IBM Software Group

SAP integration workshop

SAP BW integration options

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The SAP business warehouse integration options presentation is part of the SAP integration workshop. This presentation will give you a introduction to the different possibilities for integrating SAP business warehouse data into your WebSphere® Portal environment.

Agenda

- SAP BW introduction
- Interfaces to SAP BW
- Solution
  - Web front end
  - OLE DB for OLAP
  - OLAP BAPIs (Business application programming interfaces)
  - XML for analysis
  - Java SDK
- Summary

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This presentation starts with a short introduction to the SAP BW system. Then it will cover the different integration interfaces that will be used for the different integration solutions.

SAP BW introduction

- Data warehousing
  - A data warehouse is the main repository of the organization's historical data, its corporate memory. For example, an organization would use the information that is stored in its data warehouse to find out what day of the week they sold the most widgets in May 1992, or how employee sick leave the week before Christmas differed between California and Quebec from 2001-2005.
  - In other words, the data warehouse contains the raw material for management's decision support system.
- Data mart

The SAP business warehouse is an implementation of a data warehouse or data mart solution from SAP. A data warehouse is a place to store huge amounts of data. The data is mostly customer related, and it is collected so as to have historical data available for further evaluations.

With that possibility, companies try to find significant changes in their business and make the most profit out of this.
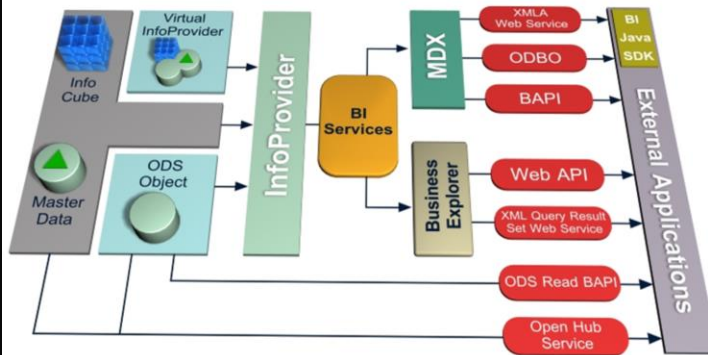
SAP BW introduction

- Data warehousing
- Data mart
  - A data mart is a specialized version of a data warehouse. Like data warehouses, data marts contain a snapshot of operational data that helps business people to strategize based on analyses of past trends and experiences.
  - The key difference is that the creation of a data mart is predicated on a specific, predefined need for a certain grouping and configuration of select data. A data mart configuration emphasizes easy access to relevant information.

A data mart is very similar to a data warehouse, but with a more specific focus for a certain reason.

Through the easy access to relevant information, an investigation process in a data mart is faster and more accurate than an research in a data warehouse.

There are different interfaces to an SAP BW system, depending on the level of access and type of the interface.
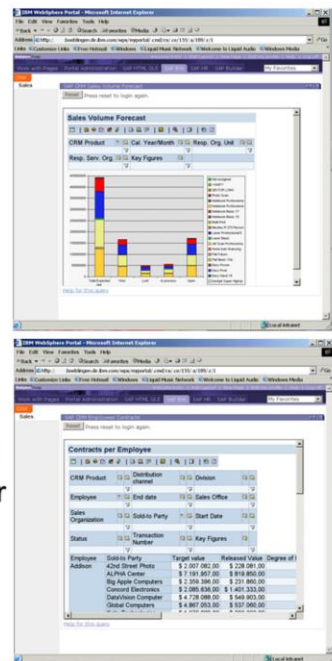
If you are running an SAP business warehouse system, you have a Web front-end for free. This front end can be easily integrated in the WebSphere environment. Single sign-on can leverage the credential vault to retrieve user ID and password.

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Solution - OLE DB for OLAP

- Like any other BW system also the SAP BW can be used as database only, which is not recommended.

