
Feature comparison

Microsoft SQL Server 2000 Reporting Services

VS.

Business Objects Crystal Reports / Crystal Enterprise

**Business Intelligence Team
Certia**



**Reporting Services
vs.
Crystal Reports / Crystal Enterprise**

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Feature	Crystal Reports (CR) / Crystal Enterprise (CE)	Reporting Services (RS)
1. Architecture		
<i>Platform support</i>	✓ All Crystal components can be installed under Microsoft Windows platform, IBM AIX and Sun SOLARIS	✓ Windows platform only. MS SQL Server 2000 or later is required.
<i>Multi layer support</i> A layered architecture allows process distribution based on functionality. We account for three layers: client, intelligent layer or server and process layer	✓ Fully scalable	All modules: Report Server and extension modules, must be installed on the same server.
<i>Client</i> Tools for user and administrator system interaction. This layer stands for report administration, publishing and browsing	✓ Tools: ePortfolio, Crystal Management Console, Wizards and Crystal Configuration Manager	✓ Report Manager: report browsing and management Report Designer (embedded in Visual Studio .NET IDE): report creation and editing
<i>Server</i> Layer hosting process management and administration modules, like security, request handling, scheduling and delivery	✓ CE modules: APS (manages security, Crystal objects and servers), Cache Server (serves previously processed pages) and Web Component Server (web server add-on for report processing and delivery)	✓ Report Server and extensions: data processing extensions, delivery extensions and rendering extensions
<i>Report processing</i> Layer to access data sources and report processing	✓ Crystal Job Server: report processing Crystal Page Server: splits previously processed report in their pages, in order to serve them preserving bandwidth	✓ Report Server: report processing
<i>Cluster aware</i>	✓ Any module can be installed in a server cluster on Windows. This feature makes sense, specially, for APS and Job Server modules	✓ SQL Server back-end database can be clustered
<i>Load Balancing</i>	✓ One of APS module functions is to balance load processing between all Job Servers available on the LAN. That balance allows to prioritize certain users and reports	Report Server module can be configured in a server farm
<i>Web Server support</i>	✓ Microsoft IIS 5.0/6.0, Apache, IBM HTTP Server, iPlanet Web Server and Lotus Domino. ISAPI, ASAPI, NSAPI, DSAPI and CGI connectors	✓ Internet Information Server 5.0 or later
<i>Cache</i>	✓ CE includes a cache server which keeps and shows pages preprocessed by Crystal Page Server. They can be shown in EPF (encapsulated page format) or HTML. By this way, when some	✓ RS allows putting the report and its data in a cache, through checking an option at report generation request time. A copy of executed report will be available to other users which access the same report. By this way, the first user who accesses the report



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	user asks for the same report, Cache Server will prepare these pages only once. Next users will receive the copy on the cache. Report is split in pages (page1, page 2, etc.) and served on a page by page basis. The cache can be configured to delete older copies of reports, by time or by number of executions	will launch the generation process; next users will recover the report from the cache. After rebooting the server, all the instances are still in the cache, because RS uses ReportServerTempDB as the database that maintains a resident copy of the reports. This functionality allows multiple report servers access the same report, which is located in the cache. We recommend the use of the cache to improve functionality and when data are volatile and it's not necessary to keep in the record in a permanent way. Reports in cache can have an expiration date-time or be refreshed on demand
<i>Wireless Support</i>	✓ Supported to see the reports through a "Mobile Client". Works through different simulators (OpenWave SDK, IPAQ or I-mode) to provide connectivity to IPAQ Pocket PC or any phone which has WAP 1.1 or 1.2 technologies. It's not necessary to design the report in any specific way, as the result of the report is prepared for the different incorporated visors.	Not available
<i>Log files</i>	✓ 1. A log file for each module that is part of CE in order to create a trace of the module. Different log modules (0...9) are allowed. This feature is configurable 2. CE has administrative tools to monitor the entire system. 3. Windows Event Log 4. Windows Performance log	✓ 1. Report Server execution log. Information about specific reports, including when and by what was executed, destiny and format in the presentation 2. Trace log. Information for debugging applications 3. Windows Event log 4. Windows Performance log
<i>ERM/CRM Connectivity</i>	✓ Through "Solution Kits", you can access some ERP/CRM as SAP, Baan, Siebel and PeopleSoft, to name a few. Integrates with ERP/CRM security/authentication	Not available
2. Suggested tools		
<i>Report Development</i>	✓ Crystal Reports	✓ Report Designer (embedded in Visual Studio .Net IDE). A VS.Net license is required
<i>Report Server</i>	✓ With CE or by the Applications Report Server (RAS). Both of them show reports through a web server. RAS includes less functionality	✓ Report Server
<i>Connections Administrator</i>	✓ Business Views. By this "Business Views" we can define our business rules, so that we can incorporate them in report design	With RS there is no tool to administer connections or to prepare any Business dictionary in a safe way



