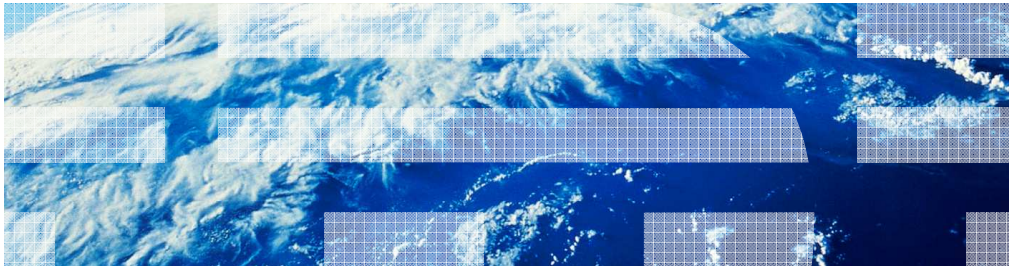IBM

Business Process Management
IBM Business Process Manager V7.5

BPM Standard capabilities

WebSphere software

IBM Business Process Manager is a comprehensive and consumable business process management platform that provides visibility and management of your business processes. It includes tools and run time for process design, execution, monitoring, and optimization. It is also designed to help process owners and business users to engage directly in the improvement of their business processes.

This presentation will discuss the basic capabilities of the IBM Business Process Manager V7.5 Express and Standard configurations.

Table of contents

Key capabilities of IBM Business Process Manager Express and Standard

- Creating and editing business processes
- Human Services and Coaches
- Creating and editing services
- Decision Services – business rules
- Common repository for model and runtime
- Running the business process in the playback inspector
- Debugging
- Monitoring
- Simulation and optimization
- BPMN2 Import
- Version management
- Governance

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Listed here are the capabilities that are key differentiators from similar products.

Each of the capabilities listed here are discussed at a level that will provide insight as to what they do and how they fit into the overall architecture.

As you can see the IBM Business Process Manager provides the tools for creating business processes and the service implementations that support them.
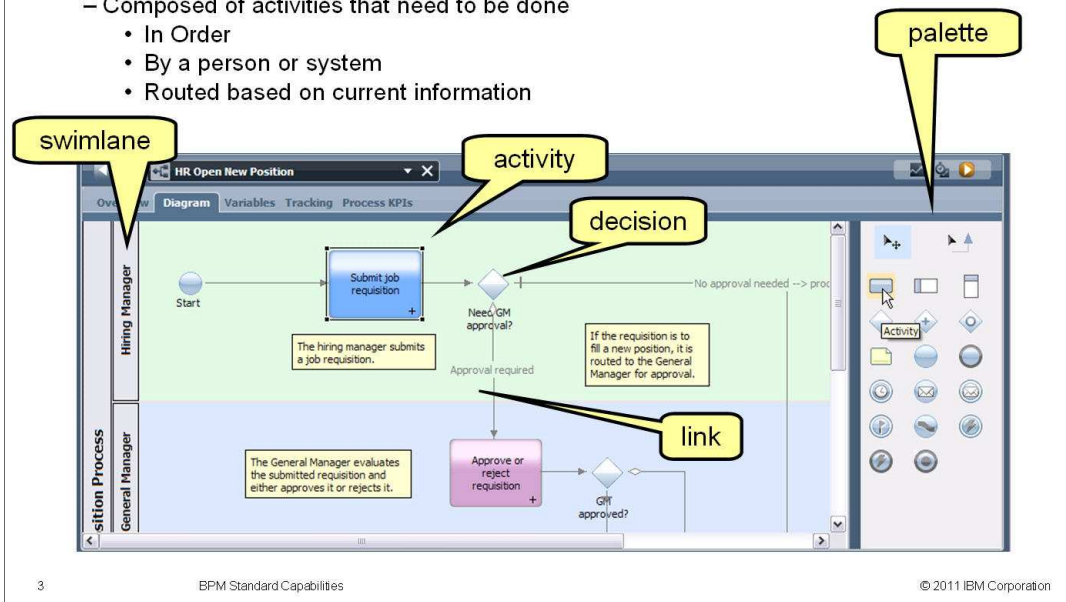
You can also run the business processes, test and debug them using the process designer.

The Business Process Manager goes beyond the basics and provides facilities for incorporating business rules as well as monitoring, simulation and optimization.

With the Process Center and Process Designer architecture you can create versions of your process applications and manage their deployment form a single location.

Creating and editing business processes is done using the Process Designer. The Process Designer is a workflow editor that lets you drag elements from the palette on the right into the canvas in the center. The basic elements are the activity, the links and the decisions. There are other elements that represent different kinds of events, such as start, stop, timers, errors and messages.

At the top level, a business process is composed of activities that need to be done in a specific order by people or systems authorized to do the task. Based on information available at the time, the flow is routed to different activities, until it reached the end.

The swimlane is how you specify who is doing the activity. Here there are two swimlanes shown, one for the hiring manager and the another for the general manager. The activities in the hiring manager lane must be completed by a person that is a hiring manager and those in the general manager lane must be completed by a general manager.

There is another swimlane that is not visible in this picture, and that is the system lane.

The activities in the system lane are activities that do not require human interaction and are automatically run by the system.

