

Crystal Reports™ 9 Developer's Guide

Crystal Decisions, Inc.
895 Emerson St.
Palo Alto
California, USA 94301

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Issue 1.

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Contents

Chapter 1: Overview

| | |
|--|---|
| Crystal Reports developer components | 2 |
| Which SDK should you use? | 2 |
| Which viewer should you use? | 3 |
| Migrating from the RDC to RAS | 4 |
| Legacy components | 4 |
| Product registration | 4 |
| Crystal Care technical support | 5 |
| Crystal Training | 5 |
| Crystal Consulting | 5 |

Chapter 2: Developer Application Scenarios

| | |
|--|---|
| RAS scenarios | 8 |
| Crystal Reports for Visual Studio .NET scenarios | 9 |

Chapter 3: Viewers

| | |
|---|----|
| Conceptual overview of Crystal Report Viewers | 12 |
| Common viewer features | 12 |
| Viewer feature descriptions | 13 |
| Viewer feature comparison | 14 |

Chapter 4: Additional Information

| | |
|---|----|
| Crystal Reports | 18 |
| RAS | 18 |
| Crystal Reports for .NET | 19 |
| Crystal Decisions Developers Zone | 19 |
| Index | 21 |

This chapter describes the Software Development Kits (SDKs) and viewers available in Crystal Reports 9. It tells you what each SDK can be used for. Finally, it provides product registration and contact information.

Crystal Reports developer components

Crystal Reports 9 includes new developer components. If you've used Crystal Reports in the past, you may already know which SDK you want to use. If you are new to Crystal Reports, or if you want to migrate from the Report Designer Component to a more web-friendly solution, this guide will help you decide which components you should use.

The SDKs available are:

- COM Report Application Server (RAS) SDK.
- Java Report Application Server (RAS) SDK.
- Report Designer Component (RDC) SDK.
- Crystal Reports SDK for Visual Studio .NET.

Licensing and Distribution

There are licensing and distribution considerations you should be aware of if you are developing an application using Crystal Reports. Please go to our web site for detailed information:

<http://www.crystaldecisions.com/products/crystalreports/licensing/>

Which SDK should you use?

There are many factors to be considered when deciding which SDK or viewer to use.

If you want to display reports on your web site and let your users/customers do basic reporting through their browsers, you will use the basic Report Application Server (RAS) and the corresponding viewers. All the RAS object model components are available in COM and Java. You can use JavaScript or VBScript to write your web application.

RAS provides a rich set of server-based reporting services, enabling you to integrate reporting into your custom web applications.

If you're looking for a more scalable, interactive web solution to reporting, you can use the full RAS SDK (which includes additional API calls and flexible deployment capabilities), available with the Advanced edition. This choice allows you to write your own application and customize any of the viewers.

RAS is also available with Crystal Enterprise to provide a rich set of server-based reporting services, enabling you to integrate reporting into your custom web applications.

The Report Application Server provides a base set of Crystal Enterprise services, focused on report processing, application integration, and run-time report modification:

- Rich Java and COM SDK for application integration.
- Embeddable server-side report viewer control.
- Extensible, multi-threaded processing server.

Applications built using the Report Application Server can be seamlessly extended to leverage additional Crystal Enterprise services.

If you're working solely with rich-client or desktop applications, you want to use the RDC. The RDC is COM-based and will work with any COM-compliant development environments, such as Visual Basic, VC++, or Delphi. For more information on the RDC and a detailed technical reference, see the *Crystal Reports Developer's Help* (*CrystalDevHelp.chm*).

Included in this version of Crystal Reports is an update for the .NET Crystal Report components, as well as new viewers like the Mobile Report Part Viewer. If you're working on the .NET platform you should use these updated components. .NET Crystal Reports components can be used for both rich-client windows applications and zero-client web solutions.

You can also extend the .NET model to use the RAS SDK for more advanced functionality in your report server.

Which viewer should you use?

There are two developer editions of Crystal Reports:

- Developer edition.
- Advanced edition.

In the Developer edition, you can use the viewers and the viewer APIs in your application to view reports. In addition, you have limited access through the RAS SDK to set the data source and parameter field information. In the Advanced edition, you can use the RAS API to add “create” and “modify” capability to the viewers in your application.