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<i>Report publishing</i>	✓ We can publish reports through Windows applications (Crystal Reports, Crystal Publishing Wizard) or with Web Applications (Crystal Management Console)	✓ We can publish reports through Windows rich-client applications (Report Designer) or with web applications (Report Manager). The recommended way is <i>Report Designer</i> , as this tool, once the reporting solution has been tested, will publish all the necessary objects
3. Security		
<i>Authentication</i>	✓ Supports several authentication types: CE Security, NT, LDAP, Active Directory and Lotus Security. We can also add several types of authentication through respective Kits (i.e.: Siebel or SAP authentication)	✓ Managed by Internet Information Services (IIS) and Windows Security. Users willing to connect to the report server must have a valid Windows user account
<i>Object Security</i>	✓ Inherited security of CE folders and files, through Windows users, user groups and CE user roles. Rights can be assigned to objects in an individual basis	✓ Windows users, user groups and RS user roles. Permissions can be assigned to objects at an individual basis
<i>Data Access Security</i>	✓ Through the Business Views we can give security to data access. Security is applied in objects, columns and rows	✓ Data security depends on the data source; credentials required by data source are always necessary. We can access to data by using Shared Data Sources or connections defined in the RDL file
4. Report Server		
<i>Publishing</i>	✓ Crystal Decisions proposes two web-based tools: <i>ePortfolio</i> , a client tool, and <i>Crystal Management Console (CMC)</i> , an administrative tool. <i>ePortfolio</i> allows to access, view, print, export, schedule and manage published reports. CMC allows to administrate and to configure the system, reports, groups, users, etc.	✓ RS includes a web environment to administrate and view reports. Publishing is handled by Report Manager or by the report designer embedded in Visual Studio .NET
<i>Publishing: object types</i>	✓ Reports (Crystal Reports), cubes (Crystal Analysis), files (pdf, xls, doc, ...), applications (exe, bat, ...) and Report packages	✓ Reports (RDL files), with its shared data sources. Any other file type will be kept as a binary object, called resource. At publishing time, Report Server saves a copy of the original file; and it doesn't maintain any physical link with the original file
<i>Report scheduling. General</i>	✓ Available. On demand, several instances (historical executions) of the same report are kept	✓ Report subscriptions execute on demand or according to a schedule
<i>Time scheduling</i>	✓ Execution at a particular time (i.e.: tomorrow at 9:00), recursively (every day at 8:45) or through templates.	✓ Snapshot generation, also called instance in CR, scheduled at time, recursively and through shared schedules
<i>Schedule calendar</i>	✓ By templates, called Calendars, which can be shared by different objects. We can add security to define templates by users or groups. I.e.: a	✓ Named Shared Schedules, allows definition of schedules which can be used by different reports, for example for subscriptions or in executions (creation of snapshots). A change in a customized



