

Chapter 32

Workflow Engine Functionality

This chapter details the functionality of the Workflow application's two major subsystems: the workflow engine and Workflow Manager; it contains the following sections:

- Workflow Engine on page 515
- Workflow Manager on page 517

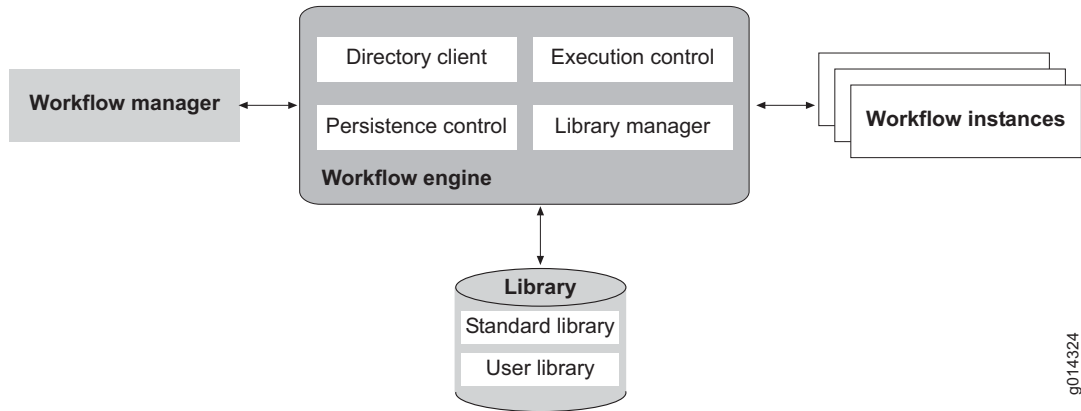
Workflow Engine

The workflow engine has four subsystems (see Figure 67):

- Execution control—Instantiates, parameterizes, and executes workflows. Also, it provides a way to access the active workflows to check their status or to cancel them.
- Library manager—Has all the knowledge about the workflow library. It encapsulates input-output operations for other blocks. Workflows can be deployed through JAR files or the SDX directory.
- Persistence control—Manages the state of active workflows to prevent them from losing information after they are started.
- Directory client—Contains information about LDAP servers and schema. (For more information, see *SDX Integration Guide, Chapter 2, Overview of LDAP Integration*.) The directory client listens to a port specified in the configuration file and receives messages sent by SDX components such as the object state manager (OSM).

On receiving a message, the directory client asks execution control for information about the runtime attributes required for that particular workflow and retrieves their values from the SDX directory. After the directory client retrieves all values, it passes them to execution control. On completion of the workflow, the directory client reports a result.

Figure 67: Workflow Engine Functional Blocks



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Workflow Execution

This section outlines workflow execution.

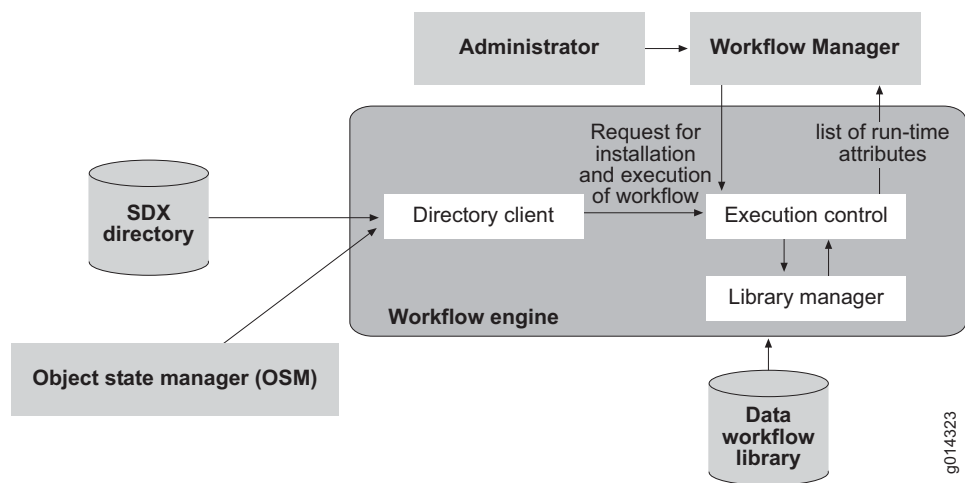
How a Workflow Is Started

Either Workflow Manager or object state manager (OSM) requests that a workflow be loaded. Execution control loads uses the name of the workflow as a key to load the workflow from the library manager.

