

WebSphere® Business Monitor
Version 7.0

Global Process Monitor Models
User Guide



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Note

Before using this information and the product it supports, be sure to read the general information under “Notices” on page 37.

This edition applies to version 7, release 0, of WebSphere® Business Monitor.

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Acknowledgements

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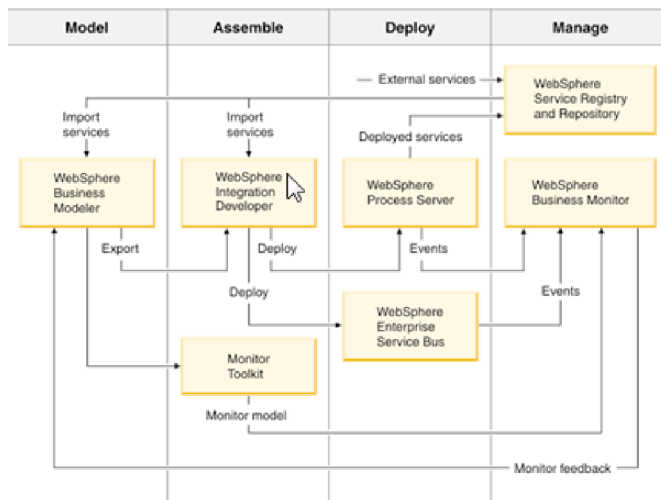
Chapter 1. Introduction

International Business Machines Company or IBM helps businesses worldwide transform their operations through technology. It provides software solutions to industries like banking, healthcare, retail, insurance, education, and transportation. These software solutions allow companies to capture data, translate data into information, use this information to predict patterns and foresee problems, and prepare for the future.

The IBM WebSphere Business Process Management (BPM) products comprise a software solution for developing and monitoring business processes. A *business process* is a defined set of business activities that represent the required steps to achieve a business objective. A business process includes the flow and use of information and resources.

The key BPM products are WebSphere Business Monitor, WebSphere Process Server, WebSphere Integration Developer, WebSphere Business Monitor Development Toolkit, and Business Space powered by WebSphere. This product family offers tools that allow a company to create, manage, run, optimize, and monitor its own business processes. With this ability, a company can rapidly correct problems as they occur and make the necessary changes, thereby reducing loss and increasing productivity.

The following figure shows how the WebSphere BPM products work together to manage business processes:



One of the key concepts in business process management is the concept of the *monitor model*. It defines the business performance management aspects of a business model, including events, business metrics, and key performance indicators (KPIs) that are required for real-time business modeling. Most monitor models need to be generated and are tailored for specific process definitions.

By comparison, a *global process monitor model* is a ready-made monitor model that does not need to be generated. It enables you to detect, track, and monitor business processes and human tasks. The business processes are detected dynamically and tracked based on the events that they emit to WebSphere Business Monitor. The collected data can be viewed in Business Space using one of several dashboard widgets, such as the Instances, Dimensional, and KPI widgets.

This user guide discusses how to work with global process monitor models. It is assumed that you are already familiar with business processes, monitor models, and WebSphere BPM monitoring tools. Although all of the WebSphere BPM products enable you to work with monitor models either directly or indirectly, the user guide focuses on the following two products:

- WebSphere Business Monitor
- Business Space powered by WebSphere

WebSphere Business Monitor is a business-activity monitoring product that provides users with the capability to measure up-to-date views of business performance, monitor real-time and completed processes, and report business operations. The information captured can help you identify business problems, correct exceptions, and change processes to increase business competitiveness by improving process efficiencies.

Business Space powered by WebSphere is a collection of related web content that conveys insight into the business and gives users the ability to react to changes in the business.

Chapter 2. Overview of global process monitor models

A global process monitor model is a ready-made generic monitor model that is installed by default on a WebSphere process server. It enables a business to detect, track and monitor business processes and human tasks without monitor model generation or deployment steps. Processes are detected and tracked based on the events that they emit to WebSphere Business Monitor. The collected data can be viewed in Business Space dashboards using several widgets, such as the Instances widget, the Dimensional widget and the KPIs widget.

Unlike generated monitor models, which are tailored for specific process definitions, a global process monitor model will detect and track any process that sends events to WebSphere Business Monitor. A global process monitor model monitors business processes at both the definition and execution level. At the definition level, it monitors the processes that have been deployed, identifies the current versions, and determines the steps to define. At the execution level, it monitors how many runs are in progress, as well as identifies the start time of each run and the current state of the process.

The monitor model also gathers statistics for each process definition and for each of its defined steps, which includes the minimum/maximum/average execution time, the number of executions started/in progress/completed, and many others.

A pre-configured dashboard is available for global process monitor models, which includes Instances views, KPI views, and Dimensional views in dashboard pages, but you can tailor and extend the dashboard according to your needs.

Chapter 3. Dashboards

A *dashboard* is a web page that can contain one or more widgets to graphically represent business data. A *widget* is a portable, reusable application or piece of dynamic content that can be placed into a web page, receive input, and communicate with an application or with another widget.

Dashboards are typically designed to provide quick access to important information. WebSphere Business Monitor supports the following two dashboard environments: Business Space and Business Space for WebSphere Portal. The Business Space dashboard is described in this user guide.

Business Space is provided with WebSphere Business Monitor and some other WebSphere products. The WebSphere Business Monitor widgets that you can add to your Business Space dashboard allow you to quickly view business performance data in a variety of graphical formats.

The dashboard shows the detailed, technical data that is captured by the global process monitor model such as execution identifiers, milliseconds, timezones, and process migrations.

The dashboard has six pages:

- Processes
- Process Statistics
- Tasks
- Task Statistics
- Invocation Chains
- KPIs

These dashboard pages are described in the following sections.

Processes page

This dashboard page contains an Instances widget that allows you to navigate the process instances in the global process monitor model.

The initial view of the Processes page displays the process definition level. The left and right sides of the Processes page are shown in the following two figures:

Name	Version No Blanks	Process Version	Steps	Step Definition	Variables
ProcessCustomerOrder	Mon_2009-06-01_14:55:33.000	↕	27	↕	11
CheckItemAvailabilityAndPrice	Tue_2009-06-02_13:53:47.000	↕	3	↕	2
ProcessCustomerInvoice	Wed_2009-06-03_23:45:29.000	↕	5	↕	2

Variable Definition	Started	In Progress	Finished	Process Execution
5	14	0	5	5

There is one row for each process definition that has been deployed and sends events. If events have arrived from several process versions, then the last version detected will be shown in the second column and earlier versions can be seen by following the **Process Version** link. The **Step Definition**, **Variable Definition**, and **Process Execution** links navigate downward from the root of the tree structure. The counts before each link indicate how many children will be found. For example, in the above figures, there are 27 different steps defined in the ProcessCustomerOrder process, and 11 different variables; 5 executions of this process have started and all 5 have finished. Detailed information about the 27 step definitions, the 11 variable definitions and the 5 process executions can be found by following the drill-down links. For example, clicking on the first **Step Definition** link may take you to a view like the one shown in the following figure:

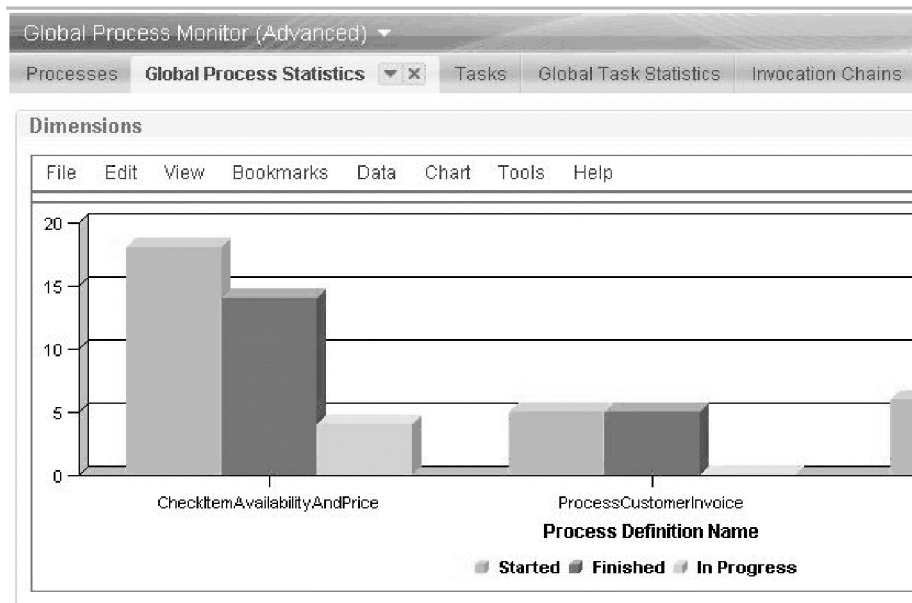
Process Definition Name	Name	Kind	Started	In
ProcessCustomerOrder	Receive	KIND_RECEIVE	5	0
ProcessCustomerOrder	LogOrder	KIND_SCRIPT	5	0
ProcessCustomerOrder	Scope	KIND_SCOPE	5	0
ProcessCustomerOrder	ReviewOrder	KIND_STAFF	5	0
ProcessCustomerOrder	InitializeReponseCounter	KIND_ASSIGN	4	0
ProcessCustomerOrder	WhileAnyOpenQuestions	KIND_WHILE	4	0
ProcessCustomerOrder	AskTheQuestion	KIND_INVOKE	9	0
ProcessCustomerOrder	InitializeLineItemTotal	KIND_ASSIGN	5	0
ProcessCustomerOrder	ItemHandling	KIND_SCOPE	5	0
ProcessCustomerOrder	ForEachLineItem	KIND_FOR_EACH_PARALLEL	5	0
ProcessCustomerOrder	HandleLineItem	KIND_SCOPE	14	0
ProcessCustomerOrder	SetCurrentItem	KIND_ASSIGN	14	0
ProcessCustomerOrder	CheckItemAvailabilityAndPrice	KIND_INVOKE	14	0

