Oracle® Retail Process Orchestration and Monitoring

Implementation Guide

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Contents

4   Schedule Customization

5   Export/Import Schedule Configuration

6   Notifications

7   User Roles and OAuth Scopes

8   Invoking POM Services Using OAuth

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Preface

This Implementation Guide describes the requirements and procedures to install this Oracle Retail Product release.

Audience

This Implementation Guide is for the following audiences:

- System administrators and operations personnel

- Database administrators

- System analysts and programmers

- Integrators and implementation staff personnel

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Conventions

The following text conventions are used in this document:

Convention	Meaning
boldface	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.
italic	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.
monospace	Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.

1

Introduction

The Process Orchestration and Monitoring (POM) application provides comprehensive batch scheduling and monitoring capabilities for Oracle Retail SaaS Applications.

POM's key features are:

- Support for Cyclical (or Hourly)/Ad-hoc (or Standalone)/End of Day (or Nightly) scheduling modes

- Configurable Schedule Invocation - Time/Externally triggered

- Configurable Schedule - Configure schedule specific to customer needs

- Hooks to integrate with external (customer) systems - For dependency management and job status updates

- Configurable notifications

2

Batch Concepts

This chapter describes the Process Orchestration and Monitoring (POM) concepts that are key to configure and implement the product successfully.

Batch Hierarchy

POM logically groups batch jobs in a schedule into a hierarchy of Processes, Flows and Cycles based on functionality and expected execution frequency.

Figure 2–1   Batch Hierarchy Diagram
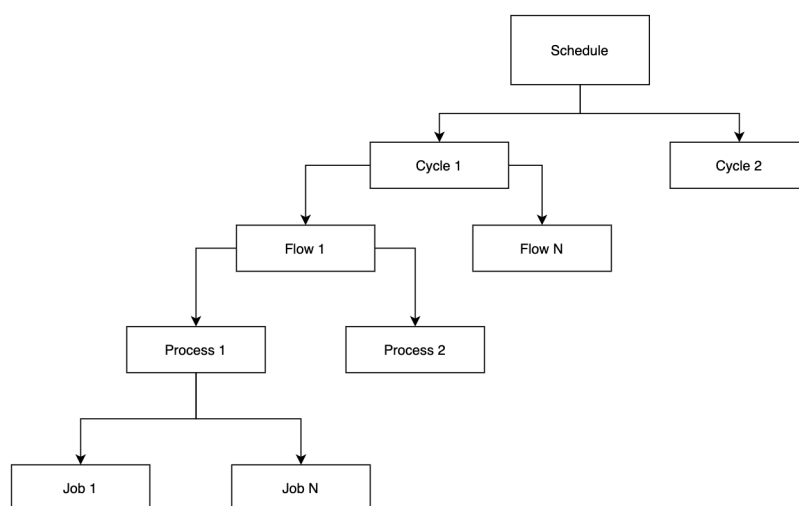
Cycle

A Batch Cycle is a logical collection of flows. Cycles are categorized into 3 groups,

1. **Ad hoc/Standalone**

   The jobs that can run multiple times a day on an as-needed basis are classified as Ad hoc cycles. Such processes are allowed to run independent of other processes in a Flow/Cycle

2. **Recurring/Hourly**

   Recurring or Hourly jobs are a special group of jobs which run multiple times a day at scheduled intervals.

> **Example:** The sales processing jobs in RMS support trickle processing by running every 30 minutes during the store trading hours. The schedule is pre-loaded with 24 cycles. Each cycle can have one or more flows where each flow is a set of jobs. The recurring cycles are time triggered from the Scheduler. Based on the client's business operations, the individual flows of each cycle will need to be scheduled. If any flow/cycle is not used then it has to be disabled as the nightly cycle will not start until the enabled cycles are all complete.

3. **End of Day/Nightly**

   This contains the set of jobs that are executed at end of the business day. The nightly cycle is time triggered from Scheduler. The nightly cycle will start only when all the loaded recurring flows are complete.

Flow

A batch flow is a logical collection of batch processes that run together. The batch flow always starts and ends with a single process, but it can run parallel processes in the middle of the batch flow.

Process

A batch process is a logical collection of batch jobs that always run in sequential order.

Job

A batch job is smallest entity in POM that can be scheduled. A job represents an actual application script.

Internal Dependencies

Internal dependencies are the dependencies between the process/job of the same schedule.

Inter-Schedule Dependencies

Inter-Schedule dependencies are the dependencies between jobs of the different schedules running on the same POM instance.

External Dependencies

External dependencies are the dependencies between the jobs running on external systems, such as a customer's system and jobs running on the POM schedule.

3

Integration

This chapter describes the various scenarios which involve configuring & integrating the Process Orchestration and Monitoring (POM) application to connect with external systems.

Setting Up a New Schedule in POM

When POM is first installed for a specific customer, it does not include any application batch schedules out of the box such as Merchandising or Retail Intelligence, and so on. An Oracle administrator or a system integrator need to first configure those schedules before they get loaded with the scheduling data. Configuring a new schedule entails setting up schedule properties such as the schedule name and description, and customer environment information for callbacks. It also entails setting up the location of different components and services with which different POM components need to interact to function properly.

Refer to the section "Configure New Schedule" in the "System Configuration" chapter of the *POM User Guide*.

Invoking Cycles in POM

Different SaaS customers operate in different models for running batch.

For some, the Oracle support team configures the time and frequency for running the batch cycles in POM on their behalf, based on their requirement.

Others may choose to use the Scheduler feature of the product. Refer to the *POM User Guide* for documentation on the Scheduler.

For others, the capability exists for them to control the time and frequency of batch executions by invoking the following ReST service.

Some may use a hybrid of all or some of the above methods.

> **Note:** All POM endpoints are protected by the OAuth authorization protocol. To invoke an endpoint in POM, a customer application must use an Access Token that was generated using the OAuth Client Credentials Grant. Refer to "Invoking POM Services Using OAuth" in this guide for further details.