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	template for a department - "First day of every month"	schedule applies to all the objects which use it. Security not available
<i>Export formats</i>	✓ Server report processor can exports to multiple formats (pdf, xls, rft and doc)	✓ Exports to the following formats (using Rendering Extensions included in RS): DHTML, xls, text, xml, image and pdf. It is possible to develop customized Rendering Extensions
<i>Delivery channels</i>	✓ Executed reports can be delivered through several channels: MAPI, file, FTP, etc.	✓ By using Delivery Extensions (e-mail delivery extension and file share delivery extension). It is possible to develop customized Delivery Extensions
<i>Printer selection</i>	✓ It's possible to specify that the generated report instance will be printed through a particular printer. That printer can be configured in the CE server or locally. You can change printer settings	There is no Delivery Extension which sends an executed report to a printer. It is possible to develop a customized Delivery Extensions for this purpose
<i>Data based subscriptions</i>	Not available in this functionality. Useful for massive distribution	✓ It's possible to create dynamic subscriptions as a result of a query. The delivery extension used to supply the report will depend on returned values by a database query
<i>Alerts</i>	✓ CE recognizes alerts defined in the report and manages them as an independent object	Not available
<i>Events</i>	✓ There are 3 types of events: custom, file and schedule events. Their purpose is to concatenate schedule steps depending on step results	Not available
<i>Report History</i>	✓ By instance planning	✓ Through snapshots, report instances which contains the design and data provided for an specific data source
<i>Publishing Wizard</i>	✓ In CR, with a direct connection to APS In CE, through Crystal Publishing Wizard or CMC (Crystal Management Console). Also, we can publish any report programmatically using the CE object model (SDK)	✓ Report publishing can be done from Visual Studio .NET or from Report Manager. From Visual Studio .NET we can publish all objects related to the reporting solution uploading reports to Report Manager. Once there, we need to specify, manually, all the files we want to add to the report server
<i>Linked Reports</i>	Not available	✓ A Linked report is like a shortcut to an existing report, which shares some properties with the original and has some customized properties on his own. The original report provides the information about connection, the query used for obtaining data and the report design. The linked report customizes name and description, location, report parameters, if they exist, report execution and history, security and subscription
5. Connectivity		
<i>SQL Commands</i>	✓ SQL sentences to create a virtual table and use it as report data source. These commands can be kept in Crystal Repository to share them with	✓ Not available. However, SQL commands are not necessary in RS because of the possibility to create and modify the query that fills the report dataset



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	other users	
<i>Open connectivity (OLEDB, ODBC, PC...)</i>	✓ Connects to any data source defined in the report design computer (ODBC, OLEDB, .Net, COM, JavaBeans, its own sources, etc.). Datadirect drivers are included	✓ RS connects to data sources through Data Processing Extensions. Using .Net data providers. (OLE DB .Net Data provider, ODBC .Net Data Provider). Data Processing Extensions for PC databases (Access, dBase, Paradox) are not included
<i>Custom COM Data Providers</i>	✓ Only available in Advanced Edition	✓ Custom Data Processing Extensions: Possibility to develop Data Processing Extensions for specific data sources, as .NET Data Provider
<i>ADO.NET (XML) Datasets</i>	✓ Available in Dev/Adv editions.	It's not possible to access to ADO.NET (XML) datasets saved previously
<i>JavaBeans</i>	✓ Java Beans connectivity is included to create reports from Java Bean elements (any compiled Java class which includes a public method that returns a java.sql.ResultSet). Available in Advanced edition.	Not available
<i>OLAP Engines</i>	✓ MS OLAP, IBM DB2, Holos, Essbase	✓ Data Processing Extension for SQL Server 2000 Analysis Services
<i>Connections defined in the server (Business Views)</i>	Available since CE version 10. Business Views defined previously to make easier to exploit enterprise data. Defined in the CE server and incorporating user/group security. It's equivalent to Business Objects Universe concept	Not available
<i>Native connections</i>	✓ Informix, Oracle, SQL Server, Lotus Domino, Local File System, Web Log Files, Microsoft IIS/Proxy Log File, Exchange/Outlook and NT Event Log	✓ Native connections with SQL Server .NET Data Provider to SQL Server 7, SQL Server 2000 and SQL Server Analysis Services; with Oracle .NET Data Provider and Oracle client with Oracle 8.1.7 and higher
<i>CRM/ERP Connections</i>	✓ With specific kits (SAP, Siebel, Baan, PeopleSoft ...). Sold separately (with licenses).	Not included. It's possible to develop Data Processing Extensions for specific data sources, as .NET Data Providers
<i>XML</i>	✓ Includes DataDirect ODBC driver and a native driver. The ODBC driver supports RAW, ADO and Data Island formats. The native connection supports only XSD files and requires .NET Framework	Not available. Again, you can develop a custom Data Processing Extension as .NET Provider
<i>Connectivity options</i>	✓ Different connections are managed by the report engine, offering the following possibilities 1. Multiple reports can share the same database connection 2. Multiple connections simultaneously on the same report. Connection information always saved within the	✓ Connections are managed by the .Net Data Provider itself, so, connection pooling and other responsibilities are left to it.



