



IBM Software Group

# WebSphere® Business Monitor V6.0

## *Logical Architecture*



@business on demand.

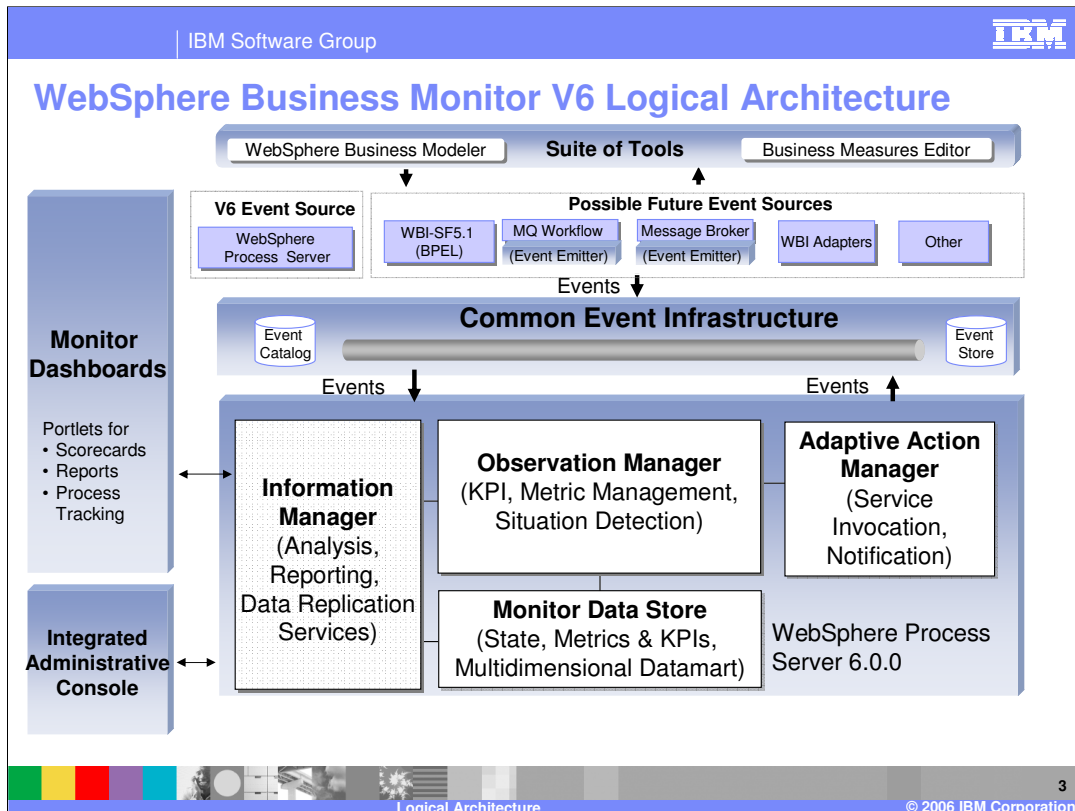
© 2006 IBM Corporation  
Updated January 31, 2006

This presentation will cover the architecture of WebSphere Business Monitor V6.