Execution Request Creation

The specification of the ReST service to start the POM cycle execution is shown below:

HTTP Method	POST
Path	http://**\<pom-server-host\>**/ProcessServices/services/private/executionEngine/schedules/**\<Schedule_Name\>**/execution **Note: \<pom-server-host\>** and **\<Schedule_Name\>** variables need to be changed according to the target environment and schedule.
HTTP Headers	Content-Type = application/json Accept-Version = 16.0 Authorization: Bearer \<\<OAuth_Token_FROM_IDCS\>\>
Request Body	```\n{\n "cycleName": "<Cycle Name>",\n "flowName": "<Flow Name>",\n "processName": "<Process Name>",\n "requestParameters":"<Comma Separated Key Value Pairs>"\n}\n``` **Notes:** ■ **processName** attribute required only for Ad hoc cycles ■ **requestParameters** attribute is optional. This is useful if external systems would like to provide custom identifiers to POM and expect them to be returned on callbacks sent from POM.
Response Body	```\n{\n "value": "171" -Execution Request ID,\n "cycleName": "CycleName",\n "flowName": "FlowName",\n "processName": "ProcessName",\n "jobName": "JobName",\n "requestType": "requestType",\n "requestParameters": ":"<Comma Separated Key Value\nPairs>"\n "executionEngineInfo": "STARTED",\n "hyperMediaContent": {}\n}\n```

Invocation	Request Payload
Nightly Cycle invocation	```\n{\n "cycleName" : "Nightly",\n "flowName" : "Nightly",\n "requestParameters" : "callerId=XXX,correlationId=123"\n}\n``` **Note:** The Nightly Cycle contains a single flow hence a single invocation will suffice to start the Nightly Flow.

Invocation	Request Payload

Hourly Cycle invocation	```
	{
	    "cycleName" : "Hourly_Cycle_<N>",
	    "flowName" : "<FLOW_NAME>",
	    "requestParameters" : "callerId=XXX,correlationId=456"
	}
	``
	
	<N> is the cycle number (1 to 24)
	
	<FLOW_NAME> is name of the flow (Process Group) to invoke. For example, SALESPROCESS_CYCLE.
	
	``
	{
	    "cycleName" : "Hourly_Cycle_1",
	    "flowName" : "SALESPROCESS_CYCLE",
	    "requestParameters":"callerId=Sys_
	Name,correlationId=456"
	}
	``
	
	Note: The Hourly Cycles comprise of many distinct flows and for each flow a separate invocation would be required.

Ad hoc Cycle invocation	```
	{
	    "cycleName" : "Adhoc",
	    "flowName" : "Adhoc",
	    "processName" : "<ADHOC_PROCESS_NAME>",
	    "requestParameters" : "callerId=xxx,correlationId=789"
	}
	``
	
	Example:
	
	``
	{
	    "cycleName": "Adhoc",
	    "flowName":"Adhoc",
	    "processName":"RPM_NEW_ITEM_LOCATION_PROCESS _ADHOC",
	    "requestParameters":"callerId=Ext_System_Name,
	correlationId= 789"
	}
	``
	
	Note: Ad hoc Cycles are composed of many discrete individual Processes. For each Process, a separate invocation is required.

Execution Request Status Tracking

The following endpoints provide the ability to check the status of an execution request in POM:

HTTP Method	GET
Path	http://**<pom-server-host>**/ProcessServices/services/private/executionEngine/schedules/**<scheduleName>**/requests/{executionId} **Note:** Replace **<pom-server-host>** according to the target environment. **<scheduleName>**: Name of the schedule. For MOM apps, the schedule name is "MERCH". For RDE, the schedule name is "RDE". **<executionId>**: ID of the execution request returned by POM when execution request was submitted.

HTTP Headers	Content-Type = application/json
	Accept-Version = 16.0
	Authorization: Bearer <<OAuth_Token_FROM_IDCS>>
Response Body	■ **executionId** - ID of the execution request
	■ **scheduleName** - Name of the schedule for which this execution request was created.
	Sample values: MERCH, RDE, and so on.
	■ **cycleName** - Name of the Cycle for which this execution request was created.
	Sample values: Nightly, Hourly, or Adhoc.
	■ **flowName** - Name of the Flow for which the execution request was created
	Sample Values:
	For Ad hoc Cycle: Adhoc
	For Nightly Cycle: Nightly
	For Hourly Cycle: Name of the flow such as DEAL_PURGE_CYCLE, and so on.
	■ **processName** - Name of the Process for which the execution request was created.
	Sample Values:
	For Ad hoc: Name of the process such as POINDBATCH_PROCESS_ADHOC, and so on.
	For Nightly/Hourly: Always set to "ALL".
	■ **requestParameters** - Parameters associated with the execution request.
	■ **status** - Status of the execution request.
	Possible Values:
	QUEUED: Request is queued up for execution.
	RUNNING: Jobs from this request are being executed
	ERROR: One of the job in this request has failed. Note that a failed job would be restarted by POM Admin; there is no need to re-submit the execution request.
	COMPLETED: All jobs from this request were executed successfully.

External Status Update

The External Status Update feature provides the ability for external systems to register with POM to receive the Job status notifications as a callback to their ReST interface.

Figure 3–1   External Dependency
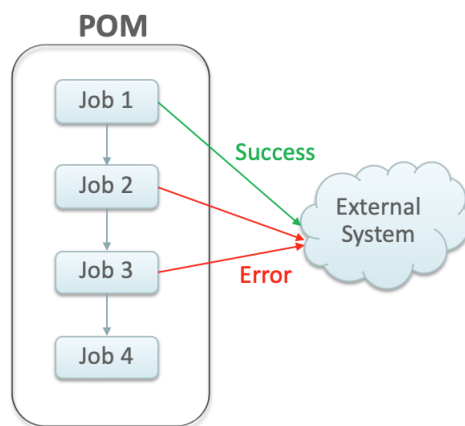
Schedule Configuration

This section details the steps to configure the External Status Updates feature at the schedule level:

1. Navigate to the System Configuration screen.

2. Click the Edit icon on the External Configuration Panel to open the External Configuration window.

3. Enter the configuration values:

   ■ **External Status URL** - External system's URL that needs to be called for status updates.

