Table of Contents

[Introduction to SSRS 1](#_Toc311215254)

[The Reporting Services Architecture 2](#_Toc311215255)

[Report Designer 3](#_Toc311215256)

[Report Layout 3](#_Toc311215257)

[Report Items 3](#_Toc311215258)

[Adding Data Regions to a Report Viewer Report 3](#_Toc311215259)

[Adding Text Boxes to a Report Viewer Report 4](#_Toc311215260)

[Adding Images to a Report Viewer Report 4](#_Toc311215261)

[Adding Rectangles, Lines, and Borders to a ReportViewer Report 5](#_Toc311215262)

[Adding Lines 5](#_Toc311215263)

[Adding Page Headers and Page Footers to a Report Viewer Report 5](#_Toc311215264)

[Types of Reports 5](#_Toc311215265)

[I. [http://i.msdn.microsoft.com/Hash/030c41d9079671d09a62d8e2c1db6973.gif](javascript:void(0))Parameterized Reports 6](#_Toc311215266)

[II. Linked Reports 7](#_Toc311215267)

[III. [http://i.msdn.microsoft.com/Hash/030c41d9079671d09a62d8e2c1db6973.gif](javascript:void(0))Snapshot Reports 7](#_Toc311215268)

[IV. [http://i.msdn.microsoft.com/Hash/030c41d9079671d09a62d8e2c1db6973.gif](javascript:void(0))Cached Reports 7](#_Toc311215269)

[V. [http://i.msdn.microsoft.com/Hash/030c41d9079671d09a62d8e2c1db6973.gif](javascript:void(0))Clickthrough Reports 8](#_Toc311215270)

[VI. [http://i.msdn.microsoft.com/Hash/030c41d9079671d09a62d8e2c1db6973.gif](javascript:void(0))Drilldown Reports 8](#_Toc311215271)

[VII. [http://i.msdn.microsoft.com/Hash/030c41d9079671d09a62d8e2c1db6973.gif](javascript:void(0))Drillthrough Reports 8](#_Toc311215272)

[VIII. [http://i.msdn.microsoft.com/Hash/030c41d9079671d09a62d8e2c1db6973.gif](javascript:void(0))Subreports 8](#_Toc311215273)

# Introduction to SSRS

* SQL Server Reporting Services provides a full range of ready-to-use tools and services to help you create, deploy, and manage reports for your organization.
* It also contains programming features that enable you to extend and customize your reporting functionality.
* Reporting Services is a server-based reporting platform that provides comprehensive reporting functionality for a variety of data sources.
* It includes a complete set of tools for you to create, manage, and deliver reports that enable developers to integrate or extend data and report processing in custom applications. Reporting Services tools work within the Microsoft Visual Studio environment and are fully integrated with SQL Server tools and components.
* With Reporting Services, you can create interactive, tabular, graphical, or free-form reports from relational, multidimensional, or XML-based data sources.
* You can publish reports, schedule report processing, or access reports on-demand. Reporting Services also enables you to create ad hoc reports based on predefined models, and to interactively explore data within the model. You can select from a variety of viewing formats, export reports to other applications, and subscribe to published reports.
* The reports that you create can be viewed over a Web-based connection or as part of a Microsoft Windows application or SharePoint site. Reporting Services provides the key to your business data.

# The Reporting Services Architecture

The full Reporting Services architecture includes development tools, administration tools, and report viewers.

Figure 1 shows a simplified diagram of the main Reporting Services components that we'll be using in this chapter.

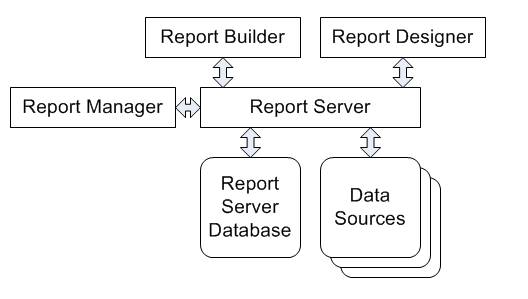


Figure 1: Report Server architecture

In this chapter you'll learn about these components:

* Report Server is the core engine that drives Reporting Services.
* Report Manager is a Web-based administrative interface for Reporting Services.
* Report Designer is a developer tool for building complex reports.
* Report Builder is a simplified end-user tool for building reports.
* The Report Server database stores report definitions. Reports themselves can make use of data from many different data sources.

