Artix™

# Artix Orchestration Administration Console

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Making Software Work Together™

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# Contents

List of Tables 5

List of Figures 7

Chapter 1 Administration Console Basics 9
- Introducing the Administration Console 10
- Using the Console Home Page 12

Chapter 2 Engine 13
- Configuration 14
- Storage 26
- Version Detail 28

Chapter 3 Deployment 29
- Deploy BPR 30
- Deployment Log 31
- Deployed Processes 32
- Indexed Properties 37
- Partner Definitions 38
- WSDL Catalog 39

Chapter 4 Process Status 41
- Active Processes 42
- Alarm Queue 46
- Receive Queue 47

Chapter 5 Process ID and Process Details 49
- Using the Process Details Page 50
- Using the Graphic View 53
- Using the Outline View 56
- Faults 62
- Fault Handling 66

Chapter 6 Process Versions 73
Process Version Life Cycles 74
Process Version Persistence Type 77
Process Suspension on Uncaught Fault 78

# List of Tables

Table 1: Home Page Options 12

Table 2: Engine Properties 15

Table 3: URN Mappings 21

Table 4: Relational Database Properties 26

Table 5: Deployed Processes Options 32

Table 6: Deployed Process Options 34

Table 7: Indexed Property Details 37

Table 8: Partner Details 38

Table 9: WSDL Catalog Properties 39

Table 10: WSDL Details 40

Table 11: Process Properties 43

Table 12: Indexed Properties 44

Table 13: Alarm Queue Selection Filters 46

Table 14: Graphic View Activity Color Key 54

Table 15: Process Element Details 57

Table 16: Process States 59

Table 17: Fault Details 60

Table 18: BPEL Standard Faults 62

Table 19: Artix Orchestration Custom Faults 64

Table 20: Action Bar Options 71

Table 21: Persistence Settings 77

Table 22: Process Suspension Settings 78

# List of Figures

Figure 1: The Active Process ID Text Box 50
Figure 2: The Active Process Details Page 52
Figure 3: Active Process Details Graphic View 53
Figure 4: A Process Activity 54
Figure 5: A BPEL Process in the Outline View 56
Figure 6: The Suspend, Resume, and Terminate Buttons 56
Figure 7: A Faulted Process 60
Figure 8: The Update Variable Data Dialog 67
Figure 9: The Update Partner Role Data Dialog 68
Figure 10: The Correlation Set Property Box 69
Figure 11: The Update Correlation Set Data Dialog 70

CHAPTER 1

# Administration Console Basics

*This chapter includes the following topics:*

| | |
|---|---|
| Introducing the Administration Console | page 10 |
| Using the Console Home Page | page 12 |

# Introducing the Administration Console

**Overview**

The Artix Orchestration Administration Console allows you to manage and configure the Artix Orchestration engine and the artifacts that are deployed into it.

The Administration Console provides ways to deploy, select, inspect, and correct processes and related endpoint references.

**Prerequisites**

Before running the Administration Console in your browser, be sure to complete configuration and database setup by following the instructions in *Artix 4.1 Orchestration Installation Guide*.

The Artix Orchestration server must be running before you can access the Administration Console.

To start the server:

1. First start the Artix Orchestration server by opening a command prompt and running the following script:

```
ArtixInstallDir\artix\Version 4.1,\bin\start_bpel
```

2. Launch your web browser and type the following into the **Address** field:

```
http://localhost:8080/BpelAdmin
```

   Alternatively, in Windows, select **Artix 4.1 Orchestration | Artix Orchestration Admin Console** from your Artix Orchestration group under **Start |(All) Programs**.

**Invoked Service properties**

The Artix Orchestration server can invoke the services within a BPEL process using a variety of addressing options. In most cases, these options are defined for each partner role in the process deployment descriptor (PDD) file that is deployed with a BPEL process.

Alternatively, addressing may occur dynamically within the process. In addition, some addressing options, such as service retry and security policies may be specified in a deployed BPEL file.

You can view the address properties of an invoked service on the Deployed Process Version Detail page. Under the Linkage column for a partner role, select the Static link to see the details. See "Deployed Process Version Detail" on page 36.

---

**How to ...**

For details on

- Updating engine configuration and tuning engine performance, see "Configuration" on page 14.
- Purging completed processes and deployment logs from the database, see "Storage" on page 26.
- Deploying new processes and process versions, see "Deploy BPR" on page 30.
- Inactivating a process version, see "Deployed Process Version Detail" on page 36.
- Suspending or terminating a running process, see "Active Processes" on page 42.
- Analyzing execution steps and diagnosing problems by viewing active processes, see "Filtering active processes" on page 42.
- Enabling logging and downloading a copy of the execution log for a running or completed process, see "Using the Process Details Page" on page 50.
- Performing process exception management by updating variables, partner links, and other process properties, see "Fault Handling" on page 66.

# Using the Console Home Page

**Home page options**

The Home page of the Administration Console provides an overview of the engine that executes BPEL processes. It contains the following items.

**Table 1:** *Home Page Options*

| Item | Description |
|---|---|
| Date Started | Engine start date |
| Deployed Processes | Number of business processes (BPEL files) currently stored in the database |
| Description | Engine configuration. This is the application server platform supported for this engine. |
| Status | Statuses for the Artix Orchestration engine are Running and Stopped. Additional database messages are included. Select **Storage** to see more detailed information regarding the database. |
| Version | Engine version number |

**Stopping and starting the engine**

You can stop and start the BPEL process engine by clicking the **Stop Engine** and **Start Engine** buttons on the Home page.

CHAPTER 2

# Engine

*The Engine section of the Administration Console menu contains the following options:*

| | |
|---|---|
| Configuration | page 14 |
| Storage | page 26 |
| Version Detail | page 28 |

## Configuration

**Overview**

The Configuration page contains the following tabbed pages:

- Engine Properties
- URN Mappings
- Function Contexts
- Alerts

## Engine Properties

### Overview

On the **Engine Properties** tab of the Engine **Configuration** page, you can make configuration changes without stopping and restarting the engine.

When you make a change and select **Update**, the changes take effect immediately. If you are using a database for persistence, the changes are also persisted to the database.

View and update engine configuration settings as shown in Table 2.

**Note:** Some of these properties are the same as the Artix Orchestration Designer Simulation preferences.

**Table 2:** *Engine Properties*

| Property Name | Description |
|---|---|
| Auto create target path for Copy/To | Determines whether Artix Orchestration can create a location path for a non-existent node in a complex variable in a process instance document. When an assignment refers to a non-existent node (or to more than one node), the standard BPEL fault, `bpws:selectionFailure`, must be thrown, according to the BPEL specification.<br><br>Enabling this option allows selections to be created on-the-fly. This means an assign copy TO operation can refer to a non-existent node and assign a value to it. This option is disabled by default. |

**Table 2:** *Engine Properties (Continued)*

| Property Name | Description |
|---|---|
| Disable bpws:selectionFailure fault | Enabling this option allows a null value to be returned from a function or assignment that contains an XPath query string. You can enable this to override XPath behavior, for cases that handle data samples with optional elements.<br><br>By default, this option is not enabled, and if the query string returns an empty selection from an assign copy FROM, the process throws a `bpws:selectionFailure` fault, which is the standard response described in the BPEL4WS specification. |
| Logging enabled | By default Artix Orchestration does not generate an execution log for running processes. Logging is turned off to enhance engine performance. You can enable this setting, and then view or download an execution log for a running or completed process. An execution log provides start/end times for activity execution and helps you troubleshoot faulting or faulted processes. |
| Replace Existing WSDL | Overwrites the current WSDL definition.<br><br>By default Artix Orchestration allows you to replace a WSDL definition currently in cache without restarting the server. You can deploy a new version of a BPR file containing an updated BPEL and WSDL file.<br><br>BPEL developers who are testing and modifying processes and WSDL definitions may find this option useful. |

**Table 2:** *Engine Properties (Continued)*

| Property Name | Description |
|---|---|
| Suspend process on uncaught fault | According to the BPELWS1.1 specification, a process with an uncaught fault terminates with a forced termination fault.<br>Enable this option to suspend all processes on an uncaught fault to put them in a suspended-faulting state. You can then perform process exception management on the faulting process followed by retrying or completing the faulting activity or scope.<br>An individual process can override this setting with an entry in the PDD file. See “Process Suspension on Uncaught Fault” on page 78. |
| Validate input/output messages against schema | Validates the data loaded into process variables against the WSDL schema.<br>Enable this option to validate data before execution starts. Disable this option for faster execution. This option is enabled by default. |
| Deployment Plan Cache | A deployment plan corresponds to each deployed version of a process, including associated disposition of running processes. Process versions that are active can be cached for better engine performance. The default number of plans that are cached is 100. For details regarding versions, see “Process Versions” on page 73. |
| Process Count | The maximum number of processes in memory. The default number is 50. Specifying 0 indicates no limit, but is not recommended. |