   Note: In addition to this configuration, you must work with Oracle support to get the External Status URL allowlist.

   ■ **External Status Update Mode** - Choose one of the options below:

   – **ALL** - POM will send a status update to the external system for each job's execution in the schedule regardless of success or failure.

   – **FAILED** - POM will notify only for failed jobs.

   – **NONE** - No status updates will be sent by POM.

> **Note:** The External Status Update Mode defined on this screen applies to all the jobs in a schedule. If status update is desired only for specific jobs then set the mode on the above screen to NONE and follow the steps defined in the Job Configuration section below.

- Click **Update Credentials** and provide the credentials for the external system.

Job Configuration

This section describes the steps to configure the External Status Update Mode at job level.

1. Navigate to the Batch Administration screen and select the schedule to update with the external status.

2. Select one of the Cycle - Nightly/Recurring/Standalone

3. Select the **Process/Job** combination and click Edit from table action menu to open the popup below.

4. Set the **External Status Update Mode** one of the following values:

 - **ALL** - POM will send a status update to the external system for each job's execution regardless of success or failure.

 - **FAILED** - POM will notify only for when this job fails.

 - **NONE** - No status update will be sent by POM for this job.

Payload Specification

Attribute	Description
processName	Name of the root process in a given cycle/flow **Note:** Process names in the callback response are prefixed with the name of the schedule. For instance, a callback response sent for Process "P1" would have processName attribute as MERCH_P1 on return.
processExecutionId	Unique identifier generated by POM to track the process executions.
activityName	Name of the job for which the callback/status update is sent.
activityExecutionId	Unique identifier generated by POM to track the job run instance.
callerId	Identifier provided by the caller to POM when submitting the invocation/execution request. POM returns the same ID back to caller.
correlationId	Identifier provided by the caller to POM when submitting the invocation/execution request. POM returns the same ID back to caller
callBackServiceDataDetail.<KeyName>	Key value pairs supplied to POM when submitting the invocation/execution request. Those are returned back to the caller
failedActivity	In the case where the callback is for a failed job, this field is populated with the details of the failed Job.
status	Status of the job execution - COMPLETED"SKIPPED, ERROR SKIPPED_ON_ERROR
activityStatus	Status of the job, and the derived activity state: ■ ERROR - ACTIVITY_FAILED ■ COMPLETED - ACTIVITY_COMPLETED ■ SKIPPED - ACTIVITY_COMPLETED ■ SKIPPED_ON_ERROR - ACTIVITY_COMPLETED

Payload Examples

Below are sample external status update payloads for the MERCH schedule.

Description	Payload

Hourly Job Callback	{
	    " callerId " : "XXX",
	    " correlationId " : "37",
	    " processName " : "MERCH_ BATCH_PROCESS _01",
	    " processExecutionId " : "MERCH_ BATCH_PROCESS_01
	~asfasfdasdfas",
	    " activityName " : " MERCH_ BATCH_JOB",
	    " activityExecutionId " : "123456",
	    " status " : "COMPLETED",
	    " activityStatus " : "ACTIVITY_COMPLETED",
	    " failedActivity " : null
	
	}

Nightly Job Callback	{
	    " callerId " : "XXX",
	    " correlationId " : "37",
	    " processName " : "MERCH_ START_NIGHT_BATCH_PROCESS ",
	    " processExecutionId " : "MERCH_ START_NIGHT_BATCH_
	PROCESS ~asfasfdasdfas",
	    " activityName " : " MERCH_ START_NIGHT_BATCH_JOB",
	    " activityExecutionId " : "123456",
	    " status " : "COMPLETED",
	    " activityStatus " : "ACTIVITY_COMPLETED",
	    " failedActivity " : null
	
	}

External Dependency

This feature allows customers to control the execution of a schedule running in POM by defining custom pre-dependencies. POM pauses the schedule execution on encountering these external pre-dependences and resumes the execution once they are released by customer.

Figure 3–2   External Dependency
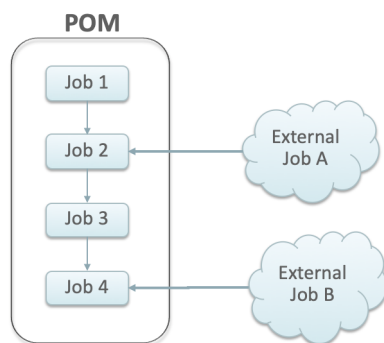
Configuration

This section details the steps involved in setting up the external dependency.

1. Navigate to the Batch Administration screen and select the schedule to which the external dependency will be added.

2. Select a Cycle - Nightly/Recurring/Standalone.

3. Find the **Process/Job** combination to which dependency needs to be added.

4. Click on the **Job** name to open the Batch Job Details panel.

5. On the External Dependency section of the screen, click the **Add** button to create the external dependency.

6. Provide the external job name.

7. Click **Ok** to save and exit or **Ok and add another** to create another dependency.

Releasing Dependency

External systems need to invoke the following POM ReST service to release/fulfill the external dependencies.

HTTP Method	POST
URL	http://**\<pom-server-host\>**/ProcessServices/services/private/schedules/**\<Schedule_Name\>**/external/jobs/**\<Ext_Dependendy_Name\>**/status/COMPLETED **Note: \<pom-server-host\>, \<Schedule_Name\> and \<Ext_Dependendy_Name\>** variables need to be changed according to the target environment and schedule.
HTTP Headers	Content-Type = application/json Accept-Version = 16.0 Authorization: Bearer \<\<OAuth_Token_FROM_IDCS\>\>
Request Body	None
Response Body	```{ "value": "true", "links": [], "hyperMediaContent" : { "linkRDO": []} }``` The true/false in the value attribute shown above indicates the success/failure of releasing the external dependency respectively.

4

Schedule Customization

All applications that run batch cycles in POM maintain a standard batch schedule with full list of jobs, pre-defined dependencies, job parameters, and so on.

As a part of the implementation, customers collaborate with Oracle support to determine the necessary schedule customizations and configuration according to the customer's needs.

