IBM Business Monitor

Process application monitoring

This presentation will give you an understanding of monitoring process applications using IBM Business Monitor.

Goals

- Introduce process application monitoring support in IBM Business Monitor

This presentation will give you an understanding of the use of IBM Business Monitor to monitor process applications in IBM BPM Server.

Agenda

- BPM built-in monitoring
- Global process monitor model
- Auto-generated monitor model
- Custom monitor model

Process application monitoring

This is the agenda for this presentation. You will learn about the built-in monitoring capability in the IBM BPM server. You will also learn about the three monitoring scenarios that are used with IBM Business Monitor. You can use the global process monitor model which is supplied with IBM Business Monitor. Or you can generate a monitor model that is specific to your process application. If you have specific monitoring requirements then you can also auto-generate the model and then customize it, adding your own key performance indicators.

Built-in process application monitoring

- Built-in simple monitoring without IBM Business Monitor
  - To see tasks (open, overdue, at risk) use scorecards in process portal
  - To see activity durations, enable auto-tracking, send data to performance data warehouse, use ad hoc reports
  - To track payload, define tracking variables, use ad hoc reports
  - To track SLA violations, define KPIs, SLAs, use ad hoc reports
- For more information: Information center > IBM Business Process Manager > Measuring and improving business processes
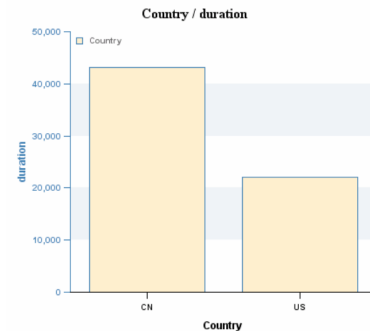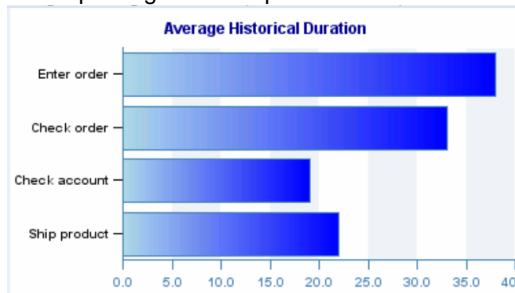
Without using IBM Business Monitor you can use some limited capability that is built into IBM Business Process Manager. Using the scorecards in process portal you can view tasks. Using the ad hoc reports you can see activity durations, tracking variables and SLA violations. To have more control over monitoring, however, you will need to install IBM Business Monitor. The rest of this presentation shows you the rich feature set provided by IBM Business Monitor.

Monitoring events

- BPM information center topic: 'Event flow' in 'Measuring and improving business processes'
- BPM information center topic detailing emitted events:

  http://publib.boulder.ibm.com/infocenter/dmndhelp/v7r5mx/index.jsp?topic=/com.ibm.wbpm.admin.doc/topics/cmon_monitor_eventoverview.html

- To disable event emission for a specific application:
  - Clear 'Enable for Business Monitoring' check box in settings
  - Turn off auto-tracking for the application
  - Remove auto-tracking events for the application

- To disable event emission for the server, update the 100Custom.xml configuration file
  - See the 'Event flow' topic for more details

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Events are automatically emitted for process applications if you have auto-tracking enabled, or auto-tracking events are present or the business monitoring check box is selected. See the referenced topics for more information about the events, including a detailed listing of the events that are produced for monitoring purposes. You can disable events for a specific application or for the entire server. To disable events for the server, there is a configuration file that you should update. See the information center for the exact updates to apply to this file.

