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http://www.businessobjects.com/thirdparty
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Introduction to the Administrator’s Reference Guide
About this guide

This guide provides you with information and procedures covering a wide range of administrative tasks. Procedures are provided for common tasks. Conceptual information and technical details are provided for all advanced topics.

BusinessObjects Enterprise is a flexible, scalable, and reliable solution for delivering powerful, interactive reports to end users via any web application—intranet, extranet, Internet or corporate portal. Whether it is used for distributing weekly sales reports, providing customers with personalized service offerings, or integrating critical information into corporate portals, BusinessObjects Enterprise delivers tangible benefits that extend across and beyond the organization. As an integrated suite for reporting, analysis, and information delivery, BusinessObjects Enterprise provides a solution for increasing end-user productivity and reducing administrative efforts.

Who should use this guide?

This guide is a supplement to the BusinessObjects Enterprise Administrator’s Guide. It provides advanced topics for system administrators who are responsible for configuring, managing, and maintaining a BusinessObjects Enterprise installation. Familiarity with your operating system and your network environment is certainly beneficial, as is a general understanding of web server management and scripting technologies.


Business Objects information resources

For more information and assistance, see Appendix A: Business Objects Information Resources. This appendix describes the Business Objects documentation, customer support, training, and consulting services, with links to online resources.
From BusinessObjects 6.x to BusinessObjects XI
Here is a list of the applications in each version's offering. Although the applications in each row belong to the same area of functionality, those in the BusinessObjects 6.x column and those in the Desktop Intelligence XI column are not necessarily equivalent:

<table>
<thead>
<tr>
<th>In BusinessObjects 6.x</th>
<th>In BusinessObjects XI</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Designer</td>
<td>• Designer</td>
</tr>
<tr>
<td>• Supervisor</td>
<td>• Business View Manager</td>
</tr>
<tr>
<td>• Supervisor over the Web</td>
<td>• Central Management Console</td>
</tr>
</tbody>
</table>
| **Several applications allow you to add objects to the repository.** | **Publishing Wizard**
|                                                            | **Several other applications allow you to add objects to the repository as well.** |
| • Administration Console                                   | • Central Configuration Manager                             |
| • Auditor                                                   | • Central Management Console                               |
|                                                            | **Auditing is incorporated in the Central Management Console.** |
| • InfoView                                                  | • InfoView                                                 |
| • Desktop Intelligence                                      | • Desktop Intelligence                                     |
| • BusinessQuery                                             |                                                           |
| • Web Intelligence                                          | • Web Intelligence                                         |
| • Web Intelligence for OLAP Data Sources                   | • Crystal Reports                                          |
| • Web Intelligence for OLAP Data Sources                   | • OLAP Intelligence                                        |
|                                                            | • OLAP Intelligence Designer                                |
| • Broadcast Agent                                           | • Central Management Console (CMC)                         |
| • Developer Suite                                           | • Developer Suite                                          |

*The Application Foundation suite and Data Integrator are available to complement the BusinessObjects 6.x suite, but are not part of it.*

|                                                           | • Performance Management (formerly Application Foundation) |
|                                                           | • Data Integrator                                         |
|                                                           | • Import Wizard                                           |
Architecture

The overall architecture of the two systems is organized in a similar manner.

**BusinessObjects 6.x**

BusinessObjects 6.x is organized in five logical layers:

- **The client tier** contains products or features that run on the end-user’s computer (either as a standalone application or in the web browser).
- **The presentation layer** contains the web and application servers, as well as the BusinessObjects components hosted on them (server SDKs, portal pages, servlets, Dispatcher, and HSAL).
- **The application services layer** provides the essential framework and services to the processing layer, such as WISessionManager, WILoginServer, and WISStorageManager.
- **The processing layer** contains report engines, as well as the additional components that implement business logic (portal workflows, repository access, scheduling, etc.).
- **The database tier** is made up of the databases containing the data used in documents and reports.

![Architecture Diagram]

---

*From BusinessObjects 6.x to BusinessObjects XI Architecture*
BusinessObjects XI

BusinessObjects XI is organized into five tiers:

- The **client tier** contains client applications.
- The **application tier** includes the web and application servers, as well as the Business Objects components hosted on them.
- The **intelligence tier** manages the BusinessObjects XI system, maintaining security information, routing requests to the appropriate processing layer services, managing audit information, and storing report instances for rapid report viewing. There are no strict equivalents for these servers in the BusinessObjects 6.x system.
- The **processing tier** accesses the data and generates reports. This layer contains fewer “servers,” or processes, than the BusinessObjects 6.x processing layer. Transactional workflows are therefore simplified, with each server processing requests for a specific type of object. In a BusinessObjects 6.x context, this corresponds a dedicated role such as WIReportServer, which processes Web Intelligence 6.x reports only, rather than a provider of shared services such as WIQT, which plays a shared role in several types of processing workflows.
- The **data tier** is made up of the databases containing the data used in reports.
From BusinessObjects 6.x to BusinessObjects XI Architecture
Basic terminology

Here are some of the main differences in terminology between the two releases:

<table>
<thead>
<tr>
<th>In BusinessObjects 6.x</th>
<th>In BusinessObjects XI</th>
</tr>
</thead>
</table>
| **Repository**         | The repository exists here as well as one of the databases maintained by the Central Management Server (CMS). The CMS is the central service/daemon in the BusinessObjects Enterprise XI system (see its entry further along in this table).  
  The repository actually contains the data associated with the security, universe and document domains. Making sure the repository database has enough space is therefore critical.  
  Although the repository database stores specific information about the objects published to it, including users, servers, security, groups, folders, categories and parameters, it does not actually store physical copies of the objects; it also contains pointers to the physical objects, such as Web Intelligence WID files, Crystal Reports RPT files, universe UNV files and third-party documents, stored in storage associated with the File Repository Servers. |
| **Repository domains** | When universe and document domains are imported from a BusinessObjects 6.x deployment, they are made into folders in the CMS database. Although the security domain itself is not imported, you can import its contents (user rights, etc.). See “Migration” on page 17. |
| **Repository**         | The BusinessObjects 6.x suite uses a repository — a database that is stored in a relational database management system. The repository is used to secure access to your data warehouse and to provide an infrastructure for distributing information to be shared by users.  
  The repository database actually contains the data associated with the security, universe and document domains. Making sure the repository database has enough space is therefore critical.  
  Although the repository database stores specific information about the objects published to it, including users, servers, security, groups, folders, categories and parameters, it does not actually store physical copies of the objects; it also contains pointers to the physical objects, such as Web Intelligence WID files, Crystal Reports RPT files, universe UNV files and third-party documents, stored in storage associated with the File Repository Servers. |
| **Repository domains** | The repository must have a security domain. It can also contain universe and document domains. |
| **Repository**         | The repository exists here as well as one of the databases maintained by the Central Management Server (CMS). The CMS is the central service/daemon in the BusinessObjects Enterprise XI system (see its entry further along in this table).  
  The repository actually contains the data associated with the security, universe and document domains. Making sure the repository database has enough space is therefore critical.  
  Although the repository database stores specific information about the objects published to it, including users, servers, security, groups, folders, categories and parameters, it does not actually store physical copies of the objects; it also contains pointers to the physical objects, such as Web Intelligence WID files, Crystal Reports RPT files, universe UNV files and third-party documents, stored in storage associated with the File Repository Servers. |
| **Repository domains** | When universe and document domains are imported from a BusinessObjects 6.x deployment, they are made into folders in the CMS database. Although the security domain itself is not imported, you can import its contents (user rights, etc.). See “Migration” on page 17. |
## In BusinessObjects 6.x

### Business Objects servers
At a minimum, the Business Objects server back end must be installed on the cluster’s primary node and all secondary nodes. This installs all the processing layer modules on the server machines.

## In BusinessObjects XI

### Central Management Servers (CMS)
The CMS is a single service which provides framework services, security management, administers scheduling tasks, and also is responsible for maintaining the database (CMS database) containing system information, such as users/groups, security levels, and services. In addition it maintains the repository and audit databases.

The CMS serves as the central nervous system of the BusinessObjects Enterprise intelligence layer. Disabling the CMS is roughly equivalent to disabling the Session Stack (starting with version 6.1, the set of core processing modules enabled or disabled as a group).

### Modules
Processes used in Business Objects transactions which can be configured through the Administration Console are called **modules**.

A few examples of modules are:
- Broadcast Agent Manager (which manages Schedulers)
- WIStorageManager
- WIReportServer

### Servers
Processes in the BusinessObjects Enterprise XI system are called **servers**. They run as services under Windows, and as daemons under UNIX.

The CMC’s ability to enable/disable and even group servers, for example, concerns processes, not actual Business Objects servers, or server machines.

A few examples of servers are:
- Job Server
- the File Repository Servers
- Web Intelligence Report Server
Clusters

A cluster is one or more Business Objects servers which provide the functional processing for a given BI portal. Each server hosts the entire set of Business Objects modules; the Session Stack must be activated in order for the server to contribute to cluster processing.

When a cluster contains more than one server machine, it is called a distributed deployment.

Clusters can contain the following elements:

- The primary node serves as the central coordinator amongst all the nodes in the cluster. There is one and only one primary node in a cluster; if the cluster contains only one node, it is a primary node.
- Optional secondary nodes run the ORB components required to communicate with the primary node and start Business Objects processes on the secondary node(s), as well as optional services.

Both primary and secondary nodes are considered cluster nodes.

CMS clusters

A Central Management Server cluster (CMS cluster) consists of two or more CMSs working together to maintain the system databases and repository. The CMSs can be on the same machine or on different ones.

This means that at a minimum only the CMS component must be installed and activated on the machine. Other processes (servers) can be installed and run on other machines.

A CMS cluster is called an expanded deployment.

The distinction between primary and secondary nodes does not apply.

When you add a new CMS to a deployment containing a previously-installed CMS, you instruct the new CMS to connect to the existing CMS database and to share the processing workload with any existing CMS machines. By default, the new cluster is given the name of the first installed CMS, prefaced by "@".

<table>
<thead>
<tr>
<th>In BusinessObjects 6.x</th>
<th>In BusinessObjects XI</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Clusters</strong></td>
<td><strong>CMS clusters</strong></td>
</tr>
<tr>
<td>A cluster is one or more Business Objects servers which provide the functional processing for a given BI portal. Each server hosts the entire set of Business Objects modules; the Session Stack must be activated in order for the server to contribute to cluster processing.</td>
<td>A Central Management Server cluster (CMS cluster) consists of two or more CMSs working together to maintain the system databases and repository. The CMSs can be on the same machine or on different ones.</td>
</tr>
<tr>
<td>When a cluster contains more than one server machine, it is called a distributed deployment.</td>
<td>This means that at a minimum only the CMS component must be installed and activated on the machine. Other processes (servers) can be installed and run on other machines.</td>
</tr>
<tr>
<td>Clusters can contain the following elements:</td>
<td>A CMS cluster is called an expanded deployment.</td>
</tr>
<tr>
<td>• The primary node serves as the central coordinator amongst all the nodes in the cluster. There is one and only one primary node in a cluster; if the cluster contains only one node, it is a primary node.</td>
<td>The distinction between primary and secondary nodes does not apply.</td>
</tr>
<tr>
<td>• Optional secondary nodes run the ORB components required to communicate with the primary node and start Business Objects processes on the secondary node(s), as well as optional services.</td>
<td>When you add a new CMS to a deployment containing a previously-installed CMS, you instruct the new CMS to connect to the existing CMS database and to share the processing workload with any existing CMS machines. By default, the new cluster is given the name of the first installed CMS, prefaced by &quot;@&quot;.</td>
</tr>
</tbody>
</table>

| **Web Intelligence**                           | **Web Intelligence**                           |
| **Application servers**                        | **Web application servers**                    |
| Scheduling functions are handled by the CMS, which instructs the Job Server to process the job on a schedule managed by the CMS. | |

| **Broadcast Agent**                            | **Web Intelligence Report Server**             |
| **WIReportServer**                             | **Public folder**                              |
| **Corporate documents page**                   | **File Watcher**                               |
| **Event Server** manages file-based events. Schedule-based and custom events, on the other hand, are managed by the CMS. | The Event Server manages file-based events. Schedule-based and custom events, on the other hand, are managed by the CMS. |
# Migration

To import repository objects such as domains, universes, universe restriction sets, users and groups, categories, documents, and reports from BusinessObjects 6.x, you use the Import Wizard. This Wizard and how to use it is described in the *BusinessObjects Enterprise XI Installation Guide*. Here is a summary of what the Import Wizard does and doesn't import:

<table>
<thead>
<tr>
<th>The Import Wizard imports:</th>
<th>The Import Wizard doesn’t import:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Users and groups</td>
<td>• Web Intelligence OLAP</td>
</tr>
<tr>
<td>• Desktop Intelligence documents or Desktop Intelligence documents in report, template and add-in documents</td>
<td>• Custom applications and interfaces created using the SDK</td>
</tr>
<tr>
<td>• Categories</td>
<td>• Broadcast Agent Scheduler or Publisher tasks</td>
</tr>
<tr>
<td>• Security</td>
<td>• Business Objects Administration Console settings</td>
</tr>
<tr>
<td>• Inbox, Personal, and Corporate documents</td>
<td>• Web Intelligence documents that are linked using OpenDoc</td>
</tr>
<tr>
<td>• Web Intelligence 2x and 6x documents</td>
<td>• BusinessObjects Auditor</td>
</tr>
<tr>
<td>• Universes and connection objects</td>
<td>• User’s timestamps</td>
</tr>
<tr>
<td>• Stored procedure privileges</td>
<td>• Scheduler jobs</td>
</tr>
<tr>
<td>• Analytic documents from source Desktop Intelligence 6.x sources</td>
<td>• Publisher web or e-mail publications</td>
</tr>
<tr>
<td>• Dashboards, name events, and rules and schedules</td>
<td>• Application Foundation resources not stored in Application Foundations repository</td>
</tr>
</tbody>
</table>
Migration and mapping of specific objects

Here is some important information about migrating specific objects from BusinessObjects 6.x to BusinessObjects Enterprise XI:

<table>
<thead>
<tr>
<th>Object</th>
<th>Specific migration information</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>User properties</strong></td>
<td></td>
</tr>
<tr>
<td>Identification Strategy</td>
<td>These properties are not mapped.</td>
</tr>
<tr>
<td>Logon</td>
<td></td>
</tr>
<tr>
<td>Enable Real Time User Rights Update</td>
<td></td>
</tr>
<tr>
<td>Enable Password Modification flag</td>
<td></td>
</tr>
<tr>
<td>Password Validity settings</td>
<td>This maps to the User cannot change password property, which when True, means what it says.</td>
</tr>
<tr>
<td>Object Security level</td>
<td>This property must be reset manually by the administrator at the global level.</td>
</tr>
<tr>
<td></td>
<td>Expressed as limit rights set on the universe folder; object levels in Desktop Intelligence 6.x map to appropriately-named user groups.</td>
</tr>
<tr>
<td><strong>User profiles</strong></td>
<td>Most Desktop Intelligence 6.x user profiles map to default groups in the new system. For example, General Supervisors become members of the Administrators groups. Supervisors, on the other hand, are not mapped to the Administrators group, but instead simply granted the appropriate rights on all imported objects. Users with the User/Versatile profile are added to an Object Level Security group based on their Object Security levels.</td>
</tr>
<tr>
<td><strong>Groups</strong></td>
<td>The Company group maps to the Everyone group.</td>
</tr>
<tr>
<td><strong>External groups</strong></td>
<td>The Import Wizard maps static LDAP groups. Dynamic groups are mapped with Enterprise authentication. After migration, Administrators need to create dynamic groups.</td>
</tr>
<tr>
<td><strong>Inbox documents</strong></td>
<td>Inbox documents are imported to the Inbox folder. If Inbox already includes duplicate documents, they are also migrated to the File Repository Servers, which manage all document instances that have been scheduled or published to the repository.</td>
</tr>
<tr>
<td><strong>Personal documents</strong></td>
<td>Personal documents are imported to the user’s Favorites folder, where only the BusinessObjects administrator and their owners have access to them. Any personal or corporate categories that referred to these documents in BusinessObjects 6.x continue to refer to them in BusinessObjects Enterprise XI.</td>
</tr>
</tbody>
</table>
Both personal and corporate categories are imported. When you import corporate categories, you can select individual categories and subcategories to import into BusinessObjects Enterprise XI.

Document and universe domains become folders with the same name. User and group access to these folders is equivalent to the rights they had on the BusinessObjects 6.x domains. Documents and universes cannot be imported unless their domain is imported as well.

Users can choose between importing all universes and connections, or only those associated with the Web Intelligence reports being imported.

Web Intelligence documents that used a BusinessObjects 6.x universe use the same universe in BusinessObjects Enterprise XI. BusinessObjects 6.x universe IDs are updated to BusinessObjects Enterprise XI IDs and CUIDs:

- For universes: Universe ID, connection ID, and core universe ID
- For Web Intelligence reports: universe ID

Scope management is a Supervisor option which allows you to control the extent of the access that all supervisors are granted to users and user groups.

General supervisors can limit other supervisors' access by setting their scope management setting to Standard, Secured or Extended mode, each of which defines a different level of access to user/group information and management.

Although this feature is mapped to the Delegated Administration feature in Business Objects Enterprise XI, the two features are not strictly equivalent; in particular, Delegated Administration does not support “modes”. Import attempts to set rights in the destination deployment that are at least as restrictive as the effective rights in the source deployment. This is true for all restrictions that limit modification and administration of objects. A delegated administrator may nonetheless be able to view imported objects (such as connections) that were previously hidden in the source deployment. It is recommended to verify effective rights on imported objects for “delegated administrators” after import and to set appropriate rights for access to objects that only exist in BusinessObjects Enterprise XI and not in BusinessObjects 6.x (e.g. calendars, events, etc.). By default, imported “delegated administrators” will inherit the rights specified for the Everyone group for access to such objects.
Migration of user rights

Key security features provided by BusinessObjects 6.x (as applied to the integrated components) are available in BusinessObjects XI. Along with the ability to specify rights at the object level, BusinessObjects XI provides the ability to specify global rights for Web Intelligence, Dashboard Manager, and Performance Manager applications.

