacts with the fulfillment element connections through adapters.
- Oracle Workflow executes any fulfillment and connection procedures specified.

The table following lists the types of adapters that are used in the Service Delivery Platform, and describes each:

Adapter Types in the Service Delivery Platform

Adapter Types	Description
Interactive	■ Simulates a Telnet, FTP, or any other type of interactive session. ■ Requires a connection procedure.
Script	■ Executes items, such as UNIX command line scripts, shell scripts, or similar executables. The scripts can be of any type of script (for example, JavaScript). ■ Does not require a connection procedure.
File	■ Used to build an XML file and to upload the file via FTP client to a remote fulfillment element type. ■ Can be used to process batch file commands, if that is required by the fulfillment element.
HTTP	■ Communicates directly to a web application server such as WAP server using the HTTP protocol. The Oracle Service Delivery Platform writes an HTTP client (a robot) that communicates with the fulfillment element type. ■ Can be used whenever the fulfillment element supports an HTTP protocol.

Adapter Commands

You can issue commands to network adapters in one of two ways.

- You pre-define a sequence of commands for the system to perform automatically during the course of the provisioning process. This is the most common method of issuing commands to the adapters.
- You issue adapter commands manually, also through the Connection Manager. However, while possible, this is not likely.
- You schedule commands to run at a future time, or times.

Types of Adapter Commands (Requests)

You request (command), or schedule a request, that an adapter perform one of the following operations:

- Suspend
- Resume
- Disconnect

- Connect
- Shut Down
- Startup

The following table identifies the available commands that the provisioning system sends to an adapter, the state that the adapter must be in to accept that command, and the state of the adapter after the command is implemented.

Adapter Request State Table

Operation	Current State	Next State
Suspend	Idle	Suspended
Resume	Suspended	Idle, Busy
Disconnect	Idle	Disconnected
Connect	Disconnected	Idle, Busy, Error
Shutdown	Busy, Idle, Suspended, Disconnect, Session Lost	Shutdown
Startup	Shutdown	Idle, Busy, Error

Suspend

This command stops the application from sending orders to be provisioned. It places service orders in a queue until the fulfillment element becomes available.

If this command is used, then the following events occur:

- The application will not send any data/commands/Service Order Requests to the connected fulfillment element.
- All service order requests that specify this adapter are stored in a job queue until the adapter is re-started.

The current status of the adapter must be *Idle* for this command to be available.

Resume

This command acts as a toggle to end/resume normal operations from a previous suspension.

If this command is used, then the following events occur:

- The Connection Manager sets any fulfillment element interfacing to this adapter to either *Idle* or *Busy*.

  - It sets the fulfillment element to **Idle**, if the job queue is empty for the adapter interfacing at the fulfillment element (meaning that no service order requests awaiting provisioning use this adapter).
  - It set the fulfillment element to **Busy**, if there is a service order request in the provisioning queue that uses the adapter interfacing to the fulfillment element.
- The application continues the provisioning process, if service order requests are waiting in the job queue. The next service order request marked for processing continues its provisioning course.

The current status of the adapter must be *Suspended* for this command to be available.

Disconnect

This command is used to close the appropriate connection. It stores the service activation order in a job queue until the connection to the fulfillment element is restored by issuing a connect request.

If this command is used, then the following events occur:

- The Connection Manager sets the adapter status to Disconnected.
- The Connection Manager places all service order requests that use this adapter into a queue until the adapter is re-connected.

The current status of the adapter must be *Suspended* or *Idle* for this command to be available.

Connect

This command is used to establish a connection to a fulfillment element so that is starts, or continues, its normal operation. Service order requests that are stored in a job queue re-start processing.

If this command is used, then the following events occur:

- The Connection Manager sets the fulfillment element to one of the following states:
  - Idle
  - Busy
  - Error
- Processing continues based on the following conditions:

  - If service order requests are waiting in the job queue, the next service order request due for processing continues its provisioning course. The status of the adapter is *Busy*.
  - If the job queue is empty for that fulfillment element (meaning no service order requests are awaiting provisioning), the status of the adapter is set to **Idle**.
  - If the Network Element Manager status is *Error*, then the connection could not be established to the Network Element, the connection procedure failed.

The current status of the adapter must be **Disconnected** for this command to be available.

Shut Down

This command is used to close the connection to a fulfillment element by discontinuing adapter operation. Service order requests are stored in a job queue until a new adapter becomes available.

If this command is used, then the following events occur:

- The Connection Manager sets the adapter status to *Shutdown*.
- The Connection Manager shuts down the adapter.

The current status of the adapter can **not** be *Shutdown* or *Reconnecting* for this command to be available. If the status is *Busy*, the shut down operation does not happen immediately. The application logs a *Shutdown* request that becomes active upon order completion.

Start Up

This command is used to start up a new adapter and establish a connection to a fulfillment element.

If this command is used, then the following events occur:

- The Connection Manager sets the fulfillment element status to **Idle** or **Busy**.
- Order service requests start processing using the new adapter.
  - If service order requests are waiting in the job queue, then the next service order request continues its provisioning course. The status of the adapter is *Busy*.
  - If the job queue is empty for that fulfillment element, then the status of the adapter is set to **Idle**.

The current status of the adapter must be **Shutdown** for this command to be available.

Adapter Modes

There are two types of adapters modes. They are:

- Startup Mode
- Debug Mode

Startup Mode

There are three possible states to the Startup Mode:

- **Automatic**

  The adapters can be started from the command line using the **xdp-ctl** utility.

- **Manual**

  The adapters can be started only through the Connection Manager.

- **Disabled**

  Adapter operations are disabled unless the adapter mode is changed to either *Automatic* or *Manual*.

Debug Mode

This mode indicates the level of logging for the UNIX executable and the interactive adapter types.

- **Low**

  Critical activities only are logged.

- **Medium**

  Most of the system activities are logged.

- **High**

  All activities are logged.

- **None**

  No activities are logged except **fatal** errors.

Network Adapter Management

You issue requests (commands) to the adapters and schedule adapter activities through the Connection Manager.

Adapter Commands

You issue the following commands to adapters:

- **Connect:** Establish a connection to the fulfillment element and resume its normal operation.
- **Disconnect:** Close the appropriate connection and store the service activation order in a job queue until the connection to the fulfillment element is restored by issuing a connect request.
- **Ftp file:** Transfer a file using ftp.
- **Resume:** Resume normal operation.
- **Shut down:** Close the connection to the fulfillment element by bringing down the adapter.
- **Start up:** Start up a new adapter and establish a connection to the fulfillment element (if any).
- **Suspend:** Stop Oracle Provisioning from sending any orders to be provisioned and have all service orders placed in a queue until the fulfillment element becomes available.

Adapter Scheduling

You schedule the use of adapters in one of three ways:

- **Immediate**: The adapter fulfills the request immediately, on the current date.
- **Future:** The adapter fulfills the request on a future date.
- **Periodic:** The adapter fulfills the request at periodic time intervals based on the supplied period.

The Connection Manager

The Connection Manager provides the means to view, quickly modify, and manage the adapters connected to each fulfillment element. Adapters maintain connectivity to each fulfillment element during service provisioning.You can manage each connection for purposes such as load balancing, trouble shooting and maintenance.

You use the Connection Manager to accomplish the following tasks:

- View all the available fulfillment elements that have been configured in Oracle Provisioning
- View the total number of service order requests awaiting activation in the queue for a selected fulfillment element
- View the average time a service order request has been waiting in the queue
- View the number of adapters currently active for this fulfillment element
- View the date and time when the order entered the queue
- View the elapsed time a service order request has been in the queue
- View network problems and order flow to perform trouble shooting
- Monitor the number of adapters currently available
- Perform administrative activities on adapters
- Schedule activities for adapters
- Define a connection management schedule as needed

Fulfillment Element Types in Oracle Provisioning

Note: Fulfillment element types are defined by system experts only.

Fulfillment elements in Oracle Provisioning are grouped into logical categories. A fulfillment element type can be any of the following:

- An operating system
- An equipment platform
- A Network Element Mediation (NEM) layer
- A piece of telecommunication-specific hardware

The table following lists examples of different fulfillment element types.

Examples of Fulfillment Element Types

Item	Fulfillment Element Type
Home Location Registration (HLR) unit	Network Element
Cisco server	Server
AT&T 5ESS switch	Telephony Switch
Nortel DMS200 switch	Telephony Switch

Parts to a Fulfillment Element Type

Any service order request provisioned through Oracle Provisioning requires that the type for that specific fulfillment element be defined in the system **before** the fulfillment element itself is defined.

To configure a fulfillment element type, you must define the following items:

- The fulfillment element type name and details
- The software generic properties for the fulfillment element type
- The attributes of the fulfillment element type

Type Attributes

An attribute defines a property of a fulfillment element type. This can include all of the attributes with a connect/disconnect procedure. Attributes are also used to uniquely identify a fulfillment element.

Each fulfillment element inherits its attributes from its fulfillment element type. The value of an attribute is the default value defined at the level of the fulfillment element.

The attributes of an fulfillment element type defines its properties and behavior. These include the following:

- IP address
- Username

The following are additional attributes for a fulfillment element type:

- Passwords used in connection/disconnection procedures
- Software generics associated with the procedures

Note: It is possible to configure multiple software versions (generics) for each fulfillment element type, each with a specific effective date.

All attributes are associated with a fulfillment element type or a fulfillment element.

- Each fulfillment element instance can have a different value.
- Each fulfillment element inherits attributes from its fulfillment element type.
- Adding attributes is performed at the fulfillment element type level.

WARNING: Setting a value for an attribute overwrites the default value of that attribute specified at the fulfillment element type level.

Fulfillment Element Type Attribute Default Values

Oracle Provisioning sets default values for the following attributes:

NE_CMD_TIMEOUT When executing commands within a fulfillment element, the default set time-out is 120 seconds.

NE_CMD_RETRY The adapter retries the command numerous times before it times-out. A failure message is returned and the default value is set to zero retry.

NE_CMD_WAIT Waiting period (in seconds) before retrying commands within a fulfillment element. The default value is set to zero seconds.

NE_NO_ACTIVITY_TIMEOUT Some fulfillment elements may terminate the session, if there is no processing activity. The Service Delivery Platform allows you to set processing time to execute a command. This allows the connection between an adapter and the fulfillment element to remain active. The default processing time is set to 120 seconds.

NE_DUMMY_CMD The Service Delivery Platform allows you to send commands to a fulfillment element to maintain the active sessions with the adapter. The adapter sends a command five seconds before processing time-out (NE_NO_ACTIVITY_TIMEOUT).

Note: If you want an carriage return command to be sent, use " " as the attribute value. The default command is " ".

NE_CONNECT_RETRY_COUNT Number of times the interactive adapter will try to reconnect automatically if the connection to the fulfillment element is dropped. The default value is zero.

NE_CONNECT_WAIT Elapsed time (in seconds) between attempts to reconnect. The Default value is zero.

Fulfillment Elements in Oracle Provisioning

In the Oracle Service Delivery Platform, a fulfillment element is a unique physical entity. It has the following characteristics:

- It has a unique name on a carrier's network.
- It is a member of a unique Fulfillment Element type.

You must give each fulfillment element a unique name. This name is registered in the system during the configuration of the fulfillment element.

For example, if a telecommunications service provider has a router of a certain fulfillment element type (such as Cisco), then a logical name (Cisco_LA, or Cisco_NY, etc.) must be created for it during configuration. This helps to identify which particular Cisco router needs to be activated during provisioning.

Definition Considerations

When configuring a fulfillment element, consider the following:

- A fulfillment element is **always** configured as an instance of a fulfillment element type.
- Attributes assigned to a fulfillment element type are inherited by the newly configured fulfillment element.
- Attribute values can be overwritten at the fulfillment element type level.

Understanding Services

In Oracle Provisioning, a service is a telecommunication-related product, offered to the customer as an individual item or in bundles.

Examples of services include:

- Telephone services: Voice, data, videoconferencing, FAX, etc.
- Internet Protocol (IP) services: Web hosting, ecommerce, email, etc.

Service Versions

It is possible to define more than one version of a service in Oracle Provisioning. You set the begin dates and end dates for each service/product version individually. However, only one version of the service is available to a given customer at one time.

Work Items in Oracle Provisioning

Services provided by the carrier are fulfilled by a set of work items performed in a specific sequence within Oracle Provisioning. A work item, then, is a unit of work which is necessary to fulfil a service action.

- You assign to a work item the appropriate parameters, fulfillment actions and fulfillment procedures necessary for the provisioning process.
- Fulfillment actions are responsible for the actual provisioning of services at the fulfillment element level.
- As an alternative to work items, users can execute the fulfillment actions conditionally in a user-defined workflow. The workflow is defined according to pre-set conditions in a service order request.

Work item Types

The available work item types are:

- **Static:** The list of fulfillment actions and their sequence are defined prior to runtime and do not change.
- **Dynamic:** The list of fulfillment actions and their sequence are determined at runtime by executing a shared procedure.
- **User-defined workflow:** The list of fulfillment actions and their sequence are determined at runtime by a predefined workflow that executes multiple procedures based on some pre-defined conditions.
- **User workflow procedure:** Sets the user-defined workflow that is to execute at runtime.

