Questions and Answers: SAP BusinessObjects BI 4.0 and the Semantic Layer for SAP Netweaver BW

Applies to:

SAP Business Objects BI 4.0, with the latest tools that access SAP Netweaver BW, BEx queries using BI consumer services (BICS). The release includes both universe design tool and the new metadata modeling tool called, information design tool. For more information, visit the [Business Objects homepage](#).

Summary

This document summarizes frequent questions for SAP Netweaver ® Business Warehouse on SAP BusinessObjects BI Solutions, especially on the capabilities of the new semantic layer with SAP BusinessObjects BI 4.0. It is meant to complement the SAP Business Objects product documentation that is delivered at release.

We welcome your feedback, comments and additional questions.

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Authors Bio

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Purpose

The purpose of this document is to provide brief answers to common questions surrounding SAP Netweaver BW access in SAP BusinessObjectsEnterprise BI 4.0 and more generally, supported features of OLAP databases.

This document does not replace the *Information Design Tool User Guide* released with the product and available on the [SAP Help Portal](#). It explains the semantic layer positioning and strategy within the overall SAP portfolio.

General Questions

What is the semantic layer?

The semantic layer is an abstraction layer between the database and the business user that frees the business user from the complexity of the data structures and technical names. It enables business users to access, interact, and analyze their data regardless of the underlying data sources and their schemas.

The semantic layer encompasses the following elements: universes, query generation, calculator, local cache (that is, a microcube), query panel, and database connectivity parameters.

What is a universe?

The **information design tool** is an SAP BusinessObjects metadata design environment that enables a designer to extract, define, and manipulate metadata from relational and OLAP sources to create and deploy SAP BusinessObjects universes.

A universe is an organized collection of metadata objects that enable business users to analyze and report on corporate data in a non-technical language. These objects include dimensions, measures, hierarchies, attributes, pre-defined calculations, functions, and queries. The metadata object layer, called the business layer, is built on a relational database schema or an OLAP cube, so the objects map directly to the database structures via SQL or MDX expressions. A universe includes connections identifying the data sources so queries can be run on the data. The role of the universe is to provide the business user with semantically understandable business objects, such as, Customer, Country, Quarter, Revenue, or Margin. The user is then free to analyze data and create reports using the business objects that are relevant to their needs without requiring knowledge of the underlying data sources and structures.

There are two types of universe: multi-source enabled relational universes, and dimensional universes.

The Semantic Layer provides:

- Access to all the major relational sources with multi-source enabled relational universes

- Support for SAP Netweaver BW 7.0.1:

  o with multi-source enabled relational universes

  o with direct access to BEx Queries (no universe)

- Support for OLAP sources — Microsoft Analysis Services 2005 and 2008 with dimensional universes

- General access capabilities via open database connectivity (ODBC)

In summary, the semantic layer and universes:

- Facilitate access to information to make it easier to answer business questions

- Increase the range of information accessible to business users

- Provide a single user experience for metadata management no matter which access method is used, thus reducing training costs and lowering TCO.

- Reduce maintenance by providing one optimized source of data and metadata for multiple reports

- Maintain IT control of who accesses the data and provides trusted information

How do I create a universe?

With BI 4.0, both types of universes are generated using the new tool called the information design tool, an SAP BusinessObjects metadata design environment. For one of the universe types, you don't even need to create it thanks to the direct access to BEx queries using BICS. The universe is created automatically on the BEx query to render it consumable by the analysis and reporting tools in the SAP BusinessObjects portfolio. The second type – the multi-source enabled relational universe - is created by following a four-step workflow (connection, data foundation, business layer and publication) in the information design tool.

What are the main benefits of the semantic layer from an IT perspective?

The common semantic layer provides a:

Single point of administration for all data sources

- Reduces the cost of delivering BI by leveraging existing IT investments in data

- Reduces, postpones or eliminates ETL development cycles

- Extends and leverage existing BI platform security model

- Promotes schema neutrality—does not impose any ETL or data warehousing

- Provides multi-source universes for relational sources

Common semantic for all

- Uses and shares the same concepts and vocabulary independently of the sources and users

- Provides consistent modeling workflows and capabilities for all data sources

Trusted and secure environment

- Provides data lineage traceable from end-user reports

- Supports and extends database security

- Extends from development to production cycle

Design environment to empower users and reduce IT bottlenecks

- Increases user self-sufficiency and reduce IT bottleneck

- Provides predefined and reusable queries, parameters, filters, calculations, list of values etc

What are the main benefits of universes from a user perspective?