The following identifies the migration path for integrated rights:

<table>
<thead>
<tr>
<th>Right Type in BusinessObjects 6.x</th>
<th>Migrated to BusinessObjects Enterprise XI as...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product Access (PA) right</td>
<td>Right to view application object</td>
</tr>
<tr>
<td>Security Command right</td>
<td>Right to application object, domain folder, or content object</td>
</tr>
<tr>
<td>Domain Access right</td>
<td>Right to view domain folder</td>
</tr>
<tr>
<td>Document/Universe Access right</td>
<td>Right to view content object</td>
</tr>
</tbody>
</table>

Different default and aggregate rules

The fundamental default and aggregate rules governing rights change radically in BusinessObjects Enterprise XI to maintain greater system security:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Product Access (PA) Right</td>
<td>Granted (The Designer and Supervisor PA right is set to Denied on the root folder at install time.)</td>
<td>Denied</td>
<td>If granted (or unspecified) anywhere: granted</td>
<td>If unspecified or denied anywhere, then denied</td>
</tr>
<tr>
<td>Security Command Right</td>
<td>Enabled</td>
<td>Denied</td>
<td>• If hidden anywhere, then hidden</td>
<td>• Hidden in 6.x = denied in XI</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• If disabled anywhere, then disabled</td>
<td>• If unspecified or denied anywhere, then denied</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Otherwise, enabled</td>
<td></td>
</tr>
</tbody>
</table>
Here is an overview of key differences in installation, configuration, and deployment:

### Server operating systems

**BusinessObjects 6.x**

BusinessObjects 6.5 supports *heterogeneous clusters*, in which Business Objects servers are hosted on Windows and UNIX machines.

**BusinessObjects XI**

The CMS “servers” in a BusinessObjects Enterprise XI cluster must all be running on machines running the same operating system and version. The other “servers” in the intelligence layer, however, such as the Job Server, can be hosted on machines running completely different (but supported) operating systems.

### Initial installation options

- Desktop
- Server
- Custom

**BusinessObjects XI**

- Client
- Server

The Server option provides three installation options:

- New
- Expand
- Custom
### In BusinessObjects 6.x

**Distributed deployments**
To distribute processing, you add additional cluster nodes to a cluster. To add a cluster node, you must install Business Objects server on the node machine. This installs the entire set of processes required for system processing on each machine. At a minimum, the Session Stack must be activated on each cluster node to share the transaction load.

**Installation and the repository**
Repository creation is completely independent of the installation of Business Objects software.

**Command-line installation**
Application servers communicate with the Business Objects cluster through the ORB.

### In BusinessObjects XI

You can distribute a single deployment's transactional capabilities on the same machine by creating multiple instances of a "server", or you can install on additional machines to distribute the load. This capability offers you the ability to scale your system vertically (more services on the same machine) or horizontally (more machines).

The CMS does not need to run on each machine.

**Setting up the CMS database, which includes the repository, is an integral part of BusinessObjects Enterprise installation.**

In a New server installation, if you install a Central Management Server and do not choose to connect the CMS to an existing database, the installation procedure automatically installs and configures MySQL as the CMS database.

After installation, you can select or create a new CMS database at any time using the Central Configuration Manager (CCM).

**Command-line installation**
Silent installation

**Application servers**
Application servers communicate with the Business Objects cluster through the ORB.

If the application server is hosted on a machine which is neither a primary nor secondary node, you must configure the ORB on it in order to allow it to communicate with the cluster.

You configure the ORB on the application server machine either by installing the Configuration Tool on that machine, then using it to configure the server as a client node of the cluster, or by configuring the ORB manually.

**Silent installation**
You must install a Web Component Adapter (WCA) on any machine hosting an application server. The WCA allows your application server to run BusinessObjects Enterprise applications making Crystal Web Requests, and to host the Central Management Console. Not all applications require the WCA. For example, InfoView doesn’t need it unless users will be viewing OLAP Intelligence documents.

Installing BusinessObjects Enterprise XI on the same machine as the application server is called a **server-side installation**.

When you perform this installation, the client and server components are installed, the default user and group accounts are created, and the sample reports are published to the system. When the installation is complete, the servers are started as services on the local machine.
<table>
<thead>
<tr>
<th>In BusinessObjects 6.x</th>
<th>In BusinessObjects XI</th>
</tr>
</thead>
<tbody>
<tr>
<td>For information on deploying web applications on application servers, see “Deploying web applications” on page 24 in this table.</td>
<td>For information on deploying web applications on application servers, see “Deploying web applications” on page 24 in this table.</td>
</tr>
<tr>
<td><strong>Web servers</strong></td>
<td></td>
</tr>
<tr>
<td>To configure the web server to work with a cluster, you must install a third-party connector to the cluster’s application server.</td>
<td>If you connect BusinessObjects Enterprise to a web server, the web server must be able to communicate with the machine that runs your Web Component Adapter (WCA).</td>
</tr>
<tr>
<td>For information on deploying web applications on web servers, see “Deploying web applications” on page 24 in this table.</td>
<td>For information on deploying web applications on web servers, see “Deploying web applications” on page 24 in this table.</td>
</tr>
<tr>
<td><strong>License key management</strong></td>
<td>License keys are stored in the CMS database. You can view your deployment’s current license keys, as well as add or delete them, using the CMC.</td>
</tr>
<tr>
<td>Before installation, you copy your license key to a directory to which all nodes or application client machines have access. During installation, you specify where these XML files are located.</td>
<td></td>
</tr>
<tr>
<td><strong>OLAP</strong></td>
<td>OLAP Intelligence is installed separately.</td>
</tr>
<tr>
<td>You install Web Intelligence for OLAP Data Sources using the standard installation process.</td>
<td></td>
</tr>
<tr>
<td><strong>Configuring clusters and the ORB</strong></td>
<td>When you install the first Central Management Server (typically a New install), you can define it as a cluster. This creates a cluster of one and sets the cluster up for subsequent Expand installs, which add additional CMSs to the cluster. The subsequent machines on which you install the CMS become part of a CMS cluster named &lt;@Name of First CMS&gt;. At the installation of each additional CMS, you specify the name of the first CMS you installed. This makes it part of the cluster.</td>
</tr>
<tr>
<td>You create clusters and configure their ORB on their nodes using the Configuration Tool. You configure the cluster’s primary node and then its secondary nodes.</td>
<td></td>
</tr>
<tr>
<td>Available web applications</td>
<td>In BusinessObjects XI</td>
</tr>
<tr>
<td>----------------------------</td>
<td>-----------------------</td>
</tr>
<tr>
<td>• Administration Console</td>
<td>• Central Management Console</td>
</tr>
<tr>
<td>• InfoView</td>
<td>• InfoView</td>
</tr>
<tr>
<td>• Auditor</td>
<td>• Performance Manager applications (formerly Application Foundation), J2EE only</td>
</tr>
<tr>
<td>• Supervisor over the Web</td>
<td>• Custom web applications developed using the SDK</td>
</tr>
<tr>
<td>• Custom web applications developed using the SDK</td>
<td></td>
</tr>
</tbody>
</table>

Although not part of the BusinessObjects 6.x suite, Application Foundation applications can also be deployed.

<table>
<thead>
<tr>
<th>Deploying web applications</th>
<th>If you choose a New installation and are using IIS or Apache/Tomcat, the Business Objects web applications are deployed automatically on the web and/or application server, unless you are deploying to an existing Java application server. Otherwise, you must deploy web applications manually.</th>
</tr>
</thead>
<tbody>
<tr>
<td>You can deploy web applications in three ways:</td>
<td></td>
</tr>
<tr>
<td>• If you’re using IIS or Tomcat/Apache, the Configuration Tool can deploy the applications automatically on web and application servers.</td>
<td></td>
</tr>
<tr>
<td>• You can use the wdeploy tool, a command-line utility that you can run on all other supported application and/or web servers.</td>
<td></td>
</tr>
<tr>
<td>• You can manually deploy the application on all other supported web and/or application servers.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Repository creation</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>You create the repository after installation and configuration, using the Supervisor application.</td>
<td>If you do not have a supported database client on the machine, installation can install and configure mySQL for use as the CMS database. To use your own database server, you must create a new, empty database on your database server prior to running the installation. This database will be configured during the install. Whenever you add a new CMS to a cluster in an Expand installation, you define the connection to the initial CMS’s database. This allows the server to connect to it.</td>
</tr>
<tr>
<td>After repository creation, you must copy the domain.key file corresponding to the repository on each node in the cluster.</td>
<td></td>
</tr>
</tbody>
</table>
Security

BusinessObjects 6.x applications use a very different security model than that provided with BusinessObjects Enterprise XI, and as such, administrators of BusinessObjects 6.x systems are encouraged to read with attention the documentation shipped with BusinessObjects Enterprise XI.

Through BusinessObjects 6.5.1, authentication is defined for an entire cluster and/or all desktop users. Implementing an authentication method is broken down into selecting an authentication mode, then its source, which can be Repository, External then Repository, or External. You can choose between Microsoft AD or an LDAP user management system for external authentication sources.

In BusinessObjects XI, security is much more granular. You implement an authentication method for each user, when you create the user’s account. When users log into the system, they specify their username and password, but may enter their authentication method as well.
<table>
<thead>
<tr>
<th><strong>In BusinessObjects 6.x</strong></th>
<th><strong>In BusinessObjects XI</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>bomain.key</strong></td>
<td>There is no bomain.key file. At login, the Central management Server (CMS) verifies the user name and password against the security information stored in the CMS database. Each CMS is configured either at installation or subsequently using the Central Management Console (CMC) to connect to a specific database.</td>
</tr>
<tr>
<td><em>The bomain.key tells Business Objects applications where to find the repository’s security domain.</em></td>
<td></td>
</tr>
<tr>
<td><strong>Setting the authentication and authorization methods</strong></td>
<td></td>
</tr>
<tr>
<td>Up through version 6.5.1, you set authentication/authorization <em>for the entire cluster</em> using the Security Configuration Tool.</td>
<td>You select the authentication method <em>for each user</em> at the creation of the user’s account, using the CMC. You can even assign multiple aliases, or authentication modes, to a single user, or create new aliases then assign them to exiting users in the system. If you import external users via LDAP, Windows NT or Active Directory, users are automatically created. So if you are not using complex scenarios in which users can log on with both NT and LDAP authentications, you don’t need to create the settings for each user individually.</td>
</tr>
<tr>
<td><strong>Configuring authentication and authorization</strong></td>
<td></td>
</tr>
<tr>
<td>You set authentication/authorization <em>for the entire cluster</em> using the Security Configuration Tool.</td>
<td>You configure authentication in the Authentication management area of the CMC.</td>
</tr>
</tbody>
</table>
### In BusinessObjects 6.x

**Available authentication modes**
- Business Objects standard
- Windows-NTLM (similar to BusinessObjects XI Windows NT authentication)
- Single Sign-On
- Basic authentication (user authentication is delegated to the web server)

### In BusinessObjects XI

- Enterprise authentication (automatically enabled when you install the system, and similar to Business Objects standard in version 6.x)
- Windows NT authentication
- LDAP authentication
- Windows AD authentication

Other authentication modes are available through add-in products, such as SAP authentication. Single Sign-On is not a mode in itself, but is available for certain authentication modes. See below.

### Single-Sign-On (SSO)

To enable SSO, you must use Netegrity SiteMinder.

Single Sign-On to BusinessObjects Enterprise can be provided through the use of third-party systems such as Windows AD or Netegrity SiteMinder.

End-to-end single sign-on includes SSO to the database at the back end.

### Authorization

You can use security commands in Supervisor to restrict user and group access to functionalities in Business Objects products.

You cannot restrict access at the object level. For example, if you grant a group the right to refresh, but not create documents, the restriction will apply regardless of the documents being used.

Because of the use of Access Control Lists (ACL), an industry standard method of controlling cascading security access, the imposition of restrictions is much more granular. You can apply user, group, and role level security **at the object level**, to documents, categories, folders, universes, and connections.

This means, for example, that you could allow a group to refresh document A, but not refresh document B.
Administration

The administrative model applied to BusinessObjects Enterprise XI is very different from the BusinessObjects 6.x model.

- The Central Management Console (CMC)
  
  The CMC allows you to perform user management tasks such as setting up authentication and adding users and groups. It also allows you to publish, organize, and set security levels for all of your BusinessObjects Enterprise content. Additionally, the CMC enables you to manage servers and create server groups, whenever the Central Management Server (CMS) is running.

- The Central Configuration Manager
  
  The CCM is a server-management tool that allows you to view and configure each of your BusinessObjects Enterprise server components while Business Objects servers are offline. This tool allows you to start, stop, enable, and disable Business Objects servers, as well as view and configure advanced server settings. On Windows, these settings include default port numbers, CMS database and clustering details, SOCKS server connections, and more. In addition, on Windows the CCM allows you to add servers to, or remove servers from your BusinessObjects Enterprise system.

  The CCM comes in two forms. In a Windows environment, the CCM allows you to manage local and remote servers through its Graphical User Interface (GUI) or from a command line. In a UNIX environment, the CCM shell script (`ccm.sh`) allows you to manage servers from a command line.

  At first, the CCM takes into account only the servers running locally. You can then connect to servers on a remote machine.

This section covers administrative tasks concerning the repository, users and groups, universes, server and cluster management, and auditing.
### In BusinessObjects 6.x

**Repository creation and management**

You create your cluster’s repository after Business Objects installation and configuration, using the Supervisor application.

**User/group creation and management**

You use Supervisor or Supervisor over the Web.

An initial General Supervisor account is created when you create the repository.

A “company name” group is automatically created at repository creation.

**Using Designer**

You can use Designer in online or offline mode.

### In BusinessObjects XI

If you do not have a supported database client on the machine, installation can install and configure mySQL for use as the CMS database. To use your own database server, you must create a new, empty database on your database server prior to running the installation. This database will be configured during the install.

Whenever you add a new CMS to a cluster in an Expand installation, you define the connection to the initial CMS’s database. This allows the server to connect to it.

**User/group creation and management**

You use the CMC.

By default, an initial Administrator and Guest account is created at installation.

Two default groups are automatically created at installation:

- Administrators
- Everyone

If you’re using Windows NT/2000, an additional group called Business Objects NT Users is also created.

**Using Designer**

You can use Designer in online mode only. This means that unless you are logged into the repository, you cannot work on a universe.
<table>
<thead>
<tr>
<th>In BusinessObjects 6.x</th>
<th>In BusinessObjects XI</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cluster start/stop</strong></td>
<td>You use the CCM to stop a Central Management Server (CMS), regardless of the operating system. At</td>
</tr>
<tr>
<td>Under Windows, you can use WINotify or the Start menu;</td>
<td>installation, you can also configure the server to start automatically at machine startup.</td>
</tr>
<tr>
<td>during installation, you can also set the Business Objects</td>
<td>Note: You cannot use the Central Management Console (CMC) to stop a CMS.</td>
</tr>
<tr>
<td>server to run automatically as a Windows service.</td>
<td></td>
</tr>
<tr>
<td>Under UNIX, you start the cluster manually using the</td>
<td></td>
</tr>
<tr>
<td>wstart command, or use S99WebIntelligence to start it</td>
<td></td>
</tr>
<tr>
<td>automatically on machine startup.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Cluster server enable/disable</strong></td>
<td><strong>In Windows</strong>, you use the Central Configuration Manager (CCM) to disable a Central Management Server</td>
</tr>
<tr>
<td>You use the Administration Console.</td>
<td>(CMS).</td>
</tr>
<tr>
<td></td>
<td><strong>In UNIX</strong>, you use the <code>cms.sh</code> script.</td>
</tr>
<tr>
<td></td>
<td><strong>Caution:</strong> You can use the CMC to disable/enable and even group servers, but this refers to what</td>
</tr>
<tr>
<td></td>
<td><strong>BusinessObjects 6.x</strong> users refer to as <em>modules</em>, not the actual cluster nodes.</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Server settings management</strong></td>
<td>**You use the Central Management Console or the Central Configuration Manager, depending on the type of</td>
</tr>
<tr>
<td>You use the Administration Console.</td>
<td>setting you want to define, and whether you are online or offline.</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Audit management</strong></td>
<td><strong>You use the CMC.</strong> You can also use the CMC to view server metrics, including information about the</td>
</tr>
<tr>
<td>You use the Audit facility in the Administration</td>
<td>**machine that the server is running on—its name, operating system, total hard disk space, free hard disk</td>
</tr>
<tr>
<td>Console.</td>
<td><strong>space, total RAM, number of CPUs, and local time.</strong> The CMC allows you to configure what information you</td>
</tr>
<tr>
<td>You can also use the Auditor application for</td>
<td><strong>want each server/service to audit.</strong></td>
</tr>
<tr>
<td>enhanced system monitoring and analysis.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Setting up Broadcast Agent schedulers</strong></td>
<td><strong>Because the scheduler is incorporated into the CMS, it comes automatically installed with BusinessObjects</strong></td>
</tr>
<tr>
<td>You create and manage schedulers using the Broadcast</td>
<td>**Enterprise XI and requires little or no additional configuration beyond setting up access to email</td>
</tr>
<tr>
<td>Agent Manager’s Properties page in the Administration</td>
<td><strong>servers, printers and file servers.</strong></td>
</tr>
<tr>
<td>Console.</td>
<td></td>
</tr>
</tbody>
</table>
### Viewing scheduled tasks

In **BusinessObjects 6.x**

You can view the full list of scheduled documents and their status using the Broadcast Agent Console.

---

In **BusinessObjects XI**

You cannot view a global list of scheduled jobs. You can view the status of one scheduled object at a time in the CMC in the object’s History page. This list includes all scheduled jobs for the object, as well as existing instances of the object (i.e. reports that have already been run and contain data).

In InfoView, you can also view a list of an object’s instances by looking at the object’s history.

A sample application built using the Administration SDK and available from the BusinessObjects Enterprise User’s Launchpad also allows you to see all the jobs scheduled by any specific user.

---

### InfoView appearance and functionality management

In **BusinessObjects 6.x**

You can use Supervisor security commands to prevent users from modifying the default settings in the InfoView Options page.