POM supports modifying the following attributes of a schedule:

- Enable/Disable a job based on the functional use-case
- Modify the job parameters
- Modify the job dependencies
- Enable/Disable the hourly cycles

Customizations can be set up in the Batch Administration screen or through the Export/Import feature of POM, which is the subject of the next chapter.

5

Export/Import Schedule Configuration

This chapter explains the export/import schedule configuration feature of POM.

Overview

POM provides a feature, in the user interface, to export and import schedule configuration data such as data retention limits, throttle limits, enable/disable flags, schedule times, and so on.

This feature can be used in two ways:

1. Data exported on a specific environment can be imported back on a different environment without any modifications. This is a typical use case where the batch schedule on a certain environment, such as Stage, is set up and fine-tuned according to a customer's requirements. This includes specifying which jobs should or shouldn't run. It also includes specifying the times certain cycles or flows will start. Once the schedule is configured and fine-tuned (on Stage, for example) the export/import feature can be used to export the configurations from Stage and import them back into production.

   Note: The user has the option to export to a spreadsheet or a JSON file. In this first use case, it is recommended the user exports to a JSON file then imports it back into the other environment.

2. Data can be altered in the exported spreadsheet then imported back into the same environment. This is useful at provisioning time where an environment is first set up with the default batch schedule configuration. A user would then export the default configuration, then modify that configuration on the spreadsheet to conform to the customer's needs. The spreadsheet is then imported back into the same environment, applying the desired configurations.

   Note: When importing the spreadsheet on the Batch Administration screen, the user will have the option of importing job-related configuration or scheduler-related configuration (run times) or both. Refer to the "Batch Administration" section in the *POM User Guide* for more details.

This chapter describes each tab in the exported spreadsheet, along with the data on each sheet. It also indicates which fields can be modified.

Schedule Info Tab

This is an informational only tab. No fields are modifiable on it.

Table 5–1   Schedule Info

Field	Description	Modifiable?
Name	Schedule or application name.	No
Version	Schedule version.	No
Installation Date	Date the schedule was uploaded into POM.	No
Customer Name	This is used on notifications to identify which customer a notification is for.	No
Environment Name	This is used on notifications to identify which customer's environment a notification is for.	No

Schedule Configuration Tab

This tab contains schedule level settings.

Table 5–2   Schedule Configuration

Field	Description	Modifiable?
First Run Business Date	Date when batch was run for the first time. See subsection "Business Date Explained" in the "System Configuration" section of the *POM User Guide*.	No
Data Retention Days	Number of days historic data is to be retained in POM.	Yes - Recommended value is 30 days.
Long Run Average Multiplier	Number which is multiplied by a job's average run time or Threshold Runtime (if provided) to determine the threshold which, when exceeded, the job is deemed long running.	Yes - Usually a number between one and three.
External Dependencies	Indicates whether POM will respect external dependencies or not. They are usually dependencies on customers' internal processes.	Yes - Valid values are Y or N.
Inter-schedule Dependencies	Indicates whether POM will respect external dependencies or not. Those are dependencies on other schedules.	Yes - Valid values are Y or N.
Callback mode	This is also known as External Status Update Mode. Depending on the value, the customer's system is notified of success or failure of any job in the entire schedule. The value set here is overridden by this same setting for any individual job defined on the other job-specific tabs.	Yes - Valid values are ALL, FAILED or NONE. When value is NONE, no callback is made. When value is ALL, callback is made on either success or failure. When value is FAILED, callback is made only on failure

Throttling Tab

At this time, this tab should only be used to set throttle limits at the application level. Throttling is a technique used to limit the number of jobs that can run concurrently for a specific application. Throttling limits are set so a server's resources are not overwhelmed by too many concurrently running jobs.

> **Note:** Previously, throttle limits could be set at the application level and/or at the module level. Now they can only be set at the application level.

Also note that this tab was intended to provide the capability to enable/disable whole applications or modules. This is not functioning at this time. In order to achieve this objective, filter on application on the Nightly Jobs Configuration, Recurring Jobs Configuration or Adhoc Jobs Configuration, then change all enabled flags to 'Y' or 'N' as desired. For enabling/disabling whole modules, this has to be done on the Batch Administration screen at this time.

Table 5–3   Throttling Configuration

Field	Description	Modifiable? - Possible values
Application	Application code.	No
Module	Module name.	No
Job Admin	Job Admin is the component usually running on the same server as the application and which executes that application's batch jobs.	No
Throttle Limit	The max number of jobs that can run concurrently for the specified application.	Yes - A number that is greater than zero.
Enabled	This flag currently does not enable or disable jobs belonging to an application/module. See the second note at the top of this section for more information.	Yes - Valid values are Y or N.

Nightly Jobs Configuration Tab

This tab contains all Nightly cycle's jobs along with their configuration.

Table 5–4   Nightly Jobs Configuration

Field	Description	Modifiable? - Possible values
Job	Job name.	No
Process	Process name to which the job belongs; a process can contain multiple jobs.	No
Cycle	This is a fixed value for this tab of 'Nightly'.	No
Application	Application name to which this process-job belongs.	No

Table 5–4   (Cont.) Nightly Jobs Configuration

Field	Description	Modifiable? - Possible values
Initial Parameter	The initial parameter this job was set up with when the base schedule was first loaded into POM.	Yes - Can contain blank or any space-separated list of parameters.
Parameter Change	Flag indicating whether the parameter can be changed after the initial load. If it can, then the new value must be loaded in the next field: Active Parameter.	Yes - Valid values are Y or N.
Active Parameter	Parameter which overrides the Initial Parameter when Parameter Change is 'Y'.	Yes - Can contain blank or any space-separated list of parameters.
Skip on error	Flag indicating whether this job can be skipped when it fails.	Yes - Valid values are Y or N.
Callback mode	This is also known as External Status Update Mode. Depending on the value, the customer's system is notified of success or failure of this specific job by calling a predefined customer endpoint. The value set here overrides that of this same setting on the Schedule Configuration tab.	Yes - Valid values are ALL, FAILED or NONE. When value is NONE, no callback is made. When value is ALL, callback is made on either success or failure. When value is FAILED, callback is made only on failure
Day of week	Contains the day(s) of the week on which this specific Job will run. POM automatically skips these Jobs on remaining days. If this field is left blank, the job will run on every day of the week	Yes - Valid values are blank or any number of comma separated days of the week (for example: SUNDAY,MONDAY,TUESDAY, WEDNESDAY,THURSDAY, FRIDAY,SATURDAY)
Threshold Runtime	Estimated runtime in seconds for this specific job. This is an optional field which, when entered, will be used to multiply by the Long Run Average Multiplier defined on the Schedule Configuration tab. When the resulting number is exceeded, the job is deemed long running. If this field is blank, then the job's average run time is used instead to multiply by the Long Run Average Multiplier.	Yes - Valid values are blank or an integer number of seconds.
Enabled	Flag indicating if this job is enabled or disabled	Yes - Valid values are Y or N.

