

HP Business Availability Center

for the Windows and Solaris operating systems

Software Version: 8.00

Using Business Process Insight

Document Release Date: January 2009

Software Release Date: January 2009



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1 Welcome to This Guide

This guide provides information about the management tasks that you need to complete for the ongoing set up and maintenance of your Business Process Insight (BPI) solution.

BPI comprises a number of different components, some of which can be distributed to other systems; however, there are some BPI components that always need to be located together and these are collectively referred to as the BPI Server components.

For information about the architecture of the BPI system and how BPI integrates with other products, refer to *Business Process Insight Reference Information*. You do not need to understand the BPI architecture in order to manage the BPI system; however, it provides useful information that helps to understand how the components relate to each other.

This chapter includes:

- [How This Guide Is Organized](#) on page 16
- [Who Should Read This Guide](#) on page 19
- [Getting More Information](#) on page 19

How This Guide Is Organized

This guide covers the following topics:

- [Chapter 2, Component Administration](#)

This chapter describes using the Administration Console to modify the BPI Server configuration parameters.

This chapter also describes how to configure the logging levels for the BPI components. This is useful if you are trying to gather information about a particular problem that is occurring in your BPI system, or if you are trying to debug a Process definition that you have created, you might need to modify the level at which the BPI components are logging.

- [Chapter 3, Enhancing BAC with Process Instance Monitors](#)

This chapter describes how to configure the integration of the BPI Server into your BAC system.

- [Chapter 4, Modeler](#)

The Modeler page is one of the BPI Administration client pages and is where you launch the BPI Modeler. The chapter describes how to launch the Modeler and also provides information about how to manage the BPI Modeler, for example, importing and exporting process definitions.

- [Chapter 5, Monitor Definer](#)

The Monitor Definer page is one of the BPI Administration client pages. The chapter describes the Monitor Definer and how to manage the Business Process Monitor Definer, for example, exporting and importing monitor definitions.

- [Chapter 6, Process Repository Explorer](#)

The Process Repository Explorer page is one of the BPI Administration client pages. The chapter describes managing Business Process data in the Process Repository using the Repository Explorer, for example, the chapter describes how to:

- view and print details of the definitions that are stored in the Process Repository.
- export versions of your Business Processes.
- permanently delete definitions.
- restore definitions previously deleted within the BPI Modeler.
- view the history of your definitions.

- [Chapter 7, Process Intervention](#)

The Process Intervention page is one of the BPI Administration client pages. The chapter describes how to use the Intervention tool to intervene in process progression.

The Intervention tool enables you to intervene or gain access to instances of Process and Data definitions. You might need to do this in cases where the process instance is blocked for some reason and cannot progress, or where you have entered inaccurate start and complete conditions in your progression rules.

The Intervention tool also enables you to:

- initiate a synchronization with the UCMDB for deployed Business Processes, process Steps and Monitors.
- delete instances.
- undeploy definitions.

- [Chapter 8, Notification](#)

The Notification page is one of the BPI Administration client pages. This chapter describes how you can configure user accounts to receive process event notifications and monitor instance threshold violations.

You use the Notification page to configure user accounts to subscribe to event notifications and violations for email and HP Operations Manager messages. You can also subscribe user accounts to events, such that when a specified subscription event is received by the Notification Server, a script is run.

- [Chapter 9, BPI Application Concepts](#)

This chapter describes using the options available within BAC to monitor the health and operational status of your Business Processes and Business Process Steps.

- [Chapter 10, BPI Application Scorecard](#)

The Scorecard page is one of the BPI Application pages and presents a type of report that enables you to display the real time status, trend, and changes-over-time data for a selected BPI Business Process.

- [Chapter 11, BPI Application Health](#)

The Health pages are a set of pages accessible from the BPI Application menu option and present the operational and business health of the Business Processes that you have defined using the BPI Modeler.

- [Chapter 12, BPI Application Reports](#)

The Reports page is one of the BPI Application pages and shows historical data relating to summaries of Business Processes, Business Process Steps, and Monitors that you have defined.

- [Chapter 13, Annotations for Process Diagrams](#)

This chapter describes how to add annotations to the flow map within the Flow Map tab and on the Business Health page.

- [Chapter 14, Deleting Completed Instances from the Database](#)

This chapter describes the tools that are available to manage data that is being collected in the BPI Database.

If you are tracking many BPI process instances, and monitor instances, statistics and violations, the data in the BPI database can build up over time. This chapter describes how to manage the data that builds up.

- [Chapter 15, Servlet Engine Authentication](#)

This chapter describes how to use the Memory Realm mechanism within Tomcat, the Servlet Engine used by the BPI Server, to secure the BPI Web pages where required. This is as an alternative to lightweight single sign-on.

- [Chapter 16, High Availability Using Microsoft Clusters](#)

This chapter describes how to create a high availability solution for BPI on Microsoft Windows.

You can install and configure BPI as part of a Microsoft Server Cluster in order to provide a high availability solution for BPI. This is a separate topic to high-availability configuration described in the *Business Availability Center Deployment Guide*.

- [Chapter 17, Backup and Recovery](#)

This chapter describes how to create a backup and recovery process for the BPI Server system.

For enterprise systems, you need to make sure that you have a backup policy for your BPI system. This chapter describes how to backup BPI and advises you of any specific requirements that might have an effect on your organizational backups. You should read this chapter in conjunction with the high-availability solution described in the *Business Availability Center Deployment Guide*.

Who Should Read This Guide

This guide is intended for the following users of HP Business Availability Center:

- HP Business Availability Center administrators
- HP Business Availability Center end users

Readers of this guide should be knowledgeable about navigating and using enterprise applications, and be familiar with HP Business Availability Center and enterprise monitoring and management concepts.

Getting More Information

For a complete list of all online documentation included with HP Business Availability Center, additional online resources, information on acquiring documentation updates, and typographical conventions used in this guide, see the *HP Business Availability Center Deployment Guide* PDF.

2 Component Administration

This chapter describes the BPI Administration Console, which is installed as part of the BPI Server. Using the Administration Console you can modify parameters relating to the BPI Server Application for Business Availability Center (BAC).

Chapters in *Business Process Insight Reference Information*, provide background information relating to the architecture of the BPI system that you might find helpful when modifying some of these parameters.

This chapter includes the following information:

- The parameters that can be modified using the Administrative Console.
- How to make sure that any modifications made through the Administrative Console are preserved.
- Accessing the License Manager software.

Not all the parameters described in this chapter need to be modified. What you need to change depends on your particular configuration and requirements. You are advised not to change anything unless you are recommended to in the documentation, or by your support representative.

Administration Console Description

You use the Administration Console to manage the BPI Server components. (The BPI components that make up the BPI Server are described in *Business Process Insight Reference Information*.) The Administration Console is a graphical management interface that displays a list of the parameters that can be modified.

The Administration Console opens on the `Status` panel, which is where you start and stop the BPI Server components.

You navigate through the Administration Console configurations using the explorer-style menu in the left-hand pane. Select the option from the pane that you want to manage. For example, if you want to manage port numbers select the `Port Numbers` option.

When you select an option in the left-hand pane, the right hand pane is updated to contain the configuration details for the parameters that can be modified.

You do not necessarily need to complete all the tasks described in this chapter for your implementation. Many of the parameters that you can change are used to configure more than one BPI component, for example, changing the database password affects all components that access the database.



Make sure that you follow the instructions in each section when making changes to the configuration for BPI Server components through the Administration Console. This is because the steps for changing the parameters can vary according to the parameter that is being modified.

Starting the Administration Console

You start the Administration Console as follows:

```
Start > Programs > HP > HP Business Process Insight > Administration
```

The Administration Console opens at the `Status` pane.

You can close the Administration Console at any time without applying outstanding changes and it does not impact the status of the system. You might need to click the `Reset` button to reset the page back to its state when you opened it. The next time that you start the Administration Console, it shows the current status of the BPI components.

Each time you start the BPI Server Administration Console, the BPI Server:

- sends details of the BPI instance database settings, Servlet Engine settings and installation directory details to BAC in order that the BPI Application infrastructure settings can be set automatically within BAC; this means you do not need to add these settings manually.

If you change the settings using the Administration Console, the BPI Application infrastructure settings are also changed. If you change the BPI Application infrastructure settings directly from BAC, the settings are overwritten the next time the BPI Administration Console is restarted. This is with the exception of the Host name; the Host name is not affected because the same server can be known by different names to different systems.

- polls for the BAC lightweight single-signon setting and uses the values to update the equivalent BPI settings under the `Security` option.

Functions Provided by the Administration Console

BPI comprises a number of individual components, each of which has its own configuration, or property file that define the parameters that can be used to control how the component behaves. Examples of parameter values that can be configured are:

- retry delays
- port numbers
- logging levels

Many of the parameters in these property files do not need to be changed. Therefore, in order to simplify the management of the BPI system, only those parameters that might need to be modified have been made available through the BPI Server Administration Console.



If you do make changes directly to the properties in the property files, you will need to reapply the changes each time you reinstall BPI, or add the same changes within the Administration Console, where they are preserved.

This is because the files and the property values in these files are overwritten when the BPI Server is installed.

Specifically, the Administration Console provides access to the following BPI Server component areas:

- Server component status, which:
 - shows whether or not the BPI Server components are running.
 - enables you to start and stop components.
 - enables you to view the content of the current log file.

See section [Status](#) on page 26 for details of the Status option.

- Notification Server parameters; see section [Component Configuration - Notification Server](#) on page 32.
- Business Impact Engine parameters; see section [Component Configuration - Business Impact Engine \(BIE\)](#) on page 36.
- Monitor Engine parameters; see section [Component Configuration - Monitor Engine](#) on page 53.
- HP Business Availability Center parameters; see section [Component Configuration - HP Business Availability Center Settings](#) on page 68.
- Process Repository parameters; see section [Component Configuration - Process Repository](#) on page 75.
- Business Event Handler parameters; see section [Component Configuration - Business Event Handler](#) on page 79.
- JMS Business Event Handler parameters; see section [Component Configuration - JMS Business Event Handler](#) on page 82.
- Servlet Engine parameters; see section [Component Configuration - Servlet Engine](#) on page 89.
- Microsoft SQL Server access.

This option is available when you have configured Microsoft SQL Server as the database for the BPI Server; see section [Component Configuration - MS SQL Server Access](#) on page 96.
- Oracle Server access.

This option is available when you have configured an Oracle Server as the database for the BPI Server; see section [Component Configuration - Oracle Server Access](#) on page 98.

- Port number settings; see section [Component Configuration - Port Numbers](#) on page 100.
- Logging parameter settings; see section [Component Configuration - Logging](#) on page 103.

The configuration parameters that you can modify for these component areas are described in the remaining sections of this chapter.



The Modeler is not a BPI Server component; its configuration is described in [Chapter 4, Modeler](#).

In addition to individual component configurations, the Administration console provides access to the HP License Manager software; see section [License Management](#) on page 108.

Status

Use this option to start and stop the BPI Server components and also to view the component log files of these components.

The Status pane lists the BPI Server components that you can start and stop, and includes buttons labeled, *Start*, *Stop* and *View Log*. The components included on the Status pane, following a full installation on Windows, are:

- **Business Impact Engine (BIE)**
The component responsible for managing the progress of process instances, based on the business and operational events received from external sources. The BIE also generates impact notifications.
- **Monitor Engine**
The component that analyzes and provides the statistical results from Business Process Monitor, monitor instances and performance indicators. The Business Process monitors are created using the Business Process Monitors Definer.
- **Business Event Handler**
Receives business events from sources external to BPI and forwards them on to the Business Impact Engine in a standard format.
- **JMS Business Event Handler**
Received JMS-sourced business events from JMS-based business application sources external to BPI and forwards them on to the Business Impact Engine in a standard format. TransactionVision is an example of a JMS-based application.
- **Process Repository**
The design-time repository where the BPI Modeler stores its definitions. The Process Repository uses the information in the Process Repository schema when deploying the Business Processes.
- **Data Samples Provider**
The BPI component that is responsible for sending KPI data samples to the BAC system. The data samples are configured within the Monitor Definer.

- **Web Services Provider**
The BPI interface that exposes BPI Web Services to an external consumer.
- **CI Status Poller**
This is the service adapter that is used to manage the communication between the Business Impact Engine and the Gateway Server that BPI connects to for CI statuses.
- **Servlet Engine**
This is the Web Server component (Tomcat) that is installed as part of BPI. This component manages the server-side of all the BPI Web-based interfaces, for example: the Notification page and Intervention tool. It also manages the process instance and violation pages that are presented through the BPI Application pages.
- **Notification Server**
The component used to send email notifications of business events to configured recipients.

In addition, there are the `Start All` and `Stop All` buttons, which you can use to start and stop all BPI Server components.

You also access the log files for the BPI Server components from the `Status` pane. This enables you to identify status and error information for that component. The level of detail shown in the log files is controlled by the logging levels that you set. Setting log levels is described in section [Component Configuration - Logging](#) on page 103.

If the log files are not displaying correctly on your system, you can change the viewer used to display the log files as described in section [Log File Locations and Changing the Log Viewer](#) on page 31.

Starting and Stopping the BPI Server Components

You can use the BPI Administration Console to start and stop the BPI Server components that you have installed, on the system where the Administration Console is running. The BPI Server components are also defined as Windows Services.

This chapter describes using the Administration Console to start and stop the BPI Server components; refer to *Deploying Business Process Insight* for details of the Windows Services for the BPI Server components.

Starting the BPI Server Components Using the Administration Console

You start the BPI Server components from the `Status` panel. Click the `Start All` button to start all the BPI components installed on the system. You must make sure that the BPI Instance database is running and that BAC is installed and running before you attempt to start the BPI components as this command does not start the database.

You can start and stop the BPI components individually. To do this, click the `Start` button adjacent to the BPI component that you want to start.



There are some dependencies between components, you are therefore advised to use the `Start All` option to start the components unless instructed otherwise.

Stopping the BPI Server Components Using the Administration Console

You stop the BPI Server components in the same way that you started them, from the `Status` panel of the Administration Console. Select the `Stop All` option to stop the BPI Server, or stop the components individually.

If you stop each BPI component individually, the `Stop All` button remains enabled. This is because the Administration Server components is still running. You are therefore advised to always use the `Stop All` command to shut down BPI Server before completing any installation tasks or tasks where it is important that all the BPI Server components are stopped.

BPI Clients

BPI has the following clients, which are accessed from the Gateway Server where the BPI Application is available. These clients require both the Gateway Server to be running and the BPI Servlet Engine to be enabled:

- **Modeler**

This is an application that you use to create and deploy your Business Processes. Using the Modeler to configure Business Processes is described in the *Business Process Insight Training Guide - Modeling Processes*. Managing the Modeler is described in [Chapter 4, Modeler](#) of this guide.

- **Monitor Definer**

You use the Monitor Definer to configure Business Process monitors and monitor instance threshold definitions. Examples and scenarios for using the Monitor Definer to configure Business Process monitors and thresholds are described in the *Business Process Insight Training Guide - Defining Business Monitors*. Managing the Monitor Definer is described in [Chapter 5, Monitor Definer](#) of this guide.

- **Process Repository Explorer**

Use the Process Repository Explorer to view and manage entries in the Process Repository database. The Process Repository database holds the details of the Business Processes that you have created using the BPI Modeler. The Repository Explorer is described in [Chapter 6, Process Repository Explorer](#).

- The Process Intervention

Use the Process Intervention Tool to make changes to definitions and instances that are active or completed in the Business Impact Engine. The Process Intervention tool is described in [Chapter 7, Process Intervention](#).

- Notification Administration

Use the Notification Administration:

- to add and configure users who want to receive email notifications of instance violations from BPI.
- to configure HPOM to receive HP Operations Manager messages.
- to configure scripts.

Using the Notification page to configure the Notification Server is described in [Chapter 8, Notification](#).

In addition there are BPI Application pages. These are the pages that enable you to monitor and track your Business Processes and are described in [Chapter 9, BPI Application Concepts](#).

You can also configure your own security options for accessing the BPI interfaces. You do this using the Servlet Engine (Tomcat); see [Chapter 15, Servlet Engine Authentication](#).

Log File Locations and Changing the Log Viewer

All the BPI components have log files; however the log files presented through the `Status` pane relate only to the BPI Server components, which are managed using the Administration Console.

The Modeler is not a BPI server component and its log file is described in [Chapter 4, Modeler](#). The structure of all BPI log files is described in the *Business Process Insight Problem Solving Guide*.

All the BPI Server log files are located in the following directory:

```
bpi-install-dir\data\log
```

Use the `View Log` button on the `Status` pane (adjacent to the `Start` and `Stop` buttons) to view the log files for the server components. By default the logs are displayed using `notepad`.

Section [Component Configuration - Logging](#) on page 103 describes the parameters for modifying the viewer application that is used to display the log files for BPI Server components.

Component Configuration - Notification Server

Table 1 lists the parameters that you can modify to change the configuration of the Notification Server using the Administration Console.

Table 1 Notification Server Parameters

Descriptive Parameter Name	Description
SMTP hostname	<p>The fully qualified domain name of the system where the SMTP email server is running; you can also enter <code>localhost</code> where appropriate.</p> <p>The BPI system needs access to a running SMTP email server in order to send impact violations through email to registered users.</p> <p>Refer to Chapter 8, Notification for information about registering users to receive email notifications.</p>
SMTP port number	<p>The port number that the SMTP server is communicating on.</p> <p>The BPI system communicates with the SMTP email server through a specific port number, which is usually port 25.</p>
Sender email address	<p>The email address that you want to appear in the <code>Sender:</code> field on email notifications sent from the BPI system. This is the email address that identifies where the message originated from.</p>
Retry interval to SMTP server (minutes)	<p>The time (in minutes) that the Notification Server waits before attempting to send a notification to the SMTP server, if it fails on the first attempt. If the Notification Server is unable to send the message, it logs a warning message and temporarily stores the message in the database. The message is removed from the database when the notification is successfully delivered, or the retry limit is exceeded.</p>

Table 1 Notification Server Parameters

Descriptive Parameter Name	Description
Maximum retries to SMTP server	Maximum number of retry attempts made by the Notification Server to send a notification message to the SMTP server. When the maximum number of retries is reached, the Notification Server deletes the message from the database, issues an error message in its log file and makes no further attempts to deliver the message to the email server.
Path to HP Operations Manager Operrmsg utility	The full path name for the operrmsg utility within HP Operations Manager. Used by the Notification Server to send notifications to HP Operations Manager.
Retry interval to HP Operations Manager (minutes)	The time (in minutes) that the Notification Server waits before attempting to send an HP Operations Manager message to HP Operations Manager, if it fails on the first attempt. If the Notification Server is unable to send the message, it logs a warning message and temporarily stores the message in the database. The warning message is removed from the database when the notification is successfully delivered.
Maximum retries to HP Operations Manager	Maximum number of retry attempts made by the Notification Server to send an HP Operations Manager message to HP Operations Manager. When the maximum number of retries is reached the Notification Server deletes the message from the database, issues an error message in its log file and makes no further attempts to deliver it.

Table 1 Notification Server Parameters

Descriptive Parameter Name	Description
Retry interval for script execution (minutes)	The time (in minutes) that the Notification Server waits before attempting to execute a script that you have created, if the script fails to execute on the first attempt. If the Notification Server is unable to execute a script, it logs a warning message in the Notification Server log file.
Maximum retries for script execution	Maximum number of retry attempts made by the Notification Server to execute a script that you have created. When the maximum number of retries is reached the Notification Server, issues an error message in its log file and makes no further attempts to execute the script.
Timeout for script execution (seconds)	The time (in seconds) that the Notification Server waits before aborting the execution of the script, after the script has started executing. Once aborted, the Notification Server waits for the retry interval before attempting to execute the script again.

Changing the Notification Server Parameters

To change the Notification Server parameters, complete the following steps on the Windows system, where the BPI Server is installed:

1. Start the Administration Console as described in section [Administration Console Description](#) on page 22.
2. Select the Component Configurations > Notification Server option from the Navigator pane on the BPI Administration Console.
3. Enter the changes that you want to make to the Notification Server parameters in the right-hand pane as appropriate.
4. Click `Apply` to apply the changes to the BPI configuration.

5. Select the `Status` option to move to the panel where the BPI component status are shown.
6. Stop and restart all the BPI Server components using the `Stop All` and `Start All` buttons. You could stop and restart only the `Notification Server` and the `Servlet Engine`; however, you are recommended to use `Stop All` and `Start All` to make sure that components are started and stopped in the correct order.

The new `Notification Server` parameter values are now applied to your BPI system.

If you want to change the login password for the `Notification Server Administration Console`, refer to [Chapter 15, Servlet Engine Authentication](#).

Component Configuration - Business Impact Engine (BIE)

The Business Impact Engine configuration parameter settings are divided into a number of logical sections. These sections appear within the Administration Console under the `Engine` option as follows:

- BIE Java Virtual Machine (JVM) settings
- BIE Model Cleaner settings
- BIE Process and Data Instance Cleaner settings
- BIE Event settings
- BIE Event Queue settings
- BIE Notification settings
- BIE JDBC settings

The parameters relating to these settings appear on the right-hand pane of the Administration Console when you select one of these options in the console's navigation tree. If the options are not visible, you need to expand the entries under `Engine` using the usual Explorer style navigation techniques.

BIE Java Virtual Machine (JVM) Settings

This section describes the parameters that you can modify through the BIE Java Virtual Machine (JVM) settings option.

[Table 2](#) shows the Business Impact Engine parameters that enable you to modify the amount of memory heap available to the JVM for the system.

A heap is a storage management structure for tracking and allocating memory. In this case, the Java heap is used for allocating the Java objects used by the Engine.

Table 2 BIE Java Virtual Machine (JVM) Settings

Descriptive Parameter Name	Description
Initial size of the JVM heap (MB)	The initial size of the storage allocated by the JVM for Java objects.
Maximum size of the JVM heap (MB)	The maximum size of the storage allocated by the JVM for Java objects.

Modifying the BIE Java Virtual Machine (JVM) Settings

To change the BIE Java Virtual Machine (JVM) Settings, complete the following steps on the Windows system, where the BPI Server is installed:

1. Start the Administration Console as described in section [Administration Console Description](#) on page 22.
2. Select the Component Configurations > Business Impact Engine (BIE) > BIE Java Virtual Machine (JVM) settings option from the Navigator pane on the BPI Administration Console.
3. Enter the changes that you want to make to the settings as appropriate in the right-hand pane.
4. Click `Apply` to apply the changes to the property files.
5. Select the `Status` option to move to the panel where the BPI component status are shown.
6. Stop and restart all the BPI Server components using the `Stop All` and `Start All` options.

The new Business Impact Engine settings are now applied to your BPI system.

BIE Model Cleaner Settings

This section describes the parameters that you can modify through the BIE Model Cleaner Settings option. The Model Cleaner is a thread that runs at intervals and deletes Process and Data definitions that have been undeployed and that no longer have any associated instances, either in progress or completed.

Table 3 shows the Business Impact Engine parameters that enable you to remove undeployed Process and Data definitions from the BPI Instance database.

Table 3 BIE Model Cleaner Settings

Descriptive Parameter Name	Description
Delay between checking for all Models (minutes)	The time interval (in minutes) that the Business Impact Engine waits before reading the latest list of definitions. This list is used as input for the Delay between checking each model parameter.
Delay between checking each Model (seconds)	The time (in seconds) that the Business Impact Engine waits between checking each entry in the list of definitions created as a result of the Delay between checking for all models parameter. It is used to establish those definitions that have been undeployed and which are therefore candidates to be deleted. Definitions are not deleted if: <ul style="list-style-type: none">• the definition is deployed.• there are associated instances in the database, either in progress or completed.• the definition is referenced from another definition that is currently defined in the BPI Instance database; for example, a Data Definition is referenced from a Process definition.
Disable cleanup of files for Models not in database?	A check box indicating whether or not to remove the Java source, Java Class and script files for process and data models that have been cleaned from the Business Impact Engine. When checked, the source, classes and scripts are not removed.

Modifying the BIE Model Cleaner Settings

To change the BIE Model Cleaner Settings, complete the following steps on the Windows system, where the BPI Server is installed:

1. Start the Administration Console as described in section [Administration Console Description](#) on page 22.
2. Select the Component Configurations > Business Impact Engine (BIE) > BIE Model Cleaner settings option from the Navigator pane on the BPI Administration Console.
3. Enter the changes that you want to make to the Engine settings as appropriate in the right-hand pane.
4. Click `Apply` to apply the changes to the property files.
5. Select the `Status` option to move to the panel where the BPI component status are shown.
6. Stop and restart all the BPI Server components using the `Stop All` and `Start All` options.

The new Business Impact Engine settings are now applied to your BPI system.

BIE Process and Data Instance Cleaner Settings

This section describes the parameters for the BIE Process and Data Instance Cleaner settings.

The BIE Process and Data Instance Cleaner settings section describes how often the instance cleaner thread is run and therefore how often the Completed and Active instances are deleted (or not deleted) from the database. [Chapter 14, Deleting Completed Instances from the Database](#) provides more information on the business Impact Engine instance cleaner threads and the parameters that control it.

Instances are initially marked as being candidates to be deleted and the business impact Engine instance cleaner then runs at intervals that you specify to delete the instances that have been marked as candidates. More details of this process are provided in [Chapter 14, Deleting Completed Instances from the Database](#).

You also have the option to delete completed instances as soon as they are complete using this setting. There is no requirement for the Engine Instance Cleaner to run in this case, as the instances are deleted as soon as they are complete.

For a new installation, the Engine Instance Cleaner threads does not run and instances are not deleted when they complete. Completed and Active instances can therefore accumulate in the database and this, eventually, has an impact on the performance of your BPI system.

If performance, or space, is a consideration, you need to modify this default to remove these instances and also consider archiving data in order that you can view historical data. Refer to [Chapter 7, Process Intervention](#) for details of how you can specify your own SQL to archive process data before it is removed from the BPI database.

There are settings for how often the Engine Instance Cleaner marks instances as being candidates to be deleted, plus individual settings for controlling when the Completed and Active Instances are deleted. These are described in [Table 4](#), [Table 5](#) and [Table 6](#).



If you delete the data for all Completed instances as soon as they are completed, data is no longer available to be viewed through the Process Instance and Violation Web pages for viewing purposes.

Table 4 lists the BIE Process and Data Instance Cleaner thread settings, which enable you to control how often the instance cleaner thread is executed.

Table 4 BIE Process and Data Instance Cleaner Settings

Descriptive Parameter Name	Description
Mark instances for deletion:	<p>The option for marking process and data instances as candidates to be deleted by the Instance Cleaner thread at a specified interval.</p> <p>You have the following options:</p> <ul style="list-style-type: none"> • Never - instances are never marked to be deleted. • Periodically - instances are marked to be deleted at the interval that you specify. • Once a day - instances are marked to be deleted once a day, at the time that you specify. • Twice a day - instances are marked to be deleted twice a day, at the times that you specify.
Delete interval for marked instances	<p>The time interval used to control when the instance cleaner thread runs to delete any instances that have been marked for deletion.</p>
Delete batch size	<p>The maximum number of active and complete process and data instances that the instance cleaner thread deletes in one Delete interval. There are four batches, one each for active and complete process instances, and active and complete data instances.</p>

Table 5 lists the settings that control when Completed process and data instances are deleted from the BPI Instance database.

Table 5 Completed Process and Data Instance Cleaner Settings

Descriptive Parameter Name	Description
Delete completed instances from the database	<p>The option for deleting Completed instances from the database. You have the following options for deleting Completed instances:</p> <ul style="list-style-type: none"> • Never - completed instances are never deleted and remain in the database • As scheduled above - completed instances are deleted from the database at an interval that you specify in the BIE Engine Process and Data Instance Cleaner settings options. • Immediately on completion - completed instances are deleted as soon as they reach the state COMPLETED and are not under the control of the settings for the Engine Instance Cleaner thread.
Age of the completed instances to be removed (minutes)	<p>The age (in minutes) that the Completed instances must be before they can be deleted.</p> <p>The following are quick references to common time durations expressed as minutes:</p> <p>1 day = 1440 minutes</p> <p>1 week (7 days) = 10080 minutes</p>

Table 6 lists the settings that control how often Active process and data instances are deleted from the BPI Instance database.

Table 6 Active Process and Data Instances Cleaner Settings

Descriptive Parameter Name	Description
Delete active instances from the database?	<p>This is an indication of whether or not you want to delete active instances from the database.</p> <ul style="list-style-type: none"> • Never - active instances are never deleted and remain in the database • As scheduled above - active instances are deleted from the database at an interval that you specify in the Engine Process and Data Instance Cleaner settings options.
Age of the active instances to be removed:	<p>The age (in days, hours or minutes) that the Active instances must be before they can be deleted.</p> <p>If you enter a value of 60 minutes, the next time that you access this pane, the value is presented in terms of hours and not minutes.</p>

These parameters, and information about archiving instances before deleting them, are further described in [Chapter 14, Deleting Completed Instances from the Database](#).

Modifying the BIE Instance Cleaner Settings

To change the BIE Instance Cleaner Settings, complete the following steps on the Windows system where the BPI Server is installed:

1. Start the Administration Console as described in section [Administration Console Description](#) on page 22.
2. Select the Component Configurations > Business Impact Engine (BIE) > BIE Process and Data Instance Cleaner settings option from the Navigator pane on the BPI Administration Console.
3. Enter the changes that you want to make to the Engine Instance Cleaner settings as appropriate in the right-hand pane.
4. Click **Apply** to apply the changes to the property files.

5. Select the `Status` option to move to the panel where the BPI component status are shown.
6. Stop and restart all the BPI Server components using the `Stop All` and `Start All` options.

The new Business Impact Engine settings are now applied to your BPI system.

BIE Event Settings

This section describes the parameters that you can modify through the `BIE Event settings` option.

The parameter settings listed in [Table 7](#) enable you to minimize the amount of time that the components spend in loops and possible database deadlock situations and provides settings for throughput rates.

Table 7 BIE Event Settings

Descriptive Parameter Name	Description
Maximum event generation number	A limit for the number of child events created from an initial incoming event. This is intended to interrupt potential infinite loops for subscriptions to data definitions.
Maximum retries for an event transaction deadlock	<p>When processing an individual event, this is the maximum number of attempts by the Business Impact Engine to retry a database transaction before aborting it. It is possible for deadlocks to occur when the Engine and other applications are accessing the BPI database simultaneously.</p> <p>When the maximum number of retries is exceeded, the Business Impact Engine generates an error message and sends an exception to the Business Event Handler. The Business Event Handler then rolls back the event transaction and retries at a later time.</p>

Table 7 BIE Event Settings

Descriptive Parameter Name	Description
Event sample count used for calculating rates	The number of Events used as a basis for calculating throughput rates. Set this parameter according to the incoming Event rate (to the Business Impact Engine). You want to use sufficient numbers of Events to give you a realistic throughput rate.
Decay period for rates when no events are received (seconds)	The time period after which the throughput rates are decremented, in stages, to zero. This is used for periods of inactivity, to maintain realistic results for throughput rates.

Modifying the BIE Event Settings

To change the BIE Event Settings, complete the following steps on the Windows system, where the BPI Server is installed:

1. Start the Administration Console as described in section [Administration Console Description](#) on page 22.
2. Select the Component Configuration > Business Impact Engine (BIE) > BIE Event settings option from the Navigator pane on the BPI Administration Console.
3. Enter the changes that you want to make to the Engine settings as appropriate in the right-hand pane.
4. Click `Apply` to apply the changes to the BPI configuration.
5. Select the `Status` option to move to the panel where the BPI component status are shown.
6. Stop and restart all the BPI Server components using the `Stop All` and `Start All` options.

The new Business Impact Engine settings are now applied to your BPI system.

BIE Event Queue Settings

The following are the parameters that you can modify through the BIE Event Queue settings option.

These settings enable you to configure a business event queuing mechanism within the Business Impact Engine (BIE). When you select the option to use a queue for incoming events, all new business events are placed on a queue by the BIE. This means that any source of business events, for example: the Business Event Handler or the JMS Business Event Handler does not need to wait for the BIE to process the business event and can immediately return to tracking the event source and process the next incoming business event. This allows the BIE to have multiple threads to process business events.

If you choose not to use a queue for business events, the Business Event Handler waits until the business event has been processed by the BIE; this includes waiting for all the necessary information from the event to be committed to the database. The effect of this is to make the BIE single-threaded for event processing; the options are all disabled and any setting for the number of event handling threads is ignored.

The settings listed in [Table 8](#) on page 46 control whether or not a queue is utilized for business events and the characteristics of the queuing mechanism.

Table 8 BIE Event Queue Settings

Descriptive Parameter Name	Description
Use a queue for incoming events?	Select this option if you want BPI to use a queue for incoming business events. Clear the check box if you do not want to use a queue. When cleared, all the remaining options for the BIE Event Queue settings are unavailable.
Maximum number of events in the queue	The maximum number of business events that can be placed on the queue. When the number of business events on the queue reaches this maximum, no further business events can be added to the queue. In this case, the Business Event Handler has to wait until the queue is reduced before it can add further events.

Table 8 BIE Event Queue Settings

Descriptive Parameter Name	Description
Save the queue to the database	<p>Select this option if you want to write each business event to the database either as it arrives on the queue, or each time the Business Impact Engine is shut down (where shut down is stopping the Business Impact Engine from the Administration Console, or stopping the Windows Services.)</p> <p>Using this option enables you to rebuild the queue in the event of a system failure. If the business events are not written to the database on arrival, there is a risk that the events might be lost following a system failure. Be aware that there is a possible performance impact when you select the option to save each event as it arrives to the database.</p>
Event queue cleaner interval (mins)	<p>The time interval used to control the frequency that the event queue cleaner runs. Each time the event queue cleaner runs, it deletes, from the database, all business events that have been successfully processed by the BIE.</p> <p>This setting is available when the option to save the queue to the database for every event is selected.</p>
Number of event handling threads	<p>The number of individual processes available to process business events held on the event queue.</p> <p>A recommendation is to set this parameter to be twice the number of CPU cores that are available on your machine. Be aware that setting this property to a value of other than one, requires you to purchase an Enterprise license for BPI.</p>

Modifying the BIE Event Queue Settings

To change the BIE Event Queue Settings, complete the following steps on the Windows system, where the BPI Server is installed:

1. Start the Administration Console as described in section [Administration Console Description](#) on page 22.
2. Select the Component Configurations > Business Impact Engine (BIE) > BIE Event Queue settings option from the Navigator pane on the BPI Administration Console.
3. Enter the changes that you want to make to the Business Impact Engine settings as appropriate in the right-hand pane.
4. Click `Apply` to apply the changes to the BPI configuration.
5. Select the `Status` option to move to the panel where the BPI component status are shown.
6. Stop and restart all the BPI Server components using the `Stop All` and `Start All` options.

The new Business Impact Engine settings are now applied to your BPI system.

BIE Notification Settings

The following are the parameters that you can modify through the BIE Notification settings option.

If the Business Impact Engine initially fails to send an event notification to the Notification Server, it can try again. The settings listed in [Table 9](#) on page 49 control at what impact level notifications are sent, and the number of retry attempts and the interval between the retries for the notifications.

Table 9 BIE Notification Settings

Descriptive Parameter Name	Description
Process step impact notification severity threshold	The minimum instance threshold for the severity for a Business Process Step's KPI that can trigger an impact of impeded or blocked for the process. When one (or more) Step services reach the instance threshold specified a notification event is issued. Possible levels of severity are: Normal, Warning, Minor, Major and Critical. These map to other HP BTO Software products' levels of severity.
Maximum number of retries	The maximum number of attempts that the Business Impact Engine tries to send a notification event to the Notification Server, if the initial attempt fails. When the maximum number of retries is reached, the Business Impact Engine issues an error message in its log file and makes no further attempts to send the notification event.
Retry delay (seconds)	The delay (in seconds) between the Business Impact Engine's attempts to retry sending notification events to the Notification Server. Each time the Engine fails a retry attempt, it issues a warning message to the log file.

Modifying the BIE Notification Settings

To change the BIE Notification Settings, complete the following steps on the Windows system, where the BPI Server is installed:

1. Start the Administration Console as described in section [Administration Console Description](#) on page 22.
2. Select the Component Configurations > Business Impact Engine (BIE) > BIE Notification settings option from the Navigator pane on the BPI Administration Console.
3. Enter the changes that you want to make to the Business Impact Engine settings as appropriate in the right-hand pane.
4. Click `Apply` to apply the changes to the BPI configuration.
5. Select the `Status` option to move to the panel where the BPI component status are shown.
6. Stop and restart all the BPI Server components using the `Stop All` and `Start All` options.

The new Business Impact Engine settings are now applied to your BPI system.

BIE JDBC Settings

The following are the parameters that you can modify through the BIE JDBC settings option.

Table 10 lists the settings that enable you to tailor the JDBC connection between the BIE and the database.

Table 10 BIE JDBC Settings

Descriptive Parameter Name	Description
Maximum number of active JDBC Connections	The maximum number of JDBC connections that the Business Impact Engine can have active at any one time. If a connection does not become available in the required time, the connection is refused and the Engine is unable to commit the transaction. In this case, the Engine writes an error to its log file.
Maximum wait time for a JDBC Connection (seconds)	The maximum length of time (in seconds) that the Business Impact Engine waits for an available JDBC connection before reporting an error. If a connection does not become available in the required time, the connection is refused and the Engine is unable to commit the transaction. In this case, the Engine writes an error to its log file.
Maximum number of idle JDBC Connections ^a	The maximum number of JDBC connections that can be idle at any one time. Set this to at least the number of active connections.
Maximum number of active JDBC Prepared Statements ¹	The maximum number of database Prepared Statements that can be active at any one time.
Maximum wait time for a JDBC Prepared Statement (seconds)	The maximum length of time (in seconds) that the Business Impact Engine waits for a Prepared Statement to be executed before reporting an error in the log file and aborting the transaction.
Maximum number of idle JDBC Prepared Statements ¹	The maximum number of Prepared Statements that can be idle at any one time.

a. These connections are managed by Apache Commons DBCP (Database Connection Pool).

Modifying the BIE JDBC Settings

To change the BIE JDBC Settings, complete the following steps on the Windows system, where the BPI Server is installed:

1. Start the Administration Console as described in section [Administration Console Description](#) on page 22.
2. Select the Component Configurations > Business Impact Engine (BIE) > BIE JDBC settings option from the Navigator pane on the BPI Administration Console.
3. Enter the changes that you want to make to the Engine settings as appropriate in the right-hand pane.
4. Click `Apply` to apply the changes to the BPI configuration.
5. Select the `Status` option to move to the panel where the BPI component status are shown.
6. Stop and restart all the BPI Server components using the `Stop All` and `Start All` options.

The new Business Impact Engine settings are now applied to your BPI system.

Component Configuration - Monitor Engine

The Monitor Engine configuration parameter settings are divided into a number of logical sections. These sections appear in the Administration Console, under the `Monitor Engine` option as follows:

- Monitor Engine Java Virtual Machine (JVM) settings
- Monitor Engine Events Settings
- Monitor Engine Statistics settings
- Monitor Engine Threshold settings
- Monitor Engine Instance Cleaner settings

The parameters relating to these settings appear on the right-hand pane of the Administration Console when you select one of the Monitor Engine options in the console's navigation tree. If the Monitor Engine options are not visible in the navigation tree, expand the entries under Monitor Engine using the usual Explorer-style navigation techniques.

Monitor Engine Java Virtual Machine (JVM) Settings

This section describes the parameters that you can modify through the Monitor Engine Java Virtual Machine (JVM) settings option. These are the Monitor Engine parameters that enable you to modify the amount of memory heap available to the JVM and are listed in [Table 11](#).

A heap is a storage management structure for tracking and allocating memory. In this case, the Java heap is used for allocating the Java objects used by the Monitor Engine.

Table 11 Monitor Engine Java Virtual Machine (JVM) Settings

Descriptive Parameter Name	Description
Initial size of the JVM heap (MB)	The initial size of the storage allocated by the JVM for Java objects.
Maximum size of the JVM heap (MB)	The maximum size of the storage allocated by the JVM for Java objects.

Modifying the Monitor Engine Java Virtual Machine Settings

To change the Monitor Engine Java Virtual Machine Settings, complete the following steps on the Windows system where the BPI Server is installed:

1. Start the Administration Console as described in section [Administration Console Description](#) on page 22.
2. Select the Component Configuration > Monitor Engine > Monitor Engine Java Virtual Machine (JVM) settings option from the Navigator pane on the BPI Administration Console.
3. Enter the changes that you want to make to the Monitor Engine Java Virtual Machine settings as appropriate in the right-hand pane.
4. Click `Apply` to apply the changes to the property files.
5. Select the `Status` option to move to the panel where the BPI component status are shown.
6. Stop and restart all the BPI components.

The new settings are now applied to your BPI system.

Monitor Engine Events Settings

This section describes the parameters that you can modify for the Monitor Engine Events settings option.

These settings provide control for the rate at which the Monitor Engine processes monitor events and the maximum sizes of the resulting database transactions as monitor events are processed.

The values for the Monitor Engine Events settings have been set to be suitable for most implementations. You should not change them unless you are advised to by your support representative.

The Monitor Engine Events settings are divided into two logical sections. These sections appear on the Monitor Engine Events settings pane within the following categories:

- Monitor Engine Event processing settings
- Monitor Engine performance checking settings

The Monitor Engine Event processing settings parameters are listed in [Table 12](#).

Table 12 Monitor Engine Event Processing Settings

Descriptive Parameter Name	Description
The maximum number of pooled monitor event processors (1 to19)	<p>The number of parallel threads available to the Monitor Engine for processing different monitor events.</p> <p>Be aware that setting this property to a value of other than one, requires you to purchase an Enterprise license for BPI.</p>
The maximum number of monitor events to process in each batch	<p>The number of monitor events that can be processed in a single batch. This provides a balance between the monitor event processing rate and database transaction size. It also optimizes how the monitor events are processed across all available threads.</p>
The monitor events idle wait time (seconds)	<p>Each time the Monitor Engine determines that there are no more monitor events to process, it waits for this time period before checking again.</p> <p>This prevents the Monitor Engine continuously initiating searches that can return no results.</p>

The following settings provide some control to regulate the rate at which monitor events are generated by the Business Impact Engine. It is used to make sure that the Business Impact Engine does not create monitor events at a rate that the Monitor Engine is unable to keep up with,

The Monitor Engine performance checking settings parameters are listed in [Table 13](#).

Table 13 Monitor Engine Performance Checking Settings

Descriptive Parameter Name	Description
The monitor events queue length high-water mark	<p>This is the number of unprocessed monitor events that signal that the Monitor Engine is not keeping up with the Business Impact Engine.</p> <p>When the high-water mark is exceeded, the Business Impact Engine temporarily stops processing Business events until the Monitor Engine has reduced the backlog to below the low-water mark.</p>
The monitor events queue length low-water mark	<p>This is the number of unprocessed monitor events that signal that the Monitor Engine has cleared its backlog and is now keeping up with the Business Impact Engine.</p> <p>As a result, the Business Impact Engine can resume its processing of Business events.</p>
Interval for checking Monitor Events queue length (seconds)	Time interval (in seconds) at which the number of Monitor Events waiting to be processed is checked against the values of the high-water mark and low-water mark parameters.

Modifying the Monitor Engine Events Settings

To change the Monitor Engine Events settings complete the following steps on the Windows system where the BPI Server is installed:

1. Start the Administration Console as described in section [Administration Console Description](#) on page 22.
2. Select the Component Configurations > Monitor Engine > Monitor Engine Events settings option from the Navigator pane on the BPI Administration Console.

3. Enter the changes that you want to make to the Monitor Engine Events settings as appropriate in the right-hand pane.
4. Click `Apply` to apply the changes to the property files.
5. Select the `Status` option to move to the panel where the BPI component status are shown.
6. Stop and restart all the BPI components.

The new settings are now applied to your BPI system.

Monitor Engine Statistics Settings

The Monitor Engine Statistics settings parameters control how the Monitor Engine processes the staged statistical data and stores them in the configured statistical time intervals (Data Samples setting).

Staged statistical data are produced and stored as monitor events are processed. At intervals that you configure, the Monitor Engine collects the staged statistics into the statistics table for the completed time intervals. Most of the parameters in [Table 14](#) control the rate at which statistics are generated and these settings should not be modified unless you are instructed to do so by your support representative. The exception is the settings that controls how far back in time monitor statistics are generated when the Monitor Engine is restarted.

When BPI is restarted following a system shutdown, the monitor statistics are calculated for all the monitor definitions defined for processes. If you have shut your BPI system down for a significant amount of time (several days), then these statistic calculations can take considerable time, and impact the performance of your system. You can configure how far back in time to calculate these statistics following a restart using the `Maximum age of generated statistics on startup (days)` setting.

In [Table 14](#), the following settings are used to control how the staged statistics are processed into the statistical time intervals:

- The maximum number of statistics consolidators (1 to 19)
- The maximum number of staged statistics' rows per transaction
- The maximum number of staging transactions each time
- The maximum number of statistics aggregators (1 to 19)

In the description of the parameters, consolidation is the process of producing the data for specific time intervals directly from the staged data. If you have defined Business Monitors that have Groups, aggregation is then the process of taking all the individual groups' time interval data and producing the overall time interval data, where overall is the combined data for all the groups.

Table 14 lists the parameters that you can set to configure how often the Monitor Engine polls the BPI database.

Table 14 Monitor Engine Statistics Settings

Descriptive Parameter Name	Description
Statistics generation polling interval (seconds)	The time interval (in seconds) that the Statistics generator polls the BPI database tables in order to update the statistics that have been configured using the Monitor Definer.
Maximum age of generated statistics on startup (days)	The time interval (in days) that the Monitor Engine uses to calculate historical monitor statistics following a period of BPI shutdown.
The maximum number of statistics consolidators (1 to 19)	The number of parallel threads available to consolidate the staged statistical data, for different monitor events, into the user-defined statistical time intervals. This includes monitor events that have Groups defined.
The maximum number of staged statistics' rows per transaction	Controls the size of database transactions as the statistical data is being consolidated.
The maximum number of staging transactions each time	Controls the rate at which statistics are consolidated. This is a multiplier of The maximum number of staged statistics' rows per transaction and is applied each time the Monitor Engine processes statistics.
The maximum number of statistics aggregators (1 to 19)	The number of parallel threads available to aggregate statistics that have Groups defined into their overall statistical time intervals.

Modifying the Monitor Engine Statistics Settings

To change the Monitor Engine Statistics settings, complete the following steps on the Windows system where the BPI Server is installed:

1. Start the Administration Console as described in section [Administration Console Description](#) on page 22.
2. Select the Component Configurations > Monitor Engine > Monitor Engine Statistics settings option from the Navigator pane on the BPI Administration Console.
3. Enter the changes that you want to make to the Monitor Engine Statistics settings as appropriate in the right-hand pane.
4. Click `Apply` to apply the changes to the property files.
5. Select the `Status` option to move to the panel where the BPI component status is shown.
6. Stop and restart all the BPI components.

The new settings are now applied to your BPI system.

Monitor Engine Threshold Settings

This section describes the parameters that you can modify through the Monitor Engine Threshold settings option.

The Monitor Engine Threshold Settings are divided into two logical sections. These sections appear on the Monitor Engine Threshold settings pane within the following categories:

- Monitor Engine Threshold checking settings
- Monitor Engine Threshold violation notification settings

Table 15 lists the Monitor Engine Threshold settings that enable you to control how often the Monitor Engine polls its data in order to identify instance threshold information for alarms, notifications.

Table 15 Monitor Engine Threshold Checking Settings

Descriptive Parameter Name	Description
Threshold minimum sample count, used for calculating relative thresholds	The minimum number of monitor instances required for the calculation of the relative scope thresholds. If the number of monitor instances available for sampling is less than this minimum figure, the instance threshold is not calculated. As a result, there are no notifications or alarms generated based on the threshold.
The maximum number of pooled threshold monitors (1 to 19)	The number of parallel threads available to the Monitor Engine for processing different Business Monitor Thresholds

Table 16 lists the Monitor Engine Threshold settings that enable you to control the number of, and frequency at which, notifications (email, HP Operations Manager messages and script invocations) are sent out when monitor instance threshold violations occur.

When an instance threshold is violated, the Monitor Engine database records the detail of the violation. You can then be notified of these instance threshold violations in a number ways; for example, email; this is done using the Notification Server.

Where there is a significant failure in your business, for example, an application becomes unavailable, you can have the situation where thousands of thresholds are violated, or a small number of thresholds are violated many times. This can result in large numbers (or a storm) of notifications being generated. In the case of email, this can quickly fill up your email Inbox and it is possible that your email Server is unable to keep up with the rate at which the notifications are generated. This in turn creates a backlog of notifications and can severely impact the performance of the BPI system. In the case of HP Operations Manager messages or scripts, the backlog created depends on how your system is configured to receive the notifications.

Use the parameters in [Table 16](#) to control the frequency and numbers of notifications that you receive. This reduces the possibility of these notification storms occurring, and still notifies users of the monitor instance threshold violations.

The following is an example of the effect of setting these parameters:

The parameter values set when you install BPI for the first time are:

- 300 seconds for the polling interval
- a maximum of 10 notifications for each instance threshold violated

This means that you receive a maximum of 10 notifications for each instance threshold violation, every 5 minutes (300 seconds); this is for each instance threshold. If there are 20 thresholds violated, there are potentially 200 (10 x 20) notifications in each 5 minute polling interval.

If you know the number of instance threshold violations your business is likely to generate, you can set these parameters such that:

- you receive all notifications for the occasional problems.
- you have the maximum instance threshold set such that when there is a system failure, notification storms are prevented and you receive a summary instead.

This also has the effect of reducing the impact of notification storms on BPI performance.

Table 16 Monitor Engine Threshold Violation Notification Settings

Descriptive Parameter Name	Description
Threshold violation notification polling interval (seconds)	The time interval (in seconds) that the Monitor Engine waits between the time that it sends the last notification message at the end of one polling period, to the start of the next polling period.
Maximum number of individual violation notifications per threshold per polling interval	The maximum number of violation notifications sent to the Notification Server for each business monitor instance threshold. The actual number of threshold violations generated might be significantly more than this maximum; however, if you are using the default Velocity email templates, each email notification also has summary information, which includes all the instance threshold violations generated during the polling interval.

Modifying the Monitor Engine Threshold Settings

To change the Monitor Engine Threshold Settings, complete the following steps on the Windows system where the BPI Server is installed:

1. Start the Administration Console as described in section [Administration Console Description](#) on page 22.
2. Select the Component Configurations > Monitor Engine > Monitor Engine Threshold settings option from the Navigator pane on the BPI Administration Console.
3. Enter the changes that you want to make to the Monitor Engine Threshold settings as appropriate in the right-hand pane.

4. Click `Apply` to apply the changes to the property files.
5. Select the `Status` option to move to the panel where the BPI component status are shown.
6. Stop and restart all the BPI components.

The new settings are now applied to your BPI system.

Monitor Engine Instance Cleaner Settings

This section describes the parameters that you can modify through the Monitor Engine Instance Cleaner settings option.

The Monitor Engine instance cleaner settings section controls how often the Monitor Engine instance thread is run and therefore how often Active and Completed monitor instances, Monitor violation instances and statistics are deleted.



If you set a low Collection interval for your Business Process monitor definitions, the monitor data can accumulate very quickly and consume a considerable amount of disk space. In addition, if you shutdown your BPI system and restart it after a significant amount of time, the monitor statistics are calculated for the period of the shutdown as soon as the BPI Server is restarted. As an example, if you set a Collection interval of five minutes and shut down your BPI system for a week. When you restart your BPI Server, the Monitor Engine calculates all the monitor statistics for each five-minute period since the last time the monitors were calculated. This can result in a significant amount of calculation time, and a significant amount of disk space for the results.

If these results are immediately deleted as a result of the instance cleaner settings, this can also have an impact on the overall operational performance of your machine.

The Collection interval is set as the value for the Data Samples period.

The configuration parameters are divided into a number of logical sections. These sections appear in the Monitor Engine Instance Cleaner settings pane within the following categories:

- Monitor Engine Instance Cleaner settings
- Active Monitor Instances settings
- Completed Monitor Instances settings

- Monitor Statistics settings
- Monitor Violation Instances settings

The parameters relating to these settings are described in the following sections.

Monitor Engine Instance Cleaner Settings

Table 17 lists the settings that controls how often the Monitor Engine instance cleaner thread is executed. This interval impacts all the other sections on the Monitor Instance Cleaner pane.

Table 17 Monitor Engine Instance Cleaner Settings

Descriptive Parameter Name	Description
Instance cleaner execution interval (minutes)	The time period (in minutes) that you want the Monitor instance cleaner thread to run. When it runs, it deletes all eligible Active monitor instances, Completed monitor instances, Monitor Alarm instances and Statistics. This thread also deletes all monitor instances for monitors that have been marked as deleted in the Monitor Definer.

Active Monitor Instances Settings

Table 18 lists the settings that enable you to control the amount of Active monitors instance data held in the BPI database tables.

Table 18 Active Monitor Instances Settings

Descriptive Parameter Name	Description
Delete active monitor instances from the database?	Select this check box if you want to delete Active monitor instances from the BPI database tables. Clear the check box if you do not want to delete the Active monitor instances.
Age of active monitor instances to be removed (days)	This option is available when you select the check box for deleting Monitor violation instances. Enter the age (in days) of the Active monitor instances that you want to be deleted when the Monitor Engine instance cleaner thread is run.

Completed Monitor Instances Settings

Table 19 lists the settings that enables you to control the amount of Completed monitors instance data held in the BPI database tables.

Table 19 Completed Monitor Instances Settings

Descriptive Parameter Name	Description
Delete completed monitor instances from the database?	Select this check box if you want to delete Completed monitor instances from the BPI database tables. Clear the check box if you do not want to delete the Completed monitor instances.
Age of completed monitor instances to be removed (days)	This option is available when you select the check box for deleting Completed monitor instances. Enter the age (in days) of the Completed monitor instances that you want to be deleted when the Monitor Engine instance cleaner thread is run

Monitor Statistics Settings

Table 20 lists the settings that enable you to control the amount of statistical data held in the BPI database tables.

Table 20 Monitor Statistics Settings

Descriptive Parameter Name	Description
Delete monitor statistics from the database?	Select this check box if you want to delete statistics from the BPI database tables. Clear the check box if you do not want to delete the statistics data.
Age of monitor statistics to be removed (days)	This option is available when you select the check box for deleting statistics. Enter the age (in days) of the statistics data that you want to be deleted when the Monitor Engine instance cleaner thread is run

Monitor Alarm Instances Settings

Table 21 lists the settings that enables you to control the amount of Monitor Alarm instance data held in the BPI database tables.