Work Item Rules

Oracle Provisioning comes preseeded with a number of rules for adding, deleting, and modifying work items. They are used to determine dependencies between work items and to analyze the impact if a work item is modified or deleted.

Understanding Packages

A service package contains at least two products/services which are sold together as a unit.

- A package may consist of either related or non-related services.
- All attributes and rules that apply to a service also apply to a service package.
- A service package must contain at least two mandatory products before it can be made available to customers. It can contain as many optional services as desired.

The dates of availability for the service package and the services/products within the package must be consistent. For example, you can not set the package available start date earlier than the earliest start date of all products in the package.

It is possible to add products/services to the package version. However, mutually exclusive products cannot be added to a package. In addition, products with dependencies (co-requisites) can not be added to a package unless the entire set is added.

During package creation, you must specify the minimum and maximum number of products the customer can order from a package that has optional products. For example, you may require that a customer pick at least three, but no more than five of eight possible services/products in the package.

> **Note:** Once a product package has been defined and in the available state, it is not possible to modify or change the package. You must create a new version of the package to modify that package in any way.

Understanding Notifications

The Notifications module is a utility which provides a graphical interface for monitoring service request orders that fail during provisioning.

If a service order request fails, then the provisioning workflow sends notifications about these failed service order requests to the Notifications utility, reporting provisioning problems at various phases of the provisioning process.

Users with sufficient privilege can review and correct the failed orders through manual intervention. The privileged user can, for example, perform the following tasks from within the Notifications utility:

- View order flowthrough.
- View workflow notifications for failed service order requests.
- Respond to a notification by assigning an error handling action to the service order request.
- Forward a notification to appropriate individuals or groups for resolution.
- Modify the service order request.
- View the workflow diagrams of order activities, using the Workflow Monitor.

If more details are necessary to asses the problem and resolve a failure, the privileged user can step through each of the failed notifications and view the actual provisioning commands sent by a particular service order request to a fulfillment element and the responses to those commands.

Based on the information contained in the notification messages received in the Notifications utility, the privileged user can follow-up with service order requests or workflow that failed during the provisioning process.

Follow-up actions include the following:

- Sending the order/workflow back to the process after modifying the order
- Sending orders to other personnel for escalation or resolution
- Stopping the process altogether

The Notifications Utility

You view and access workflow notification messages through the Notifications utility.

You can view:

- All messages (both open and closed)
- Only the open notification messages.

You can query messages based on the following criteria:

- Status
- Receive date
- Order number
- Notification Type

> **Note:** You can only search for orders which have their workflow started.

Messaging in Oracle Provisioning

Oracle Provisioning obtains messages which are initiated from workflows to communicate with external systems. A message can be used to initiate a Start Billing event with a billing system. Workflow can be configured to wait for inbound messages or can branch out to another workflow based on the information passed.

Message functions

The following are messages functions:

- Trigger a process
- Activate processes within an application
- Send application messages asynchronously using the Event Manager
- Receive application messages asynchronously using the Event Manager
- Handle incoming and outgoing messages and events using multiple queues and the Event Manager

Message Definition

The following are ways to define a message:

- **Message type:** The message type defines a message either as a timer, an event, or a message.
  - Messages are used for communication between application systems.
  - Events are used to broadcast multi-cast state changes in business objects. Events are published to both external and internal application systems.

  - Timers are messages that have a time delay and a duration interval associated with them.

- **Message for internal applications:** Internal applications can register a PL/SQL callback procedure via the Event Publisher or through an API.
- **Messages for external applications:** External applications do not register callback procedures, but have adapters that relay the published event to the remote system. External applications can register for an event using the default subscribers screen.

Message Queues

Messages can go to multiple queues. The following are some of the queues where messages can reside:

- **Inbound Message Queue**: Messages are sent to this queue for internal processing.
- **Outbound Message Queue**: Messages are sent to this queue that are enroute to peer systems.
- **Internal Event Queue**: Messages defined as Events ignore the queue name and the event is published to both the Outbound Message Queue and the Internal Event Queue.

The table following lists the messaging queues and their attributes.

Oracle Provisioning Queues

Queue Name	Service Name	Description
Inbound Message Queue	Message Server	Processes all incoming messages.
Internal Events Queue	Event Server	Events generated for internal consumption are enqueued on the internal events queue for speedy processing.
Outbound Message Queue	Communication Adapters	Dequeues messages from the Outbound Message queue and passes it to the peer system.

Outbound Message Structure

Outbound messages must have the following defined:

- Subscriber (system)
- Gateway name

- Adapter type

Message Elements

Message elements in the iMessage Studio can be marked either as mandatory or optional.

During message creation, the iMessage Studio automatically inserts the Message Code and MESSAGE as mandatory message elements in the Elements screen. In addition, the message code is defined as the root element. However, it is possible to define an element more than once in the structure.

Follow these guidelines during message creation:

- Message element names must follow PL/SQL naming conventions.
- The internal name for all message elements must be defined in upper case, replacing any spaces with an underscore.

Warning: Never delete the root element of a message.

Message Elements

- Message elements marked as parameters automatically use the default value specified.
- Message elements marked as parameters are used to derive values of remaining message elements.
- Message elements marked as parameters are not passed in the content of the message body.
- Message elements marked as parameters generate CREATE_MSG(), SEND() and PUBLISH() procedures with the specified message element as a parameter defaulted to the message specified.

Mandatory Elements

- Message elements can be marked as mandatory or optional.
- Upon receiving an incoming message, the validation logic checks all mandatory message elements to ensure that values are in the correct data format.

Message Processing Logic

The Oracle Provisioning Event Manager handles all incoming messages and events. There are four possible ways to process a message. The table following lists them.

Message Processing Logic Types

Type	Process	Description
Default Process Logic	DEFAULT_PROCESS()	Automatically executed by the Event Manager if no application has registered for the message.
Validate Logic	VALIDATE()	Automatically executed by the Event Manager on the newly arrived messages. The VALIDATE() procedure provides a hook to include business specific validation.
Incoming Message Process Logic	PROCESS()	Executed by the Event manager before delivering the message to the callback procedure of the registered application. The PROCESS() procedure also provides a hook to include any application logic.
Outgoing Message Process Logic	SEND()	Executed by the Event Manager before publishing a message to the Outgoing Queue for delivery. These logic procedures are not generated automatically, they are user-defined and the code is executed as part of the SEND() procedure.

Processing Failure

The Event Manager does not deliver a message to any registered applications if an error is detected during the execution of the processing logic. Nor does the Event Manager process and deliver a message if the message validation process failed. If an error occurs, each resulting error code and error message are logged into the system log.

Message Processing Logic - Guidelines

Use the following guidelines during creation of your message processing logic procedures.

1. If no application logic is specified, the procedure is created with a single **NULL;** statement

2. Any user defined data which is stored as part of the registration process is passed to the procedure in the parameter **p_process_reference**.
3. The parameter **p_msg_text** is the XML message
4. Element values can be obtained using the following procedure:

   xnp_xml_utils.decode(). xnp_xml_utils.decode

   This procedure works only if a message has no repeating elements.
5. User defined logic is required to return any error code and error message. This information must be passed using the parameters:
   - x_error_code
   - x_error_message
6. Any non zero value in x_error_code is considered to be an error.

Timers in Oracle Provisioning

In any reasonably complex business process, system and user generated business events are continually occurring. These business events are not isolated, but are often required as triggers to further business processes. Such business processes may have time constraints.

Timers in Oracle Provisioning are used to handle the events or processes that must occur at specified time intervals during the course of implementing complex business processes.

Timers in Oracle Provisioning are implemented using the Oracle Advanced Queuing mechanism, and the message builder features of the Oracle Service Delivery Platform.

Timer Definition

A timer is a message that consists of the following two elements:

- **Delay:** Represents the amount of time to wait before starting a timer.
- **Interval:** Represents the wait time for a timer.

Timer Categorization

Timers are divided into three categories in Oracle Provisioning:

- **Activity Timer:** The timer is associated with a particular activity within a workflow.

- **Process Timer:** The timer is associated with an entire workflow process.
- **Message Timer:** The timer is associated with a message.

Timer Usage in Oracle Provisioning

You use the iMessage Studio Message Framework to create the different types of timers that you use in Oracle Provisioning.

Timer Types

Oracle Provisioning comes with three different timer types. The table following describes each type.

Timer Types in Oracle Provisioning

Timer Type	Description
Activity Timer	The timer is associated with a particular activity within a workflow.
Process Timer	The timer is associated with an entire workflow process.
Message Timer	The timer is associated with a message.

Timer Elements

Timer messages requires two mandatory elements:

- Delay
- Interval

Additional optional elements can also be related to a product type, customer category, or the service level agreement based on the business requirements of the user.

Timer Data

It is possible to set the delay and interval timer elements in several different ways:

- The user provides the data source for the timer elements. This feature is useful in retrieving the timer information from other timer configuration tables.
- A stored procedure retrieves the timer delay and interval information.

If desired, you can also set the processing logic that occurs when the timer expires. The processing logic may include jeopardy management or error processing features when the timer expires.

Timer Testing

You may also specify that a test message be sent to test that the Timer message has been correctly configured.

Using Timers in Workflow

You can build timer functionality into your user-defined Workflow by using a set of drag-and-drop activities provided by Oracle Provisioning. These activities are part of the SDP Standard item type.

The table following lists the activities that can be associated with timers in Workflow:

Timer Activities in Workflow

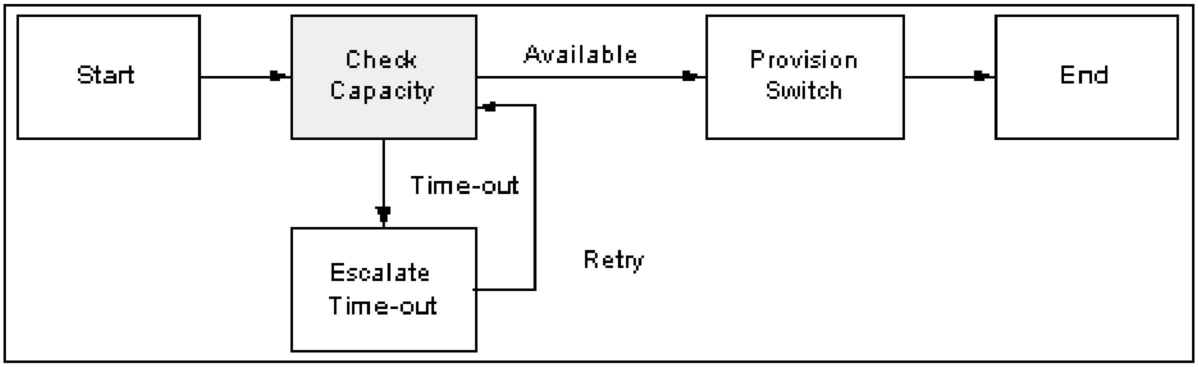
Function Name	Description
Deregister	Remove all timers for a given order
Fire Timer	Function to start either a process or activity timer
Send Message	Function that sends a message which has a timer associated with it
Start Related Timers	Function to start either an activity timer or a timer associated with a message
Subscribe to Acknowledgements	Function to subscriber for possible results from the Send Message function
Get Jeopardy Flag	Checks whether or not a jeopardy timer exists for a given order
Get Timer Status	Returns the status of a timer
Recalculate all timers	Recalculates the delay and interval elements for all timers associated with the given the Work Item name, Instance ID, Order ID, or the Fulfillment Action Instance ID.
Remove Timer	Deletes the timer with the given name

Activity Timers in Oracle Provisioning

An Activity Timer is used in conjunction with a workflow activity. The purpose of an Activity Timer is to provide the ability to set a pre-defined period of time within which a workflow activity must be completed.

For example, a workflow activity is defined to check the network capacity for a requested data service. The time period to perform the workflow activity is set to 30 minutes. An Activity Timer is then associated with the workflow activity to handle the required business logic if the 30 minute time frame for the activity is exceeded.