Recurring Jobs Configuration Tab

This tab contains the list of Recurring cycle/Process/Job along with their configuration.

Table 5–5   Recurring Jobs Configuration

Field	Description	Modifiable? - Possible values
Job	Job Name	No

Table 5–5   (Cont.) Recurring Jobs Configuration

Field	Description	Modifiable? - Possible values
Process	Process name to which the job belongs; a process can contain multiple jobs.	No
Cycle	Name of the hourly/recurring cycle this job belongs to.	No
Application	Application name to which this process-job belongs.	No
Initial Parameter	The initial parameter this job was set up with when the base schedule was first loaded into POM.	Yes - Can contain blank or any space-separated list of parameters.
Parameter Change	Flag indicating whether the parameter can be changed after the initial load. If it can, then the new value must be loaded in the next field: Active Parameter.	Yes - Valid values are Y or N.
Active Parameter	Parameter which overrides the Initial Parameter when Parameter Change is 'Y'.	Yes - Can contain blank or any space separated list of parameters.
Skip on error	Flag indicating whether this job can be skipped when it fails.	Yes - Valid values are Y or N.
Callback mode	This is also known as External Status Update Mode. Depending on the value, customer's system is notified of success or failure of this specific job by calling a predefined customer endpoint. The value set here overrides that of this same setting on the Schedule Configuration tab.	Yes - Valid values are ALL, FAILED or NONE. When value is NONE, no callback is made. When value is ALL, callback is made on either success or failure. When value is FAILED, callback is made only on failure
Day of week	Contains the day(s) of the week on which this specific Job will run. POM automatically skips these Jobs on the remaining days. If this field is left blank, the job will run on every day of the week	Yes - Valid values are blank or any number of comma-separated days of the week (for example: SUNDAY,MONDAY,TUESDAY, WEDNESDAY,THURSDAY, FRIDAY,SATURDAY)
Threshold Runtime	Estimated runtime in seconds for this specific job. This is an optional field which, when entered, will be used to multiply by the Long Run Average Multiplier defined on the Schedule Configuration tab. When the resulting number is exceeded, the job is deemed long running. If this field is blank, then the job's calculated average run time is used instead to multiply by the Long Run Average Multiplier.	Yes - Valid values are blank or an integer number of seconds.
Enabled	Flag indicating whether this job is enabled or disabled.	Yes - Valid values are Y or N.

Flows Configuration Tab

This tab contains a flow/cycle matrix. It contains a row for each flow and all recurring cycles as columns. An intersection of 'Y' means the given flow is defined to run as part of the given recurring cycle. It is recommended that all recurring cycles are enabled but not necessarily scheduled for running. See the Scheduling Flows Tab for further clarification.

Table 5–6   Flows Configuration

Field	Description	Modifiable?
Flow	Flow name.	No
Recurring cycle 1	A 'Y' or 'N' value indicating whether the given flow is run as part of recurring cycle 1.	Yes - Valid values are Y or N.
	A value of N does not disable jobs belonging to the flow/cycle intersection. Those jobs need to be manually disabled on the Batch Administration screen.	
Recurring cycle 2	A 'Y' or 'N' value indicating whether the given flow is run as part of recurring cycle 2.	Yes - Valid values are Y or N.
	A value of N does not disable jobs belonging to the flow/cycle intersection. Those jobs need to be manually disabled on the Batch Administration screen.	
Recurring cycle n	A 'Y' or 'N' value indicating whether the given flow is run as part of recurring cycle n.	Yes - Valid values are Y or N.
	A value of N does not disable jobs belonging to the flow/cycle intersection. Those jobs need to be manually disabled on the Batch Administration screen.	

Adhoc Jobs Configuration Tab

This tab contains the list of ad hoc jobs (also known as standalone) along with their configuration.

Table 5–7   Adhoc Jobs Configuration

Field	Description	Modifiable? - Possible values
Job	Job name.	No
Process	Process name to which the job belongs; a process can contain multiple jobs.	No
Cycle	This is a fixed value for this tab of 'Adhoc'.	No
Application	Application name to which this process-job belongs.	No

Table 5–7 (Cont.) Adhoc Jobs Configuration

Field	Description	Modifiable? - Possible values
Initial Parameter	The initial parameter this job was set up with when the base schedule was first loaded into POM.	Yes - Can contain blank or any space-separated list of parameters.
Parameter Change	Flag indicating whether the parameter can be changed after the initial load. If it can, then the new value must be loaded in the next field: Active Parameter.	Yes - Valid values are Y or N.
Active Parameter	Parameter which overrides the Initial Parameter when Parameter Change is 'Y'.	Yes - Can contain blank or any space separated list of parameters.
Skip on error	Flag indicating whether this job can be skipped when it fails.	Yes - Valid values are Y or N.
Callback mode	This is also known as External Status Update Mode. Depending on the value, the customer's system is notified of the success or failure of this specific job by calling a predefined customer endpoint. The value set here overrides that of this same setting on the Schedule Configuration tab.	Yes - Valid values are ALL, FAILED or NONE. When value is NONE, no callback is made. When value is ALL, callback is made on either success or failure. When value is FAILED, callback is made only on failure
Day of week	Contains the day(s) of the week on which this specific Job will run. POM automatically skips these Jobs on remaining days. If this field is left blank, the job will run on every day of the week	Yes - Valid values are blank or any number of comma separated days of the week (for example: SUNDAY,MONDAY,TUESDAY, WEDNESDAY,THURSDAY, FRIDAY,SATURDAY)
Threshold Runtime	Estimated runtime in seconds for this specific job. This is an optional field which, when entered, will be used to multiply by the Long Run Average Multiplier defined on the Schedule Configuration tab. When the resulting number is exceeded, the job is deemed long running. If this field is blank, then the job's calculated average run time is used instead to multiply by the Long Run Average Multiplier.	Yes - Valid values are blank or an integer number of seconds.
Enabled	Flag indicating whether this job is enabled or disabled.	Yes - Valid values are Y or N.

