

Applies to:

Crystal Reports XI to 2008 and SAP BusinessObjects Enterprise XI to XI 3.x

Summary

This document discusses what is needed to take advantage of Universes using Crystal Reports. Notes are provided where changes and improvements are available in newer versions of Crystal Reports.

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Table of Contents

Introduction	4
Supported only in the Universe Designer	4
Object Properties	4
Object Qualification	4
Object List of Values	4
Object Keys.....	4
Object Format	5
Universe Properties.....	5
Universe Query Limits.....	5
SQL Generation and Flow Limits	6
Allow use of union, intersect and minus operators.....	6
List of Values.....	6
Associated to Prompt.....	6
Nested Prompts	6
SQL Context.....	7
Prompt Value Format using Database parameters	8
@Variable	8
Security Restrictions	8
Special Configurations Requirements.....	9
Query Naming.....	9
DateTime	9
Identical Prompts	10
Syntax Error with Outer Join	10
Known Issues	10
Prompt Name and Ordering.....	10
Field Names Change	11
Mapping Derived Tables	11
Adding Contexts to a Report	11
Behaviors by Design	11
Changes to Universe Prompt Objects.....	11
Combined Queries	11
Renamed Queries.....	11
Recommendations and Best Practices	11
Universe Reports and Universe CUIDs.....	11
Exporting Universe over Existing Universe	11
Linked Universes versus Included Universes.....	12
Effects of Changing Universes on a Report	12
Security Issues with Saved Data.....	12
Qualified Table Names	13
Performance Considerations.....	13
Universe Support Improvements in Crystal Reports 2008, BusinessObjects XI 3.0	13
Universe Set Location	13
Easy Access to the Query Panel.....	13
Support for Universe Create/ Edit Query Right	13

Support for New Universe Types: Stored Procedure, JDBC, JavaBean	13
Improved Support for Universe Historical Instances	13
Improved Support for Single-Level LOV Prompts	14
Support for Multilingual Universe Metadata	14
OLAP Universes.....	14
Related Content.....	15
Copyright.....	16

Introduction

A BusinessObjects Universe provides an easy-to-use interface for non-technical BusinessObjects Web Intelligence users to run queries against a database to create reports and perform data analysis.

Accessing a Universe is available through the Query Panel in Crystal Reports to build queries. You can then filter the data that the Query Panel in Crystal Reports returns.

However, there are things you need to know when using Universes as a data source in Crystal Reports. This document describes the limitations and issues you may run into. New features and improvements introduced in Crystal Reports 2008 are also listed.

Supported only in the Universe Designer

The following functionality is supported in the Universe Designer, but is not supported in the Query Panel in Crystal Reports.

Object Properties

The following Object properties are defined in the Universe Designer, but are not taken into account by the Query Panel in Crystal Reports.

Object Qualification

The Universe Designer can define an Object as a:

- dimension
- measure
- detail

These definitions are not used in reports built with the Query Panel in Crystal Reports.

From the **Advanced Object** properties tab in the Universe Designer, an object is allowed for use in a:

- sort
- condition
- result

This is not allowed in the Query Panel in Crystal Reports.

Object List of Values

The UNW universe format used by the Query Panel in Crystal Reports does not store the cached list of values, but rather, only the definition.

Therefore, when generating the SQL in the Query Panel in Crystal Reports, the list of values is always refreshed. However, the list of values is not refreshed in the Crystal Reports Designer after the SQL is generated.

Note: This behavior also occurs with a BusinessObjects Web Intelligence document and a list of values.

Object Keys

Object keys allow prompts to present a recognizable list to the user but use a different key for more efficient filtering.

For example, you could present a list of countries, but use the numeric Country ID as the key.