Example Workflow Activity Timer

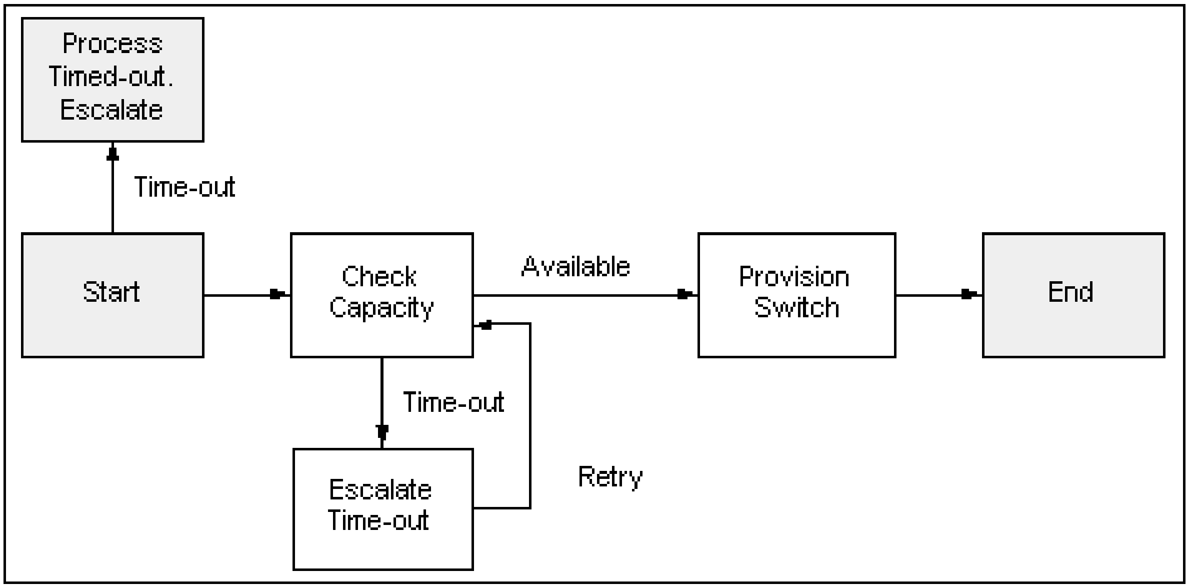


Process Timers in Oracle Provisioning

A Process Timer is used in conjunction with a Workflow process. The purpose of a Process Timer is to provide the ability to set a pre-defined period of time within which a Workflow process must be completed.

For example, a workflow process is defined to provide a requested data service. The time period to perform the Workflow process is set to one business day. A Process Timer is then associated with the workflow process to handle the required business logic if the one day time frame for the process is exceeded.

Example Workflow Process Timer



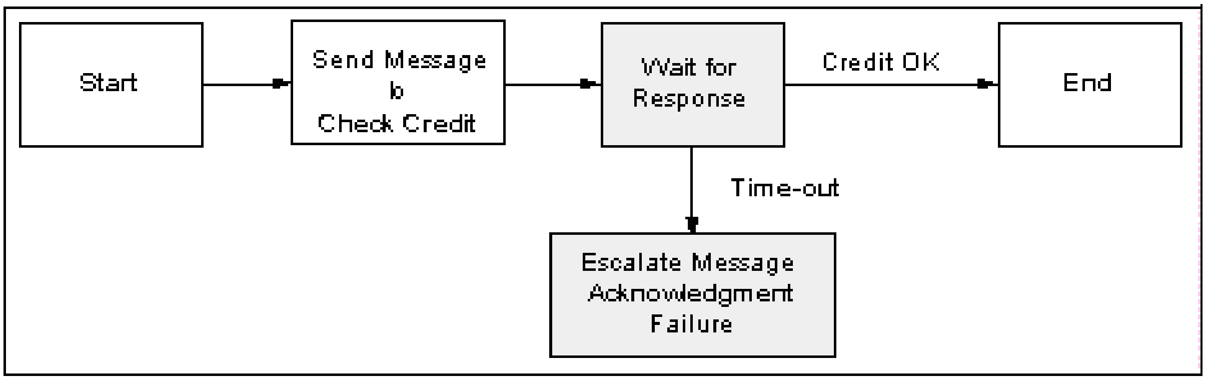
Message Timers in Oracle Provisioning

A Message Timer is used in conjunction with a message. The purpose of a Message Timer is to provide the ability to set a pre-defined period of time within which a message acknowledgment must be received.

For example, a workflow process is defined to set up an account for a network service. A message is sent to the associated network service administrator. If a reply is not received back with in 30 minutes, then the timer message is published and picked up by the workflow activity that is **Waiting for the Acknowledgments**. The acknowledgment may be a message reply or a timer in which the workflow follows a path based on the message received.

The Waiting For Acknowledgments activity subscribes to events. An event can be configured to include an acknowledgment for the message sent out, as well as a timer. Depending on the message received, the workflow progresses.

Example Message Timer



Workflow in Oracle Provisioning

Workflows are processes that execute during the main provisioning process to process and fulfill the order. Workflows can be run before starting the service provisioning process.

You use the Oracle Workflow Builder to configure the workflows to be executed during the provisioning process. The workflow can be invoked for a work item or a fulfillment action.

The main provisioning workflow waits until all sub-processes complete their activities before continuing to fulfill the order.

If an error occurs during the main provisioning process, you can intervene manually and launch appropriate workflows as the situation dictates. You can launch any workflow process in Oracle Provisioning, as necessary.

The Workflow Builder

Refer to the *Oracle Workflow Guide* for details of the workflow builder.

Workflow Processing of a Service Order Request

During the execution of a service order, the line items associated with it are processed by workflow. Which fulfillment procedures execute depend on the type and software generic of the fulfillment element configured in Oracle Provisioning.

- The mapping between fulfillment procedure and fulfillment element is specified in the Service Creation Manager.
- The fulfillment procedure involves sending commands to a fulfillment element, receiving, and analyzing responses to determine success or failure of commands.
- The procedures are written in PL/SQL which has been extended with open APIs.
- A watchdog workflow detects the termination of adapter processes and manages their recovery.
- When all adapters for a given fulfillment element are shutdown, suspended, disconnected or goes down, all service order requests for that fulfillment element are queued until the adapter is up again and ready to process the next fulfillment action in the queue.

Steps Involved in Processing a Service Order Request

- A service order consists of many line items. A line item can be either a service or a package.
- Each line item can be mapped to multiple work items.
- Each work item is mapped to a set of fulfillment actions via different means. (For example, this could be either a static or dynamic fulfillment action, workflow, or a workflow procedure.)
- Each fulfillment action invokes one fulfillment procedure at runtime depending on the type of fulfillment element.
- Each procedure is executed on one fulfillment element.
- The identity of the fulfillment element to be provisioned is determined through routing rules implemented through user-defined PL/SQL procedure.
- Error conditions detected during provisioning cause the workflow to send error notifications.
- The workflow waits for the notification response.
- The response indicates how the error condition is to be handled.

The Workflow Monitor

The Workflow Monitor utility provides a graphical interface to track a service order's path in Oracle Provisioning. When launched, it opens in a web browser screen. The browser screen displays the runtime path for the order within the Oracle Service Delivery Platform.

Using the graphical interface, you can:

- View each activity performed on an order.
- View the route of an order from the beginning to the end.
- Retrieve statistical information and branching activities for each node displayed on the workflow path.

Workflow Information Types

Oracle Provisioning workflow provides the following categories of information:

- **Definition:** The definition of the actual activity as defined in the Workflow. This also includes the description of the activity, its type and its results.
- **Usage:** The location, start/end status, performer, and time-out status information.
- **Status:** The status of execution of a particular activity, the begin and end dates for the activity.
- **Notification:** The recipient, the current status, the date sent, due date and end date for a given notification.

Understanding the Procedure Builder

Oracle Provisioning provides a procedure builder tool that you use to write PL/SQL based procedures. PL/SQL procedures must be defined before processing a service order request.

The procedure builder comes with a library of constructs (building blocks) that you can use to write procedures. These procedures, then, are used during the various phases of provisioning a service order.

Note: It is expected that the user-defined procedures are written by system experts who have knowledge of the provisioning syntax and service parameters required for the fulfillment element. They must also have good knowledge of PL/SQL.

Procedure types

The different procedures types are:

- **Connect and disconnect:** The connect procedure is used to connect Oracle Provisioning to a fulfillment element when the Oracle Provisioning application is started. Similarly the disconnect procedure disconnects Oracle Provisioning from a fulfillment element.

  You can choose from a set of PL/SQL constructs which can be used to write connection/disconnection procedures for multiple fulfillment elements.

- **Fulfillment element routing:** The Locate Fulfillment Element procedure returns the fulfillment element that should be provisioned.
- **Dynamic work item-fulfillment action mapping:** If you choose the work item type to be of type dynamic, you must use the procedure builder to define the procedure that is executed when the order is sent to Oracle Provisioning. This procedure specifies the fulfillment actions to be executed for the work item.
- **Work item parameter evaluation:** The evaluation procedure evaluates the parameter values for the work item parameters.
- **Fulfillment action parameter evaluation:** The evaluation procedure evaluates the parameter values for the fulfillment action parameters.
- **User-defined workflow:** This procedure is used to launch a user defined workflow. A workflow can consist of multiple procedures to be executed in a pre-set sequence.
- **Dynamic service to work item mapping:** This procedure specifies at runtime which work items will be executed to fulfill the service.
- **Evaluate all fulfillment action parameters:** This evaluation procedure is used to evaluate all the fulfillment action parameters together.
- **Fulfillment procedure:** This procedure specifies the provisioning commands that need to be executed in fulfilling a service order.

Using Oracle Provisioning

This topic group provides process-oriented, task-based procedures for using the application to perform essential business tasks.

Managing Notifications

From the Notification Inbox, you can take various actions to deal with workflow notification. For example, you can perform the following tasks:

- Viewing notifications
- Adding comments to a notification message
- Responding to a message notification
- Forwarding a message notification

Viewing Notifications

To view the existing notification messages in the system, perform the following steps.

Prerequisites

None

Steps

1. In the Navigator, choose **Operations** > **Notifications**.
2. Click **View Open** to view only those notification messages that are currently open.
3. Click **View All** to view notification messages, regardless of status.
4. Select a notification from the list at the left.

   The Notification Message Details window opens.
5. Close the window after viewing the information.

Adding Comments to a Notification Message

To add a comment to a notification message, perform the following steps.

Prerequisites

The message must exist for this option to be available.

Steps

1. In the Navigator, choose **Operations > Notifications**.
2. Select a notification from the list at the left.
3. Click **View Details**.

   The Notification Message Details window opens.

1. Click **Add Comment** to launch the Notification Comment window.
2. Enter your comments about the notification in the space provided.
3. Close the window.

   You are prompted to save your changes.

Responding to a Notification Message

To respond to a notification message, perform the following steps. Responding to a notification changes its status from Open to Closed.

Prerequisites

The status of the message must be **Open** for this option to be available.

Steps

1. In the Navigator, choose **Operations > Notifications**.
2. Select a notification from the list at the left.
3. Click **View Details**.

   The Notification Message Details window opens.

1. Click **Respond** to launch the Notification Response window.
2. Select one of the following responses from the drop down menu.
   - **Abort**: Terminate the process and close the order.

- **Resolved**: Ignore the reported causes of failure and continue processing the order.
- **Retry**: Retry the execution of the failed order.

3. Click **OK** to close the window and initiate the action.

> **Note:** The **Close Notification** response is available for all of the information types. The status of a notification stays **Open** until you respond to it.

Forwarding a Message Notification

To forward the notification to a third party, perform the following steps.

Prerequisites

The status of the message must be **Open** for this option to be available.

Steps

1. In the Navigator, choose **Operations > Notifications**.
2. Select a notification from the list at the left.
3. Click **View Details**.

   The Notification Message Details window opens.

1. Click **Forward** to launch the Notification Response window.
2. Select another user or group from the drop-down menu.
3. Click **OK** to close the window and reassign the message.

> **Note:** When a notification is reassigned, it is marked as **Closed**.

Resubmitting an Order

You use the Resubmission Utility to re-run orders that have been previously submitted to the Service Delivery Platform provisioning engine. This is useful, for example, if a network switch fails, or experiences service disruption that causes a provisioning order to fail. The order, however, has not been lost by the system, and can be resubmitted when the unit becomes available.

For example, a particular fulfillment element fails at 3:02 a.m. on a particular date. It remains unavailable for service until 5:20 a.m. the same day. This fulfillment element was to be used to provision a number of orders during that span of time, but as it was unavailable, the orders failed to complete. After the fulfillment element (or its replacement) becomes available, it is necessary to resubmit all orders that were to be provisioned by that particular fulfillment element during the window of time from 3:02 to 5:20 a.m. The order information is not lost, and can be re-used to resubmit the original provisioning orders.

You use the Resubmission Utility to perform the following tasks.

- Creating a new resubmission job
- Verifying the status of a resubmission job

Creating a New Resubmission Job

To re-submit all orders that were to be provisioned by a specific fulfillment element during a span of time (but were not provisioned), perform the following steps.

Prerequisites

None

Steps

1. In the Navigator, choose **Operations > Order Resubmission**.

   The Order Resubmission Jobs form window opens. Previously defined resubmission jobs display under Job ID (Fulfillment Element) at the left-hand side of the screen.

2. Click New.

   The New Job Window opens. You use this window to create a new resubmission job that targets a specific fulfillment element during a specified time window.

3. Enter the name of the fulfillment element for which you wish to resubmit orders.

   Chose a fulfillment element from the List of Values (LOVs).

4. Enter the exact date and time at which the fulfillment element became unavailable in the Outage Start Date field. And, if desired, enter the exact date and time that the fulfillment element became available again.