The waiting (working) duration of a process execution is the sum of the waiting (working) durations of all human tasks within that execution, and any subprocesses it invoked, recursively. Note that in processes where human tasks run in parallel, their aggregate waiting (working) durations can exceed the total duration of the process execution.

Process Statistics page

This dashboard page is used for graphical visualizations of the data presented in tabular form on the Processes page.

Two-dimensional widgets have been pre-configured to give an example of the kind of graphs that can be shown. The dimensional models of the global process monitor model are quite comprehensive, so that you can add a wealth of other diagrams according to your needs. A snapshot of the pre-configured page is shown in the two figures below. The first figure displays the number of executions started, finished, and underway for the process definitions. The second figure shows statistics for the total duration, waiting duration, and working duration of the ProcessCustomerOrder process. Note that the process definition in focus is selected from the **Process Name** drop-down menu.



The figure directly above suggests that the bulk of the total process duration is due to human tasks waiting to be claimed—which is not surprising. Something that does surprise, however, is the very small (apparently zero) minimum working duration. It should be possible to explain this observation using the data gathered by this monitor model. The necessary steps are outlined below, as an example of how to resolve such questions using the global process monitor model.

First, by hovering over the **Min Working Duration** column in the graph of the above figure, you might see that the minimum working duration is not zero but 1.625 seconds. Switching to the Processes page, and drilling down to the Process Execution level for the ProcessCustomerOrder process, you find one execution that has a working duration of 1.625 seconds. Drilling down to its Process Execution Step view, you could, for example, see a view like the figure below:

Global Process Monitor (Advanced) ▾			
Processes ▾ × Global Process Statistics Tasks Global Task Statistics Invocation Chain			
Instances			
<div> <div>ⓘ</div> <div>Export...</div> </div>			
Process Definition Name	Name	Kind	State
ProcessCustomerOrder	Receive	KIND_RECEIVE	FINISHED
ProcessCustomerOrder	LogOrder	KIND_SCRIPT	FINISHED
ProcessCustomerOrder	Scope	KIND_SCOPE	FAILED
ProcessCustomerOrder	ReviewOrder	KIND_STAFF	EXPIRED
ProcessCustomerOrder	Snippet	KIND_SCRIPT	FINISHED
ProcessCustomerOrder	InitializeLineItemTotal	KIND_ASSIGN	FINISHED

A single human task has run (ReviewOrder) and was completed within 1.625 seconds after it was claimed. To explore this further, you can drill down into the task's State History, where you would find that the task expired 1.625 seconds after it was claimed and before the user had a chance to complete it, as shown in the following figure:

Global Process Monitor (Advanced) ▾		
Processes ▾ × Global Process Statistics Tasks Global Task Statistics Invocation Chains		
Instances		
<div> <div>ⓘ</div> <div>Export...</div> <div> <div>⊞ Search for:</div> <div></div> <div>🔍</div> <div>Reset</div> </div> </div>		
Time	Time (xs format)	State
October 14, 2009 2:01:09 PM	2009-10-14_14:01:09.271_GMT-04:00	INACTIVE
October 14, 2009 2:01:09 PM	2009-10-14_14:01:09.302_GMT-04:00	READY
October 14, 2009 2:03:35 PM	2009-10-14_14:03:35.849_GMT-04:00	CLAIMED by UNAUTHENTICATED
October 14, 2009 2:03:37 PM	2009-10-14_14:03:37.474_GMT-04:00	EXPIRED
<div>1 - 4 4</div>		
<div>Drill Up</div>		

Tasks page

This page is similar to the Processes page in that it shows data gathered about human tasks in tabular form.

There is also some redundancy between the data shown here and data shown on the Processes page, because human tasks that are defined as a step in a process (so-called inline tasks) are tracked in both places.

A first view of the Tasks page may look like the figure below. Four different tasks have been detected, of which 5, 9, 14, and 16 executions respectively have been started. All executions have finished. The second task in the list (ProvideClarification) is defined stand-alone, while the remaining three are inline tasks in some processes. The names of these processes are listed in the first column. If more than one version of the task has been running, the Version No Blanks metric shows the last version that was detected, but just as for Process Definitions, Task Definition represents all versions of a task: aggregations accumulate data across all versions that have been active.

Global Process Monitor				
Processes	Global Process Statistics	Tasks	Global Task Statistics	Invocation Chains
Global KPIs				
Instances				
<div> <div>Export ...</div> </div>				
Defining Process Name	Name	Version No	Blanks	Started In Progress
ProcessCustomerOrder	ReviewOrder	Tue_2009-09-01_18:00:00.000	5	0
	http://OrderProcessing/ProvideClarification	Tue_2009-06-02_13:52:55.000	9	0
CheckItemAvailabilityAndPrice	DetermineItemAvailabilityAndPrice	Tue_2009-06-02_13:53:47.000	14	0
ProcessCustomerInvoice	CollectPayment	Wed_2009-06-03_23:45:29.000	16	0

The hierarchy for Human Task Definition, closely resembles that for Step Definitions.

Drilling down from a Task Definition you will find its Task Execution. The structure of the task execution resembles that for a Step Execution.

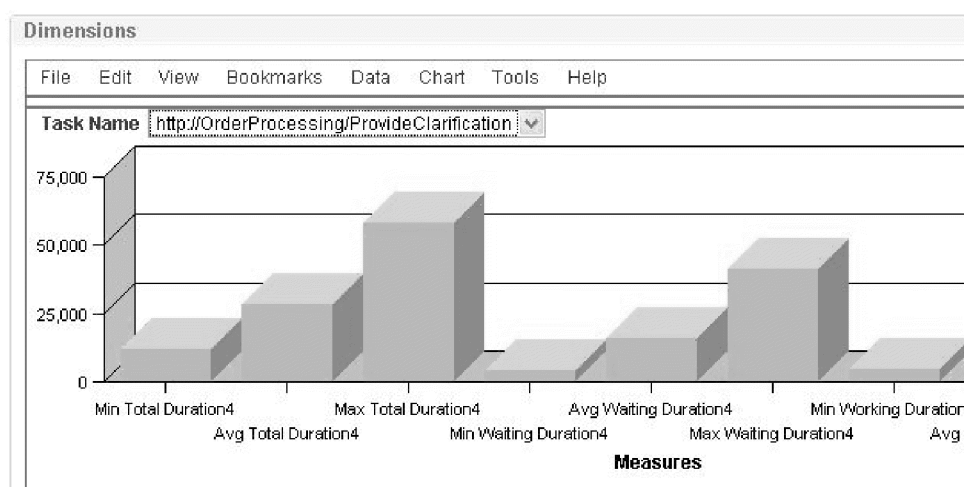
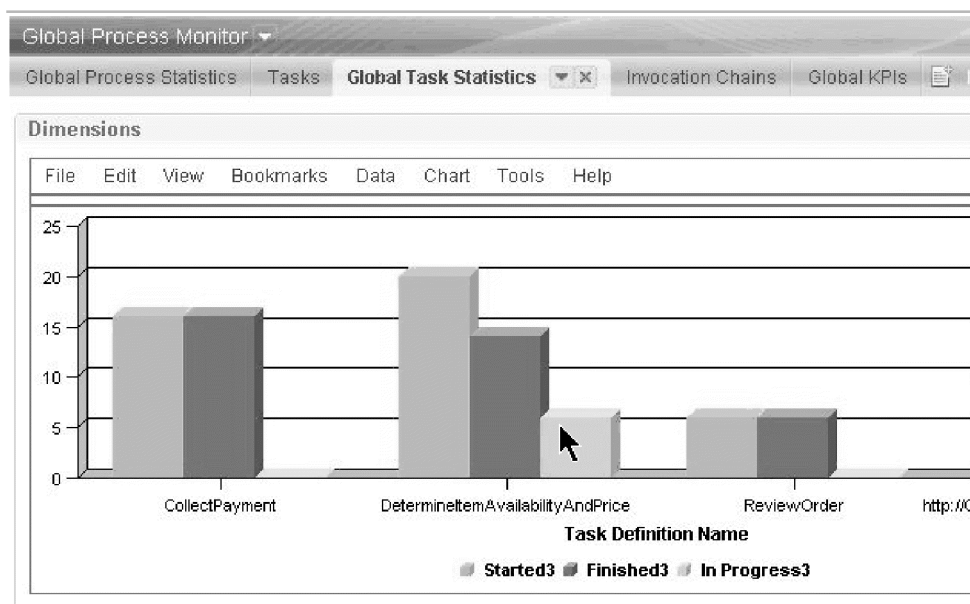
Yet another level down, you find time-stamped histories of:

- Task execution state (which also shows a task's owner when claimed)
- Potential task owners (showing the list of users who may claim the task)
- Work item updates (showing changes to the task's list of work items)
- Task escalations.

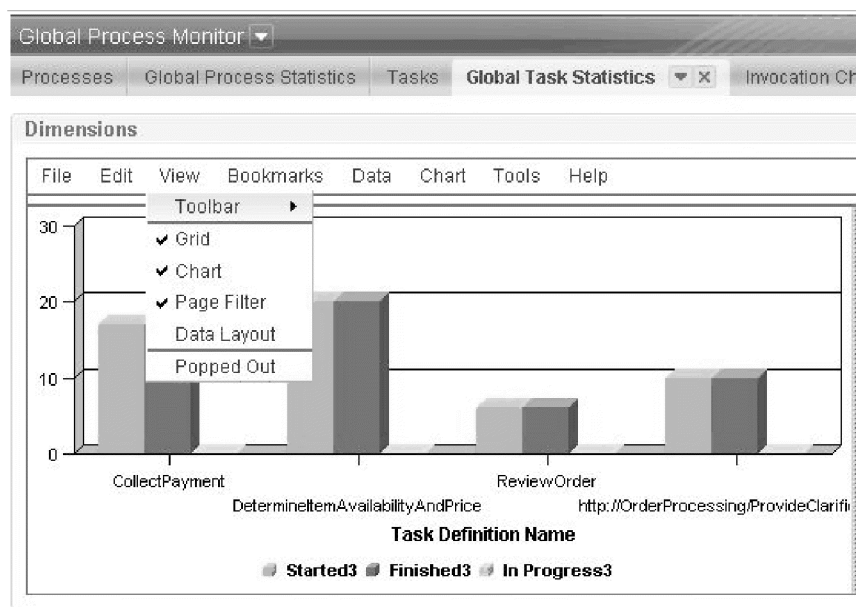
Task Statistics page

This page displays graphical visualizations of the data presented in tabular form on the **Tasks** page.

A snapshot of the preconfigured page, which is part of both the basic and the advanced dashboard configuration, is shown in the figures below. The first figure displays the number of executions started, finished, and under way for four task definitions. The second figure displays statistics for the total duration, waiting duration, and working duration of the ProvideClarification task. Note that the task definition in focus is selected from the **Task Name** drop-down menu.

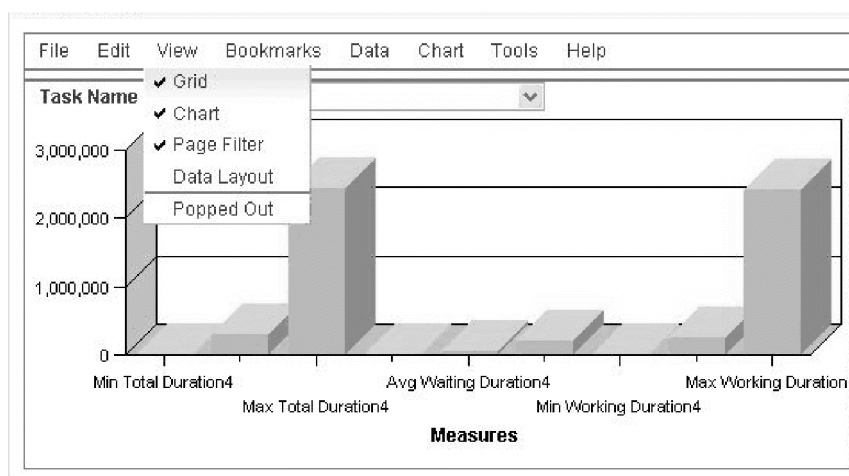


The first figure below shows that six executions of DetermineItemAvailabilityAndPrice are currently running, while all other task executions—16 for CollectPayment and 6 for ReviewOrder—have finished. The second figure below displays the same information in a tabular form.



Manage Business Spaces				
Global KPIs	New Page	Add Widgets		
Task Definition Name ↑↓	Started3 ↑↓	Finished3 ↑↓	In Progress3 ↑↓	
All Task Definition Name ↑↓	53	53	0	
CollectPayment ↑↓	17	17	0	
DeterminItemAvailabilityAndPrice ↑↓	20	20	0	
ReviewOrder ↑↓	6	6	0	
http://OrderProcessing/ProvideClarification ↑↓	10	10	0	

Both figures below show that the total time for ProvideClarification tasks is split roughly 60/40 between waiting and working time. By hovering over the columns in the graph, you find an average waiting duration of 15.592 seconds and an average working duration of 12.320 seconds. The maximum waiting duration is 41.172 seconds, the maximum working duration is 29.953 seconds, and the maximum total duration is 58.250 seconds. Why is it that the first two do not add up to the third? The task execution that waited the most before it was picked up was not the one that took the longest time to be completed.



Task Name ↑↓	Min Total Duration4 ↑↓	Avg Total Duration4 ↑↓	Max Total Duration4 ↑↓
All Task Name ↑↓	8281	291997	2433313
CollectPayment ↑↓	8281	25685	48125
DetermineItemAvailabilityAndPrice ↑↓	17907	715464	2433313
ReviewOrder ↑↓	22438	74956	150063
http://OrderProcessing/ProvideClarification ↑↓	11781	28020	58250

Finally, a few words on managing the dimensional views (applicable to all dimensional views, not just those on the current page):

- The measures (heights of columns) do not always auto-refresh. Use the browser refresh button, if necessary.
- The dimensions (for example, the tasks for which statistics are shown) never auto-refresh. When a new task is detected, you must drill up and then drill down again in order to see it.

Invocation Chains page

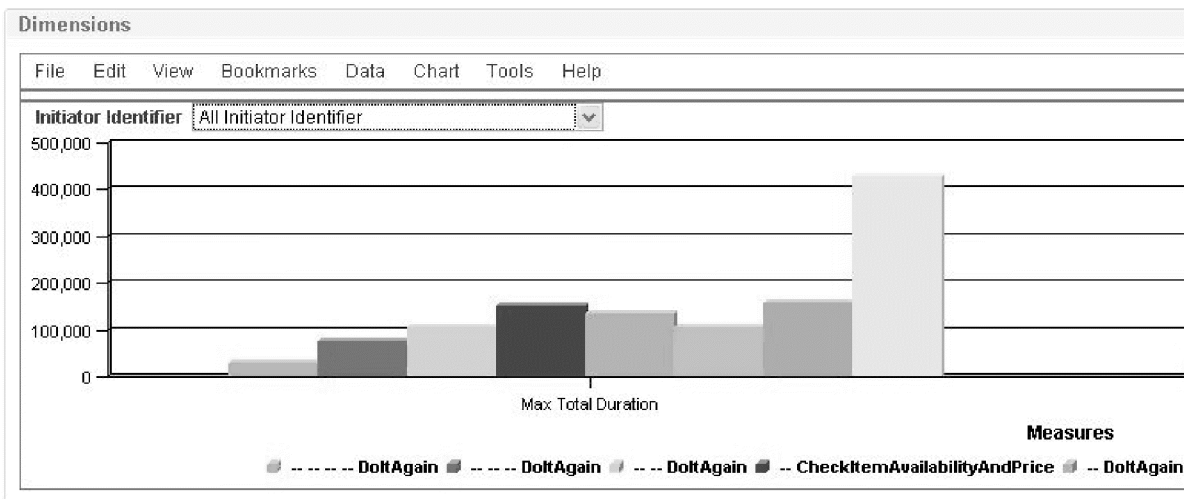
The Invocation Chains page is simply a different visualization of Process Execution, which is the last drill-down option on the Processes page. Unlike the visualization of Process Executions on the Processes page, the Invocation Chains page shows:

- All process executions, not just those of a particular process definition. As a result, the table data shown in the first figure below can become quite long.
- The process executions, which are grouped by the initiating execution identifier (the top-level execution that ultimately started them). Each group is sorted according to the time that the process executions were started.