**Table 2:** *Engine Properties (Continued)*

| Property Name | Description |
|---|---|
| Process Idle Timeout | Number of seconds to wait until process state information is written to the database during idle processing times, such as waiting for a reply from an invoked service. You can increase the timeout value to enhance engine performance. You can decrease the value to ensure the full process state is always in the database. Doing so avoids potential process recovery time in the event of a server failure. The default is 10 seconds. |
| Unmatched Correlated Receive Timeout | Set the amount of time to wait (in seconds) for a correlated message to be matched to a receive, in the case that the message arrives before the receive becomes active. If this value is exceeded, a message is discarded so that the process can complete normally. The default is 300. Specifying 0 indicates that unmatched correlated messages are immediately discarded. |
| Work Manager Threads Per Process Max | Set the maximum number of execution threads the engine can spawn simultaneously for an individual process. The default is 10. |
| Work Manager Threads Min | Set the minimum number of execution threads the engine allocates for its Work Manager. The default is 10.<br><br>This property may not appear in the Administration Console. It does not appear if Artix Orchestration server is configured to use an application server Work Manager. |

**Table 2:** *Engine Properties (Continued)*

| Property Name | Description |
|---|---|
| Work Manager Threads Max | Set the maximum number of execution threads the engine can spawn simultaneously. The default is 50. A value of -1 means that there is no maximum number of threads.<br><br>This property may not appear in the Administration Console. It does not appear if Artix Orchestration server is configured to use an application server Work Manager. |
| WSDL Cache Size | The number of WSDL files in stored cache. The default is 100. Modifying the cache size may improve engine performance. A value of -1 means unlimited caching, but is not recommended. |

## URN Mappings

### Overview

The Administration Console allows you to assign a physical address to a universal resource name (URN).

URN mappings provide a flexible and dynamic way to define target endpoint references. Use URN mappings to specify the physical address of a partner link endpoint reference instead of using the address specified in a process deployment descriptor (PDD) or WSDL file.

By mapping a URN to a URL, you do not have to rely on invoking a statically defined endpoint address. URN mappings give you flexibility, for example, to deploy the same BPR files for testing and production environments.

Instead of using the default invocation, you can specify a logical or physical address for a static endpoint reference in the PDD file. If you specify a logical address, or URN, you can then map the URN to the physical address in the URN Mappings page. If you specify a URL, you can replace the URL by mapping it to a different URL.

### Examples

The following example illustrates one type of URN to URL mapping:

```
urn:localhost =
http://localhost:8080/artix-bpel/services/{urn.3}
```

This mapping might be used when a process is deployed with the following partner link address information:

```
<partnerLink name="assessor">
   <partnerRole endpointReference="static"
     invokeHandler="default:Address">
      <wsa:EndpointReference xmlns:assessor="http://
       tempuri.org/services/loanassessor">
      <wsa:Address>urn:localhost:AssessRisk</wsa:Address>
      <wsa:ServiceName PortName=
        "SOAPPort">assessor:LoanAssessor</wsa:ServiceName>
   </partnerRole>
</partnerLink>
```

The Artix Orchestration invocation framework resolves the URN as follows:

```
urn:localhost:AssessRisk =
    http://localhost:8080/artix-bpel/services/AssessRisk
```

## Mapping URNs to URLs

Here are some ways you can map URNs to URLs. Note that each segment of the URN is separated by a colon. This means you can use a variable, such as `{urn.3}` shown in the second example below, to indicate a replacable token in the third segment.

**Table 3:** *URN Mappings*

| URN | URL |
|---|---|
| `urnSegment1:urnSegment2` | `http://localhost:8080/artix-bpel/services/MyService` |
| `urnSegment1:urnSegment2:urnSegment3` | `http://localhost:8080/artix-bpel/services/{urn.3}` |
| `http://ServerA:8080/artix-bpel/services/MyService` | `http://ServerB:8081/artix-bpel/services/MyService` |
| `urn:localhost:service` | `http://localhost:{$AE-NODE1-PORT}/artix-bpel/services/{$urn.4}` |

The last example in the table above shows how you can use variable substitution in an URL.

The URL values can optionally contain variables. The variables can be environment variables accessible through `java.lang.System.getProperties()` or a segment from the URN itself. The Apache Ant style variable declaration of `${property}` is used to identify a property within the URL. Segments from the input URN value can be referenced by using a special property naming convention of `${urn.offset}` where `offset` is a one-based offset identifying the segment from the input URN value to use for substitution.

The URL in the mapping above contains two variables. The `{$AE-NODE1-PORT}` variable pulls the port number from an environment variable. This variable would need to be set as a `-D` parameter on the Java runtime environment (for example, `java -D{$AE-NODE1-PORT}=8080 ...)` or populated externally to the Artix Orchestration server.

The `{$urn.4}` variable in the above mapping references the fourth segment from the input URN value. Notice that the URN contains only three segments. The URN in the PDD file should contain at least one other segment. A sample URN might be:

```
urn:localhost:service:StoreService
```

The value of the fourth segment of this URN is `StoreService`. The resulting URL is:

```
http://localhost:8080/artix-bpel/services/StoreService
```

## Updating or Deleting an URN Mapping

To update a URN mapping, select the URN. The URN and URL values appear in the text boxes where you can edit them and select **Update**. Editing the URN results in a new URN mapping. It does not update the existing one. Only the URL can be updated.

To delete a mapping, select the check box next to the mapping and click **Delete**.

# Function Contexts

## Using custom functions

On the **Function Contexts** tab of the Engine **Configuration** page, you can add custom function information.

**Note:** This option is available in the persistent version of Artix Orchestration only.

BPEL processes may contain custom functions that are used within XPath or other expression languages. Artix Orchestration provides a `FunctionContext` interface for implementation of custom functions. By using the `FunctionContext` interface, new or different functions may be installed and made available to the Artix Orchestration XPath (or another) expression writer.

If you already have custom functions implemented with a different interface, such as the jaxen `FunctionContext` interface, you can use them in your BPEL process.

## Implementing the FunctionContext interface

To implement the `FunctionContext` interface, do the following:

1. Locate the following folder on your machine:

```
ArtixInstallDir\lib\bpel\runtime_engine\1.0
```

2. Locate `ae_rtbpel.jar`.
3. The class file in `ae_rtbpel.jar` you need in order to implement the `FunctionContext` interface is:

```
org.Artix Orchestration.rt.xpath.IAeXPathFunctionContext
```

## Adding custom functions to Artix Orchestration Server

You add custom function details to make the functions known to the engine.

You can specify an absolute classpath location for the function or use a system property to indicate the location.

To add a custom function:

1. From the Engine Configuration page, select **Function Contexts**.
2. In the **Add Function Context Details** section, Type in a **Name** for the custom function. The name appears in the Custom Function list.
3. Type in a **Namespace**. Use the namespace that is specified in your container file that implements the Custom Function. Note that the name is case-sensitive.
4. Type in the fully qualified **Class** name of the container file that implements the custom function.
5. Type in a **Classpath** location for the custom function folder, ZIP or JAR file. The classpath can be an absolute path, or can be a system property.
6. Select **Add Context**.

Artix Orchestration server validates the function details and ensures that a class loader can load the class files.

If an error is reported, ensure that you have a valid class name and classpath location.

For each successfully added context, the name, namespace, and class of the function is displayed in a list. You can delete any function that you no longer need, if you delete the associated processes.

## Alerts

### Overview

On the **Alerts** tab of the Engine **Configuration** page, you can add the name of the service you want to run when processes are faulting.

**Note:** This option is available in the persistent version of Artix Orchestration only.

You can add the service name of a BPEL process that is designed to send out an alert when a certain process state is encountered, currently *suspended* or *faulting*. When the state occurs, the Artix Orchestration server instantiates the alert service, which can then invoke some action, such as notifying an administrator that a processing is faulting.

### Adding an alert service

To add a service, type a name in the **Service** field and click **Update**. The service name is the My Role partner link service, identified in the PDD file deployed with the BPEL process to be used as the alert service. You can find this name by looking on the Deployed Process Version Detail page.

After you add the service, the Alert Service details are displayed: Process name, namespace, and partner link. Select the Process Name to view process version details.

# Storage

## Overview

The Artix Orchestration server engine includes persistent storage based on the database settings you configured during installation. You must configure one database before running the engine. See the *Artix 4.1 Orchestration Installation Guide* for more details.