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<i>Query editor</i>	report Not included. The only tool to create and modify SQL queries is SQL Commands	✓ Includes the SQL Server Enterprise Manager query editor
6. Integration		
6.1. Report Development		
<i>Report creation at execution time</i>	✓ Report Creation API included in CR SDK(.Net, COM and JAVA versions)	✓ Creating an XML file with "rdl" extension following RDL specification
<i>Wizard for report creation at execution time</i>	✓ CRWizard embedded in the Visual Studio .Net IDE development environment (.Net) or in Office tools	Not available
<i>Embedded Object</i>	✓ We can incorporate CR Designer into the application with an embedded object	Not available
<i>Report development inside development tool</i>	✓ Crystal Reports ActiveX Designer	✓ RS - Report Designer
<i>Microsoft Office integration</i>	✓ Crystal Reports offers a wizard to create reports from Microsoft Excel and Microsoft Access. Supports Excel/Access 97 or higher. Also, we can include Crystal objects in Office XP documents or higher with Smart Tags (See Viewer Types - Smart Tags)	✓ RS supports a tight integration with a large number of Microsoft products, as MS Internet Explorer 5.5 or higher, MS Office 2000 or higher, MS SharePoint Portal Server and MS SQL Server Analysis Services 2000 or higher. Report Designer can import reports which created in a MS Access (.mdb) database or project file (.adp). The report designer will convert the report into a RDL file and it will save it in the indicated project. Export to Office Web Components (OWC) makes client interaction easier, in the same way as HTML 4.0. So, graphics will be exported to the MS Office graphic controls and matrix controls will be converted to PivotTable controls
<i>Ad-hoc Reporting</i>	✓ Power users can create, modify and analyze reports through a web interface without requiring IT department help. Integrated with CE, there is not need to install any component in the client, because it is a DHTML interface	Not available
6.2. Application Development (Client) (Report Server not required)		
<i>.Net Framework</i>	✓ .Net SDK to view and modify reports.	Not available
<i>COM</i>	✓ COM SDK to view and modify reports.	Not available
<i>Java</i>	✓ JAVA SDK to view and modify reports.	Not available
<i>API</i>	✓ Crystal Reports Print Engine API	Not available
6.3. Application Development (Client-Server)		
<i>.Net Framework</i>	✓ .Net SDK offers CE functionality to customize client tools (ePortfolio or Crystal Management Console)	✓ Reporting Services customization can be achieved by Web Services (they expose all report server), URL requests, WMI Provider (access control customization and enterprise



