



IBM Software Group

# WebSphere Business Monitor V6.1

## *Database*



@business on demand.

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This presentation introduces the database support in WebSphere Business Monitor Version 6.1.

## Goals

- Introduce WebSphere Business Monitor V6.1 database and data services



This presentation should give you a good understanding of the database and data services in WebSphere Business Monitor version 6.1.

## Agenda

- Schema generator
- Data movement services (DMS)
- Tables and views
- Representational state transfer (REST) services



In this presentation you will see the schema generator, data movement services, database tables and views, and the REST services.

## Schema generator

- Generates all model/version specific tables/views used by monitor components
- State and datamart tables stored in single database (MONITOR)
- Change management handled by defining new tables/views for each version
  - ▶ New views/tables for every version, old views left in place
  - ▶ Union view aggregates data across versions, redefined with each new version



The schema generator is the Monitor component that creates the tables and views that are required for each model version. In 6.1 the state and datamart tables have been merged into a single database called 'Monitor'. But the tables are still distinct so you have the performance advantage where Monitor server can access the operational tables and the dashboards can access the reporting tables.

When new model versions are deployed, new tables and views are created for each version. In 6.1 new views and tables are created for each new version, plus there is an aggregate view which shows data across all versions, so this is redefined for every new version.

## Schema generator

- Schema generator will generate SQL for
  - ▶ Derby
  - ▶ DB2®
  - ▶ DB2 z/OS®
  - ▶ Oracle
- SQL is saved with the monitor model EAR



The schema generator can generate SQL for the supported databases, which is saved with the EAR file. When you generate the EAR, the SQL for all the databases is generated, but when the model is deployed, Monitor knows which the installed database is and so it runs the appropriate script for that database.

## Data movement services

- DB2 Replication Manager eliminated
- New ETL (extract, transform, load) based on custom stored procedures
  - ▶ Invoked by a service at user defined intervals
  - ▶ Allows support for other databases such as Oracle, but not Derby which does not support stored procedures
- DDL to define datamart tables and ETL to populate datamart tables - generated with EAR
- DMS is optional. When DMS is not enabled, Monitor provides real-time Dashboard reporting based on data in the operational tables
- DMS can be enabled at any time after model deployment. All monitored data is copied, even data created during disabled period.
- ETL operates on a per version basis, so one ETL service per model version (each populates one set of model datamart tables)



In 6.1 the DB2 replication manager is no longer used. Now there are stored procedures which perform the extract, transformation and loading of the operational data into the reporting tables. This change allows support for additional databases other than DB2. Note that DMS is not supported for Derby which does not support stored procedures.

All the DMS artifacts are generated and stored with the EAR at the time you generate the J2EE projects for the monitor model. Since DMS is optional, you can determine whether you need the performance advantages of DMS. If you do not use it, the dashboards use data from the operational tables rather than the reporting tables. You can choose to enable DMS later, even if you don't enable it initially. When you enable it, all monitored data is copied to the reporting tables, even data which was created during the time period when DMS was disabled. If you do use DMS, then there is a separate service which is started for each model version, and each populates a different set of reporting tables.

## Schema generator – table/view definitions

- Per model
  - ▶ Event fragment table – stores in-progress events used by moderator;  
CONSUMED\_EVENT\_T
- Per model/Version
  - ▶ Monitoring context (MC) table (MCT) – Server persistency store for instance data
  - ▶ MC view (MCV) – Instance data view used for REST services and dashboard reporting. Minor data manipulation between MCT and MCV, for example stopwatch values are calculated. Serves as basis for cube fact table as well.
  - ▶ Dim view (DIM) – dimension views used to create star schema based on views
  - ▶ All instances table (TGT) – target of the DMS data copy, used by REST services and dashboards
- Per model, cross-version
  - ▶ Cross-version union view (MCU) – Instance/Fact view, created by unioning each of the version specific Instance/Fact views. Supports cross-version for dashboard reporting, KPI queries, and cube definition
  - ▶ Cross-version dimension views (DIU) – Dimension views for cross-version cube definition
- Number of metrics limited by maximum length of row in database (32k for DB2)
  - ▶ Create additional monitoring contexts to solve the problem
  - ▶ KPIs are unlimited



This chart shows the table and view definitions created by the schema generator. There is a set of tables whose schema changes for each new version. There are also views created for each new version for access by REST services and the dashboards. There are additional views which are used for performance reasons when querying against all versions.

Like the previous release, there are tables which are restricted based on the maximum length of a row in the database. You can get around the problem by creating additional monitoring contexts. KPI's do not have a limit.

## REST services

- Defined set of APIs which will be exposed publicly and used by dashboards
  - ▶ Metadata retrieval including KPIs
  - ▶ KPI update APIs
  - ▶ MC Instance data retrieval
  - ▶ KPI value retrieval
- High level (public) – REST Service wrappers invoked by dashboard or end-users doing custom reporting



The REST services are exposed as a set of URIs which is used by the dashboard for reporting purposes. You can also perform custom reporting using the same URIs. You can access metadata and instance data for the KPI contexts and monitoring contexts in a model.



## REST URIs provided by data services

- /models
- /models/{model\_id}
- /models/{model\_id}/versions/{version\_id}
- /models/{model\_id}/mcs
- /models/{model\_id}/mcs/{mcsid}
- /models/{model\_id}/versions/{version\_id}/mcs
- /models/{model\_id}/versions/{version\_id}/mcs/{mcs\_id}
- /models/{model\_id}/versions/{version\_id}/mcs/{mcs\_id}/diagram
- /models/{model\_id}/mcs/{mcs\_id}/metrics
- /models/{model\_id}/versions/{version\_id}/mcs/{mcs\_id}/metrics
- /models/{model\_id}/mcs/{mcs\_id}/instances
- /models/{model\_id}/mcs/{mcs\_id}/instances/{instance\_id}
- /models/{model\_id}/versions/{version\_id}/mcs/{mcs\_id}/instances
- /models/{model\_id}/versions/{version\_id}/mcs/{mcs\_id}/instances/{instance\_id}
- /models/{model\_id}/mcs/{mcs\_id}/instances/{instance\_id}/diagram
- /models/{model\_id}/versions/{version\_id}/kcs
- /models/{model\_id}/versions/{version\_id}/kpis
- /models/{model\_id}/versions/{version\_id}/kpis/value/{kpi\_id} (GET)
- /models/{model\_id}/versions/{version\_id}/kpis/conf/{kpi\_id} (GET, PUT, DELETE)
- /models/{model\_id}/versions/{version\_id}/kpis/conf (POST)
- /models/{model\_id}/versions/{version\_id}/kcs/{kcs\_id}/diagram
- /models/{model\_id}/exportvalues
- /models/{model\_id}/versions/{version\_id}/udfs
- /kpiicons

This is a list of the URIs which represents the REST services provided by Monitor. As you can see in this list you have access to model instance data and metadata in a variety of ways. You can retrieve data by model ID, by model/version, by monitoring context ID, by instance ID, by KPI ID, and other ways.

## Summary

- You reviewed the database data services support for WebSphere Business Monitor V6.1

In this presentation you have reviewed the database and data services support for WebSphere Business Monitor version 6.1.

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