The Storage page displays database configuration properties and allows you to delete completed processes and deployment logs.

## Database properties

The following relational database properties are displayed:

**Table 4:** *Relational Database Properties*

| | |
|---|---|
| JNDI Location | The Java Naming and Directory Interface (JNDI) context that specifies where to look for the database. For example, `comp/env/jdbc/artix-bpel` |
| Database Type | The type, such as `mysql` |

## Deleting completed and faulted processes

To delete a completed or faulted process:

1. Enter a date in the **Completed/Faulted before** field.
2. Select **Delete**. The number of matching processes is displayed.
3. Click **OK**.

## Deleting inactive plans

A *plan* consists of a process version plus the associated disposition of running processes. An *inactive plan* refers to a process version and associated processes that either have reached their expiration date or have been manually expired. If you have deleted completed processes from the database, you can delete the plan associated with those processes.

This means that the process version associated with the plan will no longer be displayed on the Deployed Processes page. The associated WSDL is not deleted, nor is any Partner Definition, since these files may be associated with other plans.

If a plan is associated with a subprocess, you cannot delete it until the main process is deleted. A *subprocess* is a BPEL process that is invoked by another process.

---

## Deleting deployment logs

To delete a deployment log:

1. Select the type of log in **Log Contents**.
2. If desired, enter dates in the **Deployed between** fields.
3. Click **Delete**. The number of matching logs is displayed.
4. Click **OK**.

## Version Detail

**Overview**

The Version Detail page shows the version number and build date of the Artix Orchestration engine libraries. This information may be useful for troubleshooting purposes.

# Deployment

*The Deployment section of the Administration Console menu contains the following options:*

| | |
|---|---|
| Deploy BPR | page 30 |
| Deployment Log | page 31 |
| Deployed Processes | page 32 |
| Deployed Process Detail | page 34 |
| Deployed Process Version Detail | page 36 |
| Indexed Properties | page 37 |
| Partner Definitions | page 38 |
| WSDL Catalog | page 39 |

## Deploy BPR

**Overview**

The Deploy BPR page allows you to add new business process archives (BPR) to the server.

**Note:** This option is available in the persistent version of Artix Orchestration only.

You can deploy one BPR at a time, but the archive can include as many BPEL files, deployment descriptors, partner definition files, and WSDL definitions as you wish.

**Deploying a BPR**

To deploy a BPR:

1. Browse to a folder containing a business process archive.
2. Select a BPR file.
3. Click **Deploy**.

The engine validates the files contained in the BPR and stores the files in the database. The Deployment Log page appears showing errors, warnings, and information about the deployed process files.

After you deploy a BPR file, you can view details for deployment descriptors, partner definition files, BPEL files, indexed properties, and WSDL definitions by making selections in the Administration Console navigation bar.

# Deployment Log

## Overview

The Deployment Log page shows a list of logs generated when new and modified BPR files are deployed. The number of errors and warnings generated, if any, are shown.

On this page you can:

- Change the display of the logs list by using the **Selection Filter**
- Select a BPR file to view its deployment log

## Selecting a deployment log

To select deployment logs:

1. Select the **Log Contents** type, if desired.
2. Select **Deployed between** dates, if desired.
3. Type in the exact **Name** of a BPR file, if desired.
4. Click **Submit**. The Deployment Logs list rebuilds based on your selection filters.

The Deployment Log page shows the name, date, and log for the selected BPR file. During deployment, the engine validates the deployment descriptor of the BPEL process, ensuring that the associated WSDL file is available and valid for the current version of the process. If any validation errors or warnings occur, make corrections and redeploy the BPR file or create a new BPR file for any invalid processes.

## Deployed Processes

**Overview**

The Deployed Processes page lists all business processes that have been deployed to the server. For each deployed process, basic process version information is displayed, as shown in the table.

**Table 5:** *Deployed Processes Options*

| Item | Description |
|---|---|
| Name | Local part of the process qualified name (qname) |
| Active Ver. | Version that process instances can attach to or can run to completion. Normally the active version is the current version. However, if the current version has reached its expiration date, active processes can run to completion based on the expired version. |
| Versions | Number of deployed versions stored in the database |
| Future Ver. | Yes\|no field indicating whether a process version has an effective date set to a future date |

**Filtering processes**

You can select the following filters to view a subset of processes:

- Process **Status**, as described below
- **Process Name**. You must type in the exact name and select **Submit**.

**Process statuses**

Process versions can have one of the following statuses:

- **Current**. By default, when no version information is specified in a deployment descriptor, a deployed process is the current version with an immediate effective date. It is ready to receive requests.
- **Future**. If an effective date is specified in a process' deployment descriptor, a process has a future version.
- **Expired**. A version is expired if reaches the expiration date specified in a process' deployment descriptor, you manually expire the version, or a newer version is deployed.

- **Inactive**. When all process instances of an expired version complete, a process version is inactive.

See "Process Versions" on page 73 for more details.

Select a process to display the Deployed Process Detail page.

## Deployed Process Detail

**Overview**

The Deployed Process Detail page displays a list of all deployed versions of a process.

For details, see “Process Versions” on page 73.

**Tasks**

You can do the following:

- To expire the current version and inactivate future versions of a process, click **Expire**.

  The result of expiring all versions is that all running processes attached to the current version will complete, but no new processes can be started. Future versions will not become active when their effective date arrives.

  **Note:** To terminate a running process, navigate to the Active Processes page and select a process.

- To reactivate an expired version, see “Deployed Process Version Detail” on page 36.
- To view details for a single version click the version number for that version to go to the Deployed Process Detail page.

**Table 6:** *Deployed Process Options*

| Property | Description |
|---|---|
| Version | The version number increments automatically when a new process version is deployed, unless a version number is specified in the deployment descriptor. The format of the number is N.nn, where N is major and n is minor. |
| Plan Id | The ID assigned to this version and associated disposition of running processes |

**Table 6:** *Deployed Process Options (Continued)*

| Property | Description |
|---|---|
| Effective Date | If an effective date was not specified in the deployment descriptor, the effective date is the same as the Deployed Date. A process is effective immediately when deployed, unless an effective date is specified. |
| Expiration Date | A process version does not have an expiration date unless one is specified in the deployment descriptor. By default, a process version automatically expires when a newer version becomes effective. |
| Deployed Date | Date the process is added to the engine database |
| Processes | Number of active process instances |
| Migrated To | Process version that this version migrates to |
| Status | Current, Future, Expired, Inactive |

## Deployed Process Version Detail

**Overview**

The Deployed Process Version Detail page displays all the details from the process deployment descriptor as well as the process definition. For explanations of the version detail table, see "Process Versions" on page 73.

**Tasks**

You can do the following on this page:

- Select **View Process Graph** to see the process in Outline view and Graph view. These views also are available for running processes. For explanations of these views, see "Using the Process Details Page" on page 50.
- Depending on the version status (Current, Future, Expired, Inactive), you may be able to update the effective date, expiration date, and running process disposition
- To inactivate this version immediately, click **Expire**. No new process instances can attach to this version.
- If you had previously expired this version, you may be able to restore it. To restore this version to the current or future version, click the available option, **Restore to Current** or **Restore to Future**.

**Details**

The Deployed Process Version Detail page shows the following details:

- Endpoint reference details for **My Role** and **Partner Role** partner links. This display is generated from information in the deployment descriptor. Hover over the partner link **Type** to view the associated namespace. Select a static endpoint type from the **Linkage** column to view the endpoint definition.
- **Indexed Properties**, if any. For details, see "Indexed Properties" on page 37.
- The **WSDL Usage** section shows WSDL files and their target namespace referenced in this process. Select a WSDL to view the definition.
- The **BPEL** tab shows the BPEL XML source code

# Indexed Properties

## Overview

An indexed property is a variable property that serves as a selection filter for active processes. This property holds a piece of data, such as a customer ID, application date, or amount. Using an indexed property in a selection query provides a fast way to filter processes based on important data items.

**Note:** This option is available in the persistent version of Artix Orchestration only.

For example, you can retrieve a list of faulting processes that share the same indexed property, suspend one or more processes, fix bad data values, and continue process execution. For details, see "Filtering active processes" on page 42.

## Details

Indexed properties are defined in the process deployment descriptor file. Deployment details are as follows:

**Table 7:** *Indexed Property Details*

| Item | Description |
|---|---|
| Plan Id | The deployed process associated with the indexed property |
| Name | Indexed property name. This name appears in the Indexed Property list in the selection filters Expression Builder. |
| Type | Property type, such as string or double |
| Variable Path | Process variable name and declaration location in the process |
| Part | Process variable part for message type variables |
| Query | Process variable part detail (optional) |

For details on how to define an indexed property, see the *Artix Orchestration Designer Help*.