Creating and editing business processes
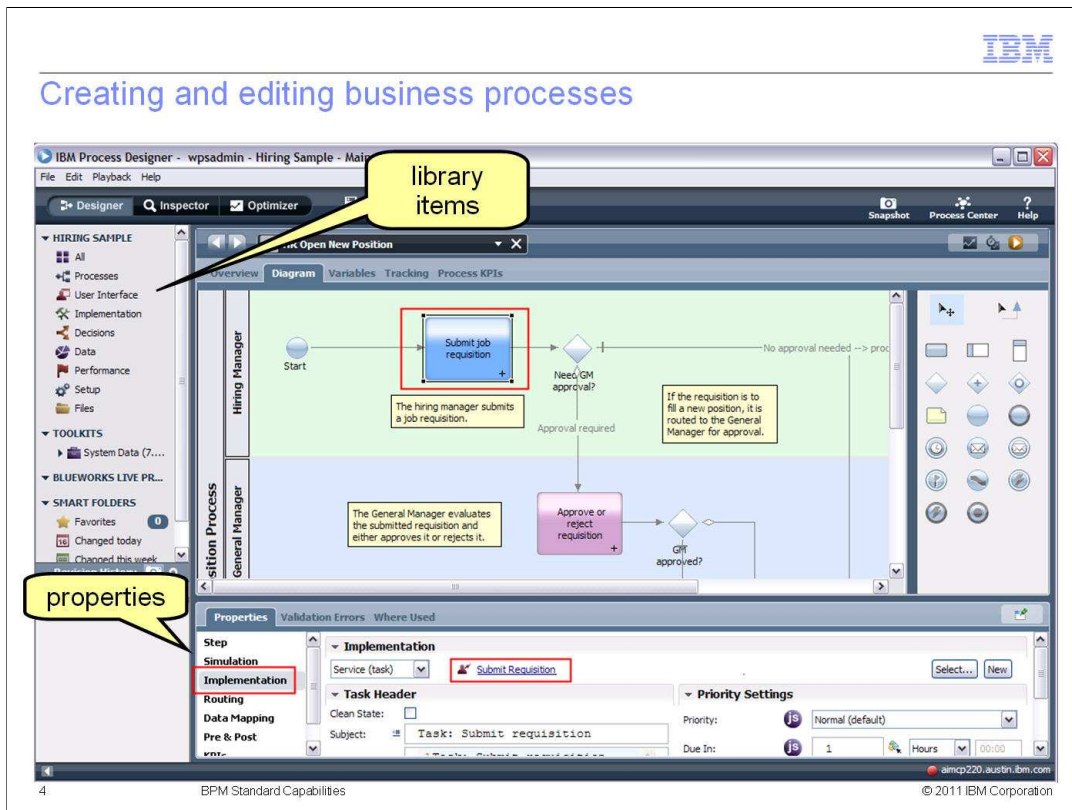
Expanding the view a little further you can see the properties pane at the bottom. Each element in the business process diagram has a unique set of properties that specify how the activity, decision, or event will behave at runtime. Selecting the element in the diagram will display a different set of properties unique to the selected element.
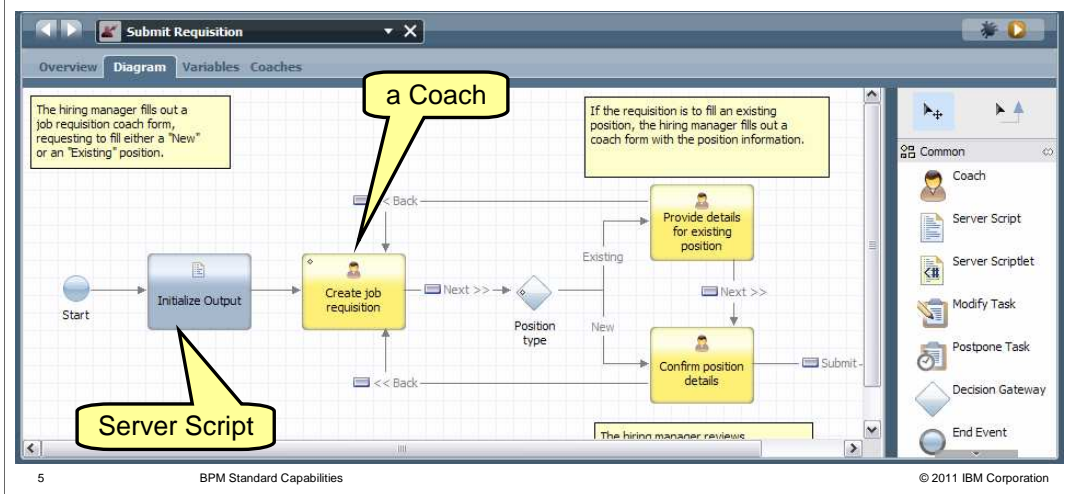
From the key concepts presentation you learned that there is a model layer and an implementation layer. The association between the activity and the implementation is made in the implementation tab of the properties for the activity.

For the selected activity, the "submit requisition" human service has been associated. This is highlighted in red.

Looking at the list of library items on the left, you'll see there is a selection for User Interfaces. The human service definitions are found in there.

