IBM TRIRIGA Application Platform Version 3 Release 5.2

Connector for SAP BusinessObjects User Guide



Note

Before using this information and the product it supports, read the information in "Notices" on page 56.

This edition applies to version 3, release 5, modification 2 of IBM® TRIRIGA® Application Platform and to all subsequent releases and modifications until otherwise indicated in new editions.

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About This Guide

This guide describes the process for setting up your IBM® TRIRIGA® Application Platform environment to work with SAP Crystal Reports. For more information about installation, go to the IBM TRIRIGA Application Platform 3 Knowledge Center and select *Installing IBM TRIRIGA Application Platform.* For more general information about reports, see the *IBM TRIRIGA Application Platform 3 Reporting User Guide.*

Conventions

This document uses the following conventions to ensure that it is as easy to read and understand as possible:



Note - A Note provides important information that you should know in addition to the standard details. Often, notes are used to make you aware of the results of actions.



Tip - A Tip adds insightful information that may help you use the system better.



Attention - An Attention notice indicates the possibility of damage to a program, device, system, or data.

Intended Audience

This guide is for users of IBM TRIRIGA Application Platform who develop or maintain SAP Crystal Reports.

Prerequisites

This guide assumes the reader has a basic understanding of the IBM TRIRIGA Application Platform.

To use SAP Crystal Reports with the IBM TRIRIGA application, you must purchase and install the correct version.

Support

IBM Software Support provides assistance with product defects, answering FAQs, and performing rediscovery. View the IBM Software Support site at <u>www.ibm.com/support</u>.

1. Overview

IBM TRIRIGA can run reports using an external report generator named SAP Crystal Reports. SAP Crystal Reports is a popular report generator used by many organizations. SAP Crystal Reports offers the ability to generate many kinds of reports that are not possible using the IBM TRIRIGA Report Manager. SAP Crystal Reports also offers many formatting possibilities that are not available with the IBM TRIRIGA Report Manager.

Why use SAP Crystal Reports?

- Popular reporting tool and market leader in reporting technology
- Quick and rapid report development
- Integrates well with many applications
- Connects to most databases available in the market, including XML (eXtensible Markup Language)
- Has robust formatting capability
- Allows exporting to a variety of popular formats

Server configuration

SAP Crystal Reports runs on a server computer. It can be running on the same server as the platform or on a separate server.

The Tools Server runs the SAP Crystal Reports Server (RAS) engine. It communicates with the Application Server and the Process Server via TCP/IP and with the Database Server via JDBC. The Tools Server does not communicate directly with users and is kept isolated from HTTP requests.

The SAP Crystal Reports Application Server (RAS) is used to run SAP Crystal Reports from the IBM TRIRIGA Application Platform.

For additional information about the hardware configuration of the IBM TRIRIGA Application Platform, go to the IBM TRIRIGA Application Platform 3 Knowledge Center and select *Installing IBM TRIRIGA Application Platform*.

URL providers

For WebSphere configuration, you will need the Name, JNDI name, and Specification to enter as URL providers. Instead of {config_path}, use the actual path to the config directory of the IBM TRIRIGA installation, for example C:/Tririga.

| Name | TRIRIGACRYSTAL |
|---------------|---|
| JNDI name | urI/TRIRIGAProperties/TRIRIGACRYSTAL |
| Specification | file:/ {config_path}/config/TRIRIGACRYSTAL.properties |

2. Installing and configuring

IBM TRIRIGA provides integration with SAP Crystal Reports by allowing reports created using the SAP Crystal Report designer to be accessed directly from within IBM TRIRIGA applications.

This integration involves the IBM TRIRIGA Application Server and the SAP Crystal Reports Application Server and includes several phases:

- Configure TRIRIGACRYSTAL.properties
- Install the SAP Crystal Report Viewer files
- Install SAP BusinessObjects Enterprise XI and configure the SAP Crystal Reports Server
- Optionally, enable Crystal support on WebSphere 8.

Configure TRIRIGACRYSTAL.properties

Locate your copy of the TRIRIGACRYSTAL.properties file. Look in the config folder in your IBM TRIRIGA installation folder. A typical path is C:\Tririga\config\TRIRIGACRYSTAL.properties.

Step

| 1. | Edit TRIRIGACRYSTAL.p roperties. | <pre># REPORT CONFIGURATION # ReportLocation is the location that CrystalReport rpt Files are stored # after they are uploaded this should not need to be modified. # # ResHost is the Server that has Crystal Decisions Report Application Server</pre> |
|----|--|---|
| 2. | Review the information in the comments at the top of the file. | <pre>installed on it. # installed on it. # AppHost Address excluding the protocol (http://) and path (/index.html)that is used by users to sign in to Tririga. # ReportUserLogon is the username that is used to log on to non-TRIRIGA data sources that are used in reports. # ReportUserPassword is the password that is used to log on to non-TRIRIGA data sources that are used in reports.</pre> |
| 3. | Change any values as appropriate for your installation. Additional information can be found in the <u>TRIRIGACRYSTAL.p</u> <u>roperties section</u> . | <pre># ServletUser is a username that is hardcoded to prevent manual requests for portal and section reports. # ServletPassword is a password that is hardcoded to prevent manual requests # for portal and section reports. # ReportCacheSize is the number of reports that can be cached meaning that # they will not have to be re-processed while navigating through the report. # PrintMode is the print mode that is used to handle the report print # feature. Valid values: PDF or ActiveX # ReportLocation=C:/Tririga/userfiles/crystalreports RasHost=RASServer</pre> |
| 4. | Save your changes to TRIRIGACRYSTAL.p roperties. | AppHost=ApplicationServer |

Install SAP Crystal Report Viewer files

You must install the SAP Crystal Reports 2013 . jar files and the SAP Crystal Report Viewer files.

WOTE: If your IBM TRIRIGA server is running on a UNIX operating system, the file names are case sensitive. Make sure that the name and case of the JAR files and Viewer files that are downloaded match the names shown in the steps.

Step

1. Select and copy jar files on your Crystal server.

For Linux Crystal Server, select the jar files below from the DirectoryWhereCrystalServerIsInstalled\sap_bobj\enterprise_xi40\java\l ib directory.

For Windows Crystal Server, select the jar files below from the DirectoryWhereCrystalServerIsInstalled\SAP BusinessObjects\ SAP BusinessObjects XI 4.0\java\lib directory.

```
CrystalReportsSDK.jar
logging.jar
webreporting.jar
webreporting-jsf.jar
sap.com~tc~sec~csi.jar
```

Copy the files to the DirectoryWhereTRIRIGAInstalled\userfiles\crystalreports\reports\Crysta lSdkRasClassLoader directory. Create any directories that are not yet created.

| 2. | Select the following directories and files in the DirectoryWhereCrystalReportsIsInstalled\SAP BusinessObjects\ SAP BusinessObjects Enterprise XI 4.0\java\lib directory: |
|----|---|
| | Directories: ActiveXControls css html images js prompting urlreporting |
| | <pre>Files: allInOne.js allStrings_en.js api-min.js crsmarttag.jsp parameterUIController-compressed.js preview.jsp processindicator.js promptengine-compressed.js ViewSeed.js</pre> |
| | And copy the selected directories and files to the DirectoryWhereTRIRIGAInstalled\userfiles\crystalreports directory. |

Click <u>http://downloads.businessobjects.com/akdlm/crystalreportsforeclipse/2_0/crjava-runtime_12.2.217.zip</u> to download a zip file containing the Crystal SDK runtime libraries. The downloaded zip file is named crjava-runtime_12.2.217.zip. You can also access the zip file by clicking <u>http://www.sap.com/solution/sme/software/analytics/crystal-reports-eclipse/index.html</u>, submitting your SAP credentials, and clicking the Runtime libraries at the bottom of the page.

4. In the lib directory located at the root of the .zip file, select the following .jar files:

```
com.azalea.ufl.barcode.1.0.jar
commons-configuration-1.2.jar
CrystalCommon2.jar
CrystalReportsRuntime.jar
cvom.jar
DatabaseConnectors.jar
icu4j.jar
jai_imageio.jar
JDBInterface.jar
jrcerom.jar
keycodeDecoder.jar
logging.jar
pfjgraphics.jar
QueryBuilder.jar
webreporting.jar
webreporting-jsf.jar
xpp3.jar
```

```
And copy them to the DirectoryWhereTRIRIGAInstalled\userfiles\crystalreports\reports\Crysta lSdkEmbeddedClassLoader directory.
```

5. From the crystalreportviewers directory found at the root of the ZIP, select the following files and directories:

Directories:

ActiveXControls css html images js prompting

Files:
allInOne.js
allStrings_en.js
processindicator.js

And copy them to the DirectoryWhereTRIRIGAInstalled\userfiles\crystalreports\jrc directory.

- 6. Locate the following JAR files, which are part of Apache Xalan version 2.7.1, in a ZIP file that can be downloaded from the following location: http://www.apache.org/dyn/closer.cgi/xml/xalan-j
 On this site, choose a mirrored site from which to download the ZIP file. Select the link titled XML/Xalan java archive. Select the download link labeled xalan-j_2_7_1-bin.zip. The JAR files can be found in a directory named xalan-j_2_7_1 at the root of the ZIP file.
 serializer.jar xalan.jar
 Place these JAR files in the following location: DirectoryWhereTRIRIGAInstalled\userfiles\crystalreports\reports\Crysta lSdkEmbeddedClassLoader
- 7. Restart the IBM TRIRIGA application server.

Install SAP BusinessObjects Enterprise XI 4.0 (BOE) / Crystal Server 2013

There are two steps:

1. Install SAP BusinessObjects Enterprise XI 4.0 (BOE).

As of IBM TRIRIGA Application Platform 3.2, IBM TRIRIGA no longer provides the Crystal BOE installer. Customers can use what they already have or can contact SAP to get access to the Crystal BOE installer. New customers or customers that do not already have Crystal or BOE licenses must use BIRT unless they acquire their own Crystal or BOE license.

2. Configure the SAP Crystal Report Server.

Configure the SAP Crystal Report Server.