5. Enter the number of adapters that this affects in the No. of Adapter field.
6. Click **Submit**.

   The job displays in the Job ID (Fulfillment Element) window. You can track the progress of order resubmission process through the Job ID.
7. Click **Cancel** to close this window.

Verifying the Status of a Resubmission Job

To view the status or details of a resubmission job, perform the following steps.

Prerequisites

None

Steps

1. In the Navigator, choose **Operations** > **Order Resubmission**.

   The Order Resubmission Jobs form window opens. Previously defined resubmission jobs display under Job ID (Fulfillment Element) at the left-hand side of the screen.
2. Select the Job ID from the list at the left.

   The pertinent information for the resubmission job displays.
3. Click **Order List**.

   The Resubmitted Order Information window opens. This window displays information about each individual order.
4. Click **Cancel** to close the Resubmitted Order Information window.
5. Click **Cancel** to close the Order Resubmission Jobs window.

Managing the System Queues

You perform a number of tasks with system queues. These include:

- Viewing summary information about queues
- Finding an order in the queue
- Viewing errors in a queue
- Starting up a queue

- Shutting down a queue
- Suspending a queue
- Resuming queue operation
- Viewing XML messages

Viewing Summary Information about Queues

The Queue Console displays the following summary information about all of the system queues.

- State (Enabled, Shutdown, Suspended)
- Number of entries in the queue
- Date that the last entry in the queue occurred
- Number of dequeue processors that are registered
- Number of processors that are currently running for the queue

To display this information, perform the following steps.

Prerequisites

None

Steps

1. In the Navigator, choose **Administration** > **Queue Console**.

   The Queue Console opens.

2. Select a queue from the list at the left.

   The View Details button is enabled if there are entries in the queue, otherwise it is grayed out.

3. Click **View Details** to view additional information about the entries in a queue.

   A window opens that displays the entries for the queue.

4. Close this window and return to the Queue Console by clicking the **X** in the upper right-hand corner of the window.

Finding an Order in the Queue

To search for an order that is currently in the queue, perform the following steps.

Prerequisites

None

Steps

1. In the Navigator, choose **Administration** > **Queue Console**.

   The Queue Console opens.

2. Select a queue from the list at the left.

   The View Details button is enabled if there are entries in the queue, otherwise it is grayed out.

3. Click **View Details**.

   A window opens that displays the entries for the queue.

4. (Optional) Select **View** > **Query By Example** > **Enter** from the View menu on the toolbar to find a specific order in the queue, or to find entries that match a search criteria.
5. (Optional) Enter the search criteria in the provided fields.
6. Select **View** > **Query By Example** > **Run** from the View menu on the toolbar.

   If one, or more records are found that match the search criteria, then the information displays.

7. Select **View** > **Query By Example** > **Cancel** from the View menu on the toolbar to close the window and return to the Queue Console.

> **Note:** If there are a large number of orders in the queue, this action may take several seconds to complete.

Viewing Errors in a Queue

A queue becomes **disabled** if an error is detected while processing orders. You mange this problem by performing the following actions:

- Viewing the cause of the error that caused this state to occur

- Correcting the problem the caused the error to occur
- Re-starting the queue

To view errors within a queue, perform the following steps.

Prerequisites

The queue must be in Disabled mode for you to perform this operation.

Steps

1. In the Navigator, choose **Administration > Queue Console**.
2. Select a queue from the list at the left that is listed as Disabled.

   The View Errors button is enabled if the queue is disabled.
3. Click **Show Content**.
4. Correct the problem.
5. Shutdown the queue.

   See Shutting Down a Queue for details of this procedure, if necessary.
6. Start up the queue.

   See Starting Up a Queue for details of this procedure, if necessary.

> **Note:** Orders remain in the queue until the queue is shutdown and started again.

Starting Up a Queue

To start all processors of the queue, perform the following steps.

Prerequisites

The queue must be in Shutdown mode for this option to be available.

Steps

1. In the Navigator, choose **Administration > Queue Console**.
2. Select a queue from the list at the left.

   If the queue is in Shutdown mode, the Startup button is enabled.

3. Click **Startup**.

   The Queue Status changes to Enabled.

Shutting Down a Queue

To shut down all processors of the queue, perform the following steps.

Prerequisites

The queue must be in either the Enabled or Disabled mode for this option to be available.

Steps

1. In the Navigator, choose **Administration** > **Queue Console**.
2. Select a queue from the list at the left.
3. Click **Shutdown**.

   The Queue Status changes to Shutdown.

Suspending a Queue

To suspend processing of orders in the queue, perform the following steps.

Prerequisites

The queue must be in either the Enabled or Disabled mode for this option to be available.

Steps

1. In the Navigator, choose **Administration** > **Queue Console**.
2. Select a queue from the list at the left.

   If the queue is in Enabled or Shutdown mode, the Suspend button is enabled.
3. Click **Suspend**.

   The Queue Status changes to Disabled.

Resuming Queue Operation

To resume processing orders in the queue, perform the following steps.

Prerequisites

The queue must be in the Disabled mode for this option to be available.

Steps

1. In the Navigator, choose **Administration > Queue Console**.
2. Select a queue from the list at the left.

   If the queue is in Disabled mode, the Resume button is enabled.
3. Click **Resume**.

   The Queue Status changes to Enabled.

Viewing XML Messages

To view the XML content for a message that is currently in the queue, perform the following steps.

Prerequisites

To view XML message content, you must select either the Outbound Messages queue, the Inbound Messages queue, or the Event queue, **and** you must have an XML-enabled browser available to display XML messages.

Steps

1. In the Navigator, choose **Administration > Queue Console**.
2. Select a queue from the list at the left.

   The View Details button is enabled if there are entries in the queue, otherwise it is grayed out.
3. Click **View Details**.

   A window opens that displays the entries for the queue.
4. Select a message from the list at the left.
5. Click **View XML**.

   If available, an XML-enabled browser window opens and displays the XML message.

Managing Network Connections

You use the Connection Manager to manage all types of fulfillment elements and their network adapters. The Connection Manager is used to control network connections.

You perform the following tasks using the Connection Manager:

- Monitoring network connections
- Defining a new adapter
- Redefining an adapter
- Scheduling an adapter
- Deleting an adapter
- Viewing adapter request errors
- Issuing a disconnect request
- Issuing a connect request
- Issuing a suspend request
- Issuing a resume operation request

Monitoring Network Connections

To view the network associated with a fulfillment element, perform the following steps.

Prerequisites

None

Steps

1. In the Navigator, choose **Administration > Connection Manager**.

   The Connection Manager opens.

2. Click **Define** and enter a filtering value if you wish to parse the list of fulfillment elements that display in the left-hand frame.

   Conversely, click **Reset** to view all defined fulfillment elements.

3. Select a fulfillment element from the list.

4. Select the Adapters tab to view information about network adapters.
5. Select the adapter type to view from the Usage drop-down list. Your choices are:
   - All Types
   - Messaging
   - Order resubmission
   - Provisioning
   - Testing
6. Choose one of the following:
   - Chose the Adapters sub-tab to view information about the current status of an adapter.
   - Chose the Modes sub-tab to view information about Startup and Debug modes for an adapter.
   - Chose the Requests sub-tab to view to view information about how the adapter has been scheduled.
7. To close the form window, click the **x** in the right-hand corner of the form window.

Defining a New Adapter

To define a new adapter in the system, perform the following steps.

Prerequisites

None

Steps

1. In the Navigator, choose **Administration > Connection Manager**.
2. Select the Adapters tab.
3. Click **New...** to open the Adapter Properties dialog box.
4. Enter a name for r the new adapter.
5. Select a value from the Usage drop-down list.
6. Select a value from the Startup Mode drop-down list.

7. Select a value from the Debug Mode drop-down list of values.
8. Click **OK** to define the new adapter and close the dialog box.

   The new adapter now displays in the list of adapters.

> **WARNING: You can start a new adapter only if it does not exceed the maximum number of connections allowed (or configured) for that specific fulfillment element**.

Redefining an Adapter

To edit an adapter definition, perform the following steps.

Prerequisites

The Current Status field for the adapter must display Shutdown for this option to be available.

Steps

1. In the Navigator, choose **Administration > Connection Manager**.
1. Select the adapter from the list at the left.
2. Select the Adapters tab.
3. Click **Edit**.

   The Adapter Properties dialog box displays.
4. Make changes as necessary.
5. Click **OK** to redefine the adapter and close the dialog box.

Scheduling an Adapter

To schedule a request for an adapter, perform the following steps.

Prerequisites

You can not schedule a request prior to the current date and time.

Steps

1. In the Navigator, choose **Administration > Connection Manager**.

2. Select the Adapters tab.
3. Click **Schedule...** to open the Adapter Request dialog box.
4. Chose a value from the Request Type drop-down list of values.
5. Chose a date and time for the request to execute the request. (If desired, open the Calendar function by clicking the [...] at the edge of the Date/Time field.)
   - To issue the request immediately, enter the current date and time.
   - To postpone the execution of the request, enter a future date.
6. Enter the period (in days) that the adapter request is to repeat by entering a value in the Repeat Every (days) field.
   - To schedule a request only once, leave this field blank.
7. Click **OK** to schedule the request and close the dialog box.

Note: To delete a scheduled request, select it and click **Delete**.

Deleting an Adapter

To delete an adapter from the system, perform the following steps.

Prerequisites

The Current Status field for the adapter must display Shutdown for this option to be available.

Steps

1. In the Navigator, choose **Administration > Connection Manager**.
1. Select the adapter to delete from the list of adapters.
2. Click **Delete**.

   The adapter no longer displays in the list of adapters.

Viewing Adapter Request Errors

If an adapter request causes an error condition, the Current Status field for that adapter displays Error.

To view details of the error condition, perform the following steps.

Prerequisites

The Current Status field for that adapter must display Error for this option to be available.

Steps

1. In the Navigator, choose **Administration > Connection Manager**.
2. Select the adapter from the list of adapters at the left.
3. Select the Adapters tab.
4. Click **Show Error**.

   The time the error message occurred and the text of the error message display.
5. Click **OK** to close the Error Message window.

Issuing a Disconnect Request

To issue a disconnect request to an adapter, perform the following steps.

Prerequisites

The Current Status field for that adapter must display Idle for this option to be available.

Steps

1. In the Navigator, choose **Administration > Connection Manager**.

1. Select the adapter from the list of adapters at the left.

2. Select the Adapters tab.

3. Click **Disconnect**.

   The Current Status field for this adapter now displays Disconnected.

Issuing a Connect Request

To issue a connect request to an adapter, perform the following steps.

Prerequisites

The Current Status field for the adapter must display Disconnected for this option to be available.

Steps

1. In the Navigator, choose **Administration > Connection Manager**.
2. Select the adapter from the list of adapters at the left.
3. Select the Adapters tab.
4. Click **Connect**.

   The Current Status field for this adapter now displays Idle.

Issuing a Suspend Request

To issue a suspend request to an adapter, perform the following steps.

Prerequisites

The Current Status field must display Idle for this option to be available.

Steps

1. In the Navigator, choose **Administration > Connection Manager**.
2. Select the adapter from the list of adapters at the left.
3. Select the Adapters tab.
4. Click **Suspend**.

   The Current Status field for this adapter now displays Suspended.

Issuing a Resume Operation Request

To issue a resume request to an adapter, perform the following steps.

Prerequisites

The Current Status field must display Suspended for this option to be available.

Steps

1. In the Navigator, choose **Administration > Connection Manager**.
2. Select the adapter from the list of adapters at the left.
3. Select the Adapters tab.
4. Click **Resume**.

The Current Status field for this adapter now displays Idle.

Managing Services

You perform a number of tasks with services. These include:

- Defining a new service
- Associating actions with services
- Associating work items with service actions
- Editing an existing action
- Deleting a service

For the steps and tasks associated with setting up a service, see Configuring Services for an overview of the processes involved.

Configuring Services

The tasks necessary to configure a service are described in the following steps.

Prerequisites

None

Steps

In configuring services, you must define all of the following items.

	Item	See
1.	The details of the service (for example, version, description and activation dates)	Defining a New Service
2.	The actions available for a specific service and version	Associating Actions with a Service
3.	The work items used by the service actions	Associating Work Items with Service Actions

Defining a New Service

Services are also referred to as products or service offerings. In each case, however, they represent services deployed by a service provider who delivers, activates, maintains and bills a subscriber for it.

To define a new service, perform the following steps.

Prerequisites

None

Steps

1. In the Navigator, choose **Setup > Service Definitions > Services**.
2. Select the Details tab.
3. Click the New icon on the task bar.

   This action causes a blank entry to display in the Services list at the left.
4. Enter a value for the Display Name.

   This is the name of the service that is to display in the audit trail and during configuration.
5. Enter a value for the Internal Name.

   This is the name for the service that is to be used internally by the system during provisioning.
6. Enter a version number.
7. Check the Provision this Service box.
   - If you check this box, then you can submit an order against the service.
   - If you do not check this box, then the configuration of this service is still in progress, and an order can not be submitted against the service.
8. Enter a short description in the Description field.
9. Enter the effective date for this service to become active.
10. Enter the effective date for this service to become inactive.
11. Enter a value for Responsibility.

