PERFORMANCE-DATA REPORTING IN SAP NetWeaver® BUSINESS INTELLIGENCE

SAP Provides a Cost-Effective Solution for Performance Reporting

Among a wide range of other functions, the SAP NetWeaver® Business Intelligence component collects, stores, and aggregates performance data. Companies can use this data for landscape-wide technical analysis and reporting, which can help to increase efficiency and reduce the total cost of operations.

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Companies rely on IT departments and hosting service providers to comply with predetermined service levels. To ensure that companies accomplish their goals, they have to use historical data for long-term, service-level reporting. To analyze performance, companies use short-term correlated performance overviews with ability to drill down to detailed information.

Increasingly, companies look to their IT groups and hosting service providers to reduce the cost of obtaining data, and to improve their methods of managing and analyzing large quantities of information. Better management and analysis of data means greater efficiency, productivity, reporting, preventive forecasting, and communications throughout an enterprise. As a result, managers can improve their decision making.

With the SAP NetWeaver® Business Intelligence (SAP NetWeaver BI) component, your company can utilize its integrated functionalities for performance and availability reporting with either a short- or long-term scope. After you have configured SAP NetWeaver BI and designed your reports, the resulting performance analysis and reporting will reduce your total cost of operations and increase your efficiency.

High-Level Reporting with Integrated Functionalities

Performance analysis and reporting using SAP NetWeaver BI provide the following integrated functionalities:

- High-level reporting on performance-history data that proves predetermined service levels have been achieved (for example, for response times and system availability)
- Trend analyses that tell you when problems from changes in performance values (for example, the growth of a database) are about to occur so you can take preventive measures
- Performance analysis with correlated views that determine the root cause of a problem – such as poor dialogue response time or high CPU utilization – so you can correct it

Central Monitoring of SAP® System Landscapes

The monitoring infrastructure of the SAP NetWeaver platform lets administrators monitor SAP® system landscapes from a central monitoring system. This infrastructure is widely known as the computing center management system (CCMS). The CCMS infrastructure is open and allows you to monitor almost any object. Performance data, availability data, and other vital monitoring information are stored in the shared memory segments of monitored components for a maximum of 24 hours. In the central monitoring system, monitors provide central views on such local data.

Performance data typically includes information on the following:

- Availability of systems or application servers
- Dialogue response times
- Efficiency of buffers
- Utilization of CPUs

In addition, workload statistics data can also be used to analyze performance bottlenecks.

Collection of Reporting Data

With SAP NetWeaver BI, data that is required for landscape-wide reporting comes from the following different sources:

- Performance data from the central performance history
- Workload statistics data from monitored systems
- Data from the SAP EarlyWatch® Alert service (collected by the SAP Solution Manager application management solution)

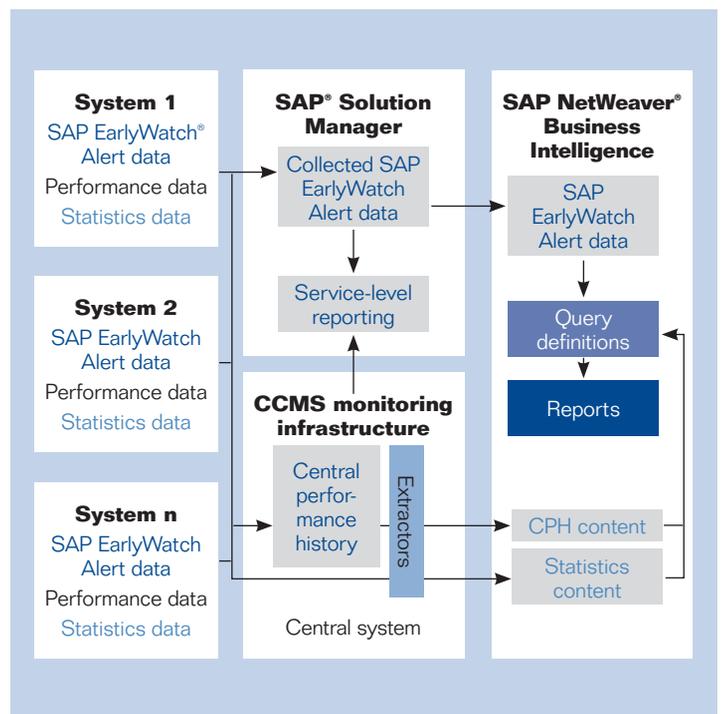Figure 1 illustrates the extraction of data from these three sources and its transfer to SAP NetWeaver BI.