The following viewers are available:

- Report Page Viewer—COM, Java, and .NET
If you're looking for basic web reporting functionality, the Report Page Viewer should be sufficient. This viewer renders a page-by-page view of your report.
- Interactive Viewer—COM and Java.
If you want more advanced searching and analysis functionality in your application, you can use the Interactive Viewer. It lets your users perform searches using Boolean operators on the data saved with the report.
- Report Part Viewer—COM, Java, and .NET
If you want to view individual report parts in your application, use the Report Part Viewer.
- Mobile Report Part Viewer—COM, Java, and .NET
This viewer allows you to deliver reports to wireless devices, such as cellular phones and PDAs.

All viewers can view Report Web Services, Crystal Enterprise Report Application Server (CERAS) documents, and reports from the Crystal Enterprise report-management system.

Migrating from the RDC to RAS

If you have an existing application that uses the RDC, there are many benefits to RAS:

- RAS provides report creation in a multi-tier environment. It provides a rich set of report-creation APIs for integration with your application while you push the report processing to a Report Server.
- The rich set of Report Creation APIs are scriptable, multi-threaded, and are available in both COM and Java.

For detailed information on how to migrate, please go to the Report Application Server Launchpad and look at the startup pages.

Legacy components

Some existing Crystal Reports developer components have been included in this version for compatibility, but they are considered legacy or have been retired. If you are using the Crystal Reports Print Engine (CRPE), or any other legacy Crystal Reports SDK component, you should consider upgrading to RAS or the RDC. For more information, see the topic “Retired Developer APIs” in the *Crystal Reports Developer’s Help* (*CrystalDevHelp.chm*).

Product registration

There are several ways you can register your product:

- Fill out the Product Registration form on the Crystal Decisions, Inc. web site at: <http://www.crystaldecisions.com/register/>
- Print the Product Registration form and fax it to the registration fax number closest to you. Crystal Decisions will then fax you a registration number that can be entered into the product the next time you use it.

Registration fax numbers

USA/Canada +1 (604) 681-5147

United Kingdom +44 (0) 20 8231 0601

Australia +6 2 9955 7682

Germany +49 (0) 69 9509 6182

Hong Kong +852 2893 2727

Singapore +65 777 8786

Registration is required to access online or telephone technical support. In addition, registering the product ensures that you are kept up-to-date with product advancements.

Crystal Care technical support

To find out about the technical support programs available for Crystal Reports:

- Consult the enclosed Crystal Care information card.
- Go to our support web site at:
<http://support.crystaldecisions.com/crystalcare/>
- Contact your regional office. For details, go to:
<http://www.crystaldecisions.com/contact/offices.asp>

Crystal Training

Whether you're a developer, information technology professional, or business user, we offer a wide range of Crystal Reports training courses designed to build or enhance your existing skills. Courses are available online, at certified training centers, or at your own site:

- For a complete list of training courses and special offers, visit:
<http://www.crystaldecisions.com/training/>
- Or contact your regional office. For details, go to:
<http://www.crystaldecisions.com/offices/>

Crystal Consulting

Our global team of certified consultants and consulting partners can guide you through a corporate-wide solution—including strategy, design, integration and deployment—for the fastest results, maximum performance, and increased productivity.

- To learn more, visit:
<http://www.crystaldecisions.com/consulting/>
- Or contact your regional office. For details, go to:
<http://www.crystaldecisions.com/offices/>

This chapter provides some typical scenarios that show how the different SDK components and viewers can be used.

RAS scenarios

There are many different types of applications you can develop using RAS. Below are just a couple of examples.

Sales report with drill down on charts

In a company's web portal application, the IT department has created a web site that contains daily company news and announcements. A dynamic Crystal report is refreshed nightly to capture information about each sales representative's progress for the quarter. IT wants to display this report on its home web page, but since the portal contains other company news, the report can only be given a space that is approximately three inches by three inches. IT can design a report, using Crystal Reports, that has a bar chart showing the progress for all sales regions. The same report can also contain additional charts that show details for each region. Rather than displaying the entire report within the limited space available, IT has chosen to show just the regional sales chart using the RAS SDK. Each morning, when users browse the company's web site for new information, they can see the regional sales chart. They can click the chart and see the drilldown information for the Eastern region. The web page refreshes and preserves all other company news, but shows a different chart—the new chart shows details of the sales in the Eastern region.