Table 21 Monitor Violation Instances Settings

Descriptive Parameter Name	Description
Delete monitor violation instances from the database?	Select this check box if you want to delete Monitor Violation instances from the BPI database tables. Clear the check box if you do not want to delete the Monitor Violation instances.
Age of monitor violation instances to be removed (days)	This option is available when you select the check box for deleting Completed monitor instances. Enter the age (in days) of the Monitor Violation instances that you want to be deleted when the Monitor Engine instance cleaner thread is run

Modifying the Monitor Engine Instance Cleaner Settings

To change the Monitor Engine Instance Cleaner Settings, complete the following steps on the Windows system where the BPI Server is installed:

1. Start the Administration Console as described in section [Administration Console Description](#) on page 22.
2. Select the Component Configurations > Monitor Engine > Monitor Engine Instance Cleaner settings option from the Navigator pane on the BPI Administration Console.
3. Enter the changes that you want to make to the Monitor Engine Instance Cleaner settings as appropriate in the right-hand pane.
4. Click `Apply` to apply the changes to the property files.
5. Select the `Status` option to move to the panel where the BPI component status are shown.
6. Stop and restart all the BPI components.

The new settings are now applied to your BPI system.

Component Configuration - HP Business Availability Center Settings

The HP Business Availability Center settings options enable you to configure the details of the Gateway Server system (or Load Balancer) in order that the BPI Server can send data samples to the Gateway Server.

The HP Business Availability Center settings page is divided into the following logical sections:

- Business Availability Center General settings; see [Table 22](#).

These are the properties relating to the connection details for the Business Availability Center server that you want BPI to use and are required for both the Data Samples settings and for CI Poller settings.

- Data Sample settings; see [Table 23](#).

These are the properties relating to the data that you want BPI to send to Business Availability Center.

- CI Poller settings; see [Table 24](#).

These are the properties that enable BPI to receive status information relating to IT operational resources, which are configured for BPI CIs, within Business Availability Center.

To configure the properties of the Business Availability integration, make sure that the HP Business Availability Center settings option is selected in the Administration Console navigator pane. The parameters are displayed in the right-hand pane.

Table 22 describes the settings related to connection details.

Table 22 Business Availability Center General Settings

Descriptive Parameter Name	Description
Hostname of Gateway server	<p>The fully qualified DNS name of the machine where the Business Availability Center Gateway Server that receives data from the BPI Data Collectors is installed. This is the Gateway Server that provides the status information for process step KPIs or access to the UCMDB for BPI and is the Gateway Server when the BPI Data Samples are sent.</p> <p>Alternatively, this could be the name of a Load Balancer if there is one configured.</p> <p>This value can also be an IP address.</p>
Use SSL?	<p>Select the checkbox to enable HTTP over SSL for the BPI:</p> <ul style="list-style-type: none"> • Data Sample Provider • UCMDB synchronizer • component obtaining status information for process Step KPIs <p>Clear the checkbox if you do not want to use HTTP over SSL. This parameter also requires that Business Availability Center is configured to use SSL; refer to the Business Availability Center help documentation for details of how to set this up.</p>
HTTP(S) port of Gateway server	<p>The port number used by the Web Server on the Business Availability Center Gateway Server for Data Collectors.</p> <p>This is usually port 80 if SSL is not enabled, or port 443 if SSL is enabled.</p>

Table 22 Business Availability Center General Settings

Descriptive Parameter Name	Description
User name	<p>The user name for a Business Availability Center account, which is for use by BPI to send data samples.</p> <p>This can be an existing user, or a new user, as long as it has permissions to access the View name as specified in Table 24 on page 73. For a new installation the view name is Business Processes.</p>
Password	<p>The password set for User name.</p> <p>If you have created your own user, enter the appropriate password details for this user name.</p>
Basic authentication enabled?	<p>Select the checkbox to enable basic authentication. Clear the checkbox to disable basic authentication. Select this option only when Business Availability Center is configured to use basic authentication for Web Server and Web browser communications.</p> <p>Basic authentication is the BAC mechanism for enabling a Web browser (or Web client) to authenticate with the Web Server using a user name and a password; refer to the Business Availability Center help documentation for details of basic authentication.</p>
Basic authentication user	User name configured for basic authentication credentials.
Basic authentication password	Password configured for basic authentication credentials.
Maximum retries for synchronization deadlock	<p>Maximum number of times that you want BPI to attempt to send data to the Gateway Server.</p> <p>This parameter ensures that, in the case of a deadlock, the synchronization attempt to the Gateway Server is aborted in order to break the deadlock.</p> <p>Failed synchronizations are automatically retried at regular intervals.</p>

Table 23 describes the settings related to the data that you want to send to Business Availability Center.

Table 23 Data Sample Settings

Descriptive Parameter Name	Description
Data samples send interval (minutes)	<p>The time interval (in minutes) that you want BPI to use to send data samples to the named Business Availability Center Gateway Server or Load Balancer.</p> <p>Select a time from the drop-down list. The selection of time intervals is aligned with the time periods for the Business Availability Center SLM calculations. in order to provide the most accurate results.</p> <p>This time interval is the measurement interval for all BPI Monitors.</p>
Connection timeout (seconds)	<p>The period of time (in seconds) allowed for the BPI Server to request a connection with the Business Availability Center Gateway Server when sending data samples.</p> <p>If this parameter is set to zero (0), the time allowed for requesting a connection is unlimited, that is, no timeout occurs.</p> <p>If a timeout does occur, BPI attempts to resend the data sample after waiting for the interval configured for Data samples send interval.</p>

Table 23 Data Sample Settings

Descriptive Parameter Name	Description
Guaranteed retention period (minutes)	<p>The period of time (in minutes) that a Data Sample is guaranteed to be made available for transfer to the Business Availability Center Gateway Server and before it is discarded.</p> <p>In cases where it is not possible to make a connection to the Business Availability Center Gateway Server, or where the Gateway Server's buffer tables are full, BPI retains copies of each Data Sample for the period specified by this parameter.</p>
Delay before sending samples (seconds)	<p>Delay (in seconds) following the Data samples send interval to allow time for the Business Impact Engine and the Monitor Engine to collate data to be sent to Business Availability Center.</p> <p>Setting a value for this parameter enables you to take account of the fact that there might be a time difference between when a business event is recorded by a business application and when BPI receives notification of the event from the application; this is because some business applications do not make data available immediately.</p> <p>Setting a delay enables BPI to collect complete and accurate statistics for each send interval before sending data samples to the Gateway Server. It also means that BPI data shown within BAC lags behind the Last Update time by the value of this delay; for example, if the Last Update time in BAC is 10:30 and you set a delay of 900 seconds (15 minutes), the values you see for the BPI data samples displayed within the BPI Application and elsewhere in BAC relate to the collection period ending at 10:15.</p> <p>Note: If you configure a delay that is more than 90 seconds, you should also increase the Decay setting for BPI samples in BAC (see the BAC Dashboard Help). If you do not, a No Data status is shown for the BPI Application instance data.</p>

Table 24 describes the settings related to the status information that you want to receive from Business Availability Center.

Table 24 CI Poller Settings

Descriptive Parameter Name	Description
View name	<p>The name of the Business Availability Center Dashboard view that contains the Business Process information (IT operational resource information in BPI terms), required for display in the BPI Application.</p> <p>The default view for the Business Availability Center Dashboard is the Business Processes view.</p>
Status event poll interval (seconds)	<p>The time interval (in seconds) that you want to be used for the CI Poller to poll the Business Availability Center Gateway Server (or Load Balancer) for status events.</p>
Connection timeout (seconds)	<p>The period of time allowed for the BPI Server to request Service status information from the Business Availability Center Gateway Server (or Load Balancer) when requesting information relating to services.</p> <p>If this parameter is set to zero (0), the time allowed for the connection is unlimited, that is, no timeout occurs.</p> <p>If a timeout does occur, the BPI Server waits for the interval configured for Status event poll interval before issuing another request for status events.</p>

Modifying the Business Availability Center Settings

To change the HP Business Availability Center settings, complete the following steps on the Windows system, where the BPI Server is installed:

1. Start the Administration Console as described in section [Administration Console Description](#) on page 22.
2. Select Component Configurations > HP Business Availability Center settings option from the Navigator pane on the BPI Administration Console.
3. Enter the changes that you want to make to the settings as appropriate in the dialog presented.
4. Click OK to dismiss the dialog.
5. Click Apply to apply the changes to the BPI configuration.

You do not need to stop and start the components after changing these settings as the configuration changes are made automatically.

The new settings are now applied to your BPI system.

Component Configuration - Process Repository

The Process Repository configuration has one of the following sections. The section that appears depends on the database type for the Process Repository Database and is related to the option that you selected and configured when you installed the BPI Server:

- MS SQL Server Access to the Process Repository database
- Oracle Server Access to the Process Repository database



Changing the database connection details relating to the Process Repository does not automatically migrate data that is stored in the Process Repository database. You should not reconfigure the database connection unless you have already used the database tools to migrate your data.

The parameters relating to these settings appear on the right-hand pane of the Administration Console when you select one of these options in the console's navigation tree.

[Table 25](#) lists the parameters that you can modify for a SQL Server Database.

Table 25 MS SQL Server Access to the Process Repository Database

Descriptive Parameter Name	Description
MS SQL Server hostname	The hostname of the system where the Microsoft SQL Server Database for the Process Repository is installed.
MS SQL Server port number	The port number that the Microsoft SQL Server Database is expecting connections on.
MS SQL Server database name	The name of the database configured for the Process Repository database.

Table 25 MS SQL Server Access to the Process Repository Database

Descriptive Parameter Name	Description
MS SQL Server authentication	<p>Select the type of authentication that you want to use when BPI connects to the Process Repository database. You can select either SQL Server authentication, or Windows authentication.</p> <p>If you select SQL Server authentication, the MS SQL Server login user and MS SQL Server login password options are enabled, as you need to provide a username and password for the SQL Server authentication.</p> <p>If you select Windows authentication, no additional information is required.</p>
MS SQL Server username	<p>The name of the user who has access privileges to the database schema for the Process Repository.</p> <p>This field is enabled only when you have selected SQL Server Authentication.</p>
MS SQL Server password	<p>The password for the user who has access privileges to the database schema for the Process Repository.</p> <p>This field can be used to re-synchronize the BPI Server version of the password with the Process Repository database password after the database password is changed using the database management tools.</p> <p>This field is enabled only when you have selected SQL Server Authentication.</p>

To change the password for the database, follow the instructions in section [Changing the Password Details](#) on page 77.

[Table 25](#) lists the parameters that you can modify for an Oracle database

Table 26 Oracle Server Access to the Repository Database

Descriptive Parameter Name	Description
Oracle Server hostname	The hostname of the system where the Oracle Server Database for the Process Repository Database is installed.
Oracle Server port number	The port number that the Oracle Server Database is expecting connections on.
Oracle Server SID	The SID for the database configured for the Process Repository.
Oracle Server login user	The name of the user who has access privileges to the database schema for the Process Repository.
Oracle Server login password	The password for the user who has access privileges to the database schema for the Process Repository. This field can be used to re-synchronize the BPI Server version of the password with the Process Repository database password after the database password is changed using the database management tools.

To change the password for the database, follow the instructions on section [Changing the Password Details](#) on page 77

Changing the Password Details

This section describes how to change the password for the Process Repository database user that you created during the BPI Server installation.

Complete the following steps to make the changes to the database password:

1. Start the Administration Console as described in section [Administration Console Description](#) on page 22.
2. Stop all the BPI components using the Stop All button.

3. **Select the Component Configurations > Process Repository > ... Server Access to the Repository Database option on the BPI Administration Console and make the changes to the following field:**
 - login password
4. **Click Apply to apply the changes to the BPI configuration.**
5. **Return to the Status option and restart all the BPI components, using the Start All button.**

The new settings are now applied to your BPI Server system.

Component Configuration - Business Event Handler

The Business Event Handler options enable you to configure the parameters for the Adaptor (based on openadaptor) that sends and receives events between the Business Impact Engine and the Business Event Handler.

These parameters are listed in [Table 27](#).

Table 27 Business Event Handler Settings

Descriptive Parameter Name	Description
Log package information?	A check box that when checked means that the Business Event Handler logs package information.
Log thread information?	A check box that when checked means that the Business Event Handler logs thread information.
Log time information?	A check box that when checked means that the Business Event Handler logs time information.
Maximum number of socket source threads	Maximum number of threads that can be created for the adapter socket source. When this instance threshold is exceeded, the request for a thread is refused and the Business Event Handler reports a <code>Connection Refused</code> error in its log file.
Maximum number of retries to deliver events into Business Impact Engine	The maximum number of times the Business Event Handler attempts to deliver an event to the Business Impact Engine (using RMI) before rolling back the transaction for the business event.

Table 27 Business Event Handler Settings

Descriptive Parameter Name	Description
Business Impact Engine event retry delay (seconds)	Time (in seconds) between each attempt to retry an event from the Business Event Handler to the Business Impact Engine using RMI.
Maximum number of retries to deliver events from Hospital	<p>The maximum number of times the Business Event Handler attempts to deliver an event from the Event Hospital to the Business Impact Engine.</p> <p>The Business Impact Engine marks particular categories of event errors to result in the event being sent to the event Hospital and marked to be automatically discharged; for example, events that are received out of sequence before a data instance has been created for the event.</p> <p>If the Business Event Handler does not succeed in delivering the event to the Engine in within the specified number of retries, the event remains in the event Hospital.</p>
Hospital event poll interval (seconds)	Time (in seconds) that the Business Event Handler polls the Event Hospital looking for events that have been marked as ready for discharge and that can be delivered to the Business Impact Engine.

Modifying the Business Event Handler Parameters

To change these settings, complete the following steps on the Windows system, where the BPI Server is installed:

1. Start the Administration Console as described in section [Administration Console Description](#) on page 22.
2. Select the Business Event Handler option from the Navigator pane on the BPI Administration Console.
3. Enter the changes that you want to make to the settings as appropriate in the right-hand pane.
4. Click `Apply` to apply the changes to the BPI configuration.

5. Select the `Status` option to move to the panel where the BPI component status are shown.
6. Stop and restart all the BPI Server components using the `Stop All` and `Start All` options. You can stop and restart the `Business Event Handler` component; however, you are advised to use `Stop All` and `Start All` to ensure that the BPI components are stopped and started in the correct order.

The new settings are now applied to your BPI system.

Component Configuration - JMS Business Event Handler

Use the `JMS Business Event Handler` options to configure the parameters for your JMS connections., which enables BPI to receive business events from a JMS-based system.

These options appear hierarchically in the Administration Console, under the `JMS Business Event Handler` navigation option as follows:

- General settings
- Service Providers
- Event Sources

The parameters relating to these settings appear on the right-hand pane of the Administration Console when you select one of these options in the console's navigation tree. If these options are not visible, you need to expand the entries under `JMS Business Event Handler` using the usual Explorer style navigation techniques.



BPI supports the JMS message type `javax.jms.TextMessage`, where the content of the text is an XML file in a particular format. This means you must be integrating with an application that sends and receives this message type if you want to use the `JMS Business Event Handler`. One example of such an application is `HP Business Availability Center TransactionVision`.

General Settings

Table 28 describes the parameters that you can set to configure the behavior of your JMS connection.

Table 28 JMS General Settings

Descriptive Parameter Name	Description
Log package information?	A check box that when checked means that the JMS Business Event Handler logs package information.
Log thread information	A check box that when checked means that the JMS Business Event Handler logs thread information.
Log time information?	A check box that when checked means that the JMS Business Event Handler logs time information.
Maximum number of retries to deliver events into Business Impact Engine	The maximum number of times the JMS Business Event Handler attempts to deliver an event to the Business Impact Engine (using RMI) before rolling back the transaction for the business event.

Table 28 JMS General Settings

Descriptive Parameter Name	Description
Business Impact Engine event retry delay (seconds)	Time (in seconds) between each attempt to retry an event from the JMS Business Event Handler to the Business Impact Engine using RMI.
Maximum number of retries to deliver events from Hospital	<p>The maximum number of times the JMS Business Event Handler attempts to deliver an event from the Event Hospital to the Business Impact Engine.</p> <p>The Business Impact Engine marks particular categories of event errors to result in the event being sent to the event Hospital and marked to be automatically discharged; for example, events that are received out of sequence and where there is no process or data instance created for the event.</p> <p>If the JMS Business Event Handler does not succeed in delivering the event to the Engine in within the specified number of retries, the event remains in the event Hospital.</p>
Hospital event poll interval (seconds)	Time (in seconds) that the JMS Business Event Handler polls the Event Hospital looking for events that have been marked as ready for discharge and that can be delivered to the Business Impact Engine.

Service Providers

This section describes the parameters that you can set to specify the details of the service providers that you are using for your JMS connections to BPI. You must add a Service Provider before you can configure a JMS Event Source. Note that there is a Service Provider already configured for a standard TransactionVision integration.

From the list of JMS Service Providers, you can:

- select HP TransactionVision from the list, if you want to configure an integration with TransactionVision. Click the Modify option to make changes to the TransactionVision JMS Service Provider parameters.
- click the Add button to add a new Service Provider to the list of available providers.

The JMS Service Provider Properties dialog is presented and the properties for adding a new service provider are described in [Table 29](#).

Table 29 JMS Service Provider Properties

Descriptive Parameter Name	Description
Service Provider Name	Unique name that identifies the service provider within the BPI interfaces for administrative and identification purposes. The name can be up to 40 characters. In the case of TransactionVision, this name is predefined as HP TransactionVision.
Description	An optional description of service provider.
Enabled?	Select the check box to enable this service provider to send JMS Business Events to BPI. Clear the check box to disable the service provider.
Service Provider Classpath	Location of the Service Provider client Java classes.

Table 29 JMS Service Provider Properties

Descriptive Parameter Name	Description
JNDI Provider Location	<p>Location of the JNDI service for the named Service Provider, typically this is a URL.</p> <p>This parameter is predefined as <code>tcp:// analyzerhost:21110</code> for the HP TransactionVision service provider.</p> <p>You need to replace <code>analyzerhost</code> with the host name of machine where the TransactionVision Analyzer is installed.</p>
JNDI Factory Class	<p>The Java class name for the initial context factory for the JNDI service.</p> <p>This parameter is predefined as <code>com.sonicsw.jndi.mfcontext.MFContextFactory</code> for the HP TransactionVision service provider. If this value is not correct for your implementation, you can modify it.</p>
JMS Factory Class	<p>The Java class name for the initial context factory for the JMS service provider.</p> <p>This parameter is predefined as <code>BPIQueueFactory</code> for the HP TransactionVision service provider. If this value is not correct for your implementation, you can modify it.</p>

Event Sources

This section describes the parameters that you can set to specify the details of the event sources that you want to access from your service provider. These are the event sources that will supply the transaction events that you have configured for your processes.



You cannot add a new Event Source until you have configured at least one Service Provider.

There is a preconfigured JMS Event Source for HP TransactionVision, or you can click the Add button to add a new Event Source to the list.

The JMS Event Source Properties dialog is presented and the properties for adding a new Event Source are described in [Table 30](#).

Table 30 JMS Event Sources

Descriptive Parameter Name	Description
Service Provider Name	Select the name of the service provider that you have configured to source the events that you require.
JMS Queue Subject	The name of the JMS queue created for BPI at the selected Service Provider. This parameter is predefined as <code>TV2BPI.EVENT.QUEUE</code> for the HP TransactionVision Queue Subject. You cannot modify this parameter, you must create a new JMS Event Source with a new name and Queue Subject if required.
User Name	If required by the Service Provider, the name of the user with authority to access the queue identified by JMS Queue Subject. Not all JMS Service Providers require a user name to be specified.
Password	If required, the password for User Name.

Modifying the JMS Business Event Handler Settings

To change these settings, complete the following steps on the Windows system, where the BPI Server is installed:

1. Start the Administration Console as described in section [Administration Console Description](#) on page 22.
2. Select the JMS Business Event Handler option from the Navigator pane on the BPI Administration Console.
3. Enter the changes that you want to make to the settings as appropriate in the right-hand pane.
4. Click **Apply** to apply the changes to the BPI configuration.

5. Select the `Status` option to move to the panel where the BPI component status are shown.
6. Stop and restart all the BPI Server components using the `Stop All` and `Start All` options. You can stop and restart the `JMS Business Event Handler` component; however, you are advised to use `Stop All` and `Start All` to ensure that the BPI components are stopped and started in the correct order.

The new settings are now applied to your BPI system.

Component Configuration - Servlet Engine

Use the `Servlet Engine` options to configure the parameters that relate to how the process instance pages are displayed within the BPI Application and the security of the pages served by the `Servlet Engine`.

These options appear hierarchically in the Administration Console, under the `Servlet Engine` navigation option as follows:

- [Process Instance Web Pages and Portlets](#) on page 89
- [Security](#) on page 91

Process Instance Web Pages and Portlets

This option enables you to manage the parameters of the BPI process instance pages, instance violation pages and the BPI portlets. BPI portlets can be found under `My BSM` and on the `Applications > Business Process Insight > Health > Business Health` page.

The parameters relating to these settings appear on the right-hand pane of the Administration Console when you select the `Servlet Engine > Process Instance Web Pages and Portlets` in the console's navigation tree. If the `Process Instance Web Pages and Portlets` options are not visible in the navigation tree, expand the entries using the Explorer-style navigation techniques.

You can also control the security settings for the `Process Instance Web Pages and Portlets` as described in section [Security](#) on page 91.

Process Instance Web Pages and Portlet Settings

This option enables you to configure parameters related to the behavior of the Process Instance pages, Violation Pages and portlets within the Business Process Insight Application Health pages and My BSM.

These parameters are listed in [Table 31](#).

Table 31 Process Instance Web Page and Portlets Settings

Descriptive Parameter Name	Description
Process Instance Web Pages refresh delay (seconds)	The time interval (in seconds) that the Process Instance pages use to set the refresh interval for the Web browser.
Maximum number of retries on database deadlock	The maximum number of attempts by the Process Instance pages to retry a database transaction before aborting it. It is possible for deadlocks to occur when the Process Instance pages and other applications are accessing the BPI database simultaneously. This parameter ensures that, in the case of a deadlock, the Process Instance pages abort the transaction in order to break the deadlock and generates an error message, which is displayed on a Web page. If the Process Instance pages abort the transaction, use the Refresh button on your browser to reload the page.
Database deadlock retry delay (seconds)	The time (in seconds) between each attempt to retry a database transaction.
Show service state for a completed step?	A check box indicating whether or not to show the status of services for Steps that have already been completed in the Business Process.
Include data properties when exporting process lists as CSV?	<p>A checkbox indicating whether or not to include the properties of a Data instance when exporting Process instances, using the Export All option, within the Process Instance pages.</p> <p>This is the option, on the Process Instance pages, to export the current process instance list to a file in a comma-separated value (CSV) format.</p>

Modifying the Process Instance Web Pages and Portlet Settings

To change these settings, complete the following steps on the Windows system, where the BPI Server is installed:

1. Start the Administration Console as described in section [Administration Console Description](#) on page 22.
2. Select the Servlet Engine > Process Instance Web Pages and Portlets option from the Navigator pane on the BPI Administration Console.
3. Enter the changes that you want to make to the settings as appropriate in the right-hand pane.
4. Click **Apply** to apply the changes to the BPI configuration.
5. If you have modified the `Show service state for a completed step?` parameter, you need to stop and restart the Servlet Engine as described in step 6. If you have not modified this parameter, continue at step 8.
6. Select the `Status` option to move to the panel where the BPI component status are shown.
7. Stop and restart the Servlet Engine component.
8. If you have modified the `Page refresh delay (seconds)` parameter, and the parameter was previously set to zero (0), you need to refresh the Web browser window where the Process Instance page is active.
9. The new settings are now applied to your BPI system.

Security

The `Security` option enables you to set the type of authorization used between BAC and the BPI Server.



Each time a BPI Server component is started, the BPI Server polls BAC for the lightweight single-signon settings and sets the BPI Server parameters based on the values set for BAC. These settings overwrite any settings that you have entered, using the Administration Console; you are therefore advised not to modify the Authorization settings and to leave the BPI Server to set them, based on the BAC values, when you start components.

The parameters relating to security appear on the right-hand pane of the Administration Console when you select `Security` in the Administration Console's navigation tree.

The right-hand pane is divided into the following logical sections:

- [Authorization Settings](#) on page 92
- [HTTP Over SSL Settings](#) on page 94

Authorization Settings

The `Authorization` settings hold the values obtained for the lightweight single-signon properties within BAC.

If you have installed the BPI Server in a domain that is different to the domain where the Gateway Server is installed, make sure that you add the BPI domain to the list of Protected Domains, under:

`Admin > Platform > Users and Permissions > Authentication`

Table 32 lists the Authorization parameters.

Table 32 Authorization Settings

Descriptive Parameter Name	Description
Authorization method	<p>Use this option to select which method, or product, that you want to use to authorize your BPI components.</p> <p>This parameter is set at installation and reset each time you restart a component. Do not modify the parameter as it will be overwritten.</p>
Domain name of local host	<p>The domain name for the Business Availability Center Gateway server. This is a fully qualified domain name for the Gateway Server host, named in the Business Availability Center settings in section Component Configuration - HP Business Availability Center Settings on page 68.</p> <p>This parameter is set at installation and can be modified if required.</p>
Bypass security for Process Instance Web Pages and Portlets	<p>This parameter is set at installation and reset each time you restart a component. Do not modify the parameter as it will be overwritten</p>

HTTP Over SSL Settings

HTTP over SSL (secure socket layer) is a secure version of HTTP. SSL enables the data from a client, such as a Web browser, to be encrypted prior to transmission to prevent unauthorized access to the data being transmitted.

Refer to [Chapter 15, Servlet Engine Authentication](#) for more information about BPI and HTTPS.

[Table 33](#) lists the properties that you can configure to encrypt the data that you send to the BPI Web-based clients.

Table 33 HTTP Over SSL Settings

Descriptive Parameter Name	Description
Enable HTTP over SSL for BPI Web Pages?	Select the checkbox to enable HTTP over SSL from the Web Server to the Web Browser, or Web Browsers, for the BPI: <ul style="list-style-type: none">• Process instance pages, instance violation pages and the BPI portlets.• Process Repository Explorer• Monitor Definer• Process Intervention• Notification The setting applies to all Web Browsers where these pages are running for a specific installation of the Servlet Engine. Clear the checkbox if you do not want to use HTTP over SSL.
SSL Keystore	This is the location of the signed certificate file required for the HTTPS connection.
SSL Keystore Password	This is the password for the signed certificate that you supply.
Enable Certificate-based Client Authentication	Select the checkbox to enable certificate-based client authentication (from the Web Browser to the Web Server). Clear the checkbox if you do not want to use this form of authentication.

Modifying the Security Parameters

To change these settings, complete the following steps on the Windows system, where the BPI Server is installed:

1. Start the Administration Console as described in section [Administration Console Description](#) on page 22.
2. Select the `Security` option from the Navigator pane on the BPI Administration Console.
3. Enter the changes that you want to make to the settings as appropriate in the right-hand pane.
4. Click `Apply` to apply the changes to the BPI configuration.
5. Select the `Status` option to move to the panel where the BPI component status are shown.
6. Stop and restart all the BPI Server components using the `Stop All` and `Start All` options. If you do not start all the components, some of the security settings can be compromised.

The new settings are now applied to your BPI system.

Component Configuration - MS SQL Server Access

The MS SQL Server Access parameters are available only when you select MS SQL Server as the database from within the BPI installation procedure. If you select Oracle as your database, the MS SQL Server parameters are not available through the Administration Console.

The MS SQL Server Access option enables you to view the current configurations for the SQL Server access and modify the password for the database access.

The database is used by the following components:

- Business Impact Engine
- Monitor Engine
- Business Event Handler
- JMS Business Event Handler
- Notification Server
- Web pages hosted within the Servlet Engine, for example, the Process Intervention pages.

These parameters are listed in [Table 34](#).

Table 34 MSSQL Access

Descriptive Parameter Name	Description
MS SQL Server hostname	This is a non-modifiable field and shows the fully qualified domain name of the system where the Microsoft SQL Server Database is installed.
MS SQL Server port number	This is a non-modifiable field and shows the port number that the Microsoft SQL Server Database is expecting connections on.
MS SQL Server database	This is a non-modifiable field and shows the name of the database configured for BPI.

Table 34 MSSQL Access

Descriptive Parameter Name	Description
MS SQL Server login user	This is a non-modifiable field and shows the name of the user who has permission to read and write the BPI database files.
MS SQL Server login password	The password for the user with permission to read and write the BPI database files. This field can be used to re-synchronize the BPI version of the password with the database password after the database password is changed using the database management tools.

To change the password for the database, follow the instructions on section [Changing the Password Details](#) on page 97.

Changing the Password Details

This section describes how to change the password for the BPI database user that you created during the installation.

Complete the following steps to make the changes to the database password:

1. Start the Administration Console as described in section [Administration Console Description](#) on page 22.
2. Stop all the BPI components using the Stop All button.
3. Select the MS SQL Server Access option on the BPI Administration Console and make the changes to the following fields:
 - MSSQL login password
4. Click Apply to apply the changes to the BPI configuration.
5. Return to the Status option and restart all the BPI components, using the Start All button.

You have now completed the tasks to change the database password details used by BPI components.

Component Configuration - Oracle Server Access

The Oracle Server Access parameters are available only when you select Oracle as the database from within the BPI installation procedure. If you select MS SQL Server as your database, the Oracle Server parameters are not available through the Administration Console.

The Oracle Access option enables you to manage the properties of the connection to the Oracle database.

The database is used by the following components:

- Business Impact Engine
- Monitor Engine
- Business Event Handler
- JMS Business Event Handler
- Notification Server
- Web pages hosted within the Servlet Engine, for example, the Process Intervention pages.

These parameters are listed in [Table 35](#).

Table 35 Oracle Server Access

Descriptive Parameter Name	Description
Oracle Server hostname	This is a non-modifiable field and shows the fully qualified domain name of the system where the Oracle Database is installed.
Oracle Server port number	This is a non-modifiable field and shows the port number that the Oracle Database is expecting connections on.
Oracle Server SID	This is a non-modifiable field and shows the name of the database sid configured for BPI.

Table 35 Oracle Server Access

Descriptive Parameter Name	Description
Oracle Server login user	This is a non-modifiable field and shows the name of the user who has permission to read and write the BPI database files.
Oracle Server login password	The password for the user with permission to read and write the BPI database files. This field can be used to resynchronize the BPI version of the password with the database password after the database password is changed using the database management tools.

If you are changing the password for the database user with permission to read and write the BPI database tables, follow the instructions on section [Changing the Password Details](#) on page 99.

Changing the Password Details

To change the password for the BPI database user, complete the following steps:

1. Start the Administration Console as described in section [Administration Console Description](#) on page 22.
2. Stop all the BPI components using the Stop All button on the Status option.
3. Select the Oracle Access tab on the BPI Administration Console and make the changes to the following fields:
 - Oracle Server login password
4. Click Apply to apply the changes to the BPI configuration.
5. Return to the Status option and restart all the BPI components, using the Start All button.

You have now completed the tasks to change the database password details used by BPI components.

Component Configuration - Port Numbers

This section describes the port numbers used by the BPI components. You might need to modify these if there is a port number clash, or if you have specific requirements with personal firewalls or other security processes.

The port number parameters are listed in [Table 36](#)

Table 36 Port Numbers

Descriptive Parameter Name	Description
RMI Registry	The port number for SUN's implementation of the Java RMI Activation System Daemon (RMID), which is used by BPI as a reliable RMI registry. The RMI registry holds the directory of port numbers used by the BPI components to receive RMI requests. If this port number is in use by another application, the BPI Server components are unable to start.
Administration Console Server	The port number that the server component of the Administration Console uses to listen for incoming administration requests.
Business Impact Engine SOAP Receiver	The port number used by the Business Impact Engine to receive incoming SOAP requests.
Business Impact Engine XML Receiver	The port number used by the Business Impact Engine to receive XML requests.
Business Impact Engine RMI Receiver	The port number used by the Business Impact Engine to receive incoming RMI requests.
Monitor Engine RMI Services	The port number used by the Monitor Engine to receive connections to RMI services.
Business Event Handler Source	The port number used by the Business Event Handler Engine Adapter to receive incoming Events into the Business Event Handler.
Business Event Handler Control	The port number used to stop and start the Business Event Handler Engine Adapter programmatically; see the <i>Business Process Insight Integration Training Guide - Business Events</i> , for more details.

Table 36 Port Numbers

Descriptive Parameter Name	Description
JMS Business Event Handler Control	The port number used to stop and start the JMS Business Event Handler Engine Adapter programmatically; see the <i>Business Process Insight Integration Training Guide - Business Events</i> , for more details.
Process Repository	The port number used by the Process Repository to listen for incoming RMI requests.
Servlet Engine HTTP	The port number that the Tomcat Web Server uses to receive HTTP requests.
Servlet Engine HTTPS	The port number that the Tomcat Web Server uses to receive HTTP over SSL encrypted requests.
Servlet Engine Shutdown	The port number used by the Tomcat Servlet Engine to shutdown.
Servlet Engine AJP 1.3	The AJP 13 protocol is a packet-based protocol that allows a Web server to communicate with the Tomcat JSP/Servlet Container over a TCP connection.
Servlet Engine Admin	The port number used by the Tomcat Servlet Engine administration tools.
Web Services Provider	Not used in BPI.
Data Samples Provider RMI Services	The port number defined for the Data Samples Provider and used by the Business Impact Engine and Monitor Engine to send data samples to Gateway Server (or Load Balancer).

If you want to modify a port number, refer to section [Modifying BPI Port Numbers](#) on page 102.

Modifying BPI Port Numbers

The BPI components use a number of different port numbers for connections. There should not be any need to modify these port numbers unless you know that other applications are already using them, or if you are using personal firewall software that filters incoming connections based on port number. You must stop all the BPI components before you can modify the BPI port numbers.

To change the port number for the BPI Server components, complete the following steps:

1. Start the Administration Console as described in section [Administration Console Description](#) on page 22.
2. Using the `Status` option, stop the BPI components using the `Stop All` button.

You cannot modify any of the port numbers until you have stopped the BPI components.

3. Select the `Port Numbers` option in the Navigator pane.
4. Make the changes to the port numbers that you want to modify.
5. Click `Apply` to apply your modifications.
6. Restart, using `Start All`, the BPI components that you previously stopped.

The port number changes have now been applied.

Component Configuration - Logging

This section describes the parameters that you can set for the log BPI component log levels and the component startup settings. Section [Logging Parameters](#) on page 103 describes the logging parameters and section [Component Startup Parameters](#) on page 106 describes the component startup parameters.

Logging Parameters

BPI includes a number of third-party products, which use their own logging mechanisms, for example:

- the Business Event Handler component, which is based on the openadaptor framework, uses Log4j as its logging mechanism.
- Hibernate, which is used by the Business Impact Engine and other BPI Server components, uses Jakarta Apache Commons logging.

Log4j and Java J2SE logging are two alternative implementations and Apache Commons is an layer above a specific logging implementation. In the case of BPI, Apache Logging is a layer over the Java J2SE logging implementation.

This Logging option enables you to set logging levels for the BPI components, and for the Business Event Handler; the Business Event Handler logging is based on openadaptor. There is no mechanism for setting the logging levels for Hibernate using the Administration Console, as the logging for the components using Hibernate is usually sufficient.

The logging parameters, which can be set through the Logging option, are listed in [Table 37](#). For your BPI implementation, you see only those logging parameters that relate to the components that you have installed.

Table 37 Logging

Descriptive Parameter Name	Description
Change the log viewer application	
Path for the log viewer application	The full path name for the application that is being used to display the log files. If the application is defined as being on your PATH, you can enter the application name without its full path name.
Logging Levels - HP Operations Manager Logging	
The Administration Console log level	The log level set for the Administration Console.
The Administration Console Server log level	The log level set for the Administration Console Server.
The Monitor Engine log level	The log level set for the Monitor Engine
The Business Impact Engine (BIE) log level	The log level set for the Business Impact Engine.
The Process Repository log level	The log level set for the Process Repository.
The Notification Server log level	The log level set for the Notification Server
The Servlet Engine log level	The log level set for the Tomcat Servlet Engine.
The Web Services Provider log level	The log level for the Web Services interface.
The CI Status Poller log level	The log level for all the CI Poller, unless overridden by specific instances of the CI Poller. You override the log level on the configuration page for the individual CI Poller. Each entry in the log file is identified by the name that you give the CI Poller in the Administration Console.

Table 37 Logging

Descriptive Parameter Name	Description
The Data Samples Provider log level	<p>The log level for all the Data Sample Destinations, unless overridden by specific instances of the Destination. You override the log level on the configuration page for the individual Data Sample Destination.</p> <p>Each entry is identified by the name that you give the Destination in the Administration Console.</p>
Log BIE events (to bie_event0_0.csv)?	<p>Check the checkbox to log all business events to the file <code>bie_event0_0.csv</code> in the <code>bpi-install-dir\data\log</code></p> <p>The file is in a comma-separated format in order that you can order and filter the events within a tool such as Microsoft Excel.</p> <p>When the maximum number of bytes that should be written to a file is reached, or the BPI Server is restarted, a new log file is opened and named <code>bie_event0_0.csv</code>. The previous log file is renamed, for example, <code>bie_event0_1.csv</code></p>

Logging Levels - Log4j Logging

The Business Event Handler log level	The logging level set for the Business Event Handler.
The JMS Business Event Handler log level	The logging level set for the JMS Business Event Handler.

The following are the logging levels that you can set for the HP Operations Manager Logging in ascending level of log detail provided:

1. Info, which reports runtime informational messages and is the default level of logging.
2. Fine, which provides more detail and is used when debugging or diagnosing problems.
3. Finer, which provides the greatest detail and is used for tracing and debugging low level problems.

The following are the logging levels that you can set for Log4j Logging in ascending level of detail:

1. Info, which reports at the informational level and is the default level of logging.
2. Trace, which should be used for debugging purposes.



When setting logging levels to report more detail, make sure that these are temporary settings as the detail logged can consume a significant amount of disk space and impact the performance of the system where BPI is installed.

Modifying the Log File Parameter Values

To modify the log levels for the BPI server components complete the following steps:

1. Start the Administration Console as described in section [Administration Console Description](#) on page 22.
2. Stop the server components using the Stop All button.
3. Select the Logging option in the Navigator pane.
4. Make the changes to the log levels that you want to modify.
5. Click Apply to apply your modifications.
6. Restart the BPI components that you previously stopped.

The logging level changes have now been applied.



The log levels set when BPI is installed are suitable for most error reporting. If you need to increase the granularity of the logging information provided, make sure that you set the log levels for a temporary period only. When set the Fine and Finer logging levels, the log files become large very quickly and can have a detrimental effect on your system's performance.

Component Startup Parameters

Use this parameter to configure the time allocated to start individual components.

BPI components have a configured time allocated for starting. If they fail to start within the period specified by the Startup timeout (seconds) parameter, they are assumed to have failed.

On some machines, it can take some time for components to start; for example, because the machine has a slow processor, or has many applications running. If this is the case in your implementation, you can increase the value of the startup time to allow more time for the component startup.

Table 38 describes the startup setting.

Table 38 Component Startup Settings

Descriptive Parameter Name	Description
Startup timeout (seconds):	The time, in seconds, that is allocated to start each BPI component. All components are allocated the same value for their startup time.

Modifying the Component Startup Parameter Values

To modify the component startup parameter for the BPI server components, complete the following steps:

1. Start the Administration Console as described in section [Administration Console Description](#) on page 22.
2. Stop the server components using the `Stop All` button.
3. Select the `Logging` option in the Navigator pane.
4. Make the changes to the startup time.
5. Click `Apply` to apply your modifications.
6. Restart the BPI components that you previously stopped.

The startup times are now modified.

License Management

You use the License Management software (Autopass) to manage the HP Process Insight software license keys. When you purchase an HP Software product, for example BPI, you receive an Entitlement Certificate. This Entitlement Certificate contains information that you need to retrieve and install BPI license keys.

The License Management utility is not an BPI component. BPI provides access to the utility to make it easier for you to request and install the BPI license keys. You can also request your license keys using email or facsimile (fax). Requesting license keys is described as part of the License Key installation in the License Management online help.

The License Management utility provides a number of features, including:

- License key installation
- License key reporting
- License key backup
- License key removal
- License key recovery

Details of these features and how to use them are provided in the License Management online help.

To install your BPI license keys complete the following steps:

1. Make sure that you have your Entitlement Certificates, which contain the order numbers that you need to retrieve your license keys.
2. Open the BPI Administration Console.
3. Select **License Manager** from the **Admin** menu on the **Administration Console** to start the **Autopass License Management** software.

The License Management utility opens at the screen to **Retrieve/Install License Key**.

4. Follow the on-screen instructions and the instructions in the License Management online help to install the BPI license keys.
5. Select the Report License Key option from the License Management Navigation window to check that the BPI license keys are successfully installed.

When the keys are successfully installed, you should see the BPI product number with an Expiration Date of Forever.

If you have problems retrieving or installing the license keys, contact your local support representative. The Administration Console provides access to the Support Web site from the Support Online option on the Help menu.

3 Enhancing BAC with Process Instance Monitors

This chapter describes how to add process instance monitors to BAC by configuring your BPI Server and how you can use BPI to track instances of Business Processes that you create and develop using the BPI Modeler.

The chapter covers the following topics:

- [Overview of BPI as an Application Within Business Availability Center on page 112](#)
- [Configuring the BPI Server to Connect to a Gateway Server or Load Balancer on page 130](#)
- [Using SSL for Connections with Business Availability Center on page 138](#)
- [Gateway Server Configuration on page 139](#)
- [Creating a My BSM Application for BPI on page 142](#)
- [SLM and Reporting on page 144](#)
- [Description of Data Samples Sent to Business Availability Center on page 145](#)

Overview of BPI as an Application Within Business Availability Center

If you have already installed HP Business Availability Center (BAC), some BPI components are also installed, namely the BPI Modeler and the Process Repository. A Process Repository Database is also created as part of the BAC installation. In this configuration, you can create Business Processes and link the Steps in the Business Process to CIs that represent IT operational resources. This then enables you to monitor the health of the Business Process and the Steps in the process relative to the IT operational resources on which they depend.

When you install the BPI Server, the BPI Application is added as a new component to the BAC Gateway Server that you have configured within the Administration Console. As a result, a new Process Repository is installed on the BPI Server system and the existing Process Repository on the BAC Gateway Server is disabled. Communication to the Process Repository Database is now from the BPI Server system and the data in the Repository Database is synchronized with the UCMDB.

The addition of the BPI application enables you to monitor the health of your Business Process and its Steps as before; in addition, it enables you to:

- map business events to Steps in your Business Process to enable you to monitor the business impact when there are problems with the Business Process.
- monitor instances of your Business Process in near-real time.
- determine how effective your Business Process is by defining Monitor CIs that measure thresholds that you define.
- view and report on the status of the health of your Business Processes.
- view detailed information about each process instance in the Business Process, the Business Process Steps and the thresholds defined for the instances.
- model your business's IT processes and your supporting business applications services. It also provides the tools to help you prioritize problems, based on business impact and service level compliance.
- report on the status of operational services and how they impact your Business Processes.

- set service level objectives (SLOs) for the BPI configuration items (CIs), which are managed within Business Availability Center.
- configure alerts, within the Business Availability Center SLM component, based on the SLOs that have been set on the BPI CIs.
- enable reports to be generated, based on the BPI CIs.
- use MY BSM portlets for views of the BPI Process and Monitor data.

The following sections describe in more detail how you can use the features of BPI within BAC for designing, managing and tracking your Business Processes. The sections have been divided into the features available for design and the features available after you have deployed your business:

- [Design-Time Integration](#) on page 114
- [Run-Time Integration](#) on page 118

Design-Time Integration

You design and subsequently deploy your Business Processes and process Steps using the BPI Modeler. The features of the Modeler that are available to you when designing processes depends on whether you have:

1. the BPI Server installed
2. enabled or disabled tracking individual process instances when defining your process.



If you do not have the BPI Server installed, then you do not have the option to enable individual process instance tracking within the Modeler; the option is disabled.

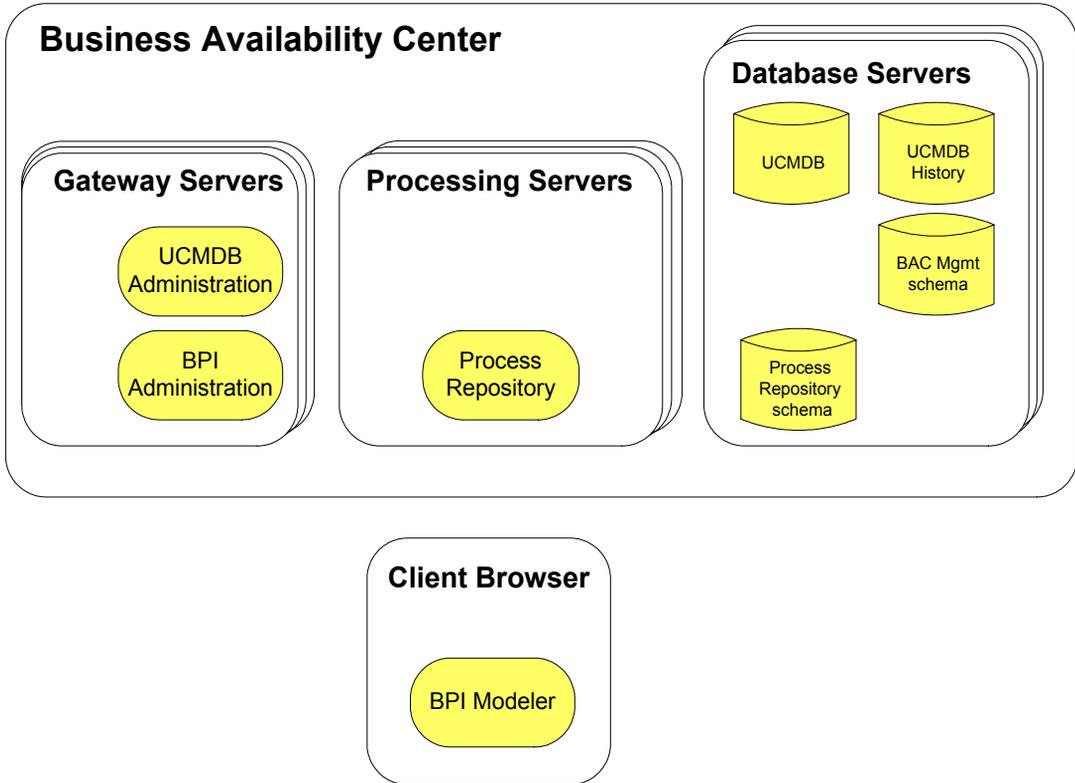
This section describes:

- [Modeling with Tracking Individual Process Instances Disabled on page 115](#)
- [Modeling with Tracking Individual Process Instances Enabled on page 117](#)

Modeling with Tracking Individual Process Instances Disabled

This section describes the concepts for modeling Business Processes, including mapping IT operational resources to process Steps when you do not have the BPI Server installed or you have not enabled individual process instance tracking.

Figure 1 Design-Time - Process Instance Tracking Disabled



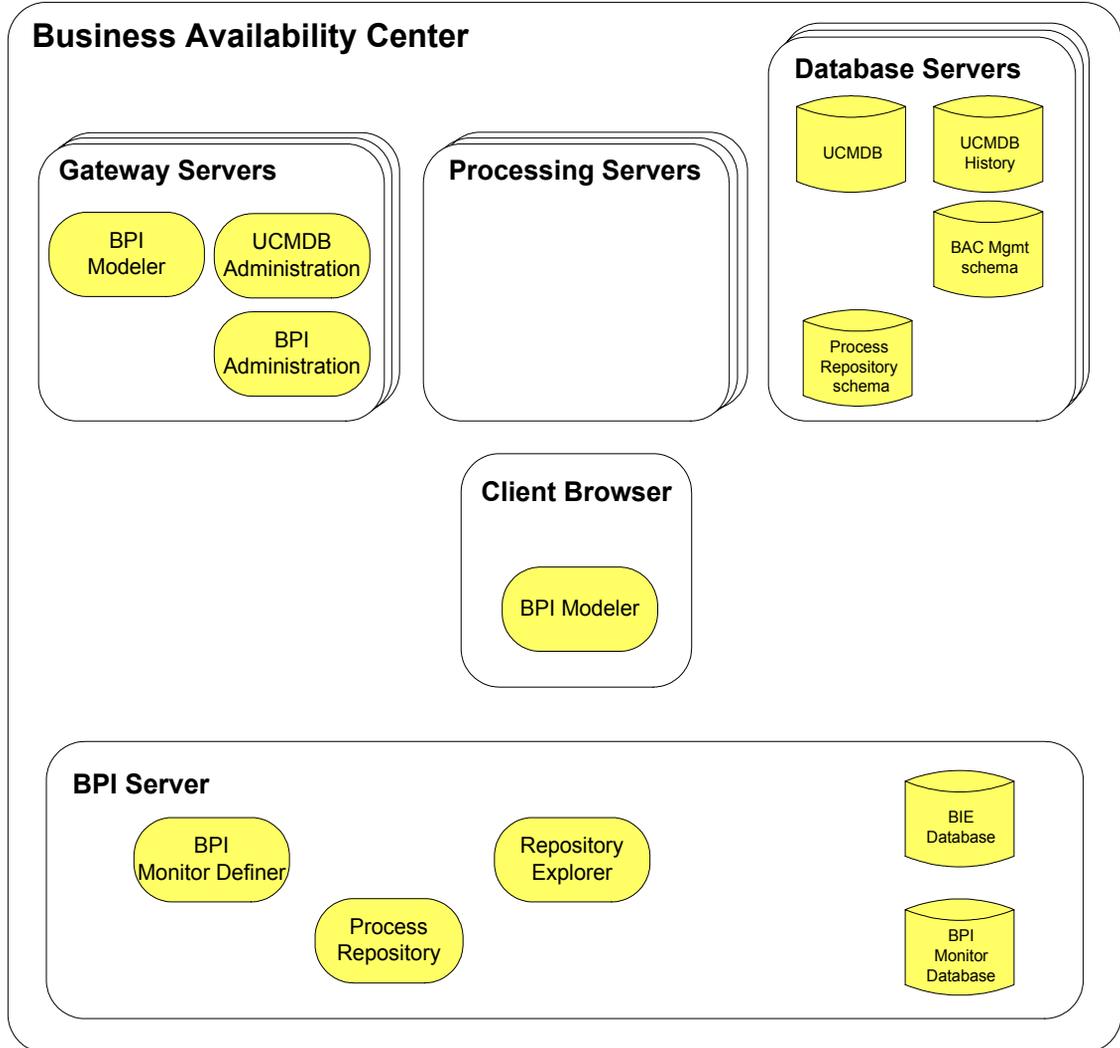
The following steps describe the communication between BAC components as shown in [Figure 1](#):

- You create your Business Processes using the Modeler. When you deploy the Business Processes, the Modeler completes its consistency checking on the Business Process.
- The Processing Server forwards the RMI command to the Process Repository, which manages how the process models are stored in the Process Repository Schema, including synchronizing the models with the UCMDB.
- As part of creating your Business Processes, you can map IT operational resources, which are defined as CIs within the UCMDB by applications such as SiteScope, to the Business Process Steps. BAC can then evaluate the status of the IT operational resource CIs for later presentation within the Flow Map.

Modeling with Tracking Individual Process Instances Enabled

This section describes the steps for modeling Business Processes when you have the BPI Server installed and you have enabled individual process instance tracking. These steps extend the modeling steps described in section [Modeling with Tracking Individual Process Instances Disabled](#) on page 115.

Figure 2 Design-Time - Process Instance Tracking Enabled



The following steps describes the communication between BAC components when you have chosen to model processes in order to track and monitor individual process instances, as shown in [Figure 2](#). You can model Business Processes and map IT operational resource CIs to the process Steps as described in [Modeling with Tracking Individual Process Instances Disabled](#) on page 115. In addition, you can model processes to track individual process instances as follows:

- Create your Business Process using the BPI Modeler and select the option to Track individual process instances.
- Create the Data Definitions, progression rules, Event Definitions and Event Subscriptions for your Business Processes.
- Deploy the Business Process, at which point the Modeler completes its consistency checking on the Business Process. The Modeler sends the definition to the Gateway Server (or load balancer) using RMI over HTTP and the Gateway Server sends the Model definitions to the Process Repository on the BPI Server using RMI.
- The Process Repository manages how the process models and their components are stored and synchronized in the Process Repository Schema; this includes creating the Java class files and the Process Instance tables in the BPI Instance database.
- When the Business Process is successfully deployed, you can define Monitors and instance thresholds for the Business Process. These definitions are stored in the BPI Instance database and are synchronized with the UCMDB.

Run-Time Integration

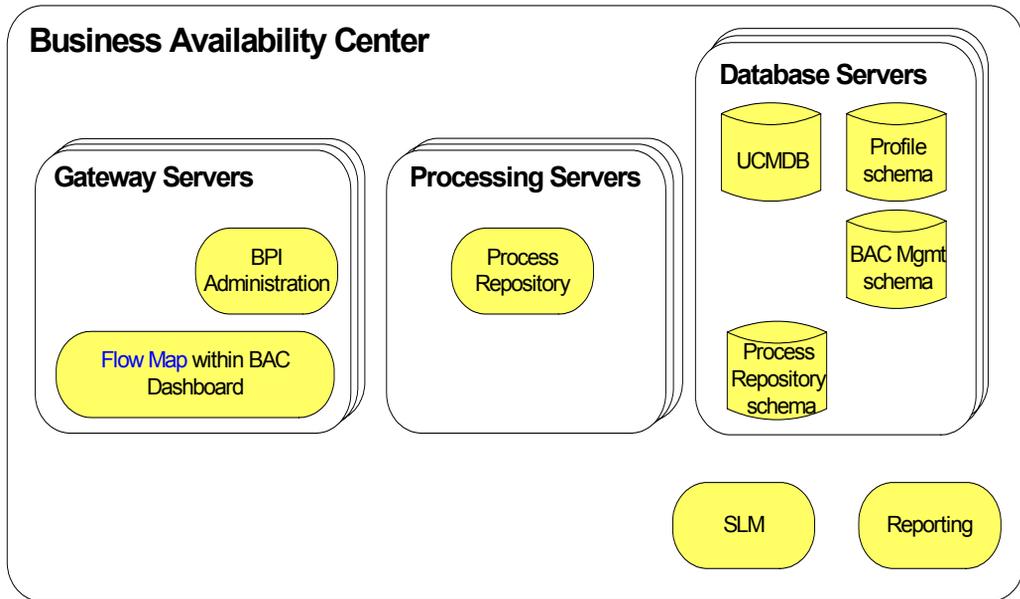
When you have defined and deployed your Business Processes and Business Process monitors, you can then track and monitor the health of your Business Process relative to the status of the IT operational resources on which the process Steps depend and on the values of the data being captured by the Business Event Handler. This section covers:

- [Monitoring - Tracking Individual Process Instances is Disabled](#) on page 119
- [Monitoring - Tracking Individual Process Instances is Enabled](#) on page 121

Monitoring - Tracking Individual Process Instances is Disabled

Figure 3. shows the components involved for displaying the monitoring data when you do not have the BPI Server installed or you have not enabled tracking of individual process instances.

