

# Crystal Enterprise

## Configuring the Crystal Enterprise SDK for Firewalls

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### Overview

This technical brief discusses the effects of a firewall in a Crystal Enterprise SDK environment, as well as how to configure the Enterprise servers and SDK to work with a firewall.

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## Introduction

There has been a shift in the focus of reporting technology from stand alone client-based applications to a distributed computing environment that allows report processing and presentation processes to run on different computers. This has been made possible by the use of TCP/IP networks to allow different reporting components to communicate and synchronize with each other, even if they are on separate computers.

This advancement, along with the ever-growing scope of the Internet, and the network security concerns that arise when working with such a large, distributed computer network, can introduce some complex communication issues between Crystal Enterprise components.

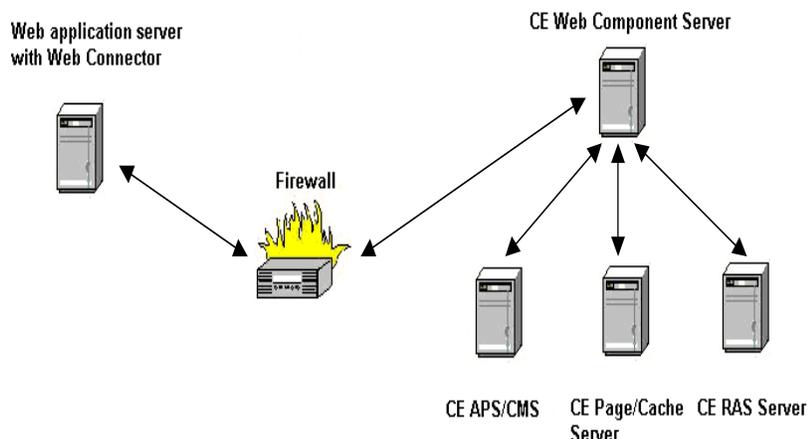
In a distributing computing environment, where an application server combined with SDK components exists on a separate computer from the report processing and analytical server components, there may be a firewall or similar network component that affects the interaction of the different reporting technologies. The infrastructure and security policies of a networked environment must be taken into account, requiring specific knowledge to enable servers to communicate correctly within the Crystal Enterprise framework.

This technical brief discusses the main issues and solutions in configuring Crystal Enterprise servers and applications to work in conjunction with firewalls.

## Crystal Enterprise Architecture

In Crystal Enterprise, report processing and presentation components are separated and encapsulated into component processes that communicate with each other using TCP/IP networking technology. These components use TCP/IP even if they exist on the same physical computer, giving the developer and network administrator the ability to offer standard reporting services bundled either on a single computer (or on any number of different computers and network setups) in a seamless manner to the end user. In this way, reporting services can be offered publicly over the Internet or intranet, while keeping the potentially sensitive and proprietary report processing components and data in a secure, private networked environment.

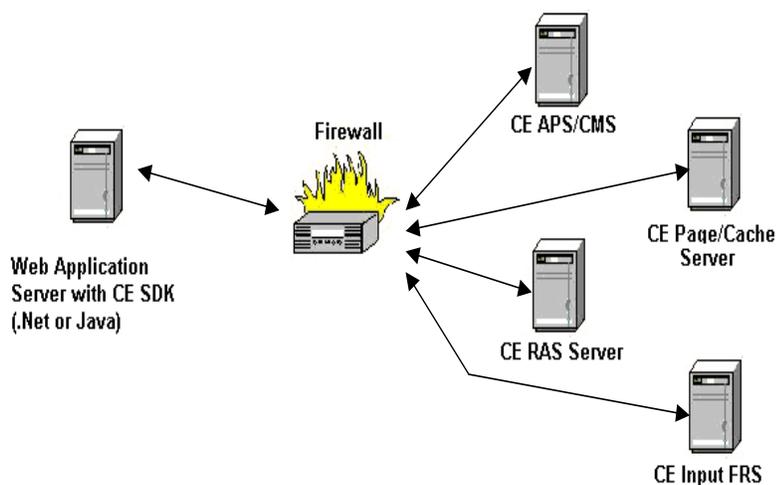
When working with a Crystal Server Pages (CSP) application, a Web Connector is used to forward URL requests to an appropriate Web Component Server (WCS) from the Web application server. Since the WCS is typically in the same subnet as the Crystal Enterprise servers, the only requirement for a firewall is that the URL traffic from the Web Connector is allowed through. The WCS manages all communication between itself and the other servers (Figure 1).



