Oracle Fusion Cloud Applications

Best Practices for Scheduled Processes

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1 Get Started

How Do I Make Sure That Scheduled Processes Run Smoothly and Quickly?

Scheduled processes do tasks that are too complex or time-consuming to do manually, for example importing data or updating many records.

Scheduled processes are available across Oracle Fusion Cloud Applications and based on functionality from Oracle Enterprise Scheduler. Because many processes can run at the same time, think of the queue of submissions as a high-speed interstate.

To ensure that the highway runs smoothly for your users, use the guidelines, and tips in this best practices document to help you with each stage of the scheduled processes life cycle:

- **Plan:** Assess the processes that your users need to run, figure out when and how often to run them, and determine what custom jobs are needed, if any.

- **Implement:** Configure any custom jobs, roll out your plan, and test.

- **Maintain:** After users start running processes, make sure that everything keeps going without issues.

This life cycle isn't linear or something that you would go through only once. For example, you might need to revisit the planning phase at any time to adjust your plan.

> **Note:** These best practices are offered for your reference only. They're not intended to represent the only approach, and might not produce the same results for everyone.

Before You Start

A prerequisite for understanding these best practices is to be familiar with scheduled processes and jobs. You should already know the concepts and tasks covered in *Scheduled Processes* and *Enterprise Scheduler Job Definitions and Job Sets*.

Additional Information

You can find information about many of the predefined processes:

- Common features
  - See: *Where to Find Information About Common Scheduled Processes*

- Oracle Fusion Cloud Sales Automation and Oracle Fusion Cloud Fusion Service
  - See: *Where to Find Information About CX Sales Scheduled Processes*
  - See: *Where to Find Information About Fusion Service Scheduled Processes*
  - See: *Where to Find Information About All Common CX Scheduled Processes*

- Oracle Fusion Cloud Financials
    - See: *Where to Find Information About Financials Scheduled Processes*

- Oracle Fusion Cloud Human Capital Management
    - See: *Where to Find Information About HCM Scheduled Processes*

- Oracle Fusion Cloud Procurement
    - See: *Scheduled Processes for Procurement*

- Oracle Fusion Cloud Project Management
    - See: *Where to Find Information About Scheduled Processes in Projects*

- Oracle Fusion Cloud Student Management
    - See: *Where to Find Information About Student Management Scheduled Processes*

- Oracle Fusion Cloud Supply Chain & Manufacturing
    - See: *Scheduled Processes for SCM*

For sample SQL queries that you can use to monitor your scheduled processes, see *Sample SQL Queries for Monitoring Enterprise Scheduler Service (Doc ID 282161.1)* .

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2 **Plan**

Why Are Scheduled Processes Running Slow or Not Running at All?

There's a limit to the number of scheduled processes that can run at the same time. That number depends on the setup for your cloud service. If you need more information, contact your help desk.

To manage the capacity and streamline batch processing, identify the scheduled processes that your users need to run, and plan out when and how often to run them.

You can find information about many of the predefined processes:

- Common features
    - See: *Where to Find Information About Common Scheduled Processes*

- Oracle Fusion Cloud Sales Automation and Oracle Fusion Cloud Fusion Service
    - See: *Where to Find Information About Oracle Sales Scheduled Processes*
    - See: *Where to Find Information About Fusion Service Scheduled Processes*
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- Oracle Fusion Cloud Procurement
    - See: *Scheduled Processes for Procurement*

- Oracle Fusion Cloud Project Management
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- Oracle Fusion Cloud Student Management
    - See: *Where to Find Information About Student Management Scheduled Processes*

- Oracle Fusion Cloud Supply Chain & Manufacturing
    - See: *Scheduled Processes for SCM*

Here are some things to do and keep in mind when you design your plan. Also, see the rest of this chapter for more details about planning. For more best practices information, see *Additional Optimization Opportunities for Scheduled Processes*.

Avoid Having Too Many Processes Run at the Same Time

For processes that take more than a minute to finish, schedule them to run at a time when there are fewer scheduled submissions in the queue, that is, during nonpeak hours.

If you're submitting processes through web service from a third-party tool, review the time gap between each invocation. The gap between invocations means the time taken before submitting a new request. These processes are submitted using a SOAP client or Oracle Integration Cloud (OIC). In the Scheduled Processes work area, you're limited to submitting processes one by one, while from SOAP UI, you can submit multiple processes in a short period of time.