Figure 3 Run-Time - Process Instance Tracking Disabled



The following is a list of the key steps involved for monitoring your Business Processes:

- Data collectors, such as SiteScope make their data samples available through the Profile database. This data is then available for Reporting and SLM.
- The data samples collected from other applications are also used for the IT operational resource CIs, which can be mapped to Business Process Steps.

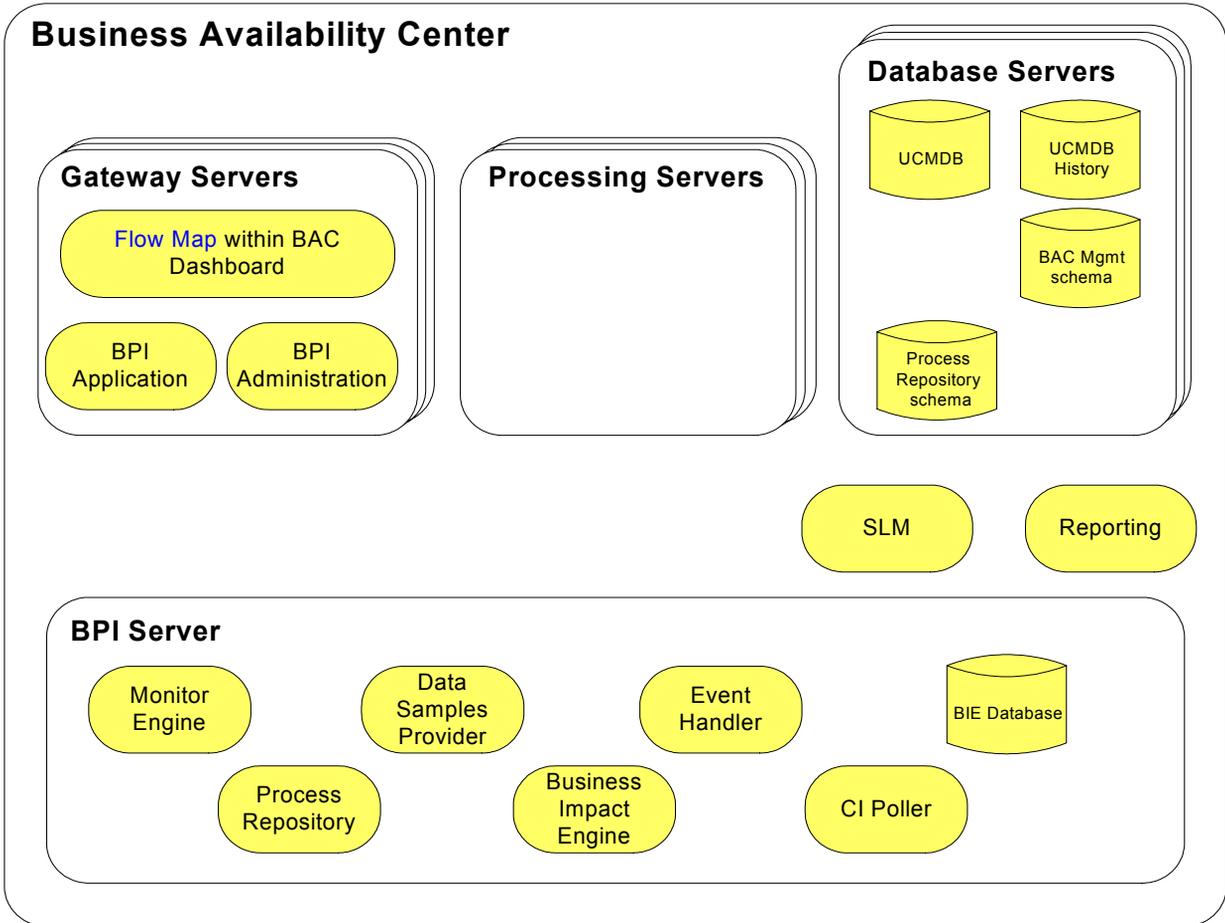
- You need to set KPI objectives on your IT operational resource CIs in order to be able to monitor status changes.
- BAC calculates the status of the dependencies for the mapped IT operational resource CIs and makes the results available to the Dashboard.

The Dashboard combines these results with the process definition model information (obtained from the Process Repository) and the results are displayed on the Flow Map within the Dashboard Application.

Monitoring - Tracking Individual Process Instances is Enabled

Figure 4. shows the components involved for displaying the monitoring data when you have the BPI Server installed and you have enabled tracking of individual process instances.

Figure 4 Run-Time - Process Instance Tracking Enabled



The following is a list of the key steps involved for monitoring your Business Processes. These steps are in addition to those described in section [Monitoring - Tracking Individual Process Instances is Disabled](#) on page 119:

- In addition to the IT operational resource CIs that are monitored and reported for your Business Processes, BPI receives business events through the Business Event Handler.
- The business data relating to individual process instances is stored in the BPI Instance database.
- At the same time as each new Monitor definition is created in the BPI database tables, a BPI Monitor CI is created in the UCMDB.
- Changes to process instance data that impact the Business Process monitors that you have defined are sent to the Monitor Engine, which in turn updates the relevant tables in the BPI Instance database.
- The BPI Server periodically sends a set of data samples to the Business Availability Center Gateway Server. This period can be configured from the BPI Administration Console; see section [Component Configuration - HP Business Availability Center Settings](#) on page 68.

The data samples are held on the BPI Server for a configurable length of time, until the Business Availability Center acknowledges receipt. If a data sample cannot be delivered in the required time, it is deleted. The values of these data samples are used to evaluate KPIs within the Business Availability Center environment.

These data samples can also be used for reporting and SLM.

- The BPI Server polls for the status of CIs to obtain details of the status of the IT operational resources that the process Steps are linked to. This period can be configured from the BPI Administration Console; see section [Component Configuration - HP Business Availability Center Settings](#) on page 68.
- The business event data and monitor data for the process instances is made available to other BAC components and displayed through the BPI Application, which is described in more detail in [Chapter 9, BPI Application Concepts](#).

Ongoing changes made to the Processes and Monitors in the BPI database tables are automatically synchronized with the UCMDB.

Data Samples

A data sample, in Business Availability Center terms, is application-specific data sent from an application, in this case, BPI. In the case of BPI, these data samples can be used by Business Availability Center to show key performance indicators (KPIs), relating to the imported Process and Monitor definitions. The data samples are taken from the values of specific Monitor values in the BPI Instance database. Data samples are sent from the BPI Server to the Gateway server that you configure within the BPI Administration Console.



If you have defined Groups for your Business Process Monitors, the Groups are not exported to the Gateway Server. The data samples that the BPI Server sends are for the entire Monitor Definition.

The data samples provide the information required to provide meaningful information about the health of your business.

Configuration Items Stored in the UCMDB

Table 39 describes the BPI data that is stored in the UCMDB as a result of the synchronization. This sharing of information between BPI and Business Availability Center enables Business Availability Center to access the BPI data from the UCMDB. The BPI data is stored in the UCMDB as configuration item (CI) of several types. For more information about CI types, refer to the CI Type Manager as follows:

Admin > Universal CMDB > Modeling > CI Type Manager

.

Table 39 Configuration Items Stored in the UCMDB for BPI Process Components

CI Type	Description
business_process	Stores the Process Name and Process Description as entered using the BPI Modeler. A business_process CI is created for each Business Process in BPI. business_process CIs are logical CIs.
bpi_step	Stores the Step Name and Description as entered using the BPI Modeler. A bpi_step CI is created for each Step in all Business Processes. bpi_step CIs are logical CIs.

Table 39 Configuration Items Stored in the UCMDB for BPI Process Components

CI Type	Description
bpi_monitor	<p>Stores the Monitor Name, Description, Type, Units, Collection Interval, Threshold Operator, Server Name and Instance Threshold limits (where specified) as defined with BPI.</p> <p>There are sub-types of the <code>bpi_monitor</code> type as follows:</p> <ul style="list-style-type: none">• <code>bpi_duration_monitor</code>• <code>bpi_value_monitor</code>• <code>bpi_custom_monitor</code> <p>Monitor data samples are sent for each <code>bpi_monitor</code> CI.</p> <p><code>bpi_monitor</code> CIs are Monitor CIs.</p>

Table 39 Configuration Items Stored in the UCMDB for BPI Process Components

CI Type	Description
bpi_process_monitor	<p>A bpi_process_monitor CI is created in the UCMDB for every business_process CI stored. This CI stores the process monitor data collected implicitly by BPI for each process; for example:</p> <ul style="list-style-type: none"> • current numbers of active instances • numbers of blocked instances • number of completed instances <p>Data samples are sent to Business Availability Center for each bpi_process_monitor CI.</p> <p>bpi_process_monitor CIs are child CIs of business_process.</p>
bpi_step_monitor	<p>A bpi_step_monitor is created in the UCMDB for every bpi_step CI stored. This CI stores the process monitor data collected implicitly by BPI for each process Step; for example:</p> <ul style="list-style-type: none"> • current numbers of active instances • number of completed instances <p>Data samples are sent to Business Availability Center for each bpi_step_monitor.</p> <p>bpi_step_monitor CIs are child CIs of bpi_steps.</p>

As with any synchronization, or sharing of data, there must be a master copy of the data to synchronize from. In this case, the BPI Server holds the master copy of the data. This means that any changes to the data within Business Availability Center UI Framework are overwritten by BPI when the data models are synchronized. If you delete a CI in the UCMDB, it is created again when the data models are synchronized.

Data synchronization occurs as a result of any one of the following:

- a Business Process is deployed, re-deployed, or un-deployed.
- a Business Process monitor definition is created, modified or deleted.
- related configuration changes are made within the BPI Administration Console.
- a synchronization is forced using the Synchronize with the CMDB option in Admin > Process Intervention.

As part of the synchronization process, BPI creates mapping tables, which are used to provide the references between the BPI data and the corresponding CI within the UCMDB. The BPI unique identifiers for the data (GUIDs) are mapped to the UCMDB GUIDs for the BPI-related CIs. This enables BPI to send data samples to Business Availability Center as well as manage the synchronization process.

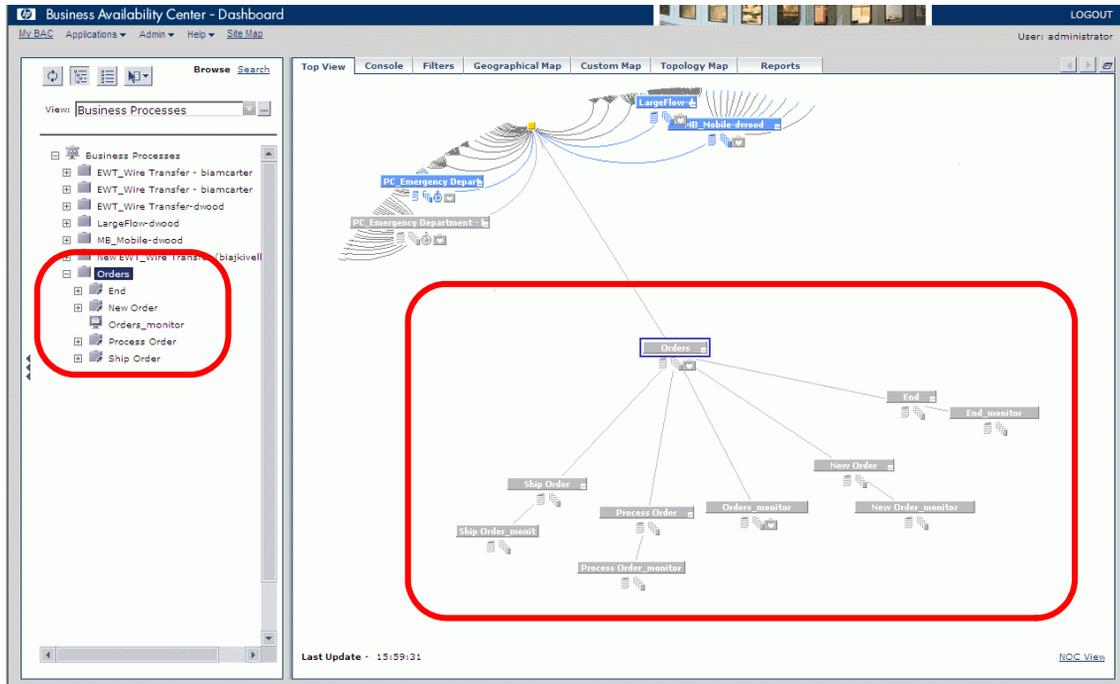
Viewing BPI CIs

To see the CIs defined within Business Availability Center:

- Select:
Applications > Dashboard
- Select Business Processes from the View option drop-down list.
This is the View within Business Availability Center that groups together all BPI processes.
- Select the Orders process listed under Business Processes.
- Select the Top View tab.

Figure 5 shows the Business Process named Orders and its associated Steps.

Figure 5 Dashboard - Top View



The Orders process, and its Steps, are listed in the View Explorer and the root view for the Orders CI and the dependent Step CIs is shown in the graphical view on the right-hand pane.

In this example, you can see that there are also other processes deployed and you also see these other processes within the Business Processes.

Also note that there are two CIs for each component of the Orders process.

Multiple CIs for Each Business Process and Business Process Step

When you view a Business Process within Dashboard, you might notice that there are two CIs defined for each Business Process component; for example, in the case of the Orders process, there is an Orders CI and an Orders_monitor CI. Similarly, for each Step, there is a Step CI and a corresponding Step monitor CI. For each Business Process or Business Process Step, BPI defines a CI within the UCMDB. This enables you to configure any dependent CI hierarchy and enables BPI to send data samples

to the UCMDB for a CI. However, within the UCMDB, data samples can only be assigned to a CI of type `bpi_monitor`. As a result, for each Business Process, BPI defines both a `business_process` CI and a `bpi_monitor` CI.

The CI with a name that ends in `_monitor` contains the data sample values as sent from BPI; these values are then inherited by the root CI.

Configuring the BPI Server to Connect to a Gateway Server or Load Balancer

This section describes the steps that you need to complete to configure both the BPI Server system and the Gateway Server system (or Load Balancer) that the BPI Server will communicate with.



If you have previously installed Business Availability Center and BPI and subsequently removed the BAC installation, including all the BAC data, you must also remove the BPI data before attempting to reconfigure BPI to connect to BAC.

If you do not, some of the BPI data has no parent CI data within the BAC database and there are inconsistencies in your Business Process models.

You configure the BPI Server to become an application within Business Availability Center through the HP Business Availability Center settings in the BPI Administration Console. These properties are divided into three sections and are described in sections:

- [Business Availability Center General Settings](#) on page 131.
- [Data Sample Settings](#) on page 133
- [CI Poller Settings](#) on page 135

Business Availability Center General Settings

You configure general settings that apply to both the Data Sample settings and the CI Poller settings using the Administration Console as follows:

1. Start the Administration Console on the machine where the BPI Server is installed:

```
Start > Programs > HP > HP Business Process Insight >
Administration
```

2. Click the HP Business Availability Center settings option in the left-hand navigation pane.

A configuration page is opened in the right-hand pane, which contains all the configuration options for the Business Availability Center integration. You need to set the parameters for the Business Availability Center General settings.

3. Enter values for the properties of the General settings. The properties are fully described in the *Business Process Insight Administration Guide*:

— Hostname of Gateway server

The fully qualified DNS name of the machine where the Business Availability Center Gateway Server is installed. This is the server that you want BPI to use as a source for Service Status information, as the destination for data samples and for UCMDB synchronization. If you have configured a Load Balancer, you can specify the name of the Load Balancer in place of the Gateway Server.

If you plan to the BPI Server in a domain that is different to the domain where the Gateway Server (or Load Balancer) is installed, make sure that you add the BPI domain to the list of Protected Domains, under:

```
Admin > Platform > Users and Permissions > Authentication
```

- Use SSL?

Enables or disables use of SSL when connecting to the Gateway Server; see also section [Using SSL for Connections with Business Availability Center](#) on page 138.

- HTTP port of Gateway server

The port number used by the Web Server on the Business Availability Center Gateway Server. Usually this is port 80, or port 443 if you have configured SSL.

- User name

The user name that you have defined to be used by BPI server components when connecting to Business Availability Center. This is the account used by BPI to obtain the Service Status information from Business Availability Center and for synchronization.

This can be an existing user, or a new user, as long as it has permissions to access the View name as specified in the Business Availability Center settings in the BPI Administration Console. For a new installation the view name is Business Processes.

- Password

The password set for User name.

- Basic authentication enabled?

Enables or disables the use of basic authentication.

Select this option only when Business Availability Center is configured to use basic authentication for Web Server and Web browser communications.

Basic authentication is the BAC mechanism for enabling a Web browser (or Web client) to authenticate with the Web Server using a user name and a password; refer to the Business Availability Center help documentation for details of basic authentication.

- Basic authentication user

The user name that is configured for BAC basic authentication.

- Basic authentication password
The password set for Basic authentication user.
- Maximum retries for synchronization deadlock
For a new configuration accept the value offered.

You do not need to restart any BPI components for these settings to take effect. BPI automatically synchronizes its data with Business Availability Center when changes are applied to the General settings.

Data Sample Settings

You need to configure the Data Sample settings in order for BPI to send data samples to Business Availability Center. Sending data samples to Business Availability Center enables you to use the BPI application to report and view the health of the Business Processes that you create.

Business Availability Center displays the sample information based on the time period specified in the `Data sample send interval` and until the next sample is sent by the BPI Server. In order to make sure that there are data samples to display, there is an additional decay period that you can set within Business Availability Center. Unless modified, the value of the decay period is set at 90 seconds.

You can also set a delay before sending data samples to the Gateway Server using the `Delay before sending samples` parameter. You configure a delay if you want to allow time for the Business Process Engine and the Monitor Engine to collate data before sending it to the Gateway Server.

Setting a delay enables you to take account of the fact that there might be a time difference between when a business event occurs and when BPI receives notification of the event; this is because some business applications do not make data available immediately. This then enables BPI to collect complete and accurate statistics for each send interval before sending the data to the Gateway Server; however, it also means that the data sample values shown in BAC lag behind the `Last Update` time by the value of the value of this delay; for example, if the current time is 10:30 and you set a delay of 900 seconds (15

minutes), the values you see for the BPI data samples displayed within the BPI Application and elsewhere in BAC relate to the collection period ending at 10:15.



BAC displays the last sample information for the time period specified in the `collection_interval` attribute. The sample is kept for an additional 90 seconds, which is the default decay setting to make sure that the data samples continue to display the same statuses. If there is no decay setting specified, the BAC views display `No data` as a status in cases where a new sample has not yet been received by BAC due to overload problems or late arrival of the new sample. This default decay setting is customizable.

If you configure a data sample delay within BPI that is more than 90 seconds, you should also increase the decay setting for BPI samples in BAC (see the BAC Dashboard Help). If you do not, a `No Data` status is shown for the BPI Application instance data.

The Data Sample settings are configured using the Administration Console as follows:

1. Start the Administration Console on the machine where the BPI Server is installed:

```
Start > Programs > HP > HP Business Process Insight >
Administration
```

2. Click the HP Business Availability Center settings option in the left-hand navigation pane.

A configuration page is opened in the right-hand pane, which contains all the configuration options for the Business Availability Center integration.

3. Enter values for the properties of the Data Samples settings. The properties are fully described in the *Business Process Insight Administration Guide*:

- Data samples send interval (minutes)

For a new configuration accept the value offered (five minutes). This interval also becomes the collection period for all BPI monitors.

- Connection timeout (seconds)

For a new configuration accept the value offered.

- `Guaranteed retention period (minutes)`

For a new configuration accept the value offered.

- `Delay before sending samples (seconds)`

Delay following the `Data samples send interval` to allow time for the **Business Impact Engine** and **Monitor Engine** to collate data to be sent to the **Gateway Server**.

4. Click the **Apply** button to apply your changes.

You do not need to restart any BPI components for these settings to take effect. BPI automatically synchronizes its data with the **Gateway Server** when changes are applied to the `Data Sample` settings.

The first time you configure the `Data Samples` settings, BPI synchronizes all deployed **Business Process** (and **Step**) definitions with the **UCMDB**. For each **Business Process** and **Step**, CIs are created in the **UCMDB**; for example, if you have a process called `MyProcess` containing a step called `Step1`, then you will have a corresponding CI in the **UCMDB** for `MyProcess`, and this will contain a dependent CI called `Step1`.

The data samples sent by the **BPI Server** are then stored against the corresponding CIs within the **UCMDB**.

CI Poller Settings

In order for the **BPI Server** to receive status information that relates to operational services that have been associated with **BPI Step CIs** within **Business Availability Center**, you need to configure **CI Poller** settings.

You configure the `CI Poller` settings using the **Administration Console** as follows:

1. Start the **Administration Console** on the machine where the **BPI Server** is installed:

```
Start > Programs > HP > HP Business Process Insight >
Administration
```

2. Click the **HP Business Availability Center settings** option in the left-hand navigation pane.

A configuration page is opened in the right-hand pane, which contains all the configuration options for the **Business Availability Center** integration.

3. Enter values for the properties of the CI Poller settings. The properties are fully described in the Business Process Insight Administration Guide:

- View name

Unless you have modified this on the Business Availability Center system, accept the value offered (Business Process)

- Status event poll interval (seconds)

For a new configuration accept the value offered (five minutes).

- Connection timeout (seconds)

For a new configuration accept the value offered.

4. Click the Apply button to apply your changes.

You do not need to restart any BPI components for these settings to take effect. BPI automatically synchronizes its data with the Gateway Server when changes are applied to the CI Poller.

You should now continue at section [Gateway Server Configuration](#) on page 139 to configure the Gateway Server to recognize your BPI Server system.

Business Process Insight Application

When you have successfully configured the BPI settings, and deployed your Business Process you are able to view and monitor the health of your processes using the Scorecard, Health and Reports options within the BPI Application. Refer to [Chapter 9, BPI Application Concepts](#) for details of the BPI Application.

Using SSL for Connections with Business Availability Center

You can specify an SSL (secure socket layer) connection between BPI and Business Availability Center.

In order to configure Business Availability Center to support HTTPS, you need to obtain an SSL certificate. SSL uses public key cryptography, which is based on key pairs. These key pairs contain one public key and one private key. These keys are used by Business Availability Center to enable HTTPS. When installed the certificate encrypts the data that is sent between BPI Web interfaces (clients) and the Business Availability Center Web Server.

In order that BPI can use SSL when integrating with Business Availability Center, you need to import the required SSL certificate from Business Availability Center. You import the certificate into the keystore for your Java distribution on the BPI Server machine.

The instructions for importing the certificate are provided in the Business Availability Center documentation in a document called: *Hardening Guide* within the `System Deployment` category of documents.

Gateway Server Configuration

In addition to configuring details of the Gateway Server system from the BPI Server system, you also need to configure the Gateway Server system with details of the BPI Server. Alternatively, this could be a Load Balancer if there is one configured for the BAC system.

To configure the Gateway Server, complete the following steps:

1. Logon to Business Availability Center on the system where the Gateway Server is running.
2. Select Admin > Platform.
3. Select Setup and Maintenance.
4. Select Infrastructure Settings.

The Infrastructure Settings Manager page is displayed.

5. Select Business Process Insight from the Applications option under Select Context.

The Business Process Insight settings page is displayed.

The page is divided into sections and some of the information is already completed with values that are set as part of the installation. You can leave these settings until you have been using BPI and have more information about what the most suitable values are. For example, you can modify the KPIs that are listed on the BPI Application Scorecard page using the Selected Scorecard KPIs setting.

- ▶ If you are using a Virtual Machine for your BPI Server, make sure that any host names are fully qualified and include the domain names, when entered in the infrastructure settings. If you do not, you can experience anomalies within the BPI Application Scorecard display and the KPI filter appears to apply only to the first entry in the scorecard list.

6. If not already completed, set the following values for Instance Database Settings:

a. Host Name

This is the fully-qualified domain name of the system where the database that you configured for the BPI Server is installed. This must match the name that you entered for the database host when you installed the BPI Server and the setting determines which Process Repository is used to manage your Process Definitions.

b. Port

This is the Port number configured for the database on the hostname above and should not be modified unless you have reconfigured your database to use an alternative port number.

c. Database Type

The database configured for the BPI Server and can be either a SQL Server database or an Oracle database.

d. Database Name or SID (according to the Database Type)

For SQL Server this is the database name that you entered when you configured the database details during the BPI Server installation.

For Oracle this is the SID that you entered when you configured the database details during the BPI Server installation.

e. User Name

User name for the database user configured during the BPI Server installation.

f. Password

Password for the database user configured during the BPI Server installation.

7. If not already completed, set the following values for Instance Server Settings:

a. BPI Host Name

This is the fully-qualified domain name of the system where the BPI Server is installed.

b. BPI Port

This is the port number for the Web Server used by the BPI Server and is identified as `Servlet Engine HTTP` or `Servlet Engine HTTPS` under the Port Numbers option within the Administration Console for the BPI Server.

c. BPI Protocol

The protocol used for the BPI Web Server and can be either HTTP or HTTPS depending on the port number configuration.

d. BPI RMI Port

The port number for the BPI Server RMI Registry. The RMI Registry port number is listed under the Port Numbers option within the Administration Console for the BPI Server.

You can also create My BSM applications for BPI as described in section [Creating a My BSM Application for BPI](#) on page 142.

Creating a My BSM Application for BPI

Within Business Availability Center, you can configure a Business Availability Center portlet server (My BSM). My BSM is a portal that you can customize to display specific content that is relevant to you, in this case, BPI Business Process information.

There is a Category, within the Personalize option, for My BSM called HP Business Process Insight. The following are the portlets that you can add for the BPI Integration category to display BPI data:

- a BPI Process Diagram portlet to display an BPI Process diagram that corresponds to a selected CI.
- a BPI Monitors Over Time portlet to display:
 - the average, minimum, maximum, process value or duration of a CI over a specific time period.
 - the violated instances of a CI over a specific time period.
- a Business Process Over Time portlet to display information about the volume (throughput), backlog (active process value) and health of a selected Business Process CI over a specific time interval.
- a Business Process Step Over Time portlet to display information about the volume and backlog of a Step CI over time.
- a Business Process Step Summary portlet to display the summary data for a selected Step CI.
- a Business Process Summary portlet to display the summary data for a selected Business Process.

For more details of the My BSM portlets available for BPI, refer to the My BSM Help.



If you configure a My BSM application for BPI, but there is no diagram shown in the portlet, check that you have used a fully qualified domain name for the Domain name of the Gateway Server as follows:

- Open the BPI Administration Console.
- Select Servlet Engine > Security from the left-hand navigator pane.
- Under Authorization settings make sure that the property Domain name of local host: is fully qualified and contains a Domain name. If it is not fully qualified, correct the entry and restart all the BPI Server components.

SLM and Reporting

As mentioned earlier in the chapter, the data samples sent to Business Availability Center are written to an offline data repository.

The Business Availability Center Service Level Management (SLM) component uses the data stored in the offline data repository as a source for building Service Level Agreements and setting Service Level Objectives, and for creating reports.

In terms of Service Level Management, you can:

- enable service level objectives (SLOs) to be set for the BPI configuration items (CIs), which are managed within Business Availability Center.
- configure alerts, within the Business Availability Center SLM component, based on the SLOs that have been set on the BPI CIs.

Refer to the Business Availability Center Service Level Management documentation for information about setting Service Level Objectives.

In terms of reporting, you can configure the Business Availability Center Report Administration component to generate reports based on the BPI CIs.

Refer to the Business Availability Center documentation related to custom reporting and alerting for more information.

Description of Data Samples Sent to Business Availability Center

BPI sends data samples to Business Availability Center and all the BPI data samples are mapped to the following KPIs within Business Availability Center:

- backlog (600)

The data sample for this KPI is taken from the active value of the Business Process or Business Process Step as calculated as part of the Business Monitor instance results.

- business impact (602)

This KPI shows the overall health of the `bpi_step` in the Business Process within Business Availability Center. It is based on the number of `blocked`, `at risk` and `healthy` instances reported in the Business Process Insight data samples. This KPI applies to processes only.

- duration (601)

The data sample for this KPI is taken from the duration value.

This KPI is displayed only if the Business Process includes a Business Monitor where the Monitor Type is equal to `Duration`.

- value (1311)

The data sample for this KPI is taken from the Process Value.

This KPI is displayed only if the Business Process includes a Business Monitor where the Monitor Type is equal to `Process Value`.

- volume (1050)

The data sample for this KPI is taken from the throughput value (Volume) as calculated as part of the Business Monitor statistics.

This value is sent from BPI and represents the value throughput for the data sample poll interval; for example, if you have a poll interval that is set to one minute, the throughput is the value processed for this one minute interval.

These data samples include as much information as is possible to give the KPI context. In the case of the business health for a Business Process, the health of the specific Business Process is reported. When reporting the overall health, any Groups that you have defined in the Monitor Definer are ignored, it is the overall monitor statistic that is reported



It might seem obvious, but in order to have Business Monitor data reported though the Business Availability Center, you must be collecting statistics on your Business Monitors.

If all the backlog, throughput and duration thresholds in the Business Process Monitor have a status of Normal, Dashboard displays the Business Process Monitor Description as the Units Description in all the relevant KPIs.

If any of the backlog, throughput and duration thresholds in the Business Process Monitor have a status other than Normal, the Dashboard displays the Instance Threshold Description for the most severe status as the Units Description in the corresponding KPI.

The time interval between data samples can be configured using the Data Sample send interval (seconds) parameter in the BPI Server Administration Console.

Value and Counts

If you have not modified the BAC configuration, Dashboard is configured to show KPIs (Backlog, Volume, Business Impact) based on the process value from your process definition. You can change this behavior by reconfiguring the KPIs within Dashboard; for example:

1. Select:

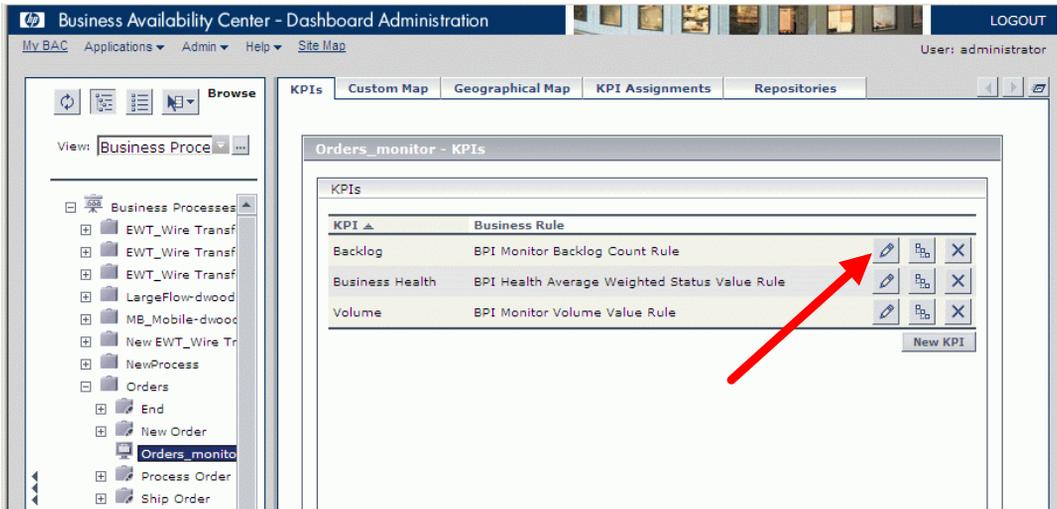
Admin > Dashboard

2. Within the Business Processes view, navigate to the Business Process Step and then Monitor that you want to modify.
3. Select the KPIs tab.

You can then add or modify a KPI that you want to show within Dashboard.

For example, [Figure 6](#) shows an example using the BPI Monitor Backlog Count Rule.

Figure 6 Switching KPIs



There are a range of KPIs that are available for you to configure as objectives for your Business Processes.

4 Modeler

This chapter describes tasks that are specific to the management of your Process definitions using the Modeler.

For information and help about using the BPI Modeler to create and deploy definitions, including examples and scenarios, refer to the *Business Process Insight Integration Training Guide - Modeling Processes*. You can also find information about using the BPI Modeler in the Modeler *Online Help*, which is accessed from within the Modeler application from the Help menu option.

This chapter describes the following:

- [Modeler Concepts](#) on page 150.
- [Modeler Management Tasks](#) on page 153.

Modeler Concepts

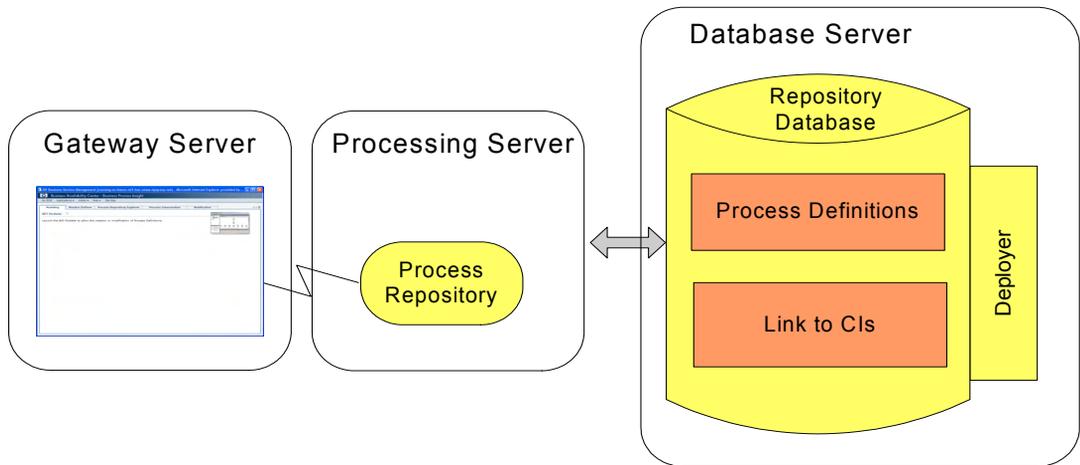
The BPI Modeler is a client-side BPI component that you use to create your Business Process definitions, Data definitions and Event definitions. It is a graphical tool, with a unified interface for all the definition types that you are creating.

- ▶ The BPI Modeler is installed when you install Business Availability Center and is accessed from the Business Process Insight option under Admin.

In order to use the full capabilities of the Modeler, you need to install the Server component of HP Business Process Insight. Without this Server component, you can model Business Processes and map process Steps to IT infrastructure CIs; however, you are not able to create process models that enable you to monitor individual process instances within Business Availability Center. All options are visible within the Modeler interface, but some options cannot be set unless you have installed the BPI Server component of Business Availability Center.

Figure 7 shows the components of the Modeler when initially installed with Business Availability Center and there is no BPI Server component installed.

Figure 7 BPI Modeler

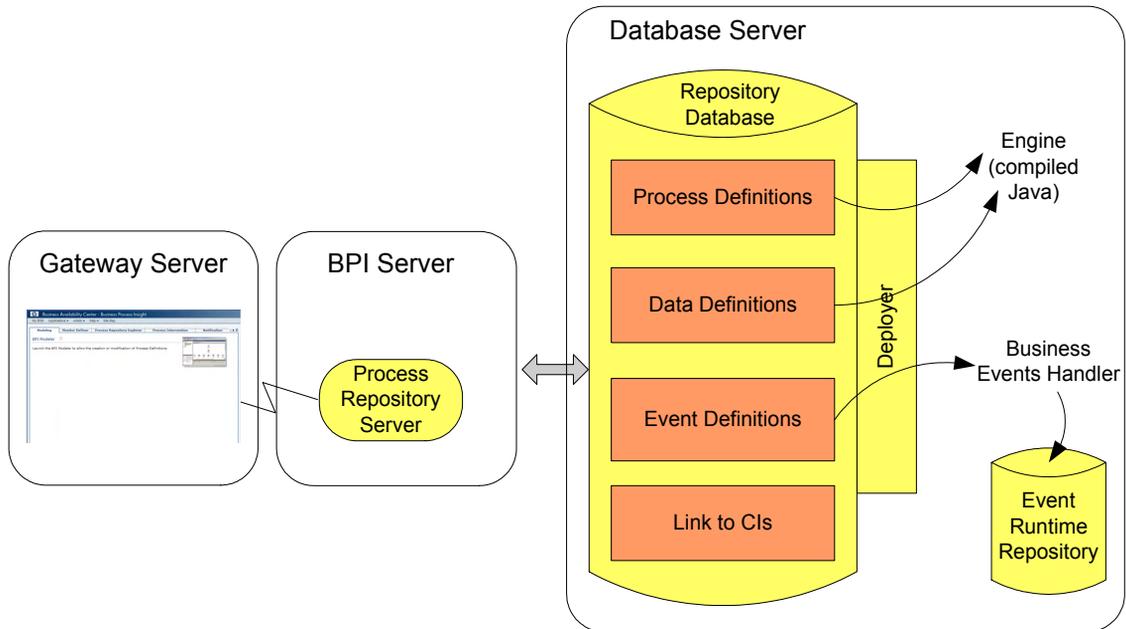


When you install the BPI Server, you are then able to create and edit Business Process definitions, Data definitions and Event definitions quickly and easily, using the BPI Modeler. When you are satisfied that your definitions are complete, you can use the Modeler to deploy them to the Business Impact Engine.

In addition, you can import Business Process Execution Language (BPEL) into the Modeler and use the BPEL definition as the start point of your Process definition.

A local repository cache, in the BPI Modeler, holds Process definitions, including Data and Event definitions until they are saved in the Process Repository schema as a set of database tables. Definitions might also need to be redeployed. The tables are managed by the Process Repository, which is described in section [Process Repository](#) on page 152. [Figure 8](#) shows the components of the Modeler after you have installed the BPI Server.

Figure 8 BPI Modeler when the BPI Server is Installed



Process Repository

The Repository schema and the Process Repository are the server-based components that manage the data as it is entered through the Modeler. These components store the model definitions in the database and ensure that the details are consistent and deployable. There is a ToDoList within the Modeler, which is associated with each definition. The ToDoList reports on the consistency of the definition and keeps track of all the outstanding issues and tasks required to ensure that the definition is consistent and complete. Note that a definition cannot be deployed unless it is consistent.

The deployer component of the Process Repository deploys the different definitions to their destinations as follows:

- Process definitions, including any imported BPEL definitions, are deployed to the Business Impact Engine as compiled Java code.
- Data definitions are deployed to the Business Impact Engine as compiled Java code.
- Event definitions are deployed to the Business Event Handler to be mapped to events from underlying business applications.

In addition, there is a Repository Explorer, which is a Web-based interface that you can use to view and manage some aspects of the data stored in the Repository Database.

The BPI Modeler and its features are described in more detail in the *Business Process Insight Integration Training Guide - Modeling Processes*.

Modeler Management Tasks

The following are the management tasks that you can complete using the BPI Modeler:

- [Starting and Stopping the Modeler](#) on page 153
- [Deploying Processes and Dependencies](#) on page 155
- [Undeploying Definitions from the BPI Modeler](#) on page 157
- [BPI Modeler Log File](#) on page 157
- [Exporting and Importing Process Definitions](#) on page 158
- [Importing BPEL Processes](#) on page 160
- [Copying Properties Between Data and Event Definitions](#) on page 161
- [Exporting Definitions to Recover Unsaved Changes](#) on page 162
- [Linking Steps to TransactionVision Events](#) on page 161
- [Linking Steps to IT Operational Resource CIs](#) on page 161

Details of the tasks for creating Business Processes definitions, Data definitions and Event definitions are contained in the Modeler online Help, which can be accessed from the Modeler Help menu option.

Starting and Stopping the Modeler

To start the BPI Modeler, complete the following steps:

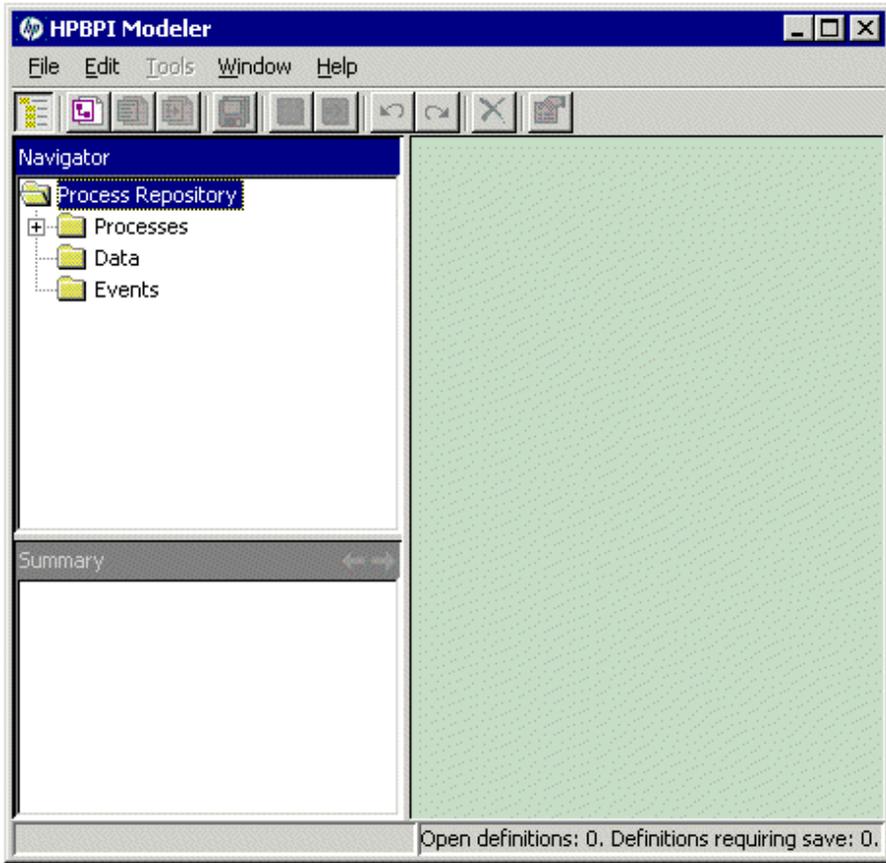
1. Select `Admin > Business Process Insight`
You are presented with a tabbed page that includes a tab for Modeling.
2. Select the Modeling page.
3. Click the icon for the Modeler on the page and wait for the Modeler to launch as a Java Web Start application.

You might be asked to confirm that you want to download the files to open the Modeler within your web page. If required, confirm that you want the download to proceed.

The BPI Modeler opens.

Figure 9 shows an example of the layout of the Modeler when you open it.

Figure 9 Modeler GUI



If you have installed the BPI Server component, you also need to make sure that the `Process Repository` component is started on the BPI Server system and the Infrastructure settings are completed for BPI.

Use the BPI Administration Console on the BPI Server system to start the `Process Repository` as described in section [Starting and Stopping the BPI Server Components](#) on page 27.

To stop the BPI Modeler, select `Exit` from the `File` menu in the Modeler window. You are prompted to save any currently unsaved changes to the models that you have been editing.

If you logout of BAC and leave the Modeler running, the Modeler no longer has access to the Process Repository. In this case, when you next try to use the Modeler, you are prompted to save any currently unsaved changes to the models that you have been editing and the Modeler closes.

Deploying Processes and Dependencies

This section explains how to deploy a Process and any associated Data definitions and Event definitions.

Before deployment, you have either created a new definition in the repository that the BIE has no knowledge of, or have created a new undeployed revision of a definition by making changes to it.

When you deploy the definition to the Engine, the Engine then creates:

- a Java-compiled definition for the process in its database
- database entries for the definition

To deploy the Process, Data and Event definitions to the Business Impact Engine, complete the following steps:

1. Open the Modeler.
2. Select the Process from the Navigator pane in the left-hand pane.
3. Select `File > Deploy` from the menu options.

You are prompted to save all currently unsaved changes, if you have not saved them already. Click `Yes`.

If you have previously deployed the process, you are presented with a dialog that lists the definitions that will be deployed and that also informs you that a previous version of the process is already deployed. In this case, you need to select an option for deployment:

- Replace the existing definition.

This replaces the definition and removes all the instance of the definition. Any statistical information collected for the instance is retained.

- Deploy under a different name.

This enables you to deploy the definition using a different name, and therefore preserving the instance information for the existing definition. If you select this option, you then select the `Next` button to make a copy of the definition.

The Modeler checks the state of all the definitions that you selected to deploy. A dialog box appears to prompt you to confirm that you want to deploy all currently undeployed changes to the Business Process and all its dependencies.

4. Click `Deploy` to confirm your request.

The deployer shows its progress as it deploys the Processes, Data and Event definitions.

5. Click `Close` when the Deployer indicates that it has finished deploying the definitions.

You have now deployed the process and its dependencies.

Undeploying Definitions from the BPI Modeler

There are circumstances where you might want to undeploy one or more of your Business Processes. In addition, you might need to undeploy individual definitions from the BPI Process Repository; for example, you might need to undeploy Event definitions when an Event becomes out of date.



If you undeploy a definition, existing instances using the definitions are still running in the Business Impact Engine until completion, or until the Instance Cleaner deletes them. New instances of any undeployed definitions are no longer created. The definition is removed by the Model Cleaner as described in section [Modifying the BIE Model Cleaner Settings](#) on page 39.

You can undeploy a definition that is referenced by another definition, so you need to make sure that you maintain consistency within your Business Processes.

To undeploy a Process, Data or Event definition, complete the following steps:

1. Open the Modeler:
2. Select the definition that you want to undeploy from the Navigator pane in the BPI Modeler.
3. Select **Undeploy** from the **File** menu and follow the instructions provided.

The status of the definition changes from **Yes** to **No**, but can be deployed.

The **Summary** Window in the BPI Modeler now shows the revised status of the definition.

If you have modified a definition, it is shown as not being deployed; however, an earlier version is deployed. If you want to know what the deployed status of definitions is (as opposed to a development status), use the **Repository Explorer**, see [Chapter 6, Process Repository Explorer](#).

You can also use the **Intervention** tool to show you the status of the definitions. The **Intervention** tool is described in [Chapter 7, Process Intervention](#).

BPI Modeler Log File

There is a Modeler log file located on the machine where the Browser is running as follows:

.../Documents and Settings/*username*/.hp_bpi

The following log files are the most significant files:

- `hpbpi_modeller0_0.log`

This log file is the most useful.

- `hpbpi_modeller_m.log`

This log file is less informative, but does contain communication errors, if they occur.

In addition, there are Modeler related log messages contained in the Process Repository log file. If the BPI Server is installed, the Process Repository log file is located as follows:

`bpi-install-dir/data/log/bia_model_repository0_0.log`

If the BPI Server is not installed, the Process Repository log file is located as follows:

`bac-install-dir\log\bpi_process_repository`

The log files are text files that you can open using a text editor. Use the log files to identify problems with your BPI system.

You can also modify your Java settings to show the Java console while the Modeler is running. You should do this only if you are trying to isolate a problem. You can access the Java Console options as follows:

Start > Programs > Settings > Java > Advanced > Java Console

Exporting and Importing Process Definitions

The BPI Modeler has an option to enable you to export and import Business Processes, including their dependencies (any Data and Event definitions) to a .zip file that contains XML files. This enables you to create Business Processes using one Modeler for testing and then move the processes to a production system when they are fully verified. You can also export and import any Business Process monitor definitions that you have defined for your processes as described in [Exporting and Importing Monitor Definitions](#) on page 173.

You use the File > Import Definitions... and File > Export Definition... menu options from the BPI Modeler to export and import your Business Process definitions.

Make sure that you have a naming policy for Process, Data and Event definitions across your organization to minimize the possibility of a name clash when the Business Processes are imported for deployment to the Business Impact Engine. You have the option to rename your definitions when you import them; however, you might prefer to have a standard naming scheme.

Exporting Definitions

Use the `File > Export Definition...` option to export the Business Processes to an XML .zip archive file. When you have exported the file, you can copy the file to the system where the BPI Modeler that you want to import the file to is installed. Finally, use the `Import` option to import the Process definitions as described in section [Importing Definitions](#) on page 160.

Importing Definitions

If you have previously exported a Process definition and you now want to import it into the BPI Modeler, complete the following steps:

1. Select the following option from the `File` menu:
`Import Definitions...`
2. Navigate, or browse, to the location of the previously exported definition file and click `Open`.
3. Click `Next` to move to the next option. You are presented with a dialog that lists the content of the definition file that you are importing.

From this dialog, you can:

- import a listed definition and overwrite any existing definition of the same type that has the same name.
- create a new copy of a listed definition or rename an existing definition. For this option, you provide a new name for the definition in the `Save As` column.
- choose not to import a listed definition.

When you have tailored your import requirements, click `Import`.

4. Click `Close` to complete the import.

When the Process definitions are successfully imported they are shown as being undeployed in the BPI Modeler. You now need to deploy the imported Processes and their dependencies to the target BPI Server system.

Importing BPEL Processes

You can use the BPI Modeler to import Business Process Execution Language (BPEL) definitions.

You import the structure of a BPEL definition using the BPI Modeler; however, you cannot import the associated BPEL logic. When you have imported the BPEL definition, you can use the structure as the basis of a Business Process, which you can then modify to suit your reporting and tracking requirements. You also need to create the Data and Event definitions required to track the imported BPEL definition.

Details of importing BPEL definitions, and the options available for tailoring the definitions when importing them are provided in the *Business Process Insight Integration Training Guide - Importing BPEL*. There are also instructions on using the Modeler commands in the BPI Modeler Online Help.

Linking Steps to TransactionVision Events

You use the BPI Event Importer to import transaction events directly from TransactionVision such that they are available to the Modeler when developing your processes.

You link to the transaction events to configure event progression, and the linked transaction events automatically provide access to the transaction class CIs.

Refer to the *Business Process Insight Reference Information* for details of BPI and integrating with TransactionVision.

Linking Steps to IT Operational Resource CIs

When you configure the Steps in your Business Process, using the Modeler, there is an option to link the Step to one or more Configuration Items (CIs) within the UCMDB.

You edit the Related CIs for a Business Process, and then you redeploy the process to commit these CI dependencies to the CMDB.

If the Business Process has already been deployed, you are not able to link a CI directly, you need to edit the Business Process using the Edit Deployed Process Settings option.

Refer to the *Online Help for the Modeler* for more details of linking CIs to Business Process Steps.

Copying Properties Between Data and Event Definitions

Using this option enables you to create properties in your Data definition that match the properties of an Event definition that it subscribes to. Similarly, it can be used to create properties of an Event definition that match those in a Data definition.

Using the copy function saves the need to define identical properties for your Data and Event definitions multiple times. To copy properties from one definition to another definition, complete the following steps:

1. Open the definition whose properties you want to define.

The properties that you select in the following steps are copied to this definition.

2. Select the `Properties` tab for the definition.
3. Select the `Copy Properties` option from the `Tools` menu.

You are presented with a `Copy Properties` dialog that has a tree definition of all the Data and Event definitions currently defined.

4. Select the definition whose properties you want to copy.

Note that you are not able to copy a property that already exists in the selected definition.

5. Select the properties within the definition that you want to copy. You can use the `Select All` option to select all the properties.
6. Click `OK` and the selected properties are copied to the definition that you opened in step 1.

You have now copied properties from one definition to another definition.

Exporting Definitions to Recover Unsaved Changes

If the BPI Modeler loses its connection to the Process Repository for any reason; for example, the BPI Server has been shutdown in order to reconfigure a component, you cannot continue and modify your Process definitions.

If you have made changes to your definitions, but not saved the changes, you have the opportunity to export these changes to a recovery file before closing the BPI Modeler.



If you close the BPI Modeler without exporting your unsaved changes, the changes are lost.

As soon as the BPI Modeler realizes that it has lost its connection to the Process Repository, it presents a dialog for you to enter the name of the file where you want to save your modifications. The next time that you start the

BPI Modeler and the Modeler successfully connects to the Process Repository, you are presented with a dialog that enables you to select the file where you saved your changes in order to import them back into the Process Repository.

If the BPI Modeler loses its connection to the Process Repository, and all your definitions are up to date, you are informed that the BPI Modeler must exit, and that no data is lost.

When you have exported the unsaved modifications, the file that is created is the same as the files created using the `Export` option and you can import the file at a later time if required or preferred.

The file used to store the definitions for recovery purposed is not deleted after the recovery process is complete. It is therefore available in the future if you wanted to import your modifications again for any reason.

5 Monitor Definer

This chapter describes tasks that are specific to the management of your Monitor definitions using the Monitor Definer.

Details of how to use the Monitor Definer to create Monitors for BPI, including scenarios and examples, is described in the *Integration Training Guide - Defining Business Monitors*. There is also information about using the Monitor Definer in the *Online Help*. This is provided within the Monitor Definer and is accessed from the Help menu option within the Monitor Definer interface.



You cannot open or use the Monitor Definer, unless you have installed the BPI Server. The Monitor Definer options appear when the BPI Server is installed and the connectivity between the BPI Server and the Business Availability Gateway Server has been configured and the BPI Server components are started. This configuration is described in [Chapter 3, Enhancing BAC with Process Instance Monitors](#).

This chapter describes the following:

- [Business Process Monitor Definer Concepts](#) on page 166.
- [Monitor Definer Tasks](#) on page 171
- [Monitor Definer Reference](#) on page 177

Business Process Monitor Definer Concepts

The Monitor Definer is a Web-based GUI that enables you to define Business Process monitors and monitor instance threshold definitions for deployed processes.

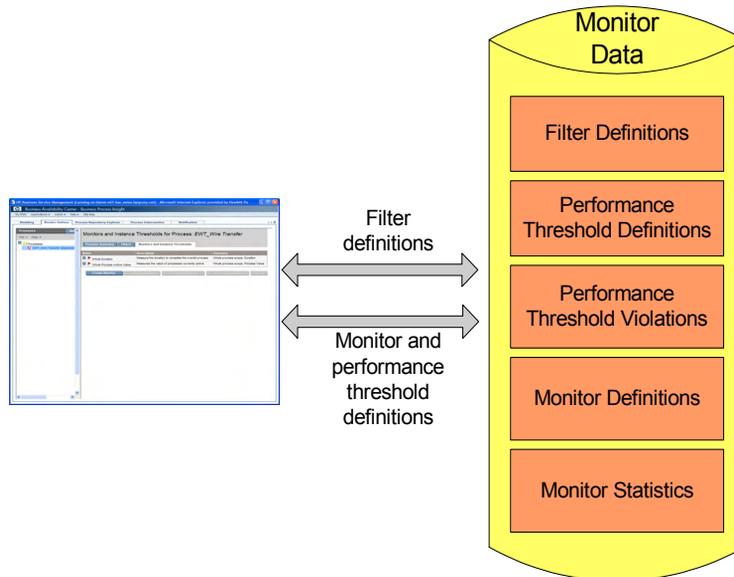
A Business Process monitor is a business measurement that has a specific meaning within your business and can be used to record information about the Business Process that you are monitoring. Monitor instance thresholds are set on individual monitor instances. When monitor instance thresholds are violated, instance threshold violations are generated and can be reported through the Business Process Insight Application Health pages. You can also configure the Notification Server to send violation messages when a monitor instance threshold is violated.