## Goals

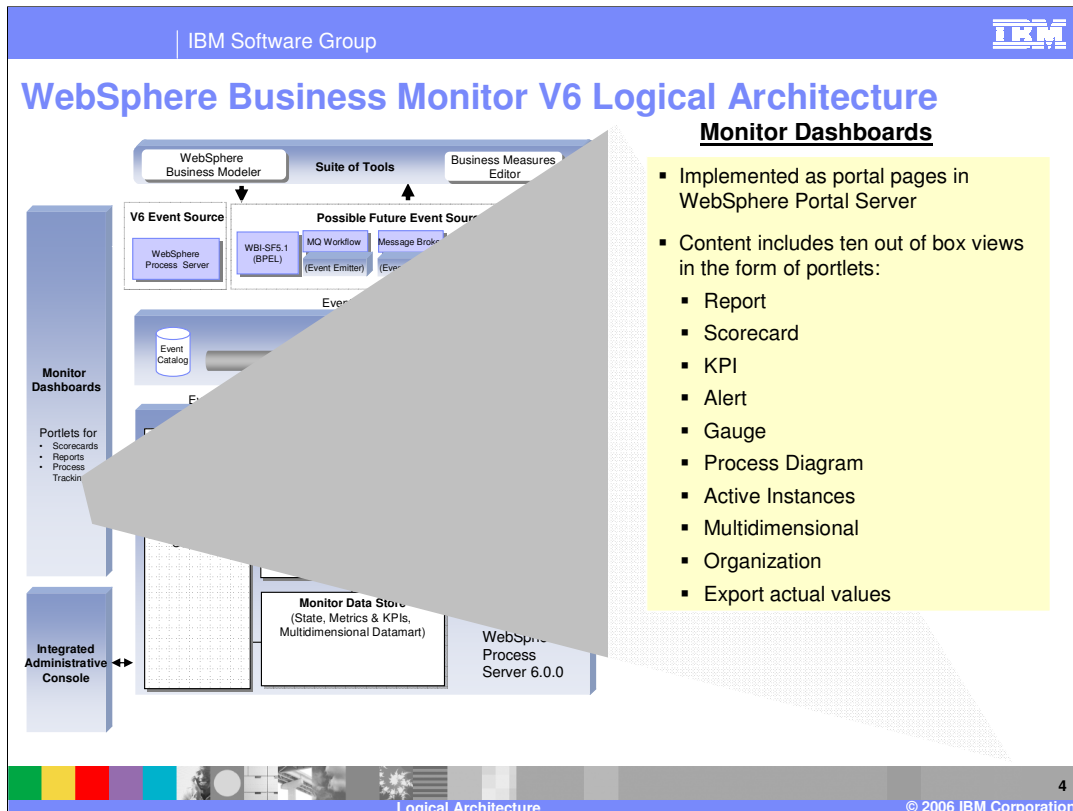
- Introduce WebSphere Business Monitor V6.0 architecture

The goal of this presentation is to provide a detailed look at the architecture of WebSphere Business Monitor V6.



WebSphere Business Monitor 6.0 allows you to monitor the run time behavior of business processes through a web application that will be deployed on WebSphere Process Server V6. The data that will be monitored is issued from a run time engine. Data is encapsulated in Common Base Events by means of event emitters and are transmitted on a common event bus: the CEI or Common Event Infrastructure. For WebSphere Business Monitor V6, only events emitted from WebSphere Process Server are supported.

The product is also responsible for its own datastore in order to handle data required for the monitoring operation. This includes instances of running monitoring contexts and metrics' values. The performance is optimized by dividing the datastore into different databases, each being optimized for specific types of DB access operations. A replication service is responsible for moving state data to the historical datastore. The latter is the basis on which data analysis will be performed. Analysis of data is made available by introducing DB2® Cube Views and accessing cubes from the AlphaBlox interface, which is the visualization module. Monitoring of data is based on a business measures model which includes different entries that permit correlation of the runtime events with a specific instance, in addition to entries that specify situations. The business measures model is obtained from the original business model by editing entries that are essential for monitoring purposes: correlation of events, metric calculations, detecting situations. Editing of the model is done by the Business Measures Editor. The Action Manager component provides for the detection of situations and taking appropriate actions.



- Monitor Dashboards**
- Implemented as portal pages in WebSphere Portal Server
  - Content includes ten out of box views in the form of portlets:
    - Report
    - Scorecard
    - KPI
    - Alert
    - Gauge
    - Process Diagram
    - Active Instances
    - Multidimensional
    - Organization
    - Export actual values

The Dashboards Client is built as a set of ten portlets using WebSphere Portal Server. AlphaBlox widgets are used in the presentation layer.

**Report View**

The Report View is intended to view performance reports relative to a time-axis. Such reports typically contain tables and graphs with textual descriptions summarizing the analysis.

**Scorecard View**

The Scorecard View is primarily to support the Executive users. A scorecard groups the KPIs that are of interest to executives.

**KPI View**

The KPI View Type shows the details of individual Key Performance Indicators.

**Alert View**

The Alert View displays the notifications for a specific user.

**Gauge View**

The Gauge View is targeted to display individual KPI value, either relative to KPI lower and upper limit values, or relative to the KPI target value, visually using the appearance of physical instruments like speedometer or tachometer in an automobile.

**Process View**

The Process View displays a graphical process diagram.