The configuration of the SAP Crystal Report Server depends on whether you are using Windows or Linux. This section first describes the configuration <u>for Windows</u>, then <u>for Linux</u>.

Configure the SAP Crystal Report Server on Windows

The IBM TRIRIGA Java data source must reside on the SAP Crystal Report Server. If it does not, many reports will fail to run and will display a message similar to the following error:

Step

Could not open Report Client Document. Caused by: com.crystaldecisions.sdk.occa.report.lib.ReportSDKServerException: Failed to open the connection.

To configure the SAP Crystal Report Server, make the following changes:

Step

1. Navigate to the /tools/Crystal folder in the IBM TRIRIGA installation folder.

For example: C:\Tririga\tools\Crystal

- Copy rowset.jar and TririgaCrystalClient.jar and paste them into DirectoryWhereCrystalReportServerInstalled\SAP BusinessObjects\SAP BusinessObjects Enterprise XI 4.0\dataAccess\connectionServer\java folder.
- 3. On the SAP Crystal Reports Server, navigate to the SAP Crystal Reports installation directory, then to the common 4.0 java folder.

```
For example: C:\Program Files\Business Objects\common\4.0\java.
```

 Edit CRConfig.xml to include TririgaCrystalClient.jar and rowset.jar in the JavaBeansClassPath, as shown in the following example. Replace {install_path} with your actual BusinessObjects Enterprise install path.

```
<JavaBeans>
        <CacheRowSetSize>100</CacheRowSetSize>
        <JavaBeansClassPath>
        {install_path}\SAP BusinessObjects\SAP BusinessObjects Enterprise XI
4.0\dataAccess\connectionServer\java\TririgaCrystalClient.jar;
        {install_path}\SAP BusinessObjects\SAP BusinessObjects Enterprise XI
4.0\dataAccess\connectionServer\java\Triveset.jar
</JavaBeansClassPath>
        <CallBackFunction>CrystalReportsLogoff</CallBackFunction>
</JavaBeans>
```

(i) NOTE: Make sure the text starting with <JavaBeansClassPath> and ending with </JavaBeansClassPath> is on one line.

 Start the Central Management Console. The default URL is http://localhost:8080/BOE/CMC. The User Name is Administrator and the Password is what you set during installation.

| 6. TI Ap th se | Navigate to Servers -> Servers List -> Report Application Server. P: The Report oplication Server is on e second page of rvers. | Servers Manage - Actions - Manage - Actions - Servers List Server Groups List Server Groups List Server Categories Service Categories Server Status | | CrystalN | ame ode.OutputFileRepository ode.ProgramJobServer ode.PublicationJobServer ode.ReportApplicationServer ode.WebIntelligenceProcessin | State State Running Running Running Running Running | Enabled Disabled Disabled Disabled Enabled Propertie Start Serve | Stale | Kind File Repo Job Serv Job Serv Report A |
|----------------------------|--|---|------------------------------|--|--|---|--|------------------------|---|
| 7. | Right click and stop the server. | | | | | | Stop Serve | rver er minatior | 1 |
| 8. | Right click and select Properties. | Servers | | • | | | | | |
| | | Manage - Actions - | | | | | | | |
| | | 🍋 🛱 🗞 🗖 🗖 | • | | ▶ P R. & | | | | |
| | | | | - | | | | | |
| | | Servers List | | | Server Name | | -11 | | |
| | | Server Groups L | .ist | | CrystalNode.Output | сніекеро | sitory | | |
| | | 🐨 🖶 Server Groups | | B | CrystalNode.Progra | mJobSer | ver | | |
| | | 🖻 🕹 Nodes | | | CrystalNode.Publica | ationJobS | erver | | |
| | | 🗄 🖷 Service Categor | ies | 8 | CarstalNode Deper | t A policati | | | |
| | | 🗄 🗟 Server Status | | 8 | (- h) Properties | | essin | gSen | ver |
| In Comm 9. | hand Line Parameters, Specify the "-ipport <port #="">" for the server. Add it to the end of the Command Line Parameters.</port> | Command Line Paramet -loggingPath "/usr/loca -fg -restart -name Crysi pidfile /usr/local/BOE/B | ters al/BC talN OE/ | DE/BOE ode.Re bobje/s | /bobje/logging/ -ippo portApplicationServer serverpids/CrystalNode | ort 1566 -ns D265 e_CrystalN | 0 | | |
| The | default port is 1566. | | | | | | | | |

| In Common Settings, | Common Settings | 1 |
|--|---|------------------------------------|
| 10. In Request Port, select the <i>Auto assign</i> check box. | Auto assign Auto assign Auto assign Auto assign | 1 |
| In Host Identifiers, select the Auto assign radio button. | O IP Address (IPv4) ✓ Automatically start this server when the Server | (I Intelligence Agent starts |
| 12. Select the Automatically start this server when the Server Intelligence Agent starts check box. | | |
| In SAP Crystal Reports Viewing | Crystal Reports Viewing and Modification Service | |
| and Modification Service, | Use Configuration Template | |
| | Allow Report Jobs to Stay Connected to the Database | |
| 13. In Temporary | until the Report Job is Closed | |
| Directory, if there is a | Browse Data Size (records): | 100 |
| value, make sure the | Idle Connection Timeout (minutes): | 30 |
| patri is valid. | Batch Size (records): | 100 |
| | refreshing a report (-1 for unlimited): | 20000 |
| | Temporary Directory: | %DefaultDataDir%/CrystalReportsRas |
| | Maximum Concurrent Report Jobs (0 for unlimited): | 0 |
| | Oldest on-demand data given to a client (minutes): | 20 |
| | Restore System Defaults | |
| | Set Configuration Template | |
| | | |
| account in Users and Groups -> User List. | CENTRAL MANAGEMENT CONSOLE | |
| | Users and Groups | |
| | Manage - Actions - | |
| | 📩 🔗 🍇 🛅 🚣 🎎 🕅 🏯 | |
| | | |
| | Group List | tor |
| | 🔁 🗄 Group Hierarchy | |
| | | |

| 1 | When you have finished making configuration changes, restart the Report Application | A | Servers Manage Actions | | ▶ 🔁 🔏 |
|---|---|---|-------------------------|---|---------|
| | Server. | Servers List Server Groups List Server Groups | 8 | Server Name CrystalNode.OutputFileRepository CrystalNode.ProgramJobServer CrystalNode.PublicationJobServer | |
| | | E Service Categories Server Status | 8 | CrystalNode ReportApplicationSeptor Cryst Start Server Restart Server Stop Server | |

Configure the SAP Crystal Report Server on Linux

The IBM TRIRIGA Java data source must reside on the SAP Crystal Report Server. If it does not, many reports will fail to run and will display a message similar to the following error:

Could not open Report Client Document. Caused by: com.crystaldecisions.sdk.occa.report.lib.ReportSDKServerException: Failed to open the connection.

You must have the following available to configure the SAP Crystal Report Server for Linux:

- Oracle Client for Linux 11g linux_x86_llgR1_client.zip (from Oracle)
- unixODBC packages (yum install unixODBC* from RedHat)
- Crystal Data Direct 6.0 Drivers for Linux

To configure the SAP Crystal Report Server, make the following changes:

Step

1. Using a remote copy tool, such as WinSCP, navigate to the /tools/Crystal folder in the IBM TRIRIGA installation folder.

For example: C:\Tririga\tools\Crystal

 Copy rowset.jar and TririgaCrystalClient.jar to the following folder: DirectoryWhereCrystalInstalled/sap_bobj/enterprise_xi40/dataAccess/conne ctionServer/beans.

For example, into
{install_path}/sap_bobj/enterprise_xi40/dataAccess/connectionServer/beans

On the SAP Crystal Reports Server, navigate to the SAP Crystal Reports installation directory, then to the /sap_bobj/enterprise_xi40/java folder.
 Edit CRConfig.xml to include TririgaCrystalClient.jar and rowset.jar in the classpath, as shown in the following example. Replace {install_path} with your actual BusinessObjects Enterprise install path.
 <JavaBeans>

 <CacheRowSetSize>100</CacheRowSetSize>
 JavaBeansClassPath>{install_path}/enterprise_xi40/dataAccess/connectionServ

```
er/beans/TririgaCrystalClient.jar:{install_path}/enterprise_xi40/dataAccess
/connectionServer/beans/rowset.jar</JavaBeansClassPath>
        <CallBackFunction>CrystalReportsLogoff</CallBackFunction>
    </JavaBeans>
```

(i) NOTE: Make sure the text starting with <JavaBeansClassPath> and ending with </JavaBeansClassPath> is on one line.

(i) NOTE: Skip the next step if you are not using Oracle.

5. Add the following lines to .bash_profile of your Crystal user. Replace {install_path} with the true path to the Crystal install dir

```
export ORACLE_HOME=/usr/local/oracle/app/oracle/product/11.1.0/client_1/
```

```
export
LD_LIBRARY_PATH=/usr/local/oracle/app/oracle/product/11.1.0/client_1/lib:
{install_path}/sap_bobj/enterprise_xi40/linux_x86/odbc/lib
```

```
export
TNS_ADMIN=/usr/local/oracle/app/oracle/product/11.1.0/client_1/network/admi
n/
```

export ODBCINI={install_path}/sap_bobj/enterprise_xi40/odbc.ini

WOTE: Make sure each of the export statements is on one line. It is the format of this guide that splits them into more than one line. For example, the second export statement above should start: export LD_LIBRARY_PATH=/usr/local/or....

()NOTE: Skip the next step if you are not using Microsoft SQL Server.

6. In the Crystal user .bash_profile, add/modify the following environment variables and source the profile. Replace {install_path} with the true path to the Crystal install dir.

NOTE: IBM TRIRIGA only certifies BOE on Linux_x86.

export BOBJEDIR={install_path}/sap_bobj

Step

export ODBC_HOME={install_path}/sap_bobj/enterprise_xi40/linux_x86/odbc

export ODBCINI={install_path} /sap_bobj/enterprise_xi40/odbc.ini

```
export LD_LIBRARY_PATH={{install_path}
/home/tririga/sap_bobj/enterprise_xi40/dataAccess/connectionServer:$ODBC_
HOME/lib:$LD_LIBRARY_PATH
```

W NOTE: You must set/export the above env variables in the same order as shown.