Global process monitoring

- Monitor any process without code generation or deployment steps
- You can install manually or at profile creation
    - C:\<ServerPath>\installableApps.wbm\monitorModels\GlobalProcessMonitorV75.ear
- Global process monitor model automatically tracks process applications and integration applications
- Events automatically generated for process applications
- For integration modules, enable events for all human tasks and service invocations
- Dashboards are provided for viewing monitored data – Import from C:\<server>\installableApps.wbm\monitorModels\BusinessSpace
    - GlobalProcessMonitor_BusinessSpace.zip
    - GlobalProcessMonitor_BusinessSpace_Advanced.zip
- See information center topic 'Configuring the global process monitor model'

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The global process monitor model enables you to monitor any process application without monitor model generation or deployment steps. Processes are detected dynamically and tracked based on the events they emit. The collected data can be viewed in Business Space using the supplied dashboards or your own customized dashboard. If you choose not to install the global process monitor model when you created a profile, you can install and configure the global process model at a later time from the administrative console. Note that the global process monitor model is automatically installed in the WebSphere® test environment.

If you have integration modules in the process application, you should specifically enable events for human tasks or services in the module. Monitoring is enabled whether you deploy a snapshot of the application or use the playback server.

Global process monitor model - Dashboard

This slide shows some dashboard widgets for the global process monitor model. You can use the supplied dashboards or configure your own dashboards manually. In the upper screen capture can see the supplied advanced dashboard. It has numerous tabs to show data for process definitions, process instances, tasks and KPIs. In the lower screen capture you see the report viewer which graphically depicts the process definitions and the statistics for the process instances.

Auto-generated monitor model

- Monitor process applications using an auto-generated monitor model – provides additional support beyond the global model, for monitoring tracking fields
- Steps
  - Enable auto-tracking (tracking fields are placed in the monitor model)
  - Enable process monitoring (enables model generation)
  - Update tracking definitions which generates and deploys the monitor model, only if process monitoring is enabled
  - Run instances in the inspector
  - Configure a dashboard
  - A dashboard is automatically generated for the monitor model, and it shows up in the space manager
  - A process diagram is generated

Process application monitoring

If you need more capability than the global process monitor model provides, then you can use the default monitor model for your process application. The default monitor model is auto-generated from your process application when you update the tracking definitions in the process designer. But you must make sure that you select the options for auto-tracking and process monitoring. To test the generated monitor model, you can run instances in the process inspector, then either use the auto-generated dashboard or create your own custom dashboard. A process diagram is also generated that depicts a graphical view of your process, similar to the process diagram shown in the process designer.
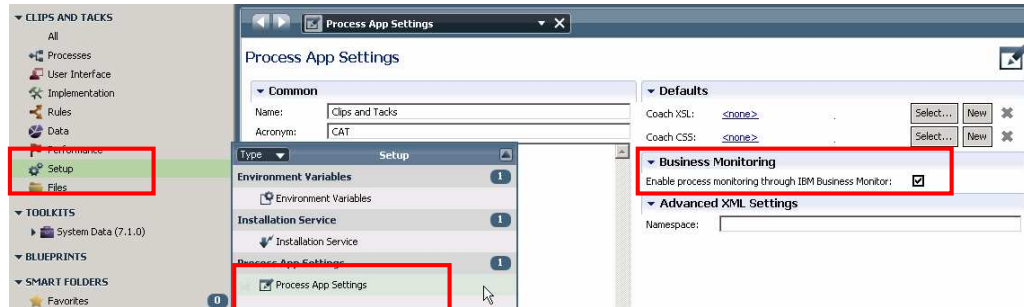
Enable auto-tracking

Click the blue bar in the diagram

This screen captures shows you how to enable auto-tracking for your process. In the process designer, click the blue bar on the left in the diagram. Then in the properties, select the check box to enable auto-tracking, and enter an auto-tracking name.
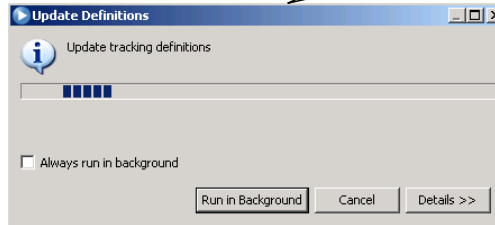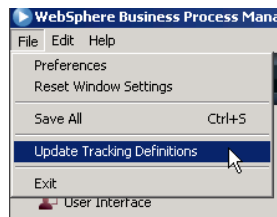
Enable process monitoring

This screen captures shows you how to enable process monitoring for your processes. In the process designer, in the setup section, select 'Process App Settings'. Here you can select the check box to enable process monitoring.