Related Topics
- Fusion Applications: ESS Frequently Asked Questions (FAQ's) (Doc ID 2723272.1)
- Invoke A ESS Job Set With Parameters Using Web Service (Doc ID 2239467.1)

Set Appropriate Frequency for Recurring Schedules

When you plan for a process to run on a recurring schedule, set an appropriate frequency, ideally with the longest intervals possible.

If running the process once a day would meet your business needs, don't plan to run it more frequently than that. If anyone attempts to run a process with an inappropriate frequency, such as every one or two seconds, they can adversely affect performance and prevent any process from running.

For example, if a process usually takes 5 minutes, don't schedule it every 4 minutes. In any environment, it's not possible to make sure that a process will complete in a particular time. So, you can test to determine the average time certain processes take to complete, and then schedule accordingly, leaving some additional time between the runs.

Consider the Order to Run Processes In

Keep in mind which processes need to be run in a specific order.

If there's a process to calculate taxes that are deducted from a payroll, and another process to generate payroll, you should plan to schedule the tax process to run before the payroll process.

Prevent Incompatible or Blocked Processes

Incompatible processes can't run at the same time. If a scheduled process has a Blocked status that means another process that's currently running is incompatible with the process and preventing the process from starting.

A process can be self-incompatible, which means it can't start if another submission for the same process is currently running.

Although blocked or incompatible processes can be resolved, consider incompatibilities when you plan. For example, if you know that certain employees need to run a process that is incompatible with a process that their manager runs, design your plan accordingly so that the employees and managers run their respective processes at different times.

Related Topics
- Resolve Blocked or Incompatible Processes

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Never Schedule Processes that Raise Processing Events

Processes that raise processing events must never run on recurring schedule. You must run these processes only as needed.

Here are few examples of processes that raise processing events:

- Send Pending LDAP Requests
- Auto-Provision Roles for All Users
- Send Personal Data for Multiple Users to LDAP

Should I Configure Custom Jobs and Job Definitions?

You're encouraged to use the predefined scheduled processes as is. But, as part of your plan, determine if your organization has any business requirements that make it necessary to have custom scheduled processes.

If you have any business requirements, determine what jobs and job definitions you need to create, or what you need to do to configure predefined job definitions.

- It's best to create something completely new, instead of duplicating or editing the predefined job definitions. To create a new scheduled process, you would plan to create Oracle Analytics Publisher reports as the basis for custom jobs. Then, on the Manage Job Definitions tab of the Manage Enterprise Scheduler Job Definitions and Job Sets page, you would create job definitions for those custom jobs. Users can then run those reports as a scheduled process from the Scheduled Processes work area.

- Only if you really need to, would you duplicate the predefined job definitions to create a custom copy that you can edit, mainly to update the parameters. There are many limitations to consider with the duplicate job definitions, and some predefined job definitions can't be duplicated anyway.

- Don't overuse custom job sets because they are high maintenance. For instance, when you add parameters to custom jobs, these parameters must be reflected on the job set as well.

Related Topics
- Create Job Definitions to Run Reports as Scheduled Processes

What Are Key Security Considerations for Scheduled Processes?

As part of your plan, determine the level of access individual users need to schedule processes.

Plan your custom roles accordingly so that they contain the appropriate roles and privileges to assign to specific users, depending on what they need access to.

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Here are key points of access that users might need:

- Access to the Scheduled Processes work area
- Ability to view, update, or cancel the processes that other users submitted
- Access to specific predefined and custom processes

3 Implement

What Setup and Configuration Do I Need for Scheduled Processes?

After you've created a plan for scheduled processes, as described earlier in this best practices document, it's time to carry it out.

These are the key aspects of implementing the plan:

- Configure job definitions, if your organization needs any custom scheduled processes.
- Provide users access to submit and manage scheduled processes.
- Test and deploy your plan.

See the rest of this chapter for details about implementing your plan.

Additional Information

You can find information about many of the predefined processes:

- Common features
    - See: *Where to Find Information About Common Scheduled Processes*
- Oracle Fusion Cloud Sales Automation and Oracle Fusion Cloud Fusion Service
    - See: *Where to Find Information About CX Sales Scheduled Processes*
    - See: *Where to Find Information About Fusion Service Scheduled Processes*
    - See: *Where to Find Information About All Common CX Scheduled Processes*
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- Oracle Fusion Cloud Student Management
    - See: *Where to Find Information About Student Management Scheduled Processes*
- Oracle Fusion Cloud Supply Chain & Manufacturing
    - See: *Scheduled Processes for SCM*

For more best practices information, see *Additional Optimization Opportunities for Scheduled Processes*.

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How Do I Configure Jobs and Job Definitions to Meet My Needs?