Ad hoc reporting over the web

A bookstore supplier is offering online book ordering to its vendors. The price of each book varies depending on the time of year, the supply and demand ratio, the customer type, and current promotions. This variance means that each vendor could get a different price list depending on the time of the year, the volume needed, and the type of book. All of these parameters are factored into the online ordering application. The supplier uses the RAS SDK to run a generic report with different parameters passed in. RAS then dynamically generates a database query based on the parameters provided, applies this report with a vendor-defined template, and delivers the book-pricing list to the customer in HTML. The vendor then downloads this pricing list in PDF format and publishes it to its subsidiaries.

For sample applications, see the developer samples installed with Crystal Reports, or go to the Developer Zone website at:

http://www.crystaldecisions.com/products/dev_zone/

Crystal Reports for Visual Studio .NET scenarios

There are many different types of applications you can develop using Crystal Reports and .NET. Below are just a couple of examples.

Real estate report web service

You are the IT manager for a large real estate company that has a database containing all the information about each property. There are associate real estate partners around the world who are only allowed to see certain portions of the information and only certain properties. You can expose or publish your data using web services and give each partner company a login ID and a password. The partners can go to the URL of the web service, using either a Winform or a Webform viewer, enter their authentication information and they will be able to view reports for their properties.

Reporting off live stock market data

You can write an application that delivers reports based on live stock market data. You can extract information from a stock market web page, and produce a data source that includes the stock information. You can then create your own application to display a report that lists the top ten stocks that have had the highest volume in the last hour or in the last day. You don't have to have a data source exposed to report off of; you can use any information from any web site. Another benefit of using DataSets is that you don't have to write your own driver.

For sample applications, see the developer samples installed with Crystal Reports, or go to the Developer Zone website at:

http://www.crystaldecisions.com/products/dev_zone/

This chapter describes each of the viewers available in Crystal Reports.

Conceptual overview of Crystal Report Viewers

Crystal Reports provides viewers for COM, Java, and .NET environments. Each viewer provides features that make it best suited for particular environments and viewing requirements.

There are two developer editions of Crystal Reports:

- Developer edition.
- Advanced edition.

In the Developer edition, you can use the viewers and the viewer APIs in your application to view reports. In addition, you have limited access through the RAS SDK to set the data source and parameter field information. In the Advanced edition, you can use the report creation API to add “create” and “modify” capability to the viewers in your application.

Common viewer features

Crystal Reports provides numerous reporting features for data analysis and presentation. Ideally, when a user accesses a report over the Web, the report retains these features. It is important to select the appropriate report viewer to render the report with its design features intact.

The majority of the report viewers provide the following features:

- Drill down on fields.
- Drill down on summarized data.
- View charts.
- Drill down on graphs.
- View subreports.
- Drill down on on-demand subreports.
- Drill down on subreports with saved data.

Because they are highly specialized, the Report Part viewers do not fully provide all the above features. Since subreports cannot be embedded in report parts, the Report Part viewers require no features specific to subreports. The .NET Mobile Report Part Viewer provides a text interface, so it is not possible to view graphs.

Embedded maps

The capability to view and drill down on maps embedded in reports is a feature available in several report viewers. This feature requires the mapping DLLs to be installed on the RAS server or the map will not be displayed in the report.

Viewer feature descriptions

The following table describes the features that are used to differentiate the particular capabilities of each report viewer.

| Feature | Description |
|---------------------------|--|
| Boolean Search | Searches report fields using Boolean and comparison operators. |
| Can Change View | Can change the view of the report by picking from the view list. |
| Close Button | Provides a button to close the report. |
| Export Button | Provides a button to export the report. Export formats include RPT, Microsoft Word, Microsoft Excel, HTML, PDF, and RTF. |
| Toggle Group Tree | Shows or hides the group tree. |
| Highlight | Highlights drilldown object or first occurrence of search text. |
| Logon or Parameter Prompt | Prompts for logon or parameters. |
| Maps | Allows viewing of and drilldown on embedded maps. This feature requires the mapping DLLs to be installed on the RAS server or the map will not be displayed in the report. |
| Navigation via Hyperlink | Navigates to another page in the same report or in another report via a hyperlink. |
| Page Navigation | Navigates to different pages in the report. |
| Print Button | Provides a button to print the report. |
| Text Search | Searches report fields for given string. |
| Render Event | Can fire an event on rendering. |
| Zero Client | Does not require client-side software to operate. |
| Mobile/PDA output | Produces output for mobile or PDA devices. |
| Zoom | Zooms to desired magnification. |

