Business Objects
an SAP® company

Crystal Reports Server Embedded 2008

Sizing and Configuration Guide for OEM Partners

Overview

This document will go over the sizing and basic configuration of unmanaged Report Application Server (RAS).

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Introduction

The Crystal Reports Server Embedded is a server-based embeddable reporting solution composed of the RAS windows service and the RAS SDK. This version of RAS is referred to as unmanaged RAS and is available only to OEM partners. Managed RAS is the version included with BusinessObjects Enterprise and supports load balancing, scalability and fault tolerance.

Report Application Server

A general rule of thumb is that each RAS (with an un-throttled full CPU license) can handle a maximum of 50 Simultaneous Report Requests. A Report Request is identified as any action performed on any report by the RAS such as opening report, refreshing, printing, clicking next page, and exporting. If two end users simultaneously click on Next Page within their report, then that is two Simultaneous Report Requests.

Example:

If your application needs to provide reporting for 100 Concurrent Users, then you can assume that they have the potential to make 100 Simultaneous Report Requests. In order to support this level of usage you will need to add another RAS to the deployment.

Memory Requirements

Depending on the design of a report, the number of records retrieved from the database, memory requirements may vary. When a report is viewed and loaded into memory the report is decompressed and expanded up to as much as 40 times the original report file size (with saved data/retrieved records).

Example (minimum memory requirements on each RAS):

500KB Report File Size (contains saved data) = 500KB * 40 (decompression ratio) = 20MB

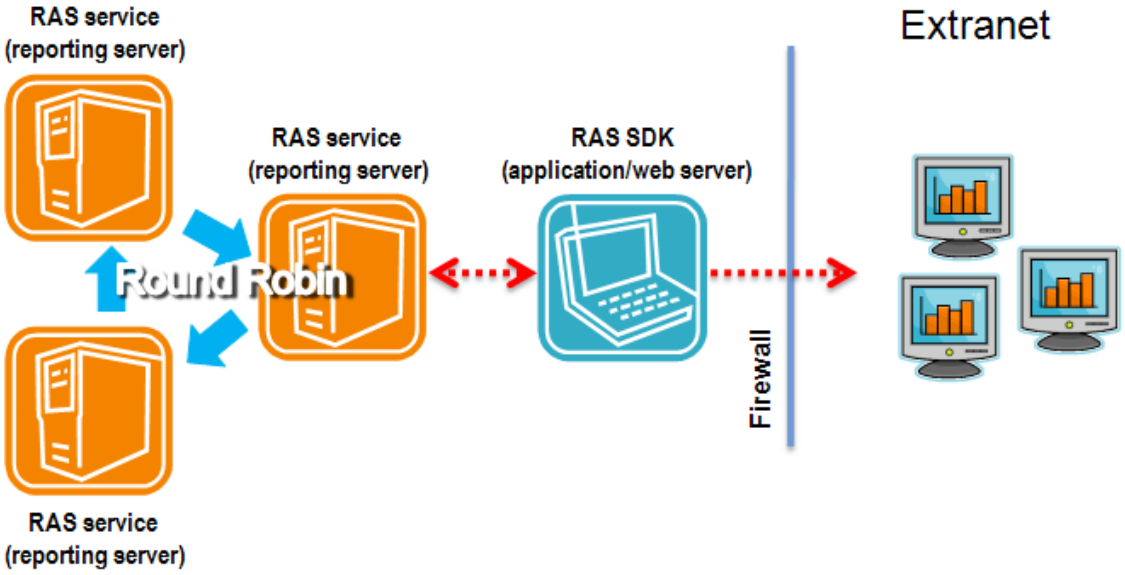
25 Reports * 20MB = 500MB minimum memory required

Configuring a Multi-RAS Server Solution

For a multiple server solution with RAS, you must configure the RAS SDK so it can communicate effectively with each RAS.

NOTE	This configuration allows the RAS solution to behave in round-robin manner only and does not provide fault tolerance. If one of the RAS fails, the request will not skip to the next available RAS. If you have three RAS in your configuration but the second RAS goes down, you will be left utilizing only the first RAS.

Adding more RAS instances means more users will have a smoother experience with faster response times when doing actions on the report. BusinessObjects Enterprise is recommended for mission critical applications that require fault tolerance and true scalability.



Server Configuration

Having multiple RAS Windows services on the same physical server is now supported in Crystal Reports Server OEM Embedded 2008. This means scaling your RAS deployments vertically is possible although load sharing between the RAS is still round-robin. For mission critical applications that require robust scalability, load balancing, and fault tolerance, we recommend the BusinessObjects Enterprise platform.

You can add additional RAS by launching individual RAS processes using the command line with the following parameters:

Switch	Description
`-name <newservername>`	The name for the new RAS server
`-ipport <portnumber>`	[Optional] This port number where RAS will be listening for requests. The port number must be different for each RAS server instance. If unspecified, RAS will default to port 1566. If the specified port is unavailable, the RAS instance will fail to start.
`-reportdirectory <filepath>`	[Optional] The report directory root this RAS instance will use for opening reports. Users will only be able to open reports are contained in <filepath>, or a subdirectory of <filepath>. If unspecified, RAS will default to the value stored in the registry. For Crystal Reports Server Embedded 2008, the registry key is **HKLM\SOFTWARE\Business Objects\Suite 12.0\Report Application Server\Instances\<Instance Name>\Server\LocalConnectionMgr\ReportDirectoryPath**

-service	[Optional] Runs RAS as a Windows service under the account executing the command. If unspecified, a RAS icon will appear in the system tray. Double-clicking on that icon will display the list of open reports.
-ProcessAffinityMask	Use a mask to specify exactly which CPUs that RAS will use when it runs on a multiprocessor machine. See page 4 for information on using this parameter.
-restart	Restart the server.