# Partner Definitions

## Overview

A partner definition file contains the service information for a partner link that has been deployed designated as a *principal* endpoint reference in the process deployment descriptor (PDD) file.

Select a principal, if any exists, to view details.

## Details

The following details are displayed for the selected principal.

**Table 8:** *Partner Details*

| Item | Description |
|---|---|
| Partner link type | The partner link type used in the partner definition for the principal |
| Role | Role defined for the partner link type |

Select a partner link type to view the namespace and endpoint reference details for the partner definition.

# WSDL Catalog

## Overview

The WSDL catalog is the centralized cross reference for all WSDL files referenced in the process deployment descriptor (PDD) files deployed to the Artix Orchestration server engine.

Any WSDL in the catalog can be accessed by any deployed BPEL process, and only one copy is maintained. There are no restrictions based on the deployment context.

## Catalog properties

The WSDL Catalog page displays the following details:

**Table 9:** *WSDL Catalog Properties*

| Item | Description |
|---|---|
| Total Reads | The number of reads to retrieve WSDL file information during process execution (in cache or not) |
| Disk Reads (%) | The number of reads made to WSDL files not in the cache expressed as an absolute number and percentage of Total Reads |
| Cache Size | The number of WSDL files in stored cache. The default is 100. You can set cache size on the Configuration page. Modifying the cache size may improve engine performance. See “Engine Properties” on page 15. |

The Deployed WSDL list shows the name and namespace for the WSDL. Rest your mouse on the WSDL to view the physical location where the WDSL was loaded from.

Select a WSDL file to view details.

## WSDL details

The WSDL Detail page shows the same information that is on the WSDL Catalog for each WSDL and also displays the WSDL XML source code.

**Table 10:** *WSDL Details*

| Item | Description |
|---|---|
| Location | The actual physical location where the WSDL is loaded from. This helps to uniquely define the WSDL's location when the deployment descriptor was created and can be used to have multiple WSDL files of the same name deployed to the engine. The WSDL location is referenced in the PDD file |
| Namespace | Target namespace in the WSDL |
| Referenced By | The process versions referencing this WSDL |

CHAPTER 4

# Process Status

*The Process Status section of the Administration Console menu contains the following options:*

| | |
|---|---|
| Active Processes | page 42 |
| Alarm Queue | page 46 |
| Receive Queue | page 47 |

# Active Processes

**Overview**

The Active Processes page shows a list of process instances that have been executed or are executing in the Artix Orchestration engine. The version that this instance is attached to is also shown. States can be *running*, *suspended*, *completed*, *compensatable* (for a subprocess), or *faulted*.

Select a Process ID or Name to view details of the process instance. For more information, see "Using the Process Details Page" on page 50.

**Filtering active processes**

You can use the comprehensive **Selection Filter** settings for advanced filtering and selecting of processes. For details, see "Filtering active processes" on page 42.

**Note:** If an active process is a subprocess, that is, it is invoked by another process, you may see additional state information for it. The additional state for a subprocess is *compensatable*. See the *Artix Orchestration Designer Online Help* for more information on creating a BPEL process to be used as a subprocess.

You can filter the active processes list by using a wide range of properties and functions. Select the filters to apply and then click **Submit**.

The selection filters include:

- **State**. Select one of the following process states:
  - **All**. All states of process instances.
  - **Running**. Normally running processes.
  - **Completed**. Normal completions.
  - **Faulted**. Processes completed with a fault.
  - **Suspended**. A process suspended for any reason.
  - **Suspended (Faulting)**. Suspended on a faulting activity. You can update variables on a faulting process prior to resuming it. For details, see "Fault Handling" on page 66.
  - **Suspended (Activity)**. Suspended on a BPEL suspend activity.
  - **Suspended (Manual)**. Manually suspended process.

- **Compensatable**. A sub-process is complete and eligible for compensation.
- **Created between**. Date and time range for process starts.
- **Completed between**. Date and time range for process completions.
- **Name**. Process name.
- **Additional query**. Use the Expression Builder to create a query based on an extensive set of criteria. Click the Dialog button at the end of the row to open the Expression Builder.

## Using the Expression Builder

You can create and submit a query for retrieving processes for display. In the Expression Builder, double-click the properties and functions to build the query, and Click **OK**. The expression appears in the **Additional query** text box. You can edit the expression and can use it in conjunction with the other criteria in the Selection Filters. Select **Submit** to retrieve processes that meet the criteria selected.

The following table describes the functions, variables, and properties you can use for filtering the active processes list.

**Table 11:** *Process Properties*

| Criterion | Example Expression |
|---|---|
| End Date | getProcessProperty("EndDate") >= "2006/02/17 10:03 AM"<br>Use the **Date** selector to enter a correctly formatted date. |
| Id | getProcessProperty("Id") = '102' |
| Name | getProcessProperty("Name") = 'LoanApproval' |
| Namespace | getProcessProperty("Namespace") = 'http://services.acme.com' |
| Start Date | getProcessProperty("EndDate") <= "2006/02/17 10:03 AM"<br>Use the **Date** selector to enter a correctly formatted date. |

**Table 11:** *Process Properties (Continued)*

| Criterion | Example Expression |
|---|---|
| State | Property Codes for process states:<br>1 - Running<br>2 - Suspended<br>3 - Completed<br>4 - Faulted<br>5 - Compensatable<br>Example: getProcessProperty("State") = '1' |
| State Reason | Property Codes indicating the reason why a process is suspended:<br>2 - Suspended (Activity). Suspended at a BPEL suspend activity<br>1- Suspended (Faulting). Suspended as a result of an uncaught fault<br>0 - Suspended (Manual). Suspended manually.<br>Example: getProcessProperty("State'Reason') = '1' |
| Version | getProcessProperty("Version") = '2' |

**Table 12:** *Indexed Properties*

| Functions | Example |
|---|---|
| getParentId() | getParentId() = '101'<br>(Returns all subprocesses whose parent process Id is 101) |
| getProcessProperty("...") | See Process Property examples above |
| getIndexedPropertyValue("...") | getProcessIndexedProperty('amount') >= 50000 |
| hasWaitingAlarm() | hasWaitingAlarm() |
| hasWaitingReceive() | hasWaitingReceive()<br>(For processes with a waiting receive or OnMessage) |
| hasWaitingReceive("partnerLinkName"[,op"]) | hasWaitingReceive('{http://services.acme.com}AR', 'Invoice') |

**Table 12:** *Indexed Properties (Continued)*

| Functions | Example |
|---|---|
| isParentProcess() | isParentProcess()<br>(Returns all processes that invoke another process)<br>isParentProcess() OR isSubProcess()<br>(Returns all processes involved either as parent or subprocess) |
| isSubProcess() | isSubProcess() (returns all processes that are subprocesses of parent processes) |
| nextAlarmTime() | nextAlarmTime() > ‘2006-12-31 14:30’<br>(Returns all processes which have an alarm scheduled for any time after 2:30 pm on December 31, 2006) |
| not(...) | (getProcessProperty("Name") = 'LoanApproval' not(getProcessProperty("EndDate") >= '2005-02-01 4 am')) |

# Alarm Queue

**Overview**

The Alarm Queue page allows you to view a list of active On Alarm process activities.

Select one or more options from the **Selection Filter** option list to narrow your view of active alarms.

**Table 13:** *Alarm Queue Selection Filters*

| Item | Description |
|---|---|
| Deadline Between | Beginning and Ending date and time for alarm |
| Process Id | Process instance Id. You can find this Id on the Active Processes page |
| Process Name | Local part of the process qualified name (qname) |

# Receive Queue

**Overview**

In the Receive Queue page, you can view a list of active receive and onMessage activities. These activities are queued for incoming messages.

**Tasks**

You can do the following from this page:

- Select a receive and then select a partner link to view details. A window opens where you can see the BPEL process location in which the receive activity executes. You can also see the correlation property alias and data, if any, associated with this receive activity.
- Select one or more options from the **Selection Filter** option list to view a selection of active receives. You can find this information on the Deployed Process Version Detail page, which shows the BPEL source code.

You do not need to enter the fully qualified name for the operation.

CHAPTER 5

# Process ID and Process Details

*This chapter contains the following topics:*

| | |
|---|---|
| Using the Process Details Page | page 50 |
| Using the Graphic View | page 53 |
| Using the Outline View | page 56 |
| Faults | page 62 |
| Fault Handling | page 66 |

# Using the Process Details Page

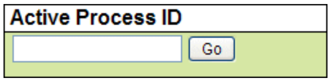
**Viewing details for a process**

The Active Process Detail page helps you analyze the execution state of a process instance.