When deciding on the report viewer technology to use in your web application, you should consider the reporting features provided by each report viewer and be aware of any limitations that might be imposed by a particular web technology.

Viewer feature comparison

The following table describes the particular capabilities of each report viewer.

| Crystal report viewer | Description | Boolean Search | Can Change View | Close Button | Export Button | Toggle Group Tree | Highlight | Logon or Parameter Prompt | Maps | Navigation via Hyperlink | Page Navigation | Print Button | Render Event | Text Search | Zero Client | Mobile/PDA Output | Zoom |
|-------------------------|--|----------------|-----------------|--------------|---------------|-------------------|-----------|---------------------------|------|--------------------------|-----------------|--------------|--------------|-------------|-------------|-------------------|------|
| COM Report Page Viewer | Provides basic web reporting viewer capabilities. | | X | | X | X | X | | X | X | X | X | X | X | X | X | X |
| COM Interactive Viewer | Provides all the capabilities of the COM Report Page Viewer, plus the ability to do a Boolean search on the current report. | X | X | | X | X | X | | X | X | X | X | X | X | X | | X |
| COM Report Part Viewer | Provides the ability to view individual report parts, including charts, text, and fields. | | | | | | X | X | | X | | | X | | X | X | X |
| ActiveX Viewer | Provides basic viewer capabilities. | | X | X | X | X | X | | X | X | X | X | | X | | | X |
| Java | | | | | | | | | | | | | | | | | |
| Java Report Page Viewer | Provides basic web reporting viewer capabilities. | | X | | X | X | X | X | X | X | X | X | X | X | X | X | X |
| Java Interactive Viewer | Provides all the capabilities of the Java Report Page Viewer, plus the ability to do a Boolean Search on the current report. | X | X | | X | X | X | X | X | X | X | X | X | X | X | | X |
| Java Report Part Viewer | Provides the capability of viewing individual report parts, including charts, text and fields. | | | | | | | X | | X | | | X | | X | X | X |
| Java Viewer | Provides basic viewer capabilities. | | X | X | X | X | | X | X | | X | X | | X | X | | X |

| Crystal report viewer | Description | Boolean Search | Can Change View | Close Button | Export Button | Toggle Group Tree | Highlight | Logon or Parameter Prompt | Maps | Navigation via Hyperlink | Page Navigation | Print Button | Render Event | Text Search | Zero Client | Mobile/PDA Output | Zoom |
|--------------------------------|---|----------------|-----------------|--------------|---------------|-------------------|-----------|---------------------------|------|--------------------------|-----------------|--------------|--------------|-------------|-------------|-------------------|------|
| .NET | | | | | | | | | | | | | | | | | |
| .NET Webform Viewer | Provides basic web reporting viewer capabilities. | | | | X | X | X | | X | | X | X | X | X | X | | X |
| .NET Webform Part Viewer | Provides the capability of viewing individual report parts, such as charts. | | | | | | | | | | | | X | | X | | X |
| .NET Winform Viewer | Provides basic viewer capabilities for Windows applications. | | | X | X | X | X | X | X | | X | X | | X | | | X |
| .NET Mobile Report Part Viewer | Provides the capability to view reports on mobile devices. | | | | | | | | | | | | | | X | X | |

Smart Tag Parsing

A Crystal Reports smart tag allows you to integrate Crystal reporting technology into Microsoft Office XP documents. Users can embed a link to a report from within Office XP programs by copying and pasting a report part into an Office XP document. By clicking on the smart tag object in Word XP documents, Excel XP spreadsheets or Outlook XP emails, users can instantly view the original Crystal report from which the data was taken. Smart tag objects are report parts such as chart, text, or field objects. These three kinds of objects can be copied from a report and pasted into a Word XP document or Outlook XP email. Text and field objects can be copied and pasted into an Excel XP spreadsheet.