Update tracking definitions

This dialog closes but deployment continues in the background

Monitor model auto-generated and deployed

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To generate the default monitor model for your process application you click the option 'Update Tracking Definitions" in the File menu in Process Designer. A progress dialog displays and eventually closes, but the deployment of the monitor model continues in the background. As you see in the bottom screen capture, when the deployment completes, the monitor model application is listed in the administrative console applications.

Auto-generated monitor model

- Dashboard is auto-generated and available in Space Manager
- Preconfigured: Instances, KPIs, reports, diagrams

When the monitor model application is deployed, a dashboard is also automatically generated and deployed. In business space, in Space Manager you see the dashboard listed. The name of the dashboard relates to the process application name with a timestamp appended. In this dashboard you find preconfigured pages to display monitored instances, KPIs, reports and diagrams.

Auto-generated monitor model - Management

- To generate the model: update tracking definitions or deploy the snapshot
- To remove the model
  - For the tip, disable process monitoring and update tracking definitions, or for snapshots use the console to remove the EAR
- Version control
  - The model ID stays the same and the model timestamp (version number) is incremented
- The generated monitor model is not stored in snapshots.
- Any number of snapshots of an installed process can be active on a server and have running instances.
- You can have a custom model and auto-generated model at the same time
- If you have a remote Monitor server, auto-generation will not work
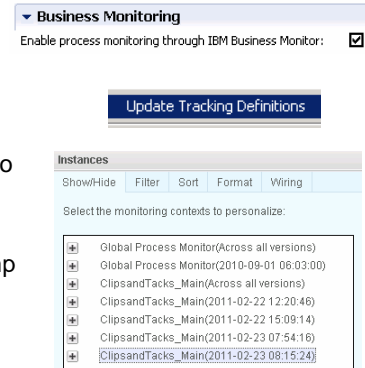
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To generate a model, ensure that monitoring is enabled, then update tracking definitions or deploy the snapshot.

To remove a model for the tip, de-select the process monitoring check box and update tracking definitions. To remove a model for snapshots, use the administrative console to remove the enterprise application.

When you make changes to the process and then generate a new monitor model, a new version is created by updating the timestamp in the model.

The generated monitor model is not stored with the snapshots. When a snapshot is deployed, and monitoring is enabled, a monitor model is generated and deployed on the fly.

Any number of snapshots of an installed process can be active on a server and have running instances. Since only one model can be active, whenever a snapshot is activated on a server, a cumulative monitor model is generated, which covers all active snapshots. Monitor instance migration is automatically initiated to transfer running instances to the new version.

You can have a custom model and auto-generated model at the same time, although typically they are stored in different process applications.

If you have a remote Monitor server, auto-generation will not work so use the custom monitor model and export the EAR and deploy it on the server.

Version control for the monitor applications

- Adding a new version
  - The new version goes to 'active' status and the previous version is 'active no new instances'
- Instances are migrated automatically
- The previous version EARs are uninstalled automatically but monitor data remains

☐	bmon CAT Main	2011-02-22T12:20:46	Deployment Error	Uninstalled	Model unavailable	⑦
☐	bmon CAT Main	2011-02-22T15:09:14	Deployment Error	Uninstalled	Model unavailable	⑦
☐	bmon CAT Main	2011-02-23T07:54:16	Deployment Error	Uninstalled	Model unavailable	⑦
☐	bmon CAT Main	2011-02-23T08:15:24	Deployment Error	Uninstalled	Model unavailable	⑦
☐	bmon CAT Main	2011-02-24T10:10:31	Deployment Error	bmon CAT Main 20110224101031 App	Members assigned	➡
☐	bmon CAT Main	2011-02-24T10:29:16	Deployment Error	bmon CAT Main 20110224102916 App	Members assigned	➡

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When you update a process and generate a new monitor model, the new version of the model is deployed along with the previous versions of the model. The model status for the latest version is 'active', but the status for previous versions are set to 'active no new instances'. Monitored instances are migrated automatically from the older versions to the new version. After the migration completes the model applications are uninstalled automatically, but the monitor data remains for reporting purposes. Version control works the same for the tip and snapshots for both auto-generated models and custom models.