To quickly view details for a particular process, type the instance ID for the process in the **Active Process ID** text box and click **Go**.

**Note:** To find a the process's instance ID, go to the Active Processes page.

**Figure 1:** *The Active Process ID Text Box*



The Active Process Detail page launches in a new browser window, providing a comprehensive snapshot of a running, suspended, faulting, faulted, or completed process instance.

**Tasks**

You can do the following from the Active Process Details page:

- View process and activity-level properties and values
- View the execution state of each activity
- Inspect the current value of variables, activity links, partner links, correlation sets, fault, compensation, and event handlers
- **Refresh** a running process to view an updated snapshot of the execution state
- **Suspend**, **Resume**, or **Terminate** a running process. These buttons appear at the top of the outline view.
- View and download the execution log to your computer from the process log. Select the **View Process Log** button at the top of the outline view. Copy the execution log to your computer from the **Process Log** text box.

Perform process exception management by correcting, resuming, retrying or completing a faulting activity. For details see

**Note:** If the Process Log box displays “Log file not available,” it means logging was not enabled when this process instance ran. For future process instances, you can enable logging from the Configuration page of the Administration Console.

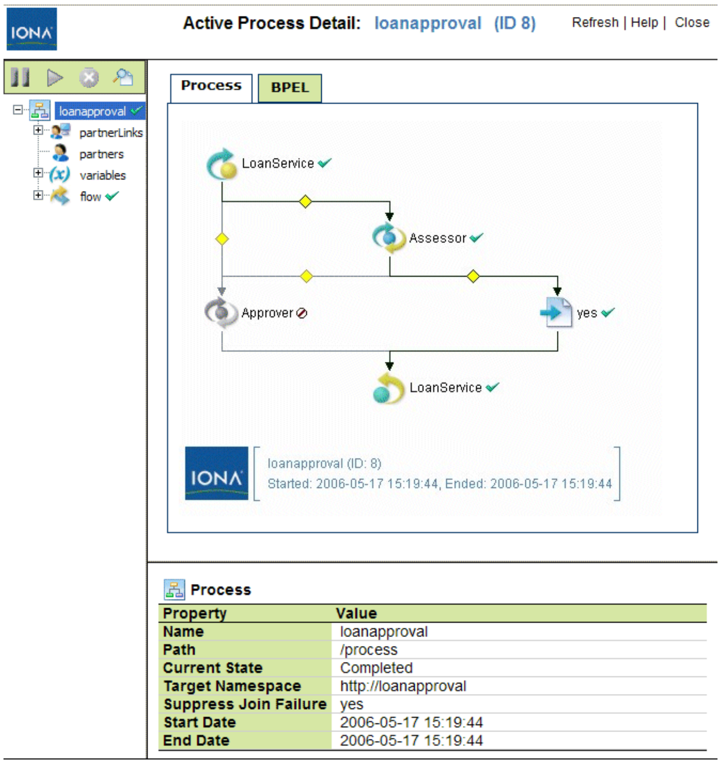
## Views

The Active Process Details page presents many details about a process instance:

- An **Outline** view shows the structural elements of a BPEL process and the current process execution state of each activity. You can select an element to view its properties and values.
- A **Graphic** view shows the main process flow. If the process has event handlers, fault handlers, and compensation handlers, you can view them by selecting a tab, such as Fault Handlers shown below. You can also select an activity to view its properties.

- A **Properties** view appears for a selected element. For example, when the Process element is selected from the Outline view, you can see process properties and their current values.

**Figure 2:** *The Active Process Details Page*



loanapproval (ID: 8)
Started: 2006-05-17 15:19:44, Ended: 2006-05-17 15:19:44

**Process**

| Property | Value |
|---|---|
| Name | loanapproval |
| Path | /process |
| Current State | Completed |
| Target Namespace | http://loanapproval |
| Suppress Join Failure | yes |
| Start Date | 2006-05-17 15:19:44 |
| End Date | 2006-05-17 15:19:44 |

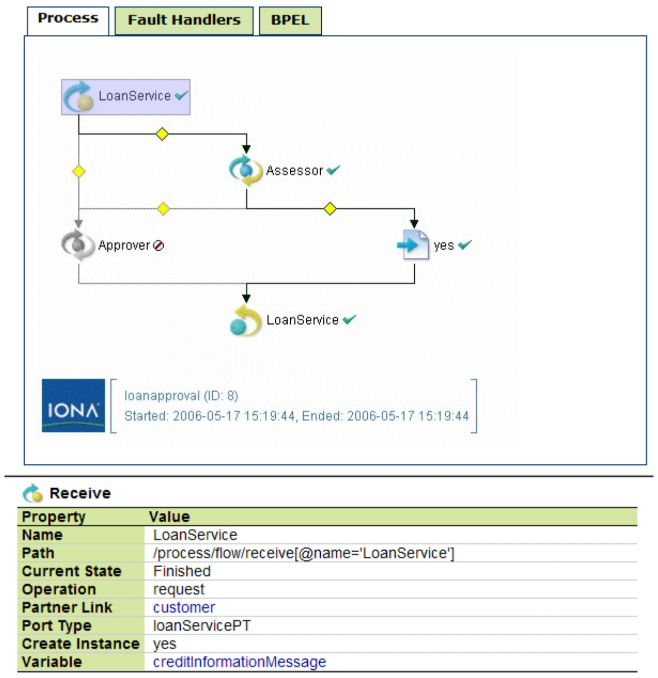
# Using the Graphic View

**Overview**

The Graphic view of the Active Process Details shows the main process flow and the execution path through the process. You can also view the process fault, event, and compensation handlers, if the process definition includes these process-level handlers. The handlers have their own tabs in the view.

In the upper-right panel of the page, you see the main flow of a BPEL process. The process diagram reflects the layout rendering that is part of Artix Orchestration Designer.

**Figure 3:** *Active Process Details Graphic View*



loanapproval (ID: 8)
Started: 2006-05-17 15:19:44, Ended: 2006-05-17 15:19:44

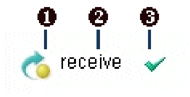
**Receive**

| Property | Value |
|---|---|
| Name | LoanService |
| Path | /process/flow/receive[@name='LoanService'] |
| Current State | Finished |
| Operation | request |
| Partner Link | customer |
| Port Type | loanServicePT |
| Create Instance | yes |
| Variable | creditInformationMessage |

## Activity icons

Each process activity has an icon, a label, and an execution state indicator, as shown in the following illustration.

**Figure 4:** *A Process Activity*



1 Activity icon. Activity icons are the same as those supplied with Artix Orchestration Designer.

2 Activity label, which can be the activity type, name, type:name, or custom text

3 Execution state indicator. For a description of each indicator, see "Using the Process Details Page" on page 50.

## Activity colors

Activities may appear in different colors, to indicate different execution states, as the following table describes.

**Table 14:** *Graphic View Activity Color Key*

| Activity Color | Execution State |
|---|---|
| full color | Executed |
| muted color | Ready to execute or inactive |
| gray | Dead path |

## Viewing activity details

To view details for a particular activity:

- Select an activity from the diagram to view its properties
- Select an activity from the diagram to put the activity in focus in the Outline

## Printing a diagram

To print the diagram, select **Print Picture** from the right-mouse menu. The diagram prints with the same caption that appears in the graph view. The timestamp indicates when the Process Details page was opened or refreshed.

To print a large diagram, select appropriate scaling options in your Printer options dialog, such as Fit to Page or print as x% of Normal Size

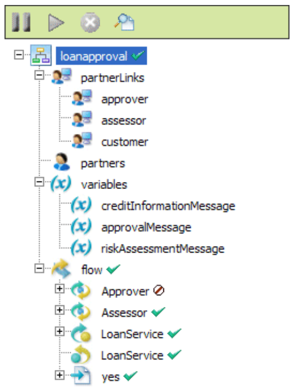
You can also save the diagram as an image file to print later.

# Using the Outline View

**Overview**

The Outline view shows allows you to manipulate a BPEL process and view properties for the individual elements in the process.

**Figure 5:** *A BPEL Process in the Outline View*



**Outline view menu bar**

The **Suspend**, **Resume**, and **Terminate** buttons are enabled only if the process is currently running or suspended. If logging is enabled, you can click the **View Process Log** button to display the execution details for the process instance. See "Engine Properties" on page 15 to enable logging.