    This sets who is responsible to maintain this information.
12. Close the window.

You are prompted to save your changes.

To complete the definition, you need to associate an action with this service.

Associating Actions with a Service

An action is an operation performed on a service, product, and package. It instructs the Service Delivery Platform to internally call pre-defined sets of activities, rules, or data.

For every service that you define, you need to assign an action for provisioning that desired service. A service combined with an action creates the definition of an order line item.

You can repeat an action across various services, however, this action may not necessarily be valid across all fulfillment elements.

To create a new service action, perform the following steps.

> **Note:** It is possible to associate multiple actions with a single service.

Prerequisites

You must define a service before associating actions with it. (You may also reuse an existing service.) See Defining a New Service for details.

Steps

1. In the Navigator, choose **Setup > Service Definitions > Services**.
2. Select the Actions tab.
3. Select an action from the Available Actions list.
   - If you do not see the name of the desired action in the Available box, enter the name of the action in the Filter field and click the **Find** icon to search for it.
   - If the action is not defined yet, click **Define Actions** to open the Define Actions window and then add it.
4. Use the arrow buttons to move your choice from the Available Actions list to the Selected Actions list.

5. Enter a value for the Start Date.

   This is the date at which this action becomes available to the service.

6. Enter a value for the End Date.

   This is the date at which this action becomes unavailable.

7. Enter a Description for this action.

8. Enter a name for the Work Item Mapping Procedure.

   If necessary, click the Add/Edit Procedure icon to launch the procedure builder and define a new procedure. See Using the Procedure Builder for details of this process.

9. Close the window.

   You are prompted to save your changes.

Associating Work Items with Service Actions

To associate a work item with a service action, perform the following steps.

Prerequisites

Each service action can have one or more work items defined for it. However, there must be at least one work item for any available service action.

Steps

1. In the Navigator, choose **Setup > Service Definitions > Services**.

2. Select a service from the list at the left.

3. Select the Work Items for Action tab.

4. Select an action from the drop down list of available actions associated with this service.

   If you do not see the action that you desire, you need to select the Actions tab and add the desired action to the list of Selected Actions.

5. Select a work item from the Available Work Items list.

   - If you do not see the name of the desired work item in the Available box, enter the name of the work item in the Filter field and click the Find icon to search for it.

- If the work item is not defined, click **Define Work Items** to open the Define Work Items window and then add it. See Defining a New Work Item for details, if necessary.

6. Use the arrow buttons to move your choice from the Available Work Items list to the Selected Work Items list.
7. Enter a Provisioning Sequence numb er for each item in the Selected Work Items list.
   - Fulfillment actions marked with a 1 have no dependencies on other fulfillment actions and are processed in parallel with all other fulfillment actions marked 1.
   - Fulfillment actions marked with a 2 have a dependency on another fulfillment action, and are processed after all fulfillment actions marked with a 1 are processed.
8. Enter a descriptive comment in the Details of a Selected Work Item field, if desired.
9. Repeat steps 4 through 8 as many times as necessary.
10. Close the window.

    You are prompted to save your changes. to save and exit.

Editing an Existing Action

To edit an existing service action, perform the following steps.

Prerequisites

None

Steps

1. In the Navigator, choose **Setup > Service Definitions > Services**.
2. Select the Action tab.
3. Click **Define Actions**.
4. Select an existing action from list.
5. Modify the action parameters as desired.
6. Close the window.

You are prompted to save your changes.

Deleting a Service

To delete a service, perform the following steps.

Prerequisites

You can not delete a service if either the following conditions is true:

- If the allowable actions on the service have previously been defined.
- If orders have been running for that service.

Steps

1. In the Navigator, choose **Setup** > **Service Definitions** > **Services**.
2. Select a service from the list at the left.
3. Click **Delete**.

   The service disappears from the list.
4. Close the window.

   You are prompted to save your changes.

Managing Packages

You perform several different tasks with service packages. These include:

- Defining a new service package
- Associating services with packages

Defining a New Service Package

To create a new package of services, perform the following steps.

Prerequisites

None

Steps

1. In the Navigator, choose **Setup** > **Service Definitions** > **Packages**.

2. Select the Details tab.
3. Enter a value for the Display name.

   This is the name of the package that is to display in the audit trail and during configuration.
4. Enter a value for the Internal name.

   The system stores this name in its database to identify the package. (Use underscores rather than blanks in the package name.)
5. Enter a value for the Description.
6. Enter a value for the Start Date.

   This is the date at which this package becomes available.
7. Enter a value for the End Date.

   This is the date at which this package becomes unavailable.
8. Close the window.

   You are prompted to save your changes.

Associating Services with Packages

To associate a service with a package, perform the following steps.

Prerequisites

You must define the service package before you add services to it. See Defining a New Service Package for details.

Steps

1. In the Navigator, choose **Setup** > **Service Definitions** > **Services**.
2. Select the Services tab.
3. Select a service from the Available Services list.

   - If you do not see the name of the desired service in the Available box, enter its name in the Filter field and click the Find icon to search for it.
   - If the service is not defined yet, click **Define Services** and then add it. See Defining a New Service for details.

4. Use the arrow buttons to move your choice from the Available list to the Selected list.

5. Enter an Activation Sequence value for each service listed under Selected Services.

   This value determines the order in which the listed services are activated.

6. Check Provisioning Required if this service is to be provisioned by the Service Delivery Platform.

   - If you check this box, then the service is provisioned through the Service Delivery Platform
   - If you do not check this box, then the service is defined within the Service Delivery Platform Configurator, but is not necessarily activated through the Service Delivery Platform.

   This feature enables Service Providers to implement the identical service name among different provisioning medium without conflict.

7. Enter a comment in the Comment field, if desired.

8. Close the window.

   You are prompted to save your changes.

Managing Work Items

You perform a number of tasks with work items. These include:

- Defining a new work item
- Deleting a work item
- Defining a new work item parameter
- Adding parameters to a work item
- Associating fulfillment actions with work items

Defining a New Work Item

To define a new work item, perform the following steps.

Prerequisites

If you plan to associate a workflow with this work item, then you must create the workflow *before* you create the work item.

Steps

1. In the Navigator, choose **Setup > Service Definitions > Work Items**.
2. Click the New icon on the toolbar.

   This action causes a blank Details window to display.
3. Enter the Display name.

   System screens display this name for the work item.
4. Enter an Internal name.

   The system stores this name for the work item in its database.
5. Enter the Version.

   The Service Delivery Platform allows multiple versions of a work item.
6. Enter the Duration.

   The work item stays active for this length of time.
7. Enter a Description for this work item.
8. Enter the Begin Date.

   The work item becomes available on this date.
9. Enter the End Date.

   The work item is no longer available after this date.
10. Chose a Work Item Type from the drop down list.

    See Guidelines following for details of work item types.
11. Chose a user role from the drop down list for Responsibility.

    This determines who is responsible to maintain this information (a user, a group, or a user group). It can also be used for fault resolution assignment (i.e., assigning it to the person responsible for ensuring that the problem is resolved).
12. Close the window.

    You are prompted to save your changes.

Guidelines

Use the following information in determining the type of work item to choose.

Work Item Types

WI Type	Comments
Static	If selected, then you must also define the fulfillment actions associated with this work item. See Associating Fulfillment Actions with Work Items for details.
Dynamic	If selected, then you must also select a procedure from a list of existing procedures or create a new procedure. The procedure determines the list of fulfillment action's and their sequence at runtime.
User-defined workflow	If selected, enter the Item Type, Process and Key Prefix. You must also enter the name of the workflow that you have created. (Remember that any workflow that you create must be saved to the general Service Delivery Platform engine before it is accessible for use.)
User workflow start procedure	If selected, then you must enter the name of the workflow procedure also, or define a new one.

Deleting a Work Item

To delete an existing work item, perform the following steps.

Prerequisites

The data must be visible in your log in role for you to delete it.

Steps

1. In the Navigator, choose **Setup > Service Definitions > Work Items**.
2. Select a work item from the list at left.
3. Click **Delete.**

   The system performs a validation procedure to determine that there are no ill effects to deleting this work item. For example, it checks to see that no parameters or fulfillment actions are assigned to the work item to be deleted. If if passes the validation procedure, then the work item is deleted by the system and it is removed from the list.

Defining a New Work Item Parameter

To define a new work item, perform the following steps.

Prerequisites

None

Steps

1. In the Navigator, choose **Setup > Service Definitions > Work Items**.
2. Select the Parameters tab.
3. Click **Define Parameters**.

   The Define Parameters window opens.
4. Click the New icon on the toolbar.

   A blank entry opens in the Display Name list at the left.
5. Enter a value for the Internal Name of the parameter.

   The Service Delivery Platform stores this name in its database fro internal use by the system.
6. Enter a description for the new parameter.
7. Close the window.

   You are prompted to save your work.

Adding Parameters to a Work Item

To add parameters to a work item, perform the following steps.

Prerequisites

None

Steps

1. In the Navigator, choose **Setup > Service Definitions > Work Items**.
2. Select the Parameters tab.
3. Select a parameter from the Available Parameters list.

If you do not see the name of the desired parameter in the Available box, enter its name in the Filter field and click the **Find** icon to search for it.

4. Use the arrow buttons to move your choice from the Available list to the Selected list.
5. (Optional) Enter a Display Sequence number for each item in the Selected Parameter list.

   This value determines the order in which the parameter displays in the work item sequence.
6. (Optional) Enter a Evaluation Sequence number for each item in the Selected Parameter list.

   This value determines the order in which the work item evaluates the parameter.
7. Check the Required box if this parameter must be present in order to provision the service.
8. Check the Log in Audit Trail box if this parameter is to be logged and visible in the audit trail.

   Parameters that have this box checked (and are actually used with an order), become visible in the audit trail.
9. Enter a Default Value, if desired.

   This value is displayed in the order, and is changed by the user. For example, this could be an IP address or a password.
10. Enter a value in the Value Lookup SQL field.

    This value is an SQL statement that evaluates the parameter value. If necessary, click **Edit Lookup SQL** to launch the SQL editor.
11. Enter a mode for when evaluation of this parameter occurs, if desired.

    The available choices are:

    - Upon order receipt
    - When provisioning order

    See the Work Item Mode Guidelines following for considerations on choosing a work item mode.
12. (Mandatory, if a mode is selected in step 11, otherwise, ignore.) Enter a name for the procedure to be used in evaluating the parameter value.

If necessary, click the Add/Edit procedure icon to launch the procedure builder and define a new procedure. See Using the Procedure Builder for details of this process.

13. Close the window.

    You are prompted to save your work.

Work Item Mode Guidelines

You may wish to review the following information before selecting a work item mode.

Order Receipt If you select **Upon Order Receipt**, then you must also define a name for the procedure and write the body for the evaluation procedure.

The following steps are performed by the Service Delivery Platform if a parameter is marked as Upon Order Receipt. The Service Delivery Platform:

- Receives an order from the upstream system with the parameter and its value.
- Performs validation on the parameters.
- Executes the evaluation procedure.
- Stores the value of the parameter returned from the evaluation procedure. (This value is used in further processing.)

Order Provisioning If you select Upon Provisioning Order, then you must also define a name for the procedure and write the body for this procedure.

The following steps are performed by the Service Delivery Platform if a parameter is marked as When Provisioning Order. The Service Delivery Platform:

- Receives an order from an upstream system with the parameter and its value.
- Performs validation on the parameters.
- Stores the value of the parameter as is, without any further manipulation.
- At runtime, whenever the parameter is referenced, the associated When Provisioning Order procedure is executed to obtain the new value.
- The new value is used for order processing.

Associating Fulfillment Actions with Work Items

To associate a fulfillment action with a work item, perform the following steps.

Prerequisites

You can only associate fulfillment actions with either static or dynamic work items.

Steps

1. In the Navigator, choose **Setup** > **Service Definitions** > **Work Items**.
2. Select a work item from the list at left.
3. Select the Fulfillment Actions tab.

   The work item type must be static for the Fulfillment Actions tab to be accessible.
4. Select a fulfillment action from the Available Fulfillment Actions list.
   - If you do not see the name of the desired fulfillment action in the Available box, enter the name of the fulfillment action in the Filter field and click the **Find** icon to search for it.
   - If the user account is not defined yet, click **Define Fulfillment Actions** to open the Define Fulfillment Actions window and then add it. See Configuring Fulfillment Actions for details on adding a new fulfillment action.
5. Use the arrow buttons to move your choice from the Available Fulfillment Actions list to the Selected Fulfillment Actions list.
6. Enter a Provisioning Sequence number for each item in the Selected Fulfillment Actions list.
   - Fulfillment actions marked with a 1 have no dependencies on other fulfillment actions and are processed in parallel with all other fulfillment actions marked 1.
   - Fulfillment actions marked with a 2 have a dependency on another fulfillment action, and are processed after all fulfillment actions marked with a 1 are processed.
7. Enter a Comment for this fulfillment action, if desired.
8. Close the window.