---

In **BusinessObjects XI**

You can modify the appearance and some functionality using the BusinessObjects Enterprise Applications management area in the CMC.

### Setting locale

In **BusinessObjects 6.x**

You set the cluster’s language at installation; you can subsequently use the Site Properties tab in the Administration Console to modify it. Users can set the language of their interface in InfoView.

---

In **BusinessObjects XI**

You don’t specifically set the CMS locale. Users set the locale for their own interface in InfoView; if they don’t, InfoView uses the locale specified on the web server.

---

### Reporting, analysis, information sharing

This section includes information on available reporting tools, as well as end-user tasks such as accessing, distributing and scheduling corporate data:

### Reporting tools

<table>
<thead>
<tr>
<th>In <strong>BusinessObjects 6.x</strong></th>
<th>In <strong>BusinessObjects XI</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reporting tools</strong></td>
<td><strong>Reporting tools</strong></td>
</tr>
<tr>
<td>• Desktop Intelligence</td>
<td>• Crystal Reports</td>
</tr>
<tr>
<td>• Web Intelligence</td>
<td>• Web Intelligence</td>
</tr>
<tr>
<td>• Web Intelligence for OLAP Data Sources</td>
<td>• OLAP Intelligence</td>
</tr>
<tr>
<td></td>
<td>• Desktop Intelligence</td>
</tr>
</tbody>
</table>
### From BusinessObjects 6.x to BusinessObjects XI

#### Reporting, analysis, information sharing

<table>
<thead>
<tr>
<th>In BusinessObjects 6.x</th>
<th>In BusinessObjects XI</th>
</tr>
</thead>
</table>
| **What reporting tools use universes?** | • Crystal Reports  
• Web Intelligence  
• Desktop Intelligence |
| Crystal Reports can also connect directly to databases using a variety of methods including ODBC and native drivers, as well as XML and text files. It can also use Business Views (the semantic layer from Crystal Enterprise) as a data source. |

#### InfoView

InfoView is a web application that must be deployed after Business Objects installation using the Configuration Tool, wdeploy, or manual procedures. It is available in JSP and ASP platforms.

The out-of-the-box portal in BusinessObjects Enterprise XI is also called InfoView. Available for both Java and .NET platforms, its interface is somewhat different from the BusinessObjects 6.x application.

#### Categories

Within InfoView, you can use categories to organize documents on a particular document list page.

BusinessObjects Enterprise XI uses both categories and folders to organize documents. Folders are used for the storage location of information, while categories are used more for the classifying information regardless of its storage location.

There are two kinds of categories:
• Corporate  
• Personal

BusinessObjects Enterprise XI automatically creates a folder for each user in the system, called Personal Folders. These folders are organized within the CMC as *User folders*. Within InfoView, these folders are called *Favorites folders*. Folders are created and managed from the CMC.

There are two types of categories:
• Corporate  
• Personal
<table>
<thead>
<tr>
<th>In BusinessObjects 6.x</th>
<th>In BusinessObjects XI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corporate categories can be created from InfoView, Desktop Intelligence, or Supervisor.</td>
<td>Corporate categories can be created either in InfoView (with reduced management capabilities) or from the CMC (full management capabilities).</td>
</tr>
<tr>
<td>As a general supervisor or supervisor, you can grant specific users or groups the right to create categories, and to rename and delete the categories they create, from BusinessObjects or Web Intelligence. You do this by enabling the security command <em>Manage All Categories</em> or <em>Manage My Categories</em>.</td>
<td>In the CMC you can restrict users’ and/or groups’ access to categories and folders. You can set <em>limits</em> on folders, which automate regular clean-ups of old Business Objects content by eliminating excess instances of particular objects, or object instances which have remained more than the specified number of days in the folder.</td>
</tr>
<tr>
<td>You can use security commands to restrict access to corporate categories.</td>
<td></td>
</tr>
</tbody>
</table>

**Scheduling**

You schedule for refresh documents and files either from 2-tier deployments of Desktop Intelligence, or from InfoView.

You can schedule:
- Desktop Intelligence documents
- Web Intelligence reports
- Web Intelligence OLAP reports

You schedule for refresh objects from the CMC or from InfoView.

You can schedule:
- Crystal reports
- Web Intelligence reports

You can also schedule program objects, such as executables, Java programs, or scripts (Jscripts and VBscripts) to run at specified times.
### In BusinessObjects 6.x

#### Publishing to the repository
You add objects to the repository by:
- Exporting universes from Designer or Supervisor
- Adding users and groups and managing security settings from Supervisor and/or Supervisor over the Web
- Saving documents to the repository from InfoView
- Publishing documents from 2- and 3-tier deployments of Desktop Intelligence

### In BusinessObjects XI

You can publish objects to BusinessObjects Enterprise in several ways.

Use the Publishing Wizard when you:
- Have access to the locally installed application.
- Are adding multiple objects or an entire directory.

The Publishing Wizard is a locally installed Windows application that enables both administrators and end users to add any supported document to BusinessObjects Enterprise.

Use the Central Management Console (CMC) when you are:
- Publishing a single object.
- Taking care of other administrative tasks.
- Performing tasks remotely.

Save directly to your Enterprise folders when you are:
- Designing reports with Crystal Reports or Web Intelligence.
- Using the OLAP Intelligence Application Designer.
- Creating other objects with BusinessObjects Enterprise plug-in components.

Upload documents stored on your local computer when you're using InfoView.

Use Designer to export universes to the repository.

Use the Import Wizard to migrate objects to a BusinessObjects Enterprise XI repository from BusinessObjects 6.x or Crystal Enterprise 10.

### SDK

<table>
<thead>
<tr>
<th>In BusinessObjects 6.x</th>
<th>In BusinessObjects XI</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Development platforms</strong></td>
<td><strong>Development platforms</strong></td>
</tr>
<tr>
<td>• Java</td>
<td>• Java</td>
</tr>
<tr>
<td>• WebServices</td>
<td>• WebServices</td>
</tr>
<tr>
<td></td>
<td>• .NET</td>
</tr>
<tr>
<td></td>
<td>• .COM</td>
</tr>
</tbody>
</table>
Rights and Access Levels
This table lists the rights available within the Advanced Rights page of the Central Management Console (CMC). Other BusinessObjects Enterprise plug-in components may in future add their own, object-specific rights to this list. The table matches the descriptions used in the CMC with the programmatic name that developers use when assigning rights with the BusinessObjects Enterprise SDK.

<table>
<thead>
<tr>
<th>Description used in the CMC</th>
<th>Name used in the SDK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respect current security by inheriting rights from parent groups</td>
<td>AdvancedInheritGroups</td>
</tr>
<tr>
<td>Respect current security by inheriting rights from parent folders</td>
<td>AdvancedInheritFolders</td>
</tr>
<tr>
<td>Add objects to the folder</td>
<td>ceRightAdd</td>
</tr>
<tr>
<td>View objects</td>
<td>ceRightView</td>
</tr>
<tr>
<td>Edit objects</td>
<td>ceRightEdit</td>
</tr>
<tr>
<td>Modify the rights users have to objects</td>
<td>ceRightModifyRights</td>
</tr>
<tr>
<td>Schedule the document to run</td>
<td>ceRightSchedule</td>
</tr>
<tr>
<td>Delete objects</td>
<td>ceRightDelete</td>
</tr>
<tr>
<td>Define server groups to process jobs</td>
<td>ceRightPickMachines</td>
</tr>
<tr>
<td>Delete instances</td>
<td>ceRightDeleteInstance</td>
</tr>
<tr>
<td>Copy objects to another folder</td>
<td>ceRightCopy</td>
</tr>
<tr>
<td>Schedule to destinations</td>
<td>ceRightSetDestination</td>
</tr>
<tr>
<td>View document instances</td>
<td>ceRightViewInstance</td>
</tr>
<tr>
<td>Pause and Resume document instances</td>
<td>ceRightPauseResumeSchedule</td>
</tr>
<tr>
<td>Print the report’s data</td>
<td>ceReportRightPrintReport</td>
</tr>
<tr>
<td>Refresh the report’s data</td>
<td>ceReportRightRefreshOnDemandReport</td>
</tr>
<tr>
<td>Export the report’s data</td>
<td>ceReportRightPageServerExport</td>
</tr>
<tr>
<td>View objects that the user owns</td>
<td>ceRightOwnerView</td>
</tr>
<tr>
<td>Edit objects that the user owns</td>
<td>ceRightOwnerEdit</td>
</tr>
<tr>
<td>Modify the rights users have to objects that the user owns</td>
<td>ceRightOwnerModifyRights</td>
</tr>
</tbody>
</table>
Access levels

This section lists the rights that constitute each of the predefined access levels that are available through the Advanced Rights page of the Central Management Console (CMC).

**Note:** There is no predefined access level to grant users the rights required to create or modify reports through the Report Application Server (RAS). For details, see “Object rights for the Report Application Server” on page 40.

**No Access**

This access level ensures that all rights remain unspecified. That is, rights are neither explicitly granted nor explicitly denied. When rights are unspecified, the system denies the right by default.

**View**

<table>
<thead>
<tr>
<th>Description used in the CMC</th>
<th>Name used in the SDK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delete objects that the user owns</td>
<td>ceRightOwnerDelete</td>
</tr>
<tr>
<td>Delete instances that the user owns</td>
<td>ceRightOwnerDeleteInstance</td>
</tr>
<tr>
<td>View document instances that the user owns</td>
<td>ceRightOwnerViewInstance</td>
</tr>
<tr>
<td>Pause and resume document instances that the user owns</td>
<td>ceRightOwnerPauseResumeSchedule</td>
</tr>
</tbody>
</table>

**Schedule**

<table>
<thead>
<tr>
<th>Description used in the CMC</th>
<th>Name used in the SDK</th>
</tr>
</thead>
<tbody>
<tr>
<td>View objects</td>
<td>ceRightView</td>
</tr>
<tr>
<td>Schedule the document to run</td>
<td>ceRightSchedule</td>
</tr>
</tbody>
</table>
## Rights and Access Levels

### Access levels

<table>
<thead>
<tr>
<th>Description used in the CMC</th>
<th>Name used in the SDK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Define server groups to process jobs</td>
<td>ceRightPickMachines</td>
</tr>
<tr>
<td>Copy objects to another folder</td>
<td>ceRightCopy</td>
</tr>
<tr>
<td>Schedule to destinations</td>
<td>ceRightSetDestination</td>
</tr>
<tr>
<td>View document instances</td>
<td>ceRightViewInstance</td>
</tr>
<tr>
<td>Print the report’s data</td>
<td>ceReportRightPrintReport</td>
</tr>
<tr>
<td>Export the report’s data</td>
<td>ceReportRightPageServerExport</td>
</tr>
<tr>
<td>Edit objects that the user owns</td>
<td>ceRightOwnerEdit</td>
</tr>
<tr>
<td>Delete instances that the user owns</td>
<td>ceRightOwnerDeleteInstance</td>
</tr>
<tr>
<td>Pause and resume document instances that the user owns</td>
<td>ceRightOwnerPauseResumeSchedule</td>
</tr>
</tbody>
</table>

### View On Demand

<table>
<thead>
<tr>
<th>Description used in the CMC</th>
<th>Name used in the SDK</th>
</tr>
</thead>
<tbody>
<tr>
<td>View objects</td>
<td>ceRightView</td>
</tr>
<tr>
<td>Schedule the document to run</td>
<td>ceRightSchedule</td>
</tr>
<tr>
<td>Define server groups to process jobs</td>
<td>ceRightPickMachines</td>
</tr>
<tr>
<td>Copy objects to another folder</td>
<td>ceRightCopy</td>
</tr>
<tr>
<td>Schedule to destinations</td>
<td>ceRightSetDestination</td>
</tr>
<tr>
<td>View document instances</td>
<td>ceRightViewInstance</td>
</tr>
<tr>
<td>Print the report’s data</td>
<td>ceReportRightPrintReport</td>
</tr>
<tr>
<td>Refresh the report’s data</td>
<td>ceReportRightRefreshOnDemandReport</td>
</tr>
<tr>
<td>Export the report’s data</td>
<td>ceReportRightPageServerExport</td>
</tr>
<tr>
<td>Edit objects that the user owns</td>
<td>ceRightOwnerEdit</td>
</tr>
<tr>
<td>Delete instances that the user owns</td>
<td>ceRightOwnerDeleteInstance</td>
</tr>
<tr>
<td>Pause and resume document instances that the user owns</td>
<td>ceRightOwnerPauseResumeSchedule</td>
</tr>
</tbody>
</table>
Full Control

<table>
<thead>
<tr>
<th>Description used in the CMC</th>
<th>Name used in the SDK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Add objects to the folder</td>
<td>ceRightAdd</td>
</tr>
<tr>
<td>View objects</td>
<td>ceRightView</td>
</tr>
<tr>
<td>Edit objects</td>
<td>ceRightEdit</td>
</tr>
<tr>
<td>Modify the rights users have to objects</td>
<td>ceRightModifyRights</td>
</tr>
<tr>
<td>Schedule the document to run</td>
<td>ceRightSchedule</td>
</tr>
<tr>
<td>Delete objects</td>
<td>ceRightDelete</td>
</tr>
<tr>
<td>Define server groups to process jobs</td>
<td>ceRightPickMachines</td>
</tr>
<tr>
<td>Delete instances</td>
<td>ceRightDeleteInstance</td>
</tr>
<tr>
<td>Copy objects to another folder</td>
<td>ceRightCopy</td>
</tr>
<tr>
<td>Schedule to destinations</td>
<td>ceRightSetDestination</td>
</tr>
<tr>
<td>View document instances</td>
<td>ceRightViewInstance</td>
</tr>
<tr>
<td>Pause and Resume document instances</td>
<td>ceRightPauseResumeSchedule</td>
</tr>
<tr>
<td>Print the report's data</td>
<td>ceReportRightPrintReport</td>
</tr>
<tr>
<td>Refresh the report's data</td>
<td>ceReportRightRefreshOnDemandReport</td>
</tr>
<tr>
<td>Export the report’s data</td>
<td>ceReportRightPageServerExport</td>
</tr>
</tbody>
</table>

Default rights on the top-level folder

The top-level BusinessObjects Enterprise folder serves as the root for all other folders and objects that you add to the system. This folder provides the following rights by default:

- The Everyone group is granted the Schedule access level.
- The Administrators group is granted the Full Control access level.
Object rights for the Report Application Server

To allow users to create or modify reports over the Web through the Report Application Server (RAS), you must have RAS Report Modification licenses available on your system. You must also grant users a minimum set of object rights. When you grant users these rights to a report object, they can select the report as a data source for a new report or modify the report directly:

- View objects (or “View document instances”, as appropriate)
- Edit objects
- Refresh the report’s data
- Export the report’s data

User must also have permission to add objects to at least one folder before they can save new reports back to BusinessObjects Enterprise.

To ensure that users retain the ability to perform additional reporting tasks (such as copying, scheduling, printing, and so on), it’s recommended that you first assign the appropriate access level and update your changes. Then, change the access level to Advanced, and add any of the required rights that are not already granted. For instance, if users already have View On Demand rights to a report object, you allow them to modify the report by changing the access level to Advanced and explicitly granting the additional Edit objects right.

When users view reports through the Advanced DHTML viewer and the RAS, the View access level is sufficient to display the report, but View On Demand is required to actually use the advanced search features. The extra Edit objects right is not required.
Configuring NTFS Permissions
Configuring NTFS permissions

When you view reports over the Web, insufficient New Technology File System (NTFS) permissions on the server can cause a number of problems. For example, a report may not appear in the viewer, even after you repeatedly enter the correct database logon information.

NTFS provides security for file storage in Microsoft Windows. If a BusinessObjects Enterprise component is running on a user account that does not have the required NTFS permissions, users may be unable to access reports over the Web.

To troubleshoot NTFS permissions, ensure that each BusinessObjects Enterprise component uses an account with the appropriate permissions. You may need to change the user account or change the NTFS access for particular files and folders.

For details on changing server user accounts, see the BusinessObjects Enterprise Administrator’s Guide. For information on changing NTFS permissions, see the Microsoft Windows help.

Configuring NTFS permissions for BusinessObjects Enterprise components

Each component requires a user account with certain NTFS access rights to specific files and folders. Ensure that each component is running on the correct user account, and make sure the user account has the required NTFS permissions.

Web Component Adapter (WCA)

By default, the Central Management Server uses the LocalSystem account to access resources and BusinessObjects Enterprise components. Ensure this user account has the appropriate NTFS permissions for specific folders:

<table>
<thead>
<tr>
<th>NTFS permissions</th>
<th>Files and folders</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Read</td>
<td>• C:\Winnt\system32</td>
</tr>
<tr>
<td>• Read &amp; Execute</td>
<td>• C:\Program Files\Business Objects\BusinessObjects Enterprise11.5\Web</td>
</tr>
<tr>
<td></td>
<td>• Content\enterprise115</td>
</tr>
<tr>
<td></td>
<td>• C:\Program Files\Business Objects\BusinessObjects Enterprise 11.5\win32_x86</td>
</tr>
</tbody>
</table>
Configuring NTFS Permissions

**Configuring NTFS permissions**

<table>
<thead>
<tr>
<th>NTFS permissions</th>
<th>Files and folders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Write</td>
<td>C:\Program Files\Business Objects\BusinessObjects Enterprise11.5\Logging</td>
</tr>
</tbody>
</table>

**Note:**
- This table shows the default installation paths.
- If your BusinessObjects Enterprise deployment includes OLAP Intelligence, the WCA user account also needs Read permission for the OLAP Intelligence FileStore\Input folder.

**File Repository Servers (FRS)**

The Input and Output File Repository Servers (Input and Output FRS) use the local System account by default; these accounts provide sufficient access to files and folders on the local machine. However, if the Input or Output FRS needs access to directories on other machines, set its user account to a domain user account with local administrative access to all computers hosting BusinessObjects Enterprise components. For details on changing the user account, see the *BusinessObjects Enterprise Administrator’s Guide*.