**Figure 6:** *The Suspend, Resume, and Terminate Buttons*

**BPEL process elements**

The Outline view displays the following BPEL process elements:

- **Process name** is the local part of the process qualified name
- **Partner links** represent the Web services that are invoked

- **Variables** contain the message or other data received, manipulated, and sent from the process
- **Correlation sets**, if present, contain the message properties that track different conversations carried on by the process
- **Fault handlers**, if present, catch faults thrown by process activities
- **Event handlers**, if present, run concurrently with a process scope and invoke an activity based on an alarm or message received
- **Activities** carry out the processing steps

**Details**

To view details about a process element, select it. Table 15 describes each element.

**Table 15:** *Process Element Details*

| Process Element in Outline | Details Displayed |
|---|---|
| Process name | Current state, Start/end time of process instance, and deployment details for the process.<br>Fault details may also be displayed. |
| Partner links | The type(s) of partner links: partner role and/or my role.<br>The endpoint reference of the partner link service. You can see the address information in the Properties view. |
| Variables | The variable type: message, simple, or schema.<br>The current value of the variable. For a running process, the value is current as of the time you opened or refreshed the Process Details window. |
| Correlation sets | The message property definition and current value. A correlation set contains a message property to ensure that each process conversation is uniquely identified. |
| Fault handlers | Name, state, and details of fault handling activity. Scopes can have their own local fault handlers. |

**Table 15:** *Process Element Details (Continued)*

| Process Element in Outline | Details Displayed |
|---|---|
| Event handlers | Name, state, and details of event handling activity. Scopes can have their own local fault handlers. |
| Activities | The activities section of the Outline begins with a flow activity that represents the main container for the whole process. Within the flow, there is a list of all process activities. The activities are in the same order as in the BPEL XML code. If the process was designed in Artix Orchestration Designer, the order matches the Outline view order.<br>The activity list shown is not necessarily in execution order.<br>For each activity, you can view the execution state and activity definition. |
| Links | If an activity is the source of a link, the link is displayed below the activity node. Link properties are displayed, including link status (whether or not the link executed), the transition condition, if it exists, and the link's target activity. |

## Activity states

You can determine the execution status of each activity by looking at the icon next to the activity.

| | |
|---|---|
| ▶ | Executing |
| › | Ready to Execute |
| ✓ | Finished |
| ✗ | Faulted. Occurs when a fault is thrown during the execution of an activity. |

| | |
|---|---|
| ⚠ | Faulting. Occurs when a fault is thrown during the execution of an activity and the fault is uncaught. If desired, you can make corrections or resume faulting processes. See “Fault Handling” on page 66. |
| ⊗ | Terminated. Occurs when the process is manually terminated. |
| ⊘ | Dead Path |
| ⏸ | Suspended |
| (none) | Inactive (the initial state of an activity) |

For a running process, the icon next to an activity may change if you refresh the Process Details window.

## Process states

The process can have the following execution states:

**Table 16:** *Process States*

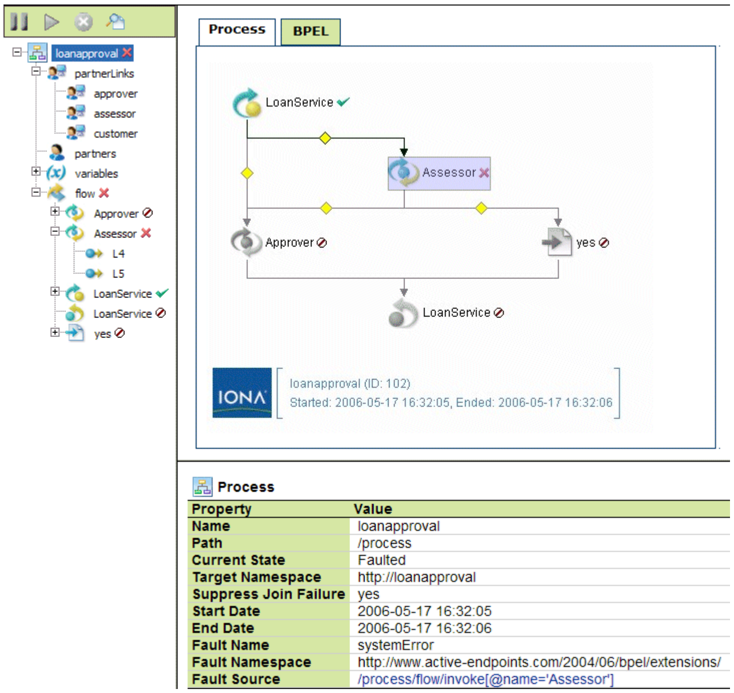
| Execution State | Description |
|---|---|
| Completed | Normal completion |
| Faulted | Completed with a fault or termination |
| Running | Snapshot of the executing process when you open the Process Details window. The process continues to run, but the Process Details window is not updated unless you select **Refresh**. |
| Suspended | The process stops running when you select Suspend from the Process Details window. |
| Faulting | Execution is stopped on a faulting activity. The activity has an uncaught fault and the process is configured for suspension on an uncaught fault. |

## Inspecting fault details

In the Process Details window, the Outline view shows a list of process activities. A red X appears next to an activity that faulted, or a red triangle next to a faulting activity.

You can select the process name to view details about the fault.

**Figure 7:** *A Faulted Process*



loanapproval (ID: 102)
Started: 2006-05-17 16:32:05, Ended: 2006-05-17 16:32:06

Process

| Property | Value |
|---|---|
| Name | loanapproval |
| Path | /process |
| Current State | Faulted |
| Target Namespace | http://loanapproval |
| Suppress Join Failure | yes |
| Start Date | 2006-05-17 16:32:05 |
| End Date | 2006-05-17 16:32:06 |
| Fault Name | systemError |
| Fault Namespace | http://www.active-endpoints.com/2004/06/bpel/extensions/ |
| Fault Source | /process/flow/invoke[@name='Assessor'] |

**Table 17:** *Fault Details*

| Property | Description |
|---|---|
| Fault Name | Standard BPEL or engine fault name |
| Fault Namespace | Standard BPEL or engine fault namespace |
| Fault Source | Process activity that threw the fault |
| Fault Message Data | Data in the throw or catch fault variable |

**For more information**

To get further information about faults:

- Select the faulted activity to view the Fault Name. See “Faults” on page 62 for more details.
- Select **View Process Log** in the Outline to view the process log. You can see the execution path leading to the faulted activity.
- For a faulting activity, you can correct data, retry or complete the activity. See “Fault Handling” on page 66.

**Note:** If the Process Log is not visible, you must enable logging on the Configuration page.

## Faults

### BPEL Standard Faults

The following list specifies the standard faults defined within the BPEL4WS specification. All these faults are named within the BPEL4WS namespace standard prefix `bpws:` corresponding to the following URI:

```
http://schemas.xmlsoap.org/ws/2003/03/business-process/
```

**Table 18:** *BPEL Standard Faults*

| Fault Name | Description |
|---|---|
| conflictingReceive | Thrown when more than one receive activity or equivalent (currently, onMessage branch in a pick activity) are enabled simultaneously for the same partner link, port type, operation and correlation set(s) |
| conflictingRequest | Thrown when more than one synchronous inbound request on the same partner link for a particular port type, operation and correlation set(s) are active |
| correlationViolation | Thrown when the contents of the messages that are processed in an invoke, receive, or reply activity do not match specified correlation information |
| forcedTermination | Special fault raised in an executing scope that is terminated |
| invalidReply | Thrown when a reply activity executes but no matching receive/onMessage with the same partner link, portType and operation, and messageExchange has executed |

**Table 18:** *BPEL Standard Faults (Continued)*

| Fault Name | Description |
|---|---|
| joinFailure | Thrown when the join condition of an activity evaluates to false and the `suppresJoinFailure` value in the scope is `no` |
| mismatchedAssignmentFailure | Thrown when incompatible types are encountered in an assign activity |
| missingReply | Thrown when a scope (or process) completes without replying to a receive that is using a message exchange (or the default message exchange) declared by that scope. This fault indicates that the process has failed to reply to a request-response message. Since the scope that defined the message exchange completed, then it is impossible to execute a reply with that same message exchange value since it is now out of scope. |
| repeatedCompensation | Thrown when an installed compensation handler is invoked more than once. |
| selectionFailure | Thrown when a selection operation performed either in a function such as `bpws:getVariableData`, or in an assignment, encounters an error |
| uninitializedVariable | Thrown when there is an attempt to access the value of an uninitialized part in a variable. By default all variables in BPEL are uninitialized until they are populated with data by an assign activity or other means like receiving data from a web service interaction. |