Job Dependencies Tab

This tab contains the definitions of all intra-schedule dependencies (or job dependencies within the same schedule) for all cycles (Nightly, Recurring and Adhoc). External, inter-schedule dependencies and execution links are defined on the Job External Associations tab.

Only the Enabled flag can be changed on this tab. Caution should be exercised when disabling a dependency, as in certain situations this can cause a job to run before data is processed by the predecessor job. This can therefore cause data corruption.

Table 5–8   Job Dependencies

Field	Description	Modifiable? - Possible values
Job	Job name.	No
Process	Process name to which the job belongs.	No
Cycle	Nightly, Adhoc or specific recurring/hourly cycle.	No
Predecessor Process	Process name to which the predecessor job belongs.	No
Predecessor Job	Job which must complete before the job defined on the current row can run.	No
Enabled	Flag indicating whether this dependency is enabled or disabled.	Yes - Valid values are Y or N.

Job External Associations Tab

This tab contains the definitions of External dependencies, inter-schedule dependencies and execution links, so all dependencies other than the intra-schedule dependencies described in the previous section.

> **Note:**   New external associations can be added in this tab.

External dependencies are usually those defined for customer processes. These are associated with a POM endpoint that the customer calls to satisfy the dependency.

Inter-schedule dependencies are those associated with another schedule. For instance, a Retail Insight job can be made to wait for a Merchandising job to complete.

An Execution link is a special dependency that sets up an application's schedule to be invoked based on a completion of a job in another application's schedule. For instance, the Retail Insight schedule can be set up to be invoked when job A completes in the Merchandising schedule.

Table 5–9   Job External Associations

Field	Description	Modifiable? - Possible values
Job	Job name.	Yes - Needs to be a valid job name already defined on the nightly schedule.
Process	Process name to which the job belongs.	Yes - Needs to be a valid process name already defined in the nightly schedule.
Cycle	Cycle name.	Yes - This can only be Nightly.
Association Type	Type of dependency.	Yes - Valid values are Internal for Inter-Schedule, External and EXEC_LINK

Table 5–9   (Cont.) Job External Associations

Field	Description	Modifiable? - Possible values
External Schedule	Name of the schedule containing the inter-schedule dependency or execution link.	Yes - This must be an existing valid schedule defined in the same instance of POM. This is only required for inter-schedule dependencies and execution links.
External Job	Name of external job.	Yes - In the case of an external dependency, this is the name that will be included in the payload of an endpoint called by the external system, such as the customer's. In the case of inter-schedule dependencies and execution links, this is a valid job name defined in the dependent schedule.
External Process	Process name to which the external job belongs.	Yes - This is required for inter-schedule dependencies and execution links. It's the process name associated with the external job.
Enabled	Flag indicating whether this dependency is enabled or disabled.	Yes - Valid values are Y or N.

Scheduling Flows Tab

This tab and the next contain configurations for scheduling flows or processes to run at specified times.

This Scheduling Flows tab contains the definitions of scheduled run times for the Nightly and recurring flows.

It simply contains one row for the Nightly flow stating the time when the Nightly processes will start every day.

The rest of the tab contains rows for each recurring flow, with columns for each of the hourly cycles making up the flow. For each cell at the intersection of Flow and hourly cycle, the time is entered for when the cycle is to start running. At present, there is a maximum of 24 hourly cycles that can be defined which, when spaced equally, would run one hour apart. Times are optional, so a blank cell indicates that the cycle will not be scheduled to run.

> **Note:**   Although there is no validation that cross-references the presence of a time in a cell with the enabling of the cycle on the Flows Configuration tab, ideally these would match up. This means that, if you enter a time for running an hourly cycle, the same intersection on the Flows Configuration tab should be 'Y'. However, it is conceivable to enable the cycle on the Flows Configuration tab but not schedule it, leaving the option open to schedule it as needed. In fact, this is the recommended practice: Enable all hourly cycles and only schedule a few as needed, but have the option to run more to catch up when necessary.

The timezone region ID entered in cell B is used for all times entered for all subsequent cycles on a given row. It is possible to specify a different timezone for select time cells (for example, 5:00 America/Chicago).

> **Note:** If the timezone region ID is null in the database, UTC is exported as the default into cell B of this tab.

Table 5–10   Scheduling Flows

Field	Description	Modifiable? - Possible values
Flow	Flow name.	No
Timezone Region ID	Timezone corresponding to the time entered in the subsequent cell(s). Timezone region ID is required, rather than a UTC offset (such as "UTC-06:00"). This is to accommodate Daylight Saving Time.	Yes - Valid timezone region IDs such as US/Eastern can be found as TZ database name at https://en.wikipedia.org/wiki/List_of_tz_database_time_zones
Nightly	Only fill this cell if Flow is Nightly. Enter the time for starting the Nightly cycle.	Yes - Enter a valid military time format such as 6:00 (6am) or 22:00 (10pm).
Recurring cycle 1	Enter a time in this cell to schedule recurring cycle 1 to run at that time. Leave blank to forego scheduling recurring cycle 1. It is possible to not schedule the cycle by default but elect to run it manually if needed.	Yes - Enter a valid military time format such as 6:00 (6am) or 22:00 (10pm). Conflict with the Nightly batch flow should be avoided as POM will skip running a recurring cycle if its start time is elapsed while Nightly is running.
Recurring cycle 2	Enter a time in this cell to schedule recurring cycle 2 for running at that time. Leave blank to forego scheduling recurring cycle 2. It is possible to not schedule the cycle by default but elect to run it manually if needed.	Yes - Enter a valid military time format such as 6:00 (6am) or 22:00 (10pm). Conflict with the Nightly batch flow should be avoided as POM will skip running a recurring cycle if its start time is elapsed while Nightly is running.
Recurring cycle n	Enter a time in this cell to schedule recurring cycle 1n for running at that time. Leave blank to forego scheduling recurring cycle n. It is possible to not schedule the cycle by default but elect to run it manually if needed.	Yes - Enter a valid military time format such as 6:00 (6am) or 22:00 (10pm). Conflict with the Nightly batch flow should be avoided as POM will skip running a recurring cycle if its start time is elapsed while Nightly is running.