**Active Instances View**

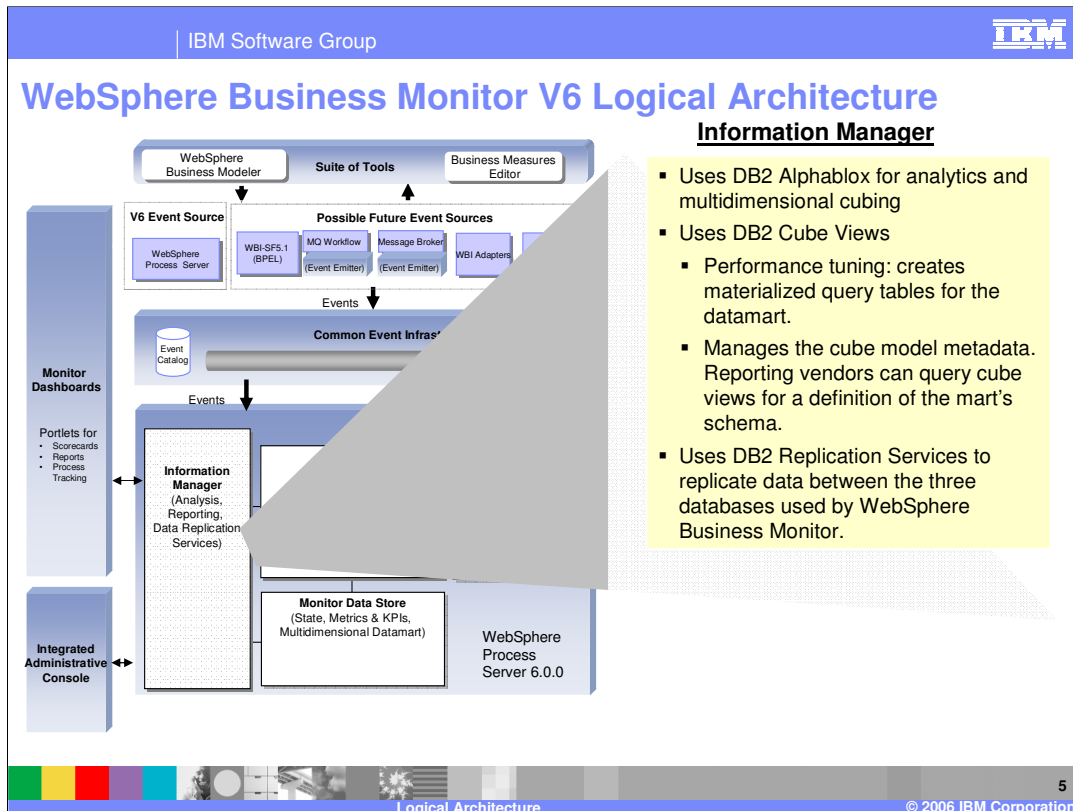
The Active Instances View is intended to view the details of an in-process monitoring context.

**Multidimensional View**

The Dimensional View provides a multi-dimensional view of business performance data.

**Organization View**

This view is used to retrieve and display organization unit and employee information from a user registry. The WebSphere Portal is configured to use (WebSphere Portal supports both an LDAP registry and a custom registry.)