Auto-generated monitor model – Changes

- Most changes to the process do not require any changes in the monitor model

- Changes that require a monitor model update
  - Adding / changing / removing auto-tracked fields
  - Adding / changing / removing custom tracked fields (tracking group definitions)

- Changes that will cause deployment errors:
  - Changing the type of a tracked field (auto-tracked or custom)

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Most changes to the process do not require any changes in the monitor model. For example, you can add or remove steps, rename items, and change expressions. The monitor details model is independent of the process steps. The monitor KPI model does reflect process steps, but you normally edit KPIs in the dashboard. The monitor dimensional model is independent of process steps. The visual model does reflect the process and must be regenerated. If you don't regenerate, the new steps will not appear in the diagram and obsolete steps will not show statistics.

There are some changes that require updating the monitor model. For example, updating auto-tracked fields or updating custom tracked fields in your tracking groups. Also, you can cause deployment errors if you change the data type of a tracked field. For example, changing a tracked field type from string to numeric.

Custom monitor model

- Monitoring process applications and integration applications using a custom monitor model
- Steps
    - For process applications, enable auto-tracking (tracking fields are placed in the monitor model)
    - For integration applications, enable events
    - Use integration designer to generate a monitor model for the application and optionally associate with a process application
    - Add additional monitoring elements then publish the changes to the process application which deploys the model
    - Configure a dashboard

　　Process application monitoring　　

If you need more capability than the default model provides, for example, for creating key performance indicators, then you can use the custom monitor model for your process application. The generated model handles process applications, integration applications, or a combination of both.

For the process application, make sure that you enable process monitoring and auto-tracking. For any integration modules in the application, enable events using the integration designer. You can then generate the custom model and optionally associate it with a process application. After the model is generated you can edit it using the monitor model editor to add your own key performance indicators or any other monitoring elements. To view the monitored data, you use business space to create and configure a dashboard.

Custom monitor model

- Integration designer > Process center perspective > Open process in workspace

Open in workspace

- Business integration perspective opens with process listed

Clips and Tacks Main
Advanced Integration Services
Processes
Order handling
Dependent Toolkits
Clips_and_Tacks_Implementation
Clips_and_Tacks_Library

- Create a process application to store the model
  – In process center perspective > Create a new process application > Open process in workspace
  – Business integration perspective opens with both processes listed

[changed] CATmonitor Main
[changed] Clips and Tacks Main

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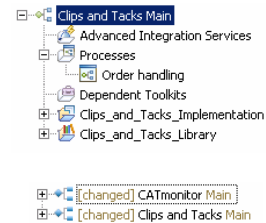
In the integration designer, you can open the process center perspective to open the process in the workspace. After you select your process to open in the workspace, the business integration perspective is opened with your process listed. It is a best practice to create a new process application to store your monitor model. This means that you can update your business application and it won't affect your monitor application, and the life cycles of the two applications are independent.
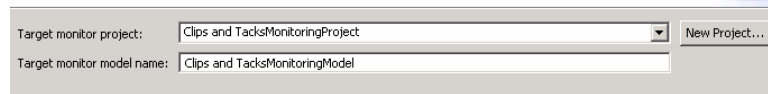
To generate the monitor model, in integration designer, open the menu and select option 'Generate monitor model'. The wizard prompts you to create a new monitor project to hold the generated monitor model.