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		administration), creation and customization of extensions consumed by the RS components, Delivery, Data Processing, etc, and RDL programming language
COM	✓ COM SDK offers CE functionality to customize client tools (ePortfolio or Crystal Management Console)	Not available
Java	✓ Java SDK offers CE functionality to customize client tools (ePortfolio or Crystal Management Console)	Not available
7. Report Types (view object types for details)		
Drill-Down Reports	✓ n depth levels (in detail and groups)	✓ n depth levels (in detail and groups)
Report with subreports	✓ Only 1 level of subreports	✓ n depth levels
Cross-tab reports	✓ available	✓ available
OLAP reports	✓ available	✓ available
Multi-column reports	✓ In details and groups	✓ In details and groups
Labels	✓ standard or user defined	✓ Only user defined
8. Objects		
8.1. Object Explorers		
Field Explorer	✓ Shows all report objects: database fields, formulas, parameters, SQL expressions, totals and special fields (report metadata, page counters, etc.)	✓ Shows all report objects
Report Explorer	✓ Shows metadata of all report objects	There is no user interface to access that information. As a bypass, you can look at the source XML of the RDL file in Visual Studio .Net IDE
Repository Explorer	✓ Shows all objects published in the Repository. In version 9, it is a shared store for objects that will be used in the reports. It can be located in any database through ODBC. In version 10, Repository is replaced by Business Views functionality	Not available
8.2. Object types		
Graphics	✓ More than 80 styles, fully customizable.	✓ Customizable graphics, limited in number in comparison to Crystal Reports. Graphics provided with RS come from Dundas Software (Dundas Chart for .NET). For better functionality, Dundas Software offers an upgraded version (http://www.dundas.com)
Maps	✓ With MapInfo (ActiveX included)	Not included
Cross-reference tables (CR) - Matrix (RS)	✓ Fully customizable. Information is showed in rows and columns; rows and columns can be	✓ With RS Matrix object. Matrix object offers functionality similar to crosstabs and pivot tables, but is more powerful and flexible. We



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	grouped in 0, 1 or n levels. We can also apply templates	can add objects (graphics, images, etc) as cell items. We can expand or contract grouping levels.
<i>OLAP Grids (CR) - Matrix (RS)</i>	✓ Fully customizable. An OLAP grid is a "Multidimensional Table" that shows data obtained from an OLAP engine	✓ With RS Matrix object
<i>Subreports</i>	✓ Limited to 1 level. It can share the connection with the main report. Also we can get subreports on demand. Subreports are inserted in the main report as an OLE object	✓ Not limited to one level (tested with two levels depth). Subreports on demand aren't available. Subreport definition is not inserted in the report
<i>OLE Objects</i>	✓ OLE objects registered in the system or coming from a database (like an image object). Their content is independent from the rest of the report.	✓ ActiveX controls. Their content is independent from the rest of the report.
<i>Formulas</i>	✓ Crystal or Basic syntax. Possibility to incorporate any formula in any object, any section and format of the report. Formulas can be reused from the local or server repository	✓ With .Net assemblies, .Net code "embedded", or Visual Basic .Net expressions for conditional format. Calculated fields can execute operations over dataset fields in all cases in which database engine doesn't allow this operation. To call an assembly from Report Designer, authorization must be properly set and a reference to the assembly must be added to the report
<i>SQL Expressions</i>	✓ SQL Expressions are sentences processed by the database engine, using database functions and operators. These expressions are integrated, As columns, in the SQL query generated by Crystal Reports. The difference with formulas is that these will be processed by the Crystal Reports engine.	✓ SQL Expressions are not needed as special objects, because the query editor allows editing the SQL sentence to add SQL expressions in the database native SQL dialect
<i>Summary fields or aggregated functions</i>	✓ It offers a graphic tool to design summarized fields. It is possible to create summarized fields with the use of formulas. Also we can convert any total accumulated inserted in the report to a percentage field on any group	✓ There is no graphic tool to create summarized fields. It is possible to create aggregated functions with the use of VB.NET expressions, using RunningValue summary function. This option is less powerful and harder of use than CR equivalent
<i>Parameters</i>	✓ <ul style="list-style-type: none"> - Input parameters defined through a dialog box at design time - It is possible to define default or suggested values - Dynamic parameters aren't available, although can be achieved with custom code - These parameters will be requested upon report execution from CR, or when 	✓ <ul style="list-style-type: none"> - Input parameters defined through a dialog box at design time. - It is possible to define default or suggested values - Dynamic parameters available. These means allowing the user to choose a parameter value from a pick list generated from a query against a data source - These parameters will be requested upon report execution - They can be referenced from any report object