Within BPI, the tool for defining Business Processes is separated from the tool for defining Business Process monitors for these processes. You use the BPI Modeler to define your Business Processes and you use the Monitor Definer to define the Business Process monitors and monitor thresholds for these Business Processes. You define Business Process monitors for a Business Process after the process has been deployed; this provides more flexibility for defining and modifying Business Process monitors without the need to redeploy your Business Processes.

You can also use filters to further target the statistical data that you want to collect. This has the added benefit of reducing the amount of data stored in the database and therefore maintaining the BPI system performance.

Figure 10 shows the Business Process Monitor Definer relative to the Business Monitor data stored in the BPI database.

Figure 10 BPI Business Process Monitor Definer



You can define monitors for:

- Single Steps
- Multiple Steps
- The whole process

These monitors can be duration based or Process Value based. In addition, you can define a custom monitor.

Data are collected based on this configuration, and instance thresholds can be defined to report on individual process instances.

You can also use the Monitor Definer to export Monitor and instance threshold definitions to an XML file, and subsequently import these definitions.

How the Business Process Monitors definer interworks with the Monitor Engine is described in section [Monitor Engine](#) on page 168.

Monitor Engine

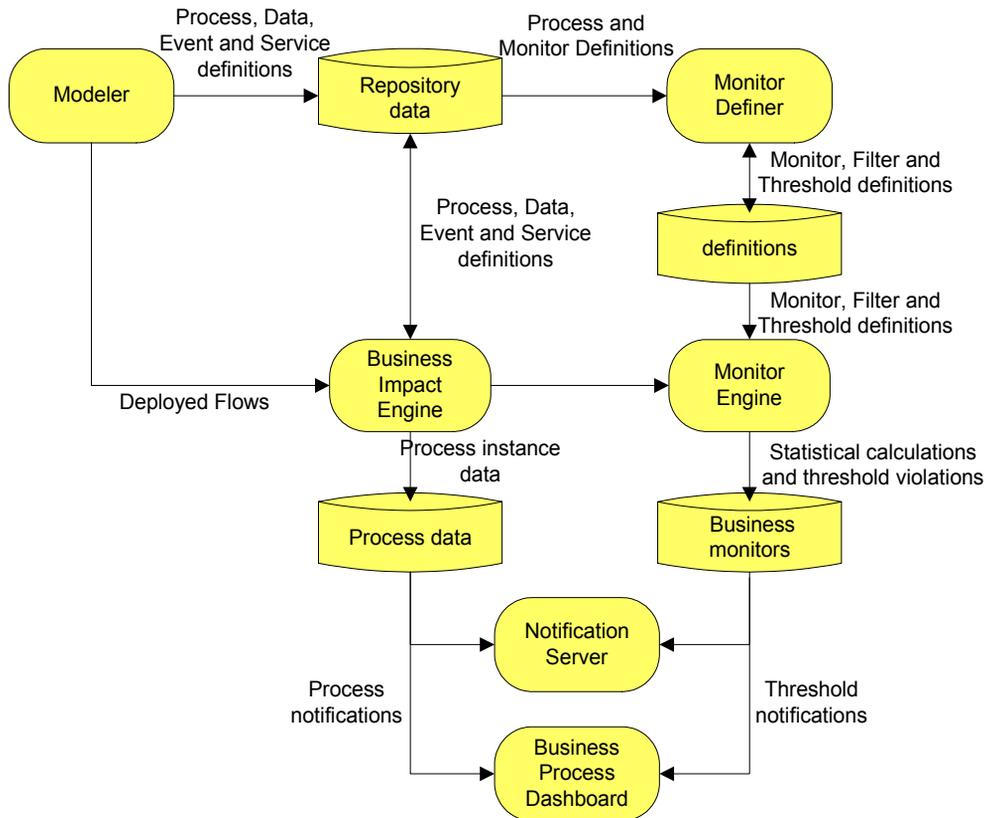
The Monitor Engine is the component of the BPI Server that analyzes and provides the statistical results from the Business Process monitor and monitor instance threshold data that you define. The Monitor Engine takes data about the individual instances from the Business Impact Engine and combines this data with the data you enter through the Monitor Definer to collect and report on the required information about the process.



If you have configured BPI to integrate with Business Availability Center, no statistical monitors and thresholds can be defined in BPI. Instead, this data is sent as data samples to Business Availability Center where the statistics can be displayed and analyzed.

Figure 11 shows the relationship between the process impact data and the monitor data that you define.

Figure 11 Process Impact and Monitor Data Relationship

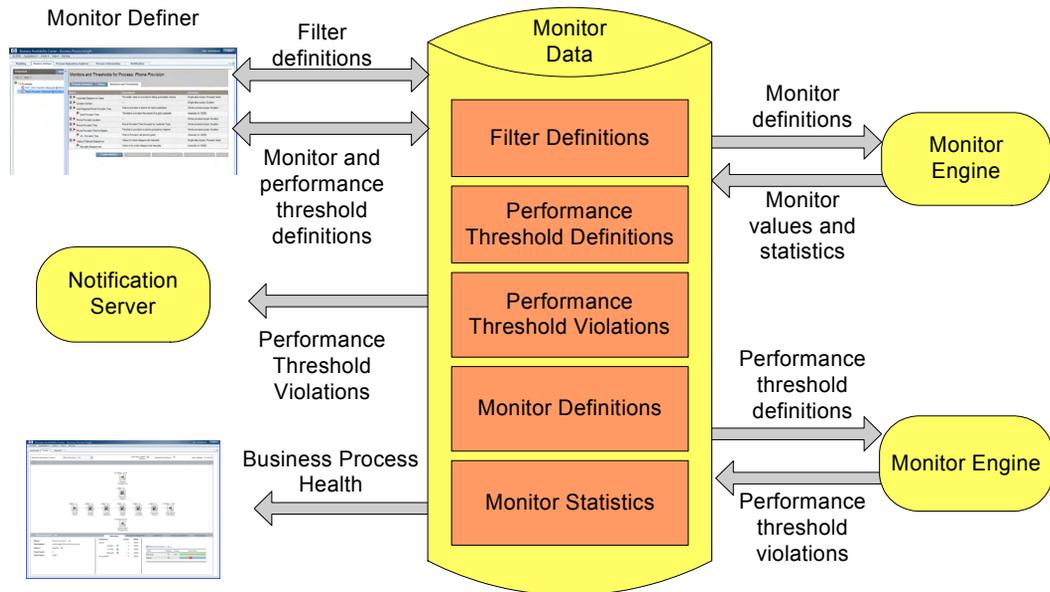


The Business Process monitors and monitor thresholds are configured through the Business Process Monitor Definer; see section [Business Process Monitor Definer Concepts](#) on page 166.

The Monitor Engine maintains business data for the Business Processes that are deployed according to the Business Process monitors that you have defined. It also maintains statistical information about the monitor thresholds that are defined.

Figure 12 shows how the monitor data is used by the Monitor Engine to report statistics and instance threshold violations to other BPI components.

Figure 12 BPI Business Process Monitor Engine



The statistics that the Monitor Engine calculates are stored in BPI database tables and are used by the Business Process Insight Application Health pages. The database tables also hold information used to determine if any monitor thresholds have been violated. These violations are reported through the Health pages and can also be reported through the Notification Server or other HPOM applications.

Managing the Monitor Engine parameters is described in section [Component Configuration - Monitor Engine](#) on page 53 of this guide and the architecture for the Monitor Engine and Monitor Definer is described in *Business Process Insight Reference Information*.

Monitor Definer Tasks

The following are the management tasks that you can complete using the BPI Monitor Definer:

- [Opening the Monitor Definer](#) on page 171
- [BPI Monitor Definer Log Files](#) on page 173
- [Exporting and Importing Monitor Definitions](#) on page 173

Opening the Monitor Definer

Before trying to start the BPI Modeler, make sure that the `Process Repository` component is started on the BPI Server system. Use the BPI Administration Console to start the Process Repository as described in section [Starting and Stopping the BPI Server Components](#) on page 27.

To open the BPI Monitor Definer:

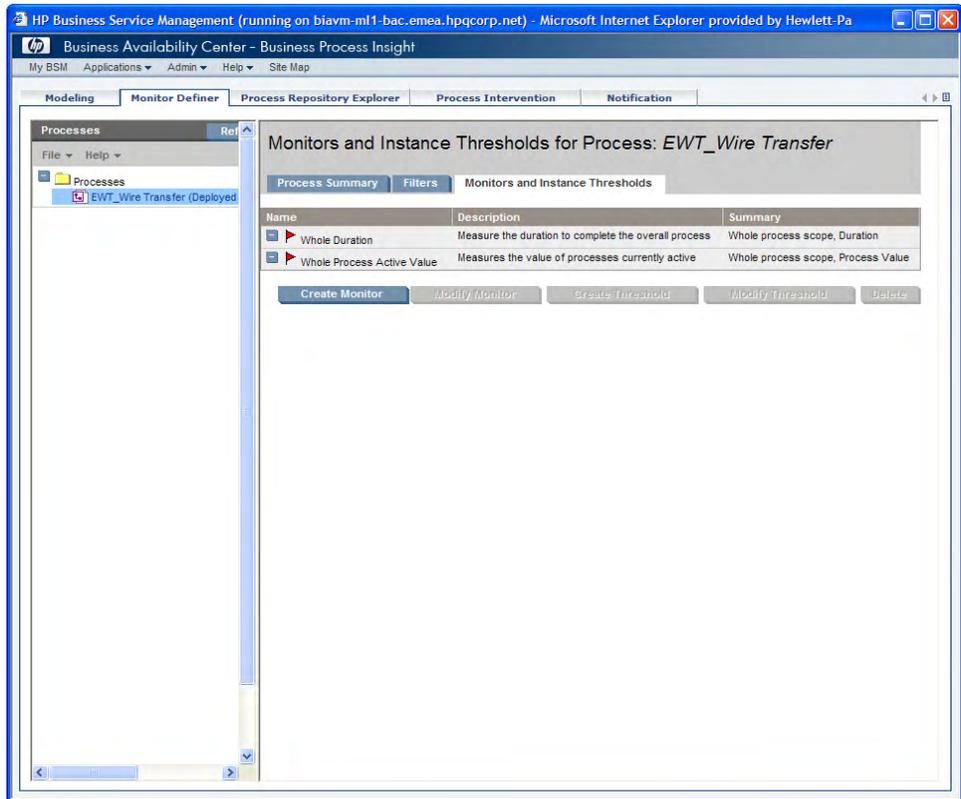
1. Select `Admin > Business Process Insight`

You are presented with a tabbed page that includes a tab for `Monitor Definer`.

2. Click the tab for the Monitor Definer and you are presented with a page listing any processes that are deployed and any monitors defined for these processes.

[Figure 13](#) shows an example of the layout of the Monitor Definer when you open it.

Figure 13 Monitor Definer GUI



BPI Monitor Definer Log Files

There are two sets of log files that you need to be familiar with when managing your Business Process monitors:

- Monitor Engine log files

The Monitor Engine log files are managed in the same way as other BPI Server components and are described in section [Component Configuration - Logging](#) on page 103.

- Monitor Definer log files

The Monitor Definer logs messages to the BPI Servlet Engine log file. These messages in the Servlet Engine log file are prefixed with the string `Monitor Definer`. The Servlet Engine is considered as a component of the BPI Server and section [Component Configuration - Logging](#) on page 103 describes the Servlet Engine log file.

Exporting and Importing Monitor Definitions

The BPI Monitor Definer has options that enable you to export and subsequently import the Business Process monitors, monitor thresholds and filters defined for a selected Business Process. You might want to export a Business Process monitor definition to enable you to create Business Process monitors for testing and then move these monitors to a production system when they are fully verified.

These definitions can be exported to a .zip archive file, which contains XML files describing the definitions. The .zip archive contains a copy of the monitor definition and some (but not all) information about the parent Process definition. The information relating to the Process definition is that required to uniquely identify the Process definition that the Business Process monitor applies to. The .zip archive file does not contain all the information relating to files that you might have created for custom Business Process monitors; it contains the custom monitor definition, but you need to separately manage and export any SQL you have created for the custom monitor definitions.

Be aware that the .zip archive created from the Monitor Definer is not the same as the .zip archive created from the BPI Modeler. You cannot interchange the .zip archives between the two applications, you must import the archive created from the appropriate application. This is because the .zip

archive from the Monitor Definer contains sufficient information about the Business Process to enable the Monitor Definer to import the monitor; it does not contain a full definition of the Business Process.



You cannot import a monitor definition until the process definition that the monitor applies to is deployed to the Business Impact Engine. Refer to section [Exporting and Importing Process Definitions](#) on page 158 for details of exporting and importing process definitions.

Exporting a Business Process Monitor

To export one or more Business Process monitors, use the `Export` or `Export All` options from the `File` menu in the Monitor Definer Navigation frame.

When you select a Business Process monitor to export, all the associated monitor instance threshold and filters are also exported. The export is based around the identifier of the Business Process that the Business Process monitor is linked to. All the information, including monitor thresholds and filters, is exported to XML files, which are then packaged into an overall `.zip` archive file. The `.zip` file can then be copied to the destination system in order to be imported.

When you export a Business Process monitor, you also need to make a copy of any additional files that you might have created that are associated with the Business Process monitor; for example, you might have defined a custom monitor. In the case of a custom monitor, you need to make sure that you have a copy of any SQL files that you have created for the custom monitor.

The name of the exported file is based on the Process name, machine name and time that the monitor is exported. This is in order to provide a unique name for the `.zip` archive file. If any of the elements of this constructed file name contain non-ASCII characters, the elements are excluded from the file name. This is because Internet Explorer allows only `.zip` archive file names that contain ASCII characters.

Importing a Business Process Monitor

Before importing a Business Process monitor, you must have already imported and deployed the Business Process to which the Business Process monitor is linked.

In addition, if you have defined custom monitors, and you are moving the definitions to a new machine, make sure that you also copy any files that you have created for the custom monitor to the new machine. For example, you might have created SQL files for your custom monitor and this SQL file is not exported as part of the .zip file. If you do not copy the files relating to any custom monitors before importing the Monitor definition and creating the appropriate stored procedures, the import fails.

To import the Business Process monitor, complete the following steps:

1. Select the following option from the File menu on the Monitor Definer navigation frame:

Import

The right-hand pane provides a browse button that you can use to navigate to the file where the file that you want to import is located.

2. Select the file that you want to import and click Open.
3. Click the Import Definitions button.

The Monitor Definer provides a summary of the monitor definitions contained in the zip file and how they will be applied to the processes that are currently defined on your system. You need to check that the monitor definitions in the zip file are being applied to the correct process definitions before importing the file. As an example, you need to make sure that you have not renamed a process since a monitor definition was exported.

4. Select the checkbox next to each set of Business Process monitors that you want to import from the zip archive file.

5. Click `Import Definitions`.

The Monitor Definer displays a feedback message indicating whether or not it successfully imported the selected monitor definition.

6. Click `OK` and the Monitor Definer returns to the `Monitors and Thresholds` page for the process.

If you import monitor definitions which are named identically to monitor definitions that are already defined within the Monitor Definer, they are imported and renamed (appended with a number), in order to make them unique. Instance threshold names are not changed as they need only be unique for the Monitor definition that they apply to.

Monitor Definer Reference

This section contains the following topics:

- [Collection Interval](#) on page 177
- [Warning Messages in Log Files](#) on page 177

Collection Interval

When you install the BPI Server and configure the integration between BPI and Business Availability Center Gateway Server, you configure the `Data Samples` settings. One of the properties of these settings is `Data samples send interval (minutes)`; this is the time interval used to send data samples to Business Availability Center. The value for the `Data samples send interval` becomes the value for the `Collection Interval` within BPI and you can no longer modify the value for `Collection Interval` within the Monitor Definer.

If you import a previously exported Business Process Monitor .zip archive file, the value for the imported `Collection Interval` is imported and recorded; however, when the integration with Business Availability Center is enabled, the value for `Collection Interval` is not used. The value is imported in order that it is available for use if the integration with Business Availability Center is subsequently disabled. The value used for the `Collection Interval`, in the case of importing to a system where the Business Availability Center integration is enabled, is the value set for the `Data samples send interval`.

Warning Messages in Log Files

Each time a Business Monitor is created with an associated Monitor Threshold or Group, a warning is generated in the Business Process Engine log file. This warning is added by Hibernate and can be ignored; there is not a problem with the Business Monitor.

6 Process Repository Explorer

This chapter describes the BPI Repository Explorer. The Repository Explorer is a Web-based interface that enables you to browse and manage the contents of the Process Repository Database. The Process Repository Database holds the data for the Business Processes that you have defined using the BPI Modeler.



You cannot open or use the Process Repository Explorer, unless you have installed the BPI Server. The `Process Repository Explorer` options appear when the BPI Server is installed and the connectivity between the BPI Server and the Business Availability Gateway Server has been configured. This configuration is described in Chapter 4, BPI and HP Business Availability Center.

For information about creating definitions using the BPI Modeler, refer to the *Business Process Insight Integration Training Guide - Modeling Processes*, or the Modeler *Online Help*.

This chapter describes the following:

- [Process Repository Explorer Concepts](#) on page 180
- [Repository Explorer Tasks](#) on page 182
- [Repository Explorer Reference](#) on page 187

Process Repository Explorer Concepts

The Repository Explorer is a Web-based interface that enables you to view, print and manipulate the contents of the Process Repository. The Repository Database is a set of database tables that hold the data for the Business Processes that you have defined using the BPI Modeler.



Note that the data presented by the Repository Explorer contains a super-set of information. It shows those definitions that were once deployed, those definitions that are currently deployed, and those definitions that have been edited and not yet deployed.

This is because you might have modified the process within the BPI Modeler, but not yet redeployed the process.

Using the BPI Modeler, you can create, modify and subsequently deploy a definition. When you have deployed the definition, you might then go on and revise the definition and significantly change it. This means that, unless you have exported the version of the definition that you previously deployed, you no longer have a copy of it within the BPI Modeler. You can therefore be in the position of having a deployed process, but no copy of the source for the process.

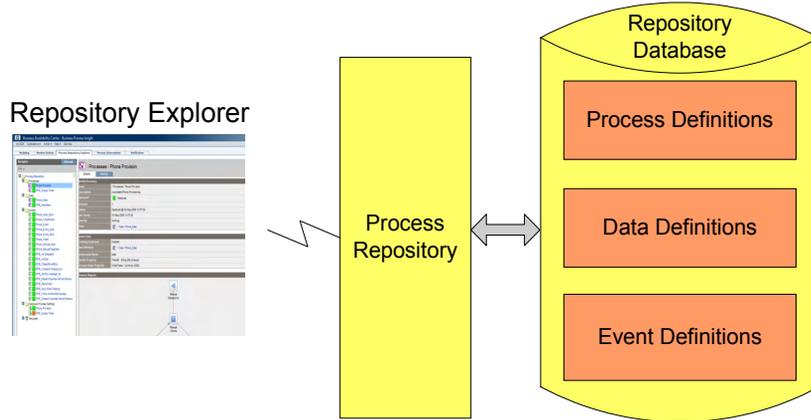
The Repository Explorer enables you to always be able to access the source to versions of processes that you have created and deployed.

Using the Repository Explorer you can:

- See whether a process is defined for instance tracking or not.
- View all the details of your currently deployed processes in a tabular form.
- Print a definition.
- Export the latest versions of your currently deployed definitions.
- Import previously exported definitions.
- View, definitions that have been deleted using the BPI Modeler. These definitions appear in the Recycled folder within the Repository Explorer, from where they can be permanently deleted.

The Repository Explorer is a view on the Process Repository data, which is created using the BPI Modeler and stored in the Process Repository database tables. You can browse and manage the data using the Repository Server as shown in [Figure 14](#).

Figure 14 Repository Explorer



Repository Explorer Tasks

The following are the tasks that you can complete using the Repository Explorer:

- [Open the Repository Explorer](#) on page 182
- [Browse Definitions](#) on page 182
- [Print Definitions](#) on page 183
- [Delete Definitions](#) on page 183
- [Exporting Process Definitions](#) on page 183
- [Undeploying a Process Definition](#) on page 185
- [Restoring a Definition](#) on page 186

Open the Repository Explorer

Before trying to use the BPI Repository Explorer, make sure that the `Process Repository` and `Servlet Engine` components are started on the BPI Server system. Use the BPI Administration Console to start them, as described in section [Starting and Stopping the BPI Server Components](#) on page 27.

To open the BPI Repository Explorer, complete the following steps:

1. Make sure that the `Process Repository` and `Servlet Engine` components are started.
2. Select `Admin > Business Process Insight`

Browse Definitions

Using the Repository Explorer, you can easily browse the current and earlier revisions of a definition to quickly see how they were defined. You need to be able to do this as the BPI Modeler is optimized for editing and not for browsing and therefore does not present the information relating to Process, Data and Event definitions in an easy-to-view way.

Print Definitions

You can also print definitions using the print option at the top right-hand corner of the GUI. This print option enables you to print the contents of the right-hand pane in the `Details` view.

Delete Definitions

You can delete any definition using the Repository Explorer, provided it is not the current version of the definition that has instances currently running in the Business Impact Engine.

To delete a definition:

1. Select the definition that you want to delete from the Navigator Frame (see section [Navigator Frame](#) on page 188)
2. Click the History tab (see section [History Tab](#) on page 192).
3. Select the checkbox for the definition, or definitions that you want to delete.
4. Click `Delete`.

Exporting Process Definitions

The Repository Explorer can be used to export any revision of a definition from the Process Repository.



Note that this definition is compatible with the Modeler and not the Monitor Definer; it does not contain any Business Process monitor information.

You might have multiple versions of a definition where you have deployed the Process definition multiple times. You can also export the latest version of a definition using the BPI Modeler; however, you cannot export earlier revisions of a definition using the Modeler, you can do this only through the Repository Explorer.

In addition to exporting individual versions of a definition, you can also choose to export the latest revision of all definitions from the Process Repository; you might want to do this to move all the latest definitions to another BPI Server.

You can export single definitions or all definitions:

- single definitions; see section [Exporting a Single Definition](#) on page 184.

You might want to do this in order to take a copy of the latest revision of the definitions. The latest version of the definition is exported to a `.zip` file. Exporting the definitions through the Repository Explorer, or the BPI Modeler, also ensures that the definitions are consistent within themselves as the definition and all its dependencies are exported.

- all definitions; see section [Exporting All Definitions](#) on page 185.

You might want to do this in order to move the definitions from one BPI Server to another BPI Server, for example, from a development system to a staging system. The latest versions of all the definitions within the Process Repository are exported to a `.zip` file, including all the dependencies.

Exporting a Single Definition

To export a definition, complete the following steps:

1. Select the definition that you want to export from the left-hand Navigator pane.
2. Click the `Export` option from the `File` menu in the Navigation pane.
Continue at step 6.
3. Select the `History` tab in the right-hand pane.
4. Select the revision of the definition that you want to export from the list.
5. Click the `Export` button in the right-hand pane.
6. The right-hand pane lists the definition that will be exported.
7. Click the `Download` button to continue to export the definition.

You are presented with your browser's `File Download` dialog.

8. Select `Save`, to save the definition as a `.zip` file.
You are presented with a `Save As` dialog, where you can specify a file name and directory location for the `.zip` file.
9. Enter the details of the file name and click `Save`.
The file is saved and a `Download complete` dialog is displayed.
10. Click `Close` and the export is complete.

Exporting All Definitions

To export all definitions, complete the following steps:

1. Click the `Export All Option` from the `File` menu in the `Navigation` pane.
2. The right-hand pane lists the definitions that will be exported.
3. Click the `Download` button to continue to export the definition.
You are presented with your browser's `File Download` dialog.
4. Select `Save`, to save the definition as a `.zip` file.
You are presented with a `Save As` dialog, where you can specify a file name and directory location for the `.zip` file.
5. Enter the details of the file name and click `Save`.
The file is saved and a `Download complete` dialog is displayed.
6. Click `Close` and the export is complete.

Undeploying a Process Definition

You cannot use the `Repository Explorer` to undeploy a specific definition. You must use the `BPI Modeler` to do this. You can use the `Cleanup Recycled` option within the `Repository Explorer` to undeploy and delete all current revisions of definitions held in the `Recycled` folder; see section [Navigator Frame](#) on page 188.

Be aware that undeploying an `Event` definition, which is referenced by a `Data` definition that has current active instances, means that these data instances might not be able to progress. If this is the case, you can use the `Intervention` tool to delete the individual `Data` definition instances.

Restoring a Definition

The Repository Explorer can be used to restore definitions that have been deleted using the BPI Modeler. These definitions are listed in the Recycled folder on the Navigator frame.

You can access the `Restore` option from the `File` menu on the Navigator frame. The steps for restoring a previously deleted definition are as follows:

1. Select the definition that you want to restore from the Recycled folder.
2. Select the `Restore` option from the `File` menu in the Navigator frame.

The definition is restored to the Process Repository and is removed from the Recycled folder in the Repository Explorer. The restored definition appears under the appropriate definition list in the Repository Explorer.

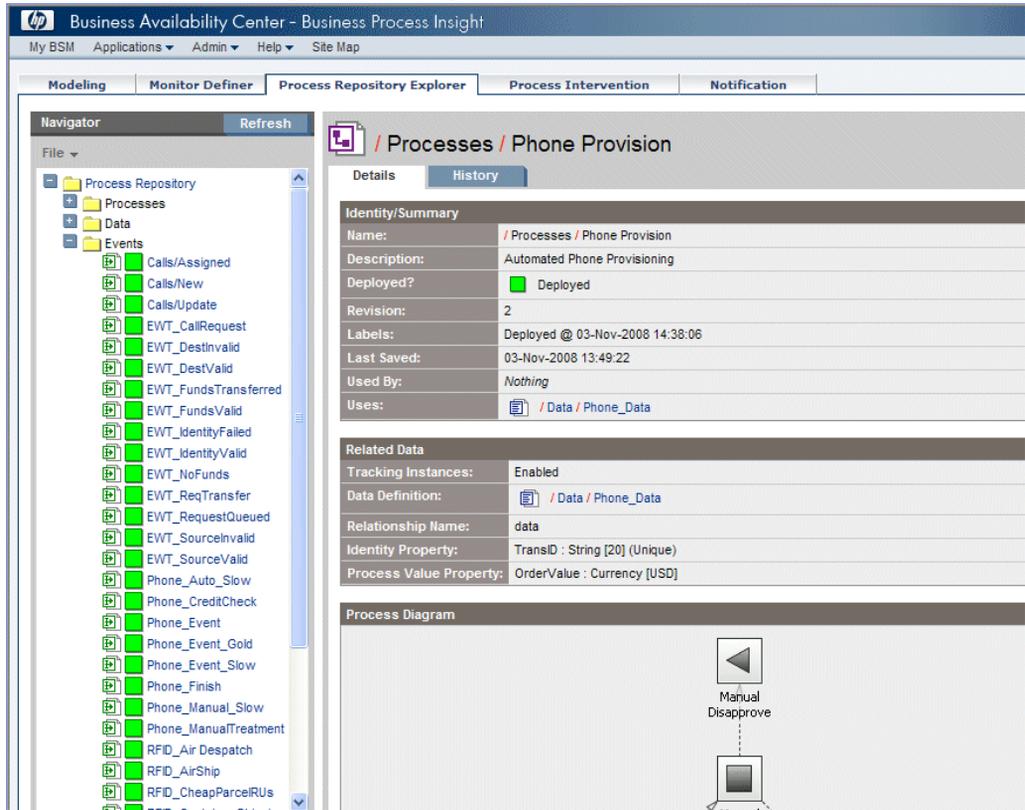
Repository Explorer Reference

The following topics are covered in this section:

- [Repository Explorer GUI Layout](#) on page 188
- [Process Repository Explorer Log Files](#) on page 193

Figure 15 shows an example of the layout of the BPI Repository Explorer.

Figure 15 Repository Explorer GUI



Repository Explorer GUI Layout

The Repository Explorer comprises:

- A left-hand Navigator frame that lists the deployed Process, Data and Event definitions. The Navigator frame also contains a Recycled folder where definitions that have been deleted from the BPI Modeler are listed.

Section [Navigator Frame](#) on page 188 describes the Navigator frame.

- A right-hand frame that displays the appropriate details of the definition that you have selected in the Navigator frame. The right-hand frame includes tabbed pages for Details and History; see sections [Details Tab](#) on page 190 and [History Tab](#) on page 192 respectively.

The right-hand frame also contains a print icon, which enables you to print the contents of the right-hand pane.

Navigator Frame

The Navigator frame lists all the definitions that have been created in the Process Repository, using the BPI Modeler; the deployment status of each definition is also displayed in the Navigator frame. The Repository Explorer uses the same icons as are used within the BPI Modeler to show whether a definition is deployed or undeployed.

The following are the menu options available within the Navigator frame:

- File
- Refresh

Click the Refresh button to refresh the Navigator frame to be up to date with the latest definitions that have been recently entered into the Process Repository using the BPI Modeler.

The following are the options accessible from the File menu:

- Export

Enables you to export the selected definition to a zip file; see section [Exporting Process Definitions](#) on page 183.

- Export All

Enables you to export the latest revision of all the definitions in the Navigator frame to a zip file; see section [Exporting Process Definitions](#) on page 183.

- Restore

This option is available when you select a definition from the Recycled folder. It restores the definition back to its original location, in the Process Repository, at the point where it was deleted in the BPI Modeler; see section [Restoring a Definition](#) on page 186.

The Navigator frame also includes a Recycled folder. Under the Recycled folder is a list of definitions that have been deleted from the BPI Modeler. When you delete a definition using the BPI Modeler the definition is moved to this Recycled folder, which is accessible only from the Repository Explorer.

- Cleanup Recycled

This option deletes all definitions in the Recycled folder and undeploys definitions that are deployed. If a definition is still in use by the Business Impact Engine, it is not deleted or undeployed. When all instances of these definitions have completed, these entries can then also be removed using the Cleanup Recycled option and the entries no longer appear in the interfaces. The instances of definitions are deleted by the Business Impact Engine using the Engine Instance Cleaner.

When you select a definition in the Navigator frame, the right-hand frame opens at the Details tab; see section [Details Tab](#) on page 190. You also have the option of selecting the History tab from the right-hand frame; see section [History Tab](#) on page 192.

Details Tab

The Details tab provides a page listing the details of the definition that you have selected in the Navigator frame. Much of the information listed under the Details tab can be determined from the BPI Modeler; however, the Repository Explorer provides the information in a structured form, which makes it easier to reference and print. The information listed under the Details tab varies according to type of definition selected in the Navigator frame:

- Processes
- Data
- Events

The following is an overview of all the sections for all the definitions:

- Identity/Summary

This section appears for all the definitions and lists an overview, or summary, of the definition. This includes information that you have entered relating to the definition using the BPI Modeler, and information relating to the revision of the definition.

This section also lists the revision number of the definition and details of the other definitions that the selected definition uses and is used by.

- Related Data

This section appears only for a Process definition and lists details of the Data definition that has been defined as the Related Data definition for the selected Process definition, including whether or not the option to track instances has been enabled for the selected process.

- Process Diagram

This section appears only for a Process definition and shows the process diagram of the selected process. It is the same process diagram as is shown through the BPI Modeler.

- Steps

This section appears only for a Process definition and lists details of the individual Steps that make up the Process definition, including:

- Name of the Step, which is shown adjacent to the icon for the Step.
- Type of Step (Start, End, Junction or Activity). Beneath the Step type is the associated progression rule (Start and Complete conditions)
- List of any CIs that the Step is linked to.

- Checked Arcs

This section appears only for a Process definition and lists details of the arcs that have been defined as Checked Arcs for the Process definition.

- Properties

This section appears for Data and Event definitions and lists details of the Properties that have been defined for the selected definition.

- Subscriptions

This section appears only for a Data definition and lists details of the Event subscriptions related to the Data definition and includes:

- Name of the subscription, which is shown adjacent to the icon for the subscription.
- Description of the Subscription as entered in the Modeler.
- Creation option, which are the conditions under which you have requested that the Event definition can be created.
- Filter expression, which is additional filtering that you can define to be applied to the incoming business event.
- Actions, which is the action that you have specified for extracting the required properties from the Business Event in order that they can be placed into the Data Definition.

- ToDo List

This section appears for all the definitions and lists the content of the current to-do list for the selected definition.

History Tab

The History tab provides a page tabulating the details of the revision history related to the selected definition in the Revision History table.

These details include:

- Revision number
- Deployment status
- Name of process as defined in the Modeler
- Date the revision was last saved
- Description (from the Description field in the definition)
- Labels, which is the date and time that the revision was deployed.

Each entry in the table has a check box which you can select (and clear). When you select the check box for one, or more, of the definitions in the table, the Export and Delete options are made available. The Export option is available only if you select a single entry. If you select more than one definition, or do not select any definitions, the `Export` option is not available.

If you want to export a definition on the Revision History table, select the definition, click the `Export` button and then follow the instructions that are presented to you by the Repository Explorer.

There is also a delete option available for each revision of the definition. You cannot delete a definition that is currently being processed by the Business Impact Engine, if you do try to delete such a definition, the Repository Explorer issues a warning message and does not allow the delete action to progress.

You can select any version of a definition to delete, including the current version of a definition. In the case of the current definition, the Repository Explorer issues a warning message for you to confirm the delete action and then continues.



You cannot recover any definition that is deleted using the Repository Explorer.

Process Repository Explorer Log Files

The Repository Explorer uses the Repository Server to access its data and the Repository Server logging is recorded under Process Repository in the Administration Console. Refer to section [Component Configuration - Logging](#) on page 103 for details of the logging settings that are used for BPI components.

In addition, you can find log messages for the Repository Explorer in the Servlet Engine log file.

7 Process Intervention

This chapter describes how you can make changes to your Business Process data, and delete completed instances of Processes and Data definitions using the Process Intervention pages.

Specifically this chapter describes:

- [Process Intervention Concepts](#) on page 196
- [Process Intervention Tasks](#) on page 199
- [Process Intervention Reference](#) on page 205

Process Intervention Concepts

The Process Intervention page enables you to access processes that you have deployed in order to modify or delete Process instances and their associated Data instances.

You might want to modify or delete instances to resolve problems with the process, or its data. This is more usually required after a period of new development or where progression rules are not behaving as expected; for example, you might need to:

- manually progress and delete process instances.
- update and delete Data Definition instances.



You cannot open or use the Process Intervention page, unless you have installed the BPI Server. The `Process Intervention` page appears when the BPI Server is installed and the connectivity between the BPI Server and the Business Availability Gateway Server has been configured. This configuration is described in [Chapter 3, Enhancing BAC with Process Instance Monitors](#).

You use Process Intervention to remove individual process instances or data instances from the database. If you want to delete several completed or active instances on a regular basis you should use the Engine Instance Cleaner parameters as described in [Chapter 14, Deleting Completed Instances from the Database](#).

The purpose of Process Intervention is to:

- enable you to access deployed Process and Data definitions, plus Process instances and Data instances.
- enable you to delete Process and Data definitions, and clear the average and total counts associated with a specific definition.
- invoke a manual synchronization between BPI CIs and the UC MDB.

The following are some examples of why you might want to use the Intervention tool:

- where a process instance has progressed through a process, but one or more Steps that should be complete still appear as active.

You can use the Intervention tool to change the state of the active Steps to Complete. Steps can get into this state if you have manually progressed a Process instance, for example, when an application that usually provides the service is not available and you have substituted another application to complete the Step.

- when the start and complete conditions for a Step are incorrect and therefore cannot be satisfied. In this case, you might want to delete all instances of the process and any associated process data.
- where you want to progress a specific process instance to its completion, for example, there might be an order processing instance waiting for an automated system to enter credit card information, and the automated system is not operational. In this case, you can modify a data instance to add credit card information manually and progress the order for a customer.
- to remove erroneous processes to tidy up your system. You might need to do this if you have been developing new processes and want to remove older versions, which are no longer required.
- where you want to search for all process instances over a certain age and remove them. You can also do this using the instance cleaner parameters tools (see [Chapter 14, Deleting Completed Instances from the Database](#)); however, you might not want to remove all the process instances, just for one specific process.
- to delete an orphaned Data definition that is not linked to a Process definition, or perhaps where the Data definition was linked to a Process that has been deleted.
- to test your BPI system. You might want to delete all the active Data definitions to reset the system.

- to reset the totals and averages for Process and Data definitions. You might want to do this periodically (daily, weekly, monthly) so you can see the totals and averages in terms of a known period.
- to manually synchronize the BPI CIs with the UCMDB for reasons such as:
 - an earlier synchronization failed when you deployed a definition using the Modeler, and you want to invoke another one immediately and not wait for the background synchronization to run.
 - CIs have been deleted from the UCMDB in error and you want to reinstate them. In this case, the synchronization adds, removes and updates CIs for the latest installation of BPI (including upgrades). If you have previously installed BPI and then removed it without undeploying definitions, these definitions are not synchronized.

Using the option to delete all existing BPI CIs from the UCMDB provides the option to remove all BPI-related CIs regardless of who or what created them. The delete action is completed before the synchronization is started. This option is useful if you want to clean out CIs that have been created by prior BPI installations.



If you want to clean up your development system using the Intervention pages, it is recommended that you use the Intervention Client to remove the definitions and all their instances from the Business Impact Engine and then re-deploy the process or processes that you want to use.

Process Intervention Tasks

The following are the tasks that you can complete using the Process Intervention tool:

- [Opening the Process Intervention Page](#) on page 199
- [Deleting Process or Data Definitions and Clearing Data](#) on page 200
- [Search for Specific Instances](#) on page 200
- [Change the State of an Instance](#) on page 201
- [Delete All Instances](#) on page 202
- [Modify or Reset the Data within a Data Instance](#) on page 203
- [Synchronize with the CMDB](#) on page 204

Before completing any of these options, you are advised to read section [Process Intervention Reference](#) on page 205, which provides information on the possible impacts of making these changes.

Opening the Process Intervention Page

You access the Process Intervention page as follows:

1. Select `Admin > Business Process Insight`
You are presented with a tabbed page that includes a tab for `Process Intervention`.
2. Click the tab for `Process Intervention` and you are presented with a page requesting you to select from `Process Definitions`, `Data Definitions` or `Synchronize with the CMDB`.
3. Select the option for the task that you want to complete.

Deleting Process or Data Definitions and Clearing Data

This section describes how to:

- Delete Process and Monitor Definitions, and instances of these definitions.
- Delete Process, Monitor and Data Definitions and all related instances.
- Clear Average Time and Total Instance Count for both the Process and the Process Steps).
- Delete Data Definition and associated instances
- Clear Average Time and Total Instance Count

If you want to deleted individual instances and not the Process or Data definition refer to the sections below.

To make your required changes:

1. Open the Process Intervention page.
2. Select the Process Definitions or Data Definitions option as appropriate.
3. Select the Process or Data definition that you want to modify, or delete.
4. Select the option for the task that you want to complete.

When you have completed your changes you can exit from the Process Intervention page.

Search for Specific Instances

To search for a specific instances of a process or data definition:

1. Open the Process Intervention page.
2. Select the Process Definitions or Data Definitions option as appropriate
3. Click the Search option for the definition that you are interested in.

The search dialog various according to whether you are searching for a process or a data instance.

4. Enter the criteria for the search as appropriate.

In the case of a Process instance, you can enter a Process instance identifier directly, or you can filter for instances according to the following criteria:

- Process instances with a specific identifier and value for the Process Value parameter.
- Process instances within specified time periods.
- Process instances that are in a particular state, for example: Active or Completed.

In the case of a Data instance, you can search based on the values of the properties of the Data instances. You are presented with a Data Instance List page where you can delete or edit the Data Instances that match the search criteria.

When you choose to edit a Data instance, you are presented with a Data instance screen where you have access to the properties of the Data instance in order to confirm that it is the definition that you are interested in.

When modifying the properties of a Data instance, make sure that you enter the correct Type for the property, for example, if the property is an Integer, a numeric value for the property must be specified.

5. Click the Search button to initiate the search. If you want to return to the previous screen click Cancel.

You can leave the search criteria blank, in which case the Intervention tool returns all the instances for the selected definition.

Change the State of an Instance

To change the state of a process or data instance:

1. Open the Process Intervention page.
2. Select the Process Definitions or Data Definitions option as appropriate

3. Click the search option for the definition that you want to list instances for.

The search option enables you to filter the list of instances that are presented.

4. Enter the criteria for the search; see section [Search for Specific Instances](#) on page 200 for information related to completing the search criteria. Click the `Search` button to initiate the filter. If you want to return to the previous screen click `Cancel`.

You can leave the search criteria blank, in which case the Intervention tool returns all the instances for the selected definition.

5. Select the instance that you want to modify and click the `Edit` option.
6. Make the change to the State of the instance at the required Step and click `OK`.

Continue and make changes to other instances in the same way.

When you have completed your changes you can exit from the Intervention page.

Delete All Instances

To delete all instances of a process or data definition:

1. Open the Process Intervention page.
2. Select the `Process Definitions` or `Data Definitions` option as appropriate
3. Click the `Search` option for the definition that you want to delete the instances for.
4. Enter the criteria for the search; see section [Search for Specific Instances](#) on page 200 for information related to completing the search criteria. Click the `Search` button to initiate the filter. If you want to return to the previous screen click `Cancel`.

You can leave the search criteria blank, in which case the Intervention tool returns all the instances for the selected definition.

5. Click the `Select All` button to select all the instances.
6. Click the `Delete` button to delete all the instances.

When you have completed your changes you can exit from the Intervention page.

Modify or Reset the Data within a Data Instance

To modify the data in a data instance:

1. Open the `Process Intervention` page.
2. Select the `Data Definitions` option.
3. Click the `Search` option for the `Data` definition that you want to list instances for.
4. Enter the criteria for the search.
5. Make the required changes to the data. Select the instance that you want to modify and click the `Edit` option.

You can leave the search option blank to select all the instances for the `Data` definition.

The full list of instances for the definition is presented.

6. Select the `Data` instance that you want to modify and click the `Edit` button.

The `Data` instance details are presented in an editable form.

7. Edit the `Data` instance as appropriate and click `OK`.

When you have completed your changes you can exit from the `Process Intervention` page.

Synchronize with the CMDB

If you want to synchronize the BPI definitions with those held in the UCMDB, complete the following steps:

1. Open the Process Intervention page.
2. Select the Synchronize with the CMDB option.

You have the option to delete all existing BPI CIs from the UCMDB before synchronizing. This is useful if there are CIs in the UCMDB that have been created by previous installations and processes were not undeployed before BPI was uninstalled.

3. Select the checkbox if you want to delete all existing BPI CIs, clear the checkbox if you do not want to delete them.
4. Click the Synchronize button to commence the synchronization.

When the synchronization is complete, you can exit from the Process Intervention page.

Process Intervention Reference

This section provides background information relating to using the Process Intervention tool to delete or modify definitions and instances.

Typically, you have identified an anomaly using the Business Process Insight Application, and are therefore using the Process Intervention tool to solve a specific problem. In this case, you have the identifier of the definition that you want to modify and you can enter this identifier directly on the search page to access the definition that you want to modify. Alternatively, you can use the Intervention tool's filtering capability to search for the instance that you want.

You need to be aware of the following when using the Intervention tool:

- When selecting the option to delete a Process and associated Data definition, make sure that the Data definition is not also a dependency for other Process definitions. If the Intervention tool detects that by deleting the Data definition other deployed processes are affected, it presents you with a page that lists all the processes that also depend on the Data definition, where appropriate.
- When you select the option to delete a data instance, or a process instance including all its data instances, you can potentially leave other process instances in an indeterminate state.

This is a similar scenario to the previous bullet describing Process and Data definitions; however, in the case of instances, the Business Impact Engine cannot determine any relationships between the data instance that is being deleted and other process instances that might have a dependency on it.

If you do delete a data instance and there are process instances that depend on it, the process can no longer progress.

If you want to delete a significant number of process instances or data instances, the quickest way to achieve this is to delete the Process definition or Data definition; however, this deletes all instances of the Process and Data definitions, including any active instances. You can then redeploy the Process and Data definitions using the BPI Modeler.

Using the Process Intervention Option

On the Process Intervention page, you are offered the following menu options:

- Process Definitions
- Data Definitions
- Synchronize with the CMDB

When you select one of the options (Process Definitions or Data Definitions), you are presented with a list of definitions within the selected category. The actions that you can complete at this point depend on the definition that you have selected:

- for Process definitions, refer to section [Process Definitions](#) on page 206.
- for Data definitions, refer to section [Data Definitions](#) on page 207.



If you make changes to the values of data properties within a process, the progression rules associated with the data properties are evaluated and the process progresses, based on the new values.

Process Definitions

When you select the Process Definitions option from the Intervention tool menu, you are presented with a list of Process definitions that are deployed in the Business Impact Engine.

The Process definitions within the Modeler are not impacted by the actions of the Intervention tool, so you can redeploy the Process; however active and completed instances of the process are potentially impacted by changes made through the Intervention tool.

At this stage, you can choose one of the following options:

- Delete Process and Monitor Definitions and instances
- Delete Process, Monitor and Data Definitions and all related instances
- Clear Average Time and Total Instance Count (Process and Steps)

This clears (or removes) the values for TotalFlows and AvrgTime from the Flows table in the BPI Instance database.

You can also choose to select:

- the **Search** option to identify specific instances of the definition; see section [Search for Specific Instances](#) on page 200.
- the **Edit** option and a process diagram is displayed. The process diagram shows the status of each Step in the process, for example, whether it is in the started or completed state. You can progress process instances from this option, by manually activating or completing Steps in the process.

The following are the icons that can be associated with each instance:

- a tick, which indicates that the Step instance has completed at least once
- a cog wheel, which indicates that the Step instance is started
- no icon, which indicates that the Step instance is not started or completed

Data Definitions

When you select the Data Definitions option from the Intervention tool menu, you are presented with a list of Data Definitions that are currently deployed in the Business Impact Engine.

At this stage, you can choose one of the following options:

- Delete Data Definition and instances
- Clear Average Time and Total Instance Count

This clears (or removes) the values for TotalInstances and AvrgTime from the Data Objects table in the BPI Instance database. *Business Process Insight Reference Information* describes the database tables in detail.

You can also choose to select the **Search** option to identify specific instances of the definition; see section [Search for Specific Instances](#) on page 200.

The Data definitions within the Modeler are not impacted by the actions of the Intervention tool, so you can redeploy the Data definition; however all active instances of the Data definition, and possibly the associated Process definition, are impacted by changes made through the Intervention tool.

8 Notification

This chapter describes the BPI Notification Server pages and how to use them to configure the Notification Server to process subscriptions for notifications such as process impact and monitor instance threshold violations.



You cannot open or use the Notification pages, unless you have installed the BPI Server. The `Notification` options appears when the BPI Server is installed and the connectivity between the BPI Server and the Business Availability Gateway Server has been configured. This configuration is described in [Chapter 3, Enhancing BAC with Process Instance Monitors](#).

The chapter also describes how to configure the Notification Server email templates and scripts, which can then be used to deliver notifications that are received by the Notification Server.

This chapter covers the following topics:

Specifically, this chapter describes:

- [Notification Server Concepts](#) on page 210
- [Notification Server Administration Tasks](#) on page 213

Notification Server Concepts

The Notification Server is the BPI component responsible for sending email notifications and HP Operations Manager messages for events. These messages provide details of the process impact, monitor instance threshold and out-of-sequence events. You can receive these notifications through your email client or through an HP BTO Software client according to your requirements.

You also have the option to execute a script when an impact event is received; for example, the script might update a file, or send an SMS message.

The Notification component can be considered in two parts:

1. The server, which is responsible for receiving the impact events from the Business Impact Engine and converting them into the appropriate email messages and HP Operations Manager Messages for delivery. This is described in section [Notification Server Concepts](#) on page 210.
2. The Notification Server administration console, which enables you to create subscriptions for users to receive email notifications. It also enables you to create subscriptions for HP Operations Manager messages and scripts; see section [Notification Server Administration Tasks](#) on page 213.

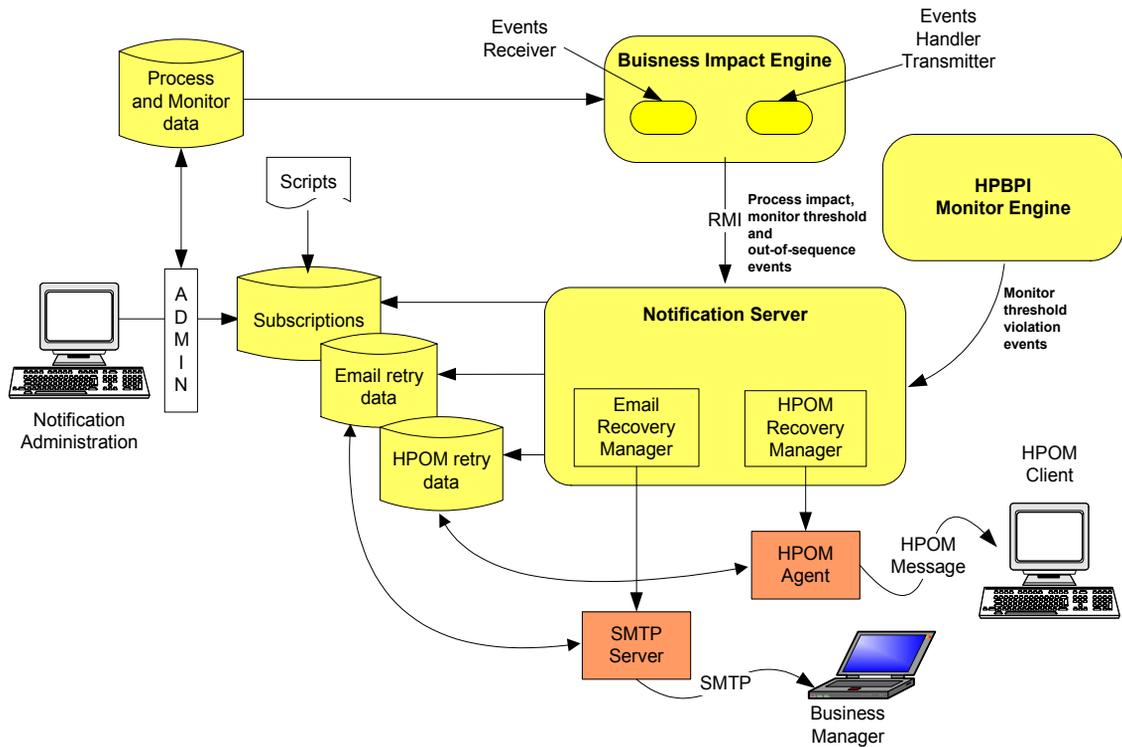
Notification Server Component

The Notification Server is a component of the BPI Server and is responsible for notifying you of the process-impact, out-of-sequence and monitor-threshold violations that you have configured through the Notification option for the Business Process Insight Application. The tasks for using the Notification options are described in section [Notification Server Administration Tasks](#) on page 213.

Notifications can be sent either through an SMTP server to an email client, or as an HPOM message to an HPOM Server. There is a retry mechanism for both types of notifications if either the SMTP server or HP Operations Manager is not available for any reason. Notifications are queued and retried after a configurable interval.

Figure 16 shows the architecture of the Notification Server and its relationship to other BPI Server components.

Figure 16 Notification Server



Business violations are created by the Notification Server as a result of receiving:

- process-impact and out-of-sequence notification events from the business object manager through the Business Event Handler Transmitter.
- monitor instance threshold violation notification events from the Monitor Engine.

The Notification Server sends these events as business violations to you, based on a set of filters. These are filters that you create and that specify the impact events for which you want notification. You can filter email notifications based on event name, event type and the name of the Business Process.

In addition to sending violations when an event is received, the Notification Server can also run any script (.bat file) that you have created. Creating scripts is described in section [Creating Script Files](#) on page 237.

Email Notification Messages

The email notifications contain impact information about:

- the Business Processes that you are monitoring.
- out-of-sequence events.

Out-of-sequence events are those events that you have chosen to monitor using the `Check sequence` option, which is an option on the BPI Modeler.

- monitor instance threshold violations.

There is a default template for these email notifications; however, you can change the layout of the email messages that are sent by the Notification Server. You can also configure the templates for the email notifications and add properties from the business violations into the messages and configure how many email notifications that you receive for a particular monitor instance threshold violation.

The default templates are provided as part of the BPI installation and instructions for creating your own templates and configuring monitor thresholds are provided in [Chapter 5, Monitor Definer](#).

The following are the template types that you can use to change the format of your messages, if required:

- Velocity, which is a Java-based template Engine.
- XSLT, which transforms one XML document into another text document.

It does not matter which tool you use, it is entirely dependent on your own preferences.

Notification Server Administration Tasks

The following are the tasks that you can complete when using the Notification option:

- [Managing Email Subscriptions](#) on page 213
- [Managing HP Operations Manager Message Subscriptions](#) on page 217
- [Managing Script Subscription](#) on page 220
- [Creating Notification Server Templates](#) on page 222
- [Creating Script Files](#) on page 237

Managing Email Subscriptions

This section includes creating:

- subscriber accounts to receive specific process impact events that are generated by the BPI Server.
- subscriber accounts to receive specific monitor instance threshold events that are generated by the BPI Server.
- subscriber accounts to receive specific out-of-sequence events that are generated by the BPI Server.

Complete the following steps to configure the Notification Server:

1. Make sure the `Servlet Engine` component is started using the BPI Administration Console, which is located on the system where the BPI Server is running.
2. On the system where Business Availability Center is running:
Select `Admin > Business Process Insight`
You are presented with a tabbed page that includes a tab for Notification.
3. Click the tab for Notification and you are presented with a page requesting you to select from Email Subscriptions, Script Subscriptions or HPOM Message Subscriptions.
4. Select Email Subscriptions.

5. Click the `New User` button to add a new user.

You are presented with a `User Information` screen.

6. On the `User Information` screen:

- a. Enter a `User Name`

This is a name that you want to assign to the user; it can be any name that identifies the user subscription.

- b. Enter an `Email Address`

This is the email address for the user named in the previous step. This must be a valid email account.

- c. Click `OK`.

The new user now has an account on the `Notification Server` and is listed in the `User List` with the other users.

You now have the option to:

- add another new user as described in the above steps.
- subscribe the new user account to the events that you want it to receive. To do this refer to section [Configuring the Events Received by Notification Server Users](#) on page 215.
- return to the main menu, where you can add more email subscriptions or add `HP Operations Manager` message subscriptions.
- delete an entry in the `User List`. To do this select the checkbox next to the `User Name` entry that you want to delete and then click the `Delete` button.

Configuring the Events Received by Notification Server Users

When you have added the user accounts for the users to receive notifications, you then need to configure these user accounts to subscribe to BPI events that you want them to receive. To do this, select the Subscriptions link on the Users List screen, under the Email Subscriptions column, for the user that you want to configure. This link takes you to the Process Subscriptions list for that user.

1. Click the New Subscription button.

You are taken to the EMail Subscription Details screen where you can add the email subscription details.

2. Select the Event Name and the Process Name for your new event subscription:

- Event Name:

You can select from: Process Impacted events, Process Monitor Threshold Violation Events, Process Out Of Sequence events, or All events. If you select All you subscribe to all types of event.