   You are prompted to save your work.

Managing Fulfillment Actions

You perform a number of tasks with fulfillment actions. These include:

- Configuring fulfillment actions
- Adding parameters to a fulfillment action
- Associating a fulfillment procedure with a fulfillment action
- Modifying a fulfillment action procedure

Configuring Fulfillment Actions

To define a new fulfillment action, perform the following steps.

Prerequisites

You must perform the following tasks before configuring fulfillment actions:

- **Configure parameters:** See Adding Parameters to a Work Item.
- **Configure fulfillment element types:** See Defining a Fulfillment Element Type.
- **Configure fulfillment elements:** See Defining a New Fulfillment Element.
- **Build the fulfillment procedures:** See Using the Procedure Builder.

Steps

1. In the Navigator, choose **Setup > Service Definitions > Fulfillment Actions**.

   The Fulfillment Actions window opens.

2. Click the New icon on the toolbar, or chose **File > New** from the menu.

   A new, blank entry opens in the Fulfillment Actions list at the left.

3. Enter a value for the Display name.

   This is the name of the fulfillment action that is to display in the audit trail and during configuration.

4. Enter a value for the Internal name.

   This is the name for the fulfillment action that is to be used internally by the system during provisioning.

5. Enter the Version number for this fulfillment action.
6. Enter a value for the Description.
7. Chose one of the available Fulfillment Element Routing procedures from the drop down list.

If necessary, click the icon next to the Procedure field and create a routing procedure for use here. See Using the Procedure Builder for details.

8. Enter a value for Evaluate a Parameter.

   If necessary, click the icon next to the Procedure field and create an evaluation procedure for use here. See Using the Procedure Builder for details.

9. Chose a Responsibility from the drop down list, if desired.

   If this field is left blank, any user role can use this fulfillment action.

10. Click the Save icon on the toolbar.

Adding Parameters to a Fulfillment Action

To associate parameters with a fulfillment action, perform the following steps.

> **Note:** A fulfillment action can have more than one parameter associated with it.

Prerequisites

None

Steps

1. In the Navigator, choose **Setup** > **Service Definitions** > **Fulfillment Actions**.

2. Select a fulfillment action from the list at the left.

3. Select the Parameters tab.

4. Select a parameter from the Available Parameters list.

   - If you do not see the name of the desired parameter in the Available box, enter its name in the Filter field and click the **Find** icon to search for it.

   - If the parameter is not defined yet, click **Define Parameters** and then add it. See Defining a New Work Item Parameter for details.

5. Use the arrow buttons to move your choice from the Available list to the Selected list.

6. (Optional) Enter a Display Sequence number for each item in the Selected Parameter list.

This value determines the order in which the parameter displays in the fulfillment action sequence.

7. Check the Log in Audit Trail box if this parameter is to be logged and visible in the audit trail.
8. Enter a Default Value, if desired.

   This value is displayed in the order, and is changed by the user. For example, this could be an IP address or a password.
9. Enter a name for the Evaluation Procedure to be used in evaluating the parameter value. Specify an evaluation procedure for each parameter that you need to define, if desired.

   If necessary, click the icon next to the Procedure field to launch the procedure builder and define a new procedure. See Using the Procedure Builder for details of this process.
10. Click the Save icon on the toolbar to save your changes.
11. Select **File > Close** to exit.

Associating a Fulfillment Procedure with a Fulfillment Action

To associate fulfillment procedures with a fulfillment action, perform the following steps.

Prerequisites

A single fulfillment action can have more than one fulfillment procedures defined. However, it must have at least one procedure to indicate the adapter type.

Steps

1. In the Navigator, choose **Setup > Service Definitions > Fulfillment Actions**.
2. Select a fulfillment action from the list at left.
3. Select the Fulfillment Procedures tab.
4. Chose a Fulfillment Element Type from the drop down list.

   If necessary, click **Define Types** and create a new fulfillment element type.
5. Enter a value for Software Version (Adapter Type) to set the software version and the connect/disconnect values.

6. Enter a value for the fulfillment procedure to select the PL/SQL procedure to execute.

   If necessary, click the icon next to the Procedure field and create a new procedure for use here.

7. Click the Save icon on the toolbar to save your changes.
8. Select **File** > **Close** to exit.

Modifying a Fulfillment Action Procedure

To modify or edit an existing fulfillment procedure, perform the following steps.

Prerequisites

None

Steps

1. In the Navigator, choose **Setup** > **Service Definitions** > **Fulfillment Actions**.
1. Click the icon next to the Procedure field that you wish to modify.

   The Add/Edit Procedure window opens.

2. Modify the procedure as desired.
3. Click the Save icon on the toolbar to save your changes.
4. Select **File** > **Close** to exit.

Using the Procedure Builder

You use the procedure builder to perform the following tasks:

- Creating a new procedure
- Deleting an existing procedure
- Viewing procedure parameters
- Editing an existing procedure

Creating a New Procedure

To create a new procedure, perform the following steps.

Prerequisites

None

Steps

1. Open the Add/Edit Procedure window by clicking the icon next to the Procedure field.
2. Verify the procedure Type.

   This field is read-only. Its value depends on the form field that called the Add/Edit Procedure window.
3. Enter the internal name for this procedure.

   The Service Delivery Platform uses this name to reference the procedure in its database.
4. Enter the display name.

   This name is displayed in the system screens.
5. Enter a description of this procedure.
6. Do one of the following:

   - Enter the desired PL/SQL code in the Procedure code field.
   - Click **Copy From** to copy the code from an existing procedure. Use the Edit function to modify it to meet your needs.

   See Guidelines following for details on guidelines to use during the creation of a procedure.
7. Click **OK** to compile and generate the procedure.

Guidelines

Use the following guidelines during creation of a procedure.

- Do **not** use an initial DECLARE statement at the beginning of the code block
- Use the provided *Script Notepad* to write your provisioning procedure.
- Write your block of code as an anonymous PL/SQL block. (The following is an example of a PL/SQL connection procedure.):

```
  err_code number;
  err_str     varchar2(400);
BEGIN
```

```
  LOGIN('telnet $ip_address $portnumber', '$username_prompt', err_code, err_
str);
     SEND('$username', '$password_prompt', err_code, err_str);
     SEND('$password', '$login_prompt', err_code, err_str);
EXCEPTION
WHEN OTHERS THEN
   RAISE;
END;
```

- Use capital letters for all PL/SQL reserved words and the constructs provided by the Service Delivery Platform.
- Use the other standard programming constructs provided by PL/SQL in your block of code as desired.
- Always add the EXCEPTION block at the end of your procedure:

```
EXCEPTION
WHEN OTHERS THEN
   RAISE
END;
```

- You must compile and generate the procedure after finishing the code by clicking OK.

  The procedure builder prompts you with compilation errors if you have either of the following conditions exist:

  - The procedure contains PL/SQL syntax errors.
  - The procedure contains unrecognized parameters.

Note: To display a list of the parameters that can be used in the provisioning procedure, click **Available Parameters**.

The displayed parameters are the internal names of the service parameters that you previously configured. Only these internal names can be used inside the provisioning procedure body.

Deleting an Existing Procedure

To delete an existing procedure, perform the following steps.

Prerequisites

The procedure to be deleted must **not** be used by any other objects.

Steps

1. Open the Add/Edit Procedure window by clicking the icon next to the Procedure field.
2. Verify that the procedure Type lists the procedure that you wish to delete.
3. Click the Delete icon on the toolbar.
4. Click the Save icon on the toolbar to save your changes.
5. Select **File > Close** to exit.

Viewing Procedure Parameters

To view the parameters or attributes which can be used in the procedure, perform the following steps.

Prerequisites

None

Steps

1. Open the Add/Edit Procedure window by clicking the icon next to the Procedure field.
2. Click **Attributes**.
3. Click **OK** to close the Parameters window.
4. Click **OK** to exit the Add/Edit Procedure window.

> **Note:** The parameters or attributes displayed are the internal names of the fulfillment element attributes that you have previously configured. Only internal names can be used inside the procedure body.

Editing an Existing Procedure

To edit an existing procedure, perform the following steps.

Prerequisites

Do not modify a default procedure.

Steps

1. Open the Add/Edit Procedu**re** window by clicking the icon next to the Procedure field.
2. Verify the procedure type.

   This field is read-only. Its value depends on the form field that called the Add/Edit Procedure window.
3. Click on the Procedure Code field.
4. Select **Edit > Edit Field** from the menu.
5. Modify the PL/SQL code in the Procedure Code text field.
6. Click **OK** to compile and generate the procedure.

Managing Fulfillment Element Types

For every fulfillment element that you define, there must first exist a definition of that fulfillment element type.

The following tasks are associated with fulfillment elements types:

- Defining a fulfillment element type
- Deleting a fulfillment element type

Defining a Fulfillment Element Type

Note: Any service order request provisioned through the Service Delivery Platform requires that a specific fulfillment order type for that request also be configured through the Service Delivery Platform.

To define a new fulfillment element type, perform the following steps.

Prerequisites

Fulfillment element types are defined by system experts only.

Steps

1. In the Navigator, choose **Setup > Interface Definition > Fulfillment Element Types**.

   The Fulfillment Element Types window opens.

2. Select the Details tab.
3. Click **Define Types**.
4. Click **Add**.

   This action causes a blank Define Fulfillment Element Types window to open.

5. Complete the fields in the Details tab.
6. Complete the fields in the Attributes tab.
7. Complete the fields in the Software tab.
8. Close the window.

   You are prompted to save your changes.

Deleting a Fulfillment Element Type

To delete an existing fulfillment element type, perform the following steps.

Prerequisites

You can not delete a fulfillment element type if either one of the following conditions is true:

- The attributes for this fulfillment element have previously been defined
- The software versions for this fulfillment element previously have been defined

Steps

1. In the Navigator, choose **Setup > Interface Definition > Fulfillment Element Types**.

   The Fulfillment Element Types window opens.

2. Select the Details tab.
3. Select the fulfillment element type to delete from the list at the left.
4. Click Delete icon on the toolbar.

5. Close the window.

   You are prompted to save your changes.

Managing Fulfillment Elements

There are a number of tasks associated with fulfillment elements. These include:

- Defining a new fulfillment element
- Deleting a fulfillment element
- Modifying a fulfillment element configuration

Defining a New Fulfillment Element

To add a new fulfillment element, perform the following tasks.

> **Warning: Each Fulfillment Element name must be unique and consist only of alphanumeric characters.**

Prerequisites

The type of fulfillment element that you wish to add must exist before you can add the fulfillment element.

Steps

1. In the Navigator, choose **Setup > Interface Definition > Fulfillment Elements**.
2. Select the Details tab.
3. Click the New icon on the toolbar.

   This action causes a blank Details screen to open.
4. Complete the fields in the Details tab.
5. Complete the fields in the SW Versions tab, including both the Details and Attributes sub-tabs.
6. Close the window.

   You are prompted to save your changes.

Deleting a Fulfillment Element

To delete a fulfillment element, perform the following tasks.

> **Warning: If you delete a fulfillment element, then the logical and physical entity of the fulfillment element is removed from the Service Delivery Platform database.**

Prerequisites

You can *not* delete a fulfillment element, if either the following is true:

- You have previously defined attributes for this fulfillment element.
- You have previously defined the software generics for this fulfillment element.

Steps

1. In the Navigator, choose **Setup > Interface Definition > Fulfillment Elements**.
2. Select the Details tab.
3. Select the fulfillment element that you wish to delete from the list at the left.
4. Click **Delete**.
5. Close the window.

   You are prompted to save your changes.

Modifying a Fulfillment Element Configuration

If changing a fulfillment element configuration (for example, disabling a fulfillment element, or changing the fulfillment element attributes such as the IP address), perform the following steps.

Prerequisites

None.

Steps

1. Shutdown the Work Item queue to stop the work item dequeuers.

2. Ensure that there are no fulfillment actions remaining in the Wait for FE queue and the FE Ready queue. This means that all the fulfillment actions are processed at this point.
3. Shutdown the adapters for the fulfillment element.
4. Change the attributes for the fulfillment element.
5. Re-start the adapters for the fulfillment element.
6. Re-start the Work Item queue.

Administering Oracle Provisioning

This topic group provides task-based procedures for required for ongoing system maintenance and includes information on administration tools and utilities.

Workflow Procedure Guidelines

Use the following rules during procedure definition.

- Use the provided **procedure notepad** to write your provisioning procedure.
- Write an anonymous PL/SQL block as to insert into the procedure body.
- Use capital letters for all PL/SQL reserved words and the constructs provided by Oracle Provisioning.
- Use the standard programming constructs provided by PL/SQL in your block of code, if desired.
- Always add the **EXCEPTION** block at the end of the procedure.