NOTE: Make sure each of the export statements is on one line. It is the format of this guide that splits them into more than one line.

●L1●

(1) NOTE: Skip the next step if you are not using Oracle.

7. Modify the {install_path}/sap_bobj/enterprise_xi40/odbc.ini to add the following:

```
[TRIRIGAIBS]
QEWSD=40442
Driver={install_path}/sap_bobj/enterprise_xi40/linux_x86/odbc/lib/CRora24.so
Description=DataDirect 6.0 Oracle Wire Protocol
HostName=oracleserverhost
ServiceName=orcl
PortNumber=1521
LogonID=tridata
Password=password
```

NOTE: If you use a DSN name other than TRIRIGAIBS, it must match the TRIRIGAIBS_ODBC value in TRIRIGACRYSTAL.properties on the Application and Process servers.

WOTE: Skip the next step if you are not using Microsoft SQL Server.

8. Modify the {install_path}/sap_bobj/enterprise_xi40/odbc.ini to add the following:

```
[TRIRIGAIBS]
QWESD=40442
Driver={install_path}/sap_bobj/enterprise_xi40/linux_x86/odbc/lib/CRsqls24.so
Description=DataDirect 6.0 SQLServer Native Wire Protocol
HostName=sqlserver,1433
Database=tridata
LogonID=tridata
Password=password
```

```
EnableQuotedIdentifiers=1
AnsiNPW=0
```

WOTE: If you use a DSN name other than TRIRIGAIBS, it must match the TRIRIGAIBS_ODBC value in TRIRIGACRYSTAL.properties on the Application and Process servers.

●L1●

DataDirect provides both NON-OEM drivers and OEM drivers. The drivers provided by BOE XI are OEM drivers. By default the Connection Server is set to use NON-OEM drivers. You must edit the Connection Server to allow the use of the OEM branded DataDirect driver. The steps are as follows:

- 9. Make a backup copy of
 {install_path}/sap_bobj/enterprise_xi40/dataAccess/connectionServer/odbc/sql
 srv.sbo
- 10. Change the following parameter from No to Yes: <Parameter Name="Use DataDirect OEM Driver" Platform="Unix">Yes</Parameter>

●L1●

11. Stop all BOE XI servers, ./stopservers, log out completely from your UNIX shell, and log back in (to make sure new env variables are set up). Start all BOE XI servers.

You should be able to run Crystal, Webi, or Deski reports using the DataDirect ODBC driver.

After installing a Service Pack, the connection may hang on Webi without any errors. This is because Service Packs may overwrite the sqlsrv.sbo, which means that the parameters have been reset to the default.

W NOTE: Skip the next two steps if you are not using Microsoft SQL Server with named instances.

- 12. For a named instance of SQL Server, use the following format: server_name\instance_name. If only a server name is specified with no instance name, the driver connects to the server and uses the default named instance on the server.
- 13. In the Universe.sbo file, make sure to define the correct version of Microsoft SQL Server for the connection.
- 14. Start the Central Management Console. The default URL is http://localhost:8080/BOE/CMC. The User Name is Administrator and the Password is what you set during installation.

| 15. Navigate to Servers -> Servers List -> Report | Servers |
|--|--|
| Application Server. | Manage - Actions - |
| | |
| | Servers List Server Name State Enabled Stale Kind |
| TIP: The Report | 🔚 🗐 Server Groups List 🕴 CrystalNode.OutputFileRepository 🔯 Running 🗟 Disabled File Repo |
| Application Server is on | Server Groups 🕴 CrystalNode.ProgramJobServer 🚯 Running 🔁 Disabled Job Serv |
| the second page of | CrystalNode.PublicationJobServer Constalled Job Server |
| servers. | CrystalNode.ReportApplicationServer Company Report A |
| | Crystalivode. webintelligenceProcessini (C) Running |
| 1/ Diskt allah and an able | Restart Server |
| 16. Right Click and enable | 🚯 |
| the server. | - Force Termination |
| 17. Right click and stop the server. | |
| 18. Right click and select Properties. | Servers |
| | Manage - Actions - |
| | 🔭 🔁 🎭 📀 😄 🕨 🔳 🖚 🛅 😓 |
| | Servers List Server Name |
| | Server Groups List 🗧 D2650PE1670.OutputFileRepository |
| | B Soprer Croups |
| | |
| | D2650PE1670.PublicationJobServer |
| | 🗐 🖷 Service Categories 📑 D2650PE1670 ReportApplicationServe |
| | |
| | D2650 Properties |
| | |
| In Command Line Parameters | Command Line Parameters |
| | |
| 10 Specify the # | -loggingPath "/usr/local/BOE/BOE/bobje/logging/ -ipport 1566 |
| is. specify the -1pport | -fg -restart -name CrystalNode.ReportApplicationServer -ns D2650 |
| <port #="">" for the</port> | pidfile /usr/local/BOE/BOE/bobje/serverpids/CrystalNode_CrystalNo |
| server. Add it to the | |

The default port is 1566.

end of the Command Line Parameters.

Step

| In Common Settings, | Common Settings | | | | |
|--------------------------------|--|------------------------------------|--|--|--|
| 20 In Request Port | Request Port: Muto assign | | | | |
| select the Auto assign | Host Identifiers: | | | | |
| check box. | O Auto assign | | | | |
| | C Hostname | | | | |
| 21. In Host Identifiers, | C IP Address (IPv4) (I | | | | |
| select the Auto assign | | | | | |
| | Automatically start this server when the Server is | Intelligence Agent starts | | | |
| 22. Select the | 1 | | | | |
| Automatically start | | | | | |
| this server when the | | | | | |
| Server Intelligence | | | | | |
| hox | | | | | |
| 50%. | | | | | |
| In SAP Crystal Reports Viewing | Crystal Reports Viewing and Modification Service | | | | |
| and Modification Service, | Use Configuration Template | | | | |
| | Allow Report Jobs to Stay Connected to the Database | | | | |
| 23. In Temporary | until the Report Job is Closed Browse Data Size (records): | 100 | | | |
| value make sure the | Idle Connection Timeout (minutes): | 30 | | | |
| path is valid. | Batch Size (records): | 100 | | | |
| | Number of database records to read when previewing or refreshing a report (1 for unlimited): | 20000 | | | |
| | Temporary Directory: | %DefaultDataDir%/CrystalReportsRas | | | |
| | Maximum Concurrent Report Jobs (U for unlimited): | 0 | | | |
| | Oldest on-demand data given to a client (minutes): | 20 | | | |
| | Restore System Defaults | | | | |
| | Set Configuration Template | | | | |
| | | | | | |
| 24. Enable the Guest | | | | | |
| account in Users and | CENTRAL MANAGEMENT CONSOLE | | | | |
| Groups -> Oser Eist. | | | | | |
| | Users and Groups | | | | |
| | Manage + Actions + | | | | |
| | | | | | |
| | | | | | |
| | Crown List & Administrat | or | | | |
| | | | | | |
| | | | | | |

| 2 | 25. When you have finished making configuration changes, restart the Report Application | | Servers | | ▶ 🛅 🍰 |
|---|---|---|---|--|---|
| | Server. | Servers List | Servers List Server Groups List Server Groups Server Groups Server Groups Server Groups | 8 | Server Name CrystalNode.OutputFileRepository CrystalNode.ProgramJobServer CrystalNode.PublicationJobServer |
| | | ■ ■ Service Categories ■ ➡ ➡ Server Status | 8 | Crystalblode ReportApplicationServer Crystalblode ReportApplicationServer Start Server | |

Enabling Crystal support on WebSphere 8

For Crystal support on WebSphere 8, the IBM TRIRIGA application needs to point to IBM ICU version 4.8.1.1. To enable this, you must create a new shared library.

To create the new shared library:

Step

- 1. Go to Environment > Shared Libraries.
- 2. Select the server scope and click the New... button.
- 3. For this new Shared Library, enter the name "TRIRIGA_IBM_ICU4_8_1_1".
- 4. Enter the classpath to the "icu4j-4_8_1_1.jar" file, which is located in the tools/lib directory of the IBM TRIRIGA installation.
- 5. Select the check box for Use an isolated class loader for this shared library.
- 6. Click OK.
- 7. Click Save.
- 8. To go to the IBM TRIRIGA application, go to Application Types > WebSphere Enterprise Applications.

9. Select the IBM TRIRIGA application.

10. Under References in the Configuration tab, click Shared library references.

- 11. Select the check box for the IBM TRIRIGA application and click the **Reference shared libraries** button.
- 12. Select "TRIRIGA_IBM_ICU4_8_1_1" from the list of available Shared Libraries and click the arrow pointing to the right. This will places the "TRIRIGA_IBM_ICU4_8_1_1" Shared Library into the "Selected" list.

13. Click OK.

14. Confirm that the "TRIRIGA_IBM_ICU4_8_1_1" Shared Library appears as a referenced Shared Library for the "tririga-ibs" application and click **OK**.

15. Click Save.

3. Verifying Installation

This chapter provides information that you can use to help confirm that your system is running properly. The tips below are not intended to substitute for your company's testing and validation procedures.

Installation Verification Tips

Review the ant.log. The ant.log is located in the root installation directory, for example C:\Tririga\ant.log. This file contains information about every step taken during the install. A line toward the end of the file indicates whether the installation succeeded or failed.

Sign in as the system user. The default User Name is system and the default Password is admin. The complete portal should display and all colors and fonts should be readable.

Login to the Administrator Console. The default login is system and the default Password is admin. In the Agent Manager, start at least the following agents in the Process Server: CleanupAgent, ExtendedFormulaAgent, FormulaRecalcAgent, SchedulerAgent, WFAgent, and WFNotificationAgent. Logout of the Administrator Console. For more information about the Administrator Console, read the *IBM TRIRIGA Application Platform 3 Administrator Console User Guide*.