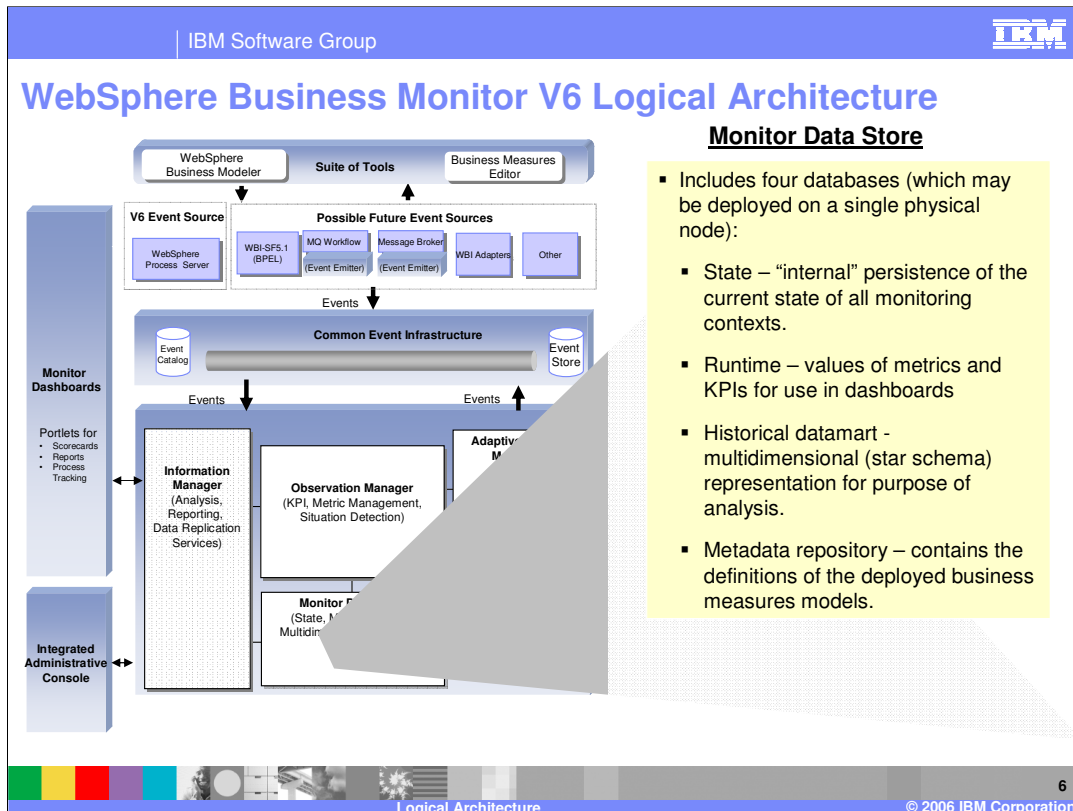


DB2 Cube Views is an on-line analytical processing (OLAP) tool which provides a multidimensional view consisting of categorical attributes such as Products and Market and numeric attributes like Sales and Profit. The categorical attributes form dimensions and the numeric attributes form the measures of a multidimensional cube. Dimensions can contain hierarchies that specify aggregation levels. The measure attributes are aggregated to different levels of detail by applying mathematical functions such as sum, average, and variance to a combination of dimension attributes.

OLAP data can be explored by using different navigational operators like drill-down, roll-up, dicing, slicing and pivot. Typically, the user begins with an aggregate level, inspects the entries visually, selects sub-ranges of data to inspect further based on business hypothesis or financial strategies, drills down in more detail, inspects the entries again and either rolls-up to a higher level view or drills down to an even more atomic level.

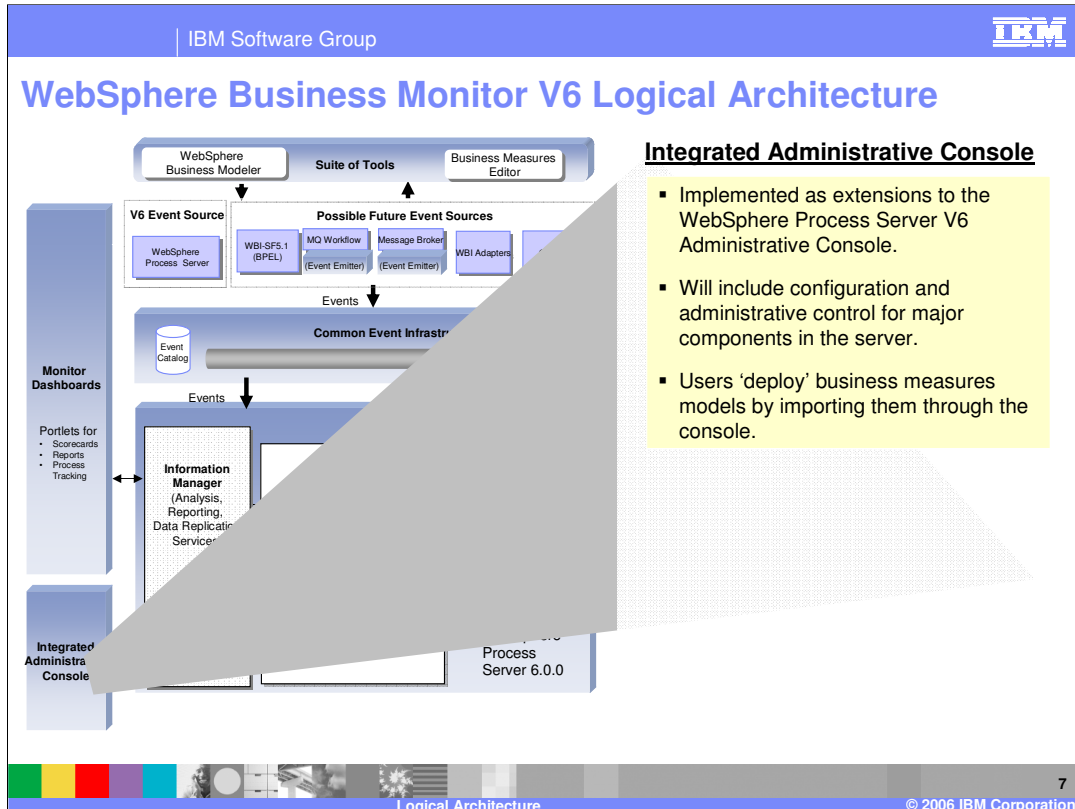
For example, there are many ways to slice and dice a cube to retrieve profit information. You can use the average product profit by region for the last month, average product category profit at the corporate level for the last quarter or average product profit at the store level for the last month. Each of the above possible calculations results in different ways of slicing and dicing the cube, which produces the result sets in one-dimension, two-dimensions or n-dimensions. So a chart could be generated to show profit margin by product, geography and quarter, and this would be considered a 3 dimensional cube.