**Figure 1 – Communication between Web Connector and Crystal Enterprise servers**

When working with the Crystal Enterprise .NET, COM or Java SDK components, the set-up and communication patterns are different than when using CSP with the Web Connector:

- The SDK components take the place of the WCS on the Enterprise framework. The SDK brokers its own communications with the different servers - the WCS is not used by the SDK.
- The Crystal Enterprise SDK components are usually located on the Web application server on a different subnet than the Crystal Enterprise servers.
- The network administrator must ensure that the Report Application Server (RAS) can broker its own connection back to the Crystal Enterprise SDK computer; this is unique to RAS and is an integral part of the RAS architecture (Figure 2).



**Figure 2 – Communication patterns when using Crystal Enterprise .NET or Java components**

As you can see from Figure 2, the firewall requires further configuration to allow communication between the Crystal Enterprise SDK and the different Crystal Enterprise servers.

Since Crystal Enterprise provides default network settings that are incompatible with most network-level firewalls, the servers have the ability to configure network interface behavior through command-line arguments. These arguments use switches on the command line to configure communication ports, address resolution, and so forth, allowing the system to work in network environments that use firewalls and even Network Address Translation (NAT) devices. These switches are discussed in the sections that follow.

## The “-port” switch

The “-port” performs the following functions:

### Sets the listener port for Crystal Enterprise servers

For example, the Crystal Management Server<sup>1</sup> (CMS) has a default listener port of 6400. Services use this port to initiate communication with the CMS

To specify an unused port number, add the port switch to the startup command for the CMS service in the Crystal Configuration Manager (CCM). For example, to change the listener port number to 6500, use the following switch command:

**-port 6500**

### Sets the external service name or address in NAT environments

The Crystal Management Server (CMS) operates as a name service for all of the Enterprise components in a Crystal Enterprise environment. That is, when the SDK requests a service, the CMS provides a computer name or IP address to the SDK where the service can be located.

Since by default the physical address of the computer that houses a service is returned, issues may arise when Network Address Translation (NAT) exists between the SDK computer and the Crystal Enterprise servers. For example, if the SDK on a computer in the 10.50.0.0/16 network wants to communicate with a Report Application Server (RAS) server on a private network with an address of 192.168.1.0/24, the SDK will query the CMS for a list of available RAS servers and their locations.

In this case, the CMS returns the IP address of the RAS server, which may be 192.168.1.5. A firewall or a router performing NAT hides the

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<sup>1</sup> The Crystal Management Server was formerly known as the Automated Process Scheduler (CMS) prior to version 10.

192.168.1.0/24 network by becoming the only gateway to it. Any traffic directed to this network must go through the gateway first, but if the RAS server is reporting that its address is 192.168.1.5, it is unlikely that the SDK computer will be able to contact the RAS server using this address.

The port switch can be used in this scenario to tell the Name Service to specify a different IP address or computer name. The following example is a command line switch for the RAS server that specifies that the service is available on computer name "gatewayrouter":

**-port gatewayrouter**

All traffic destined for the RAS server is sent first to the "gatewayrouter" computer, which then directs it to the designated recipient by following a set of rules.

### Sets the listener port and external service name or address

The port switch can be used to specify the listener port and external service name or address by inserting a colon between the computer name and the listener port. For example:

**-port gatewayrouter:6500**

## The "-requestport" switch

When the Crystal Enterprise SDK and servers communicate with each other, they use a special process to help improve scalability. The servers use their listener ports to listen for communication requests from the Crystal Enterprise SDK.

When the Crystal Enterprise SDK communicates with the Crystal Management Server (CMS)<sup>2</sup>, a "handshake" is performed with the server on the default listener port (6400, or the port specified in a **-port** switch). After the handshake, the server provides a port number to the Crystal Enterprise SDK to use for all further communication; by default these port numbers are randomly generated, dictated by the ports that the operating system offers for use when network access is requested.

Since this random port number assignment does not work within the strictly defined rules created for firewalls, the server must be assigned a permanent port to communicate with the Crystal Enterprise SDK using the **-requestport** switch. The following example shows a command line entry for the CMS, which specifies that port 6415 is to be used to communicate with the Crystal Enterprise SDK after the initial handshake is made:

**-requestport 6415**

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<sup>2</sup> The Crystal Management Server was formerly known as the Automated Process Scheduler prior to version 10.

This switch will also be required on any servers that the Enterprise SDK uses through the application. Depending on the functionality that the application offers, access may have to be configured to the particular services. The Enterprise SDK does not connect to the default listener ports for these services - it simply connects directly to the request port specified by the server.