Ensure that the user account for the Input FRS has the appropriate NTFS permissions for the following folders:

<table>
<thead>
<tr>
<th>NTFS permissions</th>
<th>Files and folders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Read</td>
<td>C:\Winnt\system32</td>
</tr>
<tr>
<td>Read &amp; Execute</td>
<td>C:\Program Files\Business Objects\BusinessObjects Enterprise 11.5\FileStore\Input</td>
</tr>
<tr>
<td>Write</td>
<td>C:\Program Files\Business Objects\BusinessObjects Enterprise 11.5\FileStore\Input</td>
</tr>
</tbody>
</table>

For the Output FRS, make sure the user account has access to the following folders:

<table>
<thead>
<tr>
<th>NTFS permissions</th>
<th>Files and folders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Read</td>
<td>C:\Winnt\system32</td>
</tr>
<tr>
<td>Read &amp; Execute</td>
<td>C:\Program Files\Business Objects\BusinessObjects Enterprise 11.5\FileStore\Output</td>
</tr>
<tr>
<td>Write</td>
<td>C:\Program Files\Business Objects\BusinessObjects Enterprise 11.5\FileStore\Output</td>
</tr>
</tbody>
</table>
Note:
- The Input and Output File Repository Servers cannot share the same directories.
- If the Input folder or the Output folder does not exist, the respective FRS creates it when the service starts.

Central Management Server (CMS)

The CMS uses the local System account by default. This account does not need access to other machines. Ensure that the System account has the appropriate NTFS permissions for specific files and folders:

<table>
<thead>
<tr>
<th>NTFS rights</th>
<th>Folders</th>
</tr>
</thead>
<tbody>
<tr>
<td>* Read &amp; Execute</td>
<td>C:\Winnt\system32\drivers\etc\hosts</td>
</tr>
<tr>
<td>* Write</td>
<td>C:\Program Files\BusinessObjects\BusinessObjects Enterprise 11.5\win32_x86\CITemp</td>
</tr>
</tbody>
</table>

Cache Server

The Cache Server uses the local System account by default. If the Cache Server needs to access BusinessObjects Enterprise components on other machines, you must set its user account to a domain user account that has local administrative access to all computers hosting components. For details on changing the user account, see the BusinessObjects Enterprise Administrator’s Guide.

Ensure that the Cache Server’s user account has the correct NTFS permissions for the following folders:

<table>
<thead>
<tr>
<th>NTFS permissions</th>
<th>Files and folders</th>
</tr>
</thead>
<tbody>
<tr>
<td>* Read</td>
<td>C:\Winnt\system32</td>
</tr>
<tr>
<td>* Read &amp; Execute</td>
<td>C:\Program Files\BusinessObjects\BusinessObjects Enterprise 11.5\win32_x86</td>
</tr>
<tr>
<td>* Write</td>
<td>C:\Program Files\Business Objects\WCA</td>
</tr>
</tbody>
</table>

Job Server

The Job Server uses the local System account by default. The Job Server must use a different user account if it needs to access BusinessObjects Enterprise components on other machines. If the CMS, the Input FRS, or the
Output FRS is not located on the same machine as the Job Server, set the Job Server’s user account to a domain user account that has local administrative access to all computers hosting these components.

Ensure that the Job Server’s user account has the correct NTFS permissions for the following folders:

<table>
<thead>
<tr>
<th>NTFS permissions</th>
<th>Files and folders</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Read</td>
<td>• C:\Winnt\system32</td>
</tr>
</tbody>
</table>
| • Read & Execute | • The system’s temporary directory  
• C:\Winnt\Business Objects  
• C:\Winnt\Fonts  
• C:\Program Files\Business Objects\Shared |
| • Write          | • C:\Program Files\Business Objects\WCA  
• C:\Program Files\Business Objects\BusinessObjects Enterprise 11.5\FileStore |

**Page Server**

The Page Server connects to the database to retrieve the information needed to build the report. For most BusinessObjects Enterprise deployments, the reporting database is located on a separate machine. If the Page Server is on a different machine from the database, you must change the Page Server’s user account from the default local System account to a domain user account with local administrative access to the computer hosting the reporting database.

Ensure that the Page Server’s user account has the correct NTFS permissions for the following folders:

<table>
<thead>
<tr>
<th>NTFS permissions</th>
<th>Files and folders</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Read</td>
<td>• C:\Winnt\system32</td>
</tr>
</tbody>
</table>
| • Read & Execute | • The system’s temporary directory  
• C:\Winnt\Business Objects  
• C:\Winnt\Fonts  
• C:\Program Files\Business Objects\Shared  
• C:\Program Files\Business Objects\BusinessObjects Enterprise 11.5\FileStore\Input |
| • Write          | • C:\Program Files\Business Objects\WCA |
Working with Performance Management Applications
About performance management applications

Depending on your license key, you may have access to performance management applications. Performance management applications include Dashboard Manager, Performance Manager, Set Analysis, Predictive Analysis and Statistical Process Control.

This section provides architecture, configuration, and troubleshooting information specific to performance management applications.

To purchase additional license keys, contact your Business Objects sales representative or your regional office. For details, go to:
http://www.businessobjects.com/company/contact_us/

Performance management repository

The performance management repository stores the metrics, goals, sets and calendar definitions used by performance management users to create dashboards and analytics. Each time users refresh a metric, the values for the metric refresh are written to the performance management repository.

The performance management repository is organized by three domains:

- The **Dashboard Manager** domain stores the metrics, rules, and calendars used by Dashboard Manager.
- The **Performance Manager** domain stores the goals and target values used by Performance Manager.
- The **Set Analysis** domain stores the sets for the segmentation engine used by Set Analysis.
For more information about the performance management repository tables, see the *Performance Management Setup and Administration* online help. To access the online help from performance management, go to the performance management Setup page and click Help on the Services bar.

**Note:** In previous Performance Management versions, the performance management repository was called the Application Foundation repository or the AF Repo. In Application Foundation 6.x versions and earlier, the equivalent to the CMS was the BusinessObjects repository.

### Setting performance management security

You define security for performance management applications, dashboards, and analytics in the Central Management Console (CMC).

### Setting security for metrics and dimensions

Performance management metrics and dimensions are stored in the performance management repository. You can specify security restrictions as follows:
- metrics
- dimensions

### Setting security for dashboards and analytics

Corporate tiered dashboards and performance management analytics are stored in the CMS database as objects, and can be secured by administrators using the CMC. As an administrator, you can manage the security for the following performance management objects: dashboards, menus and sub-menus on dashboards, and individual analytics.

**Note:**
- For information on creating and saving dashboards and analytics, see the Dashboard Manager online help.
- To set security rights for an analytic, you need to publish the analytic as a corporate document, and then secure that corporate document. For information on setting security for corporate documents, see the Controlling User Access chapter of the *BusinessObjects Enterprise Administrator’s Guide.*
To set security rights for corporate tiered dashboards
1. Log into the CMC as Administrator.
2. Go to the Objects management area of the CMC.
   The names of dashboards are listed in the Object Title column.
   Dashboards are preceded by the Performance Management icon.
3. Click the name of the dashboard you want to secure.
   **Note:** To set rights for a dashboard’s menu or submenu, navigate to the appropriate menu and click it.
4. Click the Rights tab.
   The rights for users and groups regarding the selected dashboard are displayed in the Access Level column.
5. To modify the rights for a specific user or group, click the drop-down arrow next to the security level currently displayed in the row for that user or group, and then select the appropriate security level.
   **Note:** The ability to assign the right to Schedule the selected dashboard is only available if that user or group also has the right to schedule jobs.
6. To save the new security setting, click Refresh.
   The new security rights are saved to the CMS.
   **Note:** The new security rights are applied the next time the selected users log into InfoView.

Setting security for performance management functionality

You can grant or deny users the ability to use performance management applications overall or specific performance management features.

To modify rights for users and user groups
1. Log into the CMC as Administrator.
2. Go to the BusinessObjects Enterprise Applications management area of the CMC.
3. Click Performance Management.
4. Click the Rights tab.
   The list of performance management users and groups appears.
5. To modify the rights for a user or group, click Advanced next to the user or group you want to modify.
   The available security rights are organized in the following categories:
   • **General** – access to performance management and the ability to modify and secure info objects
   • **Analysis** – the features available for Individual Profiler
• **App Foundation** – access to menus to create metrics, lists, rules, sets, analytics and dashboards

• **Configuration** – ability to create and modify metrics and analytics, and to define data sets and analytics for Predictive Analysis and Statistical Process Control

• **Rules** – the types of rules and alerts

• **Services Bar** – controls the options on the Services bar

6. Specify the security rights you want.

7. If you want a user or group to inherit rights from its parent, select the `<user or user group name> will inherit rights from the parent groups` check box.

8. Click **Apply**.

   The new security rights are saved to the CMS.

   **Note**: The new security rights are applied the next time the selected users log into InfoView.

---

**Troubleshooting performance management applications**

**Predictive Analysis**

If you are using Predictive Analysis, you may receive an error when you create a model-based metric. The error appears in the log file if the default value for the **packed_result size** in the **ci_param** table is not compliant with your database configuration.

**To resolve this issue**

1. Ensure that the **ci_param** table includes the following values:

   \[(param_id, param_type, item_name, item_value)\]

   \[where \text{item}\_\text{name} \text{is} \text{‘packed}\_\text{result size’}, \text{and \text{item}\_\text{value} \text{is an integer that corresponds to the maximum size of the \text{ci}\_\text{context}\_\text{output}\_\text{packed}\_\text{result}.}\]

   For example, you could insert the values \((0, 1, \text{‘packed}\_\text{result size’}, 20000)\) into **ci_param** \((param_id, param_type, item_name, item_value)\).

   **Note**: If one of these values does not appear in the **ci_param** table, create it.

2. Restart the performance management servers.

3. Refresh the models.
Working with Performance Management Applications

Troubleshooting performance management applications
Customizing the appearance of Web Intelligence documents
Customizing the appearance of Web Intelligence documents

You can customize the default appearance of all new Web Intelligence documents created using the Web Intelligence Java Report Panel or the HTML - Query Panel. To do so, you must edit a file called defaultconfig.xml.

By editing defaultconfig.xml, you can change the default appearance of many interface elements:

• fonts and font sizes for tables, cells, chart axes, and so on
• background colors (“wallpaper”)
• lines and borders for cells and tables
• color palettes

The new settings take effect only for reports created after the defaultconfig.xml file is modified and saved. Earlier reports are not affected by the new settings.

In the defaultconfig.xml file, settings are grouped by “key value.” (See “List of key values” on page 58.) To modify a setting, open the defaultconfig.xml file in a text editor and modify the parameter you want. Back up the original file before you start.

For an example of how to modify the defaultconfig.xml file, see “Example: Modifying the default font in table cells” on page 59.

Note:

• You cannot use defaultconfig.xml to customize the appearance of the HTML Report panel.
• The defaultconfig.xml is also used by the REBean Editing SDK. For more information, see the developer documentation.
What you can do with the defaultconfig.xml file

With the defaultconfig.xml file, you can change certain aspects of the look and feel of Web Intelligence reports. You can make the reports adhere to your corporate visual guidelines.

Here’s what a Web Intelligence report looks like before changes are made to the defaultconfig.xml file:

![Table and chart showing sales revenue and quantity sold for different states and cities in 2001 and 2002.]
By modifying a few settings—stable header and body cell fonts, alternative row settings, chart axes values, label fonts, and section cell borders—default Web Intelligence tables and charts can look like this:

![Report Title]

<table>
<thead>
<tr>
<th>State</th>
<th>City</th>
<th>Sales revenue</th>
<th>Quantity sold</th>
</tr>
</thead>
<tbody>
<tr>
<td>California</td>
<td>Los Angeles</td>
<td>$982,657</td>
<td>6,683</td>
</tr>
<tr>
<td>California</td>
<td>San Francisco</td>
<td>$721,574</td>
<td>4,721</td>
</tr>
<tr>
<td>Illinois</td>
<td>Chicago</td>
<td>$730,914</td>
<td>4,713</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>Boston</td>
<td>$238,819</td>
<td>1,505</td>
</tr>
<tr>
<td>New York</td>
<td>New York</td>
<td>$1,666,666</td>
<td>10,802</td>
</tr>
<tr>
<td>Texas</td>
<td>Austin</td>
<td>$861,123</td>
<td>3,824</td>
</tr>
<tr>
<td>Texas</td>
<td>Dallas</td>
<td>$427,245</td>
<td>2,000</td>
</tr>
<tr>
<td>Texas</td>
<td>Houston</td>
<td>$1,211,312</td>
<td>7,805</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>6,540,316.8</strong></td>
<td><strong>42,844</strong></td>
</tr>
</tbody>
</table>

### Locating and modifying defaultconfig.xml

To customize the default appearance of a new Web Intelligence document, you must edit the defaultconfig.xml associated with the report panel used to create that document. Each report panel has its own defaultconfig.xml file.
Desktop Intelligence Enterprise Java InfoView

If you deploy the Desktop Intelligence Enterprise Java InfoView, you can customize the default appearance of documents created using the Java Report Panel or the HTML-Query Report Panel. On Windows, you must edit the defaultconfig.xml files inside the desktop.war file. For additional information on modifying XML and .war files, see the BusinessObjects Enterprise Installation Guide.

To update defaultconfig.xml in the .war file

1. Stop the web application server if it is running.
2. Find the desktop.war file. On Windows, it’s found at C:\Program Files\Business Objects\BusinessObjects Enterprise 11.5\java\applications\desktop.war. On UNIX, it’s found at /bobje/enterprise11/java/applications/desktop.war.
3. Extract defaultconfig.xml from the desktop.war file.
   For the Java Report Panel, extract webiApplet\AppletConfig\defaultconfig.xml
   For the HTML-Query Report Panel, extract WEB-INF\classes\defaultconfig.xml
   Tip: On Windows, you can use a tool such as WinZip to extract and replace files in a .war file.
4. Make a backup of the defaultconfig.xml file.
5. Open defaultconfig.xml, and make your changes.
   See “List of key values” on page 58 for information on the values you can change, and “Example: Modifying the default font in table cells” on page 59 for an example.
6. Save and close defaultconfig.xml.
7. Reinsert defaultconfig.xml into desktop.war. Ensure that you insert the file into the correct directory within the .war file.
8. Restart your web application server and redeploy desktop.war. See the BusinessObjects Enterprise Installation Guide for details.

Desktop Intelligence Enterprise .NET InfoView

If you deploy the Desktop Intelligence Enterprise .NET InfoView, you can customize the appearance of new documents created using the Java Report Panel. To customize the appearance of reports created with the Java Report Panel, edit the copy of defaultconfig.xml found at:
C:\Program Files\Common Files\Business Objects\3.0\java\webiApplet\AppletConfig
List of key values

In the defaultconfig.xml file, settings are grouped by “key value.” The following table lists the key values and the corresponding interface elements.

<table>
<thead>
<tr>
<th>Key value</th>
<th>Interface element</th>
</tr>
</thead>
<tbody>
<tr>
<td>Block*defaultBg</td>
<td>Background colors for blocks</td>
</tr>
<tr>
<td>Block*selectionBg</td>
<td>Background colors for selected blocks</td>
</tr>
<tr>
<td>Cell*selectionColor</td>
<td>Selected cell color</td>
</tr>
<tr>
<td>cell_skin0,report_skin0, section_skin0,bloc_skin0</td>
<td>Combo default skin</td>
</tr>
<tr>
<td>freeCell*default</td>
<td>Free cells (not section cells)</td>
</tr>
<tr>
<td>freeCell*section</td>
<td>Section cells</td>
</tr>
<tr>
<td>graph*Data</td>
<td>Removing black line around bar charts</td>
</tr>
<tr>
<td>graph*Graph</td>
<td>General settings for graphs</td>
</tr>
<tr>
<td>graph<em>Palette</em>0</td>
<td>Adding a new color palette</td>
</tr>
<tr>
<td>graph<em>Palette</em>1</td>
<td>Adding a new color palette</td>
</tr>
<tr>
<td>graph*Wall</td>
<td>Default background colors for charts</td>
</tr>
<tr>
<td>graph*YGrid</td>
<td>Color for horizontal grid (Y axis)</td>
</tr>
<tr>
<td>graph*ZGrid</td>
<td>Removing X-axis and Z-axis grid</td>
</tr>
<tr>
<td>graph*XLabels</td>
<td>X-axis labels in a graph</td>
</tr>
<tr>
<td>graph*YLabels</td>
<td>Y-axis labels in a graph</td>
</tr>
<tr>
<td>graph*ZLabels</td>
<td>Z-axis labels in a graph</td>
</tr>
<tr>
<td>graph*XValues</td>
<td>X-axis values in a graph</td>
</tr>
<tr>
<td>graph*YValues</td>
<td>Y-axis values in a graph</td>
</tr>
<tr>
<td>graph*ZValues</td>
<td>Z-axis values in a graph</td>
</tr>
<tr>
<td>page*default</td>
<td>Default page layout. For example: A4, Letter; portrait or landscape.</td>
</tr>
<tr>
<td>Section*arrowColor</td>
<td>Color of section arrow</td>
</tr>
<tr>
<td>Section*background</td>
<td>General settings for sections</td>
</tr>
<tr>
<td>Section*selectionColor</td>
<td>Color of selected section arrow</td>
</tr>
<tr>
<td>table*AltBody</td>
<td>Alternate body cells in a table</td>
</tr>
<tr>
<td>table*body</td>
<td>Body cells in a table</td>
</tr>
<tr>
<td>table*BodyForm</td>
<td>Body cells in a form</td>
</tr>
</tbody>
</table>
Customizing the appearance of Web Intelligence documents

Example: Modifying the default font in table cells

You can modify the default font to another font available on your system, including non-standard fonts that you install on the server. The default font is Arial.

This setting is found in the table*Body key value in the defaultconfig.xml file. Languages and fonts must be supported on the client machine for correct display. In addition, all fonts must be defined in the fontalias.xml file.

**Note:** To change the default appearance of Web Intelligence documents created in a report panel, you must modify and deploy the correct copy of the defaultconfig.xml file. See “Locating and modifying defaultconfig.xml” on page 56 for more information.