Human services and Coaches

- Quickly and easily *create*, *test* and *refine* the user interfaces that are used with the human centric activities.
- Human Service uses Coaches
- Java Script is the programming language for data manipulation and logical expressions

Submit Requisition

Overview **Diagram** Variables Coaches

The hiring manager fills out a job requisition coach form, requesting to fill either a "New" or an "Existing" position.

a Coach

If the requisition is to fill an existing position, the hiring manager fills out a coach form with the position information.

Common

Coach

Server Script

Server Scriptlet

Modify Task

Postpone Task

Decision Gateway

End Event

Back

Provide details for existing position

Initialize Output

Create job requisition

Next >> Position type

Existing

Next >>

New

Server Script

<< Back

Confirm position details

Submit

The hiring manager reviews

Start

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The next key capability to discuss is the ability to quickly and easily create, test and refine the user interfaces that are used with the human centric activities.

It begins with the Human Service. The human service uses Coaches and other programming elements to implement the user interface and user interactions.

Coaches are the forms that are used to display information to the person working on an activity and return information to the business process flow.
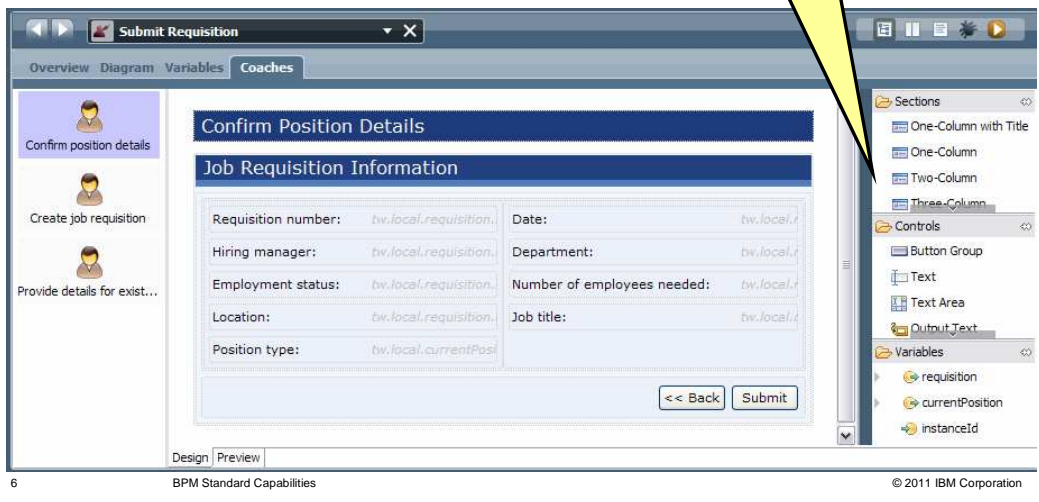
The "submit requisition" human service shown here actually choreographs several Coaches and includes a server script to initialize the output. The Coaches are web forms for gathering input and returning output from the-user.

A human service can be as simple as a single Coach or more complicated like the one shown here. Looking at the palette on the right, you'll see there are several interesting tools that you can use. The most common ones used are the server script and the decision. You can see that if you have a set of closely related user interactions, they can easily be encapsulated into a single human service.

Coaches are the web based user interface forms used for providing input to and gathering output from human centric activities.

The fields that are available come from the variables which are part of the human service that uses the Coach.

A Coach can be created from scratch by dragging and dropping the form elements and the data fields onto the form.
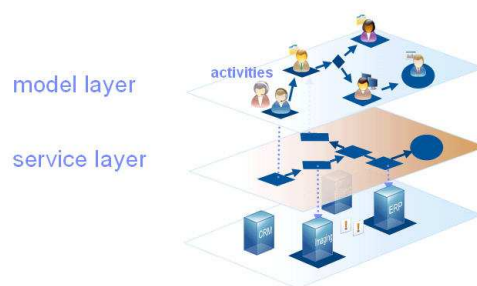
Or a default layout can be created, based on the variables available when creating a human service using a wizard.

Default Coaches allow the business process to run in the *Inspector* without specifying any additional information.

Coaches provide a very easy way to create user interfaces that can be incrementally refined to meet the final requirements.

Services are how work gets done. There are several different kinds available to help you accomplish your goals.

Use a General System service when you need to coordinate other nested services or you need to manipulate variable data.

Use an Integration service when you want to integrate with an external system. An Integration service is the only type of service that can contain a Java or Web Service integration.

Use the Web Service when you need to expose a service as a SOAP callable web service.

Use an Ajax service when you want to include a control in a Coach to implement dynamic data selection such as automatically populating drop-down lists and automatically completing edit boxes.

Use a Human service when you want to create an interactive service

Use a Decision service when you want to encapsulate complex logic or call an external rules engine.
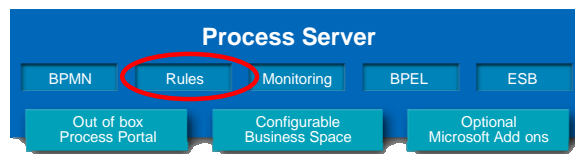
Creating and editing services

A service flow editor is available for each of the different kind of services. There are slight variations in the functions available but for the most part, they work the same. For the general system service you can use Java scripts and scriptlets, plus there a few other tools for handling errors, documenting the flow and sending alerts and monitoring.

A key distinction between the general system service and the integration service is the availability of Web Service Integration and the Java Integration. These tools are only available with the Integration Service.