Materialized Query Tables (MQTs) are leveraged in DB2 to provide precomputed, aggregated, stored data which will be repeatedly accessed. By leveraging MQTs, costly table joins and computation-intensive calculations can be performed once, and later similar queries can use the existing data to return results much faster. Building MQTs correctly can bring a significant performance boost. An interesting feature in Cube Views is that the Optimization Advisor wizard can help to generate MQTs. By analyzing your ~~WebSphere Business Monitor V6 logical architecture~~ <sup>Page 5 of 13</sup> ~~recommended summary tables~~ <sup>which users can optionally tailor to fit their needs</sup> MQTs

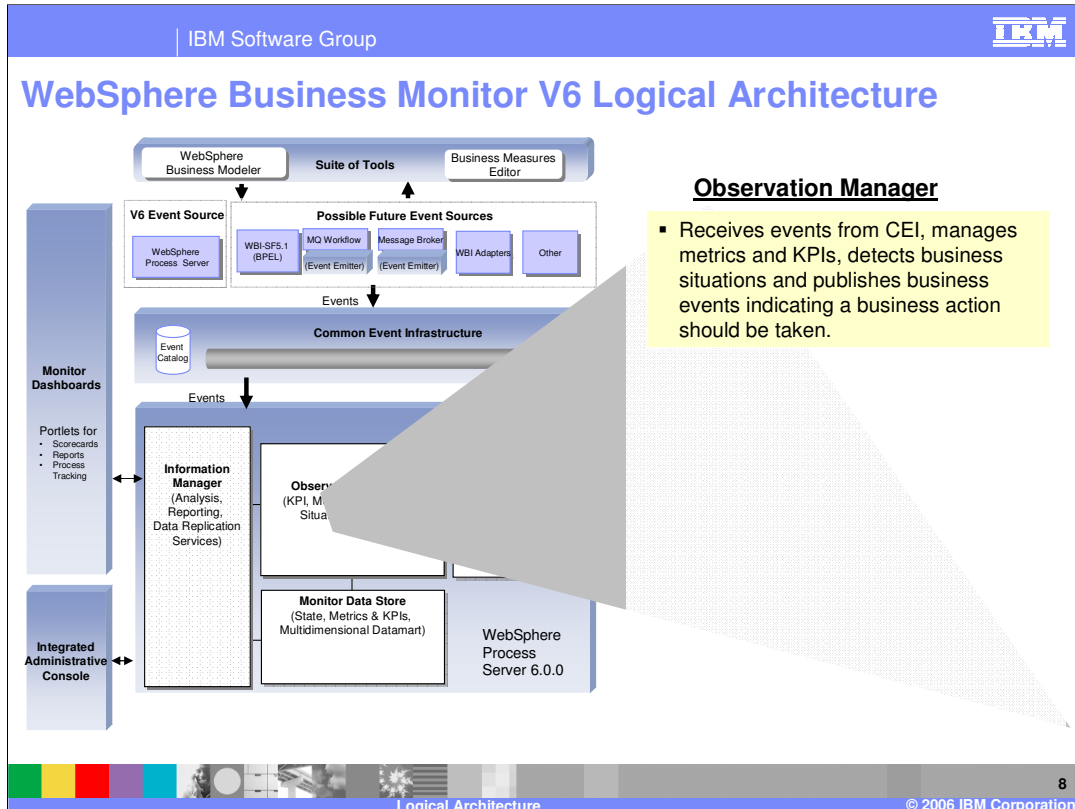


There are four databases in WebSphere Business Monitor V6. The State database contains the current state of the monitored contexts. The Runtime database contains the current monitored metrics and KPI's used for reporting purposes. The historical database is the multidimensional database which is used for historical analysis and reporting. Performance is improved by separating the state database from the reporting databases, so that the Observation Manager accesses the State database and the dashboards access the Runtime and Historical databases.