To modify the default font

1. Make a backup of the defaultconfig.xml file.
2. Open the defaultconfig.xml file.
3. Find the table*Body key value.

Here’s what it looks like:

```xml
<KEY/>
<!-- Settings for body cells in a table -->
- <KEY VALUE="table*Body">
  - <STYLE>
    <FONT FACE="Arial" SIZE="10" R="0" G="0" B="0" BOLD="no" />
    <FONT xml:lang="ja" FACE="BOJapan" SIZE="10" R="0" G="0" B="0" BOLD="no" />
    <FONT xml:lang="ko" FACE="BOKorea" SIZE="10" R="0" G="0" B="0" BOLD="no" />
    <FONT xml:lang="zh" FACE="BOChina" SIZE="10" R="0" G="0" B="0" BOLD="no" />
    <BACKGROUND R="255" G="255" B="255" />
    <ALIGN VALUE="center" />
    <HALIGN VALUE="left" />
  </STYLE>
</KEY>
```

<table>
<thead>
<tr>
<th>Key value</th>
<th>Interface element</th>
</tr>
</thead>
<tbody>
<tr>
<td>table*ExtraHeader</td>
<td>Object name cells in a crosstable</td>
</tr>
<tr>
<td>table*Footer</td>
<td>Footer cells in a table</td>
</tr>
<tr>
<td>table*Form</td>
<td>General settings for forms</td>
</tr>
<tr>
<td>table*Header</td>
<td>Header cells in a table</td>
</tr>
<tr>
<td>table*HeaderForm</td>
<td>Header cells in a form</td>
</tr>
<tr>
<td>table*Table</td>
<td>General settings for tables</td>
</tr>
<tr>
<td>UI*default</td>
<td>Custom fonts</td>
</tr>
</tbody>
</table>

Languages and fonts must be supported on the client machine for correct display. In addition, all fonts must be defined in the fontalias.xml file.
4. To change the default font for specified languages, enter the font name after FACE=.
   For example, to change only Japanese to a font named “SpecialFont,” you would enter:
   \(<FONT xml:lang="ja" FACE="SpecialFont" ...\)

5. To change the overall default font for all non-specified languages, enter the new font name after FONT FACE=.
   \(\textbf{Note}: \) You must modify the default font values separately for each language you want to change.

6. Modify any other attributes you want, such as font size.

7. Save and close the defaultconfig.xml file.
Command lines overview

When you start or configure a server through the Central Management Console (CMC) or the Central Configuration Manager (CCM), the server is started (or restarted) with a default command line that includes a typical set of options and values. In the majority of cases, you need not modify the default command lines directly. Moreover, you can manipulate the most common settings through the various server configuration screens in the CMC and the CCM. For reference, this appendix provides a full listing of the command-line options supported by each server. You can modify each server’s command line directly if you need to further customize the behavior of BusinessObjects Enterprise.

Throughout this appendix, values provided in square brackets [ ] are optional.

▶ To view or modify a server’s command line

The procedure for viewing or modifying a server’s command line depends upon your operating system:

• On Windows, use the CCM to stop the server. Then open the server’s Properties to modify the command line. Start the server again when you have finished.

• On UNIX, run `ccm.sh` to stop the server. Then edit `ccm.config` to modify the server’s command line. Start the server again when you have finished.

Note: On UNIX, each server’s command line is actually passed as an argument to the `crystalrestart.sh` script. This script launches the server and monitors it in case an automatic restart is required. For more information, see the BusinessObjects Enterprise Administrator’s Reference Guide.
Standard options for all servers

These command-line options apply to all of the BusinessObjects Enterprise servers, unless otherwise indicated. See the remainder of this appendix for options specific to each type of server.

<table>
<thead>
<tr>
<th>Option</th>
<th>Valid Arguments</th>
<th>Behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td>-name</td>
<td>string</td>
<td>Specify the friendly name of the server. The server registers this name with the Central Management Server (CMS), and the name is displayed in the CMC. The default friendly name is <code>hostname.servertype</code></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Note:</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Do not modify <code>-name</code> for a CMS.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• If you modify <code>-name</code> for an Input or Output File Repository Server, you must include “Input.” or “Output.” as the prefix to the value you type for <code>string</code> (for example, <code>-name Input.Server01</code> or <code>-name Output.UK</code>).</td>
</tr>
<tr>
<td>-ns</td>
<td>cmsname[:port]</td>
<td>Specify the CMS that the server should register with. Add <code>port</code> if the CMS is not listening on the default (6400). This option does not apply to the CMS itself.</td>
</tr>
<tr>
<td>-requestPort</td>
<td>port</td>
<td>Specify the port that the server listens on. The server registers this port with the CMS. If unspecified, the server chooses any free port &gt; 1024.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Note:</strong> This port is used for different purposes by different servers. Before changing, see the section on changing the default server port numbers in the BusinessObjects Enterprise Administrator’s Guide.</td>
</tr>
</tbody>
</table>
UNIX signal handling

On UNIX, the BusinessObjects Enterprise daemons handle the following signals:

- **SIGTERM** results in a graceful server shutdown (exit code = 0).
- **SIGSEGV, SIGBUS, SIGSYS, SIGFPE, and SIGILL** result in a rapid shutdown (exit code = 1).

Central Management Server

This section provides the command-line options that are specific to the CMS.

The default path to the server on Windows is:

```
C:\Program Files\Business Objects\BusinessObjects Enterprise 11.5\win32_x86\CrystalMS.exe
```

The default path to the server on UNIX is:

```
INSTALL_ROOT/bobje/enterprise11/platform/boe_cmsd
```

---

<table>
<thead>
<tr>
<th>Option</th>
<th>Valid Arguments</th>
<th>Behavior</th>
</tr>
</thead>
</table>
| -port    | [interface:]port| Bind WCA or CMS to the specified port, or to the specified network interface and port. Binds other servers to the specified network interface. Useful on multihomed machines or in certain NAT firewall environments. **Note:**
- Use `-port port` or `-port interface:port` for WCA and CMS. Use `-port interface` for other servers. The port command is used for different purposes by different servers. Before changing, see the section on changing the default server port numbers in the *BusinessObjects Enterprise Administrator’s Guide*.  
- If you change the default port value for the CMS, you must perform additional system configuration. For more information please see the section on changing the default server port numbers in the *BusinessObjects Enterprise Administrator’s Guide*. |
<p>| -restart |                 | Server restarts if it exits with an unusual exit code.                   |
| -fg      |                 | UNIX only. Run the daemon in the foreground. When passing the server’s command line to the <code>crystalrestart.sh</code> script, you must use this option (see <code>ccm.config</code>). If you run the server’s command line directly, do not use this option, because the foreground process blocks the shell until the server exits. |</p>
<table>
<thead>
<tr>
<th>Option</th>
<th>Valid Arguments</th>
<th>Behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td>-threads</td>
<td><em>number</em></td>
<td>Use a thread pool of the specified size. The default is one thread per request.</td>
</tr>
<tr>
<td>-reinitializedb</td>
<td></td>
<td>Cause the CMS to delete the system database and recreate it with only the default system objects.</td>
</tr>
<tr>
<td>-quit</td>
<td></td>
<td>Force the CMS to quit after processing the -reinitializedb option.</td>
</tr>
<tr>
<td>-receiverPool</td>
<td><em>number</em></td>
<td>Specify the number of threads the CMS creates to receive client requests. A client may be another Business Objects server, the Report</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Publishing Wizard, Crystal Reports, or a custom client application that you have created. The default value is 5. Normally you will not need to</td>
</tr>
<tr>
<td></td>
<td></td>
<td>increase this value, unless you create a custom application with many clients.</td>
</tr>
<tr>
<td>-maxobjectsincache</td>
<td><em>number</em></td>
<td>Specify the maximum number of objects that the CMS stores in its memory cache. Increasing the number of objects reduces the number of</td>
</tr>
<tr>
<td></td>
<td></td>
<td>database calls required and greatly improves CMS performance. However, placing too many objects in memory may result in the CMS having too</td>
</tr>
<tr>
<td></td>
<td></td>
<td>little memory remaining to process queries. The upper limit is 100000.</td>
</tr>
<tr>
<td>-ndbqthreads</td>
<td><em>number</em></td>
<td>Specify the number of CMS worker threads sending requests to the database. Each thread has a connection to the database, so you must be</td>
</tr>
<tr>
<td></td>
<td></td>
<td>careful not to exceed your database capacity. In most cases, the maximum value you should set is 10.</td>
</tr>
<tr>
<td>-AuditInterval</td>
<td><em>minutes</em></td>
<td>Specify interval at which the CMS requests audit information from audited servers. The default value is 5 minutes. (Maximum value is 15 minutes, and minimum value is 1 minute.).</td>
</tr>
<tr>
<td>-AuditBatchSize</td>
<td><em>number</em></td>
<td>Specify the maximum number of audit records that the CMS requests from each audited server, per audit interval. The default value is 200 records. (Maximum value is 500, and minimum value is 50.)</td>
</tr>
</tbody>
</table>
The Page Server and the Cache Server are controlled in much the same way from the command line. The command-line options determine whether the server starts as a Page Server, a Cache Server, or both. Options that apply only to one server type are noted below.

The default paths to the servers on Windows are:
- `C:\Program Files\Business Objects\BusinessObjects Enterprise 11.5\win32_x86\cacheserver.exe`
- `C:\Program Files\Business Objects\BusinessObjects Enterprise 11.5\win32_x86\pageserver.exe`

The default paths to the servers on UNIX are:
- `INSTALL_ROOT/bobje/enterprise/platform/boe_cachesd`
- `INSTALL_ROOT/bobje/enterprise11/platform/boe_pagesd`

### Option Table

<table>
<thead>
<tr>
<th>Option</th>
<th>Valid Arguments</th>
<th>Behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>-auditMaxEventsPerFile</code></td>
<td><code>number</code></td>
<td>Specify the maximum number of records in the audit log file. The default value is 500. If the number specified by <code>-auditMaxEventsPerFile</code> is exceeded, the server opens a new log file.</td>
</tr>
<tr>
<td><code>-AuditeeTimeSyncInterval</code></td>
<td><code>minutes</code></td>
<td>Specify the interval between time synchronization events. The CMS broadcasts its system time to audited servers at the interval specified by <code>-AuditeeTimeSyncInterval</code>. The audited servers compare their internal clocks to the CMS time, and then adjust the timestamps they give to all subsequent audit records so that the time of these records synchronizes with the CMS time. The default interval is 60 minutes. (Maximum value is 1 day, or 1440 minutes. Minimum value is 15 minutes. Setting the interval to 0 turns off time synchronization.)</td>
</tr>
<tr>
<td>Option</td>
<td>Valid Arguments</td>
<td>Behavior</td>
</tr>
<tr>
<td>-------------------------</td>
<td>-----------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>-cache</td>
<td></td>
<td>Enable Cache Server functionality.</td>
</tr>
<tr>
<td>-dir</td>
<td>absolutepath</td>
<td>Specify the cache directory for a Cache Server and the temp directory for the Page Server. The directories created are absolutepath/cache and absolutepath/temp</td>
</tr>
<tr>
<td>-deleteCache</td>
<td></td>
<td>Delete the cache directory every time the server starts and stops.</td>
</tr>
<tr>
<td>-psdir</td>
<td>absolutepath</td>
<td>Specify the temp directory for the Page Server. This option overrides -dir.</td>
</tr>
<tr>
<td>-refresh</td>
<td>minutes</td>
<td>Share cached pages for the specified number of minutes.</td>
</tr>
<tr>
<td>-maxDBResultRecords</td>
<td>number</td>
<td>Limit the number of database records that are returned from the database. The default limit is 20000 records. If a user views an on-demand report containing more than 20000 records, an error message indicates that the report contains too many database records. To increase the enforced limit, increase number accordingly; to disable the limit, replace number with 0 (zero).</td>
</tr>
<tr>
<td>-noautomaticdbdisconnect</td>
<td></td>
<td>Disable automatic database disconnection for the Page Server. By default the Page Server will automatically disconnect from the reporting database after retrieving data, to free up database licenses. This may affect performance if your site uses many reports with on-demand subreports, or group-by-on-server.</td>
</tr>
<tr>
<td>-report_ProcessExtPath</td>
<td>absolutepath</td>
<td>Specify the default directory for processing extensions. For details, see the BusinessObjects Enterprise Administrator’s Guide.</td>
</tr>
<tr>
<td>-auditMaxEventsPerFile</td>
<td>number</td>
<td>On the Cache Server, specifies the maximum number of audit actions recorded in the audit log file. The default value is 500. If this maximum number of records is exceeded, the server will open a new log file.</td>
</tr>
</tbody>
</table>
Job servers

This section provides the command-line options that are specific to the job servers, which include Job Servers, Program Job Servers, Destination Job Server, and List of Values Job Server.

The default path to the server on Windows is:
C:\Program Files\Business Objects\BusinessObjects Enterprise 11.5\win32_x86\JobServer.exe

The default paths to the server on UNIX are:
INSTALL_ROOT/bobje/enterprise11/platform/boe_reportjobsd
INSTALL_ROOT/bobje/enterprise11/platform/boe_programjobsd

<table>
<thead>
<tr>
<th>Option</th>
<th>Valid Arguments</th>
<th>Behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td>-dir</td>
<td>absolutepath</td>
<td>Specify the data directory for the Job Server.</td>
</tr>
<tr>
<td>-lib</td>
<td>processinglibrary</td>
<td>Specify the processing library to load:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• procReport or</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• procProgram</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Loading procReport starts the Job Server as a Report Job Server. Loading procProgram starts the Job Server as a Program Job Server. This option is used in conjunction with -objectType.</td>
</tr>
<tr>
<td>-objectType</td>
<td>progID</td>
<td>The program ID of the processing library, which determines the class of object supported by the Job Server:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• CrystalEnterprise.Report or</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• CrystalEnterprise.Program</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Used with -lib to specify whether the Job Server becomes a Report Job Server or a Program Job Server.</td>
</tr>
<tr>
<td>-maxJobs</td>
<td>number</td>
<td>Set the maximum number of concurrent jobs that the server will handle. The default is five.</td>
</tr>
<tr>
<td>-requestJSChildPorts</td>
<td>lowerbound-upperbound</td>
<td>Specify the range of ports that child processes should use in a firewall environment. For example, 6800-6805 limits child processes to six ports.</td>
</tr>
</tbody>
</table>
Report Application Server

This section provides the command-line options that are specific to the Report Application Server.

The default path to the server on Windows is:
C:\Program Files\Common Files\Business Objects\3.0\bin\crystalras.exe

The default path to the server on UNIX is:
INSTALL_ROOT/bobje/enterprise11/platform/ras/boe_crystalrasd

<table>
<thead>
<tr>
<th>Option</th>
<th>Valid Arguments</th>
<th>Behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td>-report_ProcessExtPath</td>
<td>absolutepath</td>
<td>Specify the default directory for processing extensions. For details, see the BusinessObjects Enterprise Administrator’s Guide.</td>
</tr>
<tr>
<td>-auditMaxEventsPerFile</td>
<td>number</td>
<td>Specify the maximum number of records in the audit log file. The default value is 500. If the number specified by -auditMaxEventsPerFile is exceeded, the server opens a new log file.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Option</th>
<th>Valid Arguments</th>
<th>Behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td>-ipport</td>
<td>port</td>
<td>Specify the port number for receiving TCP/IP requests when running in stand-alone mode (outside of BusinessObjects Enterprise).</td>
</tr>
<tr>
<td>-report_ProcessExtPath</td>
<td>absolutepath</td>
<td>Specify the default directory for processing extensions. For details, see the BusinessObjects Enterprise Administrator’s Guide.</td>
</tr>
</tbody>
</table>
Server Command Lines
Report Application Server

<table>
<thead>
<tr>
<th>Option</th>
<th>Valid Arguments</th>
<th>Behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td>-ProcessAffinityMask</td>
<td>mask</td>
<td>Use a mask to specify exactly which CPUs that RAS will use when it runs on a multi-processor machine.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The mask is in the format 0xffffffff, where each f represents a processor, and the list of processors reads from right to left (that is, the last f represents the first processor). For each f, substitute either 0 (use of CPU not permitted) or 1 (use of CPU is permitted).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>For example, if you run the RAS on a 4 processor machine and want it to use the 3rd and 4th processor, use the mask 0x1100. To use the 2nd and 3rd processor, use 0x0110.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Note:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 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.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• The default value of the mask is -1, which has the same meaning as 0x1111.</td>
</tr>
<tr>
<td>-auditMaxEventsPerFile</td>
<td>number</td>
<td>Specify the maximum number of records in the audit log file. The default value is 500. If the number specified by -auditMaxEventsPerFile is exceeded, the server opens a new log file.</td>
</tr>
</tbody>
</table>
# Web Intelligence Report Server

This section provides the command-line options that are specific to the Web Intelligence Report Server.

The default paths to the server on Windows is:

```
C:\Program Files\Business Objects\BusinessObjects Enterprise 11.5\win32_x86\WIReportServer.exe
```

The default path to the server on UNIX is:

```
INSTALL_ROOT/bobje/enterprise11/platform/ras/boe_crystalrasd
```

<table>
<thead>
<tr>
<th>Option</th>
<th>Valid Arguments</th>
<th>Behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td>-ConnectionTimeoutMinutes</td>
<td>minutes</td>
<td>Specify the number of minutes before the server will timeout.</td>
</tr>
<tr>
<td>-MaxConnections</td>
<td>number</td>
<td>Specify the maximum number of simultaneous connections that the server allows at one time.</td>
</tr>
<tr>
<td>-DocExpressEnable</td>
<td></td>
<td>Enables caching of Web Intelligence documents when the document is being viewed.</td>
</tr>
<tr>
<td>-DocExpressRealTimeCachingEnable</td>
<td></td>
<td>Enables real time caching of Web Intelligence documents.</td>
</tr>
<tr>
<td>-DocExpressCacheDurationMinutes</td>
<td>minutes</td>
<td>Specify the amount of time (in minutes) that content is stored in cache.</td>
</tr>
<tr>
<td>-DocExpressMaxCacheSizeKB</td>
<td>kilobytes</td>
<td>Specify the size of the document cache.</td>
</tr>
<tr>
<td>-EnableListOfValuesCache</td>
<td></td>
<td>Enables the caching per user sessions of lists of values</td>
</tr>
<tr>
<td>-ListOfValuesBatchSize</td>
<td>number</td>
<td>Specify the maximum number of values that can be returned per list of values batch.</td>
</tr>
<tr>
<td>-UniverseMaxCacheSize</td>
<td>number</td>
<td>Specify the number of universes to be cached.</td>
</tr>
<tr>
<td>-WIDMaxCacheSize</td>
<td>number</td>
<td>Specify the maximum number of Web Intelligence documents that can be stored in cache.</td>
</tr>
</tbody>
</table>
Input and Output File Repository Servers

This section provides the command-line options that are specific to the Input and Output File Repository Servers.