Consistent user experience

- Provides same user experience that is independent of the source

- Exposes business terminology that is relevant to business users' needs (easy to evolve as needs change)

- Reduces costs for training across departments and data domains

Trusted and secure environment

- Provides the users with confidence that they always access trusted information—data lineage

- Secures the data, the documents, the queries, the parameters, etc.

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Autonomous users

- Presents users with user-friendly business terms

- Enables users to create and change reports without involving IT

- Makes informed real-time decisions possible with up-to-date data

- Increases productivity by publishing re-usable queries, calculations, parameters, filters, list of values, etc.

What are the ways I can access SAP Netweaver Business Warehouse?

The recommended method to access SAP Netweaver BW is:

- Direct access to SAP Business Explorer (SAP BEx) queries from one of the SAP BusinessObjects BI Solutions client tools using BI consumer services (BICS).

Another access method is:

- A SAP Netweaver BW 7.0.1multi-source enabled relational universe (MSU) on one of the following InfoProviders:

    o Infocubes

    o Multicubes

    o Virtual Cubes

    o DataStore Objects

Do I need to continue to create universes on SAP BEx queries?

No, you do not need to build a universe to access SAP Netweaver BW. Prior to BI 4.0, the only way to access SAP Netweaver BW was by creating an OLAP universe that in effect flattened the OLAP cube structure into a set of tables. With BI 4.0, you can now directly access SAP Netweaver BW by selecting an existing SAP BEx query from a catalog of SAP BEx queries and then perform advanced data analysis and hierarchical member selection within the SAP BusinessObjects query and analysis tools such as SAP Business Objects Web Intelligence, SAP Crystal Reports Enterprise and SAP BusinessObjects Dashboards. The access method is not SQL or MDX, but SAP's BICS interface.

Are there differences between multi-source enabled relational universes on SAP Netweaver BW Infoproviders and direct access for SAP BEx queries via BICS?

Yes, one main difference is that direct access for SAP BEx queries via BICS enables the dimensional discovery of metadata. That is, dimension hierarchies from the cube are maintained, while multi-source enabled relational universes do not. Multi-source enabled relational universes, however, are generated and persisted on the SAP BusinessObjects repository for SAP Netweaver BW 7.0.1 Infoproviders. Direct access to SAP BEx generates an equivalent, temporary, universe-structure automatically on the fly, but they are not persisted and therefore cannot be shared or reused. Note that multi-source enabled relational universes need to be synchronized with any Infoprovider changes.

Universe metadata can be reorganized and renamed. Designers can extend the Infoprovider by adding calculated/restricted key figures, variables, pre-defined filters, etc.

Do I need to continue to invest in SAP BEx queries?

For customers who have already invested heavily in SAP BEx queries, SAP recommends using direct access on SAP BEx queries (no need for universes).

For new customers or new projects, SAP's suggestion is to evaluate both SAP BEx query and multi-source enabled universe solutions based on the business needs and IT constraints.

What are the client tools that can consume SAP BW relational universes?

Multi-source enabled relational universes (based on SAP Netweaver BW 7.0.1, InfoProviders, MultiProviders, VirtualProviders, DSOs and InfoObjects) can be consumed by SAP BusinessObjects Web Intelligence (the applet, HTML, and the Rich Client), SAP Crystal Reports Enterprise, and SAP BusinessObjects Dashboards.

What are the client tools that can consume BEx queries?

BEx queries can be consumed directly by SAP BusinessObjects Web Intelligence (the applet, HTML, and the Rich Client), and SAP Crystal Reports Enterprise thanks to the Semantic Layer.

SAP BusinessObjects Dashboards, Analysis for Office and OLAP Analysis also provide a direct access to BEx queries with BICS.