- Process Name:

You can select all process names to report on, or you can choose a specific process that is deployed to the Business Impact Engine. There is a drop down list provided, which lists all the deployed processes for you to select from, including the All option.

Click Next.

3. If you selected Process Monitor Threshold Violation Events, continue at step 5.

4. If you selected `All`, `Process Impacted` or `Process Out Of Sequence` as the Event name, you are prompted to select the Minimum Severity Level and the Template for your new subscription:

- Minimum Severity Level:

This is the minimum severity level for which you want to receive email notifications; for example, if you select `Critical` you will receive email notifications only for violations that are critical. If you select `Minor`, you receive email notifications for `Minor`, `Warning`, `Major` and `Critical` violations.

- Template:

Select the template that is appropriate to your Event Name, for example, you might have created your own template for the event. If you have selected `Process Impacted` as the Event Name, choose the `EMAIL-ProcessImpactedDefault.vm` template. If you have selected `Process Monitor Threshold` as the Event Name, choose the `EMAIL-MonitorThresholdDefault.vm` template. If you have selected `Process Out of Sequence`, choose the `EMAIL-OutOfSequenceDefault.vm` template. If you have selected `All` for the Event Name, choose the `EMAIL-GenericDefault.vm` template, as it provides the most detailed information.



If you create two subscriptions for the same event type, each with different templates, BPI uses the template from the more restrictive subscription to format the violation. For example, if you create a subscription for all process impact events using one template and a subscription for a specific process impact event using a different template; the template for the specific process impact event is the one used to format the violation.

5. If you selected `Process Monitor Threshold Violation Events`, you are prompted for the following information, in addition to that requested in step 4.:

- Monitor Name

- Monitor Threshold Name

6. Click `OK` to commit the subscription to the administration database.

The new Event Subscription is now added to the list of Process Subscriptions for the user.

You now have the option to:

- add another subscription as described above.
- delete an entry in the subscription list. To do this select the checkbox next to the entry that you want to delete and then click the `Delete` button.
- logout of the Notification Server Administration Console. You do this by closing the Web Browser Window where the console is running.

Managing HP Operations Manager Message Subscriptions

The Notification Server uses Velocity and XSLT templates to create HP Operations Manager messages before forwarding the message to the HP Operations Manager agent.

The HP Operations Manager agent then applies one or more templates to filter out unwanted messages and to make any additional changes to the HP Operations Manager message format.

Before configuring BPI to send events to HP Operations Manager, ensure that the HP Operations Manager Agent and Message Interface template are installed and set up on the system where the BPI Server, including the Notification Server are installed.

Complete the following steps to configure the Notification Server to send HP Operations Manager message notifications to the HP Operations Manager Agent for process impact, out-of-sequence or monitor instance threshold notification events:

1. Make sure the `Servlet Engine` component is started using the BPI Administration Console, which is located on the system where the BPI Server is running.
2. On the system where Business Availability Center is running:
Select `Admin > Business Process Insight`
You are presented with a tabbed page that includes a tab for `Notification`.
3. Click the tab for `Notification` and you are presented with a page requesting you to select from `Email Subscriptions`, `Script Subscriptions` or `HPOM Message Subscriptions`.
4. Select `HPOM Message Subscriptions`.

5. Click the `New Subscription` button.

You are presented with an `HPOM Subscription Details` screen where you can enter the subscription details for the `HP Operations Manager` messages.

6. From the `New Event Subscription` screen, select the `Event Name` and the `Process Name` for your new event subscription:

- `Event Name`

You can select to filter for `Process Impacted` events, `Process Monitor Threshold` events, `Process Out Of Sequence` events, or `All` events. If you select `All`, you receive `HP Operations Manager` impact violations for all `BPI` notification events.

- `Process Name`

You can select all process names to report on, or you can choose a specific process that you have defined. There is a drop down list provided, which lists all the deployed processes for you to select from, including the `All` option.

7. Click `Next`.

8. If you selected `Process Monitor Threshold Violation Events`, continue at step 10.

9. If you selected `All`, `Process Impacted` or `Process Out Of Sequence` as the `Event name`, you are prompted to select the `Minimum Severity Level` and the `Template` for your new subscription:

- `Minimum Severity Level`:

This is the minimum severity level for which you want to receive email notifications; for example, if you select `Critical` you will receive email notifications only for violations that are critical. If you select `Minor`, you receive email notifications for `Minor`, `Warning`, `Major` and `Critical` violations.

- `Template`:

Select the template that is appropriate to your `Event Name`, for example you might have created a custom template. If you have selected `Process Impacted` as the `Event Name`, choose the `OVO-ProcessImpactDefault.vm` template. If you have selected `Process Monitor Threshold` as the `Event Name`, choose the `OVO-MonitorThresholdDefault.vm` template. If you have selected

Process Out of Sequence, choose the template for the OVO-OutOfSequence.vm for the template. If you have selected All for the Event Name, choose the OVO-GenericDefault.vm template, as it provides the most detailed information.



If you create two subscriptions for the same HP Operations Manager message subscription, each with different templates, BPI uses the template from the more restrictive subscription to format the violation. For example, if you create a subscription for all process impact events using one template and a subscription for a specific process impact event using a different template; the template for the specific process impact event is the one used to format the violation.

10. If you selected Process Monitor Threshold Violation Events, you are prompted for the following information, in addition to that requested in step 9:

- Monitor Name
- Monitor Threshold Name

11. Click OK to commit the subscription to the Notification Server Administration database.

The new HP Operations Manager Message Subscription is now added to the list of HP Operations Manager Subscriptions.

You now have the option to:

- add another HP Operations Manager Message Subscription as described above.
- delete an entry in the HP Operations Manager Message Subscription list. To do this select the checkbox next the entry that you want to delete and then click the Delete button.

You can configure the template set used by HP Operations Manager and you can filter the events received through HP Operations Manager by customizing the HP Operations Manager Message Interface template. Details of how to do this are provided in the HP Operations Manager documentation.

Managing Script Subscription

You can configure the Notification Server to run a script when it receives specific notification events. Section “[Creating Script Files](#)” on page 237 describes how you can create these scripts and provides details of the variables that you can include in your scripts to report details of the violation as required.

This section describes how to configure the Notification Server to run the scripts for specific notifications that it processes for process impact, out-of-sequence or monitor instance threshold notification events:

1. Make sure the `Servlet Engine` component is started using the BPI Administration Console, which is located on the system where the BPI Server is running.

2. On the system where Business Availability Center is running:

Select `Admin > Business Process Insight`

You are presented with a tabbed page that includes a tab for `Notification`.

3. Click the tab for `Notification` and you are presented with a page requesting you to select from `Email Subscriptions`, `Script Subscriptions` or `HPOM Message Subscriptions`.
4. Select `Script Subscriptions`.
5. Click the `New Subscription` button.

You are presented with a `New Subscription` screen where you can enter the subscription details for the script.

6. From the `New Script Subscription` screen, enter the following details:

- **Event Name**

You can select to filter for `Process Impacted` events, `Process Monitor Threshold` events, `Process Out Of Sequence` events, or `All` events. If you select `All`, you receive **HP Operations Manager** impact violations for all BPI notification events.

- **Process Name**

You can select all process names to report on, or you can choose a specific process that you have defined. There is a drop down list provided, which lists all the deployed processes for you to select from, including the `All` option.

7. Click `Next`.

If there are no scripts defined, an the following error is displayed and you cannot continue:

No scripts currently available for selection.

Refer to section [Creating Script Files](#) on page 237 for details of creating scripts.

8. If you selected `Process Monitor Threshold Violation Events`, continue at step 10.
9. If you selected `All`, `Process Impacted` or `Process Out Of Sequence` as the Event name, you are prompted to select the **Minimum Severity Level** and the **Template** for your new subscription:

- **Minimum Severity Level:**

This is the minimum severity level for which you want to receive email notifications; for example, if you select `Critical` you will receive email notifications only for violations that are critical. If you select `Minor`, you receive email notifications for `Minor`, `Warning`, `Major` and `Critical` violations.

- **Script Name**

Select the script that you want the **Notification Server** to run when it received a notification event for the specified event and process. All the scripts that you have defined and saved in the `notify-scripts` are presented in the drop-down list for you to select from.

10. If you selected `Process Monitor Threshold Violation Events`, you are prompted for the following information, in addition to that requested in step 9:

- Monitor Name
- Monitor Threshold Name

11. Click OK to commit the subscription to the administration database.

The new Script Subscription is added to the list of Script Message Subscriptions.

You now have the option to:

- add another New Script Subscription as described above.
- delete an entry in the Script Subscription list. To do this select the checkbox next the entry that you want to delete and then click the `Delete` button.

Creating Notification Server Templates

The Notification Server uses templates to format email messages and messages sent to HP Operations Manager. The templates contain instructions on how to format event information, for example, event name and event time. You might want customize an email template if you want to generate email messages for different locales.

This section describes how BPI uses these templates and some guidance in how you can modify them. You need to be familiar with either XSLT, or Velocity to make the changes; XSLT is a standard for transforming XML documents. It is up to you which format you choose.

The Notification Server uses the Apache Velocity template engine to process Velocity templates. There is a user guide available with the template engine that provides details of creating and using Velocity templates. Details of Velocity templates, including a user guide for creating them, can be found at the following location:

<http://jakarta.apache.org/velocity/>

You configure the template used for each event when you create the event subscription through the Notification pages. The Notification Server then uses the template that you have defined to format all notifications related to the specified event.

Creating an Email Template

You create a custom email template for a specific event. These custom email templates must have a file name that starts with the string `EMAIL-` and a file extension of `.vm` for Velocity templates and `.xsl` for XSLT templates.

The Notification Server reads the custom templates from the following directory:

- `bpi-install-dir\data\conf\bia\notify-templates\flows`

If you want to modify these templates, make a copy of the appropriate example template from the files in the following directory:

`bpi-install-dir\examples\bia\NotifSvrTemplates`

Make sure that you add your template to the correct directory as the Notification pages presents the templates in the context of the selection, based on the contents of the above directories.

You also need to make sure that you copy the template from the `examples` directory to the `data` directory as the `examples` directory is updated and files replaced if you reinstall BPI.

The Notification Server uses an email template to create XML that describes an email. Then the notification server uses the XML to create an email.

The email XML is very simple; it contains a subject, content type, and body. The actual schema is described in the file `email.xsd`, which is located at:

`bpi-install-dir\misc\bia`

The Notification Server applies the Velocity or XSLT templates that you define to a violation from the Business Impact Engine. From this the Notification Server is able to create an email XML document based on your templates.

Creating an HP Operations Manager Template

The Notification Server uses a template to create XML that describes the HP Operations Manager message. It then uses this XML to create an HP Operations Manager message.

You configure the templates that are used to send HP Operations Manager messages through the Notification pages.

Custom HP Operations Manager template files must start with the string OVO- and a file extension of .vm for Velocity templates and .xsl for XSLT templates. Store custom templates in the following directory:

```
bpi-install-dir\data\conf\bia\notify-templates\flows
```

The following is an example of an HP Operations Manager message XML document:

```
<?xml version="1.0" encoding="UTF-8"?>
<OVOMessage xmlns:xsi="http://www.w3.org/2001/XMLSchema
  instance"xsi:noNamespaceSchemaLocation="ovomessage.xsd" >
<Severity>critical</Severity>
<Application>HPBPI application</Application>
<Object>PROCESS_IMPACTED or PROCESS_OUT_OF_SEQUENCE</Object>
<MessageGroup>NOTIFICATIONS</MessageGroup>
<MessageText>A PROCESS_OUT_OF_SEQUENCE violation occurred at
7.10pm.</MessageText>
<Option>example_option_variable_1=this is an example option
value</Option>
<Option>example_option_variable_2=this is another example option
value</Option>
</OVOMessage>
```

The example XML document contains an element for each message attribute:

- message severity
- application
- object
- message group
- message text

Optionally, the XML document, can contain message options. An option has the form *variable=value*. Refer to the *VantagePoint Operations for Unix Administrator's Reference Volume I* for more information about HP Operations Manager messages. The notification server applies Velocity and XSLT templates to an violation from the Business Impact Engine to create an HP Operations Manager message XML document.

The schema for the message is available at the following location:

```
bpi-install-dir\misc\bia\ovomessage.xsd
```

Creating a Velocity Template

This section describes the list of the BPI notification methods that have been defined for use within your Velocity template. A variable in the Velocity context contains information from an Business Impact Engine event.

A Velocity template is a file that contains the XML describing an email or HP Operations Manager message.

In addition to text, the file can contain Velocity formatting directives. The following is an example of an email Velocity template:

```
<?xml version="1.0" encoding="UTF-8"?>
<Email xmlns:xsi='http://www.w3.org/2001/XMLSchema-instance'
      xsi:noNamespaceSchemaLocation='email.xsd'>
  <Subject>
    $alert.getSeverity() $alert.getEventName() Alert
  </Subject>
  <ContentType>text/plain</ContentType>
  <Body>
    A "$alert.getEventName()" alert has occurred.

    Severity: $alert.getSeverity()
    Event Group: $alert.getEventGroup()
    Event Name: $alert.getEventName()
    Event Time: $alert.getEventTime()
    Process Name: $alert.getFlowName()
    Process Guid: $alert.getFlowGuid()
  </Body>
</Email>
```

A formatting directive starts with a hash (#) or a dollar (\$); these formatting directives are described more fully in the *Velocity Users' Guide*. A formatting directive is used to insert event information into the XML document. In the case of BPI this event information is provided through the alert variables.

The `$alert` variable contains information from a Business Impact Engine event, for example, the service name for the event. The `$alert` variable contains methods such as `getFlowName()` and `getServiceName()`, which can be used to insert the event flow name and the event service name into the XML. (`getServiceName()` inserts the service name).



If the Velocity templates that you create contain non-ASCII characters, you must encode and save the template as UTF8. This UTF8 needs to be created without a byte order mark (BOM). BOMs are added automatically by some Windows editors; for example, Notepad and Wordpad. Choose an editor that enables you to exclude the BOM.

If you include a BOM in your template encoding, it is not recognized as an XML file.

When the Notification Server generates an email notification message, it adds data to the message, where the display language is determined by the locale of the BPI Server. If your email recipients are not in the same locale as the BPI Server, you can use the Velocity templates to specify the locale for the language used for the email notifications. This enables you to provide email notifications in several languages if required.

The `java.Locale()` class is used to identify the language string used within the alert methods. The definition for the `Locale()` class can be found at the following URL:

<http://java.sun.com/j2se/1.4.2/docs/api/java/util/Locale.html>

The `Locale()` class takes a parameter comprising the language code and the country code as described in the definition for the `Locale()` class; for example: `ko_KR` for Korea and `en_CA` English-speaking Canadian.

Methods for All Violations

The following table lists the alert methods that can be used for all violations: Process Impact, Process Out-Of-Sequence, Business Monitor and Monitor instance threshold.

Table 40 Velocity Template Alert Methods for all Violations

Alert Method Name	Alert Method Description
<code>\$alert.getVersion()</code>	Returns a STRING containing the version number for the BPI event.
<code>\$alert.getSeverity(<i>locale</i>)</code>	Returns a STRING containing the severity of the BPI event. Possible values are <code>Critical</code> , <code>Major</code> , <code>Minor</code> , <code>Warning</code> , and <code>Normal</code> . The language used for these values is determined by the locale for the BPI Server or, if specified, the locale of the country and language specified in <i>locale</i> , for example: <ul style="list-style-type: none">• <code>\$alert.getSeverity("ja")</code>, for a Japanese locale• <code>\$alert.getSeverity("ko")</code>, for a Korean locale The value returned is also used to determine the color of the text in the email notification.
<code>\$alert.getEventGroup()</code>	Returns a STRING containing the name of the event group for the BPI event, that is, NOTIFICATIONS.
<code>\$alert.getEventName()</code>	Returns a STRING containing the name of the BPI event, that is, <code>PROCESS_IMPACTED</code> , <code>PROCESS_MONITOR_THRESHOLD_VIOLATION</code> or <code>PROCESS_OUT_OF_SEQUENCE</code>
<code>\$alert.getEventTime(<i>locale</i>)</code>	Returns a STRING containing the time of the BPI event, formatted using the locale for the BPI Server or, if specified, the locale of the country and language specified in <i>locale</i> .
<code>\$alert.getEventDataListSize()</code>	Returns the number of event data items in the BPI event.

Table 40 Velocity Template Alert Methods for all Violations

Alert Method Name	Alert Method Description
<code>\$alert.getEventDataNames()</code>	Returns an ARRAYLIST of the names of the event data items in the BPI event.
<code>\$alert.getEventDataByName</code> (<i>Stringname, locale</i>)	Returns a STRING containing the value of the data item with the given name using the locale for the BPI Server or, if specified, the locale of the country and language specified in <i>locale</i> .
<code>\$alert.getEventDataByIndex</code> (<i>index, locale</i>)	Returns a STRING containing the value of the data item located at the supplied index using the locale for the BPI Server or, if specified, the locale of the country and language specified in <i>locale</i> .

Methods Specific to Process Impact Violations

The following table lists the alert methods that can be used for Process Impact violations. Using any of these methods for other violations results in a message containing erroneous data.

Table 41 Velocity Template Violation Methods for Process Impact Violations Only

Alert Method Name	Alert Method Description
<code>\$alert.getFlowName()</code>	Returns a STRING containing the process name for the BPI event.
<code>\$alert.getFlowGuid()</code>	Returns a STRING containing GUID for the process definition in the BPI event.
<code>\$alert.getServiceName()</code>	Returns a STRING containing the name of the service for the BPI event.
<code>\$alert.getServiceGuid()</code>	Returns a STRING containing the service GUID for the BPI event.
<code>\$alert.getFlowNodeString()</code>	Returns a STRING containing step names for the BPI event. An example of a string returned by this method is: Bill Customer, Check Stock, Remove Item.

Table 41 Velocity Template Violation Methods for Process Impact Violations Only

Alert Method Name	Alert Method Description
<code>\$alert.getFlowNodeList()</code>	Returns an ARRAYLIST of step names in the BPI event. You can use the methods defined in the ArrayList class. For example, you can access the first element of an array list named <code>flowNodeList</code> using <code>\$flowNodeList.get(0)</code>
<code>\$alert.getFlowNodeListSize()</code>	Returns the number of elements in the process step list in the BPI event.
<code>\$alert.getRootCause()</code>	Returns a STRING containing the labels of the root cause services in the BPI event. (Note that this string cannot be localized.) An example of a string returned by this method is: Oracle Financial System->Oracle System Europe->Network Resources

Table 41 Velocity Template Violation Methods for Process Impact Violations Only

Alert Method Name	Alert Method Description
\$alert.getFlowNodeStatusList()	Returns an ARRAYLIST of the status of the Steps in the BPI event. You can use the methods defined in the ArrayList class. For example, you can access the first element of an array list namesFlowNodeStatusList using \$flowNodeStatusList.get(0).
\$alert.getFlowNodeStatusString(<i>locale</i>)	<p>Returns a STRING containing the labels for the step status in the BPI event. For example, Critical, Major, Minor, Warning and Normal. These status correspond to the HP Operations Manager severity levels.</p> <p>The language used for these values is determined by the locale for the BPI Server or, if specified, the locale of the country and language specified in <i>locale</i>, for example:</p> <ul style="list-style-type: none"> • \$alert.getFlowNodeStatusString("ja"), for a Japanese locale • \$alert.getFlowNodeStatusString("ko"), for a Korean locale
\$alert.getFlowNodeStatusListSize()	Returns the number of elements in the process step status list in the BPI event.

Methods Specific to Out-of-Sequence Violations

The following table lists the methods for out-of-sequence events only. Using any of these methods for other violations results in a message containing erroneous data.

Table 42 Velocity Template Methods for Out-of-Sequence Violations Only

Alert Method Name	Alert Method Description
<code>\$alert.getFlowName()</code>	Returns a STRING containing the process name for the BPI event.
<code>\$alert.getFlowGuid()</code>	Returns a STRING containing GUID for the process definition in the BPI event.
<code>\$alert.getFlowInstanceGuid()</code>	Returns a STRING containing GUID for the process instance in the BPI event.
<code>\$alert.getSourceNode()</code>	Returns a STRING containing the name of the step that is the source step for the out-of sequence violation.
<code>\$alert.getDestinationNode()</code>	Returns a STRING containing the name of the step that is the destination step for the out-of sequence violation.
<code>\$alert.getFlowIdentifier()</code>	Returns a STRING containing the identifier for the impacted process instance.

Methods Specific to Monitor and Instance Threshold Violations

The following table lists the monitor and instance threshold violation notification events only. Using any of these methods for other violations results in a message containing erroneous data.

Table 43 Velocity Template Methods for Monitor and Instance Threshold Violations Only

Alert Method Name	Alert Method Description
<code>\$alert.getThresholdAlertGuid()</code>	Returns a STRING containing the internal unique identifier (GUID) of the instance threshold violation event raised for a specific instance threshold violation.

The following six methods are duration periods that correspond to the Threshold violation notification polling interval (seconds) as set in the Administration Console for Monitor Engine threshold violation notification settings.

It is called the actual period because it can differ from the requested configuration interval according to the other priorities that the machine, and the JVM, have at the times the requests to start and stop tracking are made.

<code>getThresholdAlertNotificationPeriodDurationHours()</code>	Returns a STRING containing the duration of actual notification period in terms of hours.
<code>getThresholdAlertNotificationPeriodDurationHours(<i>locale</i>)</code>	Returns a STRING containing the duration of actual notification period in terms of hours, using the locale for the BPI Server or, if specified, the locale of the country and language specified in <i>locale</i> .
<code>getThresholdAlertNotificationPeriodDurationMinutes()</code>	Returns a STRING containing the duration of actual notification period in terms of minutes.
<code>getThresholdAlertNotificationPeriodDurationMinutes(<i>locale</i>)</code>	Returns a STRING containing the duration of actual notification period in terms of minutes, using the locale for the BPI Server or, if specified, the locale of the country and language specified in <i>locale</i> .
<code>getThresholdAlertNotificationPeriodDurationSeconds()</code>	Returns a STRING containing the duration of actual notification period in terms of seconds.

Table 43 Velocity Template Methods for Monitor and Instance Threshold Violations Only

Alert Method Name	Alert Method Description
<code>getThresholdAlertNotificationPeriodDurationSeconds(<i>locale</i>)</code>	Returns a STRING containing the duration of actual notification period in terms of seconds, using the locale for the BPI Server or, if specified, the locale of the country and language specified in <i>locale</i> .
<code>\$alert.getThresholdAlertNotificationPeriodStart()</code>	Returns a STRING containing the start time of the Threshold violation notification period. Start time is the time from and including the time specified.
<code>\$alert.getThresholdAlertNotificationPeriodEnd()</code>	Returns a STRING containing the end time of the Threshold violation notification period. End time is the time up to but not including the time specified.
<code>\$alert.getThresholdAlertStatusChangeTime()</code>	Returns a STRING containing the time that the <code>Metric_Fact_Alerts</code> table was updated with the instance threshold alert notification.
<code>\$alert.getThresholdAlertRaisedTime()</code>	Returns a STRING containing the time that the event notification was sent to the Notification Server.
<code>\$alert.getThresholdGuid()</code>	Returns a STRING containing the internal unique identifier (GUID) for the monitor instance threshold defined for the Business Process monitor in the BPI event.
<code>\$alert.getThresholdMessage()</code>	Returns a STRING containing the monitor instance threshold message in the BPI event. This is the message that you have defined to be displayed when the event is triggered.
<code>\$alert.getThresholdName()</code>	Returns a STRING containing monitor instance threshold name in the BPI event.

Table 43 Velocity Template Methods for Monitor and Instance Threshold Violations Only

Alert Method Name	Alert Method Description
<code>\$alert.getThresholdNumber NotificationsInPeriod()</code>	Returns a STRING containing the total number of notifications sent for the instance threshold in the Threshold violation notification polling interval.
<code>\$alert.getThresholdNumber AlertsInPeriod()</code>	Returns a STRING containing the total number of instance threshold violations generated for the instance threshold in the Threshold violation notification polling interval. The number of instance threshold violations generated might be different to the number of notifications sent, depending on how you have configured the instance threshold violation notification settings.
<code>\$alert.getThresholdNumber NormalAlertsInPeriod()</code>	Returns a STRING containing the total number of Normal instance threshold violations generated for the instance threshold in the Threshold violation notification polling interval. This number is a subset of <code>getThresholdNumber AlertsInPeriod()</code> .
<code>\$alert.getThresholdNumber WarningAlertsInPeriod()</code>	Returns a STRING containing the total number of Warning instance threshold violations generated for the instance threshold in the Threshold violation notification polling interval. This number is a subset of <code>getThresholdNumber AlertsInPeriod()</code> .
<code>\$alert.getThresholdNumber MinorAlertsInPeriod()</code>	Returns a STRING containing the total number of Minor instance threshold violations generated for the instance threshold in the Threshold violation notification polling interval. This number is a subset of <code>getThresholdNumber AlertsInPeriod()</code> .

Table 43 Velocity Template Methods for Monitor and Instance Threshold Violations Only

Alert Method Name	Alert Method Description
<code>\$alert.getThresholdNumberMajorAlertsInPeriod()</code>	Returns a STRING containing the total number of Major instance threshold violations generated for the instance threshold in the Threshold violation notification polling interval. This number is a subset of <code>getThresholdNumberAlertsInPeriod()</code> .
<code>\$alert.getThresholdNumberCriticalAlertsInPeriod()</code>	Returns a STRING containing the total number of Critical instance threshold violations generated for the instance threshold in the Threshold violation notification polling interval. This number is a subset of <code>getThresholdNumberAlertsInPeriod()</code> .
<code>\$alert.getFlowMetricGuid()</code>	Returns a STRING containing the Business Process monitor GUID in the BPI event.
<code>\$alert.getFlowMetricName()</code>	Returns a STRING containing the Business Process monitor name in the BPI event.
<code>\$alert.getFlowMetricValue()</code>	Returns a STRING containing the Business Process monitor value in the BPI event.

XSLT Templates

An XSLT template is a file containing XML that transforms event XML into email or HP Operations Manager message XML. An example of an email XSLT template is shown below.

```
<?xml version="1.0" encoding="UTF-8"?>
<xsl:stylesheet xmlns:xsl="http://www.w3.org/1999/XSL/Transform"
version="1.0"
  xmlns:env="http://schemas.xmlsoap.org/soap/envelope/"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns:etype="http://www.hp.com/openview/bia/eventtype"
  xmlns:edata="http://www.hp.com/openview/bia/eventdata">
  <xsl:output method="xml"
  indent="no" />

<xsl:template match="/">
<Email xsi:noNamespaceSchemaLocation='email.xsd'>
<Subject>
<xsl:apply-templates select="//env:Body/*/etype:Severity/*"/><xsl:text> </
xsl:text><xsl:value-of select="//etype:EventName" /> Alert</Subject>
<ContentType>text/plain</ContentType>
<Body>
A "<xsl:value-of select="//etype:EventName" />" alert has occurred.

Severity: <xsl:apply-templates select="//env:Body/*/etype:Severity/*"/>
Event Group: <xsl:value-of select="//etype:EventGroup" />
Event Name: <xsl:value-of select="//etype:EventName" />
Event Time: <xsl:value-of select="//etype:EventTime" /><xsl:text>
</xsl:text>
<xsl:for-each select="//edata:DataItem" >
<xsl:choose>
<xsl:when test="edata:Name = 'RootCause'" >
<xsl:text>Root Cause: </xsl:text>
<xsl:for-each select="//edata:Value/Services/Service" >
<xsl:text>-&gt;</xsl:text><xsl:value-of select="Label" />
</xsl:for-each>
</xsl:when>
<xsl:otherwise>
<xsl:value-of select="edata:Name" /><xsl:text>: </xsl:text><xsl:value-of
select="edata:Value" />
</xsl:otherwise>
</xsl:choose>
<xsl:text>
</xsl:text>
</xsl:for-each>
</Body>
</Email>
</xsl:template>
```

```

<xsl:template match="etype:Critical" >
<xsl:text>Critical</xsl:text>
</xsl:template>

<xsl:template match="etype:Major" >
<xsl:text>Major</xsl:text>
</xsl:template>

<xsl:template match="etype:Minor" >
<xsl:text>Minor</xsl:text>
</xsl:template>

<xsl:template match="etype:Warning" >
<xsl:text>Warning</xsl:text>
</xsl:template>

<xsl:template match="etype:Normal" >
<xsl:text>Normal</xsl:text>
</xsl:template>

</xsl:stylesheet>

```

The style sheet is applied to the event sent by the Business Impact Engine. The style sheet contains email XML text as well as XSL elements. XSL elements format information from the form of the event and insert it into the email XML.

The schemas for the event are located in the files `eventtype.xsd` and `eventdata.xsd` in the following directory:

```
bpi-install-dir/misc/bia
```

The message header contains a business event type, which is described in `eventtype.xsd`. The message body contains a business event type followed by business event data; Business event data is described in `eventdata.xsd`.

Creating Script Files

You can define a script, which is a Windows `.bat` file, to be run when a notification event is received by the Notification Server; for example, this script might send an SMS message to a recipient directly (bypassing the email server), or it might update an entry in a database or spreadsheet.

You can create a script to complete any action that you want, and you can also include any of the environment variables that have been defined for use within your scripts. These environment variables identify configuration information relating to the BPI data available for notifications and are defined in section “[Environment Variables for Scripts](#)” on page 240.

These environment variables are included in your scripts using the following notation:

```
%env_name%
```

where `%env_name%` is an environment variable name, for example, `%OVBPI_FLOWNAME%`.

The following examples show how you can create a script and configure the Notification Server to run the script when a specific notification event is received.

Example Script to Write a String to a File

The following is an example of the steps that you need to complete in order to configure the Notification Server to write the string `Hello World` to a file on receipt of a specific process impact event:

1. Create the script that you want to be executed when the notification event is received, for example:

```
echo "hello world" >>c:\notif.txt
```

This script writes the string `"hello world"` to the file `notif.txt` in the root of your `c:` drive.

2. Save the script to the following location with a unique file name and a `.bat` file extension:

```
bpi-install-dir/data/conf/bia/notify-scripts
```

The Notification Server looks in this directory for scripts and presents these scripts to you through the Web Administration Console for the Notification Server when you are configuring subscriptions. Note that if the script that you create does not have a `.bat` file extension, it is ignored.

3. Follow the instructions in section “[Managing Script Subscription](#)” on page 220 to create a subscription for the script selecting `Process Impacted` as the `Event Name` and the name of the process for the `Process Name`.

If you have the Web Administration for the Notification Server administration open at the New Event Subscription page, you might need to click the Refresh option on your Web Browser. This refreshes the page and adds the new script to the list.

Example Script to Write Process Name and Blocked Instances to a File

The following is an example of the steps that you need to complete in order to configure the Notification Server to take the process name and the number of blocked instances from the event data and write the information to a file on receipt of a specific process impact event:

1. Create the script that you want to be executed when the notification event is received, for example:

```
echo %OVBPI_FLOWNAME%,  
%OVBPI_NOOFBLOCKEDINSTANCES%>>c:\notif2.txt
```

This script writes the values of the process name and the number of blocked instances to the file `notif2.txt` in the root of your `c:` drive.

2. Save the script to the following location with a unique filename:

```
bpi-install-dir/data/conf/bia/notify-scripts
```

The Notification Server looks in this directory for scripts and presents these scripts to you through the Web Administration Console for the Notification Server when you are configuring subscriptions.

3. Follow the instructions in section [“Managing Script Subscription”](#) on page 220 to create a subscription for the script selecting Process Impacted as the Event Name and the name of the process for the Process Name.

If you have the Web Administration for the Notification Server administration open at the New Event Subscription page, you might need to click the Refresh option on your Web Browser. This refreshes the page and adds the new script to the list.

Environment Variables for Scripts

The following tables list the environment variables that can be used within your scripts to report data on process impact, process out-of-sequence and monitor instance threshold violations.

[Table 44](#) on page 240 lists the environment variables that are available for all BPI violations.

Table 44 Environment Variables for All Violations

Variable	Description
OVBPI_EVENTGROUP	name of the event group, which is always NOTIFICATIONS.
OVBPI_EVENTNAME	name of the event: PROCESS_IMPACTED, PROCESS_MONITOR_THRESHOLD_VIOLATION or PROCESS_OUT_OF_SEQUENCE.
OVBPI_SEVERITY	severity of the BPI event. Possible values are Normal, Warning, Minor, Major or Critical

[Table 45](#) on page 240 lists the environment variables available for process impact violations. Using these environment variables for other alerts results in erroneous data being returned.

Table 45 Environment Variables for Process Impact Violations

Variable	Description
OVBPI_FLOWGUID	internal unique identifier (GUID) for the process definition in the BPI event.
OVBPI_FLOWNAME	name of the process in the BPI event
OVBPI_NOOFBLOCKEDINSTANCES	number of blocked process instances at the time of the PROCESS_IMPACTED event. A blocked instance is an instance of the process that is active at a step and cannot proceed as there is a problem in an underlying operational service.

Table 45 Environment Variables for Process Impact Violations

Variable	Description
OVBPI_NOOFIMPEDEDINSTANCES	number of at risk process instances at the time of the PROCESS_IMPACTED event. An at risk instance is where one or more process instance has the potential to be blocked in the future.
OVBPI_SERVICEGUID	internal unique identifier (GUID) for the service in the BPI PROCESS_IMPACTED event.
OVBPI_SERVICENAME	name for the service in the BPI PROCESS_IMPACTED event.
OVBPI_ROOTCAUSE	the label of the root cause service, or services, in the BPI PROCESS_IMPACTED event.

Table 46 on page 242 lists the environment variables available for instance threshold violations. Using these environment variables for other violations results in erroneous data being returned.

Table 46 Environment Variables for Instance Threshold Violations

Variable	Description
OVBPI_FLOWGUID	internal unique identifier (GUID) for the process definition in the BPI PROCESS_MONITOR_THRESHOLD_VIOLATION event.
OVBPI_FLOWIDENTIFIER	identifier for the process instance in the PROCESS_MONITOR_THRESHOLD_VIOLATION event. This property contains a value only if the instance threshold violation is an instance violation, for example, Absolute duration. It does not contain a value if the property is for a statistical violations, for example, a Backlog count. This the property that you have nominated to be the identifier for the processe.
OVBPI_FLOWINSTANCEGUID	internal unique identifier (GUID) for the process instance in the PROCESS_MONITOR_THRESHOLD_VIOLATION event. This property contains a value only if the instance threshold violation is an instance violation, for example, Absolute duration. It does not contain a value if the property is for a statistical violations, for example, a Backlog count.
OVBPI_FLOWMETRICGUID	internal unique identifier (GUID) for the process monitor in the PROCESS_MONITOR_THRESHOLD_VIOLATION event.
OVBPI_FLOWMETRICNAME	name of the process monitor in the BPI PROCESS_MONITOR_THRESHOLD_VIOLATION event.

Table 46 Environment Variables for Instance Threshold Violations

Variable	Description
OVBPI_FLOWMETRICVALUE	value of the process monitor in the BPI PROCESS_MONITOR_THRESHOLD_VIOLATION event.
OVBPI_FLOWNAME	name of the process in the BPI PROCESS_MONITOR_THRESHOLD_VIOLATION event
OVBPI_THRESHOLDALERTGUID	internal unique identifier of the instance threshold identified in the BPI PROCESS_MONITOR_THRESHOLD_VIOLATION event.
OVBPI_THRESHOLDMESSAGE	message defined for the BPI PROCESS_MONITOR_THRESHOLD_VIOLATION event. This is the message that you have defined to be displayed when the event is triggered.
OVBPI_THRESHOLDNAME	name of the monitor instance threshold in the PROCESS_MONITOR_THRESHOLD_VIOLATION event.

Table 47 on page 244 lists the environment variables for the Out-of-Sequence violations. Using these environment variables for other violations results in erroneous data being returned.

Table 47 Environment Variables for Out-of-Sequence Violations

Variable	Description
OVBPI_FLOWIDENTIFIER	identifier for the process instance in the BPI event. This the property that you have nominated to be the identifier for the process.
OVBPI_FLOWINSTANCEGUID	internal unique identifier (GUID) for the process instance in the BPI event.
OVBPI_SOURCENODE	name of the step that is the source step for the out-of-sequence violation.
OVBPI_DESTINATIONNODE	name of the step that is the destination step for the out-of-sequence violation.

9 BPI Application Concepts

The BPI Application provides the interface that enables you to track all the Business Processes, Business Process Monitors and Monitor Thresholds that you have defined and deployed, including their associated data. You can also track the status of the IT operational resources that the Business Process relies on.

The BPI Application can be accessed from the following menu option:

Applications > Business Process Insight

This chapter provides an overview of the key features of the BPI Application pages and explains how to use the application to track and monitor your Business Processes. Following chapters describe the content of the application in more detail.

The chapter covers the following topics:

- [Overview of the BPI Application](#) on page 246
- [Key Elements of Business Process Insight Application](#) on page 247

Overview of the BPI Application

The BPI Application enables you to monitor and track your Business Processes. It is the interface that you use to view the overall status of your Business Processes and Business Process monitors, including any links that you might have to IT operational resources.



The Business Process Insight Application pages are available and data available only when you have installed the BPI Server and configured the Server to send data samples to the Gateway Server.

The BPI Application provides:

- an overall view of the health and status of the Business Processes that you have deployed in your BPI system, including the status of any Business Process monitors.
- an overall view of the status of the IT operational resources that you have linked your Business Process Steps to.
- details of the individual process instances and their progression through the steps in the process.
- details of the active process instances at individual steps in the process.
- details of any thresholds that have been violated.
- details of the transactions that you have linked your Business Process Steps to within TransactionVision.
- graphical representation of your monitor data, which can be displayed in terms of times, where appropriate.
- a view of the aggregated Monitor data, which can include minimums, maximums and standard deviations.
- ability to configure the types of graphs and the period over which the monitor data should be presented.
- ability to search for specific process instances.

Key Elements of Business Process Insight Application

There are three options provided for the BPI Application that enable you to track and monitor your Business Processes. These options are in addition to the Flow Map, which is available from the Application > Dashboard menu.

- Scorecard

Provides a report-style view of all the Business Processes that are currently selected to be monitored. The view is presented in terms of the current values of the KPIs configured for the Scorecard; see [Chapter 10, BPI Application Scorecard](#).

The monitor Value is based on the Process Value property of the Business Process. The Process Value is assigned when you create the Business Process in the Modeler.

- Health

Provides a graphical view of a selected Business Process in the form of the process diagram. The process diagram is annotated with information relating to the health and Business Process Monitor details of the overall Business Process in both business and operational terms, and the individual Steps in the process.

In addition, there are links to more details of the various components of your Business Process; see [Chapter 11, BPI Application Health](#).

- Reports

Provides report data for Business Processes and Business Process steps. The following reports are available for the BPI Application:

- BPI Process Summary
- BPI Monitors Over Time
- Business Process Step Summary

The Reports are described in section [Chapter 12, BPI Application Reports](#).

In addition, you can customize your Business Process diagrams and define annotations specific to your processes. Some level of annotation is provided by default; however, you can modify the form of these annotations for your Process Diagrams. These customizations are described in [Chapter 13, Annotations for Process Diagrams](#).

10 BPI Application Scorecard

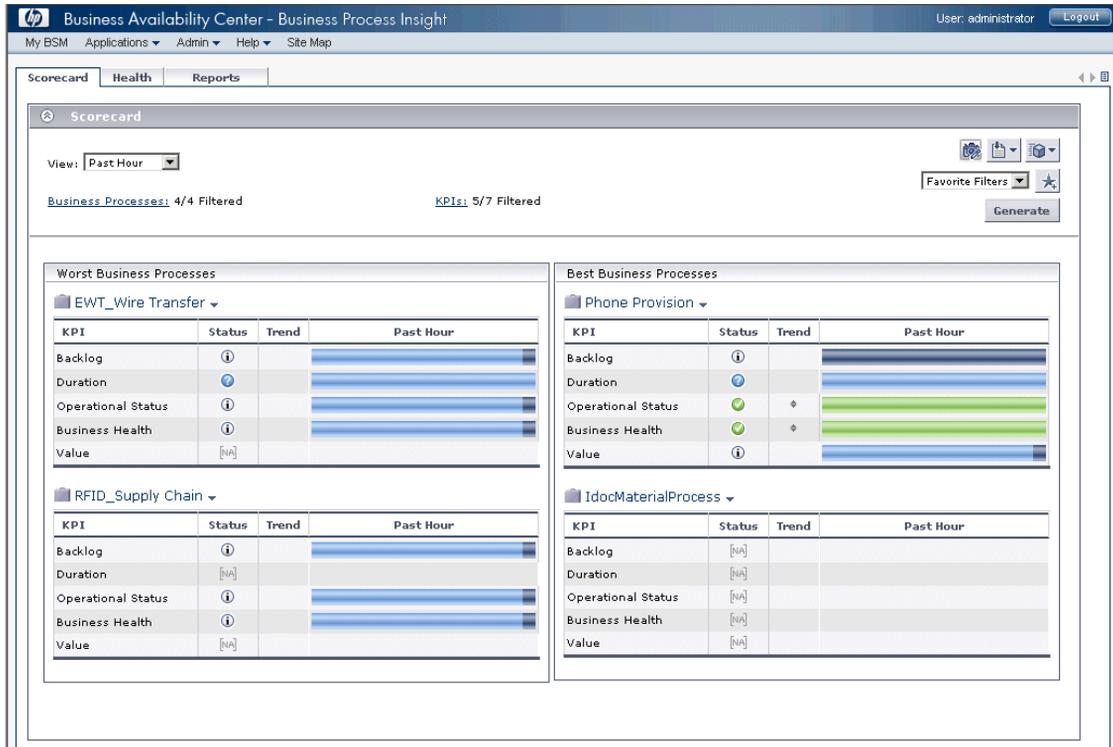
This chapter provides an overview of the key features of the BPI Application Scorecard pages and explains how to use the Scorecard pages to provide summary information for your Business Processes.

The Scorecard presents a type of report and enables you to display the real time status, trend, and changes-over-time data for the selected BPI Business Processes and Business Process Steps. These are organized by best and worst statuses.

This chapter covers the following topics:

- [Common Header](#) on page 252
- [Results Area](#) on page 254
- [Understanding KPI Statuses](#) on page 257
- [How the Scorecard Builds its Display](#) on page 258

Figure 17 is an example of the BPI Scorecard
Figure 17 Scorecard.

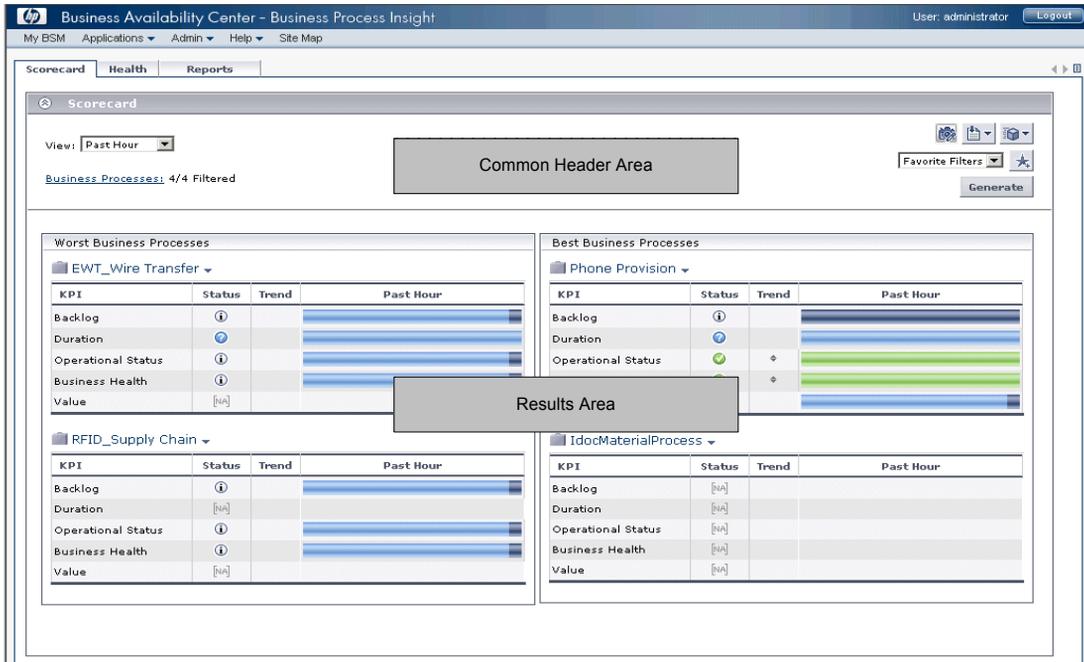


The Scorecard is divided into the following areas:

- The common header, which enables you to tailor the content of the main body of the page; see section [Common Header](#) on page 252.
- The main body of the page, where the selected Business Process data is presented; see section [Results Area](#) on page 254.

Figure 18 shows these areas of the Scorecard.

Figure 18 Scorecard Structure



Common Header

Table 48 General Information

Description	Enables you to select the criteria that you want to use for presenting Scorecard results. To access: Select Applications > Business Process Insight > Scorecard
Important Information	The Scorecard sorts and displays the ordered Business Processes and their KPIs statuses for the selected time period; for details, see section “How the Scorecard Builds its Display” on page 258. The Scorecard page is available only when you have configured the Business Process Insight Server to be integrated with BAC and configured to send data samples and configured a Profile database.

The following elements are included (unlabeled GUI elements are shown in angle brackets):

Table 49 GUI Elements

GUI Element (A-Z)	Description
<Common report settings>	For details see section Common Report Elements in <i>Reports</i> .
Business Processes	<p>Click to open the Business Processes dialog where you can select the Business Process that you want to display.</p> <p>If one Business Process is selected, its name is displayed to the right of the link. If more than one Business Process is selected, <i>(n/m) Filtered</i> is displayed to the right of the link, where <i>n</i> represents the number of selected Business Processes and <i>m</i> represents the total available for selection.</p>
KPIs	<p>Enables you to select the KPIs that you want to display on the filtered results area for each Business Process. All KPIs that have been configured for the Business Process CI and any child CIs are available for selection. Select one or more KPIs and click OK.</p> <p>If more than one KPI is selected, <i>(n/m) Filtered</i> is displayed to the right of the link, where <i>n</i> represents the number of selected KPIs and <i>m</i> represents the total available for selection</p>
View	<p>Enables you to select the viewing period used for the over-time bar in the results area. Select the viewing period from the drop-down selection box and click the Apply button to apply the changes to the page.</p>

Results Area

This part of the Scorecard shows the results of the selections made from the Common Area; see section [Common Header](#) on page 252.

Table 50 General Information

Description	Enables you to display the real time status, trend, and over time data of the Business Process. The results are organized by worst to best statuses. To access: Select Applications > Business Process Insight > Scorecard
Important Information	The Scorecard page is available only when you have configured the Business Process Insight Server to be integrated with BAC and configured to send data samples. The Scorecard page sorts and displays the ordered Business Processes and their KPIs statuses for the selected time period; for details, see section “How the Scorecard Builds its Display” on page 258.

The following elements are included (unlabeled GUI elements are shown in angle brackets):

Table 51 GUI Elements

GUI Element (A-Z)	Description
	Click the button to the right of the Business Process to display the available menu options. The context menu options are described in the <i>Using Dashboard Help</i> .
<Business Process Name>	The name of the Business Process.

Table 51 GUI Elements

<p><Over-time bar></p>	<p>Displays an over-time line, which comprises a colored band representing the KPI status results over the selected time; each color represents a specific KPI status.</p> <p>The width of the colored bands corresponds to the length of time the KPI is in a particular status. The most recent status in the time bar is on the right</p> <p>Example:</p> 
<p>KPI</p>	<p>The name of the KPI for the Business Process. The column lists the KPIs that were selected in the KPIs dialog box for the Scorecard.</p>
<p>Status</p>	<p>Indicates the status of the KPI. For details on the statuses, see Understanding KPI Statuses on page 257.</p> <p>Tooltip: Provides the value of the status, and indicated when the status was changed to the current value.</p>
<p>Trend</p>	<p>Indicates the trend of the KPI as compared to its previous state.</p> <p>For details on the trend information refer to the Dashboard Application documentation.</p> <p>Tooltip: Provides the description of the trend.</p>

All the data sample information sent by the BPI Server is displayed using the following KPIs:

- Backlog
- Business Health
- Business Impact
- Duration
- Value
- Volume

Understanding KPI Statuses

A full description of KPI statuses can be found in the section *Understanding KPI Statuses* in the *Using Dashboard Help*.

When a KPI is not relevant to the Business Process, the Status column displays [NA], the Trend column is empty, and the over time bar does not exist.

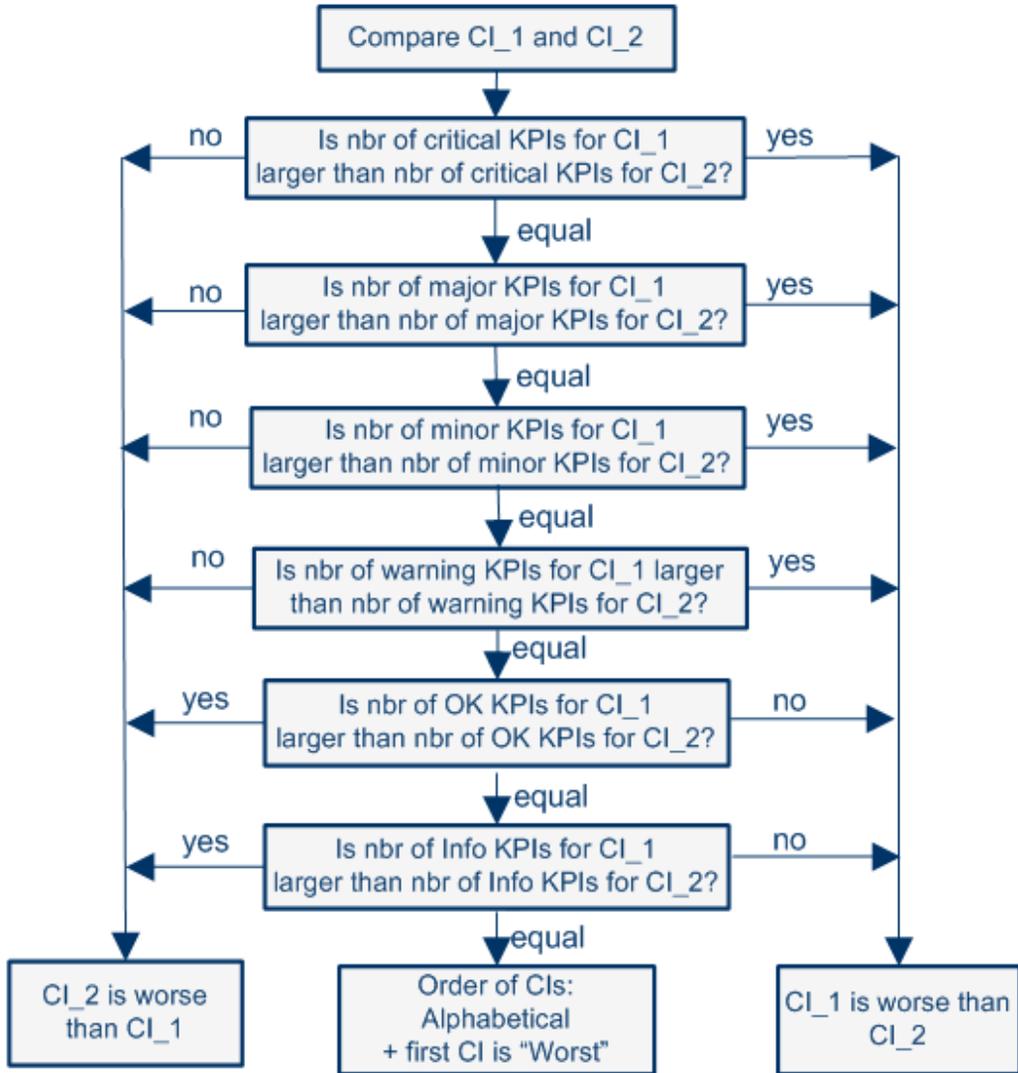
When a KPI is relevant for the Business Process but has a No Data status, the Status column displays a grey icon, the Trend column is empty, and the relevant part of the over time bar is grey.

When the Business Processes are listed in one column only, the KPIs that are not relevant for the Business Process are not displayed and each table includes as many rows of KPIs as needed.

How the Scorecard Builds its Display

The Scorecard pages sort and display selected Business Processes and their KPI's statuses from worst to best. The sorting mechanism compares the selected Business Process CIs in pairs as shown in [Figure 19](#).

Figure 19 Scorecard Sorting Process



If a pair of Business Process CIs have the same number of KPIs with a specific status, the sorting mechanism compares the number of KPIs with the next better status using the `critical`, `major`, `minor` and `warning` statuses in this order. The Business Process with the highest number of those KPIs is then given a lower grade than the other Business Processes.

If a pair of Business Process CIs have the same number of warning KPIs, then the mechanism compares the number of KPIs with `OK` status. The CI with the highest number of KPIs with the `OK` status is given a higher grade than the other CI. The same sorting is used for the `Info` status.

KPIs without data are not used in the comparison.

If a pair of Business Process CIs have exactly the same numbers of KPIs at each status level, the page sorts the CIs alphabetically (from A to Z) and the first CI in the alphabetical list, is given the lower grade.

Splitting Mechanism

When all Business Process CIs have a grade, the CIs are sorted into the Worst and Best columns. If you select four or more Business Process CIs, the Scorecard page is divided into two columns where:

- The Worst column displays the worst half of the CIs (lower grades) ordered from worst (first row) to best (last row).
- The Best column displays the best half of the CIs (higher grades) ordered from best (first row) to worst (last row).

Business Process CIs with `no data` KPIs always appear at the bottom of each Worst/Best column. The splitting mechanism removes them from the list before it lists the other CIs in the proper order and distributes these CIs between the Worst and Best columns. The CIs with `no data` KPIs are then sorted in alphabetical order and distributed between the Worst and Best columns and put at the bottom of each column.

The Worst column includes one more Business Process CI if you select an odd number of CIs

A single column displays the Business Process CIs ordered from worst to best from top to bottom when you select less than four CIs.

11 BPI Application Health

This chapter describes the BPI Application Health pages and explains how to navigate and use the them to track and monitor the health of your Business Processes.

The Health pages show the operational and business health of the Business Processes that you have defined using the BPI Modeler. The Health pages also include data on the Business Monitors, Thresholds and KPIs that you have defined for the Business Processes.

The Health pages provides:

- a graphical representation of a selected Business Process, in the form of the process diagram. The process diagram is annotated with information relating to the health of the overall Business Process and the individual Steps in the process.
- Business Process or Business Process Step summary information according to the selection criteria. This shows the overall business health of the Business Process or Business Process Step, in tabular and in graphical form. You can drill down and view related BPI reports if required.
- details of the business objective KPI that you have defined for the selected Business Process or Business Process Step.
- dials that show the status of the Monitor Thresholds for a selected Business Process. You can drill down for more detailed information relating to the Monitor, Monitor Instance Threshold or Process Instance if required.
- instance violation counts for the selected Business Process or Business Process Step.
- the ability you to view the status of the IT operational resources that are linked to Steps in the Business Process.