Decision Service

- Business rules provide a way of factoring out business logic that is likely to change over the course of the business process application
  - Allows you to manage the key logic without redeploying the entire business process application

- The Decision Service is your access to business rules

- There three different kinds of business rules available with the Decision Service
  - Business Action Language (BAL) component
    - Used to specify rules with out writing Java Script
  - JRules component
    - Calls out to an external Ilog rules server
      - IBM WebSphere Ilog JRules
  - Decision Table component
    - A table format that uses JavaScript for the logic

Process Server

| BPMN | Rules | Monitoring | BPEL | ESB |

| Out of box Process Portal | Configurable Business Space | Optional Microsoft Add ons |

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Business rules are a very powerful programming technique for creating flexible business process applications. Business rules allow you to manage the key logic without redeploying the entire business process application.

With Business Process Manager V7.5, the way to create, edit and use business rules it through a Decision Service.

There are three kinds of components.

First is the Business Action Language (BAL) component. This a very simple, if-then-else editor that provides a way for a business process modeler to develop the logic for a business rule without the need for Java or JavaScript. The business action language uses a natural language syntax.

Second, is the JRules Decision Service component.

This component integrates with IBM WebSphere ILOG JRules. You can use this rule component to connect to and implement rule applications that are available on a JRules Rule Execution Server.

The third component is the decision table.

The Decision Table component contains a rule table. Each row in the rule table represents a Boolean condition that evaluates to true or false at run time. When a rule evaluates to true, the JavaScript expression that you provide as the rule action is executed.

Decision Service - continued

A decision service is constructed in much the same way that any other service is created. There is a diagram editor with the elements in a palette on the right. Beside the three components that have already been mentioned, there are the typical, start, stop, throw, catch events and decision gateways. You compose your flow in the diagram view and then for the BAL and Decision table you switch to the decisions tab, highlighted in red.

For the Business Action Language rule on the bottom left you can see the simple editor that will expand as you input your logic statements.

For the decision table on the right, you start by working on a row of the table and then complete the actions using JavaScript, below. You can create a many if-action statements that you need.

Common repository for models and runtime

- The authored business models are stored in the same repository as the runable models

- There is no translation or transformation between the design model and the runable model.

- There is no need to keep them synchronized.
  – They are one and the same.

- Also allows for easy version management.
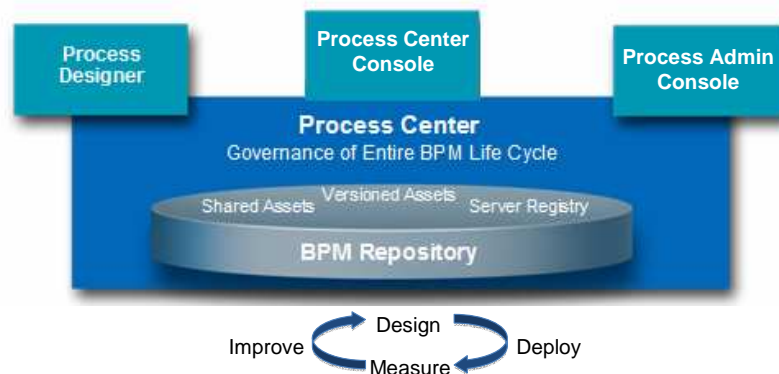
There are some tools and systems that have different process modeling and runtime semantics. Not all descriptive modeling languages are meant to become runable business models. Typically there is a transformation step and often the runtime model needs to be augmented with the runtime behavior. Extending the runtime model causes the business process model to become out of sync with the runtime time model.

With the Business Process Manager the business model is the same model as the runtime time model. There are no synchronization issues which cause the need for complex merging with every iteration of the process application.

The business process analyst makes the changes to business model and the integration designers maintain the service implementations. The different parts are brought together with the associations in the layered architecture. As soon as the changes are made the model can be run and tested. The use of default placeholders enables the process application to run if the implementation service is not ready yet.

Another feature of the common repository is the version management. Since all of the artifacts for a process application are in the same relational database, it is easy to identify the related parts and create a snapshot.

Running the business process in the playback inspector

The playback inspector is an extremely valuable feature. With the playback inspector you can step through your business processes verifying the correctness of the flow and the logic. You can see here that the flow is at the first activity, as indicated by the red flow token. As you step through the business process and an activity is reached that has a Coach associated with it, the Coach is rendered in a browser where you can complete the information and submit the form. If the activity is an automated service, it will run, and the process will automatically advance to the next step. The data can be inspected at each step using the 'execution state' and variables windows on the right.