In the second figure below, a dimensional widget displays the sum and the maximum total duration of all executions of a process, at each invocation level at which the process occurs. The idea is to quickly show "where the time is spent". (The first figure below displays this information in a list form.)

Global Process Monitor (Advanced)		
Processes	Process Statistics	Tasks
Task Statistics	Invocation Chains	KPIs

Instances		
<div> <div>Export...</div> <div></div> </div>		
Initiator Identifier	Invocation Depth	Indented Process Definition Name
_PI:90030124.c67145c3.8ce5c5f6.e9fc0830	0	ProcessCustomerOrder
_PI:90030124.c67145c3.8ce5c5f6.e9fc0830	1	-- CheckItemAvailabilityAndPrice
_PI:90030124.c67145c3.8ce5c5f6.e9fc0830	1	-- CheckItemAvailabilityAndPrice
_PI:90030124.c67145c3.8ce5c5f6.e9fc0830	1	-- CheckItemAvailabilityAndPrice
_PI:90030124.c67145c3.8ce5c5f6.e9fc0830	1	-- ProcessCustomerInvoice
_PI:90030124.c67acb33.8ce5c5f6.e9fc09f3	0	DoltAgain
_PI:90030124.c67acb33.8ce5c5f6.e9fc09f3	1	-- DoltAgain
_PI:90030124.c67acb33.8ce5c5f6.e9fc09f3	2	-- -- DoltAgain
_PI:90030124.c67acb33.8ce5c5f6.e9fc09f3	3	-- -- -- DoltAgain
_PI:90030124.c67acb33.8ce5c5f6.e9fc09f3	4	-- -- -- -- DoltAgain



KPIs page

This page displays some sample "KPIs" or key performance indicators, which are global aggregations of monitor model data. Note that aggregate values we have seen on previous pages were aggregated by process definition, by step definition or by task definition, such as the average execution time of the customer order process for example: they are collections of aggregate values, one for each process definition, one for each task definition, etc. As new processes or tasks are detected, new aggregations are started automatically.

By contrast, a KPI as defined in Monitor is a single decimal or duration value, which is either an aggregation of metrics or a function of other KPIs. However, KPIs offer some distinct features that are not available for aggregate values held in metrics or dimensional views: you can limit KPIs to fixed, repeating, or rolling time windows; define KPI targets and ranges; set alerts; extrapolate KPIs into the future; view them as thermometers or gauges; and perhaps most importantly, define new KPIs at runtime without generating and redeploying a Java EE application.

The predefined KPIs of the Global Process Monitor are shown in the figures below. They display the average total duration, waiting duration, and working duration of all human tasks, the number of (any) human tasks completed during the last seven days, and the average number of (any) human tasks completed per workday during that period. The number of tasks per workday is calculated by dividing the number of tasks completed during the last seven days by five, holidays are not accounted for. The targets for the total duration, waiting duration, and working duration were set to match the typical times of test runs. Targets in production setups would likely be higher by a few orders of magnitude. The two KPIs in the lower part of the figure below display audit event statistics. They are only in the advanced dashboard view. The number of audit events per second is calculated by dividing the number of events received over the last seven days by that time period. It does not reflect peak event rates, which may be much higher. The lower image displays this information graphically.

Global Process Monitor (Advanced) ▾

Processes

Global Process Statistics
















Tasks






Global Task Statistics

Invocation Chains









Global KPIs






KPIs

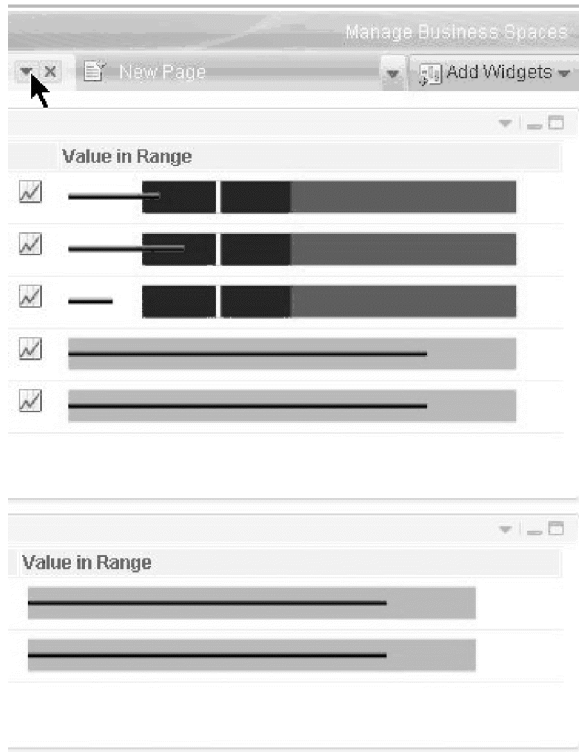
KPI Name	Status	Value	Target	Actions
Average Task Total Duration		37.037 s	1 m, 0 s	  
Average Task Waiting Duration		31.08 s	40 s	  
Average Task Working Duration		5.877 s	20 s	  
Tasks Completed During Last Seven Days		13		  
Tasks Completed Per Workday During Last Seven Days		2.60000		  



KPIs

KPI Name	Status	Value	Target	Actions
Total Audit Events During Last Seven Days		798		   
Events Per Second During Last Seven Days		0.00132		   





As you adapt this monitor model for use in your business, instead of seeing aggregate values for any and all human tasks you may want to see KPIs for specific human tasks. You can either find such data in an instance view or dimensional view on one of the previous pages, or, if you want to make use of the unique features of KPIs, define new KPIs using data filters for specific process or task names. The KPI Manager widget from the widgets menu allows you to do that conveniently.

Chapter 4. Installing the WebSphere BPM products

To work with global process monitor models, you need to install several WebSphere Business Process Management (BPM) products.

To install the WebSphere BPM products:

1. Load the following URL in a browser:
 - http://publib.boulder.ibm.com/infocenter/dmndhelp/v7r0mx/topic/com.ibm.wdpe.install.tool.701.doc/client/client_intro.html
2. Download and install the **WebSphere Dynamic Process Edition Business Tool and Testing Pack V7.0.1** product. This includes the following products that are required to work with global process monitor models:
 - IBM WebSphere Business Monitor 7.0.0.2
 - IBM WebSphere Process Server 7.0.0.2
 - IBM® WebSphere Integration Developer 7.0.0.2
 - IBM WebSphere Business Monitor Development Toolkit 7.0.0.2 (integrated in WebSphere Integration Developer)
 - IBM WebSphere Business Modeler Advanced 7.0.0.2
 - Business Space powered by WebSphere

Chapter 5. Configuring global process monitor models

To configure global process monitor models, you need to download the monitor model file, enable the events that you want to monitor, and configure the dashboard that will be used to view the monitored events.

The following sections describe how to configure global process monitor models.

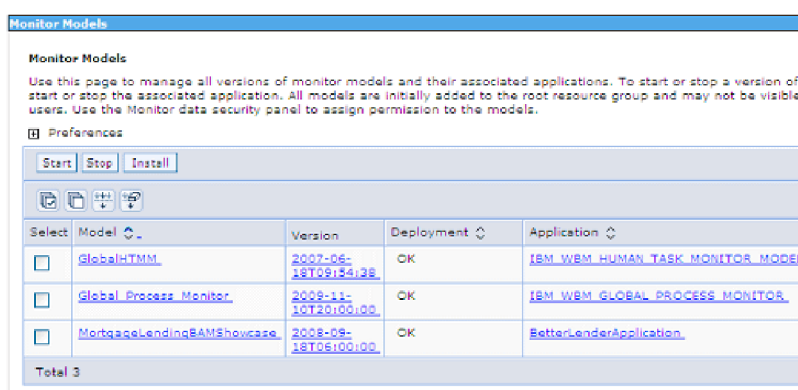
Installing global process monitor models

Global process monitor models are generally installed by default on a WebSphere process server.