Figure 1: Extraction of Data from the Three Sources

The Central Performance History

The CCMS infrastructure includes the central performance history (CPH), a functionality that allows you to store selected performance data from monitored components in the database of the central monitoring system. Then you can transfer stored performance data to SAP NetWeaver BI for high-level reporting.

With the CPH, you can store data for long periods, which you define according to your reporting needs. Storage is limited only by disk capacity. For example, you may want to aggregate 15-minute averages to hourly averages for a particular period. If this period were 10 days, you could carry out the aggregation and create the higher-level hourly averages for that period. At that point, you can discard the 15-minute averages created during the 10-day period.

The central performance history provides the following features:
- A central site for collecting and permanently storing selected performance data
- Data resolutions covering periods from one minute to one day
- Data consolidation and reorganization
- Accessibility from your alert monitors

Statistics Extraction from Monitored Systems

Workload statistics data is automatically written whenever a business action is completed (for example, a dialogue step). These statistics are collected from monitored satellite systems by an "extractor" in the central monitoring system. The extractor uses existing connections to monitored systems. The extractor then creates aggregations and transfers the aggregated data to SAP NetWeaver BI. The standard aggregation level is hourly. It is not necessary to install extractors in the satellite systems.

SAP Solution Manager

SAP EarlyWatch Alert data, collected by SAP Solution Manager, is also transferred to SAP NetWeaver BI. SAP EarlyWatch Alert – included as part of your standard maintenance contract with SAP – is a preventive service designed to help you take action before potential problems lead to actual downtime.

Data Transfer to SAP NetWeaver BI

Initially, all of the performance data from the CPH and all of the statistics data from the satellite systems are extracted to SAP NetWeaver BI. Since the retention period and resolution of selected performance values are also copied from CPH to SAP NetWeaver BI, you can establish settings for the data and resolution, as well as the for period that data is stored in the central monitoring system. New data is transferred to SAP NetWeaver BI in regular, definable intervals.

Data Storage in InfoCubes

CPH performance data and workload statistics data are stored in SAP NetWeaver BI in multidimensional data containers called "InfoCubes." Various InfoCubes can be combined into groups, called "MultiProviders." Query definitions are predefined for one or more InfoCubes.

A set of InfoCubes is available as the following CCMS-specific content:
- CPH content
- Statistics content

Central Performance History Content

InfoCubes containing the CPH data are organized according to the resolution of performance values. This distribution of data into different InfoCubes leads to better performance when data is requested in SAP NetWeaver BI. For most queries, data in only one resolution is requested, which means that there is less data to read through.

InfoCubes store the performance data obtained from the CPH as aggregated metrics for intervals of 1 minute, 15 minutes, 1 hour, and 1 day. InfoCubes are also available for online data in every resolution that can be obtained by direct request from the monitored components.

Statistics Content

In SAP NetWeaver BI, workload statistics extracted from the satellite systems are stored as aggregated data. The statistics content in SAP NetWeaver BI is based on the analysis views of the workload monitor, such as time profiles and hit lists. By default, the finest

granularity is hourly resolution. The lifetime of aggregates in SAP NetWeaver BI is determined by preconfigured, changeable settings.