The default paths to the servers on Windows are:

C:\Program Files\Business Objects\BusinessObjects Enterprise 11.5\win32_x86\inputfileserver.exe
C:\Program Files\Business Objects\BusinessObjects Enterprise 11.5\win32_x86\outputfileserver.exe

The default paths to the program that provides both servers on UNIX are:

INSTALL_ROOT/bobje/enterprise11/platform/boe_inputfilesd
INSTALL_ROOT/bobje/enterprise11/platform/boe_outputfilesd

Note: If you modify -name for an Input or Output File Repository Server, you must include “Input.” or “Output.” as the prefix to the value you type (for example, -name Input.Server01 or -name Output.UK).

<table>
<thead>
<tr>
<th>Option</th>
<th>Valid Arguments</th>
<th>Behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td>-rootDir</td>
<td>absolutepath</td>
<td>Set the root directory for the various subfolders and files that are managed by the server. File paths used to refer to files in the File Repository Server are interpreted relative to this root directory. Note: All Input File Repository Servers must share the same root directory, and all Output File Repository Servers must share the same root directory (otherwise there is a risk of having inconsistent instances). Additionally, the input root directory must not be the same as the output root directory. It is recommended that you replicate the root directories using a RAID array or an alternative hardware solution.</td>
</tr>
<tr>
<td>-tempDir</td>
<td>absolutepath</td>
<td>Set the location of the temporary directory that the FRS uses to transfer files. Use this command line option if you want to control the location of the FRS temporary directory, or if the default temporary directory name generated by the FRS exceeds the file system path limit (which will prevent the FRS from starting).</td>
</tr>
<tr>
<td>-maxidle</td>
<td>minutes</td>
<td>Specify the number of minutes after which an idle session is cleaned up.</td>
</tr>
</tbody>
</table>
Event Server

This section provides the command-line options that are specific to the Event Server.

The default path to the server on Windows is:
C:\Program Files\Business Objects\BusinessObjects Enterprise 11.5\win32_x86\EventServer.exe

The default path to the server on UNIX is:
INSTALL_ROOT/bobje/enterprise11/platform/boe_eventsd

<table>
<thead>
<tr>
<th>Option</th>
<th>Valid Arguments</th>
<th>Behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td>-poll</td>
<td>seconds</td>
<td>Specify the frequency (in seconds) with which the server checks for File events.</td>
</tr>
<tr>
<td>-cleanup</td>
<td>minutes</td>
<td>Specify the frequency (in minutes) with which the server cleans up listener proxies.</td>
</tr>
<tr>
<td>-auditMaxEventsPerFile</td>
<td>number</td>
<td>Specify the maximum number of records in the audit log file. The default value is 500. If the number specified by -auditMaxEventsPerFile is exceeded, the server opens a new log file.</td>
</tr>
</tbody>
</table>
UNIX Tools
**UNIX tools overview**

The UNIX distribution of BusinessObjects Enterprise includes a number of scripts that, together, provide you with all the configuration options that are available in the Windows version of the Central Configuration Manager (CCM). There are a number of other scripts that provide you with UNIX-specific options or serve as templates for your own scripts. Also, there are several secondary scripts that are used by BusinessObjects Enterprise. Each script is described here and the command-line options are provided where applicable.

**Script utilities**

This section describes the administrative scripts that assist you in working with BusinessObjects Enterprise on UNIX. The remainder of this guide discusses the concepts behind each of the tasks that you can perform with these scripts. This reference section provides you the main command-line options and their arguments.

**ccm.sh**

The ccm.sh script is installed to the bobje directory of your installation. This script provides you with a command-line version of the CCM. This section lists the command-line options and provides some examples.

**Note:**

- Arguments in square brackets [ ] are optional.
- By default, servers are named with a hostname.servertype convention. If the option requires the server name, use servertype as the server name. If the option requires the fully qualified server name, use hostname.servertype. If you are unsure of a server’s fully qualified name, look in the ccm.config file, locate the server’s launch string, and use the value that appears after the -name option.
Arguments denoted by *other authentication information* are provided in the second table.

<table>
<thead>
<tr>
<th>CCM Option</th>
<th>Valid Arguments</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-help</td>
<td>n/a</td>
<td>Display command-line help.</td>
</tr>
<tr>
<td>-start</td>
<td>all or servername</td>
<td>Start each server as a process. Use the short form of the server name.</td>
</tr>
<tr>
<td>-stop</td>
<td>all or servername</td>
<td>Stop each server by terminating its Process ID. Use the short form of the server name.</td>
</tr>
<tr>
<td>-restart</td>
<td>all or servername</td>
<td>Stop each server by terminating its Process ID; then each server is started. Use the short form of the server name.</td>
</tr>
<tr>
<td>-enable</td>
<td>all or hostname.servertype [other authentication information]</td>
<td>Enable a started server so that it registers with the system and starts listening on the appropriate port. Use the fully qualified form of the server name.</td>
</tr>
<tr>
<td>-disable</td>
<td>all or hostname.servertype [other authentication information]</td>
<td>Disable a server so that it stops responding to BusinessObjects Enterprise requests but remains started as a process. Use the fully qualified form of the server name.</td>
</tr>
<tr>
<td>-display</td>
<td>server [other authentication information]</td>
<td>Reports the server’s current status (enabled or disabled). The CMS must be running before you can use this option.</td>
</tr>
<tr>
<td>-updateobjects</td>
<td>[other authentication information]</td>
<td>Update objects migrated from a previous version of BusinessObjects Enterprise into your current CMS system database. Use this option after running <code>cmsdbsetup.sh</code>.</td>
</tr>
</tbody>
</table>
This table describes the options that make up the argument denoted by *other authentication information*.

<table>
<thead>
<tr>
<th>Authentication Option</th>
<th>Valid arguments</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-cms</td>
<td>cmsname:port#</td>
<td>Specify the CMS that you want to log on to. If not specified, the CCM defaults to the local machine and the default port (6400).</td>
</tr>
<tr>
<td>-username</td>
<td>username</td>
<td>Specify an account that provides administrative rights to BusinessObjects Enterprise. If not specified, the default Administrator account is attempted.</td>
</tr>
<tr>
<td>-password</td>
<td>password</td>
<td>Specify the corresponding password. If not specified, a blank password is attempted. <strong>Note:</strong> To specify the -password argument, you must also specify the -username argument.</td>
</tr>
<tr>
<td>-authentication</td>
<td>secEnterprise, secLDAP</td>
<td>Specify the appropriate authentication type for the administrative account. If not specified, secEnterprise is attempted.</td>
</tr>
</tbody>
</table>

The CCM reads the server launch strings and other configuration values from the `ccm.config` file. For details, see “ccm.config” on page 79.

**Examples**

These two commands start and enable all the servers. The Central Management Server (CMS) is started on the local machine and the default port (6400):
```
ccm.sh -start all
ccm.sh -enable all
```

These two commands start and enable all the servers. The CMS is started on port 6701, rather than on the default port:
```
ccm.sh -start all
ccm.sh -enable all -cms MACHINE01:6701
```

These two commands start and enable all the servers with a specified administrative account named `SysAdmin`:
```
ccm.sh -start all
ccm.sh -enable all -cms MACHINE01:6701 -username SysAdmin -password 35%bC5@5 -authentication LDAP
```

This single command logs on with a specified administrative account to disable a Job Server that is running on a second machine:
```
ccm.sh -disable MACHINE02.businessobjects.com.reportserver -cms MACHINE01:6701 -username SysAdmin -password 35%bC5@5 -authentication secLDAP
```
**ccm.config**

This configuration file defines the server launch strings and other values that are used by the CCM when you run its commands. This file is maintained by the CCM itself, and by the other BusinessObjects Enterprise script utilities. You typically edit this file only when you need to modify a server's command line. For details, see “Command lines overview” on page 62.

**cmsdbsetup.sh**

The `cmsdbsetup.sh` script is installed to the `bobje` directory of your installation. The script provides a text-based program that enables you to configure the CMS database, CMS clusters, and to set up the audit database.

You can add a CMS to a cluster by selecting a new data source for its CMS database. You can also delete and recreate (re-initialize) a CMS database, copy data from another data source, or change the existing cluster name.

**Note:** Before running this script, back up your current CMS database. Also be sure to see the *BusinessObjects Enterprise Administrator’s Guide* for additional information about CMS clusters and configuring the CMS database.

The script will prompt you for the name of your CMS. By default, the CMS name is `hostname.cms`. That is, the default name of a CMS installed on a machine called `MACHINE01` is `MACHINE01.cms`. To check the name of your CMS (or any other server), view the contents of `ccm.config` and look for the server's launch string. The server’s current name appears after the `-name` option.

For more information about configuring the CMS database or setting up the auditing database, see the *BusinessObjects Enterprise Administrator’s Guide*.

**configpatch.sh**

The `configpatch.sh` script is installed to the `bobje/enterprise/generic` directory of your installation. Use the `configpatch.sh` script when installing patches that require updates to system configuration values. After installing the patch, run `configpatch.sh` with the appropriate `.cf` file name as an argument. The `readme.txt` file that accompanies BusinessObjects Enterprise patches tells you when to run `configpatch.sh`, and the name of the `.cf` file to use.
The `serverconfig.sh` script is installed to the `bobje` directory of your installation. This script provides a text-based program that enables you to view server information and to add and delete servers from your installation. This script adds, deletes, modifies, and lists information from the `ccm.config` file.

When you modify a server using `serverconfig.sh`, you can change the location of its temporary files. For the Central Management Server, you can change its port number or enable auditing. For the Input File Repository Server or the Output File Repository Server, you can enter the root directory.

**To add/delete/modify/list UNIX servers**

1. Go to the `bobje` directory of your installation.
2. Issue the following command:
   
   ```bash
   ./serverconfig.sh
   ```
   
   The script prompts you with a list of options:
   
   - 1 - Add a server
   - 2 - Delete a server
   - 3 - Modify a server
   - 4 - List all servers in the config file

3. Type the number that corresponds to the action you want to perform.
4. If you are adding, deleting, or modifying a server, provide the script with any additional information that it requests.
   
   **Tip:** The script will prompt you for the name of your CMS. By default, the CMS name is `hostname.cms`. That is, the default name of a CMS installed on a machine called `MACHINE01` is `MACHINE01.cms`. However, in this script you can enter `hostname` to check the name of your CMS (or any other server), view the contents of `ccm.config`, and look for the server’s launch string. The server’s current name appears after the `-name` option.

5. Once you have added or modified a server, use the CCM to ensure that the server is both started and enabled.

For more information about each of these topics, see the *BusinessObjects Enterprise Administrator’s Guide*. 
sockssetup.sh

The sockssetup.sh script is installed to the bobje directory of your installation. The script provides a text-based program that enables you to configure the Web Component Adapter (WCA) and the Central Management Server (CMS) when they must communicate across one or more SOCKS proxy server firewalls. For technical information about BusinessObjects Enterprise and firewalls, see the BusinessObjects Enterprise Administrator’s Guide.

To modify SOCKS configuration
1. Go to the bobje directory of your installation.
2. Issue the following command:
   ./sockssetup.sh
3. Type wca to configure the communication between the WCA and the CMS. Or, type servers to configure SOCKS information between the remaining servers.

   The script may prompt you for the name or “friendly name” of the server. By default, each server’s name is hostname. servertype. To check the name of a server, view the contents of ccm.config and look for the server’s launch string. The server’s current name appears after the -name option.

   The “friendly name” of the WCA by default is hostname.wca. To check the name of the WCA, look for the <display-name> of the WCA as listed in the web.xml file in the WEB-INF directory of the webcompadapter.war archive. (This archive is found in the businessobjects_root/enterprise/JavaSDK/applications directory, where businessobjects_root is the root directory of your BusinessObjects Enterprise installation.)

4. Specify one of the available actions:
   • Type show to display any SOCKS servers that have already been entered with this script. A blank list is displayed if no servers have been added.
   • Type create to add a new SOCKS server to the list.
   • Type modify to change one of the SOCKS servers in the list.
   • Type delete to remove a SOCKS server from the list.
   • Type moveup or movedown to modify the sequence of SOCKS servers.

5. Proceed through the script and provide any additional information that it requests:
   • If you are creating a new entry in the list, you will typically need to provide the name or IP address of the SOCKS server, the port number it is listening on, the version number of the SOCKS server (4
UNIX Tools

Script templates

or 5), and any authentication information that the BusinessObjects Enterprise servers will require in order to establish a connection with your SOCKS server.

• If you choose to delete, modify, or move an existing entry, you will be asked to specify the server “by index.” Type the number that corresponds to the SOCKS server you want to modify.

For details about SOCKS and the importance of the sequence of servers, see the BusinessObjects Enterprise Administrator’s Guide.

uninstallBOBJE.sh

The uninstallBOBJE.sh script is installed to the bobje directory of your installation. This script deletes all of the files installed during your original installation of BusinessObjects Enterprise by running the scripts in the bobje/uninstall directory. Do not run the scripts in the uninstall directory yourself: each of these scripts removes only the files associated with a single BusinessObjects Enterprise component, which may leave your BusinessObjects Enterprise system in an indeterminate state.

Before running this script, you must disable and stop all of the BusinessObjects Enterprise servers.

Note:

• The uninstallBOBJE.sh script will not remove files created during the installation process, or files created by the system or by users after installation. To remove these files, after running installBOBJE.sh, perform an rm -rf command on the bobje directory.

• If you performed the “system” installation type, you will also need to delete the run control scripts from the appropriate /etc/rc# directories.

Script templates

These scripts are provided primarily as templates upon which you can base your own automation scripts.

startservers

The startservers script is installed to the bobje directory of your installation. This script can be used as a template for your own scripts: it is provided as an example to show how you could set up your own script that starts the BusinessObjects Enterprise servers by running a series of CCM commands. For details on writing CCM commands for your servers, see “ccm.sh” on page 76.
**stopservers**

The `stopservers` script is installed to the `bobje` directory of your installation. This script can be used as a template for your own scripts: it is provided as an example to show how you could set up your own script that stops the BusinessObjects Enterprise servers by running a series of CCM commands. For details on writing CCM commands for your servers, see “ccm.sh” on page 76.

**silentinstall.sh**

The `silentinstall.sh` script is installed to the `bobje` directory of your installation. Once you have set up BusinessObjects Enterprise on one machine, you can use this template to create your own scripts that install BusinessObjects Enterprise automatically on other machines. Essentially, once you have edited the `silentinstall.sh` template accordingly, it defines the required environment variables, runs the installation and setup scripts, and sets up BusinessObjects Enterprise according to your specifications, without requiring any further input.

The silent installation is particularly useful when you need to perform multiple installations and do not want to interrupt people who are currently working on machines in your system. You can also use the silent installation script in your own scripts. For example, if your organization uses scripts to install software on machines, you can add the silent BusinessObjects Enterprise installation command to your scripts.

For information about script parameters, see the comments in the `silentinstall.sh` script.

**Note:**

- Because the `silentinstall.sh` file is installed with BusinessObjects Enterprise, you cannot install silently the first time you install BusinessObjects Enterprise.
- The silent installation is not recommended if you need to perform custom installations. The installation options are simplified and do not allow for the same level of customization provided in the BusinessObjects Enterprise install script.
Scripts used by BusinessObjects Enterprise

These secondary scripts are often run in the background when you run the main BusinessObjects Enterprise script utilities. You need not run these scripts yourself.

bobjerestart.sh

This script is run internally by the CCM when it starts the BusinessObjects Enterprise server components. If a server process ends abruptly without returning its normal exit code, this script automatically restarts a new server process in its place. Do not run this script yourself.

env.sh

The env.sh script is installed to the bobje directory of your installation. This script sets up the BusinessObjects Enterprise environment variables that are required by some of the other scripts. BusinessObjects Enterprise scripts run env.sh as required. When you install BusinessObjects Enterprise on UNIX, you must configure your Java application server to source this script on startup. See the BusinessObjects Enterprise Installation Guide for more details.

env-locale.sh

The env-locale.sh script is used for converting the script language strings between different types of encoding (for example, UTF8 or EUC or Shift-JIS). This script is run by env.sh as needed.

initlaunch.sh

The initlaunch.sh script runs env.sh to set up the BusinessObjects Enterprise environment variables, and then runs any command that you have added as a command-line argument for the script. This script is intended primarily for use as a debugging tool by Business Objects SA.
patchlevel.sh

The `patchlevel.sh` is installed to the `bobje/enterprise/generic` directory of your installation. This script reports on the patch level of your UNIX distribution. This script is intended primarily for use by Business Objects SA support staff.

<table>
<thead>
<tr>
<th>Option</th>
<th>Valid Arguments</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>list</td>
<td>n/a</td>
<td>List all the installed patches.</td>
</tr>
<tr>
<td>query</td>
<td>patch #</td>
<td>Query the operating system for the presence of a particular patch by numeric ID.</td>
</tr>
<tr>
<td>check</td>
<td>textfile</td>
<td>Check that all the patches listed in <code>textfile</code> are installed on your operating system.</td>
</tr>
</tbody>
</table>

postinstall.sh

The `postinstall.sh` script is installed to the `bobje` directory of your installation. This script runs automatically at the end of the installation script and launches the `setup.sh` script. You need not run this script yourself.

setup.sh

The `setup.sh` script is installed to the `bobje` directory of your installation. This script provides a text-based program that allows you to set up your BusinessObjects Enterprise installation. This script is run automatically when you install BusinessObjects Enterprise. It prompts you for the information that is required in order to set up BusinessObjects Enterprise for the first time.