Scheduling Adhoc Tab

This tab contains the definitions of scheduled run times for the ad hoc processes.

Table 5–11   Scheduling Adhoc

Field	Description	Modifiable? - Possible values
Process	Adhoc process name.	No
Description	Description of reason for running this Adhoc process at the specified time.	Yes - Optionally describe the purpose for scheduling the Adhoc process at the specified time

Table 5–11   (Cont.) Scheduling Adhoc

Field	Description	Modifiable? - Possible values
Frequency	Frequency in minutes at which this Adhoc process is to be run.	Yes - Valid values are Daily meaning run this process once at the specified time, or EVERY:x, where x is number of minutes. For example EVERY:120 means run this process every two hours.
Limit Occurrences	Relevant only when frequency of EVERY:x is used. If a Limit Occurrences value is entered, the process will run a maximum of times equal to the specified limit.	Yes - A positive integer. For example: Frequency of EVERY:120 with a Limit Occurrences of 4 means the process will run every two hours a maximum of four times
Prevent start during nightly	A flag which, when set to Y, indicates that this process is not to be started when the Nightly process is running. If the Scheduler tries to start a run while Nightly is running, the execution's status is set to Error with an Info message of "Nightly started running so can't run the process."	Yes - Valid values are Y or N.
Schedule Time	Entering a time in this field causes the process to be scheduled at that time in case of a DAILY frequency or to start the first run at that time in case of an EVERY:x frequency. Leaving this field blank causes the process to run immediately or the first run to start immediately when the scheduler day starts. If a specific time is entered in this field but the scheduler day starts after that time, the process will be scheduled for the next day at that time.	Yes - Enter a valid military time format such as 6:00 (6am) or 22:00 (10pm).
Enabled	Flag indicating if this process is to be scheduled.	Yes - Valid values are Y or N.
Timezone Region ID	Timezone corresponding to the time entered in the subsequent cell(s). Timezone region ID is required rather than a UTC offset such as UTC-06:00. This is to accommodate Daylight Saving Time.	Yes - Valid timezone region IDs such as US/Eastern can be found as TZ database name at https://en.wikipedia.org/wiki/List_of_tz_database_time_zones

6

Notifications

This chapter provides the list of notifications sent by POM to alert users about events that occur throughout the batch execution.

By default, all notifications are shown on the POM application. It is an option to configure notifications to also send e-mails. This is accomplished through the Notifications Administration function of Retail Home. Refer to the "Notifications Administration" chapter of the *Retail Home Administration Guide* for more information.

1. **Error:** This notification is sent whenever a running batch fails for some reason. This notification is for Oracle internal users.

2. **Warning type:** This notification is sent when application/user is trying to run an already running job.

3. **InformationNotification:** This notification is for System information. This notification is for Oracle internal users.

4. **SystemErrorNotification:** This notification is to notify of all unexpected system exceptions. This notification is for Oracle internal users.

5. **New scheduler day failure:** This notification is sent when there is an issue while setting up the new scheduler day, e.g. previous scheduler day has not yet been completed.

6. **Intraday cycle completed:** This is a low priority notification that is sent whenever an intraday cycle is completed.

7. **Intraday Cycle Skipped:** This is a low priority notification that is sent whenever an intraday cycle is skipped.

8. **NightlyStart:** This notification is sent when the Nightly cycle is kicked off.

9. **Nightly cycle completed:** This notification is sent when the nightly batch completes for the scheduler day.

10. **Long running job:** This notification is sent whenever a job is taking more than the configured threshold time for getting completed.

11. **NightlySummaryReport:** This notification sends out a batch summary report to the configured mail addresses when the nightly cycle is completed. This notification is for Oracle internal users.

12. **IntradayCycleSummaryReport:** This notification sends out a batch summary report to the configured mail addresses when an intraday cycle is completed for each flow.

13. **JosSyncFailed:** This notification is sent out when there is an issue in publishing disabled jobs from POM to JOS.

> **Note:** Disabled jobs are published to JOS as a part of the New Scheduler Day process. If the previous day's nightly cycle is still running at the time of New Scheduler Day creation, then publishing of the disabled jobs to JOS is done when the last job of the nightly cycle completes.

14. **ScheduleChangesSummaryReport:** This notification sends out the Delta Summary Changes Report to the configured mail address. Delta changes include the Jobs added to the current Schedule or Jobs removed or Jobs Status changed from the previous schedule. The External Dependency changes are also shown on the report. If there are no changes between the previous and current schedules, the notification is not sent out.

15. **ExternalDepPending:** This notification is sent when a Job is waiting for and External Dependency.

16. **InterSchedDepPending:** This notification is sent when a Job is waiting for an Inter-Schedule Dependency.

17. **InterSchedDepIssue:** This notification is sent when:

    - The business date between the interdependent Schedules vary by more than a day.

    - The External Schedule is day ahead of the current Schedule and previous day data is not available.

    - The inter-schedule dependencies are not valid and disabled.

    - A schedule includes inter-schedule dependencies or execution links that are not valid.

18. **ApplicationModuleDisabled:** This notification is sent when applications or modules are disabled during MDF synchronization.

19. **ErrorNotificationExternal:** This notification is sent whenever a running batch failed for some reason. This notification is for external customers.

20. **NightlySummaryReportExternal:** This notification sends out a batch summary report to the configured mail addresses when nightly cycle is completed. This notification is for external customers.