As the system user, create a non-admin Employee. Make them an IBM TRIRIGA user. Give them some, but not all, user groups. Give them some, but not all, user licenses.

Sign in as the user you created. Check that the user has access to everything they should have access to with the security groups and licenses given.

Check that a user can create and revise records, especially People and Location records.

Open a record and select the Associations tab. Verify that the Association Tree loads.

In the Workflow Builder, (as delivered, it is under Tools > Builder Tools), open and revise an existing workflow. Navigate to see if it loads completely.

In the Data Modeler (as delivered, it is under Tools > Builder Tools), verify that the state transition loads. Publish a test business object to verify that SMTP e-mail notification works.

As either the system user or a user with rights, open the Document Manager (as delivered, it is under the Tools menu item).

Upload a new document (txt, html, or jpg are good tests).

Upload a new document with the MultiFile applet.

View the document by clicking the icon in the V column.

Check In / Check Out a document.

Installation Verification Tips

If Brava! has been installed, upload a CAD document in DXF and view the CAD document by clicking the icon in the V column.

If SAP Crystal Reports has been installed, test the operation of the Crystal integration.

Open an Employee record, select the Reports tab, and click Submit.

Open a Building record, select the Reports tab, choose Building Report, and click Submit.

In the My Reports menu item, select the Community tab. Enter Location in the Module filter, choose Crystal from the Display Type filter, and click **Apply Filters**. Select the Run Report icon a next to a report.

Test functions dependent on the X Window System (X).

SAP Crystal Reports: In the My Reports menu item, select the Community tab. Enter Capital Project in the Business Object filter, choose All from the Display Type filter, and click Apply Filters. Select the Run Report icon a next to a report.

Open or create a new Capital Project. In the Schedule tab, Add or test a Schedule Task in the Project Tasks section. In the Schedule Task line item, change one of Planned Start, Planned End, or Planned Working Hours. The other fields should adjust accordingly.

If CAD Integrator will be used, select the following options:

Sign in as a user with a CI license.

Sync a drawing with CI.

Verify that the server.log exists and is being written to. The server.log is located in the log directory of the IBM TRIRIGA install, for example C:\Tririga\log\server.log.

Check the server.log for any major exceptions on first startup.

If the environment being verified is a performance environment like Production, check TRIRIGAWEB.properties to make sure ProductionMode=Y instead of the default value of N.

A day or so after the install, verify in the Process Server server.log that the Cleanup process completed successfully. Verify this on a regular basis.

4. IBM TRIRIGA Software Configurations

This guide provides details about some of the key areas that need to be configured for the IBM TRIRIGA Application Platform and the applications that run on it to work properly. Although the installer provides most of the configurations necessary, it is important to understand what the various configurations are and where changes can be made to optimize your environment.

Properties Files

The IBM TRIRIGA properties files are located in the config directory of your IBM TRIRIGA installation, for example, C:\tririga\config.

The properties files use the concept of "name-value pairs" where a variable name is followed by an equals sign (=) and then the defined value. Lines in the properties files that begin with a pound sign (#) are comments and not read by the system. Name-value pairs are case sensitive.

Some properties need to be set only when they apply to your company implementation of IBM TRIRIGA.

TIP: The variables and settings in IBM TRIRIGA properties files may change from one version to the next. Before upgrading from a prior version of IBM TRIRIGA software, save your old properties files. After completing your upgrade install, carefully review each newly installed properties file and adjust values as appropriate for your implementation.

Information about the IBM TRIRIGA properties files for Crystal is included here. For more information about the IBM TRIRIGA properties files, go to the IBM TRIRIGA Application Platform 3 Knowledge Center and select *Installing IBM TRIRIGA Application Platform*.

TRIRIGACRYSTAL.properties

| Variable Name | Acceptable Values | Description of Use |
|----------------|----------------------|---|
| ReportLocation | Valid path | Where the SAP Crystal Reports rpt files are stored when uploaded into Document Management. This should be the install /userfiles/crystalreports directory. |
| | | For example: C:/Tririga/userfiles/crystalrepor ts |
| RasHost | Host name | The Crystal Decisions Report Application Server. |
| AppHost | String | The URL used to view an offline SAP Crystal Report. The value must be a valid host name (not localhost, not |

| Variable Name | Acceptable Values | Description of Use |
|-----------------|----------------------|--|
| | | 12.34.56.78). Include the port number if the Application Server is not using port 80 (e.g., term4.ibm.com:8001). Do not include the protocol (http://) or the path (/index.html). |
| TRIRIGAIBS_ODBC | String | Any Crystal report that runs direct SQL against an IBM TRIRIGA database must have a data source named TRIRIGAIBS. This refers to an ODBC entry that resides on the Crystal RAS server. |
| | | A single RAS server can service any number of IBM TRIRIGA database servers. Do not use this for a production RAS server, but it can be useful in other environments, such as development. |
| | | The TRIRIGAIBS_ODBC property configures which ODBC entry on the Crystal RAS server the reports will use. Begin by creating ODBC entries on the RAS server, one for each database hosting an IBM TRIRIGA instance to be supported by the RAS server. In the IBM TRIRIGA application server, configure the TRIRIGAIBS_ODBC property to indicate which ODBC entry should be used for reports run from that server. At runtime, the TRIRIGAIBS data source is replaced in the report with the name of the ODBC entry specified in the TRIRIGAIBS_ODBC property. |
| | | If a value is specified in the TRIRIGAIBS_ODBC property, the TRIRIGAIBS value in a Crystal report will be replaced with that value. If the property is left blank, the TRIRIGAIBS data source will remain in the report. |
| ReportUserLogon | String | The username used to logon to non-IBM TRIRIGA data sources that are used in reports. |
| | | O NOTE: This value can be plain text or encrypted. See the <i>IBM TRIRIGA</i> <i>Application Platform 3 Administrator</i> <i>Console User Guide</i> for information about the encryption tool. |

| Variable Name | Acceptable Values | Description of Use |
|----------------------------|----------------------|--|
| ReportUserPassword | String | The password for the logon to non-IBM TRIRIGA data sources used in reports. |
| | | O NOTE: This value can be plain text or encrypted. See the <i>IBM TRIRIGA</i> <i>Application Platform 3 Administrator</i> <i>Console User Guide</i> for information about the encryption tool. |
| CRYSTAL_MEMORY_USAGE_LIMIT | 0 - 100 Blank | The maximum percentage of available server memory that can be used while assembling query results for a Crystal report. If this percentage is exceeded, the query errors out due to insufficient memory. If this is caused by an interactive Crystal report, the following error message is displayed: "Error Occurred. There are not enough resources available to run the report at this time [MID-xxxxx]", where |
| | | Before the report actually fails, the platform attempts to reclaim unused memory by doing a garbage collection. This garbage collection has the potential to momentarily slow other activity on the system. Any attempt to reclaim unused memory will have an INFO-level log entry in the server.log. |
| | | If you see a "There are not enough resources available to run the report" error for a query, it is likely that the query was the cause of the error; however, it also is possible that other concurrent processes could have consumed memory while the query was assembling its results. |
| | | Valid values are between 0 and 100. Values of 0 and 100 essentially disable any limit being enforced. Do not use either value because a single query initiated by a single user could run the server out of memory. |
| | | An empty value or an invalid value is treated as a default value. |
| | | The default value is 35. |

| Variable Name | Acceptable Values | Description of Use |
|-----------------------------|----------------------|--|
| CRYSTAL_REQUEST_SERVER_PORT | Number | A Crystal Request Server resides within the IBM TRIRIGA Application Server. When present, this property specifies the listening port on the IBM TRIRIGA server that handles Crystal RAS Query Requests. If no port is specified, the system selects an available port. |
| ServletUser | String | The username that is hard coded to prevent manual requests for portal and section reports. |
| | | • NOTE: This value can be plain text or encrypted. See the <i>IBM TRIRIGA</i> <i>Application Platform 3 Administrator</i> <i>Console User Guide</i> for information about the encryption tool. |
| ServletPassword | String | The password that is hard coded to prevent manual requests for portal and section reports. |
| | | • NOTE: This value can be plain text or encrypted. See the <i>IBM TRIRIGA</i> <i>Application Platform 3 Administrator</i> <i>Console User Guide</i> for information about the encryption tool. |
| ReportCacheSize | Number | The number of reports that can be cached, meaning that they will not have to be reprocessed while navigating through the report. |
| OwnPage | true | The default value is true. |
| | false | |
| DisplayLogo | true | If set to true, the Crystal Business Objects/SAP logo is displayed in the viewer. |
| | false | The default value is false. |
| EnableDrillDown | true | If set to true, drill down is enabled. |
| | false | The default value is true. |
| ExportButton | true | If set to true, the Export Button is displayed. |

| Variable Name | Acceptable Values | Description of Use |
|----------------------|----------------------|---|
| | false | The default value is true. |
| GotoPageButton | true | If set to true, the Goto Page button is |
| | false | text box into which the user can type a page number to navigate to a specific page in the report. If set to false, the HTML returned displays the current page but does not allow the user to navigate by page number. |
| | | The default value is true. |
| ToolPanelViewType | GroupTree | The default value is None. |
| | ParameterPanel | |
| | None | |
| GroupTreeToggle | true | If set to true, the group tree toggle button is displayed |
| | false | The default value is true |
| | | The default value is true. |
| ParameterPanelToggle | true | If set to true, the parameter panel toggle button is displayed. |
| | false | The default value is true |
| MultiplePages | true | If set to true, the report is displayed as multiple pages. If set to false, the report is |
| | false | displayed as one long page. |
| | | The default value is true. |
| PageNavigation | true | If set to true, the page navigation buttons |
| | false | The default value is true. |
| PrintButton | true | If set to true, the Print button is displayed. |
| | false | The default value is true. |
| PrintMode | ActiveX | Controls the report print feature. |
| | PDF | If set to ActiveX, users print a report from their browser using ActiveX control. The client Web browser must support ActiveX |