Here is a table listing common application functionality and the required server that must be configured:

Application Functionality	Server offering functionality
Logging on to Enterprise, querying the InfoStore, updating object properties, scheduling objects	Central Management Server (CMS)
Publishing any objects to the repository, viewing objects that have been directly published to the system ( <b>NOT Instances</b> ) stored in third-party format (PDF, XLS, DOC, RTF, TXT, CSV, Power Point)	Input File Repository Server
Viewing scheduled instances stored in third-party format (PDF, XLS, DOC, RTF, TXT, CSV, Power Point)	Output File Repository Server
Viewing reports on-demand, or viewing scheduled instances stored in RPT (Crystal Reports) format with the DHTML, ActiveX, or Java Viewers, viewing reportsource objects created with the PSReportFactory service	Cache Server  *Note - the Page Server is used to generate this content, but the Cache server manages all requests to the Page Server - Access DOES NOT need to be configured to the Page Server
Viewing reports on-demand, or viewing scheduled instances stored in RPT (Crystal Reports) format with the Advanced DHTML Viewer, viewing reports with Enterprise .Net applications created for Crystal Enterprise version 9, working with or viewing ReportClientDocument objects via the RASReportAppFactory service	Report Application Server (RAS)

Viewing Web Intelligence documents, creating new Web Intelligence documents	Web Intelligence Report Server
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<b>NOTE</b>	In Crystal Enterprise 10 and earlier, specific types of requests are handled by the Web Component Server (WCS). This server has been deprecated in BusinessObjects XI and later). The specific requests are URLs with special extensions (that is, .cwr and .rpt) or requests made by the Enterprise .NET web services that are forwarded to the Web Component Server using an IIS plug-in called the Web Connector. The Crystal Enterprise SDK does NOT require access to the WCS unless the Enterprise .NET web services are being used or URL requests involving .cwr or .rpt extensions are used. In these cases, a web connector is required and the WCS port (6401) must be opened on the firewall. The Web Component Adapter (WCA) in BusinessObjects Enterprise XI replaces the WCS, thus removing this requirement.
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### Common Crystal Enterprise network environments

Figure 3 illustrates a common Crystal Enterprise network configuration. The servers offering public access are in the Public Access Perimeter (DMZ), which is protected from the Internet by a firewall. Meanwhile, the Crystal Enterprise processing servers, as well as the database server, are located in the Secured Internal Network, which is protected by a more restrictive firewall. This setup allows publicly available reporting services to be offered over the Internet, while the actual report processing and data is tightly secured. Access to the internal services is granted only to the servers in the DMZ.

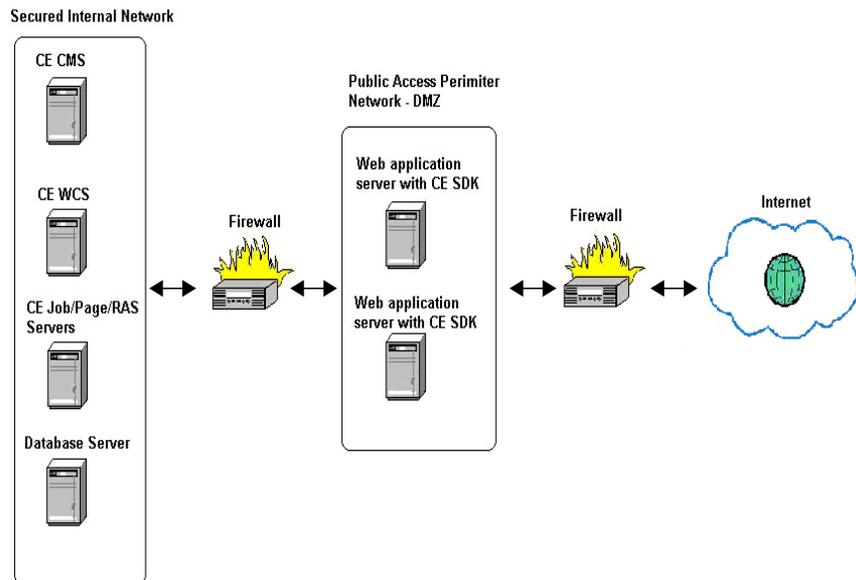


Figure 3 – Common Crystal Enterprise Network Configuration

With this type of network topography, the external firewall must be correctly configured to allow public access to the Web application servers from the Internet (using TCP port 80). Furthermore, the internal firewall must allow access from the Web application servers to the Crystal Enterprise processing services on the internal network.