To confirm that a global process monitor model is installed:

1. Launch the administrative console for the server.
2. Log in.
3. In the left frame, click **Applications** and then click **Monitor Models**. The Monitor Models page opens.

Note: On the Monitor Models page, the list of monitor models should include the entry **Global Process Monitor**, as shown in the following figure:



If a global process monitor model has not been installed by default, you can install one manually by completing the instructions at the following web page:

http://publib.boulder.ibm.com/infocenter/dmndhelp/v7r0mx/topic/com.ibm.btools.help.monitor.inst.doc/inst/cfg_bpel_ear.html

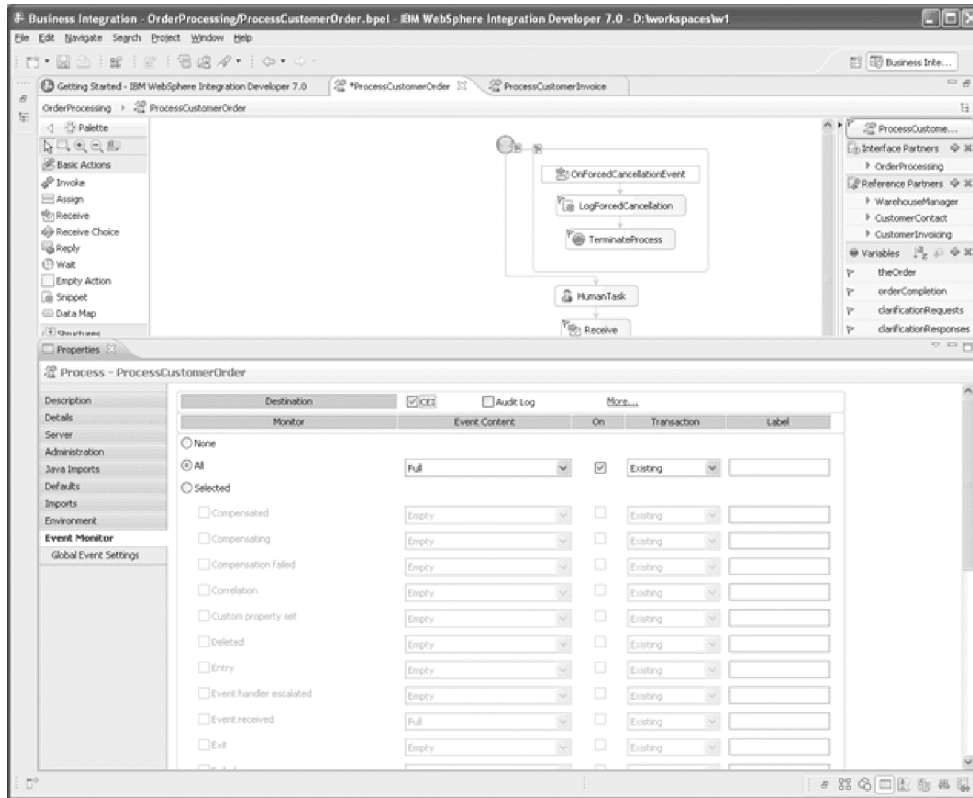
Enabling events

Events in a global process monitor model are the computer's representation of the actions of each business process. Each activity of a business process is a concrete step that a business undertakes in order to complete a business method.

For example, a movie company would have a step in which they hire a director. They would have another step in which they hire the lead actor. In a global process monitor model, this would be represented by two or more events. The program needs the events because without events there is no way to monitor business activities in order to keep track of the business project.

To enable events, complete the following steps:

1. Open WebSphere Integration Developer.
2. In the Properties view of the business process editor, click the **Event Monitor** tab, as shown in the following figure:



For more information on the **Event Monitor** tab, see the topic <http://publib.boulder.ibm.com/infocenter/dmndhelp/v6rxmx/index.jsp?topic=/com.ibm.wbit.help.cei.ui.doc/topics/tcei.html>.

3. Select one of the following options:
 - If you want to disable all events, select **None**. (**None** is the default choice.) When the **None** radio button is selected, none of the events listed on the screen will be monitored.
 - If you want to enable all events, select **All**. If the **All** radio button is selected, all the events listed on the screen will be monitored.
 - If you want to select individual events to enable or disable, choose **Selected** and then select the check boxes beside the individual events that you want to enable for monitoring. Those events that you do not select will remain disabled.

The number of events that you should enable tends to vary with your monitoring requirements. Generally, it is recommended that you enable all events at the process level, such as those events that indicate when the process starts and ends.

You do not need to monitor short-running, automated steps. These can be disabled by either leaving them unselected or clearing them if they are selected. An automated step is a step in which human intervention is not required and where there is no invocation of a subprocess and no calling of a service. However, it is recommended that you select **All** for any tasks that labelled as human tasks.

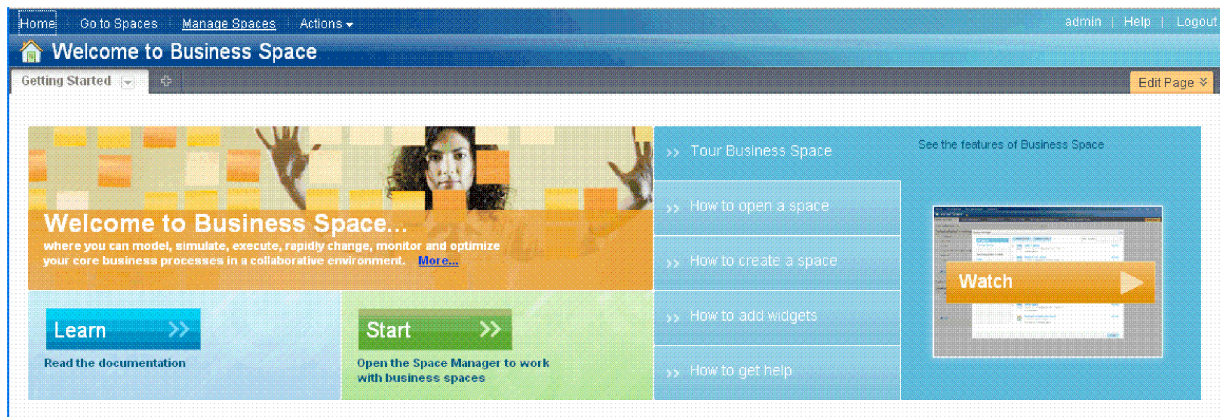
It is recommended that you monitor events for loops so that timestamp information can be obtained from the events. When you are finished enabling and disabling the events, push the **Save** icon to save these choices.