- Client based data query

- Allowed
  - ▶ Schema Information
  - ▶ Query Definition
  - ▶ Get cell content of the dataset
  - ▶ Supported by approximately 40 vendors

- OLAP services uses OLE DB for OLAP as a standard interface

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OLE D.B. is a standard that is supported by approximately 40 vendors. It was created to access any database to retrieve the cell content of the data query. Because SAP, in the background, is also a database, this mechanism is technically valid but not recommended by SAP.

Solution - OLAP BAPIs

- Application level integration using BAPI
- Business object : **MDDataProviderBW**
  - Query meta data
- OLAP business objects - **MDDataSetBW** (BUS6111)
  - Represents a multidimensional record set with transaction data of the business warehouse
  - Allows you to set and run an MDX statement
  - Gives access to the results of the MDX statement

SAP provides a special business API to send an MDX statement to the system and retrieve the corresponding answer.

For this integration, you need SAP JCo and some Java code to send the MDX statement to the target SAP system.

Solution - OLAP BAPIs

Browse BW Meta- and Masterdata

Business Object : MDDataProviderBW

- GetCatalogs   (catalog = InfoCube)
- GetCubes   (cube = query "InfoCube/Query")
- GetDimensions   (characteristics)
- GetHierarchies
- GetLevels
- GetMeasures   (for example: units, $,…)
- GetMembers
- GetProperties
- GetVariables

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Here is a more detailed list of the OLAP BAPI as a reference. You can find them if you browse the business warehouse BAPI directory.

Solution - OLAP BAPIs

Run multidimensional result sets and fetch data

Business object : MDDataSetBW

- CreateObject (creates an object with MDX Command)
- CheckSyntax (checks the syntax of the MDX Command)
- SelectData (runs MDX command and provides return dataset)
- DeleteObject
- FindCell
- FindTuple
- GetAxisInfo
- GetAxisData
- GetCellData

Here are some additional functions to manipulate objects and retrieve data using an MDX statement.

Solution - XML for analysis

- Application level integration through HTTP or HTTPS

- Web services in XMLA ("XML for Analysis")

- Embedded MDX statements

- Offers two execution modes:
  - ▶ Discover - to query meta data
  - ▶ Execute - to process MDX statements

- XSL processor can be used to transform and render
  retrieved MDX result sets

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If you do not want to use JCo or a BAPI connection at all, you can use the same MDX statement with a Web service call to retrieve the valid response.

But for both methods, you have to care about the representation of the data you retrieve from SAP

MDX example

- MDX stands for multidimensional expression
  - Expression syntax for querying datasets
- Parts of MDX statements
  - FROM clause -> selects a cube
  - SELECT clause -> defines the axes
  - WHERE clause -> defines a slice

SELECT

  CROSSJOIN({City.Berlin,City.Stuttgart}, {Quarters.MEMBERS})

  ON COLUMNS,

  {COST,SoldPieces,Revenue} ON ROWS

FROM CUSTOMER_ANALYSIS

WHERE (Country.Germany,ValueType.Actual)

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Here is a short MDX example. The "from" clause selects the cube. "Select" defines the axes, and "where" defines the slice.

To illustrate the Web service integration, you see here the SOAP Request with the MDX statement included. The SOAP Response includes all the response data, and an XSL is used to show an HTML representation of the data.

The same process can be used in the WebSphere Portlet Factory together with a charting option to generate automatically graphical representation out of the SAP B.W. data.

Solution – Java SDK

- With the newest SAP version a new JAVA connectivity in SAP NetWeaver is provided.

- Leverage the SAP WebAS connectivity for SAP BW

- No data physically stored in BW

- JDBC connect with provider driver

- Use UDConnect for an universal data connect.

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Since the introduction of the SAP NetWeaver stack there is a new Java based connectivity. This can also be used to access the information.

As you have seen there are multiple options to connect to SAP business warehouse systems. It would be the best if your customers explain their situations and you can suggest the most valuable solution to meet their needs.

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