| Variable Name | Acceptable Values | Description of Use |
|--------------------|----------------------|--|
| | | control. |
| | | If set to PDF, users save a report as a PDF file and print it from Adobe Reader. |
| | | The default value is ActiveX. |
| RefreshButton | true | If set to true, the Refresh button is displayed. |
| | false | The default value is true. |
| SearchButton | true | If set to true, the Search button is displayed. |
| | false | The default value is true. |
| Toolbar | true | If set to true, the toolbar is displayed. |
| | false | The default value is true. |
| ZoomFactorList | true | If set to true, a zoom factor list is displayed. |
| | false | The default value is true. |
| DrillDownTabs | true | If set to true, drill down tabs are displayed. |
| | false | The default value is true. |
| ToolPanelWidthUnit | Pixel | The unit of measure for the tool panel width. |
| | | The default value is pixel. |
| ToolPanelWidth | Number | The width of the tool panel in the units specified in ToolPanelWidthUnit. |
| | | The default value is 200. |
| StartPage | Number | The page number of the beginning of a report. |
| | | The default value is 1. |
| ZoomFactor | Number | Sets the zoom factor for displaying a report. |
| | | The default value is 100. |

| Variable Name | Acceptable Values | Description of Use |
|--------------------|----------------------|---|
| ViewerTitle | String | The title displayed at the top of the viewer. |
| | | The default is IBM TRIRIGA Report Viewer. |
| HyperLinkTarget | _self _parent | The hyperlink target for displaying the HTML. _self displays the HTML in the same frame |
| | _top _blank | _parent displays the HTML in the same frame or window that contains the current frameset |
| | | _top displays the HTML in the entire browser window |
| | | _blank displays the HTML in a new browser window |
| | | The default value is _blank. |
| StyleSheetLocation | Name | The name of the style sheet. |
| | | The default value is tririga.css. |
| ReportLifeSpan | Number | How long a report generated by the Report Queue Agent should exist on the disk after it has been created. |
| | | The default value is 15. |
| ReportCleanTime | 0 - 23 | The hour at which the reports that have passed the ReportLifeSpan limit are deleted, in 24-hour time. |
| | | The default value is 2. |

TRIRIGAWEB.properties

| Variable Name | Acceptable Values | Description of Use |
|----------------------|----------------------|--|
| ReportQueueAgentLoad | Number | The number of threads in proportion to the number of connections (e.g., 100.0) |

| ReportQueueAgentMaxThreads Number The maximum number of threads be used to run queued reports. If | ariable Name | Acceptable Description of Use Values | |
|---|---------------------------|---|--------------------|
| | eportQueueAgentMaxThreads | Number The maximum number of threads the used to run queued reports. If the no upper limit, set to 0. | iat can iere is |

5. Working with SAP Crystal Reports

Setup for Data Sources

There are two different types of Crystal reports: form reports and query reports. Form reports are used most often to display the contents of a single record. Form reports generated by SAP Crystal Reports contain data from one top-level record. They may contain data from one or more associated records and are used to create reports users can select on the Reports tab of a record or when a user clicks **Form** for a single record. Query reports are used most often to display multi-record reports. Query reports may contain data from any number of top-level records and multiple levels of detail that are accessible through associated business objects and records.

You can use SAP Crystal Reports to create form reports as well as query reports.

IBM TRIRIGA is a web-based application and its data structure is defined in the Data Modeler. The data schema for IBM TRIRIGA business objects is available through ADO XML. You can connect to IBM TRIRIGA data either through ADO XML or by direct database access. The following chart summarizes the pros and cons of each approach. This chapter assumes your choice is the ADO XML approach.

| Connection Method | Pro | Con |
|--|--|---|
| ADO XML | Report development is easier Each field of a business object (including smart section field) is available in the XML Naming conventions used by XML make it easy to locate any field (Section Name_Field Name) IBM TRIRIGA security is enforced on the data that is being accessed Can take advantage of associations Can use IBM TRIRIGA filters | Performance is slower than through directly accessing the data from the tables During development, report has to be uploaded into Document Manager each time to test the report |
| Direct connection to IBM TRIRIGA database | Performance is better, since you are directly connected to database Testing can be done, by saving the RPT and running it directly from the local machine RPT file can be uploaded into Document Manager only once | Developer needs to be familiar with the IBM TRIRIGA database schema, naming convention, and the like Unlike XML, explicit joins need to be made from one table to another Bypasses IBM TRIRIGA security rules If the database schema changes, the reports may need to be |

| Connection Method | Pro | Con |
|----------------------|-----|---------|
| | | updated |

An ADO XML data source needs to be set up on any machine that will be used to develop Crystal reports. This allows the Crystal Designer to retrieve the data structure information defined by the form (for a form report) or query (for a multi-record report) ADO XML files.

If you are familiar with Microsoft Corporation's .NET technology, you may be aware that ADO.NET can use ADO XML files as a data source. The files that the IBM TRIRIGA Application Platform generates are not intended to be used as true data sources. They are intended to be used with SAP Crystal Reports to design reports. They only contain a single row of metadata information representing the IBM TRIRIGA object data structure to help you lay out a report.

You only need to set up for data sources once on a Crystal report developer's computer. Begin establishing the Crystal data sources you will need to create form reports and query reports by creating the following directory structure on a computer that will be used for designing Crystal reports.

- First, create a folder named XML_Data_Source.
- Create a folder within XML_Data_Source named Forms.
- Create another folder within XML_Data_Source named Queries.

Form Reports

Form reports are used in a record's Reports tab or when a user clicks the **Form** action for a single record. Before creating a Crystal report for a form report, review the information displayed automatically by the system when the user clicks the Print Preview link. Form reports generated by SAP Crystal Reports contain data from one top-level record. They also may contain data from one or more associated records contained within query sections on the top-level record's form.

You only need to create a data source for form reports once on a Crystal report designer's computer.

If you wish to include associated records that are contained within query sections of the top-level record's form you do not need to create a separate query-based ADO XML data source. The Forms ADO XML files will contain the top-level business object definition as well as business object definitions for all associated objects represented within query sections on the top-level record's form. When a form Crystal report runs, the IBM TRIRIGA Application Platform returns the top-level record and only those associated records contained within the top-level record's query sections. No joins need to be defined within the Crystal report as all data is pre-filtered for inclusion on the report.

The remaining steps in this section are the same for each form report you wish to create:

- Use the Form Builder to create the ADO XML
- Design and create the Crystal report

- Put the report file into the Document Manager
- Add the report to the form

The examples in this section use a report that list an employee's information.

Create a Data Source

You only need to create a data source for form reports once on a Crystal report designer's computer. Follow these steps to create the data source for the report.

Step

Click Start > Settings > Control Panel.
 Select Administrative Tools.
 Select Data Sources (ODBC).
 Select the System DSN tab.
 Click Add.
 Select CR XML ODBC Driver 6.0.
 Click Finish.
 Enter TririgaFormsXML in Data Source Name. No other name should be used for this value.
 Click Add to add a location.

Add a location named Forms to the TririgaFormsXML data source using the Forms directory as the source:

- 10. Enter Forms in Location Name.
- 11. Select the Folder radio button in *Location Type*.
- 12. Click the box and find the XML_Data_Source\Forms directory you created <u>earlier</u>.
- 13. Click Apply.
- 14. Select the Advanced tab.

| 15. In <i>Table Creation</i> , select the ADC format. | Format radio button. The data source location then uses ADO |
|---|---|
| 16. Click Apply. | |
| To finish, | |
| 17. Click Close. | |
| 18. Click OK . | |
| 19. Click OK . | |

Use the Form Builder to Create the ADO XML

The ADO XML files contain information about the data in the IBM TRIRIGA system that the report will run against.

You will find naming conventions for reports in Naming Conventions in this user guide.

Step

- 1. Select the Form Builder option from the Application Builder portal section.
- 2. Scroll the Module panel and select the module for the report (in this example, triPeople).
- 3. Select the form in the right panel by selecting the radio button (in this example, triEmployee).
- 4. There are two ways to select the ADO XML:

Either,

(1) Click the ADO XML v2 action on the section bar.



Note - The ADO XML v1 action is for legacy reports created prior to TRIRIGA Application Platform 2.7.0.

Or,

(2) If the form is published, open the form and click the ADO XML v2 action on the Layout tab.



Note - The ADO XML v1 action is for legacy reports created prior to TRIRIGA Application Platform 2.7.0.

The platform generates a zip file that contains the ADO XML files SAP Crystal Reports will use.

- 5. Click Save.
- 6. Save the zip file in the XML_Data_Source\Forms directory created in <u>Setup for Data</u> <u>Sources</u>.
- 7. Extract the contents of the zip file into the Forms directory.



Tip - See <u>ADO XML v2 Formats</u> for an explanation of the name format.



Note - For form query sections, the platform only pulls the Display Columns, the field labels, and the UOM fields from the backing query of the query section.



Attention - Do not rename the XML files.



Tip - After you finish creating a report, open the XML_Data_Source \Forms folder and delete the files. When you do so, the next time you create a report you only will be working with the XML files for the new report.

Design and Create the SAP Crystal Report

Explaining how to use SAP Crystal Reports to design a report is beyond the scope of this user guide. Any good book on designing reports for SAP Crystal Reports should be helpful.



Note – For information about form reports when you have selected the ADO XML v1 action, go to <u>ADO XML v1</u>.

An important detail you should be aware of when you are designing a form report: For every field in the report there will be two fields available in SAP Crystal Reports. One field will have the same name as the field. The other field will have the name of the field followed by _Label.

For example, the General section of an Employee record has a field named triNameTX. In a form report, SAP Crystal Reports will see a field named triPeople_triEmployee_triNameTX that contains the value of the triNameTX field. SAP Crystal Reports also will see a field named triPeople_triEmployee_triNameTX_Label that contains the label for the triNameTX field. When you put a label in a report, use the field name ending with _Label instead of a text object. This ensures the label for the field stays consistent with the label specified for the field in the form. If the field label is changed in the form, the field label will show the new value the next time the report is run.