## Configuring the Crystal Enterprise firewall environment

### Configuring the Crystal Enterprise servers

The Crystal Enterprise administrator performs the following tasks when there is a Network Address Translation (NAT)-based firewall between the Crystal Enterprise SDK and servers:

#### Sets the “-port” switch

The **-port** switch is used to manage address resolution for the Crystal Enterprise servers, and to change the server’s default listener ports, if desired. Since the firewall is based on NAT, it is necessary to set the **-port** switch on the Crystal Enterprise servers that are being used by the SDK application.

To set the **-port** switch on the Crystal Enterprise servers, complete these steps:

1. Stop the servers by going to **Start > Programs > Crystal Enterprise <version#> > Crystal Configuration Manager**. The **Crystal Configuration Manager** appears (Figure 4).

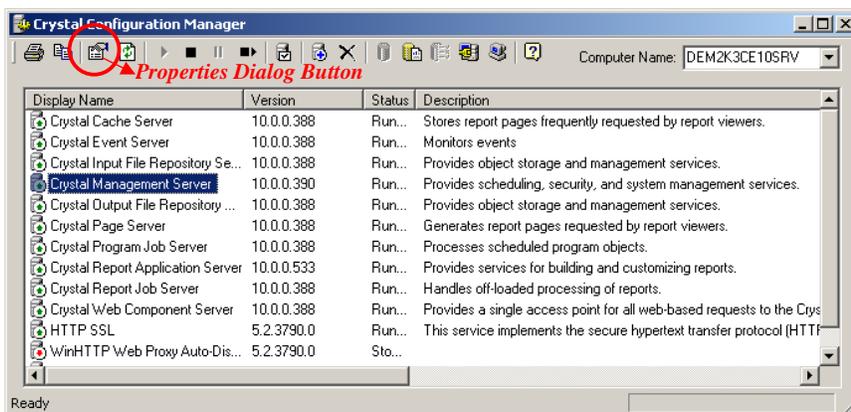


Figure 4 – Crystal Configuration Manager

2. Click the Crystal Enterprise server, and then click the **Properties Dialog** button. A properties dialog box appears for the respective server. Figure 5 shows the **Crystal Management Server Properties** dialog box.

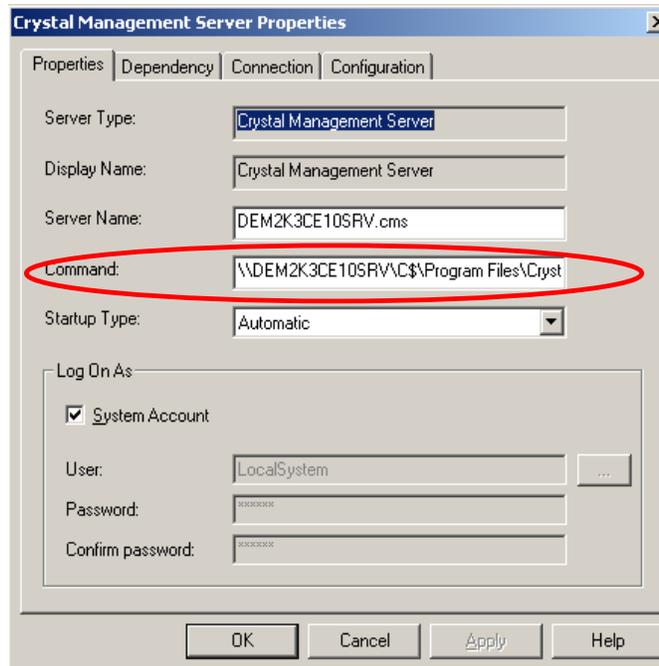


Figure 5 - Crystal Management Server Properties dialog box

The **Command** box contains the command line switches for the server. For example:

```
\\DEM2K3CE10SRV\C$\Program Files\Crystal
Decisions\Enterprise 10\win32_x86\CrystalMS.exe -service -
name DEM2K3CE10SRV.cms -restart -noauditor
```

3. In the **Command** box, type the **-port** switch and its arguments (the listener port number is an optional argument) using the following format:

```
-port servername[:listener port]
```

<b>CAUTION</b>	Be careful when changing the default listener port numbers. If a port number is specified that is already in use by another service, the Crystal Enterprise server being configured may fail to start.
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For example:

```
\\DEM2K3CE10SRV\C$\Program Files\Crystal
Decisions\Enterprise 10\win32_x86\CrystalMS.exe -service
-name DEM2K3CE10SRV.cms -port dem2k3ce10srv -restart -
noauditor
```

<b>NOTE</b>	The <b>-port</b> switch must precede the <b>-restart</b> switch.
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In this example, the **-port** switch configures the CMS to offer its services under the host name “dem2k3ce10srv” rather than the IP address of the computer.