# Report Designer

Report Designer can create reports of any complexity that Reporting Services supports, but requires you to understand the structure of your data and to be able to navigate the Visual Studio user interface.

## Report Layout

A report layout consists of three main areas: a Page header, Page footer, and the Body.

* The body of the report contains the report data. You can add data regions, text boxes, images, rectangles, sub-reports and visual enhancements to the report layout. Data regions display repeated rows of data from a data source.
* The page header and footer repeat the same content at the top and bottom of each page of the report. You can place report items such as images, text boxes, and lines in headers and footers.

## Report Items

### Adding Data Regions to a Report Viewer Report

* [Visual Studio 2008](http://msdn.microsoft.com/en-us/library/ms252086(v=VS.90).aspx)

Data regions are data-bound report items that display repeated rows of data from underlying datasets. You add data regions to a report to create tabular, matrix, chart, and list reports.

To add a data region to a report, drag it from the Toolbox onto the report layout. The data region appears on the report in graphical design mode; each part of the data region that you can specify has a visual representation so that you can see where to place fields and set properties.

To add fields to a data region, simply drag fields from the Data Source window onto the data region layout. Most data regions include labels that identify where to place the fields.

A single report can contain multiple data regions. Each data region can contain data from only a single dataset. To use data from multiple sources in a single data region (for example, in a single table or chart), you must combine the data into a single dataset prior to designing the report. Types of Data regions and its description are shown below.

|  |  |
| --- | --- |
| **Data Region** | **Description** |
| Table | A table is a data region that presents data row by row. Table columns are static. Table rows expand downwards to accommodate the data. You can add groups to tables to organize data by selected fields or expressions. |
| Matrix | A matrix is a data region that contains both columns and rows that expand to accommodate the data. A matrix is also known as a crosstab report. A matrix can have both dynamic and static columns and rows. Columns or rows can contain other columns or rows, and can be used to group data. |
| List | A list is a data region that presents data arranged in a freeform fashion. You can arrange report items to create a form with text boxes, images, and other data regions placed anywhere within the list. |
| Chart | A chart presents data graphically. Examples of charts include bar, pie, and line charts, but many more styles are supported. |

### Adding Text Boxes to a Report Viewer Report

* [Visual Studio 2008](http://msdn.microsoft.com/en-us/library/ms251779(v=VS.90).aspx)

A text box is a report item that contains single instance data on the report. Examples of ways you might use a text box include adding a title to a report, adding specific fields in the page header or footer, or adding single-instance data like customer contact information on an order detail report.

Text boxes include a label, a value, and other properties. The value is always specified as an expression. The expression can contain static text, point to a field in the database, or calculate data.

### Adding Images to a Report Viewer Report

An image is a report item that contains a reference to an image that is stored on the report server, embedded within the report, or stored in a database. An image can be a logo or picture that appears once on the report or it can be a picture that is repeated with rows of data. You can also use an image as a background for certain report items. You can get images from the following sources:

* Database
* External file share or Web site
* Embedded locally within the report

External images are specified as a URL that points to an image file. External images work well for logos and static pictures that are shared among several reports or Web pages.

Local report images are embedded in the report and then referenced. The image data is stored within the report definition and does not exist as a separate file. Embedded images ensure that the images are always available to the report, but they cannot be shared. Embedding an image increases the size of the report definition file. When you embed an image, Report Designer MIME-encodes the image and then stores it as text in the report definition.

### [Adding Rectangles, Lines, and Borders to a ReportViewer Report](http://msdn.microsoft.com/en-us/library/ms251697(v=vs.80).aspx)

* [Visual Studio 2008](http://msdn.microsoft.com/en-us/library/ms251697(v=VS.90).aspx)
* You can use rectangles, lines, images, and border styles to create visual effects within a report.
* Rectangles can be used to contain other report items or decorate the report.
* Images can either be static or based on data in a database.
* Border properties can be set for any item that occupies space in the report layout.

Although a rectangle can be used exclusively for visual effect, it is more commonly used as a container for other items. A rectangle allows you to group items together. When you move the rectangle, the items that are contained within the rectangle move along with it.