A multidimensional database usually consists of tables organized as one or more star (or snowflake) schemas. A simple star schema consists of a fact table surrounded by dimensional tables. For example, a fact table may record a company's sales figures by day for individual products and store locations. Dimension tables (perhaps named PRODUCTS and STORES) could contain details on the individual products and store locations, and are joinable to the fact table. The DB2 Cube View metadata is especially good at capturing the structure inherent in a star or snowflake schema. This metadata provides "dimensional views" of the relational data through a set of metadata objects. The metadata objects are layered from simple objects like Attributes (a simple Attribute Models a table column) to more complex objects such as Joins, Hierarchies, Dimensions, and Cube Models. A fully defined Cube Model object usually corresponds to a star (or snowflake) schema, and models a set of measures with a common dimensionality.



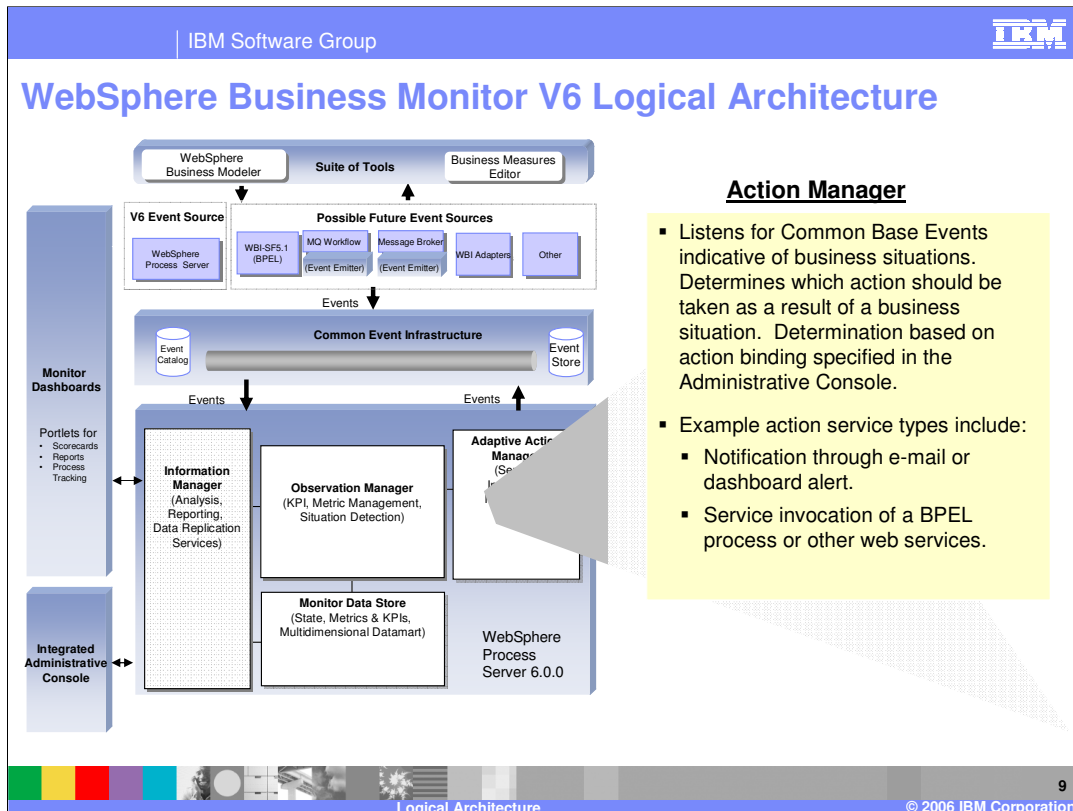
Since WebSphere Business Monitor is installed on WebSphere Process Server V6, the administrative functions are built into the WebSphere Process Server Administrative Console. Functions here include importing business measures models, running Schema Generator, configuring Action Manager.