Country Table	
Name	Country ID
Canada	10
France	11
USA	12
China	13

Customer Table	
Name	Country ID
Bob	10
Jim	10
Stephanie	11
Claudine	12

If creating a query with the Customer object and entering “Canada” when prompted for the Country, the resulting SQL would look similar to the following:

```
'SELECT Customer.Name
WHERE Customer.country_id = 10'
```

The above SQL is more efficient than the alternatives such as the following:

```
'SELECT Customer.Name
WHERE Customer.country_id = Country.ID AND Country.Name = 'CANADA''
```

However, this feature relies on BusinessObjects Web Intelligence to handle the prompt and use the appropriate key when creating the where clause in the SQL. Since the Crystal Reports Designer handles prompts in the Query Panel in Crystal Reports, the selected prompt values are substituted into the SQL without any modification to use object keys instead.

Object Format

Object format represents the format in which the object value will be displayed within BusinessObjects Web Intelligence client modules (such as Date, number).

Only number and date formatting are done in BusinessObjects Web Intelligence. Alignment, font, border, and shading definitions are only used for full client modules.

Object format is not supported in reports generated by Crystal Reports Designer.

Universe Properties

Universe Query Limits

The following universe query limits are not supported in the Query Panel in Crystal Reports.

- Limit size of result set to
- Limit execution time
- Limit size of column of long text objects
- Warn if cost estimate exceed

SQL Generation and Flow Limits

- Only UNION is supported in combined queries
- Multiple SQL statements for each context is not supported
- Multiple SQL statements for each measure is not supported

Note: The following error message may appear if multiple SQL Statements are used: "Unexpected NULL pointer".

- Selection of multiple contexts is not allowed because multiple SQL statements would be generated which is not supported.
- The Query Panel in Crystal Reports will always allow you to generate combined queries even if the security restriction is unchecked.

Allow use of union, intersect and minus operators

If the objects selected are not compatible or there is no single context that includes both objects, BusinessObjects Web Intelligence may generate multiple SQL statements (one for each object). Then the cube in InfoView or the Full Client reporter would paste together the results.

However, the Crystal Reports Designer does not have this ability, so any query that generates multiple SQL statements is not supported in the Query Panel in Crystal Reports.

List of Values

Associated to Prompt

In the Universe Designer, the list of values prompt is refreshed at run time.

In the Query Panel in Crystal Reports, the list of values prompt is refreshed only at design time for nested prompts only. Non-nested prompts are refreshed at design and run time.

Nested Prompts

In BusinessObjects Web Intelligence, as the list of values is refreshed at run time, all prompt value levels are updated.

In the Query Panel in Crystal Reports, as this workflow demonstrates at design time, only the last level of prompt is prompted at run time, and the list of values associated, will be static, and based on the nested values selected at design time.

For example:

```
List of vales of city : cityLOV object  city  WHERE region = @prompt (select region
,...., Region, ....)
      Region Object WHERE country=@prompt('select country ',....,Country)
      Country object   : countries
```

BusinessObjects Web Intelligence

Create a prompt "Which city?"

=> At run time list of values

Prompt 1: select country (like France)

Prompt 2: select region depending on this country (Normandie)

Prompt 3: select a city based on this region

Query Panel in Crystal Reports

=>At design time

Create a prompt "Which city?"

Click ok => prompt panel

Prompt 1: select country (like France)

Prompt 2: select region depending on this country (Normandie)

Prompt 3: select a city based on this region LOV = all cities in Normandie region.

=>At run time:

A prompt appears that asks you to select all cities from the region of Normandie, France. You cannot change the region or the country.

Note: There is a security risk in this example, because you may be able to see unauthorized cities through this workflow.

SQL Context

SQL context selection is not supported at run time. If the SQL is regenerated in the refresh loop, a context prompt may be required.

In the Universe Designer, the context can change at run time.

In the Query Panel in Crystal Reports, context selection at run time is not supported. The context **will always be selected at design time**, because the refresh workflow works in one call to the BusinessObjects Web Intelligence Server.

To complete the SQL generation like it is done currently through Business Objects Web Intelligence, re-edit the query and select the appropriate context.

Prompt Value Format using Database parameters

The following parameters are used to format the constant or prompted values that are inserted into the SQL. These parameters are defined in the PRM file.