Another benefit of using the field name ending with _Label instead of a text object is that it allows the report to take advantage of the IBM TRIRIGA Application Platform's internationalization support for labels. If configured to do so, the platform can supply labels in the language preferred by the user. For more information, go to the IBM TRIRIGA Application Platform 3 Knowledge Center and select Administering IBM TRIRIGA Application Platform > Localizing applications.

The following example uses the XML extracted in the previous section and the Standard Report Creation Wizard to show some of the steps in designing and creating a Crystal form report:

Step

- 1. In the Available Data Sources panel, expand the Create New Connection folder.
- 2. Click the + next to ODBC (RDO).
- 3. Select TririgaFormsXML in the Data Source Name list.
- 4. Click Finish.
- 5. In the Available Data Sources panel, expand the XML node under ODBC (RDO)\TririgaFormsXML.
- 6. Select the table with the same name as the module your report belongs to (in this example, [v2B0]triPeople_triPeople).



Tip - See <u>ADO XML v2 Formats</u> for an explanation of the name format.

- 7. Click the right facing arrow to move the table to the *Selected Tables* panel.
- 8. Click Next.
- 9. In the *Available Fields* panel, select the fields you want on your report and use the right facing arrow to move them to the *Fields to Display* panel.



Tip - See <u>ADO XML v2 Formats</u> for an explanation of the name format.



Note - As described <u>above</u>, there are two fields for each field in the database. The one ending _Label is the field label from the form.

10. Click Next three times to bypass the Grouping and Record Selection options.

11. Click Finish to close the wizard.

12. Select the File menu and make sure the Save Data with Report option is NOT checked.

- 13. Arrange the fields as desired.
- 14. Save the report as a .rpt file.



Tip - Note the location where you save the file.

Put the Report File into the Document Manager

For detailed instructions on how to use the Document Manager, see the IBM TRIRIGA 10 Document Management User Guide.

Step

- 1. Select the Document Manager from Tools menu item in the first level of the menu bar.
- 2. Expand the IBM TRIRIGA folder.
- 3. Select the folder corresponding to the module of the report (in our example, People).



Tip - Some companies prefer to create new folders for customized reports or folders for individuals.

- 4. Click New Document.
- 5. Click Browse... and select the rpt file you created.
- 6. Enter a Document Name.
- 7. Enter other fields per your company's policies and procedures.
- 8. Click Upload.
- 9. Click OK when the upload process completes. The report now shows in the list in the Document Manager.

Add the Report to the Form

Step

1. Return to the Form Builder.

2. Open and **Revise** the form for which you developed the form report (in our example, triEmployee).



Tip - If you want this report to appear in the Reports tab, ensure the *Show Reports* property is selected on the Layout tab.

- 3. Select the Includes/Forms tab.
- 4. Click Add on the Forms section bar.
- 5. Search for and select the document you uploaded into the Document Manager.
- 6. Click OK.
- 7. Return to the Layout tab and Publish the form.

To Make Changes to a Form Report

If changes need to be made to a form report, you will need to check out the report from the Document Manager, make your changes, and check in the report. The *IBM TRIRIGA 10 Document Management User Guide* describes this process in detail.

Step

- 1. To check out the file, locate the file in the Document Manager and click the Check Out icon 🖄.
- 2. Enter an appropriate *Comment*.

3. Click Check Out.

Select the option that best matches your requirement:

- 4. Click Open to create a temporary file named <filename>[1].rpt that opens in Crystal.
- 5. Click **Save** if you do not have a copy of the .rpt file or if you are not sure that the file you have is the most current.
- 6. Click **Cancel** if you have been working on the report in Crystal. This changes the status in the Document Manager without copying the file anywhere.
- 7. Make your changes to the report and save the file.
- 8. Upload the new version by checking the file back in to the Document Manager. Start by selecting the Check In icon 🖏.

Query Reports

Query reports may contain data from any number of top-level records. They also may contain multiple levels of detail that are accessible through associated business objects and records. Most often query reports are used to display multi-record reports.

You only need to create a data source for query reports once on a Crystal report designer's computer.

You do not need to create a data source for queries if you are designing a form report for a record that contains query sections.

The steps are the same for each query report you wish to create:

- Use the Report Manager to create a source query and the ADO XML
- Design and create the Crystal report
- Put the report file into the Document Manager
- Create an External IBM TRIRIGA report in the Report Manager to link to the Crystal report (.rpt) file
- View the report from the manager

The examples in this Query Reports section use a report that lists employees.

Create a Data Source

You only need to create a data source for query reports once on a Crystal report designer's computer. Follow these steps to create the data source for the report.

Step

- 1. Click Start > Settings > Control Panel.
- 2. Select Administrative Tools.
- 3. Select Data Sources (ODBC).
- 4. Select the System DSN tab.

5. Click Add.



Note - The TririgaIBS data source is defined on the Crystal server.

- 6. Select CR XML ODBC Driver 6.0.
- 7. Click Finish.
- 8. Enter TririgaQueriesXML in Data Source Name. No other name should be used for this value.
- 9. Click Add to add a location.

Add a location named Queries to the TririgaQueriesXML data source using the Queries directory as the source:

- 10. Enter Queries in Location Name.
- 11. Select the Folder radio button in *Location Type*.
- 12. Click the work and find the XML_Data_Source\Queries directory you created earlier.

13. Click Apply.

- 14. Select the Advanced tab.
- 15. In *Table Creation*, select the ADO Format radio button. The data source location then uses ADO format.
- 16. Click Apply.

To finish,

- 17. Click Close.
- 18. Click OK.
- 19. Click OK.

Use the Report Manager to Create a Source Query and the ADO XML

The following steps create a new query that will provide the Crystal report with the data structure needed to design the report and the data for the report runtime.

The ADO XML file contains the information about the data in the IBM TRIRIGA system that the report will run against.

If you have questions about how to use the Report Manager, see the <u>IBM TRIRIGA Report Building</u> chapter in this user guide. You will find naming conventions for queries in <u>Naming Conventions</u>.

- 1. Select the System Reports tab on the My Reports menu item.
- 2. Click New.
- 3. Complete the General tab. The *Type* must be Query.



Note - Do NOT choose Type = External for the source query.

- 4. Select the fields in the Columns tab.
- 5. Select the Group By and Order By values in the Order & Group tab.
- 6. Add any filters in the Filters tab.



Tip - Always filter the data as much as possible in the IBM TRIRIGA source query.

7. In the Advanced tab, click ADO XML v2.



Note - The ADO XML v1 action is for legacy reports created prior to TRIRIGA Application Platform 2.7.0.

The platform generates an XML file containing the ADO XML information SAP Crystal Reports will use.

- 8. Click Save.
- Save the XML file in the XML_Data_Source\Queries directory created in <u>Setup for Data</u> <u>Sources</u>.



Attention - Do not change the file name.



Tip - After you finish creating a report, open the XML_Data_Source \Queries folder and delete the file. When you do so, the next time you create a report you only will be working with the XML file for the new report.

Design and Create the Crystal Report

Explaining how to use SAP Crystal Reports to design a report is beyond the scope of this user guide. Any good book on designing reports for SAP Crystal Reports should be helpful.



Note – For information about query reports when you have selected the ADO XML v1 action, go to <u>ADO XML v1</u>.

The following example uses the XML extracted in the previous section and the Standard Report Creation Wizard to show some of the steps in designing and creating a Crystal query report:

Step

To create a connection to the XML file,

- 1. In the Available Data Sources panel, expand the Create New Connection folder.
- 2. Click the + next to ODBC (RDO).
- 3. Select TririgaQueriesXML in the Data Source Name list.
- 4. Click Finish.
- 5. In the Available Data Sources panel, expand the XML node under ODBC (RDO)\TririgaQueriesXML.
- Select the table with the same name as the XML file (in this example, [v2QRY]triPeople_triPeople...).



Tip - See ADO XML v2 Formats for an explanation of the name format.

- 7. Click the right facing arrow to move the table to the Selected Tables panel.
- 8. Click Finish.



Tip - Click File > Options. Select the Layout tab. Turn off the *Insert Detail Field Headings* field option. Also, on the Database tab, select *Sort Fields Alphabetically*.

9. Add fields to the report.



Tip - See ADO XML v2 Formats for an explanation of the name format.

10. Select the File menu and make sure the Save Data with Report option is NOT checked.

11. Save and exit the report.

Put the Report File into the Document Manager

For detailed instructions on how to use the Document Manager, see the *IBM TRIRIGA 10 Document Management User Guide*.

Step

To find the Document Manager, select the Tools menu item on the first level of the menu bar, then select Document Manager on the second level of the menu bar.

- 1. Expand the IBM TRIRIGA folder.
- 2. Select the folder corresponding to the module of the report (in our example, People).



Tip - Some companies prefer to create new folders for customized reports or folders for individuals.

- 3. Click New Document.
- 4. Click Browse... and select the rpt file you created.
- 5. Enter a Document Name.
- 6. Enter other fields per your company's policies and procedures.
- 7. Click Upload.
- 8. Click **OK** when the upload process completes. The report now shows in the list in the Document Manager.

Create a Crystal IBM TRIRIGA Report in the Report Manager

This creates a new IBM TRIRIGA query as an External query. This query will act as a link to the Crystal .rpt file in the Document Manager.

If you have questions about how to use the Report Manager, see the *IBM TRIRIGA Application Platform* 3 Reporting User Guide.

Step

1. Select the System Reports tab on the My Reports menu item.

2. Click New.

In the General tab, the *Type* must be External.

3. In the Business Objects sub-tab, for *Business Object*, specify where users will be able to see this Crystal report. This value does not define the data that is available to the Crystal report (that was done <u>above</u>), rather it specifies where a user can access the Crystal report.



Tip - To select multiple items, hold the Ctrl or Shift key and click your selections.

In the Options sub-tab,

- 4. Select the Search icon P next to Document.
- 5. In the IBM TRIRIGA Data Search form, point the query to the Crystal report you put into the Document Manager and click Accept.



Tip - In the IBM TRIRIGA Data Search form, use the % character as a wild card to widen your search from the first word to any word in the name. For example, type %Employee to find a report with the word Employee anywhere in the name.