A set of InfoCubes contains, for example, the following aggregated data:

- Time profile (temporal distribution of transaction steps over a day)
- Transaction and user profile (which transactions and users generate what kind of workload)
- Hit lists of top dialogue-step response time and database access (steps with longest response time)
- System load overview (for example, CPU time, number of database changes, and response times)

Automatic Configuration

As a prerequisite, monitored systems must be registered in the central monitoring system. You can then perform the integration of the source system (central monitoring system) and the target system (SAP NetWeaver BI) automatically by using a configuration tool in SAP NetWeaver BI . The tool performs most of the configuration steps required for the data transfer. Note that one system can be used as both source and target systems. This minimizes the total cost of operations.

Source System (Central Monitoring System)

The CPH is configured in the central monitoring system, which means that a standard set of assignments is made for a selection of key metrics, such as availability information and CPU utilization.

Target System (SAP NetWeaver BI)

Except for the source system definition, the configuration tool performs most of the following steps in SAP NetWeaver BI:

- Activation of relevant content
- Creation of process chains containing all the data-loading steps

The first-time population of predefined SAP NetWeaver BI Info-Cubes must be triggered manually (you must then specify a repetition period for the loading of the data, which is controlled by the process chains).

Prerequisites

The source and target systems must meet the following additional prerequisites:

- Central monitoring system on the release 7.0 of SAP NetWeaver with plug-in PI_BASIS 2005_1_700 (or higher)
- SAP NetWeaver BI on release 7.0 of SAP NetWeaver with SAP NetWeaver BI Content release 7.03 add-on
  Administrator expertise is required in the following areas:
  - SAP monitoring infrastructure
  - SAP NetWeaver BI administration, analysis, and reporting

Data Management

After you complete the configuration steps, you must transfer data from the source system to SAP NetWeaver BI, where it is stored in InfoCubes. You can perform queries and generate performance reports based on the data in the InfoCubes. SAP NetWeaver BI is used only for reporting and data output. Performance data is regularly reorganized in both the source and target systems.

Reporting

The SAP software includes a set of predefined query definitions, which provide the key performance indicators derived from the CPH and from the workload statistics of the monitored satellite systems. The software includes, for example, the following predefined query definitions:

- Availability of systems and instances
- CPU utilization
- Dialogue response time
- Dialogue response time distribution
- File system free space
- File system percentage used
- Free memory
- Swap-free space
- Users by client
- Workload time profile

You can create query definitions with the SAP query designer – an application that is part of the SAP Business Explorer tool set (an SAPGUI add-on). The query definitions provide the data for reports, which are based on templates.

Figure 2 illustrates how the preconfigured business content of SAP NetWeaver BI includes a number of query definitions for performance and statistical data for your reference. The query definitions are then used to provide data in reports.
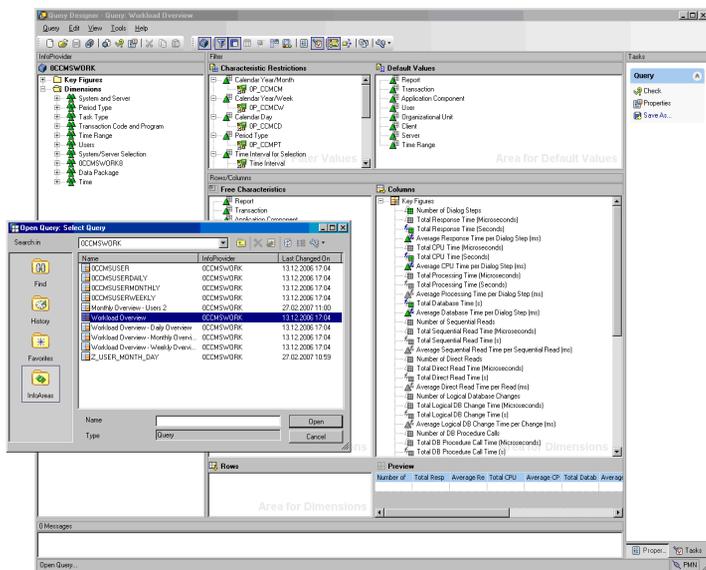

Figure 2: Sample Query Definitions for Performance and Statistical Data in the Query Designer Tool

You can also create your own query definitions that are customized for your reporting needs. Query definitions are the data providers for reports. Reports are based on templates that contain query definitions.