- USER_INPUT_DATE_FORMAT
- USER_INPUT_NUMERIC_SEPARATOR
- DATABASE_DATE_FORMAT
- UNICODE_PATTERN

For constant prompt value, these parameters will be used in Web Intelligence to format the constant through the Query Panel in Crystal Report. This may cause a format mismatch.

Refer to the [DateTime](#) section under **Special Configuration Requirements** for further information.

@Variable

Only @Variable('BOUSER') is supported in Crystal Reports, none of the other @Variables are supported.

If the SQL generated through the Query Panel in Crystal Reports involves other @Variables, the SQL cannot run in Crystal Reports.

Note: When there is @Variable('BOUSER') in the report's SQL statement, a different user opens this report will not see the saved data. Saved data will only be shown for the user who has last saved this report.

Security Restrictions

There are six types of Security Restrictions:

- Connection
- Controls
 - Limit execution time to M minutes
 - Warn if cost estimate exceeds M' minutes
 - Limit size of long objects to C characters
- SQL
 - Allow use of sub queries (Y/N)
- Allow use of UNION, INTERSECT, and minus operators (Y/N)
 - Allow complex operand in query panel (Y/N)
 - Multiple SQL statements for each context (Y/N)
 - Multiple SQL statements for each measure (Y/N)
 - Allow selection of multiple contexts (Y/N)
 - Cartesian product (Prevent/Warn)
- Objects
- Rows
- Table mapping

The Crystal Reports Designer and the Query Panel in Crystal Reports honors the following Security Restriction types:

- Connection
- Objects
- Rows
- Table mapping

The Crystal Reports Designer and the Query Panel in Crystal Reports does not honor the following Security Restriction types:

- Controls
- SQL

Note: Although the Universe Designer allows creating and assigning the Control and SQL Security Restrictions, they are not propagated to the Crystal Reports Designer or InfoView.

Special Configurations Requirements

Query Naming

For multiple universe commands to work in the same report, provide the queries with different names for the parameters. The default name is **Query1**. This name can be specified in the Query Panel in Crystal Reports when designing the query.

DateTime

- All the supported database types use a known date format except for Oracle. Oracle allows specifying the date format for the session using an **alter session** call.
- BusinessObjects Web Intelligence generates SQL with dates in the correct database format, except for Oracle which generates SQL with dates in a constant known format (though not necessarily the same as the database format).
- When the connection server executes SQL with a date constant against Oracle, it will make an **alter session** call before the execute SQL call. This **alter session** call sets the Oracle session date format to expect the format in the Business Objects SQL.
- The Query Panel in Crystal Reports uses the SQL generated by BusinessObjects Web Intelligence. However, Crystal Reports does not set the Oracle session date format. Unless the date format is set to be the same as in the BusinessObjects SQL, the execute call fails.

This issue occurs any time there is a constant value used in a value filter in the query (created in the Query Panel in Crystal Reports) against Oracle.

This issue does not occur in the following cases:

- when the database type is not Oracle
- a prompt filter is used instead of a constant value (in this case the SQL is generated by Crystal Reports).

To work around this issue, ensure the default Oracle date format in the connection server configuration is the same as the Oracle database setting. Use one of the following methods to accomplish this:

- change the Oracle date format using an **alter session** call
- change the connection server Oracle date format in the file Oracle.prm. Modify the parameter with name USER_INPUT_DATE_FORMAT in the section Configuration.

Note: Oracle.prm can be found in the following folder:

C:\Program Files\Business Objects\BusinessObjects Enterprise 11\win32_x86\dataAccess\ConnectionServer\oracle

Identical Prompts

If a query contains two identical prompts, you will only be prompted for one of them. Two prompts are considered identical when they have the same:

- question
- type (number, string or date)
- selection (mono or multi).

Note: If a subreport and main report share the same prompt, you will be prompted twice. This can be avoided by linking the main report to a subreport on a parameter.

Syntax Error with Outer Join

In the Query Panel in Crystal Reports, if you receive a Query Syntax error message for SQL Universe Outer Join linking, you must edit the parameter settings for the universe to resolve this error.