When using rectangles to contain report items, consider how the items will be affected as a whole during report

### Adding Lines

You can add lines to a report layout. By default, a line is a non-repeating design element. If you want to add a line within repeating rows of data (for example, in some cell of a detail row), you must write an expression that draws the line and puts the expression in the cell where you want the line to appear. If you want to always add a line after the repeating data, you don’t' need an expression. Simply set the **Repeat report item with data region on every page** option in the Line Properties dialog box.

### Adding Page Headers and Page Footers to a Report Viewer Report

* [Visual Studio 2008](http://msdn.microsoft.com/en-us/library/ms252093(v=VS.90).aspx)

A report can contain a header and footer that run along the top and bottom of each page, respectively. Headers and footers can contain static text, images, lines, rectangles, borders, background color, and background images. You cannot add data-bound fields or images directly to a header or footer. However, you can write an expression that indirectly references a data-bound field or image that you want to use in a header or footer.

Report headers and footers are not the same as the headers and footers in a table or group.

# Types of Reports

* [SQL Server "Denali"](http://msdn.microsoft.com/en-us/library/bb630404(v=SQL.110).aspx)
* [SQL Server 2008](http://msdn.microsoft.com/en-us/library/bb630404(v=SQL.100).aspx)

In Reporting Services, you can use reports in a variety of ways. A single report can have characteristics from more than one type. For example, snapshot reports can be parameterized, ad hoc reports incorporate click-through report functionality due to the report models upon which they are based, and sub-reports can be linked reports.

With Reporting Services, you can create the following types of reports:

1. Parameterized Reports
2. [Linked Reports](http://msdn.microsoft.com/en-us/library/bb630404.aspx#Link)
3. [Snapshot Reports](http://msdn.microsoft.com/en-us/library/bb630404.aspx#Snapshot)
4. [Cached Reports](http://msdn.microsoft.com/en-us/library/bb630404.aspx#Cache)
5. [Click-through Reports](http://msdn.microsoft.com/en-us/library/bb630404.aspx#Click)
6. [Drilldown Reports](http://msdn.microsoft.com/en-us/library/bb630404.aspx#Drilldown)
7. [Drillthrough Reports](http://msdn.microsoft.com/en-us/library/bb630404.aspx#Drill)
8. [SubReports](http://msdn.microsoft.com/en-us/library/bb630404.aspx#Sub)

## [[http://i.msdn.microsoft.com/Hash/030c41d9079671d09a62d8e2c1db6973.gif](javascript:void(0))**Parameterized Reports**](javascript:void(0))

1. A parameterized report uses input values to complete report or data processing.
2. Parameters are used in dataset queries to select report data, to filter the result set that the query returns, or to set layout properties used to display or hide parts of a report. You can also specify cascading parameters that populate a series of dependent, drop-down parameter lists. For example, a drop-down list of Region parameter values can be used to populate a drop-down list of City parameter values.
3. With a parameterized report, you can vary the output of a report based on parameter values that are set when the report runs.
4. Parameterized reports are frequently used for drillthrough reports, linked reports, and subreports, connecting and filtering reports with related data.
5. Not all parameters may be visible in the report at run time. A report author, report server administrator, or content manager can specify which values to use and then hide the input fields on the report.

Reporting Services supports two kinds of parameters:

Query parameters:

1. Query parameters are used during data processing to select or filter data.
2. If a query parameter is specified, a value must be provided either by the user or by default properties to complete the SELECT statement or stored procedure that retrieves data for a report.

Report parameters:

1. Report parameters are used during report processing to show a different aspect of the data.
2. Report parameters differ from query parameters in that they are defined in a report and processed by the report server, while query parameters are defined as part of the dataset query and processed on the database server.

## [Linked Reports](javascript:void(0))

A linked report is a report server item that provides an access point to an existing report. Conceptually, it is similar to a program shortcut that you use to run a program or open a file.

A linked report is derived from an existing report and retains the original's report definition. A linked report always inherits report layout and data source properties of the original report. All other properties and settings can be different from those of the original report, including security, parameters, location, subscriptions, and schedules.

You can create a linked report on the report server when you want to create additional versions of an existing report. For example, you could use a single regional sales report to create region-specific reports for all of your sales territories.

Although linked reports are typically based on parameterized reports, a parameterized report is not required. You can create linked reports whenever you want to deploy an existing report with different settings.