4. If you wish to change the default listener port for the CMS from 6400 to an unused port number, then add a new listener port after the computer name. For example:

```
-port dem2k3ce10srv:6500
```

In this example, the default listener port for the CMS is changed to port 6500.

5. If you have changed the default listener port, then in the SDK application specify this port when logging on to the server. For example:

```
dem2k3ce10srv:6500
```

**NOTE**

The Crystal Enterprise SDK only connects to the default listener port of the Crystal Management Server (CMS). Any changes made to the default listener ports of other servers will not affect the application as the SDK only connects to the request port of these servers.

### Sets the “-requestport” switch

After the initial “handshake” between the Crystal Enterprise SDK and the server on the listener port, a static request port is used for communication between Enterprise components. The request port is randomly assigned by the server operating system, unless the **-requestport** switch is used to specify a specific port.

To set the request port for a Crystal Enterprise server using the **-requestport** switch:

1. Stop the server by going to **Start > Programs > Crystal Enterprise <version#> > Crystal Configuration Manager**. The **Crystal Configuration Manager** dialog box appears (Figure 4).
2. Click the Crystal Enterprise server, and then click the **Properties Dialog** button. A properties dialog box appears for the respective server.
3. In the **Command** box, type the **-requestport** switch and its arguments using the following format:

```
-requestport port
```

The following example configures the Report Application Server to use request port number 6418:

```
\\DEM2K3CE10SRV \C$\Program Files\Common Files\Crystal
Decisions\2.5\bin\crystalras.exe -service -name
DEM2K3CE10SRV.RAS -ns DEM2K3CE10SRV -requestport 6418
```

**CAUTION**

Be careful when setting the request port number. If a port number is specified that is already in use by another service, the Crystal Enterprise server being configured may fail to start.

- If Network Address Translation (NAT) is used in the network environment, then the **-port** switch must be used to enable access between the different subnets. In this example for the Report Application Server, the command line would be as follows:

```
\\DEM2K3CE10SRV \C$\Program Files\Common Files\Crystal
Decisions\2.5\bin\crystalras.exe -service -name
DEM2K3CE10SRV.RAS -ns DEM2K3CE10SRV -port DEM2K3CE10SRV -
requestport 6418
```

**IMPORTANT**

The Crystal Enterprise SDK only requires access to the Crystal Management Server (CMS), the Report Application Server, and the Cache Server. Therefore, these three servers must be configured as described above for the SDK application to work successfully.

## Configuring the firewall

Now that the Crystal Enterprise servers have been set up for the network environment, the firewall must be configured to allow communication as follows:

- Record all the communication settings for the Crystal Enterprise servers required by the SDK. In the following example, the servers are to be configured with the following settings:
  - CMS/CMS: default listener port (6400), request port 6415
  - Cache Server (managing Page server): request port 6416
  - RAS Server: request port 6418

The firewall administrator must enable communication on TCP ports 6400, 6415, 6416, and 6418.

- While the specific configuration steps depend on the type of firewall, for this example, the entries required in the Rules file for a Shorewall-based, IPTables firewall are as follows:

```
DNAT    net    loc:192.168.1.5    tcp    6400
DNAT    net    loc:192.168.1.5    tcp    6415
DNAT    net    loc:192.168.1.5    tcp    6416
DNAT    net    loc:192.168.1.5    tcp    6418
```

## Configuring the application server

In a standard deployment, no further configuration is required. However, if Network Address Translation (NAT) is used, special steps must be taken to configure the application server to ensure communication:

1. If a NAT layer separates the application server and Crystal Enterprise servers, then ensure that requests being sent to the servers are routed correctly.
2. The appropriate Crystal Enterprise server(s) must be configured correctly using the **-port** switch. For example, if a CMS uses the switch **-port CMS.BusinessObjects.com**, then the application server must be able to resolve **CMS.BusinessObjects.com** to the external address of the NAT device or firewall by a corresponding entry in the Domain Name Server (DNS) or in the Hosts file on the application server.

## Configuring firewalls for high security environments

An important and common assumption made thus far is that the firewall is configured to block unauthorized inbound traffic (from the Internet or DMZ to the Crystal Enterprise servers), but all outbound traffic (from the Crystal Enterprise servers protected by the firewall) is coming from trusted computers. Therefore, all traffic is implicitly trusted and allowed out without being filtered.