21. **ExternalDepComplete:** This notification is sent when an external dependency is completed.

22. **ExecutionLinkIssue:** This notification is sent if there is a failure/warning in the Execution Link invocation.

23. **ApplicationModuleEnabled:** This notification is sent when applications or modules are enabled during MDF synchronization.

24. **ExecutionEngineIssue:** This notification is sent when there are important/critical events/failures with the Execution Engine. For example:

    - When the Job Admin invocation fails or

    - When the request is stuck in SUBMITTING state and not able to auto recover or

    - When the request is stuck in SUBMITTING state with auto reconcile or

    - When the Job is stuck in STARTING state in Job Admin

25. **BatchScheduleImport:** This notification is sent as an update on progress/errors encountered during the schedule import process.

7

User Roles and OAuth Scopes

This section lists the pre-loaded user roles/scopes in POM.

Roles	Scopes	Description
BATCH_ MONITORING_JOB	rgbu:pom:services-monitor	One of the classic user interface roles. Users within this role are typically retailer administrators responsible for monitoring and executing batch. They can perform select activities on the Batch Monitor screen to move the schedule along.
BATCH_BUSINESS_ JOB	rgbu:pom:services-customer	Another one of the classic user interface roles. Users within this role are typically retailer business users responsible for just monitoring batch and configuring POM to enable callbacks into the Company's systems.
BATCH_ ADMINISTRATOR_ JOB	rgbu:pom:services-administrator	Users within this role are retailer administrators with full access to all POM actions. They monitor, maintain and configure the batch schedules. They may also maintain POM application configurations for efficient operations. They troubleshoot batch issues and work with Oracle support personnel to address those issues. Finally, they may apply batch schedule patches and upgrades. Additionally, users assigned this role are given access to the Oracle AMS Utilities screen.
BATCH_VIEWER_ JOB	rgbu:pom:services-viewer	Users within this role are retailer business users responsible for just monitoring batch. They have view access to all POM screens except AMS Utilities.
BATCH_SCHEDULE_ CONFIGURATION_ MANAGER_JOB	rgbu:pom:services-customer-manager	Users within this role are typically retailer administrators responsible for just monitoring batch and configuring external dependencies and callbacks into the Company's systems. They have view access to all POM screens except AMS Utilities.

Roles	Scopes	Description
BATCH_SCHEDULE_ ADMINISTRATOR_ JOB	rgbu:pom:services-cus tomer-administrator	Users within this role are typically retailer administrators responsible for maintaining monitoring and executing batch. They have view access to all POM screens except AMS Utilities. They can perform select activities on the Batch Monitor screen to move the schedule along. They also have update access to the Batch Administration screen. They can also configure some application properties and can configure a new schedule
BATCH_ORACLE_ AMS_ ADMINISTRATOR_ JOB	rgbu:pom:services-am s-administrator	Users within this role are typically Oracle AMS administrators who monitor, maintain and configure the batch schedules. They also maintain POM application configurations for efficient operations. They troubleshoot batch issues and work with other Oracle development and support personnel to address those issues. Finally they apply POM and batch schedule patches and upgrades.

Note: The first two roles mentioned in the above table are associated with POM's classic user interface. They are being deprecated along with the classic user interface. Customers need to migrate to the other four non-Oracle roles before those classic roles are removed.

These roles have been given similar access in the new user interface as the access they had in the classic user interface.

For more information regarding functional access of each POM role, refer to the *Oracle® Retail Process Orchestration and Monitoring Cloud Services Security Guide*.

8

Invoking POM Services Using OAuth

This section details the steps to invoke POM ReST services using the OAuth protocol. Using the OAuth protocol is a two-step process:

- Request an access token from the authentication provider IDCS.

- Provide the access token as an authorization header when invoking a service.

Prerequisite

As a one-time setup, Customers are required to create an OAuth client using the Retail Home Create IDCS OAuth 2.0 Client function. The OAuth client must be created against the "POM" app with the scope `rgbu:pom:services-customer-administrator-<ENV_ID>`

where `<ENV_ID>` represents the unique environment identifier such as `PRD1`, `STG1`, `DEV1` and so on.

For example, the `DEV1` scope would be: `rgbu:pom:services-customer-administrator-DEV1`

For more information about creating the OAuth client, refer to the "Creating IDCS OAuth 2.0 Client Apps" chapter in the *Retail Home Administration Guide*.

Requesting the Access Token

To generate a token from IDCS, the following information is needed:

- IDCS URL

- Client Id and Client Secret

- OAuth Scope

The curl command below invokes an IDCS service to generate an access token:

```
curl -I -H 'Authorization: Basic <base64Encoded OAuth_Clientid:Secret>' -H
'Content-Type: application/x-www-form-urlencoded;charset=UTF-8' --request POST
<IDCS_URL>/oauth2/v1/token -d 'grant_type=client_
credentials&scope=rgbu:pom:services-customer-administrator-<ENV_ID>'
```

This is a standard ReST call, with the following specifics:

- `<IDCS URL>` is the IDCS URL of this instance.

- `<base64Encoded OAuth_Clientid:Secret>` is the Base64-encoded OAuth Client Id and Client Secret provided as a Basic Authentication header.

- Specify the body as:

```
grant_type=client_credentials&scope=
rgbu:pom:services-customer-administrator-<ENV_ID>
```

The response to this call will be in this format:

```
{
    "access_token": "<TOKEN>",
    "token_type": "Bearer",
    "expires_in": 3600
}
```

Invoking the POM Service

To invoke the POM ReST service, you must add an authorization header as `Bearer <token>`, that is:

- The word `Bearer`

- A space

- A valid token obtained as described in

For example, the POM nightly cycle start request would look something like the following:

```
curl -i -H 'Authorization: Bearer <OAuth Token>' -H 'Content-Type:
application/json' --request POST
'http://<pom-server-host>/ProcessServices/services/private/executionEngine/schedul
es/<Schedule_Name>/execution?skipVersion' -d '{ "cycleName" : "Nightly",
"flowName" : "Nightly"}'
```