Custom monitor model

For process, steps, tracking groups, select monitoring elements and events

In monitor perspective, monitor model is ready to edit

You can optionally select monitoring elements to be generated into the model, such as start time, end time, and tracked fields. You can do this for processes, steps and tracking groups. When the wizard is complete, the monitor perspective is opened and you can see the new monitor model listed in the project explorer.

Generated model

In these screen captures, the monitor model editor displays the details of the generated monitor model. Pre-update values and post-update values for tracking fields are stored in separate metrics in the details model. The KPI model contains many default KPIs. The dimensional model also has entries for your tracking fields. Numeric tracking fields are stored as measures using the average function. String and time tracking fields are stored as dimensions. These are handy for using in the reports view in the dashboard.

Custom monitor model

- Edit the model and make changes as required

- To access payload data, you need a tracked field.
  - For example this process has payload MyOrder but only the tracked fields are listed on the inbound event

MyOrder (Order)
- Customer (CustomerRecord)
- OrderItems (OrderItem) (List)
- TotalPrice (Decimal) [Tracked]
- OrderNumber (Integer)
- OrderStatus (String) [Tracked]
- ProcessingPreference (OrderProcess

Step Started
ACTIVITY_COMPLETED Event
ACTIVITY_FAILED Event
ACTIVITY_READY Event
ACTIVITY_TERMINATED Event
EVENT_CAUGHT Event
EVENT_THROWN Event
GATEWAY_ACTIVATED Event

Event parts:

ID	Name
BaseData	BaseData
EventPointData	EventPointData
TotalPrice	TotalPrice
OrderStatus	OrderStatus

After the custom monitor model is generated, you can edit it using the monitor model editor, and add any monitored elements that you need. If you need to access business data from your process, you need to set it up in the process as a tracked field. For example, in this process, a structure called MyOrder is available in the process designer for this process application. But MyOrder does not show in any event parts for the monitor model. But, there have been two tracking fields defined in the process application, for TotalPrice and OrderStatus. So both of these are listed in the event parts in the monitor model editor, for use as a source for metric expressions.

Custom monitor model – Generate a model

- Make your model changes, then associate the project to the process application which will then deploy the model
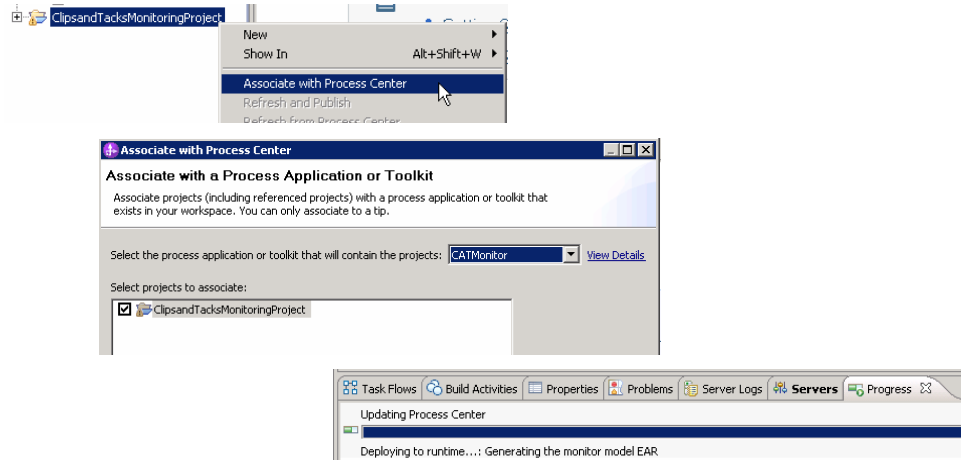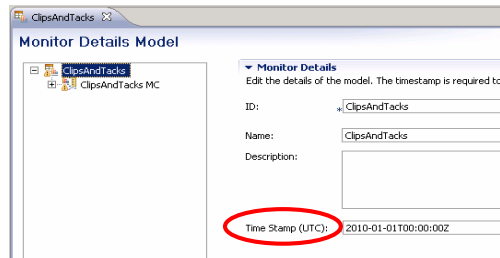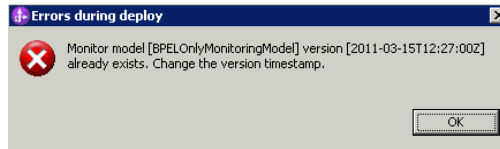
After you have finished editing the custom model, associate the project to the process application that you have created for the model. This automatically deploys the monitor model to the monitor server.