Process debugging
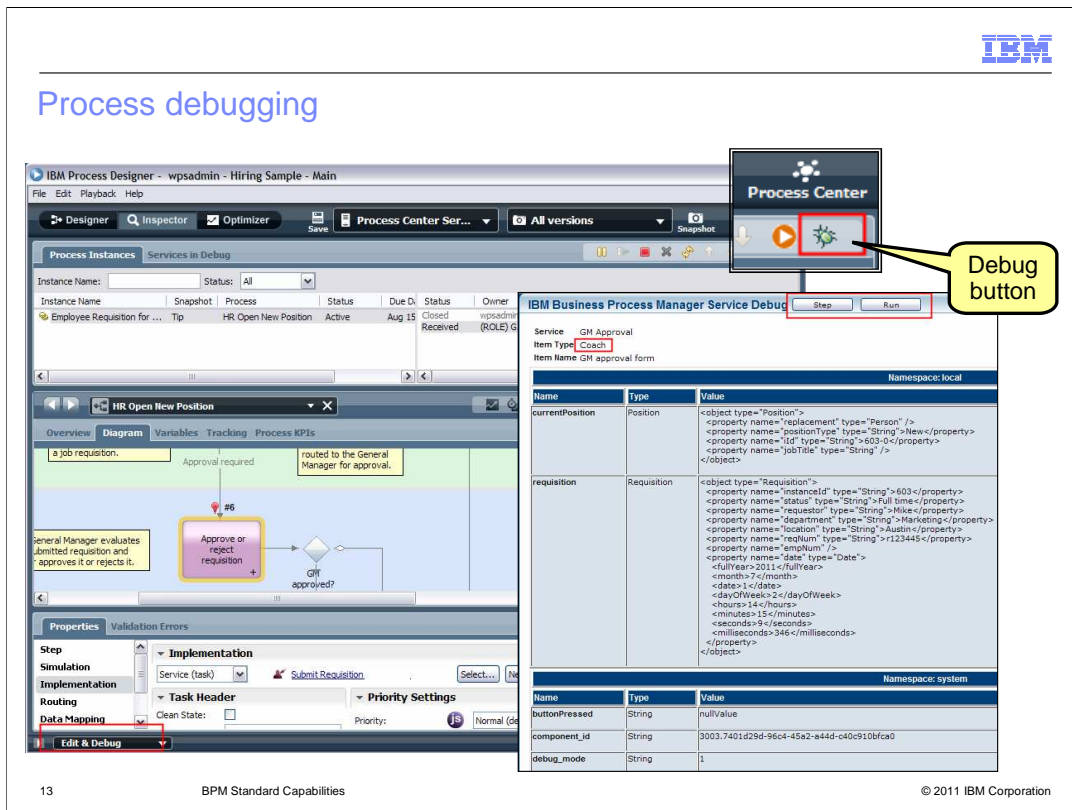
When the debug button is selected, a new browser window is opened on the service debugger, displaying the details of the activity. There are step and run buttons so you can work from the service debugger once it is displayed. The graphical flow and data display in the Inspector are coordinated with the step and run buttons in the service debugger. When a Coach is reached, it is displayed in a browser as expected.

Notice too, the edit and debug drop down that is highlighted in the lower left. This controls the display mode. When in the edit and debug mode, you can make changes to the currently selected activity or element in the process flow. The changes take effect immediately in the running process, they are to be picked up the next time the activity is run.

Service debugging
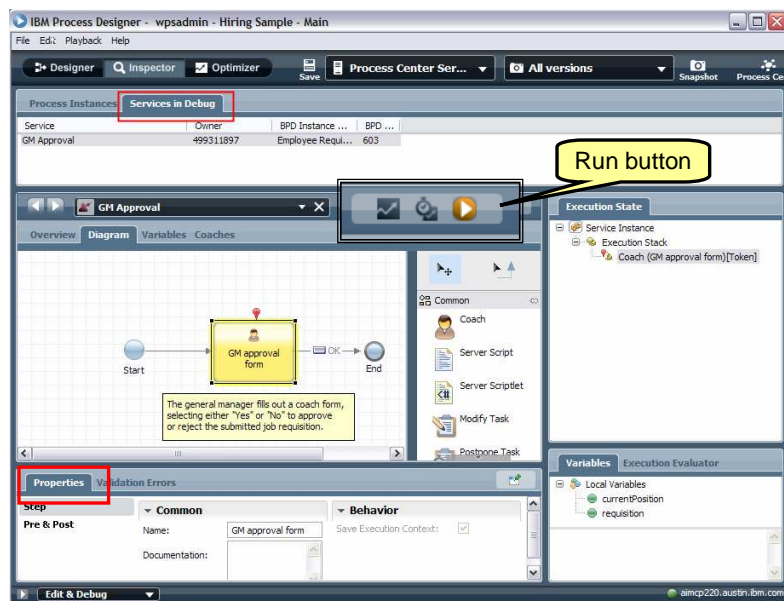
For more details visit this link to the Inspector Reference

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Throughout the course of a debugging session you will have many service instances running at the same time. They are managed separately from the process instances. See the tab highlighted in red, at the top left. When debugging services, you can change the data in the properties in the lower left and rerun with different data. If you're already in debug mode, the service debug browser will also be displayed.