Example Procedure Definition

The procedure builder provides a structure for building your procedures. For example, to build a new procedure, you simply insert your code into the following procedure definition.

```
/*******************************************************************************
This procedure calculate a new value for the Work Item parameter.
It has the follwoing input and output parameters:
p_order_id           IN NUMBER   -- order ID
p_wi_instance_id     IN NUMBER   -- wprlote, omstamce OD
p_param_val          IN VARCHAR2 -- parameter initial value
p_param_ref_val      IN VARCHAR2 -- reference value (if order amendment)

p_parmam_eval_val    OUT VARCHAR2 -- parameter new value
p_param_eval_val     OUT VARCHAR2 -- parameter new value
p_param_eval_ref_val OUT VARCHAR2 -- new reference value (if order ammendment)
*******************************************************************************/

-- Enter your procedure below:

DECLARE
```

```
-- Your declarations...

BEGIN
-- Your procedure body...
END;

 :
EXCEPTION
WHEN OTHERS THEN
RAISE
END;
```

Compiling Procedures

After creating a new procedure, you must compile it. The procedure builder prompts you with compilation errors if you have either of the following conditions exist:

- The procedure contains PL/SQL syntax errors.
- The procedure contains unrecognized parameters.

The AOL Generic Loader

The Oracle Application Object Library loader is a general purpose data migration tool that is used for patching seed data, delivering translations, or copying setup or transaction data from development to production systems.

The loader is a concurrent program named FNDLOAD. Enter the following command at a UNIX prompt.

```
FNDLOAD apps/pwd 0 Y mode configfile datafile entity [ param ... ]
```

The table following lists the parameters used with this executable and describes them.

FNDLOAD Parameter List

Parameter	Description
apps/pwd	Specifies the APPS schema and password. - If the connect_string is omitted, it is taken in a platform-specific manner from the environment using the name TWO_TASK
0 Y	Concurrent program flags

FNDLOAD Parameter List

Parameter	Description
mode	Specifies either UPLOAD or DOWNLOAD operation. ■ UPLOAD causes the specified data file to be uploaded to the database. ■ DOWNLOAD causes the loader to fetch rows and write them to the specified data file.
configfile	Specifies the configuration file to use. ■ The configuration file usually ends with a suffix of .lct, but this rule is neither enforced nor supplied by the loader.
datafile	Specifies the data file to write. ■ (DOWNLOAD) If the data file already exists, then it is overwritten. ■ The configuration file usually ends with a suffix of .lct, but this rule is neither enforced nor supplied by the loader.
entity	Specifies the entity type to begin the download or upload. ■ If you wish to upload all of the entity types in a data file (.ldt), specify a dash (-) as the entity type.
param	Specifies zero or more additional parameters that are used to provide bind values in the access SQL (for both the UPLOAD and DOWNLOAD operations). ■ Each parameter is of the form NAME=VALUE. The given NAME must not conflict with an attribute name for the entities being loaded.

Loader File Definitions

The table following lists the Loader files and provides a description of each.

Loader File Description

Name	Description	Conditions	Parameters
xnpcbevt.lct	Callback Events	First run xnpmsgps.lct	XNP_CALLBACK_EVENTS ■ MSG_CODE
xnpevtsb.lct	Event Subscribers	First load the fulfillment element data	XNP_EVENT_SUBSCRIBERS ■ MSG_CODE ■ FE_NAME
xnpgeoas.lct	Geographic Areas and Hierarchy	First load the Areas, then the Hierarchy	XNP_GEO_AREAS ■ CODE XNP_GEO_HIERARCHY ■ CODE
xnpmsgak.lct	Message Acknowledgments	First run xnpmsgps.lct	XNP_MSG_ACKS ■ MST_CODE
xnpmsgps.lct	Messages	None	XNP_MSG_TYPES ■ MSG_CODE
xnpsnumr.lct	Served Number Ranges	First load the fulfillment element data, then run xnpsptre.lct	XNP_SERVED_NUM_RANGES ■ STARTING_ NUMBER ■ FE_NAME ■ FEATURE_TYPE
xnpsptre.lct	Service Providers	None	XNP_SERVICE_PROVIDERS ■ CODE
xnpstats.lct	Porting Status Types	None	XNP_SV_STATUS_TYPES ■ STATUS_TYPE_CODE
xnptmrpb.lct	Timer Publishers	First run xnpmsgps.lct	XNP_TIMER_PUBLISHERS ■ MSG_CODE

References

For additional information, see the files in the following application directories.

- **Template configuration file**

  /fnddev/fnd/11.5/admin/import/fndstd.lct

- **Existing AOL configuration files**

/fnddev/fnd/11.5/admin/import/*.lct

Creating an Activity or Process Timer

Perform the following steps to create either an Activity or Process Timer.

Prerequisites

None

Steps

1. Open the iMessage Studio.
2. Define the Activity Timer:
   - Specify the Internal Name.
   - Select Timer from the Type LOV.
   - Specify a Display Name.
   - Specify a Description.
   - Select a value from the Priority LOV.
   - Select Timer Queue from the Queue Name LOV.
   - Specify a Responsibility.
3. Select the Data Source tab.
4. Define the Delay and Interval for the Activity Timer:
   - Select the tree root for the timer.
   - Select SQL Query from the Data Source Type LOV.
   - Select One and Only One from the Data Source Cardinality LOV.
5. Specify the Source for the timer.
6. Select the Detail tab.
7. Click **Compile** to compile the timer.

   If all goes well, the timer will compile without errors. If an error is encountered, verify that you have followed steps 2 - 5 above correctly.
8. Click the View button to examine the PL/SQL package that is generated as a result of compiling the Activity Timer (if desired).

9. Click **Apply**.

Source Guidelines

The source SQL structure for the Activity Timer must be of the following format:

```
SELECT D delay, I interval FROM dual
```

- D is the delay integer value (seconds)
- I is the interval integer value (seconds)

After setting the source SQL, you need to also:

1. Select the Delay branch from tree root for the Activity Timer.
2. Specify a reference for the Delay branch.

Delay Guidelines

The reference value Delay branch must map to the select-list specified in step 4 above. The reference value must be of the following format:

```
xnp$<activity_timer_name>.<select-list column name>
```

- <acitivity_timer_name> is the Internal Name defined in step 4.
- <select-list column name> is the first select-list value of the SQL source specified in step 5.

After setting the Delay reference value, you need to also:

1. Select the Interval branch from tree root for the Activity Timer.
2. Specify a reference for the Interval branch.

Interval Guidelines

The reference value *Interval* branch must map to the select-list specified in step 4. The reference value must be of the following format:

```
xnp$<activity_timer_name>.<select-list column name>
```

- <activity_timer_name> is the Internal Name defined in step 4.
- <select-list column name> is the second select-list value of the SQL source specified in step 5.

Creating a Message Timer

Perform the following steps to create a message timer.

Prerequisites

Before creating the message timer, you must first create the message with which it is associated.

Steps

1. Open the iMessage Studio.
2. Define a Message Timer:
   - Specify an Internal Name.
   - Select Message from the Type LOV.
   - Specify a Display Name.
   - Specify a Description.
   - Select a value from the Priority LOV.
   - Select Outbound Message Queue from the Queue Name LOV.
3. Click **Apply**.

   You must then use the Event Subscriber to associate a Timer Message (Different Timer which is an Activity Timer) to this newly created message.
4. Define Event Subscriber which is associated with a Timer
   - Access the Event Subscriber screen from the Configuration tab
   - Select the event defined in step 3 above
   - Click the Timers tab
   - Select the Activity Timer defined in step 3 above from the Timer LOV
   - Click **Apply**

Event Subscription

Applications register with the Event Manager if they need information on specific messages (events) or all instances of that message type. An application can be an external system, an operating system or a mediation layer.

Every message and event is sent to the Event Manager which becomes the source of distribution for events and messages. This is known as event subscription. Event subscription is a business process handled within Workflow.

- Applications can be set as default subscribers to specific events and messages. This is configured in the Event Subscriber utility.
- Applications can show interest in a specific instance of a message by specifying the REFERENCE_ID of the message.
- Applications can register for one of several response messages by using the reference identifier.
- When a message with a reference identifier arrives, the Event Manager performs the following tasks:
    - It executes the validation logic.
    - It executes the processing logic. It does this before delivering the message to all registered applications.
- Applications can show interest in all instances by registering with a NULL reference identifier.
- If an application is registered for a specific instance, the registration is automatically unsubscribed after delivering that message.
- Upon arrival of an expected response:
    - The message is delivered to the registered application.
    - The other expected response is marked EXPIRED.

Setting Up Event Subscription

In the Event Manager, it is possible for default subscribers to subscribe to specific events of the application. When a message occurs, the Event Manager ensures that an outbound message is automatically sent to the subscriber identified by a Fulfillment Element, OSS or gateway.

Responding to an Event

- It is possible to associate one or more responses to an event.
- A response is set during the configuration in the form of acknowledgments.

The Steps in Creating a Response to an Event

1. Create the message or event that is to the trigger for a response.
2. Configure an Acknowledgment/ Response to the message or event that you created in step 1.
3. Link the Acknowledgment that you created in step 2 to the message/event that you created in step 2.

Automatic Responses

If desired, you can associate one or more responses with an event. A response is an acknowledgment to a message.

For example, valid message responses for the message "Is this an existing customer?" are:

- "Yes, this is an existing customer."
- "No, this is not an existing customer."

These responses are messages in themselves and must be configured in Oracle Provisioning before they can be linked as responses to a message.

Administering the Oracle Service Delivery Platform

The Concurrent Manager framework provided by Oracle Applications is used to administer the Oracle Provisioning Concurrent Manager. The Concurrent Manager includes a specialized Controller program that is used by the Oracle Service Delivery Platform to start (or stop) adapters and/or dequeuers.

Orders within the Service Delivery Platform are processed using various queues. The processing of items of a queue is done with the help of **dequeuers**. These dequeuers are background processes which continuously poll a queue and process the items from the queue.

The provisioning of various network elements is accomplished with the use of adapters. Adapters are processes which are specialized in certain protocols. (Telnet, FTP, or other protocols.). You direct the adapters to perform various tasks in the system.

Note: To administer the Oracle Provisioning Concurrent Manager, open the Administer Concurrent Managers form window available through **Concurrent > Administer Manager**.

Oracle SDP Start

Application Start is a concurrent request that is performed by the Oracle Provisioning Concurrent Manager.

You use the Application Start process to perform the following tasks:

- Start the entire application, including the Controller, dequeuers and all adapters
- Start only the Controller and the dequeuers
- Start the Controller, the dequeuers and a subset of the adapters

The system automatically starts all the dequeuers and the Controller during the start process. If any dequeuers are already started, the number actually running is first determined, and matched against the number that are required to be started. The system automatically starts as many dequeuers as needed.

Note: You set the number of running dequeuers through the Queue Console, available through **Administration > Queue Console**.

Prerequisites

Application Start and Stop are mutually exclusive processes. If one is pending, the opposite operation does not proceed until the first finishes. In addition, the Oracle Provisioning Concurrent Manager processes must be up and running.

Steps

1. In the a Navigator, select **Applications > Start**.

   The Parameters box opens.

2. Enter a value in the Options field from the drop-down list of values.

   See the Guidelines following for information on these choices.

3. Enter a value in the Fulfillment Element field that is to be included (or excluded) from the application start process.

   This choice depends on the value that you chose in step 2, preceding. Again, see the Guidelines for details.

4. Enter a value (0 - 3) for the Debug Mode.

   This value sets the level of logging that can be used for debugging purposes.

5. Click **OK**.

   The Oracle SDP Start dialog box becomes available. Parameters that you set in the previous dialog box display in the Parameters field.

6. (Optional) Click **Copy**, if you wish to use start parameters from a prior start request, otherwise proceed to step 7.

   If you chose this option, then select from the provided list and continue to step 10.

7. (Optional) Click **Languages...**, if you wish to change the default language used in generating the log entries, otherwise proceed to step 8.

   If you chose this option, then place a check mark in the box next to the language, or languages, you wish to add. Continue to step 8.

8. (Optional) Click **Schedules...**, if you wish to change the default time at which this request is to be run. Perform either a or b, following.

   a. Click **Apply a Saved Schedule...** to choose from a list of predefined schedules.

   b. Chose an option from the Run the Job... list.You can set how often, and when, you wish the start request to run. Depending on which radio button you check, a number of additional fields display so that you may specify exact dates and times.

9. (Optional) Click **Options...**, to specify to whom, and in what language, you wish a notification to be sent. You can also direct the output log files to be sent to a specific printer.

10. Click **Submit** to initiate the start process and to close the dialog box.

> **Note:** Each request generates a Request ID. You can use this Request ID to view the request status and the log entries through the View Requests form window, available through **Concurrent > View Requests**.

Guidelines

Options: The table following lists the available choices. This option indicates which adapters are to be started. You must select from the provided list of values.

Fulfillment Element Select Options

Option	Description
ALL	All adapters (for all fulfillment elements) marked AUTOMATIC are started. (You set an adapter to AUTOMATIC through **Administration > Connection Manager**. You can also use the Adapter Properties form window to configure adapter properties.)
INCLUDE	Only adapters marked AUTOMATIC that are associated with the designated fulfillment element are started.
EXCLUDE	All adapters marked AUTOMATIC are started, except for those associated with the designated fulfillment element.
NONE	No adapters are started.