With the proliferation of Trojans and viruses, network administrators can no longer assume that any traffic originating inside the local network is safe. A trusted computer may be infected with a Trojan that can spread by connecting to other computers through a rogue connection.

To avoid this type of scenario, many network administrators are now configuring their firewalls based on the golden security rule, *"That which is not explicitly allowed, is denied."* That is, only authorized network traffic is allowed to leave a network through a firewall, rather than trusting all traffic that originates internally.

This high security firewall configuration has important implications on Crystal Enterprise environments because of the unique nature of the Report Application Server (RAS) server. Not only is it a server, but it is also a client. When the RAS server receives a request to process a report, it accepts and processes the request. When it finishes processing, it creates its own connection back to the Crystal Enterprise SDK on the application server. The SDK is now the server and the RAS server is the client, delivering a report stream back to the SDK.

## Configuring the Crystal Enterprise SDK for secure firewall environments

When the Crystal Enterprise SDK is initialized on an application server, it requests a listener port from the operating system, which provides a random port number for listening to connection attempts by the RAS server. Since the port number changes each time the SDK is re-initialized, it is impossible to properly filter and allow this traffic across the secure firewall. What is required is a way to configure the Crystal Enterprise SDK to listen only on a static port(s), thereby allowing firewall rules to be created to allow traffic to pass.

While the capability to configure the SDK to listen on a static port(s) is part of Crystal Enterprise 10, you must apply the latest Service Pack to the application server if you are using the Crystal Enterprise 8.5 or 9 SDK. Service Packs are found at the following location:

<http://support.businessobjects.com/fix/hot/si75/default.asp>

### Setting the SDK listener port for .NET applications

Now that the capability to configure the Crystal Enterprise SDK to listen only on a single port(s) is available, complete these steps:

1. Manually create two registry entries to specify the communication parameters, depending on the version of Crystal Enterprise:

**CAUTION**

Using the Registry Editor can cause serious problems that may require reinstalling the operating system. Business Objects is not responsible for any problems resulting from using the Windows Registry Editor; use it at your own risk. Business Objects recommends that you back up the registry before you edit it.

#### Crystal Enterprise 8.5:

- HKEY\_LOCAL\_COMPUTER\SOFTWARE\Crystal Decisions\8.5\CER\ RequestPortLower
- HKEY\_LOCAL\_COMPUTER\SOFTWARE\Crystal Decisions\8.5\CER\ RequestPortUpper

#### Crystal Enterprise 9:

- HKEY\_LOCAL\_COMPUTER\SOFTWARE\Crystal Decisions\9.0\CER\ RequestPortLower
- HKEY\_LOCAL\_COMPUTER\SOFTWARE\Crystal Decisions\9.0\CER\ RequestPortUpper

**Crystal Enterprise 10:**

- HKEY\_LOCAL\_COMPUTER\SOFTWARE\Crystal Decisions\10.0\CER\ RequestPortLower
- HKEY\_LOCAL\_COMPUTER\SOFTWARE\Crystal Decisions\10.0\CER\ RequestPortUpper

<b>NOTE</b>	Ensure that the following values are entered into the registry as decimal-base values and not hexadecimal-base (system default) values.
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The values of these registry entries are as follows (a zero (0) value allows the system to pick a port):

Registry Entry	Type	Default Value
RequestPortLower	(DWORD)	0
RequestPortUpper	(DWORD)	65536

2. Set both registry entries to the same value to specify that a single port is to be used by the SDK to listen for connections.

**Sets the SDK listener port for Java applications**

Since Java application servers do not make use of the Windows registry, a system property must be set. The following sample line of code sets the listener port to 6420 when using the Crystal Enterprise Java SDK:

```
System.setProperty("oc.iiop.port", "6420");
```

Once the listener port for the SDK has been set, a rule must be generated on the firewall to allow outbound TCP traffic through this port to complete the configuration.

**Troubleshooting error messages**

When troubleshooting firewall and network-related issues, a useful tool to have is a packet sniffer. A packet sniffer helps to analyze all packets traversing a network or subnetwork, making it possible to determine if the configuration of the Crystal Enterprise servers is correct.

A freely available packet sniffer is available at the following location:

<http://www.snapfiles.com/get/nasniffer.html>

This utility will be used for demonstration purposes in this troubleshooting section.

This section discusses how to resolve some of the common error messages received when Enterprise servers are not properly configured in a network environment that contains firewalls and/or NAT devices.