- a list of the related transaction CIs and KPIs for the selected Business Process or Business Process Step. You can drill down to the TransactionVision Aggregated Topology Report if required.

If there are no TransactionVision CIs linked to the Business Process that you are viewing, no data is available from this option

The following are the different components of the Health Page:

- [Process Diagram Area](#) on page 265

You can collapse and expand the Process Diagram if you want to provide more space for the information shown on the tabbed areas under the diagram.

- [Summary Tab](#) on page 272

The Summary Tab displays process instance information and the Scorecard over time graph for the selected Business Process.

From the Summary Tab you can link to additional pages, which enable access to details of Instances; see section [Instances Dialog](#) on page 280

- [Business Health Tab](#) on page 276

The Business Health Tab displays KPI details in the form of a dial and instance violation details in the form of a table.

From the Business Health Tab, you can link to additional pages, which enable access to details of:

— Violations; see section [Instance Violations Dialog](#) on page 292.

— Monitor details; see section [Monitor Dialog](#) on page 295.

— BPI Monitors Over Time Report; see section [BPI Monitors Over Time](#) on page 325.

— Process Over Time Report; see section [Business Process Over Time Report](#) on page 334.

— Step Over Time Report; see section [Business Process Step Over Time Report](#) on page 337.

- [Transactions Tab](#) on page 279

From the Transactions Tab, you can link to pages with TransactionVision, which provide more details of the selected Transaction Event.

Figure 20 is an example of the BPI Application Health page
Figure 20 Health Page

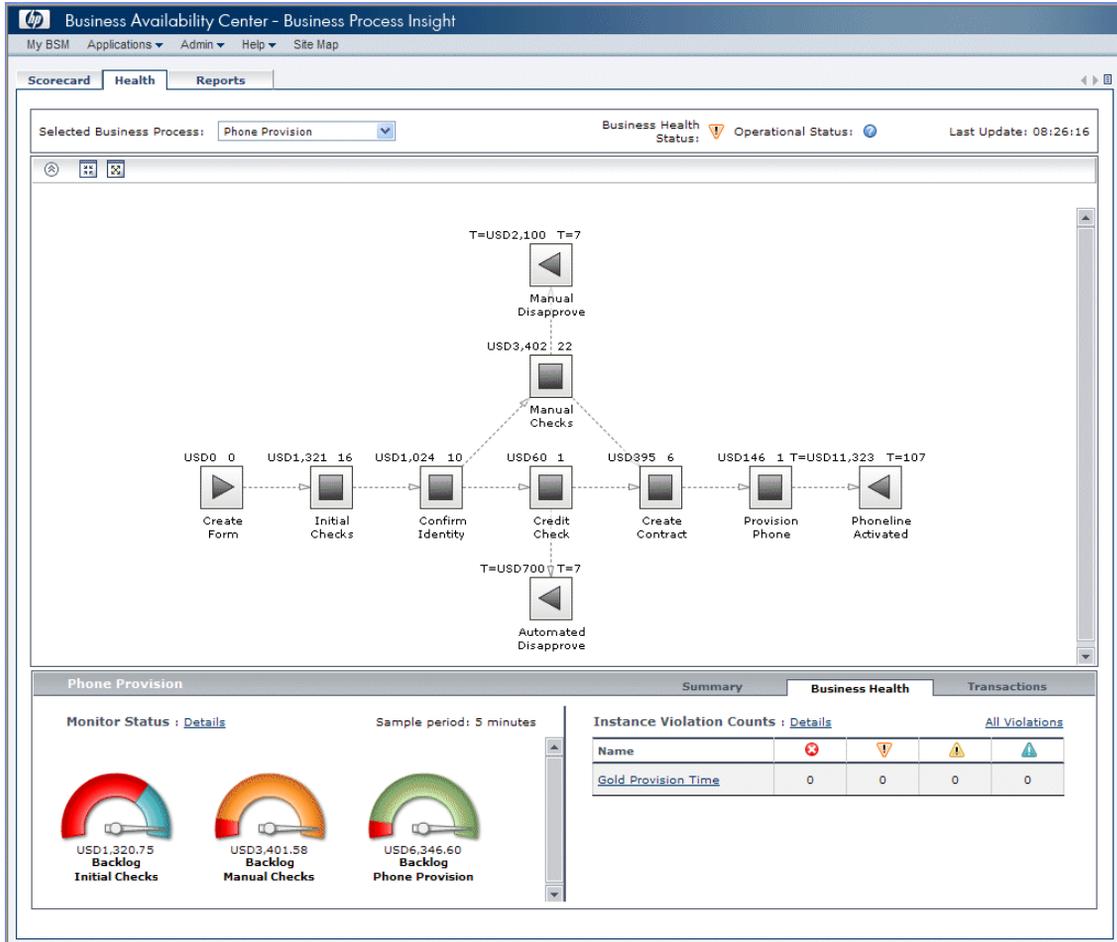


Figure 20 shows the top-level Health Page for the Business Process Insight Application.

The Health Page is subdivided into different areas of focus, but at the top-level it provides an overall view of both the business and operational health of your deployed Business Processes.

To access the Health Page select:

Applications > Business Process Insight > Health



The Health page is available only when you have configured the Business Process Insight Server to be integrated with BAC and configured to send data samples; see [Chapter 3, Enhancing BAC with Process Instance Monitors](#) for details of the integration with BAC.

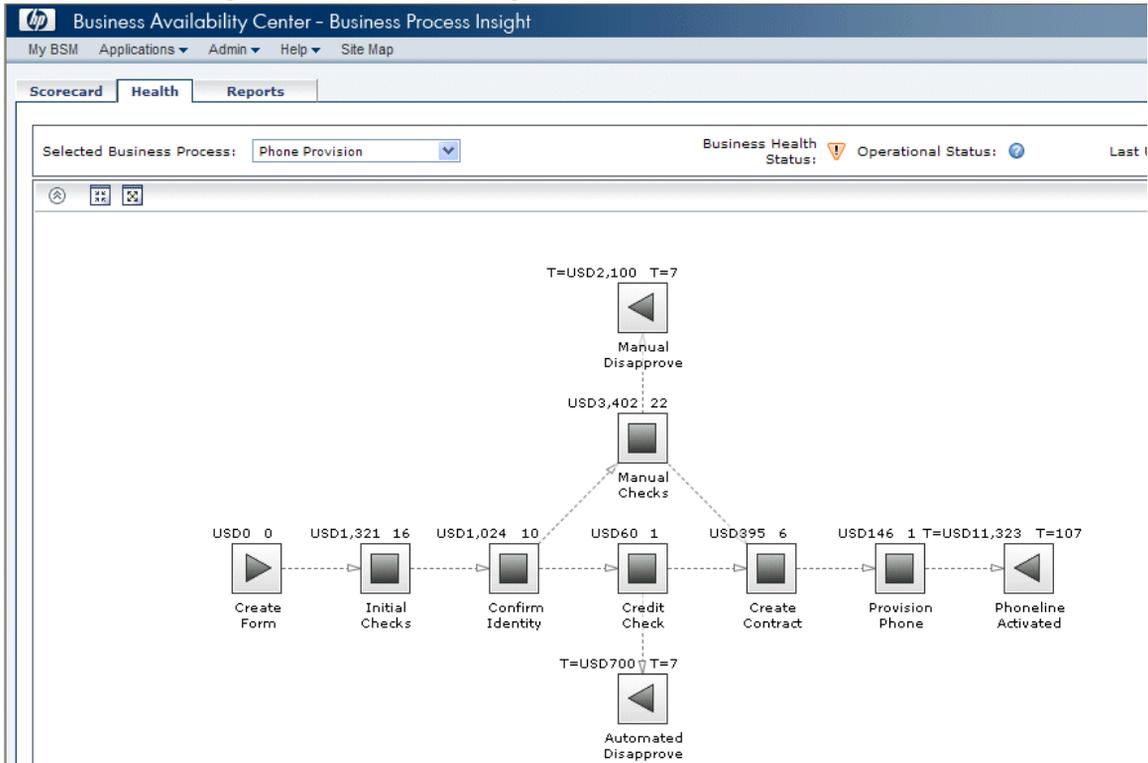
The Health Page tab is divided into the following areas, each of which provides more detailed information:

- Process Diagram; see [Process Diagram Area](#) on page 265
- Process Summary information; see [Summary Tab](#) on page 272
- Business Health information; see [Business Health Tab](#) on page 276
- Transaction information see section [Transactions Tab](#) on page 279

Process Diagram Area

Figure 21 shows the Process Diagram area on the Health Page.

Figure 21 Process Diagram Area



The Process Diagram shows the components and structure of the Business Process when created using the Modeler.

This enables you to visualize the Business Process, which includes the Step annotations to indicate how many process instances are active at a particular step and the process values.

When displayed in the Process Diagram page, the Business Process layout is the same as when created in the Modeler.

The data displayed on the Health page changes according to whether you select:

- the whole process; in this case, the data relates to all the instances for all the Steps in the process.
- a specific process Step; in this case, the data relates to all the instances for the selected Step.

Click a specific Step to obtain data for the Step. Click anywhere in the process diagram area, but not another Step, to deselect it and move to a whole process view.

[Table 52](#) describes the elements of the Process Diagram Area (unlabeled GUI elements are shown in angle brackets>):

Table 52 Process Diagram

GUI Element (A-Z)	Description
Selected Business Process	Click to open a drop-down list where you can select a different Business Process that you want to display on the Health page.
Business Health Status	Overall Business Health of the Business Process. The worst case status is presented here.
Operational Status	Overall IT operational resource status for the Business Process. The worst case status is presented here. This is the IT operational resource status as it is known to BPI.
Last Update	The date and time the data presented on the Health page was last updated. Note: If you have configured a delay for sending data samples to BAC, the data presented is not for Last Update time, but for the Last Update time adjusted by the delay you have configured; refer to section “Data Sample Settings” on page 133 for more information.

Table 52 Process Diagram

	<p>Click this icon to collapse and expand the pane where the Process Diagram is located. This allows more room for the tabbed areas below the diagram.</p> <p>The arrows point upwards when the process diagram is displayed.</p>
	<p>This and the icon that follows enable you to toggle between a fit-to-pane view and a normal view.</p> <p>Click this icon to stretch or shrink the Process Diagram such that it fits within the available space.</p>
	<p>This and the icon above enables you to toggle between a fit-to-pane view and a normal view.</p> <p>Click this icon to revert the Process Diagram to the size it was when defined within the Modeler</p>
	<p>This icon is the Step that represents a normal starting point for a process.</p> <p>Note: A visual representation of the health of the Business Process with respect the IT operational resources on which it depends. The health of each Step is shown as an icon overlay. Step Overlay on page 270 describes these overlays and their meaning.</p> <p>Customization: You can customize the Step graphic as described in Chapter 13, Annotations for Process Diagrams.</p>

Table 52 Process Diagram

	<p>This icon is the Step that represents an activity within your Business Process, for example, a check for account details.</p> <p>Note: A visual representation of the health of the Business Process with respect the IT operational resources on which it depends is shown in terms of an icon overlay. Step Overlay on page 270 describes these overlays and their meaning.</p> <p>Customization: You can customize the Step graphic as described in Chapter 13, Annotations for Process Diagrams.</p>
	<p>This icon is the Step that represents a normal end point for a process.</p> <p>Note: A visual representation of the health of the Business Process with respect the IT operational resources on which it depends is shown in terms of an icon overlay. Step Overlay on page 270 describes these overlays and their meaning.</p> <p>Customization: You can customize the Step graphic as described in Chapter 13, Annotations for Process Diagrams.</p>
	<p>This icon represents a junction point within your Business Process and is a visual Step and is used to help define the structure of the Business Process.</p> <p>It shows the start and end point of a structural element in the process and has no IT operational resource status or count and value information associated with it.</p>

Table 52 Process Diagram

<Normal Arc>	<p>Process Steps are linked using Arcs, which are dotted lines that join Steps. The Arc shows the direction of the flow in the Business Process; they do not imply any sequence or processing order, but they do imply an expected order. Arcs are not enforced; however, they are used when determining the business impact status of the process.</p> <p>If you want to know when the Steps in your process are executed in an unexpected order, use a Sequence Arc.</p>
<Sequence Arc>	<p>A Sequence Arc is a solid line and is a notification that the Steps, which are connected by the arc, are not being activated in the correct order. The connect order is determined by the direction of the arc between the steps.</p>
<Step overlay>	<p>A visual representation of the health of the Business Process with respect the IT operational resources on which it depends. The health of each Step is shown as an icon overlay.</p> <p>The Step overlay provides additional information to show the health of the of the selected Business Process with respect to the IT operational resources on which the process depends; see section Step Overlay on page 270 for more information about the meanings of the overlays.</p>
<Text below the Step icon>	<p>This is the name of the Step as entered in the BPI Modeler when the process was created; for example: Confirm Identity.</p>

Table 52 Process Diagram

<Text in upper left-hand corner of Step icon>	<p>In the case of an Activity Step, this represents the total Business Process value of all the instances that are currently active at that Step.</p> <p>In the case of an End Step, this represents the total value of all the instances that have completed at that Step.</p> <p>If the locale for the system is set, a currency symbol appears with the text for values that are currencies.</p> <p>Customization: You can customize this text as described in Chapter 13, Annotations for Process Diagrams.</p>
<Text in upper right-hand corner of Step icon>	<p>This is the count of the number of instances that are currently active at the Step. The End Step shows the total of the completed instances for the business; this is the total of all instances since the process was deployed in the Modeler or the counts were reset.</p> <p>If the locale for the system is set correctly, the count is displayed in a locale-sensitive format.</p> <p>Customization: You can customize this text as described in Chapter 13, Annotations for Process Diagrams.</p>

Step Overlay

The Step Overlays provide additional information on the Process Diagram to show the health of the Business Process. This is the health of the Business Process in terms of the IT infrastructure of the underlying systems on which the individual Business Process Steps are linked. The IT infrastructure is linked to the Steps in your Business Process when you model the process using the BPI Modeler.

The overlays are presented as visual representations and are shown in terms of an icon overlay on the Step of the Business Process.

The diagram displays the operational status as an overlay on a Step if the status is OK or above.

Table 53 describes the overlays in more detail (unlabeled GUI elements are shown in angle brackets>):

Table 53 Icon Overlays

GUI Element (A-Z)	Description
	A system health status of OK . All the system KPIs fell within their configured settings.
	A system health status of Warning . The worst status of any system KPI, for a dependent CI, was reported as a warning (using the worst-child rule).
	A system health status of Minor . The worst status of any system KPI, for a dependent CI, was reported as minor (using the worst-child rule).
	A system health status of Major . The worst status of any system KPI, for a dependent CI, was reported as major (using the worst-child rule).
	A system health status of Critical . The worst status of any system KPI, for a dependent CI, was reported as critical (using the worst-child rule).
	The system health status is No Data . This means there is insufficient data to make a decision on the system health status.

Summary Tab

Figure 22 is an example of the Summary Tab on the Health Page.

Figure 22 Summary Tab



The Summary Tab shows business and operational summary information relating to either the selected Business Process (Table 54), or the selected Process Step (Table 55).

If you select a Business Process, you can then select specific categories of process instances; for example, blocked instances. You are then moved to the Instances Details page, where the list of instances is filtered to show only those process instances that are blocked.

Table 54 describes the elements presented on the Summary Tab when the Business Process is selected; that is, you have not selected a specific Step in the Business Process (unlabeled GUI elements are shown in angle brackets):

Table 54 Summary Tab for a Business Process

GUI Element (A-Z)	Description
<Name>	The name of Business Process is shown in the title bar of the tabs area and is the name of the Business Process as entered using the Modeler.
Description	Content of description field entered using Modeler. If no description is provided, [NA] is displayed as a value.

Table 54 Summary Tab for a Business Process

Business Impact	<p>Breakdown of the health status of all the process instances for the selected Business Process. It includes instances that are:</p> <ul style="list-style-type: none">• Healthy• At Risk• Blocked <p>Section Process Status on page 311 provides more details about the status field.</p> <p>Click the status label to open the Process Instances Page, which is filtered to show only instances with the selected status; see section Instances Dialog on page 280.</p>
Instances	<p>Numbers of instances for the Business Process in each of the specified statuses; see section Process Status on page 311 for a description of the status field.</p> <p>The total Count for all instances is also presented and the count of Violations.</p>
Value	<p>Value of the instances for the Business Process in each of the specified statuses; see section Process Status on page 311 for a description of the status field.</p> <p>The total Value for all instances is also presented.</p>
Completed	<p>Click to open the Process Instances Page, which is filtered to show only instances with the status of Completed.</p>
<Scorecard summary>	<p>Scorecard display for the selected Business Process showing the over-time bar; see also Chapter 10, BPI Application Scorecard.</p>

Table 55 describes the elements presented on the Summary Tab when a specific Business Process Step is selected (unlabeled GUI elements are shown in angle brackets)

Table 55 Summary Tab for a Business Process Step

GUI Element (A-Z)	Description
<Name/Step name>	Name of Business Process and the Business Process Step is shown in the title bar of the tabs area and is the name of the Business Process and Business Process Step as entered using the Modeler.
Description	Content of description field for the Business Process Step when entered using the Modeler. If no description is provided, [NA] is displayed as a value.
Instances	<p>Lists the Active instances for the selected Step.</p> <p>Active instances are still progressing through the process.</p> <p>Click the <code>Total Active</code> link to open the Instances Page; see section Instances Dialog on page 280. The instances page is filtered to show all the process instances for the selected Step within the selected Business Process.</p> <p>Click <code>Violations</code> to open the Instances Violations Page; see section Instance Violations Dialog on page 292.</p>
Count	<p>Label for the instance counts, which lists the number of Active instances at the selected Step.</p> <p>Active instances are still progressing through the process.</p>

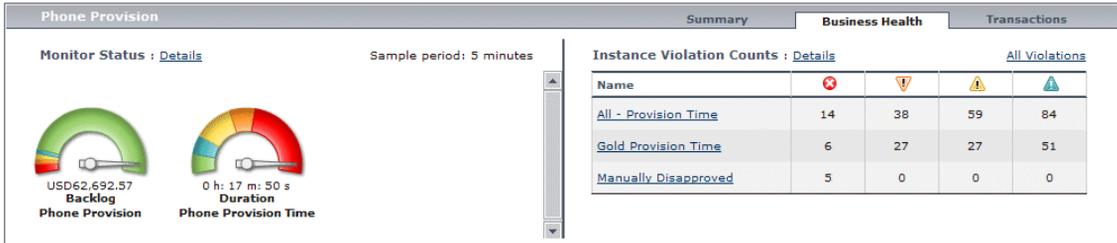
Table 55 Summary Tab for a Business Process Step

Value	Labels for the value, which lists the values of the instances that are Active at the selected Step. Active instances are still progressing through the process.
<Scorecard summary>	Scorecard display for the complete Business Process Step showing the over-time bar; see also Chapter 10, BPI Application Scorecard .

Business Health Tab

Figure 23 shows an example of the Business Health Tab on the Health Page.

Figure 23 Business Health Tab



The Business Health tab displays:

- objective dials for the objectives set on a KPI associated with a Business Process Monitor using the option:

Admin > Dashboard > KPIs

See section [Business Health Dials](#) on page 277 for more details.

- a table showing the Instance Violation Counts for the selected Business Process or Business Process Step; see section [Instance Violation Counts](#) on page 278.
- Violation details for the selected Business Process or Business Process Step.

Click to open the Violations page; see section [Instance Violations Dialog](#) on page 292.

Business Health Dials

When you open the Business Health tab, you are presented with a series of dials representing the KPI objective statuses that you have configured.

The dials provide a visual representation of the business objectives that have been set on KPIs associated with Business Process Monitor CIs.

The dial shows the current monitor value and is formatted according to the type of monitor CI. The needle on the dial indicates status of the Business Process Monitor value with respect to the objectives that have been set for the Monitor CI.

The name of the KPI and the appropriate Process or Process Step name are displayed below the dial.

If the dial represents objectives set on a custom monitor, the KPI name is shown as the custom monitor data units value.

There is a tooltip for each dial showing the monitor status, plus the monitor and objective values. The background color for the tooltip indicates the Business Process Monitor CI status.

You can select a dial and drill down for more information, according to the Monitor scope, as follows:

- For dials representing Business Process Monitors and Custom Monitors configured using the Monitor Definer, you can drill down to the Monitors Over Time Report; see section [BPI Monitors Over Time](#) on page 325.
- For dials representing process Step monitors, you can drill down to the Business Process Step Over time Report; see section [Business Process Step Over Time Report](#) on page 337

You can also drill down to the Monitors page for more details of the Monitors; see section [Monitor Dialog](#) on page 295.

The KPI status shows the current status of all the KPIs for which you have set objectives.

Instance Violation Counts

In addition to the dials, the Business Health option presents an Instance Threshold table summaries for the selected Business Process or Business Process Step.

The Instance Threshold table show the status of the instance Thresholds over the latest collection period and as adjusted by any delay that you might have configured for your data samples; see section “Data Sample Settings” on page 133. for more details.

You can select an Instance Threshold and drill down to the Threshold Violations table for more information on the individual threshold instances.

The status of the instance threshold is shown and described in [Table 53](#) on page 271.

You can also click the [All Violations](#) link to open the Violation page, which is filtered to show violations for the selected Business Process, or Business Process Step; see section [Instance Violations Dialog](#) on page 292.

Transactions Tab

Figure 24 is an example of the Transaction Tab on the Health Page.

Figure 24 Transaction Tab

Phone Provision		Summary	Business Health	Transactions
Found 4 Business Transactions		● Normal ▲ Warning ▲ Minor ▼ Major ● Critical ● Unknown		
Business Transactions	Availability			
Transaction A	0			
Transaction B	0			
Transaction C	0			
Transaction D	-			

The Transactions tab displays summary information relating to the TransactionVision CIs that are linked to the selected Business Process or Business Process Step.

Table 56 describes the Transactions Tab.

Table 56 describes the elements that are presented on the Transaction Tab. The elements are the same if you select the whole Business Process, or a Business Process Step (unlabeled GUI elements are shown in angle brackets):

Table 56 Transactions Tab

GUI Element (A-Z)	Description
Business Transactions	<p>The name of the Business Transaction as defined in TransactionVision and as linked to the BPI Business Process.</p> <p>Select a Business Transaction to view the TransactionVision Aggregated Topology report. See the TransactionVision Help for the TransactionVision Application under: Applications > TransactionVision</p>
<column data>	<p>The Status column displays the worst status value held by the Business Transaction's KPIs. The status icon tooltip lists the KPIs that hold this status.</p> <p>The Used By column lists the related Business Process steps for that Business Transaction.</p>

Instances Dialog

Figure 25 is an example of the Instances Dialog. This dialog is accessible directly from the Healthy, At Risk and Completed links on the Summary Tab of the Health page.

Figure 25 Instances Dialog

HP Business Availability Center - Business Process Insight

Process Instances

Phone Provision: Process Instances

Process Step : All Steps

Process Instances: Found 624 - showing most recent 10. [Export all as CSV.](#)

Identifier Search Instance Status: Any Maximum List Size : 10

Identifier	Process Value	Start Time	End Time	Status
657	USD299.95	04/11/08 17:26:38 GMT	--	At Risk
656	USD145.78	04/11/08 17:26:35 GMT	--	At Risk
655	USD109.99	04/11/08 17:26:32 GMT	--	At Risk
654	USD105.95	04/11/08 17:26:28 GMT	--	At Risk
653	USD99.99	04/11/08 17:26:27 GMT	--	At Risk
648	USD85.60	04/11/08 17:26:26 GMT	--	At Risk
647	USD29.95	04/11/08 17:26:24 GMT	--	At Risk
646	USD155.65	04/11/08 17:26:17 GMT	--	At Risk
645	USD55.95	04/11/08 17:26:15 GMT	--	At Risk

Healthy At Risk Blocked Completed

Close Help

The Process Instances dialog displays information relating to the process instance counts. The display is filtered according to the status of the instances and whether the instance counts have been requested from a Business Process, or a Step context. The most recent instances are listed first.

- Section [Process Instances for a Selected Business Process](#) on page 281 describes the information for a selected Business Process.
- Section [Process Instances for a Selected Business Process Step](#) on page 283 describes the information for a selected Business Process Step.

Process Instances for a Selected Business Process

This section describes the Process Instances dialog when selected from a Business Process context. The Process Instances dialog is divided into the following areas:

- Instances Dialog settings; see [Table 57](#)
- Instances Dialog results area; see [Table 58](#)

[Table 57](#) describes the elements for the settings area of the Instances dialog (unlabeled GUI elements are shown in angle brackets>):

Table 57 Instances Dialog Settings

GUI Element (A-Z)	Description
Process Step	Indicates the selection criterion for the dialog. You can list all the steps in the selected process, or you can select a specific Step and list only the Instances that are active at the Step. The number of Process Instances found and the number of Process Instances listed in the results area is displayed underneath Process Step.
Identifier	The Identifier of the Process Instance that you want to list in the results area. You can search for a specific instance, or leave this field blank if you want to list all Process Instances. Wildcard searches are also available.
Instance Status	The status of the Process Instances that you want to list in the results area. Select the value Any to list all Process Instances in all states.

Table 57 Instances Dialog Settings

Maximum List Size	The number of Process Instances that you want to list in the results area. You can select from a list size of 12, 20 50 or 100.
Export all	<p>Enables you to export all the process instances and their values to a file in comma separated value (CSV) format. You can optionally include Data definition values when exporting the process instance information; this is set from the Servlet Engine option within the BPI Administration Console; see section Component Configuration - Servlet Engine on page 89.</p> <p>The exported CSV file can then be imported into Microsoft Excel for analysis.</p>

[Table 58](#) describes the elements in the results area (unlabeled GUI elements are shown in angle brackets):

Table 58 Instances Dialog Results Area

GUI Element (A-Z)	Description
Identifier	The identifier for the Process Instance. Click to open the Process Instance page to obtain more information relating to the selected Process Instance; see section Process Instance Dialog on page 287.
Process Value	<p>The content of the Value attribute for the listed Process Instance.</p> <p>Process Value is based on the Process Value property of the Business Process. The Process Value is assigned when you create the Business Process in the Modeler, the value is typically assigned from a Business Event when the processes is active.</p>
Start Time	The time that this Process Instance fulfilled the Start Condition for the Start Step.

Table 58 Instances Dialog Results Area

End Time	The time that this Process Instance fulfilled the End Condition for the End Step, if applicable.
Status	The status of the listed Process Instance, and can be one of: <ul style="list-style-type: none"> • Healthy • At Risk • Blocked • Completed See section Process Status on page 311 for descriptions of the status values.

Process Instances for a Selected Business Process Step

This section describes the Process Instances dialog when selected from a Business Process Step view.

The Process Instances dialog is divided into the following areas:

- Instances Dialog settings; see [Table 59](#)
- Instances Dialog results area; see [Table 60](#)

[Table 59](#) describes the elements for the settings area (unlabeled GUI elements are shown in angle brackets):

Table 59 Instances Dialog Settings

GUI Element (A-Z)	Description
Step Name	Select box that shows the current selection criterion for the dialog. You can list all the instances in the selected process, or you can select a specific Step and list only the Instances that are active at the Step.
<Step Name>	Name of the selected Step

Table 59 Instances Dialog Settings

Operational Status	<p>Status of selected Step, and can be one of:</p> <ul style="list-style-type: none">• Healthy• At Risk• Blocked• Completed <p>See section Process Status on page 311 for descriptions of the status values.</p>
Average Duration (H:M:S)	<p>The average time taken for all process instances to fulfill the Start and End condition for the Step. This time is measured across all the instances that have passed through this Step.</p> <p>A value for this field is provided only when there is sufficient data to generate a statistical result.</p>
Instance Rate (per hour)	<p>The rate at which instances of the step are being completed, expressed as an hourly rate.</p> <p>A value for this field is provided only when there is sufficient data to generate a statistical result.</p>
Process Value Rate (per hour)	<p>The value of the process instances as they are processed on an hourly basis.</p> <p>A value for this field is provided only when there is sufficient data to generate a statistical result.</p>
Identifier	<p>The Identifier of the Process Instance that you want to list in the results area. Leave this field blank if you want to list all Process Instances for the selected Step.</p>
Step Status	<p>The status of the Process Instances that you want to list in the results area.</p> <p>Select the value <code>Any</code> to list all Process Instances in all states.</p>

Table 59 Instances Dialog Settings

Maximum List Size	The number of Process Instances (Active and Completed) that you want to list in the results area. You can select from a list size of 8, 20 50 or 100.
Export all	Enables you to export all the process instances and their values to a file in comma separated value (CSV) format. You can optionally include Data definition values when exporting the process instance information; this is set from the Servlet Engine option within the Administration Console; see section Component Configuration - Servlet Engine on page 89. The exported CSV file can then be imported into Microsoft Excel for analysis.

The following elements are included (unlabeled GUI elements are shown in angle brackets>):

Table 60 Instances Dialog Results Area

GUI Element (A-Z)	Description
Identifier	The identifier for the Process Instance. Click to open the Process Instance page to obtain more information relating to the selected Process Instance; see section Process Instance Dialog on page 287.
Process Value	The content of the Value attribute for the listed Process Instance.
Process Start Time	The time that this Process Instance fulfilled the Start Condition for a Start Step.

Table 60 Instances Dialog Results Area

Step Start Time	The time that this Process Instance fulfilled the Start Condition for the selected Step. If a Step fulfils its Start Condition multiple time, the most recent start time is listed.
Step Stop Time	The time that this Process Instance fulfilled the End Condition for a selected Step.

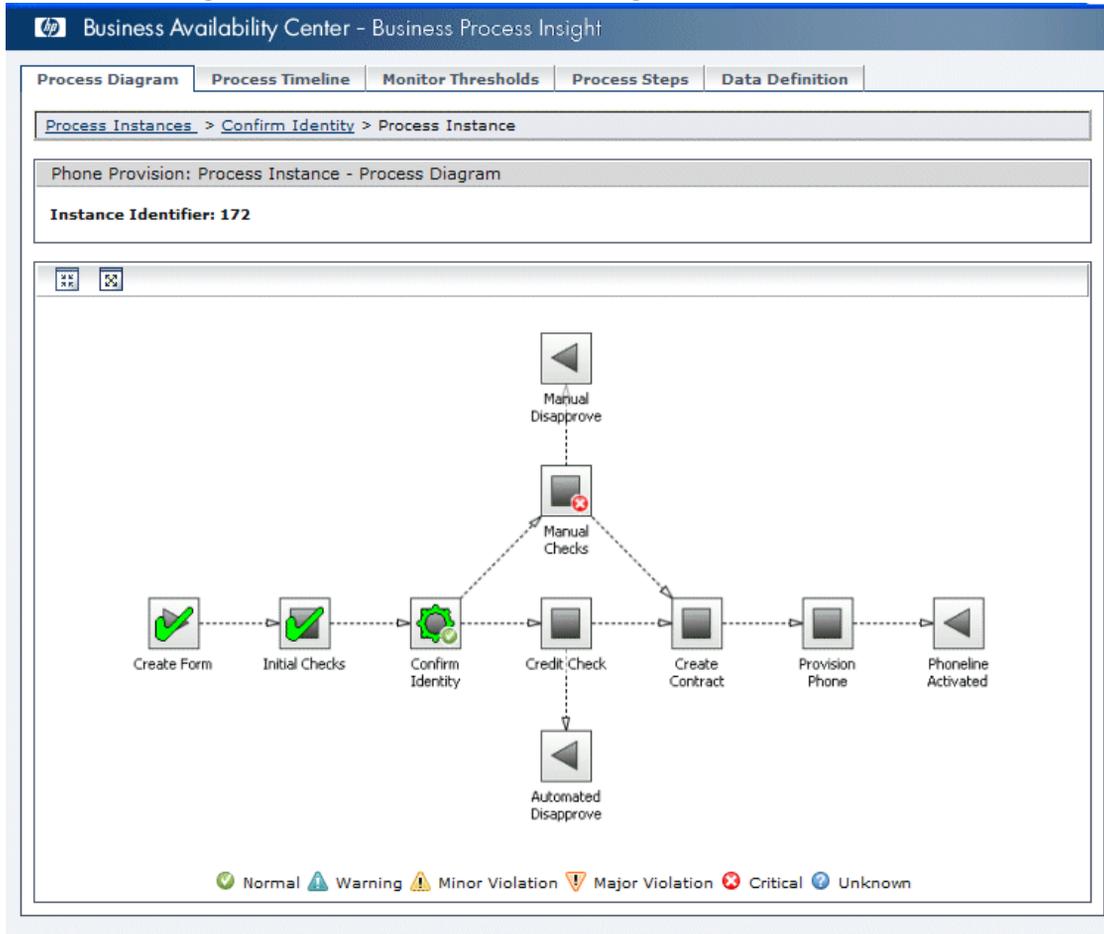
Process Instance Dialog

Figure 26 is an example of the Process Instance dialog.

This dialog is accessible from the:

- Instances dialog; see section [Instances Dialog](#) on page 280.
- Monitor dialog; see section [Monitor Dialog](#) on page 295.
- Monitor Threshold dialog; see section [Monitor Threshold Dialog](#) on page 304.
- Violations dialog; see section [Instance Violations Dialog](#) on page 292.

Figure 26 Process Instance Dialog



Displays information relating to the selected process instance.

The Process Instance dialog is divided into the following tabbed areas:

- [Process Diagram](#) on page 289
- [Process Timeline](#) on page 289
- [Monitor Thresholds](#) on page 289
- [Process Steps](#) on page 289
- [Data Definition](#) on page 290

Process Diagram

This shows the process diagram for the selected Process Instance; see section [Process Diagram Area](#) on page 265 for a description of the process diagram.

Click a Step in the process diagram and open the Step Instance dialog; see section [Step Instance Dialog](#) on page 291.

Process Timeline

This shows the Process Instance details as a time line, so you can easily see the order in which Steps are executed and graphically see the length of time spent at each Step.

Click a Step on the timeline and open the Step Instance dialog; see section [Step Instance Dialog](#) on page 291.

Monitor Thresholds

This shows the monitor instance threshold details. Each instance threshold is shown in the form of a dial. The dial shows the status of the Monitor Instance Threshold.

Click the associated Monitor to open the Monitor dialog; see section [Monitor Dialog](#) on page 295.

Click the instance threshold name to open the Threshold instance dialog; see section [Monitor Threshold Dialog](#) on page 304.

Process Steps

This page lists the details of selected Process Step and includes:

- Step Name
- time taken to complete the Step
- time that the Process Instance fulfilled the Start Condition for the Step

- time that the Process Instance fulfilled the End Condition for the Step.
- whether or not the Step fulfilled its start condition more than once.

Click a specific Step to open the Step Instance dialog; see section [Step Instance Dialog](#) on page 291.

Data Definition

This page lists the Data definition property values for the Associated Data definition that has been defined in the Modeler for the Business Process as follows:

- **Property Name**
The name of the Data Definition property as entered in the Modeler.
- **Property Value**
The value for the Data Definition property at the selected Step.

If you have configured BPI to integrate with TransactionVision, an additional column is listed. This column provides a link to the Transaction Tracking Report (managed by TransactionVision) for the selected Data Definition property. The Transaction Tracking Report is generated using the filter criteria that you have specified for the process instance.

Step Instance Dialog

This page lists all the instances that have fulfilled their Start and End conditions for the selected Step, and includes the following details:

- Details relating to the selected Step:
 - Name
The name of the selected Step.
 - Step Status
The status of the selected Step, see section [Process Status](#) on page 311 for details of the possible statuses for the Step.
 - Overall Step Duration (H:M:S)
The time taken to complete the Process Step.
- Maximum List Size
A drop-down list box that enables you to configure the number of items that appear in the list.
- Paired Start and End Times
This is a list of the history of the Step with respect to the number of times the selected instance has fulfilled the Start and End Conditions for the Step; it includes the Duration, Start Time and End Time.

Instance Violations Dialog

Figure 27 is an example of the Instances Violation dialog, which is accessible from the All Violations link on the Health Tab.

Figure 27 Instances Violations Dialog

Time Threshold Violated	Time Violation Raised	Monitor Name	Threshold Name	Monitor Value At Time Of Threshold Violation	Violation Level	Process Identifier
14-Aug-2008 00:20:50 BST	14-Aug-2008 04:53:39 BST	Phone Provision Time by Region	All - Provision Time	0 h: 5 m: 0 s	Critical	46204
14-Aug-2008 00:20:48 BST	14-Aug-2008 04:53:39 BST	Phone Provision Time by Region	All - Provision Time	0 h: 5 m: 0 s	Critical	16531
14-Aug-2008 00:20:46 BST	14-Aug-2008 04:53:39 BST	Phone Provision Time by Region	All - Provision Time	0 h: 5 m: 0 s	Critical	16550
14-Aug-2008 00:20:42 BST	14-Aug-2008 04:53:39 BST	Phone Provision Time by Region	All - Provision Time	0 h: 5 m: 0 s	Critical	16548
14-Aug-2008 00:20:42 BST	14-Aug-2008 04:53:39 BST	Phone Provision Time by Region	All - Provision Time	0 h: 5 m: 0 s	Critical	45576
14-Aug-2008 00:20:40 BST	14-Aug-2008 04:53:39 BST	Phone Provision Time by Region	All - Provision Time	0 h: 5 m: 0 s	Critical	45575
14-Aug-2008 00:20:39 BST	14-Aug-2008 04:53:39 BST	Phone Provision Time by Region	All - Provision Time	0 h: 5 m: 0 s	Critical	45571
14-Aug-2008 00:20:38 BST	14-Aug-2008 04:53:39 BST	Phone Provision Time by Region	All - Provision Time	0 h: 5 m: 0 s	Critical	16547
14-Aug-2008 00:20:36 BST	14-Aug-2008 04:53:39 BST	Phone Provision Time by Region	All - Provision Time	0 h: 5 m: 0 s	Critical	16546
14-Aug-2008 00:20:36 BST	14-Aug-2008 04:53:39 BST	Phone Provision Time by Region	All - Provision Time	0 h: 5 m: 0 s	Critical	46202

The Instance Violation dialog lists all the Threshold Violations instances related to the selected Business Process, or Business Process Step.

The most recent instance Threshold violations are listed first.

[Table 61](#) lists the elements for the Instance Violation settings (unlabeled GUI elements are shown in angle brackets):

Table 61 Instance Violation Settings

GUI Element (A-Z)	Description
Step Name	The Step Name for the single-step Monitor.
Identifier	Enter a Process Identifier to list violations related to a specific process instance. Leave this blank to list violations for all process instances, or enter a partial string to search.
Severity	Select a severity level (Warning, Minor, Major or Critical) to list violations that are greater than or equal to a specific violation level. Enter All to list all violation levels.
Maximum List Size	The number of instance violations that you want to list in the results area. You can select from a list size of 10, 20 50 or 100.
Export all as CSV	Enables you to export all the process instances and their values to a file in comma separated value (CSV) format. You can optionally include Data definition values when exporting the process instance information; this is set from the Servlet Engine option within the Administration Console; see section Component Configuration - Servlet Engine on page 89. The exported CSV file can then be imported into Microsoft Excel for analysis.

The following elements are included (unlabeled GUI elements are shown in angle brackets):

Table 62 Instance Violation Results Area

GUI Element (A-Z)	Description
Time Threshold Violated	The time that the instance threshold condition was violated.

Table 62 Instance Violation Results Area

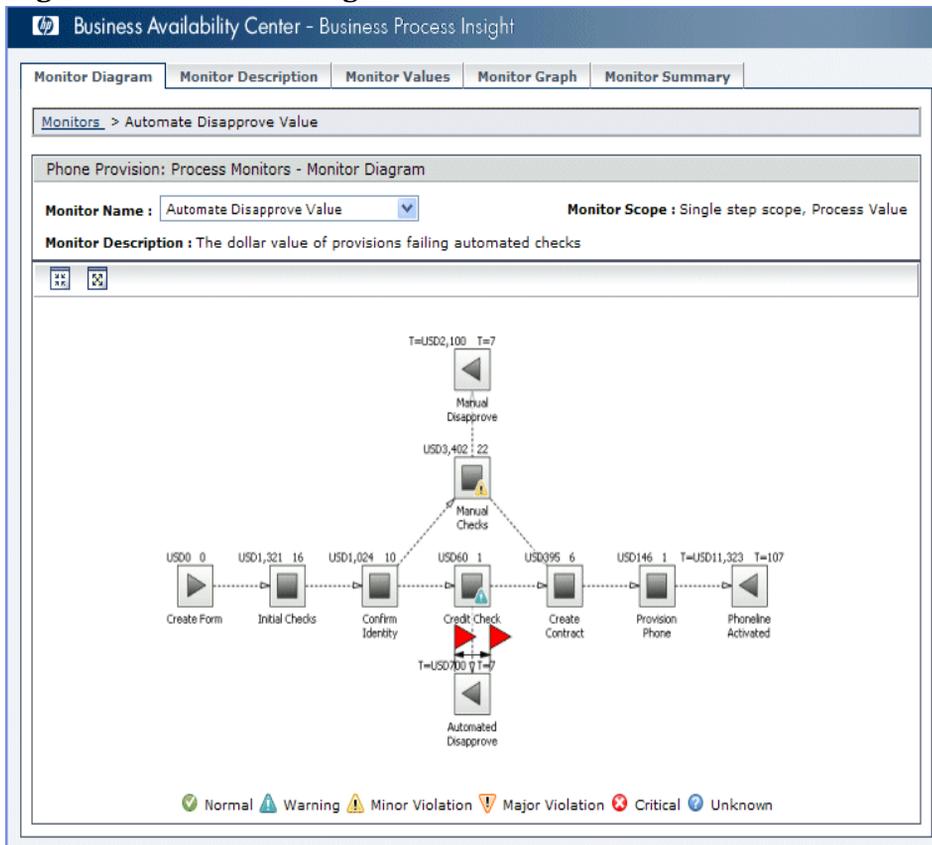
Time Threshold Raised	<p>The time that the instance threshold condition was detected by BPI.</p> <p>The time that a instance threshold is detected can be different if you have stopped the BPI Monitor Engine, or the BPI system has been disabled for some reason.</p>
Monitor Name	<p>Name of the Monitor that this instance threshold is defined for.</p> <p>Click to open the related Monitor Dialog; see section Monitor Dialog on page 295.</p>
Threshold Name	<p>Name of the instance threshold.</p> <p>Click to open the related Monitor Threshold dialog; see section Monitor Threshold Dialog on page 304.</p>
Monitor Value At Time of Threshold Violation	<p>Value of Monitor when instance threshold was violated.</p>
Severity	<p>Level of the violation, which can be one of:</p> <ul style="list-style-type: none">• Normal• Warning• Minor• Major• Critical <p>For descriptions of the violations, refer to <i>Understanding KPI Statuses</i> in the Using Dashboard section of the BAC documentation library.</p>
Process Identifier	<p>Identifier for Process Instance listed for the selected Step and affected by the instance threshold violation.</p> <p>Click to open the related Process Instance page; see section Process Instance Dialog on page 287.</p>

Monitor Dialog

Figure 28 is an example of the Monitor dialog, which is accessible from the:

- Business Health Tab; see section [Business Health Tab](#) on page 276.
- Process Instance dialog; see section [Process Instance Dialog](#) on page 287.
- Monitors dialog; see section [Monitor Dialog](#) on page 295.
- Violations dialog; see section [Monitor Threshold Dialog](#) on page 304.
- Monitor Threshold dialog; see section [Monitor Threshold Dialog](#) on page 304.

Figure 28 Monitor Dialog



Shows the data collected that relates to the Business Process Monitors that you defined for a Business Process.

The Monitor dialog is divided into the following tabbed areas:

- [Monitor Diagram](#) on page 296
- [Monitor Description](#) on page 296
- [Monitor Values](#) on page 297
- [Monitor Graph](#) on page 300
- [Monitor Summary](#) on page 303

Information about defining Business Process Monitors can be found in the:

- *Business Process Insight Modeler Online Help*
- *Integration Training Guide - Modeling Processes*

Monitor Diagram

This page shows a graphical representation of the selected Monitor as a process diagram, see section [Process Diagram Area](#) on page 265 for a description of the process diagram.

Click a Step on the process diagram to open the `Process Instances` dialog in the selected Step context.

The additional information on the process diagram are the red flags. These red flags reflect those added when you defined the Monitor in the Monitor Definer and show the start and end points for this Monitor Definition. The flags do not appear in the case of a Business Process Monitor with a scope of `Whole Process`.

Monitor Description

This page displays the details of the Monitor as defined when you created the Monitor using the Monitor Definer:

- Monitor Name
- Monitor Description
- Monitor Scope

In the case of a Monitor Definition that has been defined with a scope of `Single Step` or `Multiple Step`, the `Start Step` and `End Step` values are also listed.

You can use this page to gain an overview of all the monitors reported for the selected process.

Monitor Values

This page lists the values for the Monitor instances, starting with the most recent.

The page is divided into an area to set the filter criteria ([Table 63](#)) and a results area. The results shown in the results area varies according to whether you are viewing a Value or Duration Monitor:

- [Table 64](#) describes the Value Monitor.
- [Table 65](#) describes the Duration Monitor.

[Table 63](#) describes the elements for the Monitor Instance settings (unlabeled GUI elements are shown in angle brackets):

Table 63 Monitor Instance Settings

GUI Element (A-Z)	Description
Monitor Name	Name of the selected Monitor. The number of Monitor Instances found and the number of Monitor Instances listed in the results area is displayed underneath Monitor Name.
Process Identifier	Enter a Process Identifier to filter the list based on a specific Process Instance, or leave the field blank to filter on all instances.
Monitor Status	Select the value of the status for the Monitor that you want to filter the results on: <ul style="list-style-type: none">• All• Active• Completed

Table 63 Monitor Instance Settings

Maximum List Size	The number of Monitor instances that you want to list in the results area. You can select from a list size of 10, 20 50 or 100.
Export All as CSV	Enables you to export all the Monitor instance data to a file in comma separated value (CSV) format. The exported CSV file can then be imported into Microsoft Excel for analysis.

Table 64 describes the elements for the Monitor Instance results area for a Value Monitor (unlabeled GUI elements are shown in angle brackets):

Table 64 Monitor Instance Results Area - Value Monitor

GUI Element (A-Z)	Description
Process Identifier	The identifier for the Process Instance.
Start Time	Time when process instance entered the scope of the Monitor.
End Time	Time when process instance exited the scope of the Monitor.
Monitor Status	Status of the Process Instance, which can be one of All, Active or Completed,

Table 64 Monitor Instance Results Area - Value Monitor

Process Value	The configured value of each Process Instance that is currently within the scope of the monitor
Severity	<p>The worst status of any instance threshold in this monitor and which the process instance has violated. The status can be:</p> <ul style="list-style-type: none"> • Normal • Warning • Minor • Major • Critical • Unknown <p>For descriptions of the violations, refer to <i>Understanding KPI Statuses</i> in the Using Dashboard section of the BAC documentation library.</p>

[Table 65](#) describes the elements for the Monitor Instance results area for a Duration Monitor (unlabeled GUI elements are shown in angle brackets):

Table 65 Monitor Instance Results Area - Duration Monitor

GUI Element (A-Z)	Description
Process Identifier	The identifier for the Process Instance.
Start Time	Time when process instance entered the Monitor scope.
End Time	Time when process instance exited the Monitor scope.
Monitor Status	Status of the Monitor instance, which can be one of All, Active or Completed,

Table 65 Monitor Instance Results Area - Duration Monitor

Monitor Duration	The value of the Monitor specified as a time.
Severity	<p>The worst status of any instance threshold in this monitor and that the process instance has violated. This status can be:</p> <ul style="list-style-type: none">• Normal• Warning• Minor• Major• Critical• Unknown <p>For descriptions of the violations, refer to <i>Understanding KPI Statuses</i> in the Using Dashboard section of the BAC documentation library.</p>

Monitor Graph

This page shows the Monitor results as a graph based on the statistics collected for the Monitor; these statistics are selected from the `Data Aggregation Method`. The graph can be either a bar chart or a line. The data shown on the graph is tailored to your filter criteria. When you have completed the settings for the filters, the graph is drawn automatically as required.

The page is divided into an area to select the filter criteria ([Table 66](#)) and a results area, which show the required data in graphical form.

Table 66 describes the elements of the Monitor Graph settings (unlabeled GUI elements are shown in angle brackets):

Table 66 Monitor Graph Settings

GUI Element (A-Z)	Description
Monitor Name	Name of the selected Monitor. You can change the Monitor that you want to see the results for using this drop-down selection box.
Data Aggregation Method	The statistical sources that you want to use as the data to be plotted on the graph.
Graph Type	Select the type of graph that you want to show. This can be either a bar chart, or a line graph.
Graphing Period	Select the time period that you want to plot results for. If you select All, then all the data collected is plotted.

Table 66 Monitor Graph Settings

Chart by group	If you have defined Groups for your Monitors, in the Monitor Definer, you have the option to chart your data using the Group definitions. Select <i>Yes</i> to chart using your Group definitions, or <i>No</i> to chart the data without using groups.
Export Graph as CSV	Enables you to export the statistical data plotted on the graph to a file in comma separated value (CSV) format. You can optionally include Data definition values when exporting the process instance information; this is set from the Servlet Engine option within the Administration Console; see section Component Configuration - Servlet Engine on page 89. The exported CSV file can then be imported into Microsoft Excel for analysis.
Export all data sources as CSV	Enables you to export all the statistical data for all the data sources to a file in comma separated value (CSV) format. You can optionally include Data definition values when exporting the process instance information; this is set from the Servlet Engine option within the Administration Console; see section Component Configuration - Servlet Engine on page 89. The exported CSV file can then be imported into Microsoft Excel for analysis.

Monitor Summary

This page displays summary information relating to recent and all values of the Monitor. The page includes:

- Recently Completed Monitor Values

The data relating to each listed Monitor value over the last collection interval (Data sample collection period).

- Monitor Values to date

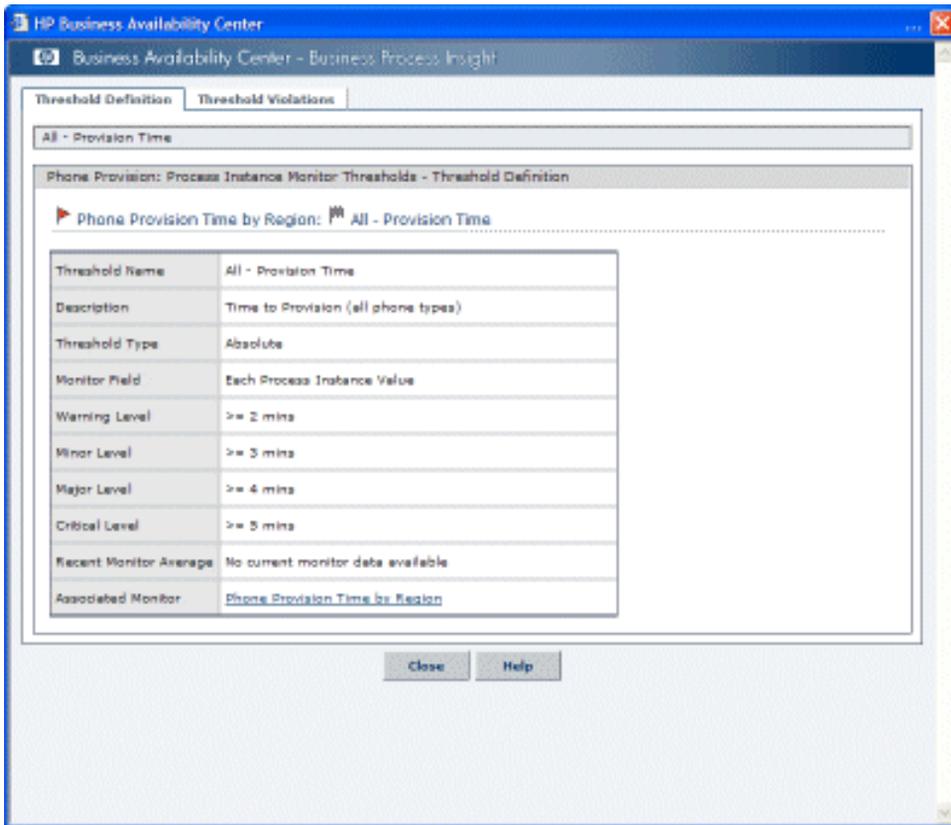
The data relating to each listed Monitor value since the Monitor was deployed.

Monitor Threshold Dialog

Figure 29 is an example of the Monitor Threshold dialog, which is accessible from:

- Health Page; see section [Business Health Tab](#) on page 276.
- Monitor dialog; see section [Monitor Dialog](#) on page 295 .
- Violations dialog; see section [Instance Violations Dialog](#) on page 292.

Figure 29 Monitor Threshold Dialog



Shows the statistical data collected that relates to the Business Process Monitor Thresholds that you defined in the Monitor Definer.

The Monitor Threshold dialog is divided into the following tabbed areas:

- [Threshold Definitions](#) on page 305
- [Threshold Violations](#) on page 306

Threshold Definitions

This tab displays the details of the Monitor Threshold as defined using the Monitor Definer:

- Threshold Name
- Description
- Threshold Type
- Monitor Field
- Warning Level
- Minor Level
- Major Level
- Critical Level

For descriptions of the violations, refer to *Understanding KPI Statuses* in the Using Dashboard section of the BAC documentation library.

The following is additional information relating to the parent Monitor Definition:

- Recent Monitor Average
The average Monitor value as measured over the latest collection interval; see section “Collection Interval” on page 177 for information relating to the collection interval.
- Associated Monitor, where you can link to the Monitor Page that shows information for the Monitor that is associated with the selected Threshold.

Threshold Violations

This tab displays a list of all the violations found for the selected instance threshold.

The data shown in the list is tailored to your filter criteria. When you have completed the settings for the filters, the list is populated automatically as required.

The page is divided into an area to select the filter criteria ([Table 67](#)) and a results area ([Table 68](#)), which show the required data in list form.

The following elements are included (unlabeled GUI elements are shown in angle brackets):

Table 67 Threshold Violation Settings

GUI Element (A-Z)	Description
Identifier	Enter a Process Identifier to list violations related to a specific process instance. Leave this blank to list violations for all process instances.
Severity	Select the violation level that you want to list. If you select the value <code>ALL</code> , all violation levels are listed.
Maximum List Size	The number of Threshold Violations that you want to list in the results area. You can select from a list size of 8, 20 50 or 100.
Export all as CSV	Enables you to export all the Threshold Violation data to a file in comma separated value (CSV) format. You can optionally include Data definition values when exporting the process instance information; this is set from the Servlet Engine option within the Administration Console; see section Component Configuration - Servlet Engine on page 89. The exported CSV file can then be imported into Microsoft Excel for analysis.