Debugging sessions are not limited to the Process Center Server. If there is another Process Server that is connected to the Process Center, you can use the drop down menu in the top menu bar to switch the target server. The process application snapshot must be deployed and you must have the proper permissions in order to run the processes and services.
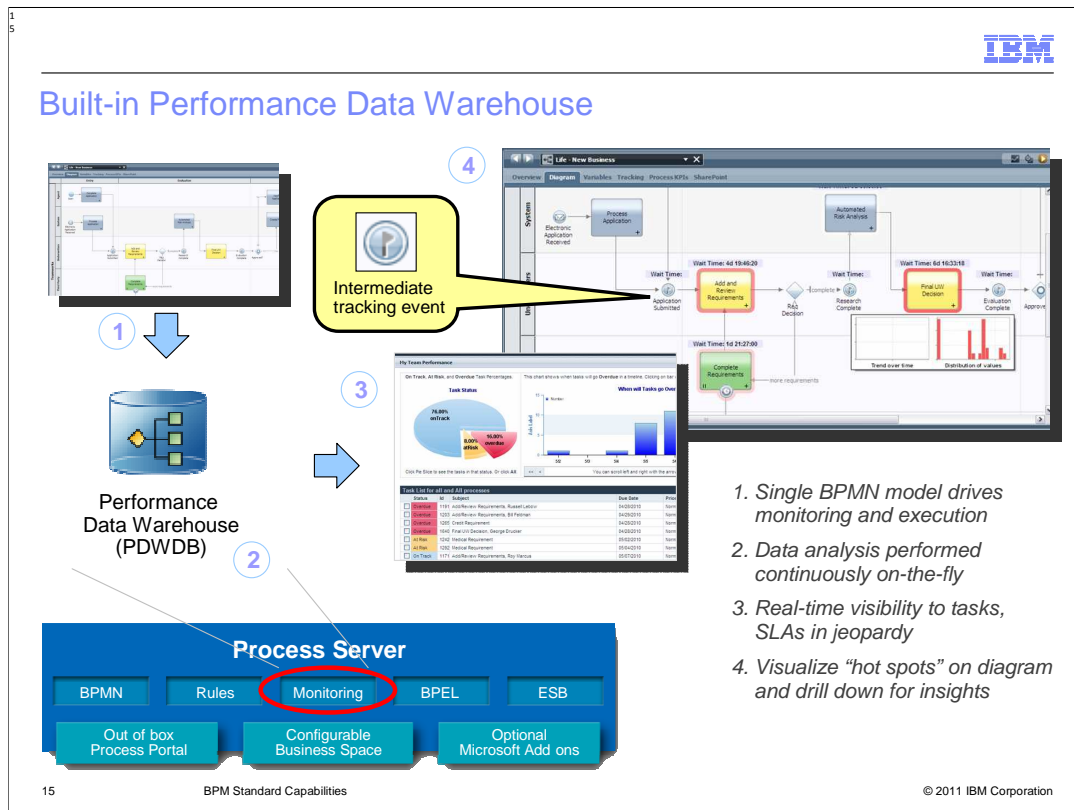
The Performance Data Warehouse comes with the BPM standard environment. Not to be confused with the IBM Business Monitor that is sold as a separate product. With the built-in performance data warehouse you instrument your business process flow and service implementations with intermediate tracking events. These are called custom tracking events. Custom tracking events are emitted when the process flow passes through an intermediate tracking event node.

There is another kind of tracking event that can also be used. These are the built-in auto-tracking events. Auto-tracking events are emitted when a process execution starts or ends, when a sequence flow is traversed, and

when process steps are ready, active, or complete.

Whenever an event is emitted, be-it a custom or auto-tracking event, it is accumulated in the Performance Data Warehouse database.

There are standard reports or you can create your own to analyze the data collected.

Picture number four shows the hot spots identified by the red boundaries. Selecting a hot spot will display a graph of the data.

There is another tool available, which is not shown here, called the Performance Administration Console.

The Performance Administration Console is used to help identify performance bottlenecks

Process Manager simulation and optimization

Improve → Design → Deploy → Measure
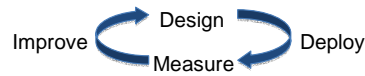
- IBM® Business Process Manager Optimizer is a tool designed to help you understand and refine the process models that you develop in IBM BPM.
  - Simulate your processes while you are developing them to understand how well those process models might perform
  - Analyze your processes after they are up and running using historical data stored in the Business Performance Data Warehouse.

- With the Optimizer you can…
  - Simulate process performance
  - Identify bottlenecks and other issues
  - Compare actual process performance to simulations
  - Compare simulations to historical performance data
  - Simultaneously analyze multiple processes from a single or multiple process applications

The IBM BPM Optimizer runs simulations using estimates that you provide for staffing levels, activity execution times, and so on. Simulating your processes during development enables you to test and refine process designs before implementation.

For each process, with auto tracking enabled, you can measure actual execution, wait, and other times. You can also track the values of specific business data (process variables) as they move through each step in a process. Running historical analyses using IBM BPM Optimizer enables you to measure and then improve the efficiency of your processes.

The Optimizer provides a variety of analysis scenarios, ranging from simple simulations to validate your overall process modeling strategy,

to advanced what-if comparative analyses.

Process manager Optimizer

This picture is to give you an idea of the output from the simulator and the optimizer.

Starting from the top left, the Analysis scenarios is where you decided what you want to run.

Moving to the right is a color coded 'heatmap' of the business flow diagram. The task, "Find Job candidates" is highlighted in dark red, indicating that it is a very hotspot. The 'Heatmap settings' in the bottom left window, is where you specify the range and other parameters to be used when doing the heatmap analysis.

Live reports for the selected element are displayed in the window below. In the live reports section there is a graphical summary and a table for details of the data. The window on the upper right, "Smart Start", directs you to the activities and processes that deserve a closer look based on the most recently performed analysis scenario and the current visualization mode.

The "Recommendations" window in the bottom right, makes practical recommendations for addressing issues that are identified in your processes, and suggestions for how to optimize your process models.