The *Queued* check box is available only when the report Type is External. Selecting the Queued check box indicates the report is to be run in a queued manner.

If a queued report has runtime filters and/or Crystal filters, they are presented to the user before the report is queued, just like they are for a non-queued report.

Queued Crystal reports may be launched from and/or are accessible from the following places: My Reports, Manager query lists, Report Manager, and query sections.

The following access points are not supported for queued reports: Portal Sections (if a queued report is attached to a portal section, the system launches it in a non-queued manner) and form actions.



Note - When a queued report finishes processing, the system sends a notification to the user's Notifications portal section. The user can access the report by clicking the hyperlinked Subject.



Attention - A queued Crystal report attached to a workflow notification executes along with the notification. However, if the report contains filters that do not have a default value, the report generation may error out because there is no user to provide the values. Set the default values for all filters when you define such a report.

6. If appropriate, select the *Queued* check box.

View the Report

In this example, the Crystal report is in the Community tab.

Step

1. Select the Run Report icon 🖨. The system generates the report and displays it in a separate window.

To Make Changes to a Query Report

If changes need to be made to a query report, you will need to check out the report from the Document Manager, make your changes, and check in the report. The *IBM TRIRIGA 10 Document Management User Guide* describes this process in detail.

Step

- 1. To check out the file, locate the file in the Document Manager and click the Check Out icon 💆.
- 2. Enter an appropriate *Comment* and click Check Out.

Select the option that matches your requirement:

- 3. Click Open to create a temporary file named <filename>[1].rpt that opens in Crystal.
- 4. Click **Save** if you do not have a copy of the .rpt file or if you are not sure that the file you have is the most current.
- 5. Click **Cancel** if you have been working on the report in Crystal. This changes the status in the Document Manager without copying the file anywhere.
- 6. Make your changes to the report and save the file.
- 7. Upload the new version by checking the file back in to the Document Manager. Start by clicking the Check In icon 🕲.

Printing Crystal Reports

IBM TRIRIGA offers two modes for printing Crystal reports. One uses ActiveX control to send a report directly to the printer. The other exports a report to a PDF file that can be printed from Adobe Reader. For the ActiveX mode, the client Web browser must support ActiveX control.

 The PrintMode property in the TRIRIGACRYSTAL.properties file determines which mode your users experience. The default is ActiveX, which sends a report directly to the printer. To export a PDF file, set the property to PDF. Additional information about setting the PrintMode property in the TRIRIGACRYSTAL.properties file can be found in the TRIRIGACRYSTAL.properties section.

Naming Conventions

IBM TRIRIGA follows a set of naming conventions in its applications and in custom development that it does on behalf of its customers. Follow these naming conventions to reduce unexpected interactions between IBM TRIRIGA's applications and applications created by others and to help ensure that future upgrades go more smoothly.

| Element | Naming Convention | aming Convention | |
|-----------------|---|--|--|
| Name Prefix | A three character typically cst. For | customer prefix is assigned to all implementations, IBM TRIRIGA applications, the prefix is tri. | |
| Report or Query | cst+"-" + Form N Report/Graph) - K | st+"-" + Form Name (or Business Object Name or Module Name if port/Graph) - Keyword - Context | |
| | There are no space | es between the cst- and the tri object name. | |
| | For example: cst Current Year | -triPurchaseOrder - Workflow - POs for | |
| | If the query refere | ences a new or customized object: | |
| | Form Name (or Business Object Name or Module Name) · Context | | |
| | For example: cst Details | Employee – Crystal – Employee Contact | |
| | Keywords are: | | |
| | Crystal | Query with linked Crystal rpt document | |
| | Debug | Query to help isolate data issues | |
| | Display | Query to display data in query sections | |
| | Filter | Query to filter data for other queries via Association filters | |

| Element | Naming Conventio | on | |
|----------------------------|---|--|--|
| | Find | Query for Find action of a locator or section | |
| | Formula | Query to provide input values for extended formulas | |
| | Graph | Graph reports intended for end users | |
| | Graphics | Graphics Editor report | |
| | GUIMetric | Query for metric in a form | |
| | HGrid | Hierarchical query for nesting queries | |
| | Patch | Query used in patch helpers | |
| | Portal | Query for portal section | |
| | Report | Report intended for end users | |
| | Reserve | Calendar/Reserve-based query of data associated with record | |
| | Summary | Summary Report intended for end users | |
| | Subquery | For the bottom level of an HGrid query structure | |
| | Workflow | Query for workflow Query task | |
| Cc fil \$\$ ty | Context should inc filters, if editable \$\$RECORDID\$\$ of type of context re | clude filters to states, data filters, association , and the like. For queries tied to a r other platform key, make sure to include the cord in the context part of the name. | |
| I (| umbering standards for reports. SYSTEM is reserved for IBM TRIRIGA elivered reports. | | |
| Na Fo Co Fo Em | Naming Conventio | on for Labels: | |
| | Form Label (or Bu | siness Object Label or Module Label) - Context | |
| | Context should de | scribe what the report displays to the user. | |
| | For example: Emp. Employees | loyees – All Associated Active | |

Crystal Reports Tips

| Торіс | Тір |
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| \$\$DATEFORMAT\$\$ | Return the \$\$DATEFORMAT\$\$ variable to a Crystal report to indicate which date format is preferred by a user. This way the report design can account for the different options present in your user |

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| | community. |
| Add A Field | If the field was selected in the original design, modify the Crystal report and check the updated version into the Document Manager. |
| | If the field was not in the original design, |
| | • For a form report, recreate the ADO XML and update the Crystal report. |
| | • For a query report, open the query and add the field. After applying your changes, recreate the ADO XML file. Update the Crystal report. |
| | In Crystal you will need to select Database > Verify Database to refresh the dataset with the new field that was added to the IBM TRIRIGA query. |
| Bulk Printing | Follow these steps to bulk print Crystal reports: |
| | 1. Go to the Data Modeler and verify that the triRecordIdSY field exists on the business object of the records you will be printing. If not, find the field and add it to the business object's General section. |
| | 2. Create a query for the business object you will be printing to return only the triRecordIdSY field. You can add static field filters and/or association filters to modify result set. For example, if the records to be printed will be determined by the user selecting them in a query section, you might use an association filter to filter using the \$\$RECORDID\$\$ record (i.e., the record containing the query section) for the selected records. |
| | 3. On the Advanced tab of the query, click the ADO XML v2 action. Click Save when prompted and copy the name of the ADO XML file given without the [v2QRY] prefix and without the .xml extension. Cancel out of the download prompt. There is no need to save the XML document as you only need the name. You will need this name later to build the URL to send to Crystal. |
| | 4. In the Document Manager, find the report you want to print in bulk. Open it and copy either the File Path value, or get the documentId by right-clicking on the link used to open the document record, going to properties and copying the docId from the Address (URL) path there. The address will be something like javascript:openDocument(4054908); Copy the number from within the parentheses. |
| | 5. The URL that is built takes either parameter("reportPath" or |

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| | | "docId"), but not both. By using the docId as an attribute in the RepBuilder.jsp URL (see example below), you have the ability to move the report around in the Document Manager without having to go back to the bulk printing URL later and change the path. The docId will always remain the same. |
| | 6. | Now that you have everything set, you can build your URL. |
| | | Take the name of the ADO XML file you copied earlier (omitting the $[v2QRY]$ prefix and the .xml at the end of it). This is what your queryName will be. |
| | | For this explanation, we'll just call it "theQueryName". The real name will be long and may resemble something like this: |
| | | triItemtriMoveRequestLineItemtriMoveRequestLi neItem_BulkPrint |
| | | The URL takes exactly 4 parameters: |
| | | 1. source (which is always "bulk") |
| | | 2. version (which is always "2") |
| | | 3. queryName (equal to "theQueryName") |
| | | 4. then one of the following: |
| | | a. docId (which is the docId of the report you want to bulk print) |
| | | OR |
| | | b. reportPath (which is the path of the report you want to bulk print) |
| | | Your final URL will look something like the following: |
| | | <pre>/html/en/default/common/RepBuilder.jsp?source=bul k&version=2&queryName=theQueryName&docId=1234</pre> |
| | | OR |
| | | /html/en/default/common/RepBuilder.jsp?source=bul k&version=2&queryName=theQueryName&reportPath=\RO OT\Report1.rpt |
| | | Depending on which of the optional parameters you use. |

| Торіс | Тір | |
|---|-----------------------------------|--|
| | | For example: |
| | | <pre>/html/en/default/common/RepBuilder.jsp?source=bul k&version=2&queryName=triTasktriInspectionTasktriInspectionTask_Selected_Tasks_Bulk_Print&docI d=1488586</pre> |
| | 7. | Now that you have your URL, you will need to place it anywhere in the system that can take a custom URL, or you can simply cut and paste the URL into the address bar of your browser, as long as you still have a valid session open. |
| | | For example, you can place a link in a smart section and put the above URL as the hyperlink. If you decide to do this, and you chose to use the File Path as your last parameter, you will need to escape or URLEncode the path backslashes. Otherwise it will not work because the hyperlink is passed using JavaScript and the non-encoded characters will break the JavaScript code. |
| | 8. | Click the link you created in the previous step. The system runs the query you set up in step 2 to return only the business object Record Ids. It uses the data from all of those records in the Crystal report identified in step 4. In Crystal, you may want to modify the report to group and/or page the data by a field such as triRecordIdSY, thus giving you a bulk printing solution. |
| Cleanup | Afte XMI Whe wor | er you finish creating a report, delete the files from the Data_Source\Forms Or XML_Data_Source\Queries folder. en you do so, the next time you create a report you only will be king with the XML files for that report. |
| Could not get metadata for report Error | An e Dire by a | error like this indicates either the Report Directory or Temp ectory is invalid. In most situations, the invalid path is left behind a previous version of RAS server. |
| System cannot find the file specified Error | Mak Crys vali req the | the sure the paths are valid. In order to work with IBM TRIRIGA, the stal RAS server needs each of these values to be populated with a d directory path. The IBM TRIRIGA Application Platform does not uire any specific structure for these directories, and they can be same path. |
| Crystal Selections | Can | be used in the same report as IBM TRIRIGA filters. |
| | Whe to r | enever possible use IBM TRIRIGA filters on the IBM TRIRIGA query ninimize the size of the XML file. |
| | Use Cry: | Crystal selections to further limit records after the join. Use stal parameters to further select data. |