To start additional RAS servers, run crystalras.exe from the command line with the details above.

Here is a sample command line to start a second RAS on the machine "myServer":

```
"\\dtsevm2k3-2\C$\Program Files\Business Objects\BusinessObjects Enterprise
12.0\win32_x86\crystalras.exe" -name myServer.RAS_NEW -ipport 1234 –
reportdirectory C:\reportfolder\
```

You can discover the command line of your first RAS by opening the **Central Configuration Manager** (CCM) from the **Start Menu**, right clicking **Report Application Server** and selecting **Properties**.

NOTE	To add the new RAS server as a Windows service, you can use the Windows shell command sc.exe. For documentation on sc.exe, refer to the Windows MSDN documentation.
	
	In XI 3.0, for a service to display in the CCM it must begin with the prefix BOE120. Here is a sample set of command lines that creates a new RAS service, sets the display name and service description and then starts the service:
	
	`C:\> sc create BOE120RAS2 binpath= \""\\tpenner4\C$\Program Files\Business Objects\BusinessObjects Enterprise 12.0\win32_x86\crystalras.exe\" -name tpenner4.RAS_NEW -ipport 1578 –reportdirectory C:\temp -service " DisplayName= "Terry's New RAS" start= auto`
	
	`C:\> sc description BOE120RAS2 "Provides service for building and customizing of Crystal Reports documents."`
	
	`C:\> sc start BOE120RAS2`

Setting up Processor Affinity

If you have a single processor license, the RAS server process will be restricted to using only 1 processor even if it is installed on a multi processor machine. If you have a two processor license, then it will be restricted to 2 processors only.

By default the RAS server process will simply use the first processors it comes across in the hardware list. For more control over hardware resources, however, you may want to bind the RAS server process to a certain processor instead of letting it choose its own. You can do this by setting processor affinity between the RAS server process and the processor.

Processor affinity for RAS is configured by using the following command line switch in the CCM:

`-ProcessAffinityMask`
Use a mask to specify exactly which CPUs that RAS will use when it runs on a multiprocessor machine. The mask is in the format 0xffffffff.

NOTES	• Each f represents a processor. For each f, substitute either 0 (use of CPU not permitted) or 1 (use of CPU is permitted). • The list of processors reads from right to left. The last f represents the first processor.

For example, if you run the RAS on a 4 processor machine and want it to use the third and fourth processor, use the mask 0x1100. To use the second and third processor, use 0x0110.

NOTES	• RAS uses the first permitted processors in the string, up to the maximum specified by your license. If you have a two processor license, 0x1110 has the same effect as 0x0110. • The default value of the mask is -1, which has the same meaning as 0x1111.

SDK Configuration

The RAS SDK initially relies on a configuration file named clientSDKOptions.xml to locate the RAS servers. By default, the **clientSDKOptions.xml** file relevant to ASP and .NET development is installed to the following directory: **\Program Files\Business Objects\common\4.0\bin**. By default, the **clientSDKOptions.xml** file relevant to Java development is installed in the same directory as the Java SDK JAR files: **\Program Files\Common Files\Business Objects\4.0\java\lib**

For Java web applications, the **clientSDKOptions.xml** file must be accessible to your J2EE web application server. Add a copy of the **clientSDKOptions.xml** file to one of the following:

- Your application's class folder.
- A folder in your application's **CLASSPATH**.
- A JAR file within the application's lib directory.

1. Open the appropriate clientSDKOptions.xml file in a text editor and locate these lines:

```
<ServerInfo version="2"
xsi:type="CrystalReports.ServerInfo"
id="2">
```

```
        <Server>NAME</Server>
        <Adapter>TCPIP</Adapter>
</ServerInfo>
```

NOTE	By default, the setup program replaces NAME with the name of the machine where you ran the installation.

2. Modify the file to meet your requirements. To connect the RAS SDK to a RAS running on a different machine, replace NAME with the fully qualified domain name of the machine that is running your Report Application Server.
3. To balance the reporting load in a round robin manner across multiple RAS machines, create additional <ServerInfo> elements and increment the value of the id attribute, as demonstrated in this example:

```
<ServerInfo version="2"
xsi:type="CrystalReports.ServerInfo" id="2">
      <Server>SERVER01</Server>
      <Adapter>TCPIP</Adapter>
</ServerInfo>
<ServerInfo version="2"
xsi:type="CrystalReports.ServerInfo" id="3">
      <Server>SERVER02</Server>
      <Adapter>TCPIP</Adapter>
</ServerInfo>
```

NOTE	You can override the Server value in clientSDKOptions.xml dynamically, at runtime, through the RAS SDK. This technique is particularly useful if you want each application on a single web server to use its own RAS server for report processing. Refer to the RAS SDK documentation at http://diamond.businessobjects.com/developer/library for more details on this method.

Finding More Information

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

▶ www.businessobjects.com