The Observation Manager component is responsible for collecting events from CEI, processing these events and emitting situation events.

- The server will collect events from CEI and deliver these events for processing.
- The collected events will be processed and all metric and KPI changes will be reflected in the database and any situations that have been affected by the event are fired.
- Any Outbound event definitions that were generated by the fired situations are emitted to CEI.

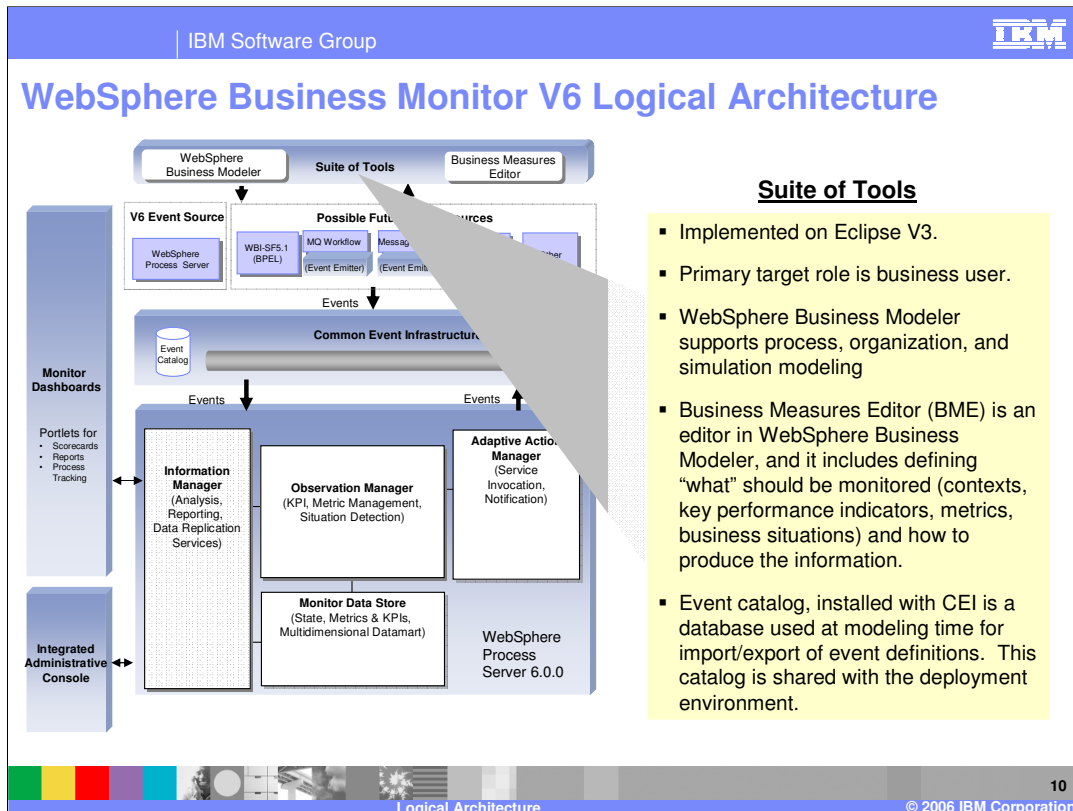




The Action Manager is one of the key components in WebSphere Business Monitor 6.0. It receives situation events emitted by Observation Manager, selects appropriate actions based on rules and policies predefined by a business user, and invokes a selected action or a set of actions..

- An administrator for WebSphere Business Monitor binds situation events to Action Services in the Action Catalog. This is done with the WebSphere Business Monitor **Administration Console**.
- The Action Manager receives situation events from Common Event Infrastructure (CEI), which is emitted to CEI by Observation Manager.
- The Action Manager parses the received situation event and selects an appropriate action by looking in the Action Catalog.
- Finally, the Action Manager invokes an action service such as alert, e-mail, or web service invocation.