| Торіс | Тір | |
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| Currency | To ensure that null or blank currency values display as \$0.00 when generating reports, take the following steps: | |
| | Open the report in Crystal. | |
| | • Select File > Report Options | |
| | • Select the check box labeled "Convert Database NULL Values to Default". | |
| | • Select the check box labeled "Convert Other NULL Values to Default". | |
| | • Click OK. | |
| | • Save the report. | |
| Filters | When adding a filter to a report: | |
| | • IBM TRIRIGA filters - Use IBM TRIRIGA filters if possible. IBM TRIRIGA filters select the data before it goes to the XML file. The smaller the XML file, the better. | |
| | Adding IBM TRIRIGA filters does not affect the Crystal report code. | |
| | You do not have to check in / check out of the Document Manager. | |
| | • Crystal filters - Use Record Select, Group Select, or Parameters. | |
| IndexOutOfBoundsException | An error like this is a JRC-specific issue. The exception occurs because the parameter used by the Command table is being renamed. This technique works for reports run in a RAS server; however, JRC throws an IndexOutOfBoundsException. | |
| | The workaround is to make sure the parameter used by the Command table matches the one defined in Parameter Fields, as illustrated below: | |
| Java Reporting Component | Java Reporting Component (JRC) is a self-contained set of reporting libraries that run inside an IBM TRIRIGA application server. When a report runs using JRC, the report executes and renders without making calls to the report server. Because of the JRC architecture, it executes and renders reports faster than the traditional report server. JRC is best suited for smaller data sets; run larger data sets on a dedicated report server. | |
| | By default, all form reports run through JRC. | |
| | If a particular report should be run via the report server instead, the report can be configured to use the report server by putting ::DISABLE_CRYSTAL_EMBEDDED_ENGINE:: in the Comments | |

| Торіс | Тір |
|--------------------------|--|
| | section in the SAP Crystal Report property. |
| Maximum Processing Limit | When you run a Crystal report that returns a lot of data, you may get an error on the page stating that the Crystal server has reached its maximum processing limit. By default, Crystal installs with the maximum at 20000. You can change this value in the properties of your Crystal server. Modify the <i>Number of database records to read</i> <i>when previewing or refreshing a report</i> property either to something larger or to -1 for unlimited. |
| Memory Management | No single Crystal report can consume more than a specified amount of the server's available memory. This specified amount is configured in the CRYSTAL_MEMORY_USAGE_LIMIT property in TRIRIGACRYSTAL.properties. If, while running a Crystal report, the platform detects that the configured threshold has been reached, it throws an exception. In the case of an interactive Crystal report, a message stating this information displays to the user. The message says, "Error Occurred. There are not enough resources available to run the report at this time [MID - 32343]", where the MID refers to the message ID of a log entry in the server log. The entry in the log file has additional information about the amount of memory available at the beginning of the query execution and how much was consumed before the query threw the error. |
| Multi-Query Joins | For query reports, a query is created for each table. Note that a query can contain data from many business objects, similar to doing a join prior to the Crystal join. The fewer the queries, the more efficient the report. The queries must have fields that can be joined in Crystal. |
| | The standard join types supported by Crystal are: |
| | • Inner Join - Displays only those records from both tables that have matching values for the linked fields. Inner Joins are used frequently when there is a one-to-one relationship between the left and right tables. Be careful when using Inner Joins on multi-record reports since data from the tables will be omitted if there are no matching values in the linked fields. |
| | • Left Outer Join - Displays all records from the left table and only those records from the right table that have matching values for the linked fields. Left Outer Joins are used commonly for multi-record reports when joining multiple tables. |
| | • Right Outer Join - Displays all records from the right table and only those records from the left table that have matching values for the linked fields. Right Outer Join is not always available. |
| | • Full Outer Join - Displays all data from both tables, but joins the data on the same row if there are matching values for the linked fields. Full Outer Join is not always available. |

| Торіс | Тір | |
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| Streaming | The data from non-form reports that do not contain sub-reports stream from the IBM TRIRIGA server to the Crystal RAS server. | |
| To Display Logos | To display logos in Crystal, you must have direct access to the database. You must connect with access to the data schema. | |
| | 1. Select Database Expert on the SAP Crystal Report. | |
| | 2. Create a new ODBC connection with TririgaIBS as the DSN. Supply the User ID and Password. Select Add Command. | |
| | In the parameter list, create a new parameter called \$\$COMPANYLOGO\$\$ as a numeric field. The default value should be blank. | |
| | 4. In the SQL section, enter the query below. | |
| | Select content from dm_content where content_id = | |
| | With your cursor immediately to the right of the = in the SQL statement, double-click the \$\$COMPANYLOGO\$\$ parameter to insert the parameter into the SQL statement. The resulting statement should read: | |
| | <pre>Select content from dm_content where content_id = {?\$\$COMPANYLOGO\$\$}.</pre> | |
| | 5. Exit the Database Expert. | |
| | From the Field Explorer, Expand Database Fields > Command. Select the Content command that holds the logo and insert it into the Page Header section. | |
| | 7. Right-click the Content field in the page header and select Format Graphic. | |
| | 8. Click the Picture tab and change the Scaling Width to 183%, and Height to 48%. | |
| | 9. When this report is uploaded into the Document Manager, the logo should be visible. | |
| | The logo will not appear until the report is run from within IBM TRIRIGA. | |

ADO XML v1

The ADO XML v1 action is for legacy reports created prior to TRIRIGA Application Platform 2.7.0. Use the ADO XML v2 action whenever possible.

ADO XML v1 does not support a query that contains multiple associated business objects.

The field name format for ADO XML v1 is SectionName_FieldName. For example, RecordInformation_triNameTX, triRealEstateLeaseContract_triNameTX.

With ADO XML v1, the ADO XML generated for a query section in a form for a form report takes all fields from the primary business object.

ADO XML v2 Formats

ADO XML v2 Field Name Format

ADO XML v2 uses the following format to identify fields:

ModuleName_BusinessObjectName_SectionName_FieldName[_Index]

where:

| Element | Description |
|--------------------|--|
| ModuleName | The module of the business object for the field. |
| BusinessObjectName | The business object for the field. |
| SectionName | The section for the field. |
| | The platform does not include "General" section names (e.g., General, RecordInformation). If omitted, you will still see the For example, triProject_triProject_triNameTX. |
| FieldName | The field name. |
| Index | In cases where there is a duplicate field name, for example from a multi-business object source, the platform adds Index to ensure field uniqueness in the ADO XML. |
| | Index is an incremental positive integer. It is used first with the first duplicate occurrence. For example, the first time the ModuleNameFieldName occurs, there is no Index. The second and subsequent times the same ModuleNameFieldName occurs, the platform adds _2, _3, and so on. |



Note - If you change the sequence of fields with duplicate names in the Columns tab, your Crystal report will not be correct. If you change the definition in the Report Manager in any way, you also must change the Crystal report.

If the ModuleName_BusinessObjectName_SectionName_FieldName[_Index] includes a special character, the platform uses the following encoding/decoding characters:

| Special Character | Platform Changes To |
|-------------------|---------------------|
| : (colon) | : (colon-pipe) |
| _ (underscore) | :: (colon-colon) |

For example, if module = triPeople, business object = triPeople, section = ReportsTo, and field = triFirst_Name, the field name is encoded to triPeople_triPeople_ReportsTo_triFirst::Name.

ADO XML v2 Data Source Encoding

ADO XML v2 file names are prefixed with a data source tag. The data source tag identifies the data source type that the XML file contains, and it is in the format [v2<datasourcetag>].

<u>Form reports</u> are used in a record's Reports tab or when a user clicks the **Form** action on a record. For form reports, the ADO XML v2 output is made up of the organization, project, top-level business object, and the business object's sections' ADO XML files. The following table lists the data sources for a form report:

| Prefix | Description |
|--------|--|
| | The ADO XML output for Organization and Project. |
| | These files are of the form [v2SYS]+BusinessObjectName |
| | For example, [v2SYS]Organization |
| [v2B0] | The ADO XML output for the top-level business object. |
| | These files are of the form [v2B0]+ModuleName_BusinessObjectName |
| | For example, [v2B0]triPeople_triPeople |
| [v2SS] | The ADO XML output for smart sections. |
| | These files are of the form [v2SS]+ModuleName_BusinessObjectName_SmartSectionNam e |
| | For example, [v2SS]triPeople_triPeople_triCalendar |

| Prefix | Description |
|--------|---|
| [v205] | The ADO XML output for form query sections. |
| | These files are of the form [v2QS]+ModuleName_BusinessObjectName_FormSectionName |
| | For example, [v2QS]triPeople_triPeople_triPhone |
| [v2CS] | The ADO XML output for smart sections that reference a Link business object. |
| | These files are of the form [v2CS]+ModuleName_BusinessObjectName_SectionName |
| | For example, [v2CS]triPeople_triPeople_triTestSection |

<u>Query reports</u> may contain data from any number of top-level records. They also may contain multiple levels of detail that are accessible through associated business objects and records. Most often query reports are used to display multi-record reports. The following table lists the data sources for a query report:

| Prefix | Description |
|---------|--|
| [v2QRY] | The ADO XML output for query report. |
| | These files are of the form [v2QRY]+ModuleName_BusinessObjectName_QueryName |
| | For example, [v2QRY]triPeople_triPeople_triPeople+- -Reports-To+Manager |

ADO XML v2 Table Name Format

If the ADO XML v2 table name includes a special character, the platform uses the following encoding/decoding characters:

| Special Character | Platform Changes To |
|-------------------|---------------------|
| " " (space) | (hyphen-hyphen) |
| - (hyphen) | - (hyphen-pipe) |
| _ (underscore) | -~ (hyphen-tilde) |

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