Note: It is not possible to copy and paste a chart into an Excel XP spreadsheet.

Smart tag parsing is available for COM and Java. It works in conjunction with the Report and Report Part viewers.

This chapter lists and describes additional information and resources available.

Crystal Reports

- **CrystalDevHelp.chm:** C:\Program Files\Crystal Decisions\Crystal Reports 9\Developer Files\Help\En
This file is the main developer help file for Crystal Reports. It contains all technical reference material for the RDC, information on using the Embeddable designer, user-defined functions, and Active Data. It also provides diagrams of all relevant object models.
- **Legacy.chm:** C:\Program Files\Crystal Decisions\Crystal Reports 9\Developer Files\Help\En
This help file contains reference material for the Crystal Reports Print Engine.
- **License.chm:** C:\Program Files\Crystal Decisions\Crystal Reports 9\Developer Files\Help\En
This file contains information on the License Manager installed with Crystal Reports.
- **Runtime.chm:** C:\Program Files\Crystal Decisions\Crystal Reports 9\Developer Files\Help\En
This help file explains the runtime dependencies that you should be aware of when distributing your application.
- **Techref.pdf:** on the CD in the “Docs” directory.
This file is a PDF version of the printed *Technical Reference Guide*. It contains all of the reference material for the RDC, including object model information.

RAS

- **RAS_SDK.chm:** C:\Program Files\Crystal Decisions\Report Application Server 9\Help\En
This help file describes the web development tools and components that are available in the Report Application Server COM SDK.
- **Report_Viewers.chm:** C:\Program Files\Crystal Decisions\Report Application Server 9\Help\En
This help file describes the viewer development tools and components that are available through the COM web reporting viewers, ActiveX Viewer, and the Crystal Report Viewer for Java.
- **RAS JavaDocs in HTML format:** C:\Program Files\Crystal Decisions\Report Application Server 9\Help\En\JavaDocs\RAS
The RAS JavaDocs contain the documentation for the RAS Java SDK.
- **Viewer JavaDocs in HTML format:** C:\Program Files\Crystal Decisions\Report Application Server 9\Help\En\JavaDocs\Viewer
The Viewer JavaDocs contain the API reference documentation for the Java Viewer APIs.

Crystal Reports for .NET

If you develop with the .NET platform, and you install Crystal Reports 9, you can access the new help from the Crystal Reports 9 node in the Visual Studio .NET Help Contents window. The updated help can also be viewed through the MSDN Visual Studio .NET viewer.

Crystal Decisions Developers Zone

The Crystal Decisions Developers Zone is the key place for the latest development news. Updated weekly, you will find this to be an invaluable resource on the latest features, issues, and tips and tricks.

http://www.crystaldecisions.com/products/dev_zone/

Index

A

| | |
|--------------------------|----|
| additional information | |
| Crystal Reports | 18 |
| Developers Zone..... | 19 |
| RAS..... | 18 |
| Visual Studio .NET | 19 |

D

| | |
|----------------------|---|
| developer components | |
| described | 2 |
| legacy | 4 |

P

| | |
|---------------------------|---|
| product registration..... | 4 |
|---------------------------|---|

R

| | |
|-----------------------------|----|
| RAS, scenarios | 8 |
| registration | |
| fax numbers | 4 |
| of product | 4 |
| web site | 4 |
| Report Viewers | 12 |
| choosing which to use | 3 |
| described | 13 |
| embedded maps..... | 12 |
| feature comparison | 14 |
| features | 12 |
| Smart Tag Parsing..... | 15 |

S

| | |
|-----------------------------|---|
| scenarios | |
| RAS..... | 8 |
| Visual Studio .NET | 9 |
| SDKs..... | 2 |
| choosing which to use | 2 |
| support | |
| product registration | 4 |
| technical..... | 6 |
| web site | 6 |

T

| | |
|------------------------|---|
| technical support..... | 6 |
|------------------------|---|

V

| | |
|-------------------------------------|---|
| Visual Studio .NET, scenarios | 9 |
|-------------------------------------|---|

W

| | |
|-----------------|---|
| web sites | |
| consulting..... | 6 |
| training | 6 |