To edit the parameter settings:

1. Open the universe. Click **File > Parameters**.
2. On the **Parameters** tab, change the value for the ANSI92 argument to "Yes". Click **OK**.
3. Save the universe.

Known Issues

Prompt Name and Ordering

Prompt names are generated as QueryName_Prompt#, so if the query is called Query1 and it had three prompts they would be named Query1_Prompt1, Query1_Prompt2, Query1_Prompt3.

Crystal Reports requires all prompt names to be distinct, so if multiple queries with prompts are used in the same report the queries must all have different names to ensure that the prompts do not conflict.

The ordering of the prompts is determined by the order in which they are encountered in the query. If a change to the universe or the query definition causes the ordering of the prompts to change, items in the report that were using prompts may get mapped to the wrong prompt.

This is a known issue and has been assigned Track ID ADAPT356874.

Field Names Change

When you open a report that has one of its field names changed, the **Field Map Prompt** dialog box appears in the Crystal Reports Designer. This dialog box allows you to decide what the fields now represent.

However, at runtime, if you open a report that has one of its field names changed, the **Field Map Prompt** dialog box does not appear and the fields are removed.

This is a known issue and has been assigned Track ID ADAPT00320280.

Mapping Derived Tables

If a normal table is mapped to a derived table through a security restriction, the SQL generated when using elements of the normal table will be invalid.

This is a known issue and has been assigned Track ID ADAPT00365964.

Adding Contexts to a Report

If a universe is changed so that an existing report requires a context to be resolved in order to run, the report will not respond when it is opened.

This is a known issue and has been assigned Track ID ADAPT00370829.

Behaviors by Design

Changes to Universe Prompt Objects

For reports with parameters built with the Query Panel in Crystal Reports, if the definition of the underlying object that the prompt is based on changes (for example, from a numeric type to string type), the existing report may not work.

If the object type changes, Crystal Reports may not know how to update the affected formulas.

Combined Queries

When a combined query is created (by clicking the union icon) the objects in the result panel of the first query is copied into the new query, and the new query has no filters.

Renamed Queries

The query name can only be specified the first time the query is created. If multiple queries are used in a single report it is recommended that they have different names, otherwise there may be conflicts between the prompts.

Recommendations and Best Practices

Universe Reports and Universe CUIDs

The connection between a universe report and universe is the CUID – a unique identifier in the Crystal Management Server (CMS). Should the CUID change by any process, the saved data for the reports based on that universe will be discarded and the reports will not be able to refresh.

When moving universes between different CMSs, Business Objects recommends using BusinessObjects Enterprise > Import Wizard to preserve the original CUID for the universe.

Exporting Universe over Existing Universe

When you try to export a universe to a folder that already contains a universe with the same name and a different CUID, you will be prompted to either **Replace** or **Cancel**.

If you choose to replace an existing universe with a new one, all objects in the system that references the existing universe (such as BusinessObjects Web Intelligence docs and derived universes) will still find the universe.

In addition, security settings (including both ACL rights such as view/edit and Security Restrictions) are preserved. However, if the definition of the universe changes (schema or objects) then its dependency may break (such as BusinessObjects Web Intelligence doc or derived universe cannot find required objects or security restrictions restrict non existent objects or tables).

The option to **Replace** does several things:

- preserve the ID/CUID and all security settings (Security Restrictions) and rights on the universe
- replace the definition of the universe (the .unv/.unw file) as well as any connection information, core universes, etc.
- update the revision number to be the maximum (local revision number, CMS revision number) + 1.

Linked Universes versus Included Universes

When creating a universe that uses tables from other universes, Business Objects recommends that you link the other universes rather than include them.

You will also encounter problems if you attempt to include a universe that was previously linked to the main universe. This will change the IDs of all the fields that were in the linked universe and any reports that used those fields will no longer be able to find them.

Effects of Changing Universes on a Report

When a universe changes, reports based off that universe need to be validated the next time they are opened. If there is no change to the data in the report, the report will open as before. However, if the data has become invalid the report will first need to be fixed before it can be used. Depending on the change this can be done either by refreshing the report or re-editing the query.