The following elements are included (unlabeled GUI elements are shown in angle brackets>):

Table 68 Threshold Violation Results Area

GUI Element (A-Z)	Description
Process Identifier	The identifier for the Process Instance. Click to open the Process Instance page to obtain more information relating to the selected Process Instance; see section Process Instance Dialog on page 287.
Time Threshold Violated	The time that the instance threshold condition was violated.
Time Violation Raised	The time that the instance threshold condition was detected by BPI. The time that an instance threshold is detected can be different if you have stopped the Monitor Engine, or the BPI or BAC system has been disabled for some reason.
Monitor Value At Violation Time	Value of parent Monitor instance at the point where the Violation occurred.
Severity	The level of the instance threshold violation, which can be: <ul style="list-style-type: none"> • Normal • Warning • Minor • Major • Critical • Unknown For descriptions of the violations, refer to <i>Understanding KPI Statuses</i> in the Using Dashboard section of the BAC documentation library.

Synchronization and Delay in Seeing Updates to Data

The data displayed on the BPI Scorecard and the BPI Reports is based on data sample data. The frequency that the data samples are sent are configured using the `Data samples` settings within the BPI Server Administration Console.

The remaining BPI Application data is obtained directly from the BPI Instance database.

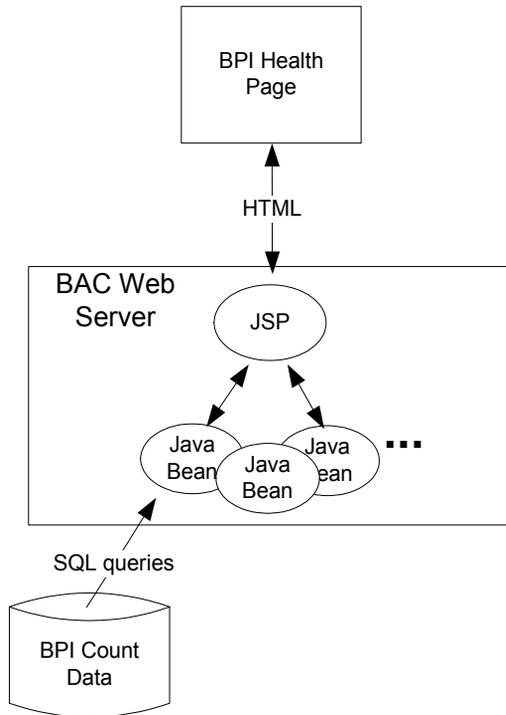
It is therefore possible that when you view data within the Health page that you might see a CI before it is available within either the Scorecard or the Reports.

BPI Instance and Violation Health Information

Some of the information presented from the Health pages (links from the Health Tab) is sourced directly from the BPI Server and some is sourced from the BAC system.

When you open the Health Page, the page comprises a set of Java Server Pages (JSPs) and Java beans, which run on the Web Server configured for your BAC installation. The data presented within the Process Diagram area, the Summary Tab and the Business Health Tab is sourced using the BAC Web Server, which obtains its count information directly, from the BPI Server database; see [Figure 30](#).

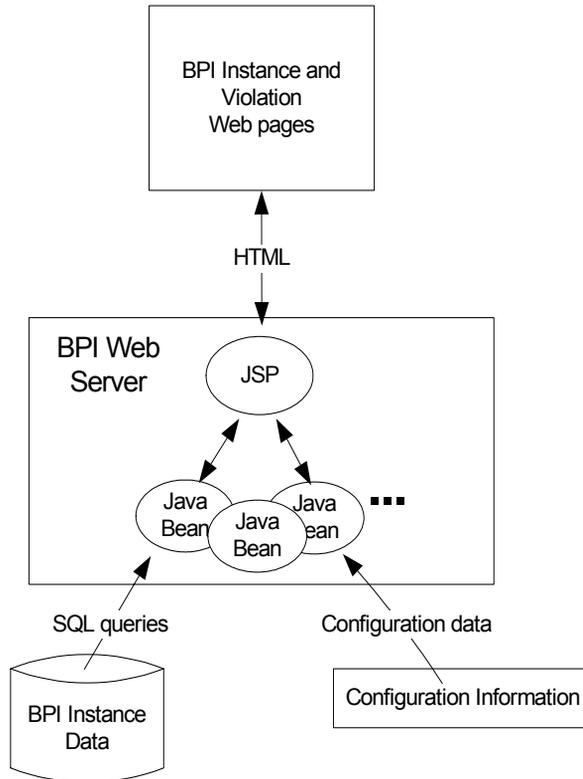
Figure 30 Health Page Count Data



If the BPI Server is not running for any reason, but the BPI Instance database is still available, this information can be seen using within the Health Pages. If the Business Impact Engine database is not available, this count data is not available within the Health pages.

The BPI Instance and Violation pages, which you access when you drill down from the top-level Health page to subordinate pages and dialogs, are managed by a set of Java Server Pages (JSPs) and Java beans. These JSPs run on the Web Server configured for the BPI installation and the instance and violation data is obtained from the BPI Instance database; see [Figure 31](#).

Figure 31 Instance and Violation Information



If the BPI Server, or Servlet Engine, is not running for any reason, this information is not available within the Health Pages.

Process Status

When displaying the status of a process, the following terms are used:

- **Blocked**
This means that at least one instance of the process is active for a Step, and this instance cannot proceed due to a problem in an underlying IT operational service.
- **At Risk**
This means that there are currently no process instances in a blocked state, however there are process instances in progress that might reach the blockage some point in the future.
- **Healthy**
This means that all active process instances are currently past the blockage and can therefore continue to run to completion, or there is no problem with the IT infrastructure.

There is also an icon representing each of the statuses, which is used in place of text. These icons are shown in [Figure 32](#).

Figure 32 Business Process Status Icons



Step Rates

Within the instance and violation information, you can display the overall details of a process and then drill down into a particular Process Step to view details of the overall statistics for that Step. These statistics include the current node Instance Rate and current node Weight Rate. These rate values provide information about the current throughput at a given Step. The

rates are expressed as a value per hour in much the same way as the speedometer in your car tells you how far you would travel in a hour if you kept traveling at your current speed.



Be aware that these rate values can give slightly incorrect values when the Step activity is low.

The rates eventually reset themselves to zero, if there is a prolonged period of inactivity.

12 BPI Application Reports

The BPI Application Report pages display historical data relating to summaries of Business Processes, Business Process Steps, and Monitors that you have defined.

This chapter covers the following topics:

- [Profile Database Configuration Requirements](#) on page 314
- [Enrich the Business Process Report View](#) on page 315
- [Business Process Summary Report](#) on page 316
- [BPI Monitors Over Time](#) on page 325
- [Business Process Step Summary](#) on page 329
- [Business Process Over Time Report](#) on page 334
- [Business Process Step Over Time Report](#) on page 337

The BPI reports customized BAC Reports and comprise charts and tables that help you track and analyze the health of your monitored BPI environment.

You can view and generate the BPI reports, as well as drill down and apply various filtering criteria to examine performance trends and pinpoint the cause of health and performance issues.

Reports enable you to examine and analyze the data that is collected for Business Process Insight in the Profile database. When generating reports, you can specify various report settings, including time range and resolution, profile, grouping, and filters.

As with all BAC reports, you can customize the BPI reports by adding a header and a footer, by selecting to automatically or manually generate the report, or by customizing other display elements. More details of using reports can be found in *Report Manager*.

Profile Database Configuration Requirements

In order to see report information for your Business Processes, you need to make sure that you have created a Profile database using the following option within BAC:

Admin > Platform > Manage Profile Databases

When there is data available in the Profile database; that is, BPI is sending data samples, the following BPI reports are available to help you analyze the BPI Business Process data:

- **Business Process Summary**

Displays summary data for the selected Business Process; see section [Business Process Summary Report](#) on page 316.

You can drill down to the following reports from the Business Process Summary report:

- Business Process Over Time
- BPI Monitor Over Time
- Business Process Step Summary

- **BPI Monitors Over Time**

Displays two graphs for each selected Monitor definition; see section [BPI Monitors Over Time](#) on page 325.

The first graph displays the average/minimum/maximum/weighted value or duration of the selected Monitor over time.

The second graph displays the number of Monitor instance violations over time.

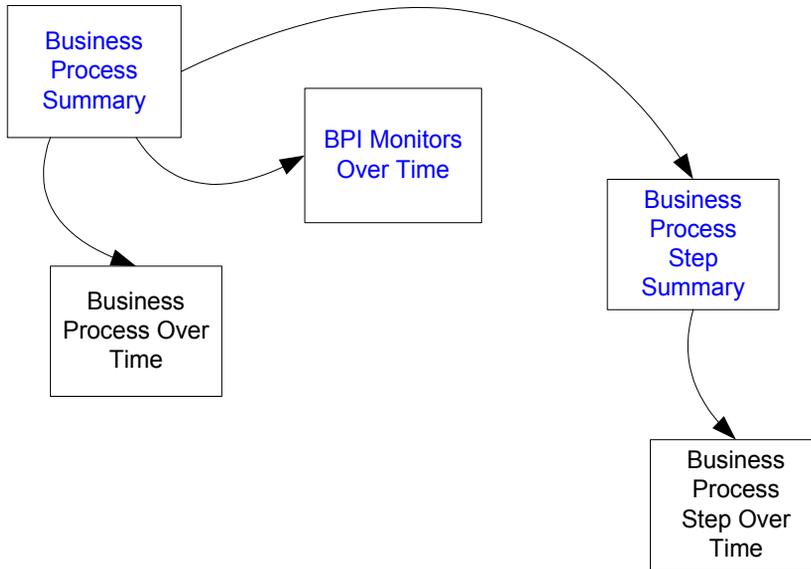
- **Business Process Step Summary**

Displays summary data for the selected Business Process Step; see section [Business Process Step Summary](#) on page 329.

You can drill down to the Business Process Step Over Time report from this report.

Figure 33 shows the hierarchy of reports for Business Process Insight.

Figure 33 Hierarchy of Reports



Enrich the Business Process Report View

You can additionally attach IT Universe CIs to the appropriate Business Process Step. This enables you to add additional CI information to your reports to enhance the level of information that the reports provide.

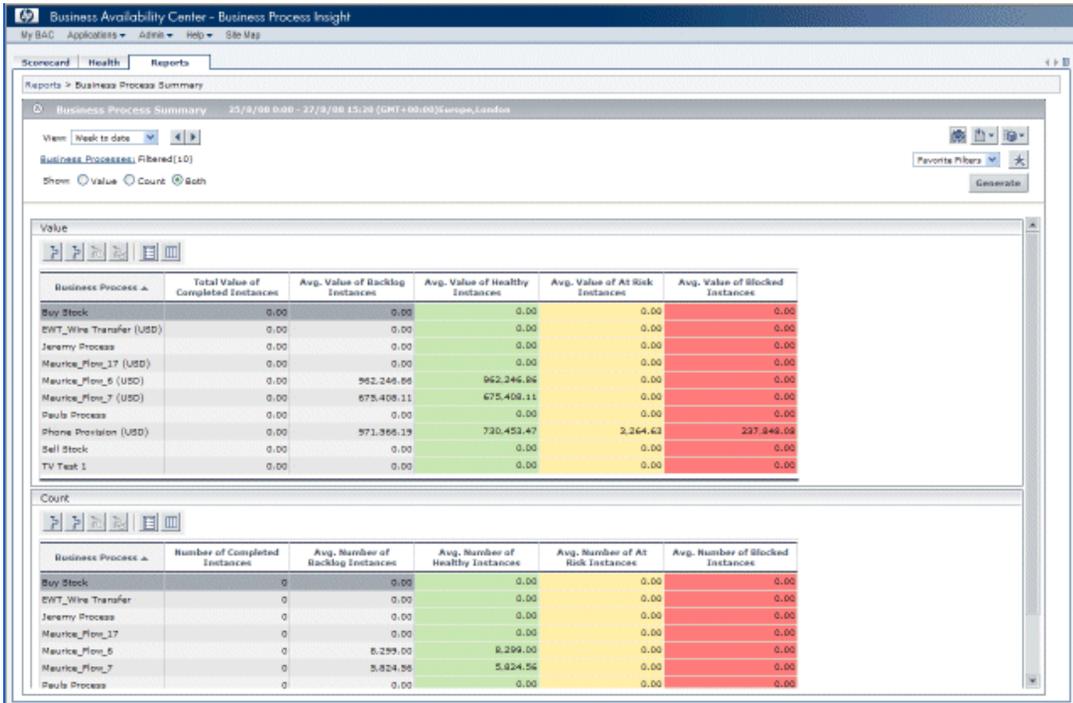
Business Process Summary Report

Figure 34 is an example of a Business Process summary report.

This report is accessible from:

Applications > Business Process Insight > Reports > Business Process Summary

Figure 34 Business Process Summary Report



The Business Process summary report displays the summary data for the selected Business Processes.

Use this report to gain an overall view of the historical health of your Business Processes.

The Business Process Summary report is divided into the following areas:

- Report settings; see [Table 69](#)
- Report Value area; see [Table 70](#)
- Report Count area; see [Table 71](#)

[Table 69](#) describes the elements of the Business Process Summary report settings (unlabeled GUI elements are shown in angle brackets):

Table 69 Business Process Summary Report Settings

GUI Element (A-Z)	Description
<Common report settings>	For details see section Common Report Elements in <i>Reports</i> .
Business Processes	<p>Click to open the Business Processes dialog box where you can select the view and the processes that you want to display.</p> <p>You can select only Business Processes for which you have a Business Process Monitor defined. If one Business Process is selected, its name is displayed to the right of the link. If more than one Monitor is selected, Filtered (<i>n</i>) is displayed to the right of the link, where <i>n</i> represents the number of selected Processes.</p>
Show	<p>Select one of the following options:</p> <ul style="list-style-type: none"> • Value. Select to display value data for the Business Processes in the Value area. • Count. Select to display Business Process count values in the Count area. • Both. Select to display both the counts and the values. This is the default for the Report.

Table 70 describes the elements of the Business Process Summary Value area. The Value area is displayed when you select Value or Both from the Show: option (unlabeled GUI elements are shown in angle brackets).

Table 70 Business Process Summary Value Area Settings

GUI Element (A-Z)	Description
	<p>Select a Business Process and click the Drill Down to Business Process Over Time Report button to drill down to the Business Process Over Time report for the selected Business Process. The report is displayed with the most appropriate option selected.</p>
	<p>Select a Business Process and click the Drill Down to Business Process Step Summary Report button to drill down to the Business Process Step Summary report for the selected Business Process. The report is displayed with the most appropriate option selected.</p>
	<p>Select a Business Process and click the Drill Down to Duration Monitors Over Time Report button to drill down to the BPI Monitors Over Time report for the selected Business Process where only the Duration Monitors are shown in the report.</p> <p>The button is enabled only if the selected Business Process has Duration Monitors defined.</p>

Table 70 Business Process Summary Value Area Settings

	<p>Select a Business Process and click the Drill Down to Value Monitors Over Time Report button to drill down to the Monitors Over Time report for the selected Business Process where only the Value Monitors are shown in this report.</p> <p>Custom Monitor can also be selected for this report.</p> <p>The button is enabled only if the selected Business Process has a Value Monitor defined.</p>
Business Process	<p>The name of the selected Business Process.</p> <p>Note: You can sort on this column.</p> <p>Tooltip: Displays the name of the Business Process and the currency symbol, in cases where the value is a currency type.</p>
Total Value of Completed Instances	<p>Displays the total of the value attribute for all the Business Process instances that were completed in the selected time period.</p> <p>The background color of the table row is set to gray.</p> <p>Tooltip: Displays the value of the table cell with a currency unit if it is available.</p>
Avg. Value of Backlog Instances	<p>Displays the average of the value attributes for all the Business Process instances with a status of Active over the specified period of time.</p> <p>The background color of the table row is set to gray.</p> <p>Tooltip: Displays the value of the table cell with a currency unit if it is available.</p>

Table 70 Business Process Summary Value Area Settings

Avg. Value of Healthy Instances	<p>Displays the average of the value attributes for all the Business Process instances that have a <code>Healthy</code> status over the specified period of time. The background color of the table row is set to green.</p> <p>Tooltip: Displays:</p> <ul style="list-style-type: none">• The value of the table cell.• The value of the Avg. Number of Backlog Instances cell.• The percentage of the current table cell value compared to the value of the Avg. Number of Backlog Instances cell.
Avg. Value of At Risk Instances	<p>Displays the average of the value attributes for all the Business Process instances that have an <code>At Risk</code> status over the specified period of time. The background color of the table row is set to yellow.</p> <p>Tooltip: Displays:</p> <ul style="list-style-type: none">• The value of the table cell.• The value of the Avg. Value of Backlog Instances cell.• The percentage of the current table cell value compared to the value of the Avg. Value of Backlog Instances cell.

Table 70 Business Process Summary Value Area Settings

Avg. Value of Blocked Instances	<p>Displays the average of the value attribute for all the Business Process instances that are in the <code>Blocked</code> status over the specified period of time.</p> <p>The background color of the table row is set to red.</p> <p>Tooltip: Displays:</p> <ul style="list-style-type: none"> • The value of the table cell. • The value of the Avg. Number of Backlog Instances cell. • The percentage of the current table cell value compared to the value of the Avg. Number of Backlog Instances cell.
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Table 71 describes the elements of the Business Process Summary Count area. The Count area is displayed when you select `Count` or `Both` from the `Show:` option (unlabeled GUI elements are shown in angle brackets).

Table 71 Business Process Summary Count Area Settings

GUI Element (A-Z)	Description
	<p>Select a Business Process and click the <code>Drill Down to Business Process Over Time Report</code> button to drill down to the Business Process Over Time report for the selected Business Process. The report is displayed with the <code>Count</code> option selected.</p>
	<p>Select a Business Process and click the <code>Drill Down to Business Process Step Summary Report</code> button to drill down to the Business Process Step Summary report for the selected Business Process. The report is displayed with the <code>Count</code> option selected.</p>

Table 71 Business Process Summary Count Area Settings

	<p>Select a Business Process and click the Drill Down to Duration Monitors Over Time Report button to drill down to the Monitors Over Time report for the selected Business Process where only the Duration Monitors are shown in the report.</p> <p>The button is enabled only if the selected Business Process has a duration Monitor defined.</p>
	<p>Select a Business Process and click the Drill Down to Value Monitors Over Time Report button to drill down to the Monitors Over Time report for the selected Business Process where only the Value Monitors are shown in this report.</p> <p>Custom Monitors can also be displayed in this report.</p> <p>The button is enabled only if the selected Business Process has a Value Monitor defined.</p>
<p>Business Process</p>	<p>The name of the selected Business Process.</p> <p>Note: You can sort on this column.</p> <p>Tooltip: Displays the name of the Business Process.</p>
<p>Number of Completed Instances</p>	<p>Displays the total number of the Business Process instances that were completed in the selected time period.</p> <p>The background color of the table row is set to gray.</p> <p>Tooltip: Displays the value of the table cell.</p>

Table 71 Business Process Summary Count Area Settings

Avg. Number of Backlog Instances	Displays the average number of backlogged Business Process instances out of the number of samples reported over the specified period of time. The background color of the table row is set to gray. Tooltip: Displays the value of the table cell.
Avg. Number of Healthy Instances	Displays the average number of the Business Process instances that have a Healthy status, out of the number of samples reported over the specified period of time. The background color of the table row is set to green. Tooltip: Displays: <ul style="list-style-type: none">• The value of the table cell.• The value of the Avg. Number of Backlog Instances cell.• The percentage of the current table cell value compared to the value of the Avg. Number of Backlog Instances cell.

Table 71 Business Process Summary Count Area Settings

<p>Avg. Number of At Risk Instances</p>	<p>Displays the average number of the business process instances that have an At Risk status, out of the number of samples reported over the specified period of time. The background color of the table row is set to yellow.</p> <p>Tooltip: Displays:</p> <ul style="list-style-type: none">• The value of the table cell.• The value of the Avg. Number of Backlog Instances cell.• The percentage of the current table cell value compared to the value of the Avg. Number of Backlog Instances cell.
<p>Avg. Number of Blocked Instances</p>	<p>Displays the average number of Business Process instances that are in the Blocked status, out of the number of samples reported over the specified period of time. The background color of the table row is set to red.</p> <p>Tooltip: Displays:</p> <ul style="list-style-type: none">• The value of the table cell.• The value of the Avg. Number of Backlog Instances cell.• The percentage of the current table cell value compared to the value of the Avg. Number of Backlog Instances cell.

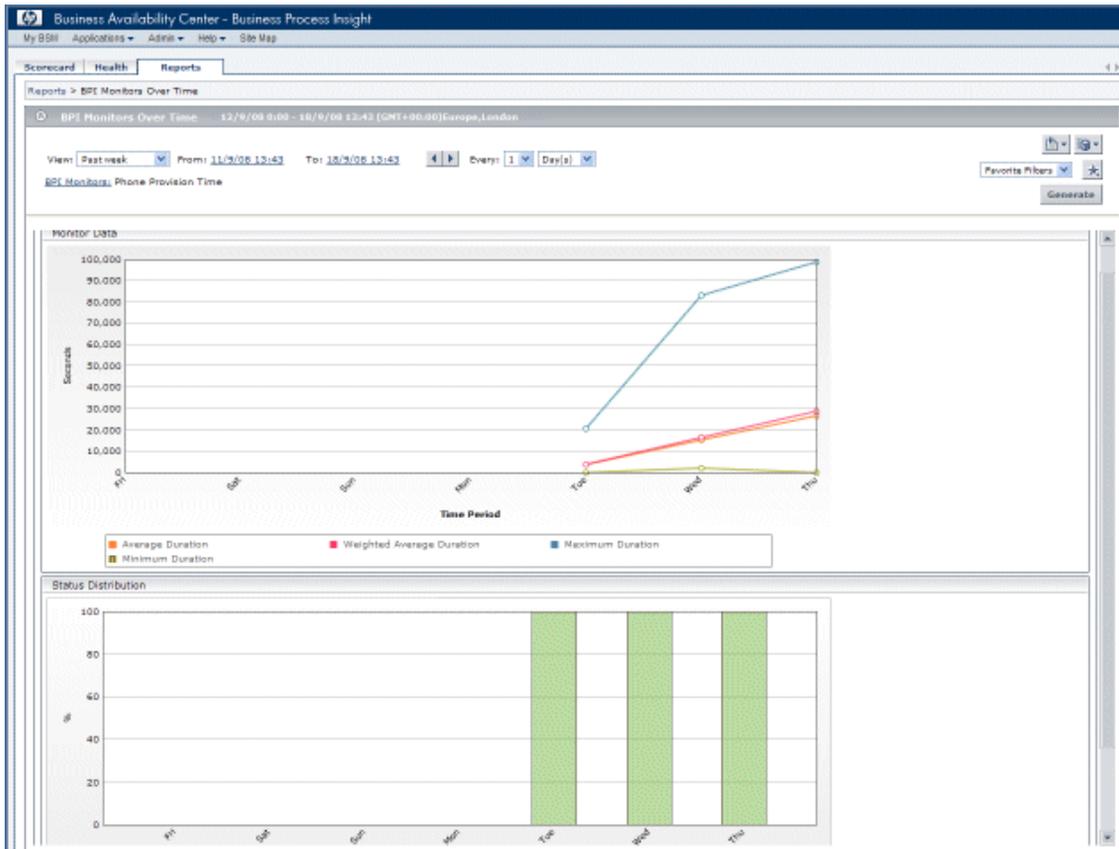
BPI Monitors Over Time

Figure 35 is an example of the BPI Monitors Over Time Report.

This report is accessible from:

- Applications > Business Process Insight > Reports > BPI Monitors Over Time
- The Process Summary Report; see section [Business Process Summary Report](#) on page 316.

Figure 35 BPI Monitors Over Time Report



The BPI Monitors Over Time report displays two graphs for a selected Business Process Monitor:

- Monitor Data, which plots the average/minimum/maximum/weighted value or duration of the selected Business Process Monitor over time.
- Status Distribution, which plots the Monitor instance violations over time, based on their status.

Use this report to list information relating to the Business Process Monitors status for your Business Processes over a selected time period. The report data is shown in graphical form and can also be published in tabular form.

The BPI Monitors Over Time Report is divided into the following areas:

- Report settings; see [Table 72](#)
- Monitor Data; see [Monitor Data Area](#) on page 327
- Status Distribution; see [Status Distribution](#) on page 328

[Table 72](#) describes the elements of the BPI Monitor Over Time Report settings (unlabeled GUI elements are shown in angle brackets).

Table 72 Business Process Monitors Over Time Report Settings

GUI Element (A-Z)	Description
<Common report settings>	For details see section Common Report Elements in <i>Reports</i> .
BPI Monitors	Click to open the BPI Monitors dialog box. If one Monitor is selected, its name is displayed to the right of the link. If more than one Monitor is selected, Filtered (<i>n</i>) is displayed to the right of the link, where <i>n</i> represents the number of selected Monitors.
Graph by Group	This option appears when one Business Process Monitor is selected. If more than one monitor is selected, this option is not available. Click Graph by Group to drill down to a Monitor Graph with a display that is split according to the different elements in the Group definition

Monitor Data Area

The Monitor Over Time Report displays a separate set of charts for each selected Monitor and for the selected time period in the Monitor Data area.

If you have selected an BPI Value or Custom Monitor, the graph displays the following information:

- Average Value per Instance

The average value of the completed instances of the selected Monitor out of the total number of completed instances.

- Maximum Value

The maximum value of all the completed instances of the selected Monitor.

- Minimum Value

The minimum value of all the completed instances of the selected Monitor.

If you have selected an BPI Duration Monitor, the graph displays the following information:

- Average Duration

The average duration of the completed instances of the selected Monitors out of the total number of completed instances of the selected Monitors.

- Weighted Average Duration

The weighted average duration of all the completed instances of the BPI Monitors out of the total number of completed instances of the Monitor.
Maximum Duration.

The maximum duration of all the completed instances for the selected Monitor.

- Minimum Duration

The minimum duration of all the completed instances for the selected Monitor.

There is tooltip for each point on the graphs and you can progressively drill down to a specific hour for more detailed data.

Status Distribution

The Monitor Over Time Report displays a separate bar chart for each of the selected Monitors for the selected time period in the Status Distribution area.

The Monitor Over Time report displays the following data for the selected Monitor over the selected time period:

- Total % of Value/Duration Critical Violated Instances

The percentage of the total number of instances of the Monitor instances that completed with a Critical Violated status out of the total number of completed instances of the Monitor.

- Total % of Value/Duration Major Violated Instances

The percentage of the total number of instances of the Monitor instances that completed with a Major Violated status out of the total number of completed instances of the Monitor.

- Total % of Value/Duration Minor Violated Instances

The percentage of the total number of instances of the Monitor instances that completed with a Minor Violated status out of the total number of completed instances of the Monitor.

- Total % of Value/Duration Warning Violated Instances

The percentage of the total number of instances of the Monitor instances that completed with a Warning Violated status out of the total number of completed instances of the Monitor.

- Total % of Value/Duration Non-Violated Instances

The percentage of the total number of instances of the Monitor instances that completed with a Non-Violated status out of the total number of completed instances of the Monitor.

Tooltips for bars in the bar chart display the number of instances, the total number of instances, and the percentage and you can progressively drill down to a specific hour for more detailed data.

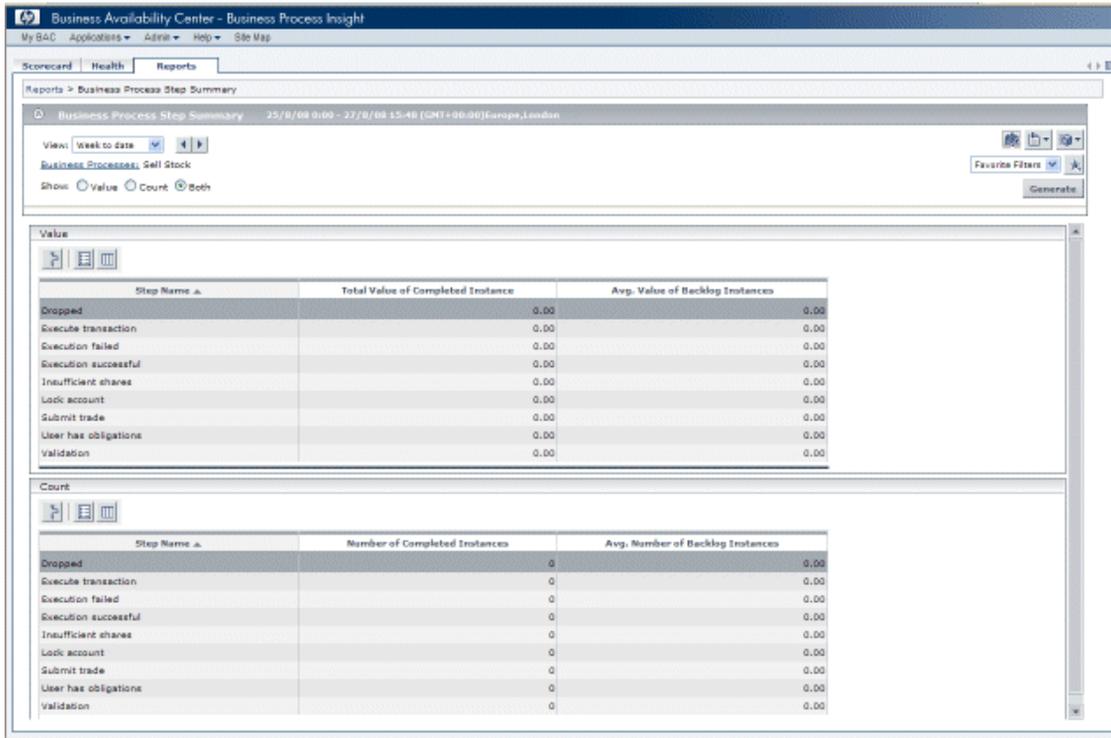
Business Process Step Summary

Figure 36 is an example of a Business Process Step Summary report. Use this report to show summary information for a Business Process Step over a selected period of time.

The report is accessible from:

Applications > Business Process Insight > Reports > Business Process Step Summary

Figure 36 Business Process Step Summary Report



The Business Process Step Summary Report displays two tables for a selected Business Process Step:

- Value table

This table lists the value of completed process instances at each Step, plus the average value of the active instances at each Step (backlog).

- Count table

This table lists the total number of completed process instances at each Step, plus the average number of the active instances at each Step (backlog).

The Business Process Step Summary Report is divided into the following areas:

- Report settings; see [Table 73](#)
- Value table; see [Table 74](#)
- Count table; see [Table 75](#)

Table 73 describes the elements of the Business Process Step Summary Report settings (unlabeled GUI elements are shown in angle brackets).

Table 73 Business Process Step Summary Report Settings

GUI Element (A-Z)	Description
<Common report settings>	For details see section Common Report Elements in <i>Reports</i> .
Business Processes	Click to open the Business Processes dialog box where you can select the Business Process whose Steps you want to report on. Select the required Business Process and the name of the process is displayed to the right of the link.
Show	Select one of the following options: <ul style="list-style-type: none"> • Value - Select to display value data for the Business Process Steps in the Value area. • Count - Select to display Business Process Step count values in the Count area • Select Both to display both the Step Value and Step Count values for the Business Process Steps. Both the Value and the Count area are displayed. This is the default.

Table 74 describes the elements of the Value table (unlabeled GUI elements are shown in angle brackets).

Table 74 Business Process Step Summary Value Area Settings

GUI Element (A-Z)	Description
	Select a Business Process and click the Drill Down to Step Over Time Report button to drill down to the Step Over Time report for a selected Business Process Step. The report is displayed with the Value option selected.
Step Name	The name of the selected Business Process Step. You can select to list the Steps in ascending or descending alphabetical order. Tooltip: Displays the name of the Business Process Step.
Total Value of Completed Instance	Displays the total of the value attribute for all the Business Process Step instances that were completed in the selected time period. Tooltip: Displays the value of the table cell, with value units (where value units are set).
Avg. Value of Backlog Instances	Displays the average value (backlog) of the active instances at each Step in the process over the selected time period. Tooltip: Displays the value of the table cell.

Table 75 describes the elements of the Count table (unlabeled GUI elements are shown in angle brackets).

Table 75 Business Process Step Summary Count Area Settings

GUI Element (A-Z)	Description
	Select a Business Process and click the Drill Down to Step Over Time Report button to drill down to the Business Process Step Over Time report for the selected Business Process Step. The report is displayed with the Count option selected.
Step Name	The name of the selected Business Process Step. Tooltip: Displays the name of the Business Process Step.
Number of Completed Instances	Displays the total number of the Business Process Step instances that were completed in the selected time period. Tooltip: Displays the value of the table cell.
Avg. Number of Backlog Instances	Displays the average value (backlog) of the active instances at each Step in the process over the selected time period. Tooltip: Displays the value of the table cell.

Business Process Over Time Report

[Figure 37](#) is an example of a Business Process Over Time Report. Use this report to show an over-time graph of information relating to the Business Process value and count data over a selected time period.

The report data is shown in graphical form and can also be published in tabular form.

The report is accessible from:

Applications > Business Process Insight > Reports > Business Process Summary > Business Process Over Time

<Business Process Over Time Report displays two charts for each selected Business Process:

- Data

The Data graph displays data relating to the Value or Count for the selected Business Process over the selected time period.

- Health

The Health bar chart displays the overall health of the Business Process over the selected time.

The Business Process Over Time Report is divided into the following areas:

- Report settings; see [Table 76](#)
- Data; see “Data” on page 335
- Health; see [Health](#) on page 336

Table 76 describes the elements for the Business Process Over Time Report settings (unlabeled GUI elements are shown in angle brackets).

Table 76 Business Process Over Time Report Settings

GUI Element (A-Z)	Description
<Common report settings>	For details see section Common Report Elements in <i>Reports</i> .
Business Processes	<p>Click to open the Business Processes dialog box where you can select a Business Process that you want to display.</p> <p>You can select only Business Processes that have a Business Process Monitor defined for them. The name of the Business Process is displayed to the right of the link.</p>
Show	<p>Is preselected when you enter the report according to the setting at the Parent Business Process Summary, you can change the selection as follows:</p> <ul style="list-style-type: none"> • Select Value to display value-related data for the Business Processes in the Value area. • Select Count to display count-related data for the Business Processes in the Count area.

Data

The Business Process Over Time report displays the following data for the selected Business Process over the selected time period:

- Total Value/Count of Completed Instances

The total Value or Count of the completed instances for the selected Business Process.

- Avg. Backlog Value/Count

The average Value or average Count for the backlog KPI for the selected Business Process. This average is taken from the total number of completed Business Process instances.

Tooltips for the over time graph display the same information for the selected entry and you can progressively drill down to a specific hour for more detailed data.

Health

The Business Process Over Time report displays the following health information for the selected Business Process over the selected time period:

- Avg. % of Blocked Instances or Avg. % of Blocked Instances Value

The percentage of the average number of instances of the Business Process, which are in the state of `Blocked`, measured from the total number of instances over the period.

- Avg. % of At Risk Instances or Avg. % of At Risk Instances Value

The percentage of the average number of instances of the Business Process, which are in the state of `At Risk`, measured from the total number of instances over the period.

- Avg. % of Healthy Instances or Avg. % of Healthy Instances Value

The percentage of the average number of instances of the Business Process, which are in the state of `Healthy`, measured from the total number of instances over the period.

Tooltips for the bars in the bar chart display the same information for the selected entry and you can progressively drill down to a specific hour for more detailed data.

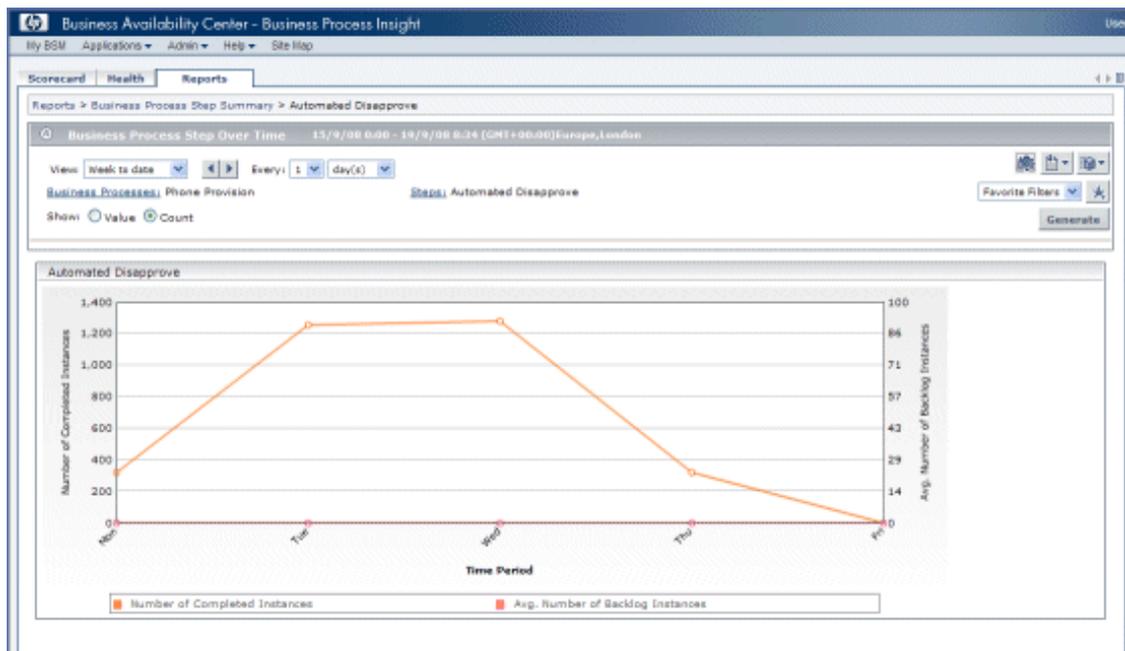
Business Process Step Over Time Report

Figure 37 is an example of a Business Process Step Over Time Report. Use this report to show an over-time graph of information relating to the Business Process Step status. The report data is shown in graphical form and can also be published in tabular form.

The report is accessible from:

Applications > Business Process Insight > Reports > Business Process Step Summary > Business Process Step Over Time

Figure 37 Business Process Step Over Time Report



Use this report to show information relating to the values and counts for Steps in the selected Business Process Step over a selected time period.

You can display either Value or Count information for the Steps as follows:

- Value

This over-time graph shows the total value of completed instances and the average Backlog value of process instances at the selected Step.

- Count

This over-time graph shows the number of completed instances and the average number of Backlog instances at the selected Step.

Table 77 describes the elements for the Business Process Step Over Time Report settings (unlabeled GUI elements are shown in angle brackets).

Table 77 Business Process Step Over Time Report Settings

GUI Element (A-Z)	Description
<Common report settings>	For details see section Common Report Elements in <i>Reports</i> .
Business Processes	Click to open the Business Processes dialog box where you can select the Business Process that you want to display data for.
Steps:	Click to open the Steps dialog box where you can select the Business Process Step that you want to display.
Show	Is preselected when you enter the report according to the setting at the Parent Business Process Step Summary, you can change the selection as follows: <ul style="list-style-type: none">• Select Value to display value-related data for the Business Process.• Select Count to display count-related data for the Business Process.

Value

The Business Process Step Over Time report displays the following Value data for the selected Business Process Step over the configured time period:

- Total Value of Completed Instances

The total Value of the completed instances for the selected Business Process Step.

- Avg. Value of Backlog Instances

The average Value for the backlog KPI for the selected Business Process Step. This average is taken from the total number of completed Business Process instances.

Tooltips for the over time graph display the same information for the selected entry and you can progressively drill down to a specific hour for more detailed data.

Count

The Business Process Step Over Time report displays the following Count data for the selected Business Process Step over the configured time period:

- Number of Completed Instances

The total number of the completed instances for the selected Business Process Step.

- Avg. Number of Backlog Instances

The average number of instances for the backlog KPI for the selected Business Process Step. This average is taken from the total number of completed Business Process instances.

Tooltips for the over time graph display the same information for the selected entry and you can progressively drill down to a specific hour for more detailed data.

13 Annotations for Process Diagrams

This chapter describes how to add annotations to your process diagram within the Flow Map on the Dashboard Application Flow Map page and the Business Process Insight Application Health page.

The chapter covers the following topics:

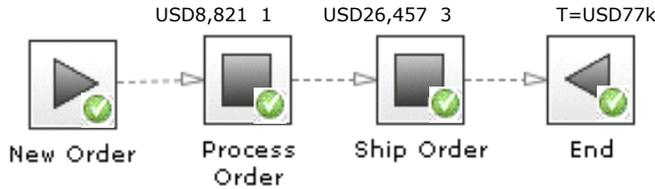
- [Overview](#) on page 342
- [Customizing your Process Diagram](#) on page 343
- [Character Set Encoding](#) on page 354

Overview

BPI enables you to view any deployed Business Process. When displaying the process diagram, it annotates each of the steps by showing the number of active process instances and the Value of the total instances at each step.

Figure 38 shows an example of a process diagram when shown from the Health Page.

Figure 38 Process Diagram



BPI enables you to customize a process diagram as follows:

- You can configure a customized image for each step in the process.
- You can configure the text that is shown above each step.

As an example, you can customize your process diagram to be displayed as shown in Figure 39. In Figure 39, the instance values and the instance counts are shown on two of the steps and the End step is configured to show the total value of all completed instances.

Figure 39 Customized Process Diagram



Customizing your Process Diagram

You configure the changes that you want to make to your Process Diagram within a file called `annotations.xml`.

You create an `annotations.xml` file and then copy it to the following location, under the BAC installation hierarchy:

```
BAC-install-dir\lib
```

where `BAC-install-dir` is the installation directory for the Business Availability Center Gateway Server that the BPI Server is configured to connect to.

When BPI detects that the file exists, it uses the file when it draws a Process Diagram.

If the file `annotations.xml` does not exist, or if there is an error processing the xml, the file is ignored and the process diagram is shown as it would if the file does not exist.

The *Business Process Insight Problem Solving Guide* provides some information on troubleshooting your system when your annotations are not displayed as expected.

annotations.xml File Format

The file `annotations.xml` is structured as follows:

```
<?xml version="1.0" encoding="..." ?>
<annotations>
  <step name="...">
    <texttype> ... </texttype>
    <textsymbol> ... </textsymbol>
    <textdp> ... </textdp>
    <scalesymbol> ... </scalesymbol>
    <image> ... </image>
  </step>

  ...further steps...

</annotations>
```

The following sections describe this structure in more detail and provide some examples configuration options.

encoding=

The first line of the annotations file declares that this file contains XML and it declares the encoding used within this XML.

If your annotations include 8-bit Western European characters, then you could set the first line of the file to be:

```
<?xml version="1.0" encoding="ISO-8859-1"?>
```

The following are examples of other XML encodings you could use:

```
windows-1252  
UTF-8  
UTF-16
```

The XML encoding that you use depends on the editor you are using to create the annotations file and the type of characters you are using.

<annotations>

The `annotations` element simply encloses the set of `step` elements.

You must have one, and only one, `annotations` element within the `annotations.xml` file.

<step>

You define a `<step>` element for each step in the Process Diagram that you want to annotate.

BPI uses only one `annotations.xml` file, and there is no way to specify a Process Name in the `annotations.xml`. This means that when you specify a `<step>` element for a particular Process Step name, any process with a Process Step matching that name has that Process Step annotated when the process diagram is displayed within the process diagram. As a result, you might want to consider making sure that your step names are unique across your process definitions.

As an example, you might have a `<step>` element structured as follows:

```
<step name="New Order">  
...  
</step>
```

In this case, any process with a Process Step named `New Order` is annotated when BPI displays it as a Process Diagram.

<texttype>

The `texttype` element enables you to specify the data that is displayed above the image of the Process Step.

You can specify one of the following values:

- `count`

This displays the number of active instance at this Process Step.

For example:

```
<texttype>count</texttype>
```

If you do not specify a `texttype` element, a value for `count` is automatically added to the Process Diagram.

When displayed within the Process Diagram, the value for `count` is displayed above, and slightly to the right, of the Process Step.

- `value`

This is the value of all the current active instances at the specified Process Step and as defined by the Process Value property for the Process.

For example:

```
<texttype>value</texttype>
```

When displayed within the Process Diagram, the Process Value of the active instances is displayed above, and slightly to the right, of the Process Step.

- both

This enables you to display both the active count of process instances at this Process Step, and the active value of these instances.

For example:

```
<texttype>both</texttype>
```

When displayed within the process diagram, the value of the active instances is displayed above, and slightly to the left, of the Process Step, and the count of the active instances is displayed above, and slightly to the right, of the Process Step.

- none

If you do not want to show any text above the Process Step use option.

For example:

```
<texttype>none</texttype>
```

<textsymbol>

The `textsymbol` element enables you to specify a character sequence to display as part of the active instance value. This character sequence is usually displayed before the active instance value, but its position is localizable.

The `textsymbol` element is used only if you have specified a `texttype` setting of `value` or `both`.

For example:

```
<textsymbol>$</textsymbol>
```

<textdp>

The `textdp` element enables you to specify the number of decimal places to use when displaying the value attribute for active instances at a specified Process Step.

The `textdp` element is used only if you have specified a `texttype` setting of `value` or `both`.

For example, you might set the value for `textdp` to be 2 as follows:

```
<textdp>2</textdp>
```

If you then have a value of 2.8765, this is shown as follows on the Process Diagram:

2.88

If you do not specify a `textdp` element, the value is shown with zero decimal places on the Process Diagram.

If you specify a negative value for the value of `textdp`, that is, a number between -1 and -100, then the number that you want to display is truncated by that number of digits, and the value rounded.

For example, you might set the following value for `textdp`:

```
<textdp>-3</textdp>
```

If you then have a value of 234567, this is shown as follows on the Process Diagram:

235



If you specify a negative value for `textdp`, you also need to specify a `scalesymbol` element, as described in section [<scalesymbol>](#) on page 348.

<scalesymbol>

The `scalesymbol` element is used to define the symbol you want to be displayed with the active instances value to reflect the scaled number. In other words, if you have specified a `textdp` with a negative value then you need to set a `scalesymbol` to show the scaling that has occurred.

The following are examples of how you might set values for `textdp` and `scalesymbol` and the results that are displayed:

1 Example 1.

```
<textdp>-3</textdp>  
<scalesymbol>K</scalesymbol>
```

If you then have a value of 234567, this is shown as follows on the Process Diagram:

235K

2 Example 2.

```
<textdp>-6</textdp>  
<scalesymbol>M</scalesymbol>
```

If you then have a value of 1234567, this is shown as follows on the Process Diagram:

1M

<image>

The `image` element specifies a file name of an image that you want to be displayed in place of the standard Process Step image. The file name for the image is relative to the `webapps` directory.

For example, you might set the following:

```
<image>customimages/myImage.gif</image>
```

In this example, BPI looks for the file `myImage.gif` in the following directories; one under the BAC installation directory and one under the BPI installation directory:

```
bac-install-dir\AppServer\webapps\bpi.war\customimages
```

```
bpi-install-dir\nonOV\jakarta-tomcat-5.0.19\webapps\hpbpi-bpd\  
customimages
```

You need to create the directory `customimages`, if it does not already exist.

Examples

The following are examples of using the annotation element:

No Text on Process Step

If you do not want any text shown above your Process Steps, specify your XML as follows:

```
<step name="Process Order">  
  <texttype>none</texttype>  
</step>
```

In this example, the Process Order step is shown as in [Figure 40](#).

Figure 40 No Text



A Custom Image for Process Step Image

If you want to replace the default Process Step image with a custom image, specify your XML as follows:

```
<step name="Process Order">  
  <texttype>none</texttype>  
  <image>customimages/engineer_on_call.gif</image>  
</step>
```

In this example, the Process Order step is shown as in [Figure 41](#).

Figure 41 Custom Image



This example assumes that the image file exists in the following directory:

```
BAC-install-dir\AppServer\webapps\bpi.war\customimages
```

Value for Active Instances and Custom Image on a Process Step

If you want to show the value for the active instances on a custom image for a Process Step, specify your XML as follows:

```
<step name="Process Order">
  <texttype>value</texttype>
  <textsymbol>${}</textsymbol>
  <image>customimages/engineer_on_phone.gif</image>
</step>
```

In this example, the Process Order step is shown as in [Figure 42](#).

Figure 42 Active Value



This example assumes that the image file exists in the following directory:

```
BAC-install-dir\AppServer\webapps\bpi.war\customimages
```

Scaled Active Value

If you want to show the value for the active instances that has been scaled and that also includes a custom image for a Process Step, specify your XML as follows:

```
<step name="Process Order">
  <texttype>value</texttype>
  <textsymbol>${</textsymbol>
  <textdp>-3</textdp>
  <scalesymbol>K</scalesymbol>
  <image>customimages/engineer_on_phone.gif</image>
</step>
```

In this example, the `Process Order` step is shown as in [Figure 43](#).

Figure 43 Active Value Scaled



This example assumes that the image file exists in the following directory:

BAC-install-dir\AppServer\webapps\bpi.war\customimages

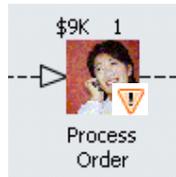
Value and Instance Count

If you want to show both a value, which has been scaled, for the active instances and the number of active instances, plus a custom image for a Process Step, specify your XML as follows:

```
<step name="Process Order">
  <texttype>both</texttype>
  <textsymbol>${</textsymbol>
  <textdp>-3</textdp>
  <scalesymbol>K</scalesymbol>
  <image>customimages/engineer_on_phone.gif</image>
</step>
```

This displays the Process Order step as shown in [Figure 44](#).

Figure 44 Both Value and Instance Count



This example assumes that the image file exists in the following directory:

BAC-install-dir\AppServer\webapps\bpi.war\customimages

A Complete Process

The following is an example of the file `annotations.xml` for a complete process:

```
<?xml version="1.0" encoding="ISO-8859-1" ?>
<annotations>
  <step name="New Order">
    <texttype>none</texttype>
    <image>customimages/phone_receiver.gif</image>
  </step>
  <step name="Process Order">
    <texttype>both</texttype>
    <textsymbol>$</textsymbol>
    <textdp>2</textdp>
    <image>customimages/engineer_on_phone.gif</image>
  </step>
  <step name="Ship Order">
    <texttype>both</texttype>
    <textsymbol>$</textsymbol>
    <textdp>2</textdp>
    <image>customimages/ship.gif</image>
  </step>
  <step name="End">
    <texttype>value</texttype>
    <textsymbol>$</textsymbol>
    <textdp>-3</textdp>
    <scalesymbol>K</scalesymbol>
    <image>customimages/success.gif</image>
  </step>
</annotations>
```

In this example, the Process Diagram is displayed as shown in [Figure 45](#).

Figure 45 A Complete Process Diagram



This example assumes that the image files exist in the following directory:

`BAC-install-dir\AppServer\webapps\bpi.war\customimages`

Character Set Encoding

If you want to create an annotations file that contains a specific character set encoding, for example, UTF-8, you need to ensure that:

- you use an editor that supports UTF-8.
- the editor that you use does not add any extra characters (hidden characters) to the file. As an example, Notepad writes three additional bytes to the start of a file, which although not visible within Notepad, create errors in the XML file that you create.
- you specify the first line of your XML as follows:

```
<?xml version="1.0" encoding="UTF-8"?>
```

In the UTF-8 example, if you specify UTF-8 as the XML encoding and do not use a corresponding UTF-8 editor when entering the UTF-8 characters, BPI fails to parse the file `annotations.xml` and therefore ignores your settings.

You need to make sure that you use an editor that supports the character set encoding that you specify in your annotations file.

14 Deleting Completed Instances from the Database

This chapter describes how to delete completed Process, Data and Monitor instances using the database instance cleaner options.

Use the Business Impact Engine Instance Cleaner parameters for regular removal of completed instances from the database.

The instance cleaner parameters are not designed to enable individual instances to be manipulated nor do they enable you to name the process definitions or data definitions whose instances are to be deleted; these functions are provided by the Intervention tool.

Specifically this chapter describes:

- [Business Impact Engine Process and Data Instance Cleaner Parameters](#) on page 356.
- [Monitor Engine Instance Cleaner Parameters](#) on page 363

Business Impact Engine Process and Data Instance Cleaner Parameters

The Business Impact Engine (BIE) Instance Cleaner parameters enable you to control the numbers of Completed and Active Process and Data instances that are stored in the database. There are separate parameters for deleting Completed and Active Monitor instances from the database; see section [Monitor Engine Instance Cleaner Parameters](#) on page 363.

Using the BIE instance cleaner parameters, you can control:

- how often the BIE Instance Cleaner thread marks Completed and Active Process and Data instances as candidates to be deleted.
- when the BIE Instance Cleaner clean-up thread is run
- how often active and completed process and data instances are deleted from the database (if at all)
- the age of the instances that you delete

Following a new BPI installation, the BIE Instance Cleaner thread does not run and Completed and Active instances therefore accumulate in the database.

This section describes the behavior of these parameters and the SQL procedures, which you can modify to enable you to archive the data, before it is deleted, to a location of your choice. By archiving the data you have it available for your reporting tools, but it is no longer stored in the BPI database tables and therefore does not impact the performance of your system.

In summary, the instance cleaner parameters are intended for regular removal of Completed and Active instances as they occur during normal operations. They are not intended to be used for the removal of individual completed instances, or removal of instances in states other than the COMPLETED or ACTIVE state. Use the Intervention tool to remove individual instances; see section [Chapter 7, Process Intervention](#).

Configuring the BIE Instance Cleaner Parameters

You modify the instance cleaner parameters using the BPI Administration Console as described in section [BIE Process and Data Instance Cleaner Settings](#) on page 39.

These parameters enable you to mark instances as being candidates to be deleted. Instances are initially marked to be deleted but are not immediately deleted, to reduce the impact of the database activity on other Business Impact Engine activities. Once the instances have been marked as candidates to be deleted, they are subsequently deleted by the clean-up thread at intervals specified by the instance cleaner parameter values. You can specify the frequency that you want them deleted and the numbers of instances that you want deleted in one database Delete statement, using the parameters.

In addition to modifying the instance cleaner parameters, you can modify the stored procedures invoked by the instance cleaner thread and add SQL commands to archive the Business Impact Engine data to a location of your choice; see section [Archiving Completed and Active Process Instances](#) on page 360. You should only archive BIE data when you understand the performance of the database.

The following are some examples of how you can set the instance cleaner parameters to achieve specific outcomes, or requirements.

Example for Deleting Completed Instances

In the following example, you are deleting complete process instances from the database that are more than one day old and with a candidacy of once a day:

- From the Engine Process and Data Instance Cleaner settings:
 - Set the Mark instances for deletion: option to Once a Day.
Enter 01:00 as the time for the instances to be marked. Pick a time when the database is not busy processing other BPI data.
 - Set the Delete interval: option to 1 minute.
This is the interval at which the Process and Data instance cleaner thread runs and attempts to delete any Process and Data instances that are marked as being candidates to be deleted.
 - Set the Delete batch size to 500
This is the number of instances that the instance cleaner thread attempts to delete each time it runs.
- From the Completed Process and Data Instances settings:
 - Set the Delete completed instances from the database option to As scheduled above
The Completed instances are then deleted on the basis of the times set for the Engine Instance Cleaner thread.
 - Set the Age of the completed instances to be removed (minutes) to two days, which is expressed in minutes (2880 minutes).