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	<p>scheduled/executed in CE.</p> <ul style="list-style-type: none"> - They can be referenced from any report object 	
<i>Cascading parameters</i>	<p>Not available. It can be done customizing a CSP page or through a custom user interface</p>	<p>✓ RS allows creation of a group of parameters where the value list for a parameter depends on another parameter value. Filtering a list of parameter values based on another parameter value is called cascading, depending or hierarchical parameters</p>
<i>Pictures, lines and figures</i>	<p>✓ It's not possible to apply conditional format to lines and figures</p>	<p>✓ Fully customizable. Rectangles contain other objects.</p>
<i>User Defined Functions</i>	<p>✓ With User Functions Library (UFL) we can call to User Defined Functions (UDF) by any development environment that supports creation of ActiveX DLL. ("External Functions")</p>	<p>✓ By creating .NET assemblies</p>
<i>Custom Functions</i>	<p>✓ Functions created inside one report (called "internal functions"). Can be exported to the Repository for global use</p>	<p>✓ By creating .NET assemblies</p>
<i>Hyperlinks</i>	<p>✓ Any report object can be linked to an external file (rpt or file system), to a web or e-mail address. Links can be conditional.</p>	<p>✓ It's not an object by itself, but some of them have a property related to this functionality (Jump to report, Jump to bookmark, Jump to URL). They allow redirection to some part of the report or to another report in the server or to an URL address</p>
<i>Data region</i>	<p>Not available. In CR, to drag and drop a database field to the details section in a designer, instructs de report engine to print all the records returned by the query at execution time. Results similar to RS approach can be achieved by using several detail sections, subreports and other functionalities, but requires advanced user skills</p>	<p>✓ In RS, dragging and dropping a database field in the designer, instructs the report engine to show only the first record returned by the database query at execution time (or in Preview). To see all the records, you must use a Data Region type of control. Data Region controls work like a Visual Studio .NET grid control. Available Data Region controls are: Tables, Matrix, Chart and List</p>
<i>Lists</i>	<p>Not applicable</p>	<p>✓ Data Region control with fixed style. This control is as a container of other controls, allowing put them freely in the "body" section of the report. Grouping and filtering is allowed in data region and subsections.</p>
<i>Tables or Grids</i>	<p>Not applicable</p>	<p>✓ Data Region control with fixed style. Table-like control with fixed rows and columns. Each cell can be any available kind of control. Grouping and filtering is allowed in data region and subsections.</p>
<i>Shared Data Sources</i>	<p>✓ To create data sources shared between reports we must use "Business View" functionality</p>	<p>✓ Data sources can be shared between multiple reports. It's not saved with the report and it's managed by the RS server.</p>
<i>Top-N, Bottom-N, Top %, Bottom %</i>	<p>✓ Available, includes wizards</p>	<p>✓ Available, includes wizards</p>