The process manager optimizer provides a very powerful tool for understanding the dynamic behavior of a business process.

BPMN 2 import

- Business Process Management Notation – Version 2

- BPMN 2 is a standard modeling notation for modeling businesses processes.

- Supported by several different IBM pro
  - IBM WebSphere business Modeler
  - WebSphere Business Compass
  - IBM Blueworks Live

- Provides a way to move models from one product to another
  - A migration "starter kit"

- The transformation from one system to another is currently less that 100%
  - Not all products support the same set of features
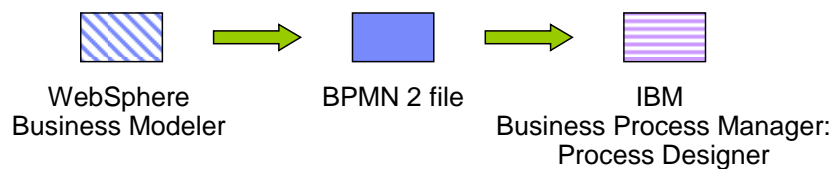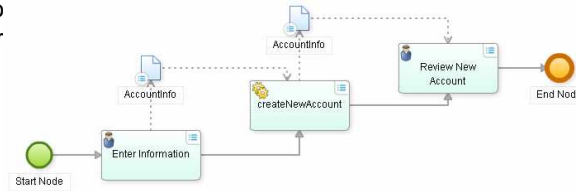
WebSphere Business Modeler → BPMN 2 file → IBM Business Process Manager: Process Designer
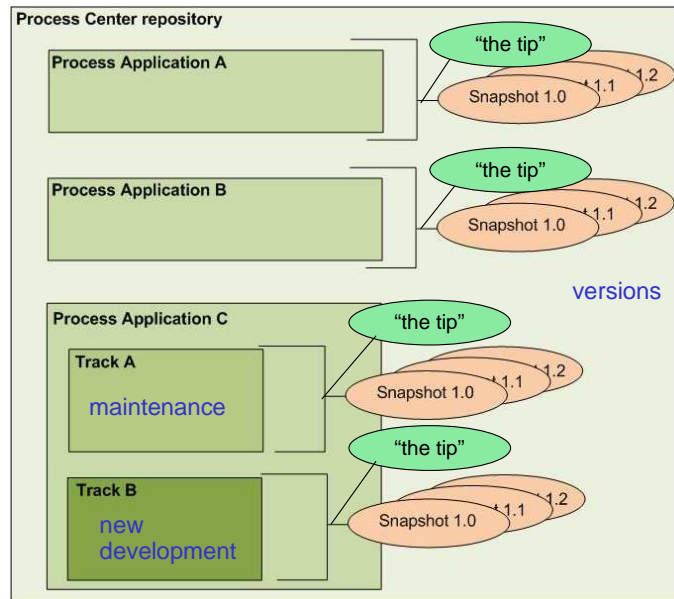
Business process management notation version 2 is a standard modeling notation for modeling business processes.

Having the ability to import BPMN 2 models makes it easier to get business process models from other systems into the IBM Business Process Manager, Process Designer.

Since the Process Designer does not fully support BPMN 2 there are gaps. For this reason this feature should be viewed as a way to 'jump-start' your migration effort to the IBM BPM V7.5, and not a full migration tool.

Version management

- The unit of management is…
  - Process Application
  - Toolkit

- A snapshot captures the state of all the elements within a process application or toolkit at a specific point in time.

- Snapshots typically represent a milestone or are used for playbacks or for installation

- The snapshot is the deployable unit

- Tracks are version branches of a process application or toolkit
  - Allows parallel development
    - A maintenance stream
    - A new development stream

Process Center repository

Process Application A — "the tip", Snapshot 1.0, 1.1, 1.2

Process Application B — "the tip", Snapshot 1.0, 1.1, 1.2

versions

Process Application C
- Track A — maintenance — "the tip", Snapshot 1.0, 1.1, 1.2
- Track B — new development — "the tip", Snapshot 1.0, 1.1, 1.2

Version management with IBM Business Process Manager V7.5 is achieved through the use of snapshots of the Process Application and the Toolkit.

A snapshot captures the state of all the elements within a process application or toolkit at a specific point in time. All of the artifacts reside in the Process Center repository. Creating a new version of a Process Application or Toolkit is as easy as selecting the snapshot button in the Process Designer menu bar.

A snapshot is a an immutable version of the process application or toolkit. It is used for version management, deployment, exporting and importing.

Since snapshots are read only, attempts to edit one will automatically take you to the current working copy. This working copy is called "the tip".

By default there is only one working copy of a given process application or toolkit in the repository at a time.