For complete details on responding to the setup script when you install BusinessObjects Enterprise, see the *BusinessObjects Enterprise Installation Guide*.

setupinit.sh

The `setupinit.sh` script is installed to the `bobje` directory of your installation when you perform a system installation. This script copies the run control scripts to your `rc#` directories for automated startup. When you run a system installation you are directed to run this script after the `setup.sh` script completes.

**Note:** You must have root privileges to run this script.
UNIX Tools

Scripts used by BusinessObjects Enterprise
International Deployments
International deployments overview

When you distribute reports to a worldwide audience, you need to accommodate users working in various languages, time zones, and countries. BusinessObjects Enterprise and Crystal Reports provide powerful capabilities for presenting data in a number of languages. This chapter provides recommendations for creating and managing content deployed through BusinessObjects Enterprise to a multilingual, worldwide audience.

International deployments require thorough planning, from choosing the best server configuration to adopting special report design techniques. To support multiple languages in BusinessObjects Enterprise, you need to ensure that the servers have the appropriate resources for delivering content in different languages. In Crystal Reports, you can create flexible reports that allow users to choose between different languages or formats.

**Note:** For large BusinessObjects Enterprise deployments, it is good practice to work with our global team of certified consultants and consulting partners. For more information, contact your Business Objects sales representative.

Deploying BusinessObjects Enterprise internationally

Deploying a BusinessObjects Enterprise system for an international audience introduces a unique set of challenges. When you increase support to address a specific user need such as a new language, you may need to increase the complexity of your deployment.

Many problems can be avoided by planning the BusinessObjects Enterprise deployment in advance. How much multilingual support do your users need? Do you have the people, processes, hardware, and software in place to provide an international BusinessObjects Enterprise system?

When you have determined the best approach, you can configure the available resources to deliver the best possible BusinessObjects Enterprise solution for your users.
Planning an international BusinessObjects Enterprise deployment

To ensure that your deployment is successful, you need to thoroughly plan the deployment with international considerations in mind.

Assess the language needs of your users. Begin with a comprehensive list of job tasks and other user requirements. Then ensure that you have the appropriate resources for delivering BusinessObjects Enterprise to all of your users, and for maintaining its future growth.

Languages

A quick survey of your organization should provide enough information to determine your language requirements. Which languages are used most often across the organization? Is there a demand for reports in all of these languages? Which languages does your company currently support on its web site? How many languages do your report users speak? It may be necessary to provide reports in only two or three languages.

Make sure you check your language requirements against the list of supported languages for BusinessObjects Enterprise. BusinessObjects Enterprise software provides components for the following languages:

- Dutch
- English
- French
- German
- Italian
- Japanese
- Korean
- Simplified Chinese
- Spanish
- Traditional Chinese

For these languages, the software itself has been translated (or localized), with all functions and features available in the specific language.
Resources

After you determine which languages are required, look at the resources required to implement the different server configurations that will meet the language needs of your users.

You can provide separate BusinessObjects Enterprise deployments for each language, or you can ask users to create reports in one language and deliver them using servers in another language. Do you have the resources and people you need to manage multiple systems or can you support only one BusinessObjects Enterprise deployment?

For any deployment that involves more than one language, you must account for additional server requirements. For example, if you run an English version of BusinessObjects Enterprise on a multilingual operating system, you must ensure that you have the correct combination of components for both languages.

You should choose the right deployment based on the available resources. For each server, ensure that you have the appropriate operating system, fonts, and language files.

- **Languages**
  Install the appropriate languages on all servers. Even if only a few users design reports in Spanish and Japanese, Spanish and Japanese language files must be installed on all servers used in the deployment.

  For information on installing languages, consult your operating system’s documentation.

- **Fonts**
  If a language requires a special font, install the font files on all machines running BusinessObjects Enterprise components. For information on installing fonts, consult your operating system’s documentation.

**Note:**

- Depending on the languages, data may not be displayed properly. For example, if you publish reports in a “double-byte” language like Japanese to an English server, the double-byte characters may not display properly in chart titles, drill-down tabs, group tree values, and strings in formulas. These strings use the system font specified by the server to display text. Unless the system font supports double-byte characters, BusinessObjects Enterprise will not display the strings properly.

- If, after installing the necessary fonts on the various servers, BusinessObjects Enterprise does not render the report properly, install Crystal Reports on the problematic servers. Then, open the problem report and refresh it.
• **Operating systems**
  Depending on your language needs, you may need to install a localized operating system on machines running BusinessObjects Enterprise components. The operating system may affect certain messages that appear when working with BusinessObjects Enterprise. To ensure that all messages appear in the language you want, make sure you install the appropriate version of the operating system, and make sure it is a language supported by BusinessObjects Enterprise.
  For example, if you access French reports from a French client using an English version of BusinessObjects Enterprise on the server, you must have a French operating system on the server.

• **People**
  Depending on your configuration, you may need additional people to help deliver and maintain your BusinessObjects Enterprise system. If you deploy multiple systems for different languages, you may need another system administrator or IT professional to configure and maintain the system. When you are working with localized versions of operating systems and software, it is good practice to have someone on staff who not only has the technical IT skills, but also the language skills required to manage the system.
International Deployments
Deploying BusinessObjects Enterprise internationally
Creating Accessible Reports
About accessibility

When you create Crystal reports for a large audience across the organization—and around the world—you need to account for the diverse needs of that audience. Report designers often create reports for specific languages, countries, job tasks, or work groups, but it is also important to consider the accessibility requirements of users.

Report users may have physical, sensory, or cognitive limitations that affect their ability to access the Web. They may not be able to see, move, or hear. They may have low vision or limited movement. Some people have dyslexia, color-blindness, or seizure disorders; others have difficulty reading or understanding text. They may have a combination of disabilities, with varying levels of severity.

People with disabilities often use assistive technologies: products or techniques that help people perform tasks they cannot perform otherwise. Assistive technologies include adaptive software programs such as screen readers (which translate text into audible output), screen magnifiers, and speech-recognition software. People with disabilities may also use special browsers that allow only text or voice-based navigation. They may use assistive devices such as refreshable Braille displays, or alternative keyboards that use “sip-and-puff” switches or “eyegaze” technology.

To meet the reporting needs of people with disabilities, your reports should be designed to work with as many assistive technologies as possible.

Despite the wide range of potential accessibility issues, you can use the techniques described in this chapter to create reports that are useful for everyone.

Benefits of accessible reports

As more business and government leaders adopt new standards for delivering web content to people with disabilities, accessible design is becoming critical to information management and delivery.

Accessible design provides many benefits:

• Accessible reports are easier for everyone to use.
  
  Many accessibility guidelines result in improved usability. An accessible report must provide logical and consistent navigation. Its content must be clearly written and easy to understand.

• Accessible reports are more compatible with a variety of technologies, new and old.
Accessible content is easier to export to simple formats that are more compatible with mobile phone browsers, personal digital assistants (PDAs), and other devices with low-bandwidth connections.

Some people may not have a keyboard or a mouse. They may have a text-only screen, a small screen, or a slow Internet connection. Accessible design makes it easier for people with limited technology to access information.

- Accessible content is easier to reuse for other formats.
  
  In the viewers, accessible reports are more accurately copied or exported to other formats.

- Accessible reports improve server efficiency.
  
  You may reduce the number of HTTP requests on the server, by providing clear navigation so people can find what they need faster. Providing text-only alternatives can reduce the number of graphics, which take up valuable bandwidth.

- Recent initiatives indicate a worldwide trend towards providing accessible web content.
  
  More companies are making accessibility a requirement for their web content, especially in the United States, where the government introduced section 508 of the Rehabilitation Act. Accessibility is quickly becoming an essential part of web content delivery.

- You may be legally required to provide accessible content.
  
  Each year, more countries introduce anti-discrimination laws that ensure equal opportunities for people with disabilities. Even if you are not legally required to meet accessibility guidelines, you may want to do business with an organization that is required to adhere to them.

- Creating accessible reports is easier than modifying existing reports to make them accessible.
  
  If you build accessible features into your reports now, it will be significantly less expensive than to redesign existing reports later.

### About the accessibility guidelines

The most comprehensive accessibility guidelines are the Web Content Accessibility Guidelines (WCAG), developed by the international World Wide Web Consortium (W3C). The WCAG is widely considered the definitive set of recommendations for delivering web content to people with disabilities. The WCAG has influenced the development of similar web content standards around the world.
Organizations and governments worldwide are adopting the accessibility recommendations of the W3C. In Australia, the Disability Discrimination Act includes standards for web site accessibility. Similar guidelines have been introduced in the United Kingdom and throughout Europe. In Canada, all government web content is now developed according to the Common Look and Feel (CLF) initiative, which is largely based on the W3C's Web Content Accessibility Guidelines. Taking web accessibility a step further, the United States government introduced legislation in the form of Section 508 of the Rehabilitation Act, which ensures the right to accessible government web content.

Common to all guidelines is a focus on providing web content that is useful for all people, regardless of disability or impairment. For reports, accessible design is focused on the same key concepts:

- Content must be easy to understand and navigate.
- Text equivalents or alternatives should be provided for non-text objects.
- Objects should be logically organized to clarify relationships between objects.
- Reports must not rely on any one specific type of hardware, such as a mouse, a keyboard, or a color screen.

For more information on specific accessibility guidelines, see “Resources” on page 117.

### Accessibility and Business Objects products

Business Objects products allow you to design accessible reports and deliver them to your users via the Web. The products provide different levels of accessibility support.

#### Crystal Reports

By observing accessibility guidelines, you can use Crystal Reports to create reports that are accessible to users with disabilities. However, Crystal Reports does not currently provide complete accessibility for report designers with disabilities.

**Note:** The reports in this chapter were created in Crystal Reports and tested using screen readers (including JAWS 4.5).

#### Web Intelligence

Web Intelligence provides accessible access through its HTML Report Panel interface, where you can view, create, and edit Web Intelligence documents. Web Intelligence documents are read from left to right and top to bottom, and you can navigate through the report panel’s frames and tabs using the Tab key.
OLAP Intelligence

Although you can use many of the same design guidelines to improve the accessibility of Crystal Analysis Professional reports, Worksheets are difficult to format for accessibility. Web Intelligence or Crystal reports are the recommended options for delivering reports to people with disabilities.

BusinessObjects Enterprise

After you create accessible Web Intelligence documents or Crystal reports, you can publish them to BusinessObjects Enterprise, where people with disabilities can view them on the Web using InfoView and the DHTML viewers. The management components of BusinessObjects Enterprise, including the Central Management Console (CMC) and the Central Configuration Manager (CCM), do not currently provide access for people with disabilities. The ActiveX and Java viewers are also not accessible.

Improving report accessibility

To begin improving the accessibility of your reports, start with accessibility guidelines that are quick and easy to implement. A small change in your design conventions or company template may have a significant impact on accessibility.

Simple navigation and clearly-written content are critical for accessibility, but they are easy to implement and useful for all report users.

Placing objects in reports

There are a few general guidelines to keep in mind when you place objects on a report.

Organizing objects logically

When you place objects on reports, make sure their placement is clear and logical, especially when you need to imply a relationship between two objects in a report. For example, if you include a text description of a chart, ensure that it is close enough to the chart to make the connection clear.

Many assistive technologies read from left to right and from top to bottom; therefore, if you include a text description and title for a chart, you should decide which one you want the user to read first. This will ensure that the objects in a report are read in the correct order.
Placing objects in order

When you publish a Crystal report to BusinessObjects Enterprise, the HTML version organizes the objects in the report according to their placement order in Crystal Reports, not according to where they were positioned on the report. The report appears the same on the screen, but the underlying HTML code lists the reports objects in their placement order. Instead of reading the report from left to right and top to bottom, screen readers and other assistive devices may follow the order specified in the HTML. To make a report accessible with a screen reader, you may need to change the placement order.

Note: If you create a text-only alternative of your report, add it to your report as a subreport and make sure that the subreport appears first in the placement order. For further details, see “Text” on page 99.

Changing the placement order

By default, the placement order of objects follows the order in which you inserted them onto the report. To change this placement order, you can use the Move commands to move objects forward and backward in the placement order. A screen reader reads the objects at the back of a report first, and then moves forward through the placement order.

✵ To change the placement order of objects in a Crystal report
1. Right-click an object in the report and click the Move command.
2. Use the To Back, Backward, Forward, and To Front commands to change the object’s placement in the report.
   Objects at the back of the report are read first, and objects at the front of the report are read last.
3. Change the placement order for all objects in the report until they appear in the order that you want a screen reader to read them.

Testing the placement order

After you add all objects to the report, you can test their placement order by tabbing through the objects.

✵ To test the placement order of objects in a Crystal report
1. Make sure no objects in the report are selected.
2. Press the Tab key.
   Crystal Reports selects the first object in the placement order.
3. Tab through the remaining objects.
   The order that Crystal Reports uses to tab through the objects is the same order adopted by a screen reader that views the published version of the report.
Text

The most common accessibility issue encountered by report designers is also one of the easiest to resolve: providing text-only versions of non-text objects. A non-text object is an object that conveys meaning through a picture or sound. Non-text objects include pictures, charts, graphical buttons, graphical representations of text, sounds, animations, and audio or video clips.

People who use assistive technologies are accustomed to text-only substitutes and, therefore, will respond well to the text-only alternatives you provide.

There are a number of ways you can use text to substantially improve your reports’ accessibility:

- Provide text equivalents for objects in reports.
- Provide text alternatives for reports.
- Ensure that text is written and formatted clearly.

Text is a useful tool for creating accessible reports. Most assistive technologies require text input, including screen readers, speech synthesizers, and Braille displays. You can easily resize and format text, and text is the most flexible medium for import and export.

Providing text equivalents

When you create reports, there are many opportunities to use text equivalents to clarify non-text objects.

- Place a descriptive text object next to a non-text object, and be sure to add them to the report in consecutive order (for more details see “Placing objects in order” on page 98).

Whenever possible, a text equivalent should communicate the same information as its corresponding object in the report. If a report displays data in a pie chart, for example, include a text box next to the chart that summarizes its contents.

Describe the purpose of the non-text object. For example, if an image performs an action when you click it, describe the action. For a button that opens your web site, provide a text box labeled “Click to view our web site.”

- If a report includes audio links, provide a transcript for significant audio clips.
- If a report links to a multimedia or video presentation, provide a transcript. You may also want to provide captioning for the audio portion and an audio description of the visual portion. Captioning should be synchronized with the audio.
Providing text-only alternatives

If there are too many non-text objects on a report, or if you do not have the resources to integrate accessible design into all of your reports, then you can provide complete text-only alternatives. For reports that represent data using only charts and graphics, for example, you can provide a link to a text-only alternative that provides the same data in data tables and text objects.

Whenever possible, a text-only alternative should provide the same information as the original report. The information conveyed through images in the main report should also be described using text objects on the alternative report.

**Note:** If you cannot produce a complete text-only version of the report, you can still improve accessibility by providing a descriptive summary of key information or conclusions illustrated by the report.

It is good practice to provide the text-only alternative on a subreport, linked from the top left corner of the main report, so the user has the opportunity to switch to the text-only version as soon as possible. Add the subreport to the report before any other object to ensure that a screen reader will read it first. If you want the subreport link to appear only for people using screen readers or similar software, you can create a subreport link that is the same color as the background color. The link will appear as a small blank space, but a screen reader will read the text for the link.

**To add a text-only alternative to a subreport**

1. Create a text-only version of the report and save it.
2. Open a new report.
3. On the **Insert** menu, click **Subreport**.
4. In the Insert Subreport dialog box, select **Choose an existing report** and click **Browse** to locate the report you created in step 1.
5. Click the subreport, then choose **Format Subreport** from the **Format** menu.
6. In the Format Editor, on the **Subreport** tab, select **On-demand Subreport**.
7. To hide the subreport link, on the **Font** tab, choose the color that matches the background color of the report.

**Note:** Instead of hiding the subreport link, you can conditionally suppress the section that contains the subreport. For details, see “Accessibility and subreports” on page 108.
Using punctuation

To improve the logical flow of spoken text, you may need to add extra punctuation to create pauses. Without extra punctuation, screen readers may read several text objects as one continuous sentence, making the content difficult to understand. For example, information in data tables may be read without stopping. To prevent this, you can break up information in data tables by inserting periods between fields.

Certain punctuation marks are read aloud, which may be distracting if used too frequently. For example, when a screen reader reads a colon “:”, it may read it aloud as “colon” instead of a pause. You can change the amount of spoken punctuation in your screen reader’s settings.

To troubleshoot your report’s punctuation, it is good practice to read the report using a screen reader. Do objects run together too quickly? Or are there too many pauses? Are any punctuation marks read aloud? Does this improve or deter from the usability of the report?

Formatting text

After you create text equivalents or alternatives for non-text objects, ensure that the text is clearly written and easy to read. Observe the following design guidelines:

• Use a larger font.

Although people with visual impairments can use the Zoom feature to increase the size of the report, they will not need to magnify the report as much if the font size is larger. For example, chart labels or legends can appear in a small font by default. For general legibility, it is good practice to use a font larger than 8 point. For accessibility, ensure that text is larger than 11 point.

• Use a “sans serif” font.

Simple fonts such as Arial and Helvetica can be easier to read than serif fonts like Times or Palatino.

• Choose left or justified alignment.

Left-aligned or justified text is easier to read than centered or right-aligned text.

• Ensure that text follows the guidelines for color usage. For details, see “Color” on page 102.

Note: You can allow users to choose different font settings using a parameter and conditional formatting. For details, see “Accessibility and conditional formatting” on page 106.
Finding the right balance between text and non-text objects

Text equivalents are very flexible and often the best solution for accessibility, but they are not always necessary or preferred.

Not all non-text objects require text equivalents. You need to include text alternatives only for non-text objects that provide information or navigation elements that the user cannot do without. Images used for decorative purposes do not need a text description. If a report has a watermark image that acts as a background for the data, you do not need to provide a text equivalent. Adding text descriptions for decorative objects can produce unnecessary clutter.