Event (Notification)

The directory client requests execution control to execute a workflow with a given name and runtime attributes in response to a request from an SDX component. Then the control instantiates the workflow and gives it a unique ID. Finally, the control sets all runtime attributes and starts the workflow (see Figure 68).

Figure 68: Execution of Workflow



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You input all runtime attributes shown in a screen and then execute the workflow. The results are not forwarded to the SDX directory or any SDX component. Execution control returns a result to Workflow Manager only.

Workflow Manager

Workflow Manager is an infrequently used GUI through which you can:

- Edit runtime properties during the troubleshooting of workflows.
- Execute a workflow as part of troubleshooting.
- Cancel an active workflow as a last resort to solve a problem.
- Browse the status of running workflows.
- Display the progress information of the work items inside a workflow.
- Reconfigure the event adapter (dynamically).
- Reload the workflow library (dynamically).
- Reconfigure the workflow engine (dynamically).

To use Workflow Manager, you input all runtime attributes shown in a screen and then execute the workflow. The results are not forwarded to the SDX directory or any other SDX component. Execution control returns a result to Workflow Manager only.

Workflow Manager GUI

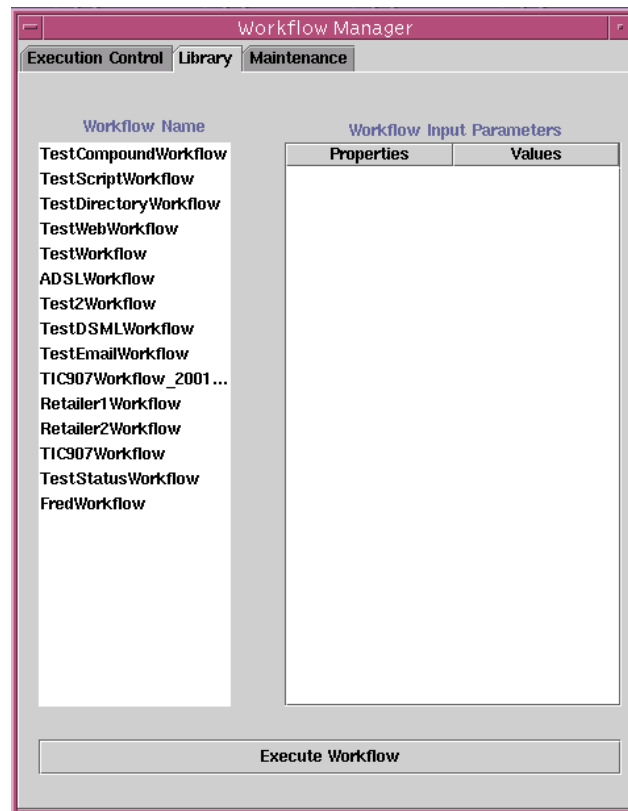
Figure 69 shows Workflow Manager functional interfaces. Although Workflow Manager is capable of starting a workflow, it is designed for administering the workflow engine in exceptional situations, such as troubleshooting and cancelling workflows.

Figure 69: User Interfaces Through Workflow Manager Log Files

Library Tab

Workflow Manager displays in the Library tab all workflows that you can execute. To execute a workflow, highlight one workflow name, fill in its attributes in the table, and click the Execute Workflow button.

Figure 70: Library Tab



After a workflow is successfully started, the workflow engine assigns a workflow ID (number) to the workflow instance, and a message box pops up to display it.

Execution Control Tab

Use the Workflow ID to perform any operations related to that workflow, such as checking its status and cancelling it. These operations are available in the Execution Control tab.

Figure 71: Execution Control Tab



You can perform the following three procedures by using the buttons on the Execution Control tab.

Viewing Workflow Details

To view details on an active workflow:

1. Enter the ID of the respective workflow in the Workflow ID text box.
2. Click Show Workflow Data.

The information about a workflow state is displayed in the Workflow State Data table.

Canceling Workflows

To cancel a workflow:

1. Enter the ID of the workflow in the Workflow ID text box.
2. Click Cancel Workflow.

The specified workflow is canceled, but no message is displayed.

Viewing Workflow Progress

To view the progress of a workflow or inspect a workflow:

1. Enter the ID of the workflow in the Workflow ID text box.
2. Click the Inspect Workflow button.

The list of executing work items is displayed in the Executing Work Items list box, and the list of terminated work items is displayed in the Terminated Work Items list box.