Can I reuse OLAP universes that were created with SAP BusinessObjects Enterprise XI 3.x?

Yes. OLAP universes created with BusinessObjects Enterprise XI 3.x will continue to work in BI 4.0 and Web Intelligence 4.0 users can continue to use those OLAP universes. However OLAP universes can only be edited using the universe design tool, not the new information design tool. Use the upgrade management tool to move OLAP universes (as you would any universe) from a 3.x repository to the 4.0 repository.

However, in order to take advantage of the new BI 4.0 semantic layer and its multi-dimensional capabilities you need to open each Web Intelligence document based on OLAP universes and then change the source to map it onto a BEx query.

Which SAP BusinessObjects BI Solutions 4.0 clients are compatible with which universe file types?

The table below summarizes which SAP BusinessObjects BI clients are compatible with which file types:

SAP BusinessObjects BI Solutions 4.0 Clients → File type	SAP BusinessObjects Web Intelligence (Applet, HTML, and Rich Client)	SAP Crystal Reports 2011	SAP Crystal Reports Enterprise	SAP BusinessObjects Dashboards	SAP BusinessObjects Explorer
SAP BEx query via BICS (no universe)	YES ✔	NO ✖	YES ✔	YES ✔	NO ✖
BI 4.0 UNX (multi-source enabled relational universe)	YES ✔	NO ✖	YES ✔	YES ✔	YES ✔
XI 3.1 UNV (OLAP universe)	YES ✔	NO ✖	NO ✖	YES ✔ via QAAWS	NO ✖
XI 3.1 UNV (relational universe)	YES ✔	YES ✔	NO ✖	YES ✔ via QAAWS	NO ✖
XI 3.1 UNV (relational universe) converted to BI 4.0 UNX	YES ✔	NO ✖	YES ✔	YES ✔	YES ✔

Detailed capabilities questions

Is SAP BW's time-dependent master data available in the SAP BusinessObjects semantic layer?

Yes. Time dependencies exposed through keydate variables are available if you access SAP Netweaver BW 7.0.1, with SAP BEx queries (via the direct BICS access).

Time dependencies are not available when accessing Infoproviders directly.

Are SAP BW hierarchies supported in the semantic layer, SAP BusinessObjects Web Intelligence and SAP Crystal Reports Enterprise?

Yes, with BI 4.0 the semantic layer is fully multi-dimensional, this being one of the main objectives of the release.

Hierarchies are fully supported for SAP BEx queries which you access directly but are not yet supported by relational universes.

This means that the business intelligence clients that consume the semantic layer, for example, SAP Business Objects Web Intelligence, and SAP Crystal Reports Enterprise, gain access to multi-dimensional metadata.

Is SAP Netweaver BW data security addressed by the Semantic Layer?

SAP BI authorizations are supported with SAP BEx queries (which you access directly) and for multi-source enabled universes.

Can I reuse SAP BEx query features in multi-source enabled relational universes?

No, because the SAP BEx query features are bound to the SAP Netweaver BW technical elements. Today, the following added values do not have an exact equivalent in a relational universe:

- Restricted key figures
- Calculated key figures
- Structures
- Variables
- Conditions
- Exceptions

What SAP Netweaver BW 7.0.1 features are supported by the multi-source enabled relational universes in BI 4.0?

Please refer to the following table to understand how the metadata maps between BOE XI 3.x and BI 4.0. Note universes in BI 4.0 may only be created on certain Infoproviders.

Metadata mapping	SAP BusinessObjects Enterprise release	
	XI 3.x OLAP universe	BI 4.0 Direct access BICS
Dimension	Class 📁	Folder 📁
Characteristic	Sub-class 📁	Dimension
Hierarchy	Sub-class 📁	*Not supported*
Hierarchy level	Object	*NA*
Display attribute	Detail ◆	Attribute dimension ✳
Characteristic properties (Key, Caption, Short description, Medium description, long description)	Detail ◆	Attribute dimension ✳
Navigational attribute	Object	Dimension
Key figure <u>without</u> unit/currency	Measure (numeric)	Measure (numeric)
Key figure <u>with</u> unit/currency	Measure (numeric)	Measure (numeric)
	Property unit/currency (string)	Dimension unit/currency (string)
	Object: formatted value (string)	*NA*

What SAP Netweaver BW 7.0.1, features are supported by using BEx queries?