Example for Deleting Active and Completed Instances

In the following example, you are deleting Completed process instances that have an age of more than 30 days, and Active process instances that have an age of more than 50 days, with a candidacy set to once a day:

- From the Engine Process and Data Instance Cleaner settings:
 - Set the Mark instances for deletion: option to Once a Day.
Enter 01:00 as the time for the instances to be marked. Pick a time when the database is not busy processing other BPI data.
 - Set the Delete interval: option to 1 minute.
This is the interval at which the Process and Data instance cleaner thread runs and attempts to delete any Process and Data instances that are marked as being candidates to be deleted.
 - Set the Delete batch size to 1000
This is the number of instances that the instance cleaner thread attempts to delete each time it runs.
- From the Completed Instances settings:
 - Set the Delete completed instances from the database option to As scheduled above
 - Set the Age of the completed instances to be removed (minutes) to 30 days, which is expressed in minutes (43200 minutes).
- From the Active Instances settings:
 - Check the Delete active instances from the database? check box so the active instances are deleted on the basis of the Engine Instance Cleaner thread settings.
 - Set the Age of the active instances to be removed to 50 days.

Example for Deleting Completed Instances as Soon as They Are Complete

In the following example, Completed instances are deleted as soon as they are complete:

- Set the `Engine Process` and `Data Instance Cleaner` settings as required for the `Active` instances, as these settings are ignored in the case of the `Completed Instances` setting `Immediately` on completion.
- From the `Completed Instances` settings:
 - Set the `Delete completed instances from the database` option to `Immediately` on completion
 - Age of the completed instances to be removed (minutes) is also not applicable and is not an editable field.

Be aware that using this setting has the effect of removing data that might have a value for tracking purposes. If your process instances do not have long lives, then there is going to be very little data in the database to be reported on. Make sure that you do not need the data that you are deleting from the database.

- Set the `Active Instances` settings as required.

Archiving Completed and Active Process Instances

You have the option to archive `Completed` and `Active` instances before they are deleted from the database by the instance cleaner thread. This enables you to remove data from the BPI database to improve performance, but still keep the data for reporting purposes.



You cannot archive `Completed` instances if you choose the option to `Delete` completed instances from the database `Immediately` on completion. This is because for this option, the instances are deleted as soon as the event that completes the instance is received.

To archive the instance data, you need to make changes to the stored procedures or functions provided with BPI to delete the process and data instances. There are stored procedures for Microsoft SQL Server and

functions for the Oracle Server, both contain the SQL commands required to delete data from the BPI database and also provide a return code to the calling program. The following are the stored procedures/functions:

- `bia_DeleteDataInstances`

This procedure deletes the data instances in the `COMPLETED` state and that meet the criteria specified in the configuration. This stored procedure also provides the following SQL Cursor that you can use:

```
completedInstances_cursor
```

This stored procedure is available for Microsoft SQL Server only.

You can add your custom SQL statements to the stored procedure in order to archive the Business Process data before it is deleted.

- `bia_DeleteFlowInstances`

This procedure deletes all process instances in the `COMPLETED` state that meet the criteria specified by the configuration. This stored procedure also deletes the associated Step instances, Step started and Step completed times, and any monitors that are defined for the process instance.

- `DeleteActiveDataInstances`

This procedure deletes the data instances in the `ACTIVE` state and that meet the criteria specified in the configuration. This stored procedure also provides the following SQL Cursor that you can use:

```
activeInstances_cursor
```

This stored procedure is available for Microsoft SQL Server only.

As for the `bia_DeletedDataInstances` procedure, you can add your custom SQL statements to the stored procedure in order to archive the Business Process data before it is deleted.

- `DeleteActiveFlowInstances`

This procedure deletes all process instances in the `ACTIVE` state that meet the criteria specified by the configuration. This stored procedure also deletes the associated Step instances, Step started and Step completed times, and any monitors that are defined for the process instance.

These stored procedures or functions are contained in the following SQL file:

```
bpi-install-dir\misc\bia\EngineStoredProcedures_script.sql
```

There are also examples of this file located at:

- `bpi-install-dir\examples\bia\EngineScripts`
- the `examples` directory on the distribution media

The example files are named as follows, according to the database:

- `EngineStoredProcedures_script.mssql`
- `EngineStoredProcedures_script.oracle`



Be aware that changes to the SQL file `EngineStoredProcedures_script.sql` are lost if you reinstall or upgrade BPI. Make sure that you have made backup copies of your modifications, which you can then reapply following a reinstallation.

You need to make your changes to the stored procedures, which have been created in the database for BPI, to add the SQL to archive the Completed or Active instances.

You are also advised to make changes to the following SQL script and make a backup copy of the script to ensure that you have a copy of the changes:

```
bpi-install-dir\misc\bia\EngineStoredProcedures_script.sql
```

The instance cleaner parameters are executed at the frequencies specified in the Engine Instance Cleaner Settings. The value of the Age of the completed instances to be removed and Age of the active instances to be removed parameters is passed to the stored procedure, or function, when it is called.



It is possible for two data instances to be created, each representing the same Business Process: one in the BPI Instance database and one in the archive database. This occurs when an out-of-sequence event is received by the Engine after the Completed or Active instances are archived and deleted. An out-of-sequence event is where an event is received by the Business Impact Engine for an activity in a process instance that is earlier than the latest event received for the same process instance.

In summary, you need to ensure that your archive code can take account of the fact that there might be more than one instance that represents the same Business Process when this scenario exists.

Monitor Engine Instance Cleaner Parameters

The Monitor Engine Instance Cleaner parameters enable you to control the numbers of monitor instances that are stored in the database. These include:

- Active monitor instances
- Completed monitor instances
- Monitor statistics
- Monitor alarm instances

There are separate parameters for deleting Completed and Active business impact Engine instances from the database; see section [Business Impact Engine Process and Data Instance Cleaner Parameters](#) on page 356.

Using the Monitor Engine instance cleaner parameters, you can control:

- how often the Monitor Engine Instance Cleaner thread is run.
- how often active and completed monitor instances are deleted from the database (if at all).
- how often monitor statistics are deleted from the database (of at all).
- how often monitor violation instances are deleted from the database (of at all)
- for all monitor instances, the time and the age of the instances that you delete.

Following a new BPI installation, the Monitor Engine Instance Cleaner thread does not run and the different monitor instances therefore accumulate in the database.

Configuring the Monitor Engine Instance Cleaner Parameters

You modify the Monitor Engine instance cleaner parameters using the BPI Administration Console as described in section [Monitor Engine Instance Cleaner Settings](#) on page 63.

These parameters enable you to delete the Monitor Engine instances periodically, using the instance cleaner thread, as specified by the instance cleaner parameter values.

You can control how often the monitor instance cleaner thread is executed and the age of the specific monitor instances that you want to delete. Each type of monitor instance can be separately controlled.

The following are some examples of how you can set the Monitor Engine instance cleaner parameters to achieve specific outcomes, or requirements.

Example for Deleting Completed Monitor Instances

If you want to delete completed monitor instances from the database, which are more than one day old and once a day, set the monitor engine instance cleaner parameters as follows:

- From the Monitor Engine Instance Cleaner settings:
 - Set the Instance cleaner execution interval (minutes) to 5.
- From the Completed Monitor Instances settings:
 - Select the Delete completed monitor instances from the database? option in order to activate the Age of completed monitor instances to be removed (days) option.
 - Set the Age of completed monitor instances to be removed (days) option to 2.
- Set the other option as appropriate for your implementation.

15 Servlet Engine Authentication

This chapter describes how to use the Memory Realm mechanism within the Servlet Engine (Tomcat) to:

- modify the login details for the BPI Web-based interfaces, which are the process instance and violation pages, which are accessible from the Business Process Insight Application pages.
- configure the use of HTTP over SSL for BPI

The chapter is structured as follows:

- [Tomcat Realm Mechanism](#) on page 366
- [Tomcat and HTTP Over SSL](#) on page 372

The BPI components that can be configured for authentication using the Servlet Engine are:

- Process Repository, which affects both the Repository Explorer and the Modeler.

Setting authentication for the Process Repository also impacts any Contributed components that use the repository.

- Intervention tool
- Notification pages
- Monitor Definer
- Process instance and violation pages

With the exception of the process instance and violation pages, each of these components requires you to provide a username and password in order to access the Web screens. Following a new BPI installation, the username and password for these components are predefined as:

- Username: `admin`
- Password: `hpbpi`

Tomcat Realm Mechanism

BPI uses Tomcat as its Servlet Engine to present JSPs to the user, through a Web browser; starting the Servlet Engine is described in section [Starting and Stopping the BPI Server Components](#) on page 27. For authentication, BPI uses the Tomcat Realm mechanism, specifically it uses the Memory Realm mechanism, which is more fully described in the Tomcat documentation at the following URL:

<http://jakarta.apache.org/tomcat/tomcat-5.0-doc/realm-howto.html>

Within the Tomcat documentation, a Realm is described as a database of usernames and passwords, which identify valid users of a Web application (or set of Web applications), plus a list of roles associated with each valid user.

Within BPI the following roles have been defined:

- `ovbpi-model-repository`, which is the role for the Repository Explorer and the Modeler; see [Chapter 4, Modeler](#) and [Chapter 6, Process Repository Explorer](#).
- `ovbpi-notify-admin`, which is the role for the Notification pages; see [Chapter 8, Notification](#).
- `ovbpi-int-client`, which is the role for the Intervention tool; see [Chapter 7, Process Intervention](#).
- `ovbpi-metric-definer`, which is the role for the Web-based Monitor definition interface; see [Chapter 5, Monitor Definer](#).
- `ovbpi-event-injector`, which is for a contributed tool and is provided on the BPI media.

There is an XML file called `tomcat-users.xml`, which the credentials for these roles. The file is located at:

```
bpi-install-dir/nonOV/jakarta-tomcat-5.0.19/conf
```

If you have upgraded from a previous version of BPI, there is another XML file located in the same directory as follows:

```
bpi-install-dir/nonOV/jakarta-tomcat-5.0.19/conf/  
tomcat-users.xml.versionstring
```

where *versionstring* is the version number of the product.

You need to compare the new file, which includes the version string, with your existing `tomcat-users.xml` configuration file and modify `tomcat-users.xml` to include any changes shown in the newly installed file.

The reason that the BPI installation procedure does not replace the file is because you might have made your own changes to the file, which you do not want to be overwritten.

Following a new installation, the file has the following content:

```
<?xml version='1.0' encoding='utf-8'?>  
<tomcat-users>  
  <role rolename="ovbpi-model-repository"/>  
  <role rolename="ovbpi-int-client"/>  
  <role rolename="ovbpi-notify-admin"/>  
  <role rolename="ovbpi-metric-definer"/>  
  <role rolename="ovbpi-event-injector"/>  
  <user username="admin" password="hpbpi"  
roles="ovbpi-notify-admin,ovbpi-int-client,ovbpi-event-injector,  
ovbpi-metric-definer,ovbpi-model-repository"/>  
</tomcat-users>
```

You are strongly advised to assign different credentials to the different roles in order to increase the security of your system. This is particularly the case for the Intervention tool, from where you can delete active process instances and data instances.

Modifying Login Credentials

To assign different credentials, you need to edit the XML file that defines the roles and the login credentials. The following is an example of how you can do this:

```
<?xml version='1.0' encoding='utf-8'?>
<tomcat-users>
  <role rolename="ovbpi-model-repository"/>
  <role rolename="ovbpi-int-client"/>
  <role rolename="ovbpi-notify-admin"/>
  <role rolename="ovbpi-metric-definer"/>
  <role rolename="ovbpi-event-injector"/>

  <user username="inject" password="inject"
    roles="ovbpi-event-injector"/>
  <user username="interv" password="secret"
    roles="ovbpi-int-client"/>
  <user username="notif-admin" password="admin"
    roles="ovbpi-notify-admin"/>
  <user username="monitor" password="secret"
    roles="ovbpi-metric-definer"/>
  <user username="model-repository" password="admin"
    roles="ovbpi-model-repository"/>
</tomcat-users>
```

In this example, the following clients now have a separate username and password:

- The `ovbpi-event-injector` role for the contributed tool has a username and password of `inject`.
- The `ovbpi-int-client` role for the Intervention tool has a username of `interv` and a password of `secret`.
- The `ovbpi-notify-admin` role for the Notification pages has a username `notif-admin` with a password of `admin`.
- The `ovbpi-metric-definer` role for the Monitor Definer interface has a username of `monitor` and a password of `secret`.
- The `ovbpi-model-repository` role for the Process Repository (used within the BPI Modeler) has a username `model-repository` with a password of `admin`.

To make changes to the `tomcat-users.xml` file, complete the following steps:

1. Make sure that you have logged out of the BPI Modeler, Notification pages and the Intervention tool.
2. If you are using the Event Injector contributed component, you must also close the Event Injector.
3. Open `tomcat-users.xml` in a text editor:

```
bpi-install-dir/nonOV/jakarta-tomcat-5.0.19/conf/  
tomcat-users.xml
```
4. Make your required changes to the file.
5. Save and close the `tomcat-users.xml` file.
6. Make your changes to the Security settings in the Administration Console as required.
7. Stop and restart all the BPI components from the Status pane of the BPI Administration Console for the changes to take effect.

You must stop and restart all the BPI components when you change the security options, if you do not, some of the security settings can be compromised.

Memory Realm is a simple implementation of the Tomcat 5 Realm interface. It is described in the Tomcat documents as a demonstration implementation and not designed for production use.

Modifying Servlet Engine Files

If you intend to modify the Servlet Engine configuration files, you need to be aware that changes made directly to the Servlet Engine files are overwritten by BPI configuration files. As an example, if you want to configure another form of Tomcat Realm security, you would expect to make the changes in the `web.xml` and `server.xml` files under the following directory:

```
bpi-install-dir\nonOV\jakarta-tomcat-5.0.19\conf
```

However, before making any changes to these files, you need to be aware of how BPI manages configuration changes to the Servlet Engine files. BPI overwrites the Servlet Engine configuration files in order to add BPI-specific configuration details and as a result of your making changes to configuration parameters using the Administration Console. BPI overwrites the Servlet Engine configuration files whenever a change is made to any parameter using the Administration Console, it does not have to be a Servlet Engine specific change.

If you want to make changes directly to the Servlet Engine configuration files, you need to make the modifications in the BPI-specific configuration files and then make sure that BPI propagates these modifications to the Servlet Engine files.

BPI has a number of configuration files and the Servlet Engine files related to `web.xml` and `server.xml` are located under the following directory:

```
bpi-install-dir\newconfig\DataDir\conf\bia\tomcat\conf
```

These files are database specific and you need to modify the files that are appropriate to your configuration.

If you are using Oracle, you need to modify the following files:

```
bpi-install-dir\newconfig\DataDir\conf\bia\tomcat\conf\  
server.engine.oracle.xml  
bpi-install-dir\newconfig\DataDir\conf\bia\tomcat\conf\  
server.views.oracle.xml
```

If you are using SQL Server, you need to modify:

```
bpi-install-dir\newconfig\DataDir\conf\bia\tomcat\conf\  
server.engine.mssql.xml  
bpi-install-dir\newconfig\DataDir\conf\bia\tomcat\conf\  
server.views.mssql.xml
```

When you have made the required changes to these files, you need to artificially make a change to any parameter using the Administration Console and apply the change. As a result of this change, the Administration Console updates all the relevant configuration files, including the Servlet Engine files, and your modifications are then propagated to these files.

Tomcat and HTTP Over SSL

HTTP over SSL (secure socket layer) is a secure version of HTTP. SSL enables the data from a client, such as a Web browser, to be encrypted prior to transmission to prevent unauthorized access to the data being transmitted.

Using SSL, the Web Server and the Web browser (client) establish a secure connection, which enables them to trust each other and send data knowing that the connection is secure. In order to do this, a level of authentication is required and this is provided through Certificates. You obtain Certificates from a Certificate Authority (CA).

You can configure HTTPS for the Tomcat Servlet Engine installed with BPI and then enable the use of HTTPS for your BPI Web applications using the Administration Console. Note that the use of SSL is between the BPI Servlet Engine and the BPI Web applications only. Other HP BTO Software products can also be configured to use SSL; however, BPI can not be configured to use SSL as a means of communicating with these other HP BTO Software products.

There are two aspects of configuring HTTPS for BPI, one aspect is related to the Servlet Engine configuration and one to the Web client configuration. These are described in the following sections.

Servlet Engine Configuration

In order to configure the Tomcat Servlet Engine to support HTTPS, you need to obtain an SSL certificate. SSL uses public key cryptography, which is based on key pairs. These key pairs contain one public key and one private key. These keys are used by the Servlet Engine to enable HTTPS on the machine where the BPI components are running. When installed the certificate encrypts the data that is sent from the Servlet Engine to the Web client, or Web browser.

There is more than one form of keystore, which is a repository of certificates used for identifying a client or a server. The Java Keytool generates a key based on the JKS format of keystore. There is also a PKCS12 format of keystore; however, this cannot be used with BPI. You can use only the JKS format as generated from the `keytool` command.

The following are ways that you can obtain, or generate, a certificate:

1. Using the Java Keytool

Keytool is a key and certificate management utility that ships with your Java distribution. It enables users to administer their own public/private key pairs and associated certificates for use in self-authentication or data integrity and authentication services, using digital signatures.

Use the `keytool` command, from a Command Window, to generate a Java Key.

2. From a Certificate Authority

You can obtain SSL certificates from Certificate Authorities (CA) such as Verisign.

In order to obtain an SSL certificate from a CA, you first need to generate a Certificate Signing Request (CSR) for the Certification Authority to sign. You can do this using the Java Keytool. When generating this certificate make sure that you supply the fully qualified domain name of the machine where the BPI is installed as the common name (cn) attribute.

The CSR certificate and the certificate chain received from the CA need to be stored in a JKS keystore file.

When you have obtained all the required information and configured the Servlet Engine to send HTTPS requests, you can use the Administration Console to enable HTTPS as the protocol to be used to send data to one or more of the BPI Web Clients. This is done through the `Security` options; see section [Security](#) on page 91.

Web Client Certificate-Based Authentication

You can also use the Servlet Engine to provide certificate-based client authentication, based on HTTPS, for your Web applications:

- Process instance and violation Web pages
- Repository Explorer
- Monitor Definer
- Intervention tool
- Notification Server Administration

In order to use client authentication, you first need to configure the Servlet Engine to be able to send HTTPS requests to the Web Browser, as described in section [Servlet Engine Configuration](#) on page 372. You need to configure the Servlet Engine on each system where it installed. You then need to obtain a client certificate, which is signed by a CA, plus a CA root certificate.

In order for the Servlet Engine to be able to receive encrypted data from the Web Browser, you need to enable client authentication to ensure only Web browsers presenting a valid certificate can authenticate with the Servlet Engine.

Each CA provides a root certificate, which you install, or import, for your Web Server (in this case the Tomcat Servlet Engine). The Servlet Engine uses this certificate to determine whether or not it trusts the data being sent from the Web Browser. You obtain this root certificate from your CA. When you have the certificate, you import it into the keystore for your Java distribution. The root certificate needs to be imported so it can become a trusted certificate, enabling a chain of authorization to be established between the Web Server and the Web Browser.

The keystore location for the Servlet Engine is as follows:

```
java-home\jre\lib\security\cacerts
```

The Administration Console allows you to select a keystore file from any location; however, the Tomcat Servlet Engine requires the keystore to be located on a local hard drive. The keystore must not be located on a virtual or network drive.

You import the certificate using the `keytool` utility that comes with your Java distribution, using the following command:

```
keytool -import -keystore java-home/jre/lib/security/cacerts  
-storepass changeit -alias rootca -file rootca.pem -trustcacerts
```

where:

- *java-home* is the directory where your Java distribution is installed.
- `changeit` is the default password for the Java security keystore for a new Java installation.

Type `yes` when prompted if you trust this certificate

When you have imported the root certificate on the Web Server, you then need to import both the root certificate and the client certificate on each Web Browser where you intend to use the BPI Web-based interfaces (or those for which you want to enable HTTPS). Follow the instructions in your Web Browser documentation for installing Certificates.

When you have completed the configuration to set up your Web Browser to Web Server HTTPS connection, you can use the Administration Console to enable certificate-based client authentication. This is done through the Security options; see section [Security](#) on page 91. Client authentication is used only for those clients where you have also enabled HTTPS as described in section [Servlet Engine Configuration](#) on page 372.

16 High Availability Using Microsoft Clusters

A highly available system is one that enables applications and services to continue after hardware and software failures, thus reducing the time when the system is not available for use; also known as downtime. You can have planned downtime, where you have set aside time for maintenance tasks, such as upgrading, and you can have unplanned downtime. Unplanned downtime is where the system fails due to events such as hardware and software failures.

High availability in terms of BPI is where your BPI system is always available when it is planned to be available and fail over mechanisms are in place to minimize, or eliminate, unplanned downtime.

A Microsoft Server Cluster can provide some of the high availability capabilities, but it cannot provide a complete solution for high availability with no single point of failure. You need to make sure that your BPI deployment includes other protection mechanisms for disks, networks, power supplies, memory, controllers and systems; for example:

- dual power supplies to BPI systems
- dual paths from system to disks
- dual network controllers
- uninterruptable power supplies (UPS)
- disk mirroring and (or) the use of redundant arrays of inexpensive disks (RAID)

In other words, to achieve the maximum availability of your system, you need to build in redundancy at all levels.

You can install BPI in a Microsoft Server Cluster environment in order to provide a high-availability solution for BPI. By using the cluster technology when one node in a cluster fails or is taken offline another node in the cluster takes over the failed node's operations. When BPI functions are moved from one node in the cluster to another node, users can experience some temporary interruption in their use of BPI, but this interruption is minimal.

Modes of High Availability

There are two modes of high availability that are offered by Microsoft:

- Active / Passive

In this mode, one node in the cluster hosts an application at any given time; this can be likened to having a standby system in place.

- Active / Active

In this mode, different instances of the same application are running concurrently on different nodes in the cluster. In this mode, when a node fails the remaining nodes in the cluster need to take on additional load and this can impact performance.

BPI must be deployed in the Active/Passive mode within the cluster. You cannot use the Active/Active mode with BPI.

By supporting Microsoft Server Clusters in an Active/Passive mode, BPI Services are automatically restarted on an alternative machine, if the machine on which they are currently running fails for any reason.

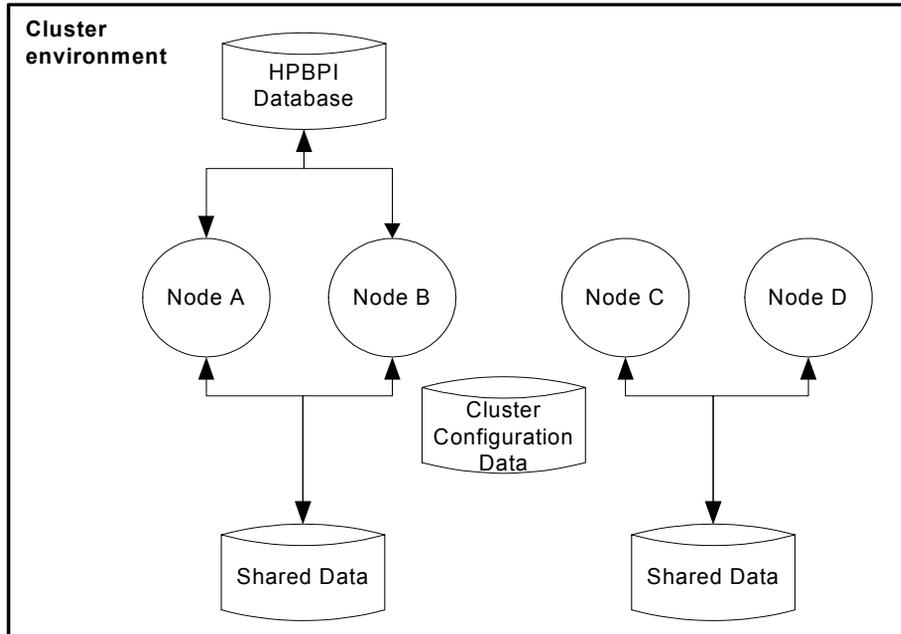
A Microsoft Server Cluster can support up to eight nodes; however, in an Active/Passive mode, BPI requires only two nodes to be configured within the cluster. You can configure additional passive nodes for BPI to keep to a minimum the single points of failure, but it is not needed in order for BPI to operate within the Server Cluster.

Each node within the cluster can host one or more resource groups. A resource group is a collection of components that are managed and viewed as a single unit within the cluster; for example, a public file share, a Web server, and a database application can all be managed as resources. BPI is managed as a Resource Group within the cluster. The use of Resource Groups enables you to manage the order in which resources are started within the cluster, and dependencies between resources. This then enables you to specify specific dependencies for BPI; for example, the dependency between BPI and its database.

The nodes and the resources within the cluster are constantly monitored and in the event of a failure on the node where BPI is running, the workload of the failed node is re-started on another designated node. Note that there is an interruption to service while BPI is in the process of failing over and following the failover, the BPI Modeler needs to be restarted as it has lost its connection to the Process Repository.

In [Figure 46](#) Node A and Node B are both configured to run BPI in Active/Passive mode. Node A is currently hosting BPI. If Node A fails for any reason, the cluster can start BPI on Node B.

Figure 46 BPI Operating on Two Nodes in a Cluster



In order for the failover to be successful, both Node A and Node B must have access to the BPI data. This includes the installation data and configuration files on disk, plus all the Process, Monitor and Events data in the database. In [Figure 46](#) it is only Nodes A and B that have this access. Nodes C and D are also operating in the cluster but are not available for BPI failover.

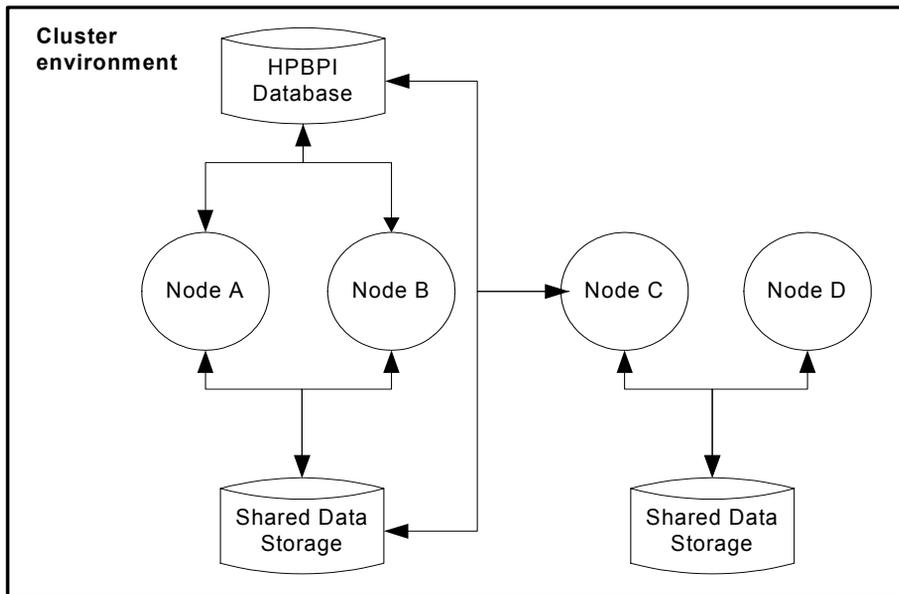
The BPI shared data device is a resource that needs to be managed by the cluster and must therefore reside within the bounds of the cluster. The BPI database might or might not be managed by the cluster, depending on how you have configured your system. In this case, the device where the database is located might or might not be managed as part of the cluster.

The documentation for the Microsoft Server Cluster provides details of the hardware configuration require, plus recommendations for using technology such as RAID for the shared storage to minimize the single points of failure.

There is also a cluster configuration database that must be accessible to all the nodes in the cluster and which contains information such as the membership of the cluster, the configuration data and quorum information.

You can have additional nodes in the cluster made available for BPI failover if you want to minimize the your single points of failure. In [Figure 47](#) BPI has also been installed and configured on Node C, which means that either Node B or Node C can be used as a failover system if needed. Note that Node C is also available as a failover node for another application whose data is stored on a different device to that used by BPI.

Figure 47 BPI Operating on Three Nodes in a Cluster



Configuring BPI Within a Microsoft Cluster

This section describes the BPI-specific tasks that you need to complete in order to have BPI operate within the Microsoft Server Cluster environment. The section assumes that the Server Cluster has been configured to meet your organizational requirements; it does not provide any information relating to the installation and setup of the cluster. Refer to the Microsoft Server Cluster documentation for this information.

In order to have BPI operate within a cluster environment, it is necessary to install BPI on each node in the cluster that you want BPI to run on. This does not mean you have to install BPI on every node in the cluster; see section [Modes of High Availability](#) on page 378.

You need to install BPI multiple times, even though each node has access to the same shared install directory and database. This is to ensure that the BPI Windows Services are created on every node where BPI is to run. You also need to install and register the BPI license on each node on the cluster where BPI is to run; see section [Licenses for BPI in a Cluster Environment](#) on page 385 for more information about licensing BPI in a cluster environment.

If you do not install on each node, it is not possible to configure the BPI Windows Services as generic service resources for the cluster. This is because the Cluster Administrator checks that each generic service exists on every node where the resource is configured in order to restart it in the event of a failover.

Groups

BPI installs a number of Windows services, therefore one way to configure BPI within the cluster is to set up the services using the Generic Service resource type; for example, resources can be grouped as self-contained resource groups, called Groups. How you configure a resource within the cluster is outside the bounds of this document. You need to read the information provided by Microsoft to determine the best configuration for your requirements.

The following are suggested scenarios for grouping the BPI resources:

1. Configure a self-contained resource group for BPI resources and have the database outside the cluster environment. This means that if there is a catastrophic cluster failure, the BPI data is still accessible for browsing and for analysis.

This configuration enables a specific disk drive (or partition), IP address and virtual server name to be assigned to BPI and BPI can then be moved between nodes as an independent resource.

2. Configure a self-contained resource group for BPI resources and have the database installed as a cluster application. You then configure the BPI resources to be in the same resource group as the database.

In this case, BPI can share the disk, virtual server name and IP address of the database. This enables you to define specific dependencies between BPI and the database and the database and BPI can be treated as a single entity and operates as described in scenario 1. In addition, you need only allocate one disk and host name.

3. Configure a self-contained resource group for BPI resources and have the database installed as a cluster application. You then configure the BPI resources to be in a different resource group to the database.

By allocating different resource groups to BPI and the database, each can failover independently of the other, which minimizes the potential downtime of the BPI system. In addition, BPI can be moved between nodes as an independent resource as in scenario 1.



Note that when a specific physical disk partition is assigned to BPI, it cannot be shared by another resource group.

You also need to assign the following resource types to BPI:

- An IP Address resource
- A Network Name resource

These resource types become the virtual server name and address that BPI clients must use to access the BPI Server within the cluster. This virtual server name is valid for whichever node in the cluster BPI is configured to run on and should be used as the BPI Server name when configuring the BPI Host Name property in the Infrastructure Settings:

Admin > Platform > Infrastructure > Business Process Insight

Having all the BPI resources in the same resource group enables you to define dependencies between the BPI services, and the disk and network resources. This means that the cluster manager does not try to start BPI unless all the required resources are available.

When you have identified how you want to manage the BPI resources within the cluster, use the Cluster Administrator to create the new resource groups.

[Summary of Configuration Requirements](#) on page 383 provides a summary of the nodes that you need to take to set up BPI within a Microsoft cluster environment.

Summary of Configuration Requirements

The following is a summary of the nodes that you need to complete in order to install and configure BPI on an existing Microsoft Server Cluster:

1. Make a decision on how you are going to configure the BPI Services as resource groups; that is, whether they have a dedicated resource group, or whether the BPI services are added to an existing resource group.
2. If BPI is to have a dedicated resource group, allocate a shared physical disk for BPI.

If BPI is to share an existing resource group, you can choose to allocate a different (and unique) shared physical disk for BPI, or use the shared physical disk already defined for the group. As an example, there might be a resource group already allocated for the database and you can use the same shared physical disk or allocate a different one.

3. Allocate an IP address and network name for BPI. If BPI is sharing a resource group, these details already exist. If you are creating a resource group specifically for BPI, you need to allocate a unique IP address and network name.
4. If you are configuring a new resource group for BPI, use the Cluster Administrator to create a new resource group. In this new group, create the resources for the allocated physical disk, the BPI IP address and network name.

5. Ensure that the version of the J2SE required by BPI is accessible to each node of the cluster where you want to install and run BPI.

To avoid multiple installations, you can install the J2SE on the shared disk, where it is accessible to all the BPI instances operating in the cluster. You can also choose to install it on a disk that is local to each node, in this case, the installation path must be the same on every node, for example `c:\Program Files\java`.

6. From a node in the cluster where the physical disk resource that you want to use for BPI is active, install BPI. You need to provide the following, cluster specific, information as part of the installation:
 - a. When the BPI installer prompts for the installation directory, enter the drive letter of the allocated physical disk for BPI.
 - b. When the BPI installer prompts for the database host name and the database is installed within the cluster environment, use the virtual network name allocated to the database; do not use `localhost` as the hostname.
7. For each of the other nodes where you want BPI to be able to run (or failover to), use the Cluster Administrator to make the disk for BPI active on that node. When the disk is active, you can install BPI on the node. These subsequent installations are identified and treated as reinstalls by the BPI installation procedure. The installer detects the previous installation on the shared disk and presents as defaults the installation details that it finds, including the database details. This means that any existing data in the database is preserved and it is therefore possible to add new nodes to the cluster at a later time.
8. Use Cluster Administrator to create the following new Generic Service resources in the BPI resource group for the following services:
 - OVBPIAdminServer
 - OVBPIBACDataSamplesProvider
 - OVBPIEngine
 - OVBPIEventHandler
 - OVBPIJmsEventHandler
 - OVBPIMetricEngine
 - OVBPIModelRepository
 - OVBPINotificationServer

- OVBPIServiceAdapters
- OVBPIServletEngine
- OVBPIWebServicesProvider

If you have BPI adapters that also have services, you can create generic services for these in the same way.

9. Set the OVBPIAdminServer resource to be dependent on the shared disk and virtual network name resources used by BPI. If the OVBPIAdminServer service is in the same resource group as the database, it must also be made dependent on the database server resource.
10. For each of the BPI services, set the resource name to be the same as the service name.
11. Set all the remaining BPI resources to be dependent on the OVBPIAdminServer resource.
12. Make sure that any BPI adapters access BPI using the virtual server name.

You can test the cluster installation and configuration by checking that the BPI group can be made online using the Cluster Administrator and that the BPI Modeler can access BPI using the configured virtual network name.

Licenses for BPI in a Cluster Environment

You need to obtain and install a separate BPI licence on every node of the cluster where BPI is installed.

In the Active/Passive mode of cluster configuration, BPI is operational on one node only at any one time; the active node. You therefore need purchase only one set of the required Business Process licenses for this Active/Passive cluster configuration. However, as BPI license keys are linked to a specific Node Name, and you need install BPI license keys on each cluster node where BPI in installed. You therefore need to obtain additional licenses for failover (passive) nodes in the cluster.

For this purpose, a set of additional complimentary license products has been created for BPI, and you can order and use these licenses for the failover nodes in the cluster (for each of the passive nodes you want to configure). You

need to order these additional licenses using the product numbers that correspond to the licensed product, or products, that you have already purchased.

To obtain these complimentary licenses, you need to contact the HP Password Delivery Service. You do this after you order and receive your initial BPI licenses. Your request for additional licenses needs to include the original order number.

The following URL takes you to the HP Password Delivery Service Web page:

<http://www.webware.hp.com>

In the left-hand menu is a link for contacting the Password Delivery Center, where you can find contact details for your region.

Full details of the complimentary product numbers can be found in the BPI product Data Sheet. The Data Sheet is available from the BPI product page of the Management Software Web site:

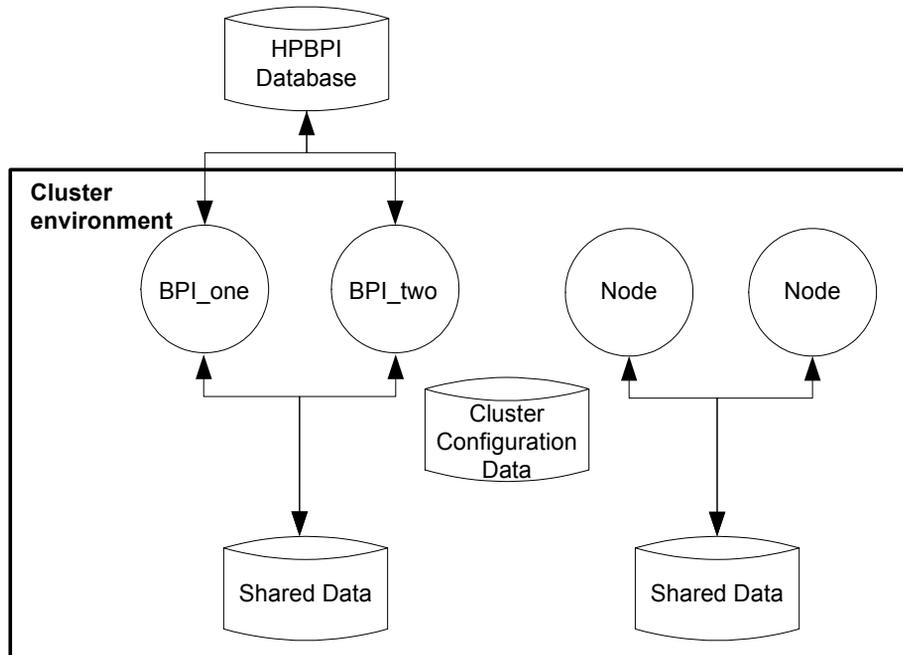
<http://www.hp.com/managementsoftware>

Section [Cluster License Example](#) on page 387 provides an example of an BPI cluster configuration.

Cluster License Example

BPI is to be installed on two nodes in your cluster. The virtual server name for this BPI resource BPI_apple. The node names of the physical nodes in the BPI cluster are BPI_one and BPI_two; see [Figure 48](#).

Figure 48 Cluster Licensing



You purchase one BPI LTU for Enterprise Foundation on node BPI_one. The following are examples based on the BPI version 2.10 product numbers:

BB185AA HP BPI Enterprise Foundation LTU

You also need to request one complimentary license for BPI_two as follows:

BB185AA-COMP HP BPI Enterprise Foundation LTU

When referencing these nodes from within the cluster set up, you use the actual server names (BPI_one and BPI_two).

Use the Cluster Administrator to configure the BPI Resource Group on each node in turn. When the Resource Group is online, you can request and install the appropriate BPI license using the Administration Console on that node.

Reinstalling BPI In a Cluster

You can reinstall BPI in the cluster using the instructions in *Deploying Business Process Insight*. You need only install BPI on one node in the cluster to reinstall, as this process updates the files and directories on the shared disk.

The only time you need to install BPI on all the nodes in the cluster is if there is a change to the local information, for example, BPI service definitions or shortcuts.

Removing BPI From the Cluster

Use the instructions in *Deploying Business Process Insight* to remove the BPI files from the shared disk.

Note that you can use the uninstall procedure only for the first node in the cluster where you want to remove BPI. This is because the all the files and directories on the shared disk have already been removed.

The following are still present on each of the other nodes in the cluster where BPI is installed:

- BPI component shortcuts
- BPI services
- personal configuration files for the BPI Modeler and the BPI Administration Console

These need to be removed as required; see the *Business Process Insight Problem Solving Guide* for information about removing BPI Services.

Other Considerations

The following are other points that you need to be aware of when configuring BPI to operate within a cluster environment:

- When you shut down the BPI components using the BPI Administration Console, the cluster server attempts to automatically restart them. You can modify this behavior from the Cluster Administrator tool; there is a property that specifies that specific resources are not restarted if they are

shut down. However, if you use the Cluster Administrator and not the BPI Administration Console to start and stop the BPI components, you do not have this problem.

- If you have created a customized adaptor, using openadaptor, and the adaptor is running on a machine outside the cluster environment, there is additional information that you need to be aware of. This information is appropriate only for adaptors running outside the cluster and sending business events to the Business Event Handler installed within the cluster; the information covers configuring the adaptor to retry in order to re-establish a connection with the BPI cluster when there is a cluster failover. The information that you need is covered in the *Business Process Insight Integration Training Guide - Business Events* in the section describing Service Wrappers.

17 Backup and Recovery

This chapter describes the backup and recovery procedures for the BPI Server in cases where you are not using the Business Availability Center high-availability solution (see the Business Availability Center Deployment Guide for more details of the high-availability solution).

It is important to back up your BPI Server system to ensure that the BPI files and data can be recovered in the event of a media corruption. It is also important to back up your system to ensure that any processes being processed and their associated data and events can be recovered to a known state.

There are general high reliability configurations, which are recommended for all systems, for example, using mirror or Redundant Array of Inexpensive Disk (RAID) storage. Restoring or recovering from a backup should be a last resort. Your goal should be to make sure that the backups are never required.

This section does not cover how to set up your system for high availability. The section focuses on the recommended procedures for backing up and recovering BPI instance data.



The Process Repository data is part of the BAC backup and recovery process and is not covered in this chapter.

The section also describes the behavior of the BPI system when specific components are shutdown, and provides recommendations for minimizing the effect of the shutdown.

If you have a system shutdown or failure, you want to keep your BPI system as synchronized as possible during the shutdown period. This section describes techniques for design that can help achieve this.

The following list describes some key considerations that you need to be aware of when designing your BPI system for effective backup and subsequent recovery:

- For planned component shutdowns:
 - Shut your BPI system down during quiet periods where possible.
 - Use high reliability tools where appropriate.
- Design adapters to minimize the number of events lost during a system failure.

For most adapters, it is possible to design them such that they process events from the last time the adapter was executed. The *Business Process Insight Integration Training Guide - Business Adapters* describes how you do this.

- Minimize the number of Check Sequence arcs that you use in your processes.

When the BPI system is recovered following a shutdown, it is likely to receive a burst of out-of-sequence events. You are recommended to use Check Sequence arcs only where essential. Overuse can cause the BPI system to generate an excess of violations when it restarts. The *Business Process Insight Online Help for the Modeler* describes Check Sequence arcs in more detail.

Files and Directories to Backup

The following list describes the BPI data that is persisted within your BPI Server system and that therefore needs to be part of your backup policy:

- All BPI schema objects for the BPI Instance database schema.

You specified the database details when you installed BPI, you need these details in order to complete your backup.

The database for BPI should be backed up using the utilities and procedures provided as part of your database management system.

- Event definitions

BPI stores details about Event definitions that have been deployed to the Business Impact Engine in a series of files; these files are located as follows:

```
bpi-install-dir\data\repository\events
```

- Configuration information

BPI includes configuration information, which controls how BPI is setup and is relatively static. This configuration information is located in the following directory:

```
bpi-install-dir\data\conf\bia
```

- Template configuration files

The following directory contains the template definitions for most of the configuration files for the BPI Server and presented (managed) within the Administration Console. When you configure a component using the Administration Console, all the configuration files in `data\conf\bia` are regenerated, based on the content of the template files located at:

```
bpi-install-dir\newconfig
```

- Log files

These do not need to be backed up to restore a consistent system; however, you are advised to back up the log files, which are located at:

```
bpi-install-dir\data\log
```

- Data files

These are the files (Class files, Java files and so on) that contain the details of the deployment status of your definitions. BPI includes configuration information relating to the processes and data that are deployed within the database. This information changes whenever the components of a process are deployed to the Business Impact Engine. This information might be static in a production system, but variable in a development system where Business Processes are being designed, developed and tested and are therefore in a state of change.

These data files are located at:

```
bpi-install-dir\data\datafiles
```

- Business Event Handler

Events received by the Business Impact Engine from the Business Event Handler are not acknowledged by the Engine until they have been successfully received. Out-of-sequence events and events that contain errors (for example, missing data) are stored in the Business Event Handler hospital.

The Business Event Handler includes database tables for the hospital and event store. By default these tables are created in the same database as the rest of the BPI data, and are therefore backed up with the BPI data.

- Application adapter files and data

Application adapters are those developed using the Business Event Handler component to access business data from applications within your organization. The *Business Process Insight Integration Training Guide - Business Events* describes how to build application adapters.

It is usual for application adapters to be located close to (or co-located with) their data source, which means that they are likely to be running on a different system to the system where BPI is installed.

Any data used by that application adapter that needs to be synchronized with the application data (for example buffer tables populated using database triggers or adapter history files), should be backed up as part of the backup procedures for the application. Where possible the buffer table should exist within the same database as the application data that is being monitored. This makes it easier to backup the data together and keep it synchronized.

- TransactionVision

You need to back up the TransactionVision event data related to the BPI Server as described in the TransactionVision Help.

With the exception of the application adapter files and data, you must back up all of the data described above at the same time in order to maintain its consistency.

How often you back up the BPI data depends on how frequently the data is changing. The data can be backed up while the BPI system is operational; however, you need to ensure that you do not deploy or undeploy and definitions during the backup as the backup includes directories.



As the BPI instance database cannot be synchronized with the Event definition files and data files, it is not possible to recover the BPI system to the point of failure from a backup. You must use the appropriate database management system tools to restore your system to the most recent backup and not to the point of failure.

As you cannot recover to the point of failure, if you have installed a database solely for BPI, you can consider not backing up all the transaction log files. This will reduce the amount of disk space required by the database for recovery purposes. In the case of Microsoft SQL Server, you could use the Simple Recovery model, rather than the Full Recovery model. The Simple Recovery model enables you to recover to the most recent backup. The Full Recovery model enables you to recover the database to the point of failure.

In the case of Oracle, you need to use ARCHIVELOG to enable online backups. If you do not want to use ARCHIVELOG, you can stop BPI and complete an offline backup.

How the BPI System Behaves When Components are Shutdown

This section describes the behavior of the BPI components when they are shutdown. It provides additional information that helps you understand the behavior of the system for backup and recovery purposes.

Engine Shutdown

If the Business Impact Engine component is shutdown, it is no longer able to receive and process events.

As a result of the Engine shut down, the Business Event Handler component stops accepting business events until the Business Impact Engine is restarted. When the Engine is restarted, any business events waiting to be processed are automatically submitted to the Business Impact Engine.

Database Shutdown

If the database is shut down for any reason, the Business Impact Engine can no longer communicate with it and also shuts down, as described in section [Engine Shutdown](#) on page 396. In addition, all other BPI components that use the database are shut down.

Notification Server Shutdown

When the BPI system determines that a notification is required, the Business Impact Engine passes a notification to the Notification Server. All notifications are held by the Business Impact Engine, in the database, until the Notification Server has confirmed that it has accepted responsibility for them.

If the Business Impact Engine shuts down before the notification is sent to the Notification Server, the notification is retried when the Business Impact Engine restarts. Note that the service status shown is the latest status. No notifications are generated for any interim changes that occur when the Business Impact Engine is shut down. For example, if the Engine shuts down when a service is in the state `Critical`, and the service subsequently changed

from Critical to Normal and then back to Critical, when the Engine restarts, the service status is shown as Critical. In this case, the information about the state change to Normal and then back to Critical is not recorded.

Email Server Shutdown

If the Notification Server cannot make a connection to the email server to send the notification to the designated user, the Notification Server stores the notification in the database and resends it at a later time when a connection is established. The Notification Server continues the attempt to resend the notification until it reaches the value for the `Maximum retries to SMTP server` parameter. When this maximum is reached, the Notification Server stops retrying and logs an error in its log file.

Business Event Handler - BPI Adapter Shutdown

If the Business Event Handler shuts down for any reason, the effect of the shutdown depends on the design of the individual adapters that are connected to it.

For database adapters, where you are using buffer tables, make sure that the buffer tables are backed up and synchronized with the application data that is being tracked.

For file adapters, make sure that the current position in the file is backed up with the source application data.

This means that when the Business Event Handler BPI adapter is restarted, the application adapters can be also restarted and any events marked as `DISCHARGE_WAIT` can then be sent back into the BPI system.

Servlet Engine Shut Down

If the Servlet Engine is shut down for any reason, all the currently open BPI clients using Browser Windows also stop. You might need to restart the Web Browser Windows and the BPI clients when the Servlet Engine is restarted.

Completing an Online Backup for BPI

Before starting an online backup, you need to ensure that your database is configured such that it is capable of completing a backup online. For example, in the case of an Oracle Server, you need to make sure that the Oracle instance you have specified for BPI is running in ARCHIVELOG mode. If it is not, you cannot complete an online backup.

You should also align the BPI backup process with that of the overall BAC system backup processes in order to make sure that the data is as consistent as possible across your deployment after you have recovered the data.

The following steps describe the process for completing an online backup:

1. Ensure no one is using the BPI Modeler.
2. Close the BPI Modeler.
3. Use the BPI Administration Console to shut down the Process Repository component. This prevents changes being added to the repository whilst the backup is taking place.

Do not make any further administration changes using the Administration Console until after the online backup is complete.

4. Backup the following BPI directories and their subdirectories on the system where the BPI Server is installed:

```
bpi-install-dir\data\repository  
bpi-install-dir\data\conf\bia  
bpi-install-dir\data\datafiles  
bpi-install-dir\data\log  
bpi-install-dir\newconfig
```

If you prefer, you can backup the entire *bpi-install-dir\data* directory.



Any log files currently locked by BPI processes cannot be backed up, so there are some error messages in the backup process referring to these files. Older log files are successfully backed up.

5. Back up the BPI data in the database using the database management system backup utilities.
6. Use the BPI Administration Console to restart the Process Repository component on the system where the BPI Server is installed.
7. Restart the BPI Modeler.

Your backup is now complete.

It is possible that the Engine Model Cleaner process is running at the same time as the online backup is completed. This is not a problem, but can result in inconsistencies between the data stored in the Engine's database and its configuration files. If you see warnings in the Business Impact Engine log file indicating that the Engine cannot find a definition in the database, it is as a result of this scenario.

Restoring your BPI Data from a Backup

This section describes how to restore your BPI system following:

- a complete system failure
- a BPI file system failure
- a database failure

In all cases, you are restoring both the database and the file system for the BPI components.

The following are points to note when restoring the database and the file system:

- Process instances created after the last database backup are lost.
- Process instances completed after the last database backup remain active and are unlikely to complete.
- Process, Data or Event definitions created since the last database backup need to be redeployed.

The Modeler detects that the current process is not the latest one and the Process is set to a deployment state of:

Not deployed, but can be deployed; an earlier revision is deployed

You can select to deploy the process and the later version that has been detected in the Process Repository is deployed.

- Modifications to Process, Data or Event definitions since the last database backup need to be redeployed.

The Modeler detects that the current process is not the latest one and the Process is set to a deployment state of:

Not deployed, but can be deployed; an earlier revision is deployed

You can select to deploy the process and the later version that has been detected in the Process Repository is deployed.

- Process, Data or Event definitions deployed since the last database backup need to be redeployed.
- Monitor definitions that are new or have been modified since the last database backup need to be redeployed.

- Email users and subscriptions configured through the Notification Server Administration Console after the last backup are lost and need to be re-added.
- Scripts and files created since the last backup need to be recreated; for example, any Velocity templates or Notification Server scripts that you have recently created might need to be redone.
- Email users and subscriptions deleted since the last database backup reappear and will need to be deleted again.
- Process, Data, Service and Event definitions that have been undeployed reappear and need to be undeployed again.
- Recent configuration changes made using the Administration Console need to be redone.

Where appropriate, you are advised to restore the database files, BPI Event definition files and BPI configuration files to maintain consistency. If you do this, you also need to re-enter any Event definitions created since the backup was completed.

Steps to Restore your BPI System

This section describes the steps for restoring your BPI system.

If you have had a severe system failure, you are recommended to reinstall BPI including all its dependencies, for example, the database management system (Microsoft SQL Server or Oracle Server) and the J2SE, before restoring any files.

To restore the BPI data, complete the following steps:

1. Ensure no one is using the BPI Modeler.
2. Close the BPI Modeler to prevent new and modified definitions being created.
3. Use the BPI Administration Console to shut down all the BPI components.

Do not make any further administration changes using the Administration Console until after the recovery is complete.

4. Restore the files that you previously backed up under:

```
bpi-install-dir\data  
bpi-install-dir\newconfig
```

If your BPI system has been running since the last backup you are likely to receive warnings for log files that already exist; this is expected. However, other error and warning messages should be fully investigated before continuing.

If you are using an Oracle database continue at step 6. If you are using a Microsoft SQL Server database, continue at step 5.

5. Use the Microsoft SQL Server database utilities to restore the BPI database to the last backup. Be aware that when restoring files following the reinstallation of the database, the system identifiers for the database users are not the same. As a result, the newly created BPI user is not able to access the data in the restored database.

For Microsoft SQL Server you use the Management Studio to execute an SQL command similar to the following (if you are not using the default schema name or database user defined within BPI, substitute the correct schema name or user for your database):

```
use hpbpiSchema;  
exec sp_change_users_login 'Update_One', 'hpbpiuser',  
'hpbpiuser';
```

You also need to ensure that the default database for your database user is set correctly; for example: hpbpiSchema.



As the BPI database cannot be synchronized with the BPI file data relating to Event definitions and configuration information, it is not possible to recover to the point of failure from a backup. You must use a database management system command to restore your system to the most recent backup and not to the point of failure.

Continue at step 7.

6. Use the Oracle Server database tools to restore the BPI database to the last backup.



As the BPI database cannot be synchronized with the BPI file data relating to Event definitions and configuration information, it is not possible to recover to the point of failure from a backup. You must use a database management system command to restore your system to the most recent backup and not to the point of failure.

7. Restart the Business Impact Engine, Monitor Engine and Process Repository from the BPI Administration Console.

8. Restart the BPI Modeler.
9. Open a Monitor Definer Window.
10. Re-apply any Business Process data that has been entered through the BPI Modeler, since the last backup.
11. Re-apply any monitor definition data that has been entered using the Monitor Definer, since the last backup.

You have now restored your BPI data.

12. Undeploy any Process, Data, Service or Event definitions that are deployed and that were undeployed before you restored your BPI system.
13. Use the BPI Administration Console to restart the remaining BPI components.
14. Delete any email users and subscriptions that have reappeared since you restored your BPI system.
15. Use the Process Intervention tool to re-synchronize with the UCMDB.

Now go to section [Completing the BPI Recovery Procedure](#) on page 404 to complete the recovery procedure.

Completing the BPI Recovery Procedure

This section describes points to note after you have completed an BPI recovery from backup.

After you have completed the steps described in section [Restoring your BPI Data from a Backup](#) on page 400, you have recovered to the latest backup. You have therefore potentially missed events that are relevant to your Business Processes. This means that BPI can raise erroneous events, particularly in cases where you have Check Sequence arcs defined.

You do also have the option to take a differential backup, which is faster. However, you are advised to adopt the backup and recover policies adopted for other applications within your organization, using the information provided in this section, which is specific to BPI.

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