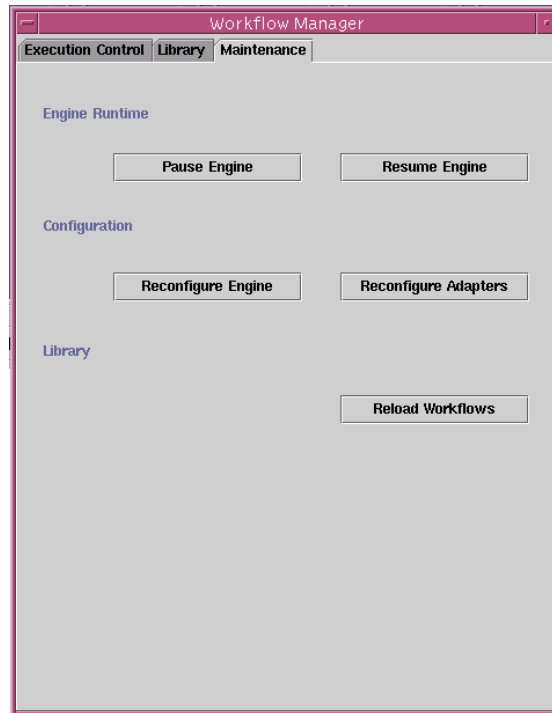


NOTE: You can check the progress of a workflow that has already been completed or even canceled, in addition to an active workflow.

Maintenance Tab

Use the Maintenance tab to pause the workflow engine so that the workflow configuration or workflow library can be reloaded or reconfigured. After the library is reloaded or reconfigured, click Resume Engine to start the workflow.

Figure 72: Maintenance Tab



Use the buttons on the Maintenance tab to perform the following procedures.

Pausing and Resuming Workflow

To pause and then resume an active workflow:

1. To stop the workflow engine, click Pause Engine. Workflow requests are still accepted, but no workflows are started.
2. To resume processing workflows, click Resume Engine. The active workflows continue to execute. The workflow requests received while the workflow engine was stopped are processed.

Reconfiguring the Workflow Engine

To reconfigure the workflow engine:

1. Click Pause Engine to stop the workflow engine.
2. Enter the new configuration information.
3. Click Reconfigure Engine.
4. Click Resume Engine.

Reconfiguring an Event Adapter

To reconfigure an event adapter:

1. Click Pause Engine to stop the workflow engine.
2. Enter the new event adapter settings.
3. Click Reconfigure Adapters.
4. Click Resume Engine.

Reloading a Workflow

To reload a workflow:

1. Click Pause Engine to stop the workflow engine.
2. Perform modifications in the workflow library (add workflows to a JAR file, or add a workflow to the SDX directory).
3. Click Reload Workflows.
4. Click Resume Engine.

Using the Workflow Probe

At the command line, type:

```
probe [-d <output directory> | -we <workflow id> | -wc <workflow id>] <log file name>
```

- `<log file name>` —Path of the execution log, usually located in the `/opt/UMC/var/log` directory and named `wfexec.log`.

The three mutually exclusive options specify:

- `-d <output directory>` —Output directory for the statistics. Two files are created, named `wistat.csv` and `wfstat.csv`. They are both in the comma-separated values format. `Wistat.csv` contains statistics on the work item's performance organized by work item name, work item type, and the workflow to which they belong. `Wfstat.csv` contains the statistics on the workflow's performance organized by workflow name. If not specified, assume the current directory as the output.
- `-we <workflow id>` —Prints a list of the work items that are currently executing in the given workflow, one work item per line.
- `-wc <workflow id>` —Prints a list of the work items that have already been completed in the given workflow, one work item per line.

Table 73 shows the layout of the `wfstat.csv` file.

Table 73: wfstat.csv File

| Column Name | Workflow Name | Total | Completed | Time to Complete | Cancelled | Time to Cancel |
|-------------|---------------|---------|-----------|------------------|-----------|----------------|
| Data type | String | Integer | Integer | Time (s) | Integer | Time (s) |

Table 74 shows the layout of the `wistat.csv` file.

Table 74: wistat.csv File

| Column Name | Work Item Name | Work Item Type | Workflow Name | Total | Completed | Time to Complete | Cancelled | Time to Cancel |
|-------------|----------------|----------------|---------------|---------|-----------|------------------|-----------|----------------|
| Data type | String | String | String | Integer | Integer | Time (s) | Integer | Time (s) |