Based on the analysis you did for your plan for scheduled processes, you might need custom jobs and job definitions to meet your organization's requirements. Remember, you must test all custom jobs in your test environment before deploying to the production environment.

Here are some best practices to follow when you configure jobs and job definitions.

Follow Oracle Analytics Publisher Best Practices When Creating Custom Jobs

When you create a custom Oracle Analytics Publisher report as the basis for a custom job, make sure to follow best practices for creating reports so that the custom scheduled process doesn't take too long to run.

If you properly design and create the reports, you ensure maximum performance and scalability, and you minimize the performance impact on resources for scheduled processes.

Related Topics

- *Performance Best Practices*
- *Oracle Business Intelligence Publisher Performance Recommendations for Fusion Cloud Applications*
- *Create Job Definitions to Run Reports as Scheduled Processes*

Use Care When Duplicating Predefined Job Definitions

If you're duplicating a predefined job definition on the Manage Job Definitions tab, here are some best practices to consider:

- It's best if you have technical knowledge of Oracle Application Development Framework business components, and a basic understanding of what these are: view objects, view criteria, view accessors, bind variables, list of value definitions, return values from the list of values, and so on.
- Open every parameter and make sure that all the required parameters are populated properly.
- Make sure not to delete any predefined parameters that are copied over.
- Test the duplicate carefully because it might not work exactly like the original.

Related Topics

- *Duplicate Job Definitions*
- *ADF Business Components*

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Avoid Deleting List of Values Sources

Lists of values sources are used for parameters in job definitions. The sources determine the values that users can choose from when setting parameters as part of submitting a scheduled process.

On, the Manage List of Values Sources tab of the Manage Enterprise Scheduler Job Definitions and Job Sets page, when you delete a list of values source, you won't be able to find it and manage it anymore. But, it's not really gone. Any job definitions using that source can continue using it.

So after you delete a source, you can't create another one later with the same name, because the deleted one is technically still there, even though you won't be able to find it. To avoid confusion, it's recommended that you don't ever delete any list of values source. Just create values source as needed, with unique names.

Related Topics

- *Manage List of Values Sources*

Use Appropriate Page Element for Parameters

On the Manage Job Definitions tab, when you define parameters for job definitions and select String as the data type, you can select a page element that gives users a list of options to choose from for the parameter.

Here are some best practices to consider for the page element:

- Select **Choice list** only if the list for the parameter will have 10 or fewer options, and test it out to make sure that would be the case. In fact, users would get an error if it turns out there are more than 500 options.

- Select **List of values** if there will be more than 10 options for the parameter. There's no limit to the number of possible options. But, if you know that there will be fewer than 10, use the choice list instead. The list of values includes a search, which doesn't make sense if there are only a few choices and they're already displayed.

Related Topics

- *Define Parameters for Job Definitions*

How Do I Give Users Access to Scheduled Processes?

By default, the Scheduled Processes work area is available only to users with roles that have the Manage Scheduled Processes (FND_MANAGE_SCHEDULED_PROCESSES_PRIV) privilege.

It's recommended that you keep things that way, which means you should follow these best practices:

- Assign roles with the (FND_MANAGE_SCHEDULED_PROCESSES_PRIV) privilege only to users who need to run and manage scheduled processes. There's a limit to how many processes can run at the same time, so you want to make sure that users who don't need to run processes won't have access to the work area.
- In the Structure work area, always leave these default settings for the Scheduled Processes page entry:
  - **Show on Navigator** list has **EL Expression** selected

     o The EL expression is:

```
#{(securityContext.userGrantedResource['resourceType=FNDResourceType;
resourceName=FND_Scheduled_Processes_Menu;action=launch'])}
```

Here are a few more things to remember:

- In the Scheduled Processes work area, users can submit the processes they have access to and manage the processes they submitted themselves. Assign appropriate roles to users who also need to see and manage processes that others submitted.

- The custom job definitions that you create or duplicate aren't available for anyone to run by default. Same goes with custom job sets. Add the privilege associated with the custom job definition or job set to a custom role, and assign the role only to users who need to run the custom scheduled process.

Related Topics

- Configure the Navigator and Page Entries on the Home Page for Navigation
- Assign Roles for Access to Manage Scheduled Processes
- Create Job Definitions to Run Reports as Scheduled Processes
- Create Job Sets
- Edit Job Role and Abstract Role
- Assign Roles to an Existing User

How Should I Test and Roll Out Scheduled Processes for My Users?