You create report templates with the Web application designer tool in the SAP Business Explorer tool set. For simple performance reports, you can also use the SAP NetWeaver Visual Composer tool.

Figure 3 shows you how you can publish reports in the SAP NetWeaver Portal component.
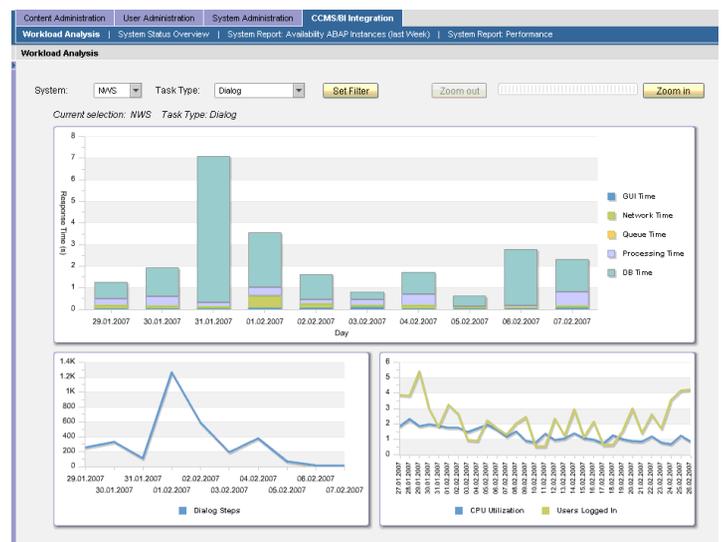

Figure 3: Performance Report from the SAP NetWeaver® Portal

Alternatively, you can use the broadcasting functionality within the Web application designer tool to distribute reports in definable periods, as shown in Figure 4.
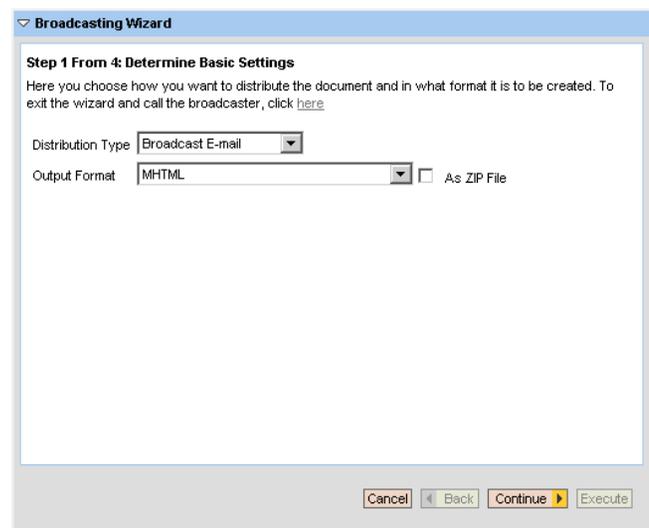

Figure 4: Broadcasting Functionality in the Web Application Designer Tool

Data Reorganization

To ensure that the quantity of data does not grow indefinitely, the data in the CPH and the corresponding data in SAP NetWeaver BI is automatically reorganized at regular intervals.

Business Benefits

SAP NetWeaver BI provides the following benefits for reporting and analysis of collected performance data and workload statistics:

- Lower total operating costs for performance reporting
- Improved productivity due to efficient management of large quantities of data
- Better decision making due to the following reasons:
  - Improved data analysis from correlation of different, independent data sources (for example, CCMS, the SAP Customer Relationship Management application, and the SAP ERP Financials solution)
  - Accurate, useful forecasting data
  - High-level analysis and reporting
- Better communication due to flexible, customized reports and personalized Web reporting in the SAP NetWeaver Portal component
- Improved efficiency due to the linking of reports for drill-down analyses

Further Information

To learn more about how SAP can help your company manage performance data and organize it effectively, call your SAP representative today or visit us on the Web at www.sdn.sap.com.

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