## [[http://i.msdn.microsoft.com/Hash/030c41d9079671d09a62d8e2c1db6973.gif](javascript:void(0))Snapshot Reports](javascript:void(0))

A Report Snapshot is a report that contains layout information and query results that were retrieved at a specific point in time. Unlike on-demand reports, which get up-to-date query results when you select the report, report snapshots are processed on a schedule and then saved to a report server. When you select a report snapshot for viewing, the report server retrieves the stored report from the report server database and shows the data and layout that were current for the report at the time the snapshot was created.

Report snapshots serve three purposes:

* Report history. By creating a series of report snapshots, you can build a history of a report that shows how data changes over time.
* Consistency. Use report snapshots when you want to provide consistent results for multiple users who must work with identical sets of data. With volatile data, an on-demand report can produce different results from one minute to the next. A report snapshot, by contrast, allows you to make valid comparisons against other reports or analytical tools that contain data from the same point in time.
* Performance. By scheduling large reports to run during off-peak hours, you can reduce processing impact on the report server during core business hours.

## [[http://i.msdn.microsoft.com/Hash/030c41d9079671d09a62d8e2c1db6973.gif](javascript:void(0))Cached Reports](javascript:void(0))

A cached report is a saved copy of a processed report. Cached reports are used to improve performance by reducing the number of processing requests to the report processor and by reducing the time required to retrieve large reports. They have a mandatory expiration period, usually in minutes.

## [[http://i.msdn.microsoft.com/Hash/030c41d9079671d09a62d8e2c1db6973.gif](javascript:void(0))Clickthrough Reports](javascript:void(0))

A clickthrough report is a report that displays related data from a report model when you click the interactive data contained within your model-based report. These reports are generated by the report server based on the information contained within the report model. The person who created the model determines which fields are interactive and which fields are returned when a clickthrough report is opened. These field settings cannot be changed in the report authoring tools.

Clickthrough reports are auto generated. However, you can create an alternative customized report to the model for interactive data items that is displayed instead.

## [[http://i.msdn.microsoft.com/Hash/030c41d9079671d09a62d8e2c1db6973.gif](javascript:void(0))Drilldown Reports](javascript:void(0))

Drilldown reports initially hide complexity and enable the user to toggle conditionally hidden report items to control how much detail data they want to see. Drilldown reports must retrieve all possible data that can be shown in the report.

For reports with large amounts of data, consider drillthrough reports instead.

## [[http://i.msdn.microsoft.com/Hash/030c41d9079671d09a62d8e2c1db6973.gif](javascript:void(0))Drillthrough Reports](javascript:void(0))

1. Drillthrough reports are standard reports that are accessed through a hyperlink on a text box in the original report.
2. Drillthrough reports work with a main report and are the target of a drillthrough action for a report item such as placeholder text or a chart.
3. The main report displays summary information, for example in a table or chart. Actions defined in the table or chart provides drillthrough links to reports that display greater details based on the aggregate in the main report.
4. Drillthrough reports can be filtered by parameters, but they do not have to be.
5. Drillthrough reports differ from subreports in that the report does not display within the original report, but opens separately.
6. They differ from clickthrough reports in that they are not auto generated from the data source, but are instead custom reports that are saved on the report server.
7. They differ from drilldown reports in that they retrieve the report data only for the specified parameters or for the dataset query.

## [[http://i.msdn.microsoft.com/Hash/030c41d9079671d09a62d8e2c1db6973.gif](javascript:void(0))Subreports](javascript:void(0))

1. A subreport is a report that displays another report inside the body of a main report. Conceptually, a subreport is similar to a frame in a Web page. It is used to embed a report within a report. Any report can be used as a subreport.
2. The subreport can use different data sources than the main report.
3. The report that the subreport displays is stored on a report server, usually in the same folder as the parent report. You can set up the parent report to pass parameters to the subreport.

# Data Connections, Data Sources, and Connection Strings

* [SQL Server "Denali"](http://msdn.microsoft.com/en-us/library/ms156450(v=SQL.110).aspx)
* [SQL Server 2008](http://msdn.microsoft.com/en-us/library/ms156450(v=SQL.100).aspx)
* [SQL Server 2005](http://msdn.microsoft.com/en-us/library/ms156450(v=SQL.90).aspx)

To include data in a report, you must first create data connections, also known as data sources, and then create datasets.

A data connection includes the data source type, connection information, and the type of credentials to use. There are two types of data sources: Embedded and Shared.

* An Embedded data source is defined in the report and used only by that report.
* A Shared data source is defined independently from a report and can be used by multiple reports.