Configuring dashboards

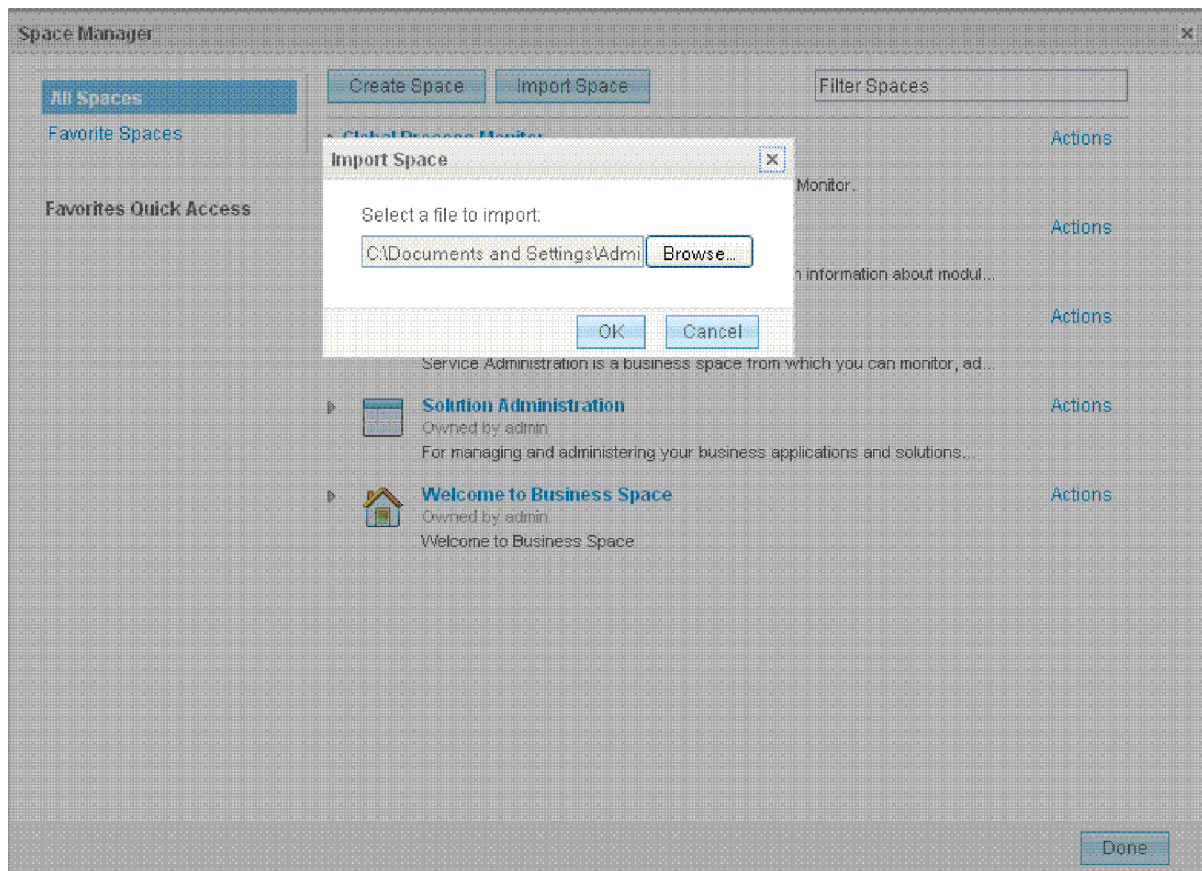
It is generally necessary to download and configure dashboards before you can work with them.

To configure dashboards:

1. Go to the web page that contains the dashboards: <http://publib.boulder.ibm.com/bpcsamp/monitoring/globalprocessmonitor.html>
2. At the top right of the page, click **Installation**. The Installation page opens.
3. Decide whether you want to download the basic or the advanced dashboard. The advanced dashboard has additional formats for dates and times. It also displays standard deviations for the statistics collected. The advanced dashboard also has two displays that provide data on process instance migration. One display shows you aggregated statistics on process instance migration and the other displays shows you details about every migrating instance. If you do not want to migrate process instances to new versions of your processes, then download the basic dashboard.
4. Complete the following steps after you have decided which dashboard to download:
 - For the basic dashboard, get the file from your local server. It can be found on your server at: `app_server_root/installableApps.wbm/monitorModels/BusinessSpace/GlobalProcessMonitor_BusinessSpace.zip`. Substitute the appropriate server root for `app_server_root` under the operating system you are using. Alternatively, you can get the basic dashboard by copying the following link into a web browser: http://publib.boulder.ibm.com/bpcsamp/monitoring/globalprocessmonitor/download/GlobalProcessMonitor_BusinessSpace.data.
 - For the advanced dashboard, get the file from your local server. It can be found on your server at: `app_server_root/installableApps.wbm/monitorModels/BusinessSpace/GlobalProcessMonitor_BusinessSpace_Advanced.zip`. Substitute the appropriate server root for `app_server_root` under the operating system you are using. Alternatively, you can get the advanced dashboard by copying the following link into a web browser: http://publib.boulder.ibm.com/bpcsamp/monitoring/globalprocessmonitor/download/GlobalProcessMonitor_BusinessSpace_Advanced.data.
5. Launch Business Space. For example, in Websphere Integration Developer, right-click on the process server in the Servers view and select **Launch > Business Space** to open Business Space in a browser window, as shown in the following figure:



6. When Business Space has been launched, log into Business Space using a password provided by your administrator.
7. In Business Space, click **Manage Spaces**. The Space Manager window opens.
8. At the top of the screen, click **Import Space**. A dialog box appears over the window, as seen in the following figure:



9. Click **Browse** and navigate to the location where you downloaded the dashboard file.
10. Click **OK** in the dialog box.
11. Click the name of the dashboard. It opens in Business Space.

Chapter 6. Running and monitoring global process monitor models

The purpose of a global process monitor model is to electronically monitor business processes to help businesses view the operation and overall health of their business processes. Any business process can be programmed into a global process monitor model. In this topic, a sample application is used as a running example to help explain how to work with global process monitor models.

The sample application monitors four interrelated processes:

- A customer order
- A customer invoice
- Availability and price of parts
- Cancellation of the customer's order (it is hoped that this fourth process is rarely used!)

These four processes represent a generic set of business processes. Once items are priced, they are ordered from inventory. This generates conditions such as "item not in stock". Collecting payments is another important process. Each process can have an unlimited number of instances. You would rarely want to cancel orders because the more orders cancelled, the less business for the company.

1. Start the Business Process Choreographer Explorer (BPC Explorer):
 - a. Direct your web browser to the Business Process Choreographer Explorer URL. The value of the URL depends on how the virtual host and context root were configured for your installation. The URL takes the following form: `http://application_server_host:port_number/context_root`
 - b. If security is enabled, enter your user name and password and then click **Login**, as shown in the figure below:



2. In the sidebar menu, click **Process Templates** and select your template. For example, in the following figure, you could select the **ProcessCustomerOrder** template:

<div>Start Instance</div> <div>Instances</div> <div>View Structure</div> <div>Refresh</div>			
<input type="checkbox"/>	Process Template Name	Valid From	Long Running
<input type="checkbox"/>	CancelCustomerOrder	9/4/2009 11:46 PM	yes
<input type="checkbox"/>	CheckItemAvailabilityAndPrice	6/2/2009 9:53 AM	yes
<input type="checkbox"/>	ProcessCustomerInvoice	6/3/2009 7:45 PM	yes
<input checked="" type="checkbox"/>	ProcessCustomerOrder	9/1/2009 2:00 PM	yes
Items found: 4 Items selected: 1		Page 1 of 1	Items per page:

- Click **Start Instance** to launch an execution of your selected template. Fill out the form that comes up. For example, in the sample application, you could enter a fictitious customer order and leave the fields **unitPrice-supplierUse** and **itemTotal-supplierUse** blank.
- Click **Submit** when you are done. In the sample application, this might return the form seen in the figure below:

Submit

Process Template Name: ProcessCustomerOrder
Operation: processCustomerOrder
Process Name: test run 01
Process Input Message:

Form View

orderSubmission

orderNumber: 10101

address

name: Some Corporation
street: 1 Some Street
city: Some City
state: NY
zip: 11111
country: USA

items

name	sku	units	unitPrice-supplierUse
the first item	111	1	
the second item	222	2	
the third item	333	3	
Add			

dueDate: 1/1/2010

itemTotal-supplierUse:

Edit Source

- Back in BPC Explorer, click on **All Tasks**.

Note: This view shows any human tasks in the business process that may be ready for someone to work on. For example, in the sample application, you would see a task named **ReviewOrder**, as shown in the figure below:

All Tasks

Use this page to work with task instances for which you have access rights. [i]

Work on Release Transfer Start Change Priority Change Business Category Refresh

Priority	Task Name	State	Kind	Owner	Originator	Escalated	Suspended
<input checked="" type="checkbox"/> 5	ReviewOrder	Ready	To-do Task	admin	no	no	no

Items found: 1 Items selected: 1 Page 1 of 1 Items per page: 20

- Select the check box for the task and click **Work on**.

Note: In the sample application, you are acting in different roles. When you enter an order, you act as a buyer representative, but when you are about to perform an order, this is the first task that you would execute as the seller.

In the upper part of the screen, you see the new customer order that just came in. In the lower part of the screen, you can enter questions that arise as you review the order. They will be sent to the customer for clarification. In the figure below, the review is asking whether a certain carrier can be used for shipping and whether the customer expects any discounts to be applied while the order is being priced:

Task Output Message

Form View

theQuestions

question

Can we ship via FedEx?

Insert Remove

Any discounts applicab

Insert Remove

Add

Edit Source

- Use the **Add** button to enter additional questions and click **Complete** when you are done.

Note: Some tasks have timeout values. For example, the ReviewOrder task in the sample application has a timeout of 2.5 minutes. If it is not completed within 2.5 minutes after it was started, it will expire and the process will continue as if the review had been successful (that is, as if it had not resulted in any questions). Therefore, do not hesitate too much when completing these kinds of tasks, or they expire before you have a chance to send any questions.

