

BusinessObjects

Connecting to Salesforce.com Data with Crystal Reports Best Practices Guide

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Introduction:

The purpose of this document is to provide suggestions and guidance on how to maximize the capabilities of the Crystal Report Driver for Salesforce.com. This is the second version of the Crystal Reports Salesforce.com Driver; it includes a number of enhancements and bug fixes. Specifically, there are several key enhancements to improve the Driver's performance:

- ◆ Filtering is pushed over to the Salesforce.com servers. By processing filters server side, the Crystal Reports Salesforce.com Driver can execute filtering via Salesforce's SOQL query.
- ◆ Support for Salesforce.com Professional Edition accounts. The Crystal Reports Driver for Salesforce.com now supports Developer Edition Accounts, Enterprise Edition Accounts, Unlimited Edition Accounts and Professional Edition Accounts.

Prerequisites:

For existing Crystal Reports XI customers, you will need to upgrade to Crystal Report Service Pack 1 or later.

(http://support.businessobjects.com/downloads/service_packs/crystal_reports_en.asp)

Performance Best Practice Guide:

The following section provides guidelines on how to minimize performance issues when designing and running Salesforce.com reports. These guidelines will be adjusted in the future as the Crystal Reports Salesforce.com Driver is migrated to future versions of the Salesforce.com Reporting API. Future versions of the Salesforce.com API will be architected to improve performance when processing large reporting datasets with multiple joins.

1. Maximize filtering and confine datasets to significantly improve performance.

We recommend that you pull a subset of all your data in the report by adding filters in the report whenever possible. The more filters you add in the report, the less data will be fetched from Salesforce.com, and the quicker response you will get when you view a report. Filtering is strongly recommended for datasets larger than 50,000 records.

2. Turn off Cache Join

The Salesforce.com API does not currently provide the capability to join multiple objects server side, so our report processing engine handles this locally on the client side. This could lead to large memory consumption if your dataset is huge and you are not using filters. You may need to configure the system to use less memory, especially in the case where many requests to view different reports are running concurrently. You can turn off cache join by adding this line to CRConfig.XML.

```
<UseCacheJoin> FALSE</UseCacheJoin>
```

In Crystal Reports XI, CRConfig.XML is usually located in \Program Files\Common\ Business Objects \3.0\java.

In Crystal Reports XI R2, CRConfig.XML is usually located in \Program Files\Business Objects\Common\3.5\java.

Salesforce.com is planning to release a new API in late 2006 that will be able to process server side joins. Business Objects is working with Salesforce.com to prepare for the new release and you will be able to upgrade and take advantage of additional performance gain as soon as it is available.

3. Schedule reports that have large datasets

Scheduling reports that contain large sets of data is highly recommended, as scheduling can generate reports during off-hours when there is less overall load on the Salesforce.com system.

As a general guideline, if the data in your Salesforce.com report is larger than 30,000 records it will likely take longer than 5 minutes to view your report in real time. In this scenario, we recommend scheduling the report to run during off-hours.

4. Increase JVM memory size

If the tables you report against are large, such as 50,000+ records, we recommend that you increase the JVM memory size to get a faster response. Increasing JVM memory size is not required to run your reports successfully, but it will help you view your large reports in a shorter time.

The Crystal Reports Salesforce.com Driver is Java-based and executes in a Java environment. The default JVM memory size is typically 32MB-64MB. You can increase it by changing the Crystal Reports configuration of the JVM in the file, CRConfig.XML.

To increase the memory size to 512MB – 1024MB, modify the following entries in CRConfig.XML:

```
<JVMMaxHeap>1024000000</JVMMaxHeap>  
<JVMMinHeap>512000000</JVMMinHeap>
```

Known Issues and Limitations:

1. Low performance when joining large tables

The Salesforce.com API does not provide the capability to execute joins server side, so the Crystal Reports Salesforce.com Driver has to fetch all of the records from joined tables and process the joins locally. Even though Crystal Reports provides cache join to optimize the performance of large dataset joins, it will still take a long time to process, potentially up to several hours if you are joining several large sized tables.

2. Query Locator time out issue

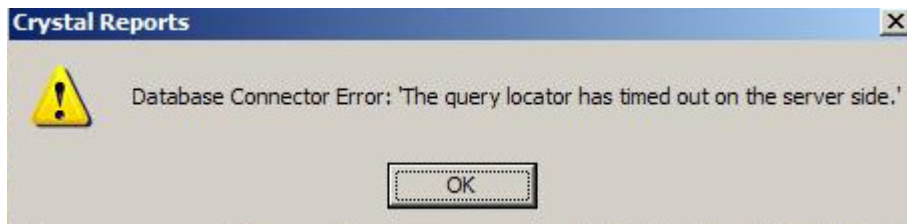
When joining large-sized tables, you may run into a query locator time out error. The query locator is a server-side cursor generated by Salesforce.com and is used to navigate the query result. It will automatically expire in 15 minutes without any activity.

In the case of joining two tables, the report processing engine will read one table partly, and then it will process the other table. If the processing time is longer than 15 minutes, the Crystal Reports Salesforce.com Driver will try to read the rest of the records in the first table and the cursor in that query will time out. In the case of joining multiple tables, the chance of running into a query locator time issue is higher as the report processing engine might have to return to handle the first table after finishing processing other tables, increasing the possibility of a query locator time out error in the first table.

If you run into query locator time out issue, we recommend that you add filters into your report to reduce the amount of records you fetch from Salesforce.com.

However, if that is not possible, you can try to reverse the link order in the case of joining two tables. For example, you linked table A to table B, then you can try to link table B to table A.

When you run into query locator time out error, you will get an error message as below:



3. Connecting Salesforce.com through proxy is not supported.

Business Objects is working with Salesforce.com to provide this capability in future versions of the Crystal Reports Salesforce.com Driver.

4. Operator limitation (minor issue)

Crystal Reports offers the Select Expert Wizard which report designers can use to add filters into their reports. However, Salesforce.com has query limitations on Reference type fields, ID fields and multipicklist. As a result these types of fields cannot work with the following operators: less than, greater than, between, less than or equal, greater than or equal and is not between.

5. Invalid Session ID

If you encounter the below error message in the middle of viewing, refreshing or scheduling a report, it is because your Salesforce.com sessions expired automatically after a predetermined length of time, which can be configured at **Setup | Security Controls**. The default is 120 minutes (two hours).

You can simply increase the predetermined length of time to overcome this issue.



Finding more information:

For more information and resources, refer to the product documentation and visit the support area of the web site at <http://www.businessobjects.com/>

If you are interested in providing feedback or enhancement requests for the Crystal Reports Salesforce.com Driver, please contact Business Objects R&D at feedback.crdc@businessobjects.com.