When executing business process definitions in the Inspector, you are running "the tip" in the Process Center Server.
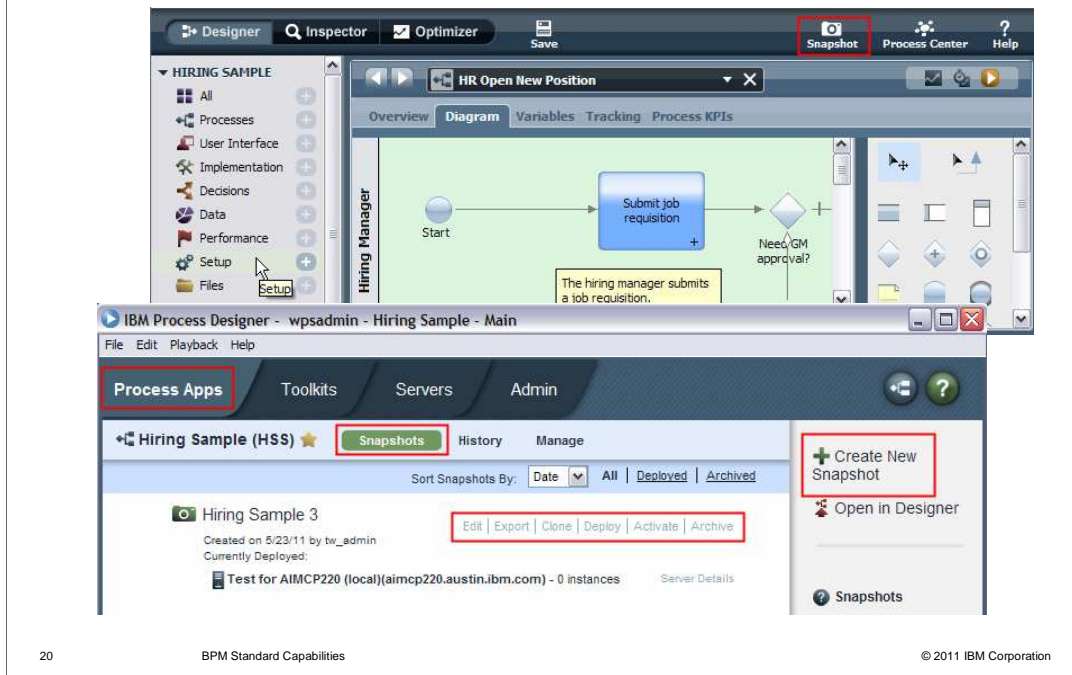
The process application or toolkit remains at the tip level until a snapshot is created.

To have more than one working copy of a process application or toolkit, you use tracks.

Tracks allow parallel development to occur with isolation from changes in other tracks.

For example, tracks enable one team to fix the current version of a process application while another team builds a completely new version.

To deploy a process application and it's dependencies to a different process server environment for testing, staging, or production, you must first create a snapshot.

Creating a new version of a Process App or Toolkit

Creating a new version of a Process Application or a Toolkit is as easy as selecting the snapshot button from the Process Designer menu bar or the "Create New Snapshot" from the Process Apps or Toolkit sections of the Process Center.

From the screen capture of the Process Center shown here, you can see that there is a snapshot of the Hiring Sample 3. There are also options in the Process Center for managing the snapshot. You can edit, export, clone, deploy, activate and archive a snapshot.

If you need to revert to a previous snapshot or version, you can create a clone.

A clone is a copy of a snapshot with a new unique acronym.

Life-cycle governance

Runtime environments

Development
(the Process Center)

↓

Test

↓

Quality assurance

↓

Production

The Process Center provides centralized control for governing deployment of processes and services to the supported runtime environments. These runtime environments are development, test, quality assurance and production.

You can manage Process Applications and Toolkits using the Edit, Export, Clone, Deploy, Activate, and Archive functions.

You can add offline servers and remove online servers.

And you can manage the user privileges for the Process Applications and Toolkits

Governance

Definition: In the case of a business, governance relates to consistent management, cohesive policies, guidance, processes and decision-rights for a given area of responsibility

- IBM Business Process Manager V7.5 provides a high level of manageability and governance with these features:
  - Process Center
    - provides a scalable central repository and control center for organizing and managing all process artifacts, applications, and services that are created as part of a BPM program.
  - Toolkits
    - manage process artifacts for reuse across multiple process applications.
  - Snapshots
    - capture the state of all artifacts in a process application or toolkit at a specific point in time with just one mouse-click.
      - includes business process diagrams, rules, data, forms, services, and simulation scenarios
  - Versioning
    - restores any historical snapshot of a process application or toolkit.
  - A Process Server registry
    - provides centralized tools to install and track deployed versions of multiple processes across various runtime server environments.
  - Life-cycle governance
    - provides centralized control for governing deployment of processes and services to production run time.

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The Governance Definition is:

in the case of a business, governance relates to consistent management, cohesive policies, guidance, processes and decision-rights for a given area of responsibility.

Listed here are the features and capabilities of the IBM Business Process Manager that provide manageability and governance. They have all been discussed in this presentation. Here you can see them all together in the context of governance.

IBM

Summary

Key capabilities of IBM Business Process Manager Express and Standard

- Creating and editing business processes
- Human Services and Coaches
- Creating and editing services
- Decision Services – business rules
- Common repository for model and runtime
- Running the business process in the playback inspector
- Debugging
- Monitoring
- Simulation and optimization
- BPMN2 Import
- Version management
- Governance

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This presentation has taken you through the key capabilities of the IBM Business Process Manager that make it a comprehensive and consumable business process management platform.

A flexible architecture, separating the model from the service implementation.

Tools for creating, testing and deploying business processes and their supporting services.

Advanced features for monitoring, simulation, and optimization.

And a Process Center with a single repository for model and runtime components, which also provides a single point of management and version control.

All of these together give you what you need to develop robust human centric business processes.

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