Fulfillment Element: Select the fulfillment element that is to be included or excluded (see the preceding table) from the application start. You must select from the provided list of values.

Debug Mode: Select the debugging mode to be used for the Controller and the dequeuer processes. You must select from the provided list of values.

The table following lists the available options.

Debug Options

Debug Level	Description
0	No trace
1	Minimum trace
2	Medium trace
3	Maximum trace

Note: Adapters are started with the debug level configured through the Adapter Properties window.

Oracle SDP Stop

Application Stop is a concurrent request that is performed by the Oracle Provisioning Concurrent Manager.

You use the Application Stop process to perform the following tasks:

- Stop the entire application, including the Controller, dequeuers and all adapters
- Stop a subset of the adapters

Prerequisites

Application Start and Stop are mutually exclusive processes. If one is pending, the opposite operation does not proceed until the first finishes. In addition, the Oracle Provisioning Concurrent Manager processes must be up and running.

Steps

1. In the a Navigator, select **Applications > Stop**.

   The Parameters box opens.

2. Enter a value in the Options field from the drop-down list of values.

   See the Guidelines following for information on these choices.

3. Enter a value in the Fulfillment Element field that is to be included (or excluded) from the application stop process.

   This choice depends on the value that you chose in step 2, preceding. See the Guidelines for details.

4. Enter a value for the Stop Mode.

   See the Guidelines following for information on these choices.

5. Click **OK**.

   The Oracle SDP Stop dialog box becomes available. Parameters that you set in the previous dialog box display in the Parameters field.

6. (Optional) Click **Copy**, if you wish to use stop parameters copied from a prior stop request, otherwise proceed to step 7.

   If you chose this option, then select from the provided list and continue to step 10.

7. (Optional) Click **Languages...**, if you wish to change the default language used in generating log entries, otherwise proceed to step 8.

   If you chose this option, then place a check mark in the box next to the language, or languages, you wish to add. Continue to step 8.

8. (Optional) Click **Schedules...**, if you wish to change the default time at which this request is to be run. Perform either a or b, following.

c. Click **Apply a Saved Schedule...** to choose from a list of predefined schedules.

d. Chose an option from the Run the Job... list.You can set how often, and when, you wish the start request to run. Depending on which radio button you check, a number of additional fields display so that you may specify exact dates and times.

9. (Optional) Click **Options...**, to specify to whom, and in what language, you wish a notification to be sent. You can also direct the output log files to be sent to a specific printer.

10. Click **Submit** to initiate the stop process and to close the dialog box.

> **Note:** Each request generates a Request ID. You can use this Request ID to view the request status and the log entries through the View Requests form window, available through **Concurrent > View Requests**.

Guidelines

Options: The table following lists the available choices. This option indicates which adapters are to be stopped. You must select from the provided list of values.

Fulfillment Element Select Options

Option	Description
ALL	All adapters, for all fulfillment elements, dequeuers and the Controller are stopped. This option signifies the complete application stop.
INCLUDE	Only adapters marked AUTOMATIC that are associated with the designated fulfillment element are stopped.
EXCLUDE	All adapters marked AUTOMATIC are stopped, except for those associated with the designated fulfillment element.

Fulfillment Element: Select the fulfillment element that is to be included or excluded (see the preceding table) from the application stop. You must select from the provided list of values.

Stop Mode: Select the mode to be used. You must select from the provided list of values.

The table following lists the available options.

Stop Mode Options

Debug Level	Description
NORMAL	This specifies the standard shutdown mode. Depending on the choice that you made under Options, this could be the entire system, or only a subset of it. For example, if you select the NORMAL mode, and the Options value is set to ALL, then the following occurs: ■ If there are no adapters still processing orders, then all the dequeuers and the Controller are stopped. ■ If some of the adapters are still processing orders, all the dequeuers stop, except for the Event Manager. Once an adapter has finished processing an order, the Event Manager shuts the adapter down and a database job shuts down the Event Manager and Controller.
ABORT	**Specifies an abnormal mode of shutdown. All the running processes (as specified in the Options selection) are terminated at the operating system level.**

Provisioning Procedure Macros

Oracle Provisioning comes with a set of predefined constructs that can be used to build procedures. These constructs are.

- SEND
- SEND_HTTP
- LOGIN
- RESPONSE_CONTAINS
- GET_RESPONSE
- GET_PARAM_VALUE
- NOTIFY_ERROR

SEND

The SEND macro accepts a command string as an argument. This command string is sent to the fulfillment element as the command to be executed. You use the SEND macro to “send” commands to the network elements.

Signature

The signature of the SEND construct is as follows:

```
SEND(<command > <varchar2>, <encrypt flag> <varchar2>, <prompt (optional)>
<varchar2>, <err code (out)> <number>, <error string (out)> <varchar2>)
```

The application stores all the transactions sent and received, to and from the fulfillment elements in its audit trail. However, it also provides a mechanism that allows you not to store, or write sensitive information contained in the service order request to the audit trail, if desired. Responses from fulfillment elements may also carry the same sensitive information.

Therefore:

- If you set the encryption flag to Y, then you are disabling the logging of all responses from the fulfillment elements.
- If you set the encryption flag to N, then you are enabling the normal logging of responses from the fulfillment elements.

Syntax

The usage of the construct is defined as follows:

```
SEND(
<command> string which contains the command to be sent,this is where you specify
your service parameters in $variable_name format.
<'Y' or 'N'> to indicate whether the command response must be logged into the
audit trail,
<prompt> is an optional field which indicates the prompt at the Network Element
after the execution of <command>>
<a number place holder for the out parameter error_code>,
<a varchar2 place holder for the out parameter error string>
);
```

Restrictions

Note the following restrictions on the use of the SEND macro.

1. For parameter values with white spaces, specify the corresponding **$variable_names** in double quotes.
1. Eliminate white spaces between SEND and the "(" following it.

   Correct Usage: SEND(

   Incorrect Usage: SEND (

2. Do not use SEND inside comments.

SEND_HTTP

The SEND_HTTP macro accepts a command string as an argument. This command is then sent to the fulfillment element as the command to be executed using the HTTP protocol. Typically, in this scenario, the command is an URL.

Signature

The signature of the construct is as follows:

```
SEND(
 <a string which contains the URL to be sent>  ,
<'Y' or 'N' indicator which indicates whether the URL should be logged into the
audit trail>,
<a number place holder for the out parameter error_code>,
<a varchar2 place holder for the out parameter error string>
);
```

Restrictions

Note the following restrictions on the use of the SEND_HTTP macro.

1. Eliminate white spaces between SEND_HTTP and the "(" following it.

   Incorrect Usage: SEND_HTTP (

   Correct Usage: SEND_HTTP(

LOGIN

The LOGIN macro accepts a command string as an argument. It uses the argument to initiate a connection. Use this macro to initiate a connection to a fulfillment element which has an interactive interface (for example, Telnet).

> **Note:** The LOGIN construct should appear before the first SEND construct in the procedure.

Signature

The signature of the LOGIN construct is as follows:

```
LOGIN(
<a string which contains the command to be sent>  ,
< a string which contains the command response expected>,
<a number place holder for the out parameter error_code>,
<a varchar2 place holder for the out parameter error string>
);
```

SEND (Connection Procedure)

This SEND macro accepts a command string as an argument. It uses the argument to send the command set (connect) to the fulfillment element. One of the connection commands is executed.

Signature

The signature of the LOGIN construct is as follows:

```
SEND(
 <a string which contains the command to be sent>  ,
< a string which contains the command response expected>,
<a number place holder for the out parameter error_code>,
<a varchar2 place holder for the out parameter error string>
);
```

Restrictions

Note the following restrictions on the use of the LOGIN macro.

1. Use the LOGIN macro once only before any SEND construct.
2. Use the LOGIN macro only in a connect procedure.
3. Do not use order, line, work item, and fulfillment action as service parameters. The $ variables are fulfillment element attributes, and, as such, can not be used as service parameters.

RESPONSE_CONTAINS

The RESPONSE_CONTAINS procedure macro is a PL/SQL function that compares a user-defined string against the string returned by a fulfillment element in response to the last command that it received. The macro returns TRUE if the two strings match, otherwise it returns FALSE.

Signature

The signature of the construct is as follows:

```
RESPONSE_CONTAINS(
    <a string which contains the string to be matched>
)
  return BOOLEAN;
```

Restrictions

Note the following restrictions on the use of the RESPONSE_CONTAINS macro.

1. Do not use $ variables.
2. Eliminate white spaces between RESPONSE_CONTAINS and the "(" following it.

   Incorrect Usage: RESPONSE_CONTAINS (

   Correct Usage: RESPONSE_CONTAINS(

GET_RESPONSE

The GET_RESPONSE macro returns the response string from the fulfillment elements for the **last** command sent.

Signature

The signature of the construct is as follows:

```
GET_RESPONSE return VARCHAR2
```

Syntax

The usage of the construct is defined as follows:

```
  err_code number;
  err_str     varchar2(400);
  lv_user varchar2(80);
BEGIN
  lv_user := GET_PARAM_VALUE('$WI.user');
SEND('AddProfile -h $WI.hostname -p $FA.dbport -u $WI.user', 'Y', err_code, err_
str);
IF RESPONSE_CONTAINS('profile already exist') THEN
  NOTIFY_ERROR('Error when provisioning Cisco Secure HA Server. Subscriber ' ||
lv_user || ' already exists','A');
  RETURN;
END IF;
EXCEPTION
  WHEN OTHERS THEN
  RAISE;
END;
```

Restrictions

Note the following restrictions on the use of the GET_RESPONSE macro.

1. Do not use $ variables.
2. Eliminate white spaces between RESPONSE_CONTAINS and the "(" following it.

   Incorrect Usage: GET_RESPONSE (

   Correct Usage: GET_RESPONSE(

GET_PARAM_VALUE

Use the GET_PARAM_VALUE procedure macro to obtain the value of the parameter during run-time.

Signature

The signature of the construct is as follows:

```
GET_PARAM_VALUE (<parameter name> <varchar2>) return VARCHAR2
```

- The <parameter name> is the name of the parameter in *$* format.
- The value returned by the function *can* be *NULL*.

When using this macro, specify the parameters as a *$* variable. For example, parameter *TN (*if used inside a provisioning procedure), is specified as *$ORDER.TN*.

Restrictions

Note the following restriction on the use of the GET_PARAM_VALUE macro.

1. Eliminate white spaces between GET_PARAM_VALUE and the "(" following it.

   Incorrect Usage: GET_PARAM_VALUE (

   Correct Usage: GET_PARAM_VALUE(

NOTIFY_ERROR

The NOTIFY_ERROR procedure macro indicates an abnormal exit point from the procedure. The provisioning of a service order request at a fulfillment element has an ERROR status.

This macro appends or replaces a response initiated by the fulfillment element / network element. This is the input string.

Signature

The signature of the construct is as follows:

```
NOTIFY_ERROR(<user's string> <varchar2>, <mode> <char>)
```

- The <user's string> contains a user-defined friendly message
- The <mode> flag is either **A** or **R**.

  A indicates that the user message is to be appended to the response string coming from the fulfillment element.

  R indicates that the user message is to be replaced by the response string coming from the fulfillment element.

Guidelines

1. You use this macro under the following conditions:
   - You want to identify errors coming from the fulfillment element during the provisioning process.
   - You want to identify errors when exiting from the provisioning procedure.
2. You use the NOTIFY_ERROR macro to abort a provisioning procedure.
3. You must follow every NOTIFY_ERROR instance in the procedure by a RETURN statement. This is the only way to abort the execution of the provisioning procedure.
4. The Service Delivery Platform uses the <user's string> to display the provisioning errors of a failed Service Order Request. Make this name user-friendly. This name provides the ability to translate cryptic network element error messages into those that are more user friendly.

Example Service Delivery Platform Procedures

Following are several example workflow procedures:

- Example provisioning procedure
- Example connect procedure

Example Provisioning Procedure

```
DECLARE
err_code number;
err_str     varchar2(400);
lv_user varchar2(80);
BEGIN
lv_user := GET_PARAM_VALUE (‘$user’);
  SEND(‘AddProfile -h $hostname -p $dbport -u $user’, ‘Y’, err_code, err_str);
  IF RESPONSE_CONTAINS (‘profile already exist’) THEN
     NOTIFY_ERROR(‘Error when provisioning Cisco Secure HA Server. Subscriber ‘
|| lv_user || ‘ already exists’,’A’);
RETURN;
 END IF;
EXCEPTION
WHEN OTHERS THEN
   RAISE;
END;
```

Example Connect Procedure

```
DECLARE
err_code number;
err_str     varchar2(400);
lv_user varchar2(80);
BEGIN
LOGIN(‘telnet $ip_address’, ‘login:’, err_code, err_str);
SEND(‘$username’, ‘$Password:’, err_code, err_str);
SEND(‘$Password’, ‘$’, err_code, err_str);

EXCEPTION
WHEN OTHERS THEN
   RAISE;
END;
```