Alerts can also be sent to SMS and pager destinations, however, this is also triggered by e-mail (JavaMail™ to an SMTP server). WebSphere Everyplace Connection Manager is not used for text messaging in V6.



WebSphere Business Modeler is a tool which supports modeling various aspects of your business, including process, organization and simulations. The Business Measures Editor (BME) is a WebSphere Business Modeler component that extends the modeler functionality to allow specification of a business measures model that describes the Business Performance Management (BPM) aspects of a business model. The BME provides an easy to use modeling tool for events, business metrics, and situations required for real-time business monitoring and control.

## Summary

- This presentation reviewed the architecture of WebSphere Business Monitor V6

In summary, this presentation outlined the architecture of WebSphere Business Monitor V6.

## Trademarks, Copyrights, and Disclaimers

The following terms are trademarks or registered trademarks of International Business Machines Corporation in the United States, other countries, or both:

IBM	CICS	IMS	MQSeries	Tivoli
IBM (logo)	Cloudscape	Informix	OS/390	WebSphere
e(logo)/business	DB2	iSeries	OS/400	xSeries
AIX	DB2 Universal Database	Lotus	pSeries	zSeries

Java and all Java-based trademarks are trademarks of Sun Microsystems, Inc. in the United States, other countries, or both.

Microsoft, Windows, Windows NT, and the Windows logo are registered trademarks of Microsoft Corporation in the United States, other countries, or both.

Intel, ActionMedia, LANDesk, MMX, Pentium and ProShare are trademarks of Intel Corporation in the United States, other countries, or both.

UNIX is a registered trademark of The Open Group in the United States and other countries.

Linux is a registered trademark of Linus Torvalds.

Other company, product and service names may be trademarks or service marks of others.

Product data has been reviewed for accuracy as of the date of initial publication. Product data is subject to change without notice. This document could include technical inaccuracies or typographical errors. IBM may make improvements and/or changes in the product(s) and/or program(s) described herein at any time without notice. Any statements regarding IBM's future direction and intent are subject to change or withdrawal without notice, and represent goals and objectives only. References in this document to IBM products, programs, or services does not imply that IBM intends to make such products, programs or services available in all countries in which IBM operates or does business. Any reference to an IBM Program Product in this document is not intended to state or imply that only that program product may be used. Any functionally equivalent program, that does not infringe IBM's intellectual property rights, may be used instead.

Information is provided "AS IS" without warranty of any kind. THE INFORMATION PROVIDED IN THIS DOCUMENT IS DISTRIBUTED "AS IS" WITHOUT ANY WARRANTY, EITHER EXPRESS OR IMPLIED. IBM EXPRESSLY DISCLAIMS ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NONINFRINGEMENT. IBM shall have no responsibility to update this information. IBM products are warranted, if at all, according to the terms and conditions of the agreements (e.g., IBM Customer Agreement, Statement of Limited Warranty, International Program License Agreement, etc.) under which they are provided. Information concerning non-IBM products was obtained from the suppliers of those products, their published announcements or other publicly available sources. IBM has not tested those products in connection with this publication and cannot confirm the accuracy of performance, compatibility or any other claims related to non-IBM products. IBM makes no representations or warranties, express or implied, regarding non-IBM products and services.

The provision of the information contained herein is not intended to, and does not, grant any right or license under any IBM patents or copyrights. Inquiries regarding patent or copyright licenses should be made, in writing, to:

IBM Director of Licensing  
IBM Corporation  
North Castle Drive  
Armonk, NY 10504-1785  
U.S.A.

Performance is based on measurements and projections using standard IBM benchmarks in a controlled environment. All customer examples described are presented as illustrations of how those customers have used IBM products and the results they may have achieved. The actual throughput or performance that any user will experience will vary depending upon considerations such as the amount of multiprogramming in the user's job stream, the I/O configuration, the storage configuration, and the workload processed. Therefore, no assurance can be given that an individual user will achieve throughput or performance improvements equivalent to the ratios stated here.

© Copyright International Business Machines Corporation 2005,2006. All rights reserved.

Note to U.S. Government Users - Documentation related to restricted rights-Use, duplication or disclosure is subject to restrictions set forth in GSA ADP Schedule Contract and IBM Corp.