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<i>Bottom % Alerts</i>	✓ Alerts allow highlighting data in the executed report according to defined conditions. When opening an executed report, it will display alerts triggered and the data associated with them	Not available
9. Database Field Types		
<i>Basic Fields (varchar, integer, ...)</i>	✓ Total control	✓ Total control
<i>Blob Fields (memo, image, ...)</i>	✓ Total control since v10. For instance, we can access the contents of a Memo field from a formula.	✓ Total control
<i>Stored Procedures</i>	✓ CR can use stored procedures	✓ Data source of a dataset can be a store procedure
<i>Views</i>	✓ Accessible	✓ Accessible
<i>Synonyms</i>	✓ Accessible	✓ Accessible through query editing
10. Formatting		
<i>Fixed and conditional format</i>	✓ Fixed and conditional format (not applicable to all object types). Format can be based on object value or in an external object value.	✓ Applicable to all the objects. Equal or even more powerful than in CR. Conditional format will be tested with Visual Basic .NET expressions, or by custom code, embedded or with a reference to an assembly.
<i>Field format</i>	✓ We can apply format (fixed or conditional) on database fields, formulas, SQL expressions, parameters, totals and special fields.	✓ We can apply format (fixed or conditional) on any object
<i>Object Format</i>	✓ We can apply format (fixed or conditional) to charts, maps, cross reference tables, OLAP grids, subreports, OLE objects, images, lines and pictures	✓ We can apply format (fixed or conditional) on any object
<i>Section Format</i>	✓ We can apply format (fixed or conditional) to groups, group headers and footers, areas, sections and subsections	✓ There are only 3 sections in a report: Page Header, Body and Page Footer. In the Body section it's possible to find unlimited data regions, with multiple sections including Page Header, Group Header (n), Details, Group Footer (n), and Page Footer. The creation of a report with multiple sections is harder than in CR. None of the three sections contained in RS admits creating subsections. We only can create subsections in the Data Region controls that allow it, as in Tables. In a Table we can have as many subsections as we wish. Page header and footer can't contain data fields
<i>Highlighting Wizard</i>	✓ We can attach semaphores on any report item. This functionality is useful to highlight any value	Semaphores are not included. It can be emulated with conditional format expressions.



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<i>Conditional page breaks and sections</i>	✓ by applying conditional format on it. Conditional format can be applied to page breaks, to sections and groups. Is applicable to headers and footers.	Not available
<i>Templates</i>	✓ A template is a report file whose format can be applied to a new or existing report. Formatting is applied to fields, charts, summary fields, hyperlinks, bitmaps, lines, pictures, borders and OLE objects.	Not available
11. Grouping and sorting		
11.1. Grouping		
<i>Hierarchical groups</i>	✓ Grouping based on hierarchical data as manager/employee	✓ Available
<i>Top-N, Bottom-N, Top %, Bottom %</i>	✓ Available, includes wizards	✓ Available
<i>Specified grouping</i>	✓ Allows definition of groups that not exists in the data source. I.e. you can define "Iberia" as "Spain and Portugal" countries	Not available
11.2. Sorting		
<i>Group sorting, including Top-N, Bottom-N, Top and Bottom %</i>	✓ Available, includes wizards	✓ Available
<i>Specified sort</i>	✓ Allows prioritizing the position of elements with independence of their general order. I.e.: instruct CR to put "USA" in first place and the rest of countries by general sorting criteria (alphabetically or by sales descendant, i.e.)	Not available
12. Report viewers		
<i>ActiveX Viewer</i>	✓ ActiveX viewer is common to all Crystal Decisions tools	Not available
<i>DHTML Viewer</i>	✓ Both DHTML and DHTML interactive. With direct printing since version 10. The later is called "interactive" because it allows the user to interact with the report itself, allowing to filter data or sections showed	All the reports are browsed using an HTML viewer, but not DHTML
<i>Java Report Viewer</i>	✓ Printing functionality included.	Not available
<i>Netscape Viewer plug in</i>	✓	Not available
<i>SmartTag ActiveX Viewer</i>	✓ Crystal Reports objects can be integrated in Office documents (Outlook/Word/Excel 2002 and	Not available