## **Err Msg: “Unable to retrieve cluster members...” or “Server...not found...”**

### **Error message**

“Unable to retrieve cluster members. CMS host '<%servername%>' address was resolved properly, but cannot be reached to establish a CMS connection. Verify that your router/firewall allows communication on port <port number>”

- OR -

“Server '<%servername%>' not found or server may be down”

### **Cause**

This error message appears because the port number on the firewall has not been opened.

### **Resolution**

To resolve this error message, open the port (or the defined listener port for the Crystal Management Server (CMS) if it has been changed) on the firewall.

## **Err Msg: “Unable to retrieve cluster members...” or “Unable to connect to service InfoStore...”**

### **Error message**

“Unable to retrieve cluster members. Transport error: Communication failure.”

- OR -

“Unable to connect to service InfoStore from server '<%servername%>' via CMS '<%servername%>'”

### **Cause**

When communicating with the CMS, the SDK sends a connection request to the CMS listener port (6400 by default), which in turn notifies the SDK to use another port number for all further communication. Since this new port number is randomly generated by the host operating

system, it is not possible to create static firewall rules to allow traffic through a specific port.

**Resolution**

To troubleshoot this error message, complete these steps:

1. Use the **-requestport** switch to tell the Crystal Management Server (CMS) to use a static port(s) for all further communication, allowing the firewall administrator to create a rule that allows this traffic through the firewall.
2. Ensure that the specified port(s) has been opened on the firewall.
3. If this error message persists, run the packet sniffer on the application server, and then create a filter so that only packets with a destination port of 6400 and 6415 are shown (or the respective configured listener and request ports) (Figure 6):

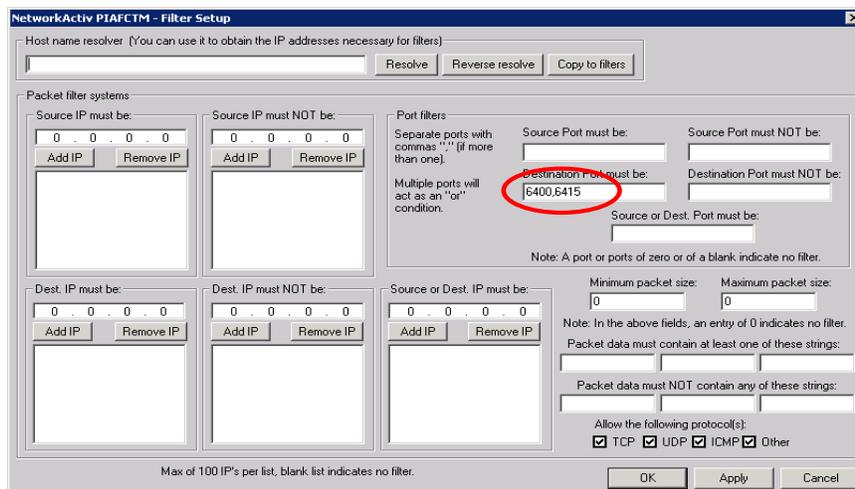


Figure 6 - Packet Sniffer

4. On the main page of the packet sniffer, ensure that the option to **Apply filters to incoming packets** is selected, and then click the **Start** button. Here is a sample packet capture:

Type	Size	Source IP	Destination IP	sPort	dPort	Date/Time
TCP	48	10.50.34.68	10.50.34.44	1215	6400	[2004.08.11 - 10:33:35.414]
TCP	40	10.50.34.68	10.50.34.44	1215	6400	[2004.08.11 - 10:33:35.444]
TCP	43	10.50.34.68	10.50.34.44	1215	6400	[2004.08.11 - 10:33:35.444]
TCP	40	10.50.34.68	10.50.34.44	1215	6400	[2004.08.11 - 10:33:35.464]
TCP	40	10.50.34.68	10.50.34.44	1215	6400	[2004.08.11 - 10:33:35.464]
TCP	48	10.50.34.68	192.168.1.5	1216	6415	[2004.08.11 - 10:33:35.464]

TCP	48	10.50.34.68	192.168.1.5	1216	6415	[2004.08.11 - 10:33:38.408]
TCP	48	10.50.34.68	192.168.1.5	1216	6415	[2004.08.11 - 10:33:44.416]

In the packet capture above, the SDK computer making the connection attempt has an IP address of 10.50.34.68, and the connection request on port 6400 is being sent to IP address 10.50.34.44. After the initial packets have been sent, the communication switches over to port 6415, but the destination address has changed to 192.168.1.5.