Before you roll out your plan for scheduled processes, test it out by submitting the processes to run according to the plan. And see if all the scheduled processes finish without any issues in a timely manner.

This testing should give you insight to your environment's capacity so that you don't risk affecting the performance. As your organization's needs change, your scheduled process needs might change too. It's a best practice to test your plan on an ongoing basis to ensure that your scheduled processes are performing optimally.

When you're ready, communicate the plan to your organization so the users know when and how often to run which scheduled processes. Also inform them of some things to keep in mind when they submit processes:

- **Use parameters where possible:** Instead of leaving parameters blank, enter the necessary parameters, to streamline the processing and get more precise results.

- **Verify parameters before submitting a process:** When users submit a process with parameters, they should pay special attention to what they enter for the parameters. After they submit the process, they can't change the parameter settings, even if the process has not started running. What they can do is cancel the process and submit it again with the parameter values they want.

- **Consider regional time zones when scheduling processes:** Scheduled processes run according to the time zone in the regional settings of the user preferences. When users submit a process, they can select a different time zone, and that time zone overrides the regional settings. Be aware that time changes, such as Daylight Saving Time (DST) can affect scheduled processes, and users must take that into account when scheduling processes.

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For example, if users want to schedule a process to run on the day that a DST time change occurs, they should select a time zone that observes that time change. Some time zones have a different date when DST starts (Asia/Amman - 30th Oct). In this case, they must cancel the old schedule and create a new one.

- **Consider making a note of the process ID:** After users click the Submit button, they get a process ID for their submission. If users ever need to find this exact submission later, recommend that they make a note of the ID. This is especially the case if they submit a process to run on a recurring schedule. If they want to change or cancel the schedule later, they must act on this original submission, and the quickest way to find it is by process ID. But, without the ID, they can still use the search on the Scheduled Processes work area to find the submission, for example by submission time.

Related Topics
- Submit Scheduled Processes and Process Sets
- Cancel or Make Changes to Scheduled Processes

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4 Maintain

How Do I Support Users Who Are Running Scheduled Processes?

As your users proceed to submit and manage scheduled processes, you need to support them by performing maintenance tasks, and ensuring that the queue of scheduled processes keeps moving.

Make sure you have a custom role with the Administrator Role so that you can view, update (includes changing process priority), and cancel processes that other users have submitted, not just yours.

See the rest of this chapter for details about supporting your users.

Additional Information

You can find information about many of the predefined processes:

- Common features
    - See: *Where to Find Information About Common Scheduled Processes*

- Oracle Fusion Cloud Sales Automation and Oracle Fusion Cloud Fusion Service
    - See: *Where to Find Information About CX Sales Scheduled Processes*
    - See: *Where to Find Information About Fusion Service Scheduled Processes*
    - See: *Where to Find Information About All Common CX Scheduled Processes*

- Oracle Fusion Cloud Financials
    - See: *Where to Find Information About Financials Scheduled Processes*

- Oracle Fusion Cloud Human Capital Management
    - See: *Where to Find Information About HCM Scheduled Processes*

- Oracle Fusion Cloud Procurement
    - See: *Scheduled Processes for Procurement*

- Oracle Fusion Cloud Project Management
    - See: *Where to Find Information About Scheduled Processes in Projects*

- Oracle Fusion Cloud Student Management
    - See: *Where to Find Information About Student Management Scheduled Processes*

- Oracle Fusion Cloud Supply Chain & Manufacturing
    - See: *Scheduled Processes for SCM*

For more best practices information, see *Additional Optimization Opportunities for Scheduled Processes*.

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How Do I Keep Track of Scheduled Processes That Were Already Submitted?

To make sure that the scheduled processes that your users submit run smoothly, constantly keep track of the submissions.

Here are some key things that you can do in the Scheduled Processes work area to track and get information about the submitted processes:

- Use the saved searches to see the processes that were submitted within a specific time frame, for example in the last hour or 24 hours.

- Select specific processes in the search results to get details about the process:
    - **Status Details tab:** More information about the current status of the scheduled process, for example to see incompatibilities for a blocked process.
    - **Process Details tab:**
        - A log, if available, to see the stages the process has gone through, information or error messages, and other information about how the process ran or is running.
        - Parameter values that users submitted the process with. For example, parameters often determine the amount of data to work on, so parameter values might explain why a process is running for a long time.

- Use the **Hierarchy** view when looking at a problematic job to help you determine why a parent is stuck. The default **Flat List** view doesn't show if the job has sub-requests.

Keep the following best practices in mind as you monitor scheduled processes.