**Table 18:** *BPEL Standard Faults (Continued)*

| Fault Name | Description |
|---|---|
| forEachCounterError | Thrown when one of the loop expressions for a forEach activity evaluates to something other than an `xs:unsignedint`. This includes the mandatory start and final expressions as well as the optional completionCondition expression. |
| completionConditionFailure | Thrown after the completion of a forEach iteration if it is determined that there are not enough iterations remaining to execute in order to fulfill the completionCondition |
| invalidBranchCondition | Thrown if the integer value evaluated from the completionCondition expression in a For Each activity is larger than the number of iterations that will execute in the forEach; e.g., `completionCondition > (final - start) + 1` |

**Artix Orchestration Custom Faults**

The following list specifies the custom faults defined for the Artix Orchestration engine. All these faults are in the namespace:

```
http://www.iona.com/2004/06/bpel/extensions/
```

**Table 19:** *Artix Orchestration Custom Faults*

| Fault Name | Description |
|---|---|
| systemError | Unrecoverable system error |
| badProcess | Invalid BPEL |
| validationError | Error in message variable data. Validation errors are reported only if the configuration option “Validate input/output messages against schema” is enabled. |

**Table 19:** *Artix Orchestration Custom Faults (Continued)*

| Fault Name | Description |
|---|---|
| xpathFunctionError | Error in executing XPath function |
| invalidTransitionCondition | Non-Boolean return from an XPath evaluation of a transition condition |
| xpathDateParseError | Error in parsing an `xsd:date` or `xsd:datetime` |
| xpathDurationFormatError | Error in parsing an `xsd:duration` |

# Fault Handling

**Overview**

A process can receive an unexpected fault during its execution. In such an event, the process may not have the necessary fault handling logic, and the process may terminate. A more desirable result is to suspend the process, retry, step over, or make corrections and then complete the process normally.

You can configure Artix Orchestration to suspend processes on uncaught faults. You can then use the following process exception management techniques available in the Administration Console:

- Find faulting processes quickly by using selection filters in the Active Processes page
- Update the value of variables, partner links, and correlation properties
- Retry an activity or scope
- Mark an activity or scope as Complete and continue to the next activity
- Set up alerts for faulting processes

**Suspending a process on an uncaught fault**

You can configure the engine to suspend processes on uncaught faults so that you can inspect a problem, make corrections, if desired, and continue the process.

For details, see "Engine Properties" on page 15. In addition, on a process-by-process basis, you can override the engine-wide setting with a setting in the PDD file. The global setting may not be desirable for all process types. For example, a "straight-through" process, which has someone waiting for a response, may not be a desirable candidate to suspend.

**Correcting faults**

Use the Selection Filters on the Active Processes page to view a list of faulting processes.

Select a process from the list and then from the Active Process Details page, you can do any of the following to correct a problem:

- Update the value of variables
- Update the endpoint reference of partner links, such as the service name or `ws:address`

- Update the value of correlation properties
- Retry, complete, or step activities

## Selecting a faulting process

To select a faulting process:

1. From the Active Processes page, select a process with a Suspended-Faulting state. Use the Selection Filters to quickly locate the process you are looking for.
2. Click the **Plan Id** to display the Active Process Details page.

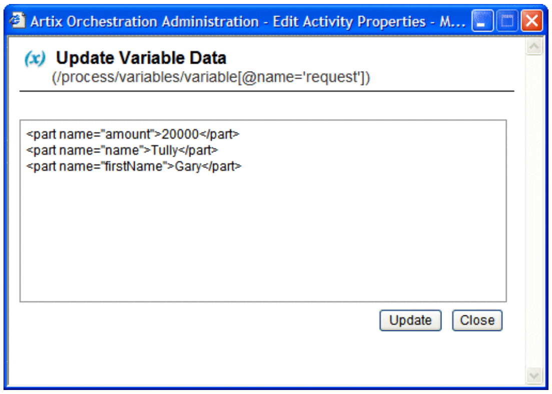
## Updating the value of a variable on a faulting activity

A variable may cause an uncaught fault if it is invalid with regard to an activity's operation.

To update a variable value:

1. From the Outline view of the Active Process Details page, select a variable. The current value of the variable is shown in the Variable Data Instance box.
2. Click **Edit** at the bottom of the Variable Data Instance box.
3. In the Update Variable Data dialog, make the modifications necessary. Possible modifications include:
   - data value(s)
   - XML data structure

**Figure 8:** *The Update Variable Data Dialog*


Artix Orchestration Administration - Edit Activity Properties - M...
Update Variable Data
(/process/variables/variable[@name='request'])
Update
Close

```
<part name="amount">20000</part>
<part name="name">Tully</part>
<part name="firstName">Gary</part>
```

4. Click **Update**.

## Updating partner link data on a faulting activity

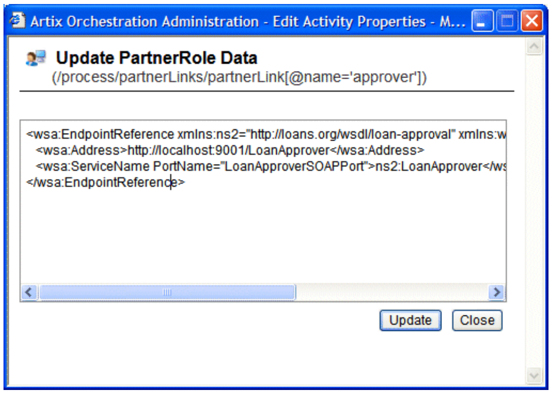
A partner link endpoint reference may cause an uncaught fault for a variety of reasons:

- The service is unavailable
- The address contains invalid information
- The address is missing required information, such as a header or credentials

If an endpoint is not available or the address is incorrect or incomplete, you can supply new `ws:address` information for a faulting partner link, as follows.

1. From the Outline view of the Active Process Details page, select a partner link. The current value of the endpoint reference is shown in the Partner Role Data box.
2. Click **Edit** at the bottom of the box.
3. In the Update Partner Role Data dialog, make the modifications necessary.

**Figure 9:** *The Update Partner Role Data Dialog*


Artix Orchestration Administration - Edit Activity Properties - M...
Update PartnerRole Data
(/process/partnerLinks/partnerLink[@name='approver'])

```
<wsa:EndpointReference xmlns:ns2="http://loans.org/wsdl/loan-approval" xmlns:w
  <wsa:Address>http://localhost:9001/LoanApprover</wsa:Address>
  <wsa:ServiceName PortName="LoanApproverSOAPPort">ns2:LoanApprover</ws
</wsa:EndpointReference>
```

4. Click **Update**.

**Updating a correlation set on a faulting activity**

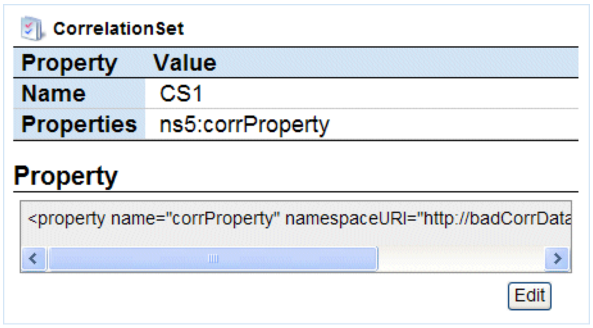
A *correlation set* is a set of properties shared by messages. The purpose of the correlation set is to act as a conversation identifier: it keeps together all messages intended for the same process instance. If an activity is faulting due to bad message data, you may need to correct the correlation property data as well as the message variable data.

Correcting correlation data requires a comprehensive understanding of the message properties defined in the process's WSDL file and the expected value in the property alias associated with the input/output variables of receive, onMessage, invoke, and reply activities. Also, be aware that a correlation set can be declared at the process level or at a scope level. For details on defining and using correlation sets, see the *Artix Orchestration Designer Online Help*.

To update a correlation set:

1. From the Outline view of the Active Process Details page, select a correlation set. The current value of the correlation property is shown in the Correlation Set Property box.