If you get a connection error when refreshing a report the universe may have changed in ways that make the query definition in the report unusable (for instance, a nested prompt has been introduced). To fix the report you will need to re-edit the query.

If the universe cannot be found on the Crystal Management Server (this could happen if a universe is not imported correctly) the report can still run by using the **Set DataSource Location** feature.

To use the **Set DataSource Location** feature, create a query definition (equivalent to the original one used in the report) using a universe from the CMS. Then set the data source location to this new query.

Note: Crystal Reports 2008 has improved ability to set the data sources location to a Universe.

Security Issues with Saved Data

The saved data in a report based on a universe is not secure if the report is unmanaged.

If a report based on a universe is saved with saved data and is then opened in a previous version of Crystal Reports, the saved data will not be discarded.

Business Objects recommends that you do not distribute a report based on a universe if you want to ensure the security of the saved data.

Qualified Table Names

The Query Panel in Crystal Reports (and BusinessObjects Web Intelligence) will not use fully qualified table names in the generated SQL. This may cause problems if the qualification is needed to determine which table is being used.

To work around this behavior, fully qualify your tables in the Universe Designer. To fully qualify your table, rename the tables (right-click the table and select **Rename Table**).

Performance Considerations

There are several factors that may affect the BusinessObjects Web Intelligence server and cause performance to decline. For example:

- when many users simultaneously hit the same BusinessObjects Web Intelligence server from the Query Panel in Crystal Reports
- when the SQL is regenerated for the report thus causing the report data to refresh.

The SQL is regenerated if the universe has been updated since the report was created or if the universe is overloaded.

Universe Support Improvements in Crystal Reports 2008, BusinessObjects XI 3.0

Crystal Reports 2008 and the associated version of BusinessObjects, XI 3.0, have a number of improvements related to the use of Universes by Crystal Reports.

Universe Set Location

It is now much easier to update a report to use a different Universe. Field mapping support is included in the case where fields don't automatically map between the old and new Universes.

Easy Access to the Query Panel

The Query Panel can now be easily reached from the Crystal Report designer's Database menu.

Support for Universe Create/ Edit Query Right

BusinessObjects XI 3.0 introduced a new right: the Universe Create/Edit Query right. Crystal Reports supports this right.

Support for New Universe Types: Stored Procedure, JDBC, JavaBean

Business Objects XI 3.0 introduced new Universe types, based on Stored Procedures, JDBC connections and JavaBeans. Crystal Reports supports these Universe data sources as well.

Improved Support for Universe Historical Instances

In BusinessObjects XI 3.0, you can elect to treat an instance of Universe-based Crystal Report as a 'historical instance', whereby the instance is treated as a snapshot in time and will no longer defer back to the Universe for security and other content updates.

This option is only available for instances, not the master report.

Improved Support for Single-Level LOV Prompts

The Crystal Reports support for LOV prompts is improved in BusinessObjects XI 3.0. Single-level LOV prompts are now refreshed and displayed as expected.

Customers of BusinessObjects XI and XI Release 2 should see the whitepaper, "[Universe LOV Refreshing in Crystal Reports](#)", available on the [SAP Developer Network](#), for help in improving the behavior of Universe LOV prompts with Crystal Reports.

Support for Multilingual Universe Metadata

Universes in BusinessObjects XI 3.0 introduce the ability to create Universe metadata in multiple languages. Crystal Reports is able to work with such Universes, although it will only display the 'primary' language of the Universe's metadata.

OLAP Universes

Crystal Reports does not support OLAP Universes. OLAP data can be consumed directly by Crystal Reports. See the appropriate Platform Support document on the [SAP Developer Network](#) for additional Crystal Reports OLAP support information.

Related Content

[Universe LOV \(LOV\) Refreshing in Crystal Reports](#)

[Troubleshooting Database Connectivity for Crystal Reports](#)

[Universe Best Practices](#)

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