**Reporting Services
vs.
Crystal Reports / Crystal Enterprise**

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Feature	Crystal Reports (CR) / Crystal Enterprise (CE)	Reporting Services (RS)
	later versions), i.e. embedding a report chart in a Word document. Using Crystal Reports Smart Tags the user can refresh, print, browse the original report, etc.	
13. Viewer features		
<i>Local Printing</i>	✓ Since v10 all viewer can print to any printer defined in the client computer where report is going to be seen. Any other defined printer can be selected.	✓ It's not possible to print reports directly. For printing a report we must to export it to a format that allows printing. Printing will be performed by the destination application (i.e.: Excel or Adobe Acrobat)
<i>Server Printing</i>	✓ With CE, when planning the report , we can choose the destination printer and, also, set the configuration (orientation, ...)	Not available. By creating a custom Delivery Extension we can send the document directly to printer
<i>Export</i>	✓ Exports to different formats from each one of the different visors	✓ Exports to multiple formats with RS or with subscriptions (through Rendering Extensions).
<i>Formats</i>	✓ HTML 3.2/4.0, PDF, Excel, XML, Word, RTF, Text, Report Definition, CSV, Tab and space delimited text and ODBC	✓ HTML 3.2/4.0, PDF, Excel, XML, Word, Office Web Components (OWC), RTF, CSV text and space Image (TIFF) Formats which support pagination: PDF, HTML, TIFF Custom Rendering Extensions can be developed
<i>Excel-Format</i>	✓ Exports to Excel, optionally exporting only data. Some formatting options can't be exported (multi-column report, page jumps, etc); because it makes no sense to do so. User can choose to export all the page headers and footers or only some of them.	✓ Available
<i>PDF Format</i>	✓ Export with very high fidelity, as in WYSIWYG. There are some limitations: OLE Bitmap objects must be embedded not linked.	✓ A suitable format for reports with lots of pages and for those ones which have to be shown as a file. This format can be paginated.
<i>Destinations</i>	✓ CE Destinations: Disk, MAPI and FTP. CR Destinations: Disk, MAPI, Lotus Domino, Lotus Domino Mail and Exchange Files.	✓ Supported in RS through Delivery Extensions: to disk and e-mail. It is possible to create custom Delivery Extensions
<i>Pagination</i>	✓ When they have to show the report, CR and CE, make a first pagination depending on the features of the report and depending of the printer linked to it. It knows beforehand how many pages will be necessary for this particular printer. It runs with WYSIWYG technology.	✓ Paginated reports are strongly recommended for all those reports that manage high data volumes. The size of the report will not change, not even the way to generate it. With pagination we can control how much data are supplied to navigator and prevent possible delays and timeouts. RS doesn't takes care of information given by the printer to format the report .WYSIWYG technology is not used to print the report on paper.
<i>Drill-Down</i>	✓ Most viewers can drill down on groups, charts, maps and subreports. Page under Demand	✓ Available in any report object. In fact, when an object is not a summary object, it links to information related with the object.



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Feature	Crystal Reports (CR) / Crystal Enterprise (CE)	Reporting Services (RS)
	technology (EPF format) implements this functionality, stripping the result in little pieces. CE ads a page server and a cache manager.	That way, we can hide or show objects conditionally, when clicking on an object, linking them to it
<i>Navigation in parts</i>	✓ With the interactive DHTML viewer, we can define departure objects in the report so that through them we can navigate. It would be similar to hyperlinks applied to report objects.	✓ Using bookmarks on report objects
<i>Filters on viewed data</i>	✓ In some viewers (as interactive DHTML) we can filter data shown	Is not possible to apply filters for shown data in a dynamic way
<i>Group navigation</i>	✓ Available as a group tree	✓ Available as a group tree
<i>Page on demand</i>	✓ Only in ActiveX viewer. CE processes the report and generates an instance accessible to all users (according to applied security). Instead of downloading the full report to the client, CE splits the instance in little pieces (encapsulated pages), smaller but with the same features. These pages (EPF format) are created by CE with a module called Page Server and they are shown by another module called Cache Server	Not available
<i>Advanced search</i>	✓ In some viewers (as interactive DHTML) we can do advanced searching on the report data.	Advanced searching is not available. It only searches on a value inside the visible area of the report, not in the drilldown data.

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