**Figure 10:** *The Correlation Set Property Box*



CorrelationSet

| Property | Value |
|---|---|
| Name | CS1 |
| Properties | ns5:corrProperty |

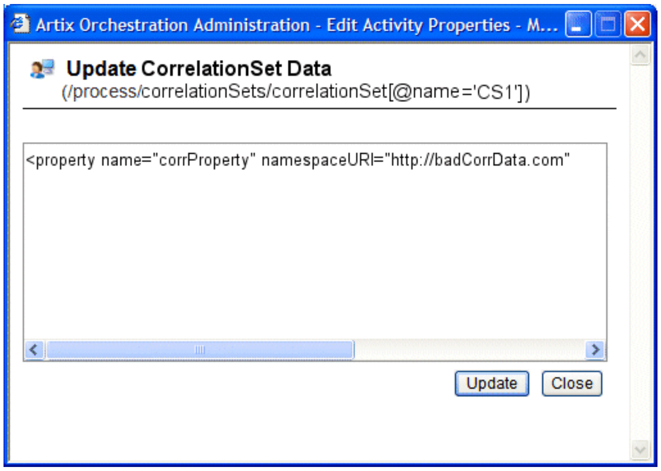
Property

```
<property name="corrProperty" namespaceURI="http://badCorrDat
```

2. Click **Edit** at the bottom of the box.

3. In the Update Correlation Set Data dialog, make the modifications necessary.

**Figure 11:** *The Update Correlation Set Data Dialog*


Artix Orchestration Administration - Edit Activity Properties - M...
Update CorrelationSet Data
Update
Close

(/process/correlationSets/correlationSet[@name='CS1'])

```
<property name="corrProperty" namespaceURI="http://badCorrData.com"
```

4. Click **Update**.

---

**Using Step, Retry and Complete**

After correcting the variables, correlation properties, or partner links causing an uncaught fault (if desired), you can retry or complete (step over) the faulting activity or an enclosing scope.

On the Active Process Details page, select the faulting activity or scope from the Outline view or Graph view. The activity shows a Faulting state and includes an **Action** bar.

**Table 20:** *Action Bar Options*

| Button | Action | Description |
|---|---|---|
| ▶ | Step | Steps the current activity. After stepping an activity, the next activity (if any) becomes ready for execution, and you can continue to step through the process or use the process level Resume button to continue. This button is disabled for a faulting activity since you can accomplish the same result simply by resuming the process from the Outline view menu bar. |
| ↶ | Retry | Retries the faulting activity or scope. If you corrected the cause of an uncaught fault, the next activity will become ready to execute and you can either resume the process or continue to step through the process one activity at a time. If you retry an executing scope, then the scope will first terminate any of its enclosed activities that are still running and also issue a compensate call to any eligible enclosed scopes prior to retrying. |
| ✓ | Complete | Marks the activity or scope as completed normally. The next activity will become ready to execute, and you can either resume the process or continue to step through the process one activity at a time. Keep in mind that you may have to take some additional steps to fix a process if you use the Complete button. Since the activity that you are marking as complete does not execute, there may be variables or correlation sets that are not properly initialized as a result of completing the activity. |

## Setting up alerts for faulting processes

When unexpected faults occur, you can manually check for the occurrence of suspended processes through the Active Process Page. Alternately, you may want to have the system notify you if there was a problem with one of your processes. To do so, you can designate a service to be notified of these faults. The service can then take steps to dispatch notifications of the problem (e.g., to an enterprise management system or pager) or in systemic cases automate recovery of the process.

Artix Orchestration allows you to designate a BPEL process as an alerting service. The service, which you can create in Artix Orchestration Designer, is based on a WSDL file that defines the schema, messages, port types, operations, and partner link types available for building an alerting system. Once the process is deployed, you can go to the **Alerts** tab of the **Configuration** page to set up the service to handle alerts.

For more information, see:

- "Alerts" on page 25
- The Process Exception Management topic in *Artix Orchestration Designer Online Help*
- The `alerts.wsdl` file in the `*ArtixInstallDir*\artix\*VersionNumber*\etc\bpel` directory, which is required for creating an alerting service.

## Process exception management and endpoint policies

Artix Orchestration uses endpoint policies governed by the WS-Policy specification. A policy can describe when to avoid invoking a service, based on system downtime and how many times to retry a service that does not reply. The endpoint policy information is added to the PDD file of a process.

CHAPTER 6

# Process Versions

*Artix Orchestration manages process versions. Version details include:*

| | |
|---|---|
| Process Version Life Cycles | page 74 |
| Process Version Persistence Type | page 77 |
| Process Suspension on Uncaught Fault | page 78 |

# Process Version Life Cycles

## Overview

Process versioning allows different versions for a given process to exist in Artix Orchestration. Two deployments are considered to be different versions of the same process if they have the same target namespace and name in the BPEL file, but one deployment differs from the other in some way.

Process versioning allows you to control when processes become effective and for how long. You can also control what happens to processes created by older versions when a new version becomes effective. While multiple versions of a process can exist concurrently, only the latest effective version is capable of creating new process instances.

**Note:** Process versioning is available in the persistent version of Artix Orchestration only.

## Version states

The latest effective version is in a *current* state. Other states include *future*, to describe versions that have an effective date in the future, *expired* to describe versions whose expiration date has arrived or has been set, and *inactive* to describe expired versions that no longer have running process instances.

## Versioning in a PDD

The process deployment descriptor provides selections for describing how a deployment is to be versioned. These selections are all optional and have default values as described below.

The following example shows the syntax for version information in the PDD file.

```
<version effectiveDate="2005-12-12T00:00:00-05:00"
expirationDate="2007-12-12T00:00:00-05:00" id="1.5"
runningProcessDisposition="migrate"/>
```

where:

- **effective date** is the date the new version becomes the current version and all new process instances run against it. Depending on the disposition selected for running processes, some may continue to run until complete using the older version. The effective date is an XML schema date/time value. The time expression includes a time zone, indicated as the midnight hour plus or minus the number of hours ahead of or behind Coordinated Universal Time (UTC) for the computer's time zone. In the example above, the computer time zone is eastern standard time, which is five hours behind UTC. If you do not provide an effective date, it defaults to the date and time the process is deployed to the server.

- **expiration date** is the date, beyond the effective date, the current version expires. An expired version is not capable of creating new process instances. Once all of the running processes tied to an expired version complete then the version becomes inactive. All process instances for the current version run to completion. The expiration date is an XML schema `datetime` value. (Same as effective date). If you do not provide an expiration date, the version does not expire until you manually expire it in the Administration Console or until a newer version is deployed.
- **id** is the process version number in major.minor format. You do not need to provide a version number. Artix Orchestration server auto-increments new versions. The server increments a version number by dropping the minor value and adding 1 to the max number. For example, version 1.5 increments to version 2.0.
- **runningProcessDisposition** is the action the server takes on any other versions of the same process that currently have processes executing once this version's effective date arrives.

**runningProcessDisposition valid values**

Valid values for runningProcessDisposition are:

- **Maintain**. Indicates that all process instances for the previous versions should run to completion. This is the default value.
- **Terminate**. Indicates that all process instances running under previous versions should terminate on the effective date of the new version, regardless of whether or not the process instances are complete.
- **Migrate**. All running process instances created by previous versions will have their state information migrated to use the newly deployed process definition once its effective date arrives. If there are incompatible changes between the versions that would not permit

them to be migrated, you receive an error message during deployment of the new process, and its deployment fails. Changes should be limited to XPath expression changes in the BPEL XML file.

## Criteria for a New Version

A new version of a deployed process must meet the following criteria:

- The fully qualified process name must not change
- A new version can include a change to either the BPEL XML or the process deployment descriptor file
- A version is not new if the autoincrement feature determines that the BPEL XML and the deployment descriptor are the same as the deployed version having the highest version number. If the BPEL XML and the descriptor file do not contain any differences, then the version on the server is up-to-date and no deployment occurs.
- If you need to modify WSDL-related properties, such as partner links or correlation properties, then you should create a new process, not a new version

# Process Version Persistence Type

## Overview

Persistence refers to storage of active processes. When a process runs on the server, by default all state information is stored in the server database. However, this setting can be changed in the PDD file.

Persistence setting selections are as follows:

**Table 21:** *Persistence Settings*

| Item | Description |
|---|---|
| System Default | The current engine setting for all processes. The default engine setting is Full persistence |
| Full | The default setting. For each process instance, all state information is stored for a running, faulted, and completed process. |
| None | No process information is stored in the server database when a process terminates |

# Process Suspension on Uncaught Fault

**Overview**

According to the BPELWS1.1 specification, a process with an uncaught fault terminates with a forced termination fault.

On the Engine Properties tab of the Configuration page, you can enable an option to suspend all processes on an uncaught fault to put them in a suspended-faulting state. You can then perform process exception management on the faulting process followed by retrying or completing the faulting activity or scope.

An individual process can override the engine setting with an entry in the PDD file. The settings are:

**Table 22:** *Process Suspension Settings*

| Item | Description |
|---|---|
| System Default | The current engine setting for all processes. The default engine setting is to disable suspension on uncaught fault; however the current setting may be different. |
| False | Do not allow this process to suspend on an uncaught fault. The process will terminate abnormally. This setting overrides the engine setting. |
| True | Suspend this process on an uncaught fault to put it in a suspended-faulting state. You can then perform process exception management on the faulting process, followed by retrying or completing the faulting activity or scope. This setting overrides the engine setting. |

See "Fault Handling" on page 66 for more details.