

# Crystal Reports XI Release 2

## Component Licensing Explained

---

### Overview

This technical brief discusses the component licensing model used in Crystal Reports XI Release 2 (and earlier versions) applications. By reading this document, you will have a better understanding of how the model affects the development of your Report Designer Component or .NET applications.

### Contents

<b>INTRODUCTION</b> .....	<b>2</b>
<b>COMPONENTS VERSUS SERVERS</b> .....	<b>2</b>
<b>CONCURRENT PROCESSING LICENSING</b> .....	<b>2</b>
<i>Single-threaded Winform application</i> .....	3
<i>Webform application running on a single CPU</i> .....	3
<i>Hyper-threading with any number of CPUs</i> .....	3
<i>VMWare and Citrix</i> .....	3
<i>Webfarms/Webgardens with multiple CPUs in IIS</i> .....	3
<b>FINDING MORE INFORMATION</b> .....	<b>4</b>

## Introduction

The Report Designer Component (RDC) and Crystal Reports XI for .NET (CR .NET) use a concurrent processing license (CPL) model. This technical whitepaper explains the performance implications of this model for your Crystal Reports application.

## Components versus servers

The RDC and CR .NET components use three (3) CPLs **per process**. Unlike the Business Objects servers such as the Page Server and Report Application Server, which are part of BusinessObjects Enterprise and Crystal Reports Server, the component has no awareness of other processes also handling report requests. As a result, there are fewer optimization options and your resource consumption will be greater than a similar solution developed using one of the servers.

The maximum number of concurrent users your solution can handle is therefore less than on equivalent hardware set up using BusinessObjects Enterprise. As a general rule, if your application regularly serves more than five (5) concurrent users, you should strongly consider a server solution to optimize your deployment.

Because the RDC and CR.NET components do not control the context in which they are instantiated, there are a wide variety of potential setups that can affect your performance. However, both technologies are thread safe and can be successfully used in a multi-threaded environment, provided you understand the limitations listed above.

## Concurrent Processing Licensing

When a request such as “export” or “set a parameter to value x” is sent to the RDC or CR .NET engine, the control of your application is passed to that component as part of the execution context. Each request can take a different amount of time to process – setting a parameter is generally much quicker than exporting – and the component will allow a maximum of 3 actions to be processed currently inside the component. Additional requests are queued and must wait for one of the 3 requests inside the engine to complete.

For example, if you have 5 users in a web application using CR .NET and they all initiate an export action simultaneously, 3 of those actions will immediately process while the other two will need to wait until one of the first export requests completes.

The most common scenarios and the resulting throughput are described below:

## Single-threaded Winform application

In this scenario, there is only ever one action executed at a time and therefore the user will not have any requested queued. Since multiple instantiations of the application are running on separate processes, each instantiation will receive 3 CPLs.

## Webform application running on a single CPU

Any requests that access the RDC or CR .NET will be subject to 3 CPL limit. The RDC and CR.NET components do not affect other parts of your application – the 3 CPL only applies to concurrent requests actively processing in the Crystal Reports engine. If you have set Microsoft Internet Information Services (IIS) to only create one process for all your IIS applications, then that one process will share the 3 CPLs. If all IIS applications are set to run in their own process, then each process will work with 3 CPLs.

## Hyper-threading with any number of CPUs

Hyper-threading is thread-level-parallelism that allows for multiple threads of an application to be run simultaneously on a processor. Since the threads are still part of one process, hyper-threading provides little or no benefit to a component based reporting solution. There is still a maximum of 3 concurrent requests that can be handled.

## VMWare and Citrix

These technologies allow for a virtualization of the underlying server hardware. In this scenario, the CR .NET and RDC components are only aware of the process in which they are running, and not the base underlying hardware actually powering the virtual machine. Since the process is created by the virtual machine, the number of true concurrent requests handled by the Crystal Reports components is not directly dependent on the physical hardware, but on the hardware reported by the VMWare or Citrix virtual machine.

## Webfarms/Webgardens with multiple CPUs in IIS

In this scenario, multiple CPUs are set up to run a single IIS application. IIS allows for significant flexibility for configuring this scenario. Often IIS is defined for one worker process to be run per application per CPU. Therefore, you would get up to a maximum of approximately 3 CPLs per CPU, or 3 CPLs per IIS worker process. Consult your Microsoft IIS documentation for further technical details on IIS configurations and their implications on the threading model.

## Finding more information

### **Business Objects Diamond Technical Community**

<http://diamond.businessobjects.com>

### **Business Objects Technical Support**

<http://technicalsupport.businessobjects.com>

For more information and resources, refer to the product documentation and visit the support area of the web site at

<http://www.businessobjects.com/>

► [www.businessobjects.com](http://www.businessobjects.com)

No part of the computer software or this document may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording, or by any information storage and retrieval system, without permission in writing from Business Objects.

The information in this document is subject to change without notice. Business Objects does not warrant that this document is error free.

This software and documentation is commercial computer software under Federal Acquisition regulations, and is provided only under the Restricted Rights of the Federal Acquisition Regulations applicable to commercial computer software provided at private expense. The use, duplication, or disclosure by the U.S. Government is subject to restrictions set forth in subdivision (c) (1) (ii) of the Rights in Technical Data and Computer Software clause at 252.227-7013.

The Business Objects product and technology are protected by US patent numbers 5,555,403; 6,247,008; 6,578,027; 6,490,593; and 6,289,352. The Business Objects logo, the Business Objects tagline, BusinessObjects, BusinessObjects Broadcast Agent, BusinessQuery, Crystal Analysis, Crystal Analysis Holos, Crystal Applications, Crystal Enterprise, Crystal Info, Crystal Reports, Rapid Mart, and WebIntelligence are trademarks or registered trademarks of Business Objects SA in the United States and/or other countries. Various product and service names referenced herein may be trademarks of Business Objects SA. All other company, product, or brand names mentioned herein, may be the trademarks of their respective owners. Specifications subject to change without notice. Not responsible for errors or omissions.

Copyright © 2007 Business Objects SA. All rights reserved.