Please refer to the following table to understand how the metadata maps between BOE XI 3.x and BI 4.0.

Metadata mapping	SAP BusinessObjects Enterprise release	
	XI 3.x OLAP universe	BI 4.0 Direct access BICS
Dimension	Class 📁	Folder 📁
Characteristic	Sub-class 📁	Dimension
Level based Hierarchy	Sub-class 📁	Hierarchy
Parent-child Hierarchy	Sub-class 📁	Hierarchy
Hierarchy level	Object	*NA*
Display attribute	Detail ◆	Attribute dimension ✳
Characteristic properties (Key, Caption, Short description, Medium description, long description)	Detail ◆	Attribute dimension ✳
Navigational attribute	Object	Dimension

	Measure (numeric) 📊	Measure (numeric) 📊
Key figure <u>without</u> unit/currency	*NA*	Property formatted value (string) ✴
Key figure <u>with</u> unit/currency	Measure (numeric) 📊	Measure (numeric) 📊
	Property unit/currency (string) 📄	Property unit/currency (string) ✴
	Object: formatted value (string) 📄	Property formatted value (string) ✴

How do you consume SAP BEx queries?

SAP BEx queries are accessible only in direct access (BICS). One SAP BEx query connection can be shared by all clients (SAP BusinessObjects Analysis, SAP Business Objects Web Intelligence, SAP Crystal Reports 2011, SAP Business Objects Dashboards) and used for multiple SAP BEx queries.

Can you consume SAP BEx queries with SAP BusinessObjects Web Intelligence and SAP Crystal Reports Enterprise?

Yes, once the connection is created, the SAP BEx query can be selected from the client tool as if it were a universe. Of course, direct access on a SAP BEx query does not allow you to rename, modify or add metadata.

Are there restricted features in SAP Business Objects Web Intelligence while accessing BEx queries?

Yes. The query drill, or online drill feature in SAP Business Objects Web Intelligence is only available for reports created from multi-source enabled relational universes, and limited to the defined scope of the BEx query. If you want to drill outside of the initial query scope, you must modify the BEx query to select and retrieve more members and run it again. SAP Business Objects Web Intelligence also provides hierarchy navigation through fold/unfold capability for BEx queries.

Is it possible to mix relational data and SAP BW data in a single universe?

You can build a multi-source enabled universe on a relational source and an SAP BW source as long as the SAP BW source is accessed through SQL, which is a supported scenario in BI 4.0. Please refer to the question below for more details on features supported for SAP Netweaver BW multi-source enabled relational universes and BEx queries.

Can I use the translated metadata from SAP BW in universes?

It is not possible in BI 4.0 to import SAP BW translated metadata in a universe.

However it is possible to generate multiple universes (one per language) and use the XLIFF import/export capabilities in *Translation Manager* to merge the different translated metadata.

What are the key compatibility issues with SAP Netweaver BW multi-source enabled relational universes?

The table below shows which SAP Netweaver BW features in the BI 4.0 multi-source enabled relational universe are available.

Feature	Relational Universe
Overwrite connection	*NA*
Data Foundation	YES ✔
Hierarchies	NO ✖
Custom objects	YES ✔
Native filters	YES ✔
Business filters	YES ✔
Mandatory filters	YES ✔
Use Designer functions in objects or filters definition: @Prompt, @Select, @Variable, etc	YES ✔
Automatic update of universes (Life Cycle Management)	NO ✖
Mandatory prompts in universe	YES ✔
Optional prompts in universe	YES ✔
List of values	YES ✔
Hierarchical list of values	YES ✔
SQL list of values	YES ✔
Business Objects list of values	YES ✔
Static list of values	YES ✔
Object format	YES ✔
Objects restriction	YES ✔
Row level security (data restriction)	YES ✔
Perspectives	YES ✔
Calculated members	*NA*
Calculated measures	YES ✔
Named sets	*NA*
Query language	SQL

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