Related Topics

- *View Status and Other Details for Scheduled Processes*

- *Cancel or Make Changes to Scheduled Processes*

- *Statuses of Scheduled Processes*

Track the Amount of Traffic in the Queue

In the Scheduled Processes work area, regularly check how many processes are currently running or waiting to run. Pay attention to processes with these statuses.

- **Ready:** That might mean that the maximum number of processes running at the same time was already reached. So new submissions are now in the queue.

- **Wait:** That might also mean that the limit has been reached, but usually it means that the process is scheduled to run in the future.

- **Blocked:** Check the Status Details tab to see what incompatibility is preventing the process from running, and take any appropriate action.

Related Topics
- Resolve Blocked or Incompatible Processes

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Change the Priority of Processes in the Queue

When there are many processes in the queue, consider changing their priority, especially processes with the Wait status. This way you make sure that the more important processes run first.

Monitor Processes Running for a Long Time

Keep an eye on processes that have had Running status for days, or even weeks. You might need to investigate if there's a business reason holding up the process, or consider if you might need to cancel those and resubmit.

You can check for processes that have been running for a long time, using the SQL queries given in *Sample SQL Queries for Monitoring Enterprise Scheduled Services (ESS), Doc ID 2820161.1*.

If you have many processes to cancel, you might be able to cancel some or all of them in bulk. But before you do that, select each one and see its details to make sure you really want to cancel it.

> **Note:** Use the **Force Cancel** option to cancel processes that have been canceling for over 30 minutes but isn't done yet.

Related Topics
- Cancel or Make Changes to Scheduled Processes

Cancel and Reschedule Processes for Inactivated Users

If a user is inactive, for example because the user left the company, the processes they submitted on a recurring schedule won't run.

For security reasons, it's best that you cancel that submission and schedule a new one if still needed. The same situation applies to users who are locked or failed to authenticate.

How Does Downtime Affect Scheduled Processes That Were Already Submitted?

When the application goes down in maintenance mode, no scheduled processes will run during the downtime. Take note of when maintenance will happen so that you can prepare and plan ahead.

It's a good idea to ensure that you and your users follow these best practices:
- Avoid submitting long-running processes before the downtime.
- In general, put on hold any processes that are still running before the downtime, then release them after the downtime is over. If you know the reasons for the downtime, here are additional considerations:

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- ○ **Release update:** You don't need to put all processes on hold, but it's recommended.
  - ○ **Cloning or migration:** No need to put processes on hold, since processes will be deleted from the target environment.
  - ○ **Oracle Analytics Publisher server bounce:** You don't need to put all processes on hold.
- Avoid submitting any processes during the downtime.

Here's what happens before, during, and after the maintenance period:

- Starting 3 hours before, and during the entire downtime, you will see a message in the Scheduled Processes work area about the maintenance. Don't submit any processes while you still see this message.

- During a grace period of 5 minutes before the downtime starts, any processes that are still running might be automatically paused. But if they're not, then those processes end with a Canceled status after the grace period.

- No processes run during the downtime. If a process was submitted on a recurring schedule and was supposed to run during the downtime, it doesn't run at the scheduled time but right after the downtime ends.

- Any processes that were automatically paused during the downtime resume running after the downtime ends.

Related Topics
- Cancel or Make Changes to Scheduled Processes
- Statuses of Scheduled Processes

Why Are Reports Taking Too Long to Run?

Scheduled processes based on Oracle Analytics Publisher reports might take too long to run because of something going on with the reports themselves. When users submit these processes, they're essentially running Analytics Publisher reports.

Many predefined scheduled processes are based on Analytics Publisher reports. All the custom jobs definitions that were created brand new (not created by duplicating or editing predefined job definitions) are also based on reports. Predefined or custom job definitions based on Analytics Publisher reports have the BIPJobType job type.

So if there are performance issues with the scheduled processes queue, check if there are processes based on reports that are taking too long to run, for example 30 minutes or even multiple hours. Usually that means the SQL queries are slow in fetching data. If the problematic processes are for custom reports, revisit and tune the custom reports. In general, if you have custom reports running as scheduled processes, keep an eye on them regularly to make sure they don't take too long and prevent other processes in the queue from running in a timely manner.

You should also monitor the report performance using tools from Analytics Publisher. As an administrator, you can run queries against the ESS_REQUEST_HISTORY table from Analytics Publisher. This way, you'll know if the table is getting larger or if there are any issues such as too many submissions of certain processes.

Related Topics
- Performance Best Practices
- Oracle Business Intelligence Publisher Performance Recommendations for Fusion Cloud Applications

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