In the sample application, after submitting questions to the customer, you switch roles again and answer these questions acting as a customer representative. You would see a **ProvideClarification** task in BPC Explorer, as shown in the figure below. This task is started repeatedly (as many times as there are questions to answer). In the sample application, you would see it started twice:

Work on		Release		Transfer		Start		Change Priority		Change Business Category		Refresh			
<input type="checkbox"/>	Priority	<input type="checkbox"/>	Task Name	<input type="checkbox"/>	State	<input type="checkbox"/>	Kind	<input type="checkbox"/>	Owner	<input type="checkbox"/>	Originator	<input type="checkbox"/>	Escalated	<input type="checkbox"/>	Suspended
<input checked="" type="checkbox"/>	5		ProvideClarification		Ready		To-do Task				admin		no		no
<input type="checkbox"/>	5		ReviewOrder		Finished		To-do Task		admin		admin		yes		no
Items found: 2 Items selected: 1 Page 1 of 1 Items per page: 20															

- Select a task. In the sample application, you would select **ProvideClarification** and click **Work on**, then provide clarifications on the seller's review question, as shown in the following figure:

Task Name

Task Input Message

ProvideClarification

Form View

clarificationRequest

orderNumber

10101

question

Question No. 1 : Can we ship via FedEx?

View Source

Task Output Message

Form View

clarificationResponse

Yes.

Edit Source

Note: In the sample application, you become the buyer again. An example is shown in the figure above. There would be new ProvideClarification tasks waiting to be worked on until all questions have been answered.

- After all review questions have been answered, the fulfillment stage occurs and a new page is shown. Parallel tasks are started, one per line item. In the sample application, the parallel tasks are determining the item's availability and price. For example, the three items in the sample order are shown in the figure below:

Work on Release Transfer Start Change Priority Change Business Category Refresh								
<input type="checkbox"/>	Priority	Task Name	State	Kind	Owner	Originator	Escalated	Suspended
<input type="checkbox"/>	5	DetermineItemAvailabilityAndPrice	Ready	To-do Task		admin	no	no
<input type="checkbox"/>	5	DetermineItemAvailabilityAndPrice	Ready	To-do Task		admin	no	no
<input type="checkbox"/>	5	DetermineItemAvailabilityAndPrice	Ready	To-do Task		admin	no	no
<input type="checkbox"/>	5	ReviewOrder	Finished	To-do Task	admin	admin	yes	no
Items found: 4 Items selected: 0 Page 1 of 1 Items per page: 20								

- Select each task in turn and click **Work on**.

Note: In the sample application, you are now taking on the role of a fulfillment clerk or warehouse manager. Fill in the item's availability and unit price. The result might look like the figure below:

[Complete](#)
[Save](#)
[Release](#)
[Cancel](#)

Task Name: DetermineItemAvailabilityAndPrice

Task Input Message

Form View

itemRequested	name	the first item
	sku	111
	units	1
	unitPrice-supplierUse	

[View Source](#)

Task Output Message

Form View

availabilityAndPrice	unitsInStock	100
	pricePerUnit	11.11

[Edit Source](#)

- Click **Complete** when you are done. If all items are available, and after all have been priced, the order is shipped to the customer and an invoice for the purchase is prepared at the same time.
- Select the **CollectPayment** task (as shown in the figure below) and click **Work on**.

Work on Release Transfer Start Change Priority Change Business Category Refresh								
<input type="checkbox"/>	Priority	Task Name	State	Kind	Owner	Originator	Escalated	Suspended
<input checked="" type="checkbox"/>	5	CollectPayment	Ready	To-do Task		admin	no	no
<input type="checkbox"/>	5	ReviewOrder	Finished	To-do Task	admin	admin	yes	no
Items found: 2 Items selected: 1 Page 1 of 1 Items per page: 20								

Note: You are in a buyer role again, and your final task is to pay the bill. An invoice for doing this is presented, as shown in the figure below:

itemCost	155.54
shippingAndHandling	7.44
totalDue	162.98
balancePaid	0.0
amountStillOpen	162.98
message	Thank you for your order!

[View Source](#)

Task Output Message

Form View

payment	100.00
---------	--------

[Edit Source](#)

The total item cost (based on the pricing that was entered earlier) has been tallied, shipping and handling cost has been added, and an order total has been calculated. The invoice also shows balance paid, which initially should be zero.

- In the lower part of the form, enter the first amount of your payment.

Note: If the invoice is not paid in full, it will be made ready again for selection. Once selected, it shows balance paid and the amount that is still open. This invoice will only disappear after the bill is settled completely.

The sample application order process reports its progress by writing messages to the **SystemOut.log** file. The messages produced by the sample application are shown below.

```
[10/22/09 12:41:58:157 EDT] 0001eeae SystemOut 0 BusinessObject: CustomerOrder@3c223c22
(orderNumber=10101, address=Address@3d083d08, items=[BusinessObject: LineItem@3fb63fb6 (name=the
first item, sku=111, units=1), BusinessObject: LineItem@40fe40fe (name=the second item, sku=222,
units=2), BusinessObject: LineItem@41624162 (name=the third item, sku=333, units=3)],
dueDate=Fri Jan 01 00:00:00 EST 2010) [10/22/09 12:43:29:032 EDT] 00003df2 SystemOut 0 For order
'10101' the following question is submitted : Question No. 1 : Can we ship via FedEx? [10/22/09
12:45:05:516 EDT] 0001ef9f SystemOut 0 Question No. 1 : Can we ship via FedEx? for order '10101'
received answer : Yes. [10/22/09 12:45:09:141 EDT] 0001ef9f SystemOut 0 For order '10101' the
following question is submitted : Question No. 2 : Any discounts applicable? [10/22/09
12:46:54:094 EDT] 0001efbc SystemOut 0 Question No. 2 : Any discounts applicable? for order
'10101' received answer : None that we know of. [10/22/09 12:48:33:876 EDT] 0001efbc SystemOut 0
Fetching 3 units of item 'the third item' (sku = 333) from warehouse. [10/22/09 12:48:55:829
EDT] 0001f034 SystemOut 0 Fetching 2 units of item 'the second item' (sku = 222) from warehouse.
[10/22/09 12:49:34:547 EDT] 0001f04f SystemOut 0 Fetching 1 units of item 'the first item' (sku
= 111) from warehouse. [10/22/09 12:49:48:766 EDT] 0001f04f SystemOut 0 Shipping completed after
9503 time units. [10/22/09 12:49:51:594 EDT] 0001f04f SystemOut 0 Shipping cost calculation :
units_to_ship=6; shipping_cost_per_unit=1.24; shipping_cost_total=7.44 [10/22/09 12:54:10:313
EDT] 000001f5 SystemOut 0 Adding $100 to previous payment of $0 results in new balance of $100
towards the total amount of $162.98. The amount still open was reduced from $162.98 to $62.98.
[10/22/09 12:54:48:813 EDT] 000001f5 SystemOut 0 Adding $62.98 to previous payment of $100
results in new balance of $162.98 towards the total amount of $162.98. The amount still open was
reduced from $62.98 to $0.00. [10/22/09 12:54:54:563 EDT] 0001f058 SystemOut 0 Response to
customer : Thank you for your order #10101. All items have been shipped, and payment of $162.98
has been received.
```

Of the four processes, the **CheckItemAvailabilityAndPrice** and **ProcessCustomerInvoice** processes are subprocesses of **ProcessCustomerOrder**. The **CancelCustomerOrder** process, however, must be started individually and it prepares an order cancellation. Its initial screen is shown in the figure below:

Submit

Process Template Name: CancelCustomerOrder
Operation: cancelOrder

Process Name: cancel test run 01

Process Input Message: Form View

orderNumber	10101
dueDate	1/1/2010
reason	Changing supplier.
forced	<input checked="" type="checkbox"/>

Edit Source

The **orderNumber** and the **dueDate** must match those for the order being cancelled. The **reason** field just serves for documentation. The **forced** field has the following significance: forced order cancellation is possible at any time, the corresponding event handler is associated with the process as a whole. Non-forced order cancellation is only possible while the order is in the fulfillment stage. The corresponding event handler is associated with a scope that demarcates that phase of the order process.

Frequently Asked Questions

1. What if the program crashes?

If the program is installed correctly and there is still a crash, restart the program and contact the program's vendor. The global process monitor model will track the program's events both before and after the crash.

2. If I have used the advanced dashboard, can I switch to basic (or vice-versa)?

Yes, and the data will display correctly regardless of which dashboard is chosen.

3. Will the global process monitor model affect the performance of my business process?

The global process monitor model should have a minimal impact on performance if the enabled events are selected with care.