The IP address of the Enterprise server is actually the private IP address 192.168.1.5. There must be a NAT device between the SDK and the Enterprise server, which translated the IP address 10.50.34.44 to the actual private IP address of the server. When logging on, the name of the Crystal Management Server (CMS) is usually provided, which resolves to the public address of the firewall. The firewall handles the NAT for the private network that contains the Enterprise servers in this example. Therefore, the initial connection to port 6400 was sent to the correct IP address.

When Enterprise servers offer their services, they do so by offering their IP addresses, rather than their own computer names. Using private IP addresses may cause errors because they cannot be routed through the firewall.

5. To resolve this error message, use the **-port** switch on the Enterprise servers to specify the server name when offering services.

In this example, the name of the Enterprise server is "demce10srvcb0", and it resolves to the IP address of 10.50.34.44 on the application server. If you use this computer name in the **-port** switch for the Enterprise servers, this name rather than the IP address will be passed back to the SDK, thus allowing all subsequent requests to be routed properly through the firewall. Once the **-port** switch is added to the CMS, this error message no longer appears when you attempt to log on to the server.

## Err Msg: "The Page Server you are trying to connect..." or "All the servers with CMS..."

### Error Message

"The Page Server you are trying to connect to is not accessible. Please contact your system administrator."

- OR -

"All the servers with CMS <%servername%>, cluster @<%servername%>.CRYSTALD.NET and kind cacheserver are down or disabled."

### Cause

This error message appears because of one or more of the following reasons:

- A request port has not been set for the Cache Server. When using the Page Server to generate reports, the Cache Server handles the request to see if it can be served by a page in the cache, before sending the report job to the Page Server.
- A request port has been set for the Cache Server, but this port has not been opened on the firewall.
- The Enterprise servers are behind a NAT device, preventing the report request from being sent to the correct IP address. A packet capture on the SDK computer should confirm whether packets destined to the request port of the Cache Server are being sent to the actual IP address of the Cache Server rather than the external interface for the NAT device.

### Resolution

To resolve this error message:

1. Add the **-requestport** switch to the Cache Server.
2. Open the request port used for the Cache Server on the firewall.
3. Use the **-port** switch on the Cache Server for the server to offer its services by name rather than IP address.

## Err Msg: “Failed to find an available Report Application Server” or “All the servers with CMS...”

### Error Message

“Failed to find an available Report Application Server”

- OR -

“All the servers with CMS <%servername%>, cluster @<%servername%>.CRYSTALD.NET and kind rptappserver are down or disabled.”

### Cause

This error message appears because of one or more of the following reasons:

- A request port has not been set for the Report Application Server.
- A request port has been set for the Report Application Server, but this port has not been opened on the firewall.

- The Enterprise servers are behind a NAT device, preventing the report request from being sent to the correct IP address. A packet capture on the SDK computer should confirm whether packets destined to the request port of the Report Application Server are being sent to the actual IP address of the Report Application Server rather than the external interface for the NAT device.

### Resolution

To resolve this error message:

1. Add the **-requestport** switch to the Report Application Server.
2. Open the request port used for the Report Application Server on the firewall.
3. Use the **-port** switch on the Report Application Server for the server to offer its services by name rather than IP address.

## Err Msg: “Request timed out...”

### Error Message

“Request timed out because there has been no reply from the server in <xxxxx> ms”

- OR -

“com.crystaldecisions.sdk.occa.report.lib.ReportSDKException: The request timed out because there has been no reply from the server for <xxxxx> milliseconds.---- Error code:-2147217385 Error code name:requestTimeout”

### Cause

This error message appears only when using the Report Application Server, and only when the firewall is filtering outbound connection requests from the internal, protected network.

The Report Application Server (RAS) is unique among Enterprise servers in that it is also a client. After fulfilling report-processing requests from the Crystal Enterprise SDK, the RAS server brokers its own connection back to the SDK to deliver the results of the request. Since the SDK is now the server in this transaction, it requires a port to listen for these connection attempts.

### Resolution

To resolve this issue, a static port must be used by the SDK to listen for inbound connections – just like a request port for the Enterprise servers. For the Crystal Enterprise 10 SDK, this functionality is already present. To add this capability to the Crystal Enterprise 8.5 or 9 SDK, apply the

appropriate latest Service Pack. Service Packs are available at the following location:

<http://support.businessobjects.com/fix/hot/si75/default.asp>

For instructions on how to configure this setting, refer to the section [Configuring the SDK for Secure Firewall Environments](#) in this document.

## Finding More Information

For more information and resources, refer to the product documentation and visit the support area of the web site at [www.businessobjects.com](http://www.businessobjects.com)

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

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