Custom monitor model – Generate a model

- If you make a change to a deployed monitor model, then republish:

Errors during deploy

Monitor model [BPELOnlyMonitoringModel] version [2011-03-15T12:27:00Z] already exists. Change the version timestamp.

OK

ClipsAndTacks

Monitor Details Model

- ClipsAndTacks
  - ClipsAndTacks MC

▼ **Monitor Details**
Edit the details of the model. The timestamp is required to

ID: ClipsAndTacks

Name: ClipsAndTacks

Description:

Time Stamp (UTC): 2010-01-01T00:00:00Z

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If you edit a deployed monitor model, then save those changes and publish them to the server, you get an error message. This happens because you didn't update the timestamp for the monitor model in the monitor model editor. The timestamp is used as the version control identifier.

Custom monitor model - Management

- To generate the model, use the model generation wizard in the integration designer
- To remove the model, you can uninstall using the administrative console or unassociate and republish
- Version control
  - Option 1: Create a new process application for associating with a new monitor model version
  - Option 2: Directly deploy the monitor model EAR to the monitor server
  - If you create another version of your process and generate another monitor model, you have two options:
    - Use the compare/merge tool to compare both monitor models and bring in the KPIs into the new model
    - Use the 'update from application' function to bring the process changes into the original version of the monitor model
- Put the model in a separate process application, and manage its life cycle independently from the monitored process
- If a process application contains a custom monitor model, when a snapshot is taken both are included in the snapshot

Process application monitoring

To generate the model, use the model generation wizard in the integration designer.

To remove the model, you can uninstall using the administrative console or unassociate the model from the process application and republish it.

For version handling you can create a new process application for associating with the new monitor model version. You can also export the EAR for the new model version and deploy it manually.

If you update your business process application, then you will generate a new monitor model version. However, you can have updates to the previous monitor model version, so you need to get those updates into the new version. To do that, you can use the compare/merge tool in integration designer. Or you can use the 'update from application' function to bring the process changes into the original version of the monitor model, then just discard the new version of the monitor model.

It is a best practice to put the monitor model in a separate process application from your business process. This makes sense because monitor models evolve at their own pace independent of the evolution of monitored entities. Also undeployment of a process should not trigger monitor model undeployment. Finally, events from more than one process application can be monitored by a single monitor model.

If a process application contains a custom monitor model, when a snapshot is taken both are included in the snapshot.

Custom monitor model - Management

- To remove the model, disassociate it
  - To facilitate iterative development environment, purges data for a custom model when the last EAR for the model has been uninstalled

- This moves the project outside of the process application

- To re-associate the model to a process application, use option to associate

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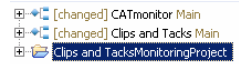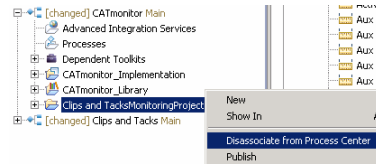
To remove a monitor model from the server, you can use the menu option to disassociate it from the process center. For iterative development purposes, if there are no more versions deployed, then the monitored data is automatically purged. This does not apply to production servers.

When you disassociate the model from the process center, the monitor project moves outside of the process application in the project list.

To re-associate the monitor model to a process application, you can use the option 'Associate with Process Center'.

Summary

- Covered process application monitoring using IBM Business Monitor

Process application monitoring

In summary, this presentation covered the various aspects of process application monitoring using IBM Business Monitor, including using the global process monitor, default monitor model and custom monitor model.

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