4. Can there be more than one business process running at the same time or must each be run separately?

You can run many business processes simultaneously and the global process monitor model will keep track of all of them.

5. How long does it take to install the global process monitor model?

It depends on the computer, but the global process monitor model should be quick to install. However, in default configurations it should already be installed.

6. Where can I find instructions on how to enable events on specific steps of my business process?

See the section in this user guide entitled **Enabling Events**.

7. Is the data gathered by the global process monitor model secured?

The data display is protected by the security built into Business Space. A user name and password is required to log in and view the dashboard.

8. Can the global process monitor model be accessed remotely by multiple computers so that multiple employees in the company can use it?

Yes, anyone with a browser who knows the appropriate login credentials can access the global process monitor Dashboard.

9. Are there versions of this program written in languages other than English?

Yes, the language of the machine's locale should be the language that Business Space displays in.

10. What is WebSphere Business Monitor?

WebSphere Business Monitor evaluates business performance and captures data that is used to refine business process models. It is a Web application that captures real-time business performance data and displays personalized views and analysis of business measures, such as KPIs and metrics.

11. What is the WebSphere Business Process Management (BPM) product family?

The Websphere BPM product family is an end-to-end software solution for your implementation of business process management, including tools for process analysis, definition, execution, monitoring, and administration. The ability to model, integrate, manage, and monitor current and new business processes within your company and across the value chain of partners and customers enables you to rapidly correct problems as they occur and to capitalize on new opportunities.

12. What do dashboards do?

Dashboards do the following:

- Monitor and manage business performance indicators
- Retrieve information quickly and efficiently
- Personalize the analysis and display of business performance reports, and compress information to focus on the business objectives and the key performance indicators (KPIs)
- View business-critical information graphically, using visual cues such as color so that employees will recognize problems early and make decisions quickly.

- Visualize performance data, such as KPIs and metrics, which can be summarized in reports and graphs
- Analyze and investigate business situations by tracing situations to specific events and inserting the event details
- Set up actions and alerts as part of a business performance management solution

13. **What type of businesses can use a global process monitor model?**

Any business that has business processes can use it.

Glossary

A

activity

1. A unit of work or a building block that performs a specific, discrete task. See also **task**.
2. An element of a process, such as a task, a subprocess, a loop, or a decision. Activities are represented as nodes in process diagrams.
3. Work that a company or organization performs using business processes. An activity can be atomic or non-atomic (compound). The types of activities that are a part of a process model are process, subprocess, and task.

aggregate metric

A metric that is calculated by finding the average, maximum, minimum, sum, or number of occurrences of an instance metric across multiple runs of a process. Examples of aggregate metrics are an average order amount, a maximum order amount, a minimum order amount, the total order amount, or the number of occurrences of \$500 for an order amount.

audit log

A log file containing a record of system events and responses.

B

business activity monitoring

The collection and presentation of real-time information that describes a business process or a series of activities spanning multiple systems and applications.

business analyst

A specialist who analyzes business needs and problems, consults with users and stakeholders to identify opportunities for improving business return through information technology, and transforms requirements into a technical form.

business event

1. An event that occurs during a business process.
2. A significant occurrence in a business process, generally identified by a business analyst, that warrants monitoring over time to reveal a key performance indicator (KPI).

business measure

A description of a performance management characteristic that you want to monitor. Business measures include instance metrics, aggregate metrics (also called measures), and key performance indicators (KPI).

business process

A defined set of business activities that represent the required steps to achieve a business objective. A business process includes the flow and use of information and resources.

business process container

A process engine that contains process modules.

business process management

The services and tools that support process management (for example, process analysis, definition, processing, monitoring and administration), including support for human and application-level interaction. BPM tools can eliminate manual processes and automate the routing of requests between departments and applications.

business space

A collection of related web content that conveys insight into the business and gives users the ability to react to changes in the business.

C

CEI See **Common Event Infrastructure**.

CEI Event

An event generated over the Common Event Infrastructure (CEI) and logged in a CEI data store.

Common Event Infrastructure

The implementation of a set of APIs and infrastructure for the creation, transmission, persistence, and distribution of business, system, and network Common Base Events. See also **event emitter**.

D

dashboard

A web page that can contain one or more widgets that graphically represent business data.

deploy

1. To place files or install software into an operational environment. In Java Platform, Enterprise Edition (Java EE), this involves creating a deployment descriptor suitable to the type of application that is being deployed.
2. To transfer assets from a local development environment into an operational, or runtime, environment.

dimension

A data category that is used to organize and select monitoring context instances for reporting and analysis. Examples of dimensions are time, accounts, products, and markets.

dimensional model

The part of the monitor model that defines the cubes and cube content that are used for storing, retrieving, and analyzing the data that is gathered over time.

dimensional level

An element or subelement of a dimension that is arranged hierarchically. For example, the time dimension can have years, months, and days as its levels.

E

- event**
1. A change to a state, such as the completion or failure of an operation, business process, or human task, that can trigger a subsequent action, such as persisting the event data to a data repository or invoking another business process.
 2. An occurrence of significance to a task or system. Events can include completion or failure of an operation, a user action, or the change in state of a process. See also resource model, receiver, alert, message.
 3. A change to data in an enterprise information system (EIS) that is processed by the adapter and used to deliver business objects from the EIS to the endpoints (applications) that need to be notified of the change.

event catalog

A repository of event metadata used by applications to retrieve information about classes of events and their permitted content.

event model

The part of the monitor model that contains references to all of the elements of the event definitions used in the monitor model.

H

human task

A task that requires intervention by a human in order to complete.

I

inline task

In the human task editor, a unit of work that is defined within an implementation of a business process. See also **stand-alone task**.

instance

An active process element, for example, the performance of a process.

instance metric

A metric that returns the result, such as the amount of an order, from one run of the process. See also **metric**.

iWidget

A browser-oriented component, potentially extending a server-side component, that provides either a logical service to the page or a visualization for the user (typically related to a server-side component or a configured data source).

K

KPI Key Performance Indicator: A quantifiable measure designed track one of the critical success factors of a business process.

M

metric A holder for information, typically a business performance measurement, in a monitoring context. See also **aggregate metric**, **instance metric**.

model A representation of a process, system, or subject area, typically developed for understanding, analyzing, improving, and replacing the item being represented. A model can include a representation of information, activities, relationships, and constraints.

monitor

In performance profiling, to collect data about an application from the running agents that are associated with that application.

monitor details model

A container for monitoring contexts and their associated metrics, keys, counters, stopwatches, triggers, and inbound and outbound events. The monitor details model holds most of the monitor model information.

monitor context

A definition that corresponds to an object to be monitored, such as a process execution, an ATM, a purchase order, or the stock level in a warehouse. At run time, monitoring contexts process the events for a particular object.

monitor model

A model that describes the business performance management aspects of a business model, including events, business metrics, and key performance indicators (KPIs) that are required for real-time business monitoring.

O**outbound event**

An event emitted from a monitoring context or from a KPI context.

P**process**

1. A sequence or flow of activities in an organization with the objective of carrying out work. In BPMN, a process is depicted as a graph of flow elements, which are a set of activities, events, gateways, and sequence flow paths that adhere to BPMN execution semantics.
2. A progressively continuing procedure consisting of a series of controlled activities that are systematically directed toward a particular result or end.

3. The sequence of documents or messages to be exchanged between the Community Managers and participants to run a business transaction. An event emitted from a monitoring context or from a KPI context.

process definition

A specification of the runtime characteristics of an application server process.

process instance

A manifestation of a modeled process that is created in a simulated or real environment.

process model

A representation of a real-time business process. A business process model is composed of the individual steps or activities that make up the process, contains the conditions that dictate when the steps or activities occur, and identifies the resources that are required to run the business process.

process module

A program unit that contains a set of process templates that support administrative tasks.

S

staff activity

An activity in a process that queries human interaction for decisions on how to proceed. A staff activity is used in a long-running process where the process will halt to await the outcome of the human interaction.

stand-alone task

A unit of work that exists independently of a business process, and implements human interaction as a service. See also **inline task**.

V

variable

A representation of a changeable value.

W

widget

A portable, reusable application or piece of dynamic content that can be placed into a Web page, receive input, and communicate with an application or with another widget.

work item

In the human task editor, the representation of a task. Staff members can browse all work items that they have the authority to claim.

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User Guide

Version 7.0

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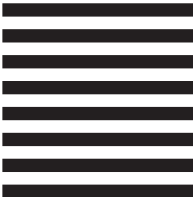
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