Text versions of visual or auditory objects in reports should be used as a complement to the object—not as a replacement. You do not need to remove non-text objects. Visual objects in reports can be very helpful, especially for people with learning disabilities such as attention deficit disorder, or for people who are deaf. People with hearing impairments may be accustomed to visual communication such as sign language, and may find images more useful than text.

No one presentation method can meet the needs of all users. Audio clips can be very useful for people with visual impairments, but people with hearing impairments will be unable to use them. To help both groups, provide a combination of audio and text. Multimedia presentations may provide audio information for people with visual impairments, as well as video information for people who are deaf or hard of hearing. Multimedia presentations are particularly effective for people with attention deficit disorder. However, people with certain mental health disabilities may be distracted by visual or audio objects.

The best approach is to communicate the same information with both text and non-text objects. Add descriptive text to support the images, and add images that support the text.

If text objects begin to overwhelm your report, you may want to provide a complete text-only version in a separate report or a subreport. For details, see “Providing text-only alternatives” on page 100.

To learn more strategies on how to choose presentation methods that meet the needs of a variety of audiences, see “Designing for flexibility” on page 105.

Color

The colors you choose for objects in reports can have a significant impact on accessibility for people with visual impairments, low vision, or color blindness. Ensure that your reports can be understood when viewed without color.
Contrasting colors

Users with limited vision may be unable to distinguish between colors. To test the color contrast in your report, print or view a black and white copy. You should be able to distinguish between values or fields displayed in different colors (in a pie chart, for example).

If you cannot distinguish between colors on the report, try different colors or use gray shading. If this does not resolve the issue, you can change other characteristics.

For text, use the Format Editor to change the font, size, or style. You can add borders, underlining, or background shading to differentiate text objects from each other.

For charts, use a combination of shading and patterns. You can automatically convert a color chart to a black and white one using the Chart Expert, or you can select values individually and choose your own patterns.

► To convert a chart into black and white
1. Select the chart and choose Chart Expert from the Format menu.
2. In the Chart Expert, click the Options tab.
3. In the “Chart color” area, select Black and white, then click OK.
   The chart colors convert to a variety of high-contrast pattern and color fills.

► To change the fill for a chart value
1. Select the chart, then click the shaded area you want to change.
2. On the Chart menu, point to Chart Options, and then click Selected Item.
3. In the Formatting dialog box, on the Fill tab, choose a color and click Pattern.
4. In the Choose A Pattern dialog box, click a pattern, then click OK.
   Note: You can also select a texture, gradient, or picture as a fill for the chart value. See the Chart Help for more information.

Using color to convey information

Do not use color as the only identifying characteristic for critical information in a report.

For example, a text object may instruct users to “click the green button” to open a subreport. Users with limited vision cannot tell which button is green. The button should be recognizable by another defining characteristic besides its color. For example, you can change the button graphic to a shape that is
not used elsewhere on the report, and instruct users to “click the green arrow button”. This solution provides color information for people who can distinguish colors, and extra information for people who cannot.

Other common situations where color may be used to provide important information include:

- **Highlighting**
  
  To highlight particular values in a table, do not change only the color of the value. If you highlight outstanding invoices in red, for example, they may look the same as the paid invoices to someone with limited vision. In the Highlighting Expert dialog box, change a font characteristic other than color, such as font style.

- **Hyperlinks**
  
  Using color as the only method for identifying hyperlinks may also cause problems for color-blind users. When you print your report in black and white, check the hyperlinks to ensure that they are still visible.

- **Identifying important areas of the report**
  
  Do not organize a report by using color as a background or as a separator between different sections or areas. Instead of using color to identify sections, establish clear and consistent navigation for the entire report.

### Navigation

As with other aspects of accessible design, providing several alternative navigation methods can help you meet the reporting needs of more people. The W3C recommends including several different navigation methods. On the other hand, simplicity is critical for intuitive navigation. Section 508 recommends simple navigation that uses the least number of navigation links possible. Either approach can be effective for your reports, as long as you maintain clarity and consistency.

You may want to use report parts to navigate a report (or to connect several reports). If you provide a series of links in a page header, keep in mind that screen-reading software will reread the navigation information every time the user refreshes the page or views a new page. In this case, simple navigation is preferable.

For a large report, you could provide a list of navigation links as a table of contents in the report header. More extensive navigation can be useful when you have a large volume of data. To allow users to skip the list, you could start with a “Skip the table of contents” link that jumps ahead to the first page header.
In general, report navigation should follow these guidelines:
- Identify the target of each link.
- Provide information at the start of the report that describes the layout and navigation.
- Use navigation consistently.
- Provide the opportunity to skip repetitive navigation links.

**Parameter fields**

When you include parameter fields in a report, make sure they are clear and simple. Although parameter fields can be a useful tool for providing accessible content, they can also introduce several accessibility concerns. It is important to test all parameter fields for accessibility.

Parameter fields should follow these guidelines:
- Provide a list of default values for the user to choose from.
  Avoid requiring the user to type a value for a parameter. When users provide their own values, they need to make sure the format of the value will be recognized by the parameter field. A list of default values is easier to use, and it ensures that the user chooses from values with valid formats.
- Try to avoid complex parameter fields.
  A complex parameter field may be more accessible when it is broken down into multiple parameters. When you test the accessibility of your parameter fields, pay particular attention to parameters that require a range. It may be easier to understand if you provide two parameter fields that prompt for discrete values for the top and bottom of the range, rather than ask the user to choose both values in the same parameter field.
- For date fields, do not allow users to choose their own values.
  The calendar used to select date values is not currently accessible. Provide a pick-list of default date values. Using a list of default values also helps avoid invalid date formats.

**Designing for flexibility**

Flexibility is the key to providing accessible reports. Because different users require different levels of accessibility, it is good practice to provide a variety of presentation styles and methods to meet the needs of as many people as possible. For a detailed report, however, you may not be able to provide multiple presentation styles without cluttering the report with extra objects.
To address this problem, plan the degree to which you want to integrate accessible formats into your reports. You can provide accessible formatting for each object, for each section, or as a subreport. You can then allow users to choose their own accessibility options using a parameter field that prompts them to choose whether or not to display accessible formats.

Using this parameter field, you can conditionally format objects, or conditionally suppress sections that address different access needs. Or you can provide different display options by using subreports.

To create an accessibility parameter field

1. In Crystal Reports, on the View menu, click Field Explorer.
2. In the Field Explorer, right-click Parameter Fields and click New.
3. In the Create Parameter Field dialog box, type the parameter name (Access, for example) and the prompting text (Do you want to enable accessible formatting for this report?).
4. Ensure that the Value type is set to String.
5. Click Set default values.
6. In the Set Default Values dialog box, create Yes and No values and move them to the Default Values area using the arrow buttons.
7. Click OK.
8. Click OK in the Create Parameter Field dialog box.

Accessibility and conditional formatting

Using the accessibility parameter field in simple formulas, you can provide multiple formats for any object in a report. If a user chooses “Yes” when prompted by the parameter, the conditional formulas will ensure that the objects are modified with accessible formatting conventions. If a user chooses “No”, then the report appears without accessible formatting, perhaps in the standard company template.

For accessible text formatting, you can follow the guidelines suggested by this chapter and by the W3C, or you can survey your report users to determine the formats that work best for them. After you determine the formatting options you want to use, you can create conditional formulas that define the options. For example, you can display all database fields in a large Arial font, in white text on a black background, with the Can Grow option enabled.

The following procedure creates a conditional formatting formula based on the ?Access parameter field. The formula increases the font size if the ?Access parameter field is set to “Yes”. You can use similar formulas to
change colors, add borders, or enable the Can Grow setting. For complete instructions on conditionally formatting fields and using the Format Formula Editor, see the Crystal Reports Online Help.

Note: If text objects are too small to accommodate the enlarged font, you can use a similar conditional formatting formula to enable the Can Grow setting, which appears on the Common tab of the Format Editor.

► To apply accessible settings to font size conditionally

1. Open the report in the Design tab of Crystal Reports.

2. In the Details section, right-click the field you want to conditionally format, and select Format Field.

3. In the Format Editor, click the Font tab.

4. Click the Formula button that corresponds to the Size list.

   The Format Formula Editor opens a new formula named Font Size.

5. In the Formula text window, type this formula (which uses Crystal Syntax):

   ```
   if {?Access} = "Yes"
   then 20
   else 10
   ```

   This formula ensures that the font size for the currently selected field is increased from 10 point to 20 point when the user chooses to display accessible formatting.

6. Click Save and close.

Accessibility and suppressing sections

Instead of formatting individual objects conditionally, you can create separate sections for accessible versions of the report content, then use the accessibility parameter field to conditionally suppress sections. The accessible and non-accessible sections can be suppressed or shown, based on the parameter value the user selects.

Creating separate sections for accessible versions of report content may be more time-consuming, but there are a few situations where suppressing sections conditionally can be more practical than formatting on the object level:

• If a report contains many objects, suppressing sections may require fewer conditional formulas.

• Not all settings and features can be formatted conditionally. By suppressing sections, however, you can make any formatting changes you want.
• You may want to provide completely different types of information for people viewing the accessible version of the report. For example, you may want to split visual and audio objects into two different sections and conditionally suppress them based on the parameter value the user chooses.

To suppress an accessible section
1. Right-click the left boundary of the section you want to suppress conditionally, and click Section Expert.
2. In the Section Expert, click the Formula button that corresponds to the Suppress (No Drill-Down) setting.
   The Format Formula Editor opens a new formula named Suppress (No Drill-Down).
3. In the Formula text window, type this formula (which uses Crystal Syntax):
   
   ```
   if {?Access} = "No" then True
   ```
   This formula selects the Suppress option if the user chooses not to view accessible report content.
4. Click Save and close.
5. Click OK in the Section Expert.

Accessibility and subreports

Accessible report design may become too cumbersome using conditionally formatted objects and suppressed sections. Two situations in particular may be problematic:

• To make the report accessible, you may need to change the overall organization of the report sections, or you may need to provide different objects.

• If the report contains a large number of objects or sections, it may take too much time to create conditional formulas for all of them.

For example, if a report contains many non-text objects displayed in a complex series of groups and sections, you may want to provide a text-only version that uses different objects and a simplified group structure to meet accessibility guidelines. The easiest way to address this problem is to create a subreport that displays the accessible version of the report and place the subreport at the beginning of the main report. For details on creating a text-only accessible subreport, see “Providing text-only alternatives” on page 100.
If you want only screen readers to be able to see the subreport, you can hide it by changing the subreport link to the same color as the background. Alternatively, you can use the ?Access parameter field to allow users to choose whether or not the subreport appears in the report. Place the subreport in its own section and conditionally suppress the section based on the ?Access parameter field. For details, see “Accessibility and suppressing sections” on page 107.

**Improving data table accessibility**

Large tables of data can be difficult to interpret if a person is using a non-visual means of accessing the web, such as a screen reader. People using screen magnifiers or the Zoom feature may also find data tables hard to navigate because they cannot see the table headings at all times. It can easily become difficult to associate the value that a screen reader is reading with the corresponding column and row headings. Users need to be able to understand the data value’s position in the table and its relationship to other values.

To improve data table navigation, you can use text objects to provide contextual information with each value. Using conditional formatting or suppression, you can create a report that displays these objects only if the user chooses to view them. Other design guidelines can help make large tables of data easier to understand, such as providing summary paragraphs and expanded column headings.

**Note:** This chapter uses terminology consistent with the W3C accessibility guidelines. In these guidelines, the term data table refers to values arranged in columns and rows. In Crystal Reports, data tables take the form of group or page headings combined with database fields in the Details section. Do not confuse data tables with database tables, which are data sources used by Crystal Reports.

**Text objects and data table values**

You can make a large table easier to understand and navigate by adding text objects that provide information about each value in the table.

Include whatever information is necessary to establish the meaning and context of the value displayed. When appropriate, include information that describes column headings or neighboring fields. For example, if a report displays employee names and salaries, you can add a text object before the Salary database field that reads “{Last Name}’s salary is “. The user can determine the context and meaning of the value by reading the accompanying text object.
Ensure that your text objects use punctuation that will make the content easier to understand when read aloud by a screen reader. Without accessibility-orientated punctuation, data tables may be read as one long sentence, making navigation and interpretation very difficult. For example, you can add periods after values so a screen reader will pause between columns and rows. For details, see “Using punctuation” on page 101.

As with all objects in reports, the order in which you place text objects on the report can affect accessibility. Screen readers read the objects in the order they were originally added. (For details, see “Placing objects in order” on page 98.) The correct placement order is critical when you add a text object that identifies the contents of a particular column in a data table. If you add the text objects at the end of the design process, they may be read after the columns that they refer to. When you add text objects that describe values in a report, ensure that you place them on the report in the order that you want them to be read.

Before you can create an accessible data table, you must plan your report in advance, determining which objects and database fields you want to include. Because objects must be placed in the order you want them to be read, planning your content for accessibility is essential. As part of this planning, it is good practice to choose how you will use text objects to identify data table values. You can simply add text objects before each database field. Or you can conditionally suppress text objects or use formulas to combine text objects and values.

### Labelling data tables with text objects

Before each field, add a text object that describes the field's position in the table. In the following example, the text box provides information about the Employee ID number. When the report is read with a screen reader, each number is preceded by the brief explanation in the text box.
Providing extra information for each value can make a data table appear cluttered for people without vision impairments, so you may want to hide the extra text objects by changing the font color to the same color as the background. The extra text is invisible, but is still detected and read by screen readers.

![Data Table Example](image)

**Labelling data tables conditionally**

Although adding text objects is relatively easy to implement, it does not address all accessibility concerns. Invisible text is read by screen readers, but does not help people with limited vision. You can allow the user to choose whether or not to display text descriptions in the data table by conditionally formatting or suppressing text objects.

Make sure your report includes an accessibility parameter field. For instructions on how to create the ?Access accessibility parameter field, see “Designing for flexibility” on page 105.

You can use the parameter field to suppress the text objects conditionally. While it has the same effect as changing the font color to the background color, conditionally-suppressed text also allows you to use the parameter field to specify other formatting options such as font size and style.

To display the text objects only when the user chooses Yes for the ?Access parameter field, the following report uses a simple conditional formula to enable the Suppress option on the Common tab of the Format Editor.

```
{?Access}="No"
```

The formula must be added for each text object you want to suppress.

When the user chooses Yes for the ?Access parameter field, the text objects are not suppressed; the data table displays text descriptions.

**Note:** The report shown also uses the ?Access parameter field to enable the Can Grow option (also on the Common tab of the Format Editor) and increase the font size for people with visual impairments.
When the user chooses No for the ?Access parameter field, the conditional formula suppresses the text objects, leaving spaces in the report in place of the text objects.

**Labelling data tables with formulas**

Another method for adding explanatory text to a data table is to create formulas that combine text, database fields, and conditional formatting. By adding the text and the database fields together in a conditional formula based on the ?Access parameter, you can provide optional text for values in a table without leaving blank spaces in the report. Using formulas also reduces the number of objects on the report, making it easier to maintain the proper placement order.

**Note:** Do not use this method if the report has summary fields or calculated fields. Although formulas provide the best display of data, they can interfere with calculations because the data is converted to text.

The following report uses formulas placed in the Details section that combine the database fields and the extra text. When the user chooses Yes for the ?Access parameter field, each formula builds a string that includes the description and the value.
This report uses the following formulas:

@Employee ID
If {?Access}="Yes" then "Employee ID " + ToText(Employee.Employee ID,0) + ". " else ToText(Employee.Employee ID,0)

@Last Name
If {?Access}="Yes" then "Employee last name is " + Employee.Last Name + ". " else Employee.Last Name

@Salary
If {?Access}="Yes" then "Employee's Salary is " + ToText(Employee.Salary) + ". " else ToText(Employee.Salary)

Notice the added punctuation. The periods at the end of each formula improve screen reader legibility by creating a pause between fields.

Note:
• The report also uses the ?Access parameter field to enable the Can Grow option and increase the font size.
• In @Employee ID, ?Access parameter field has been set to "0" to enable the Can Grow option and increase the font size.

When the user chooses No for the ?Access parameter field, the formula returns only the data. The report does not display blank spaces in place of the conditional text objects. Both versions of the report are easy to read.
Other data table design considerations

In addition to labelling data values with text objects, other report design techniques can help you create data tables that are easier to understand and navigate.

- Include an introductory paragraph that summarizes the content of the table. The summary should be brief: one or two sentences if possible.
- Ensure that headings provide enough information to clearly identify the values that they label.
- To test a table’s accessibility, read its headings and values in a linear fashion from left to right and from top to bottom. For example, if a report displays last and first name fields for each customer, it may read better if it displays first name followed by last name. Whenever possible, test the report using assistive technologies such as screen reading software.

The final accessible report includes a summary of the data table.

To display the table summary conditionally, the report designer divided the Page Header into two sections. The first page header is suppressed when the ?Access parameter field is set to No. The second page header is suppressed if the user chooses Yes. For details, see “Accessibility and suppressing sections” on page 107.

Accessibility and BusinessObjects Enterprise

Designing accessible reports is only part of the solution. You need to make sure that you deliver reports through an accessible interface that follows the same design guidelines.

Although the administrative components and scheduling functionality of BusinessObjects Enterprise are not currently accessible to everyone, InfoView and the DHTML viewer allow for accessible access to reports over the Web.
Several enhancements have been made to BusinessObjects Enterprise to account for accessibility issues. Text descriptions are now provided in ALT tags for the toolbar buttons and other images. Descriptions for text boxes are clearer, and shortcut links are provided in the DHTML viewer so you can navigate past the toolbar and group tree.

**Setting accessible preferences for BusinessObjects Enterprise**

For the best accessibility support in BusinessObjects Enterprise, you need to set certain display preferences.

For InfoView, display objects in the Action view. The Action view is more accessible because it provides a text list of the available reports and does not use shortcut menus for report commands. Depending on your users’ needs, you may also want to reduce the number of reports displayed on each page.

For viewing reports, choose the DHTML viewer as the default viewer in your preferences.

If you administer accounts for other users, you can set their BusinessObjects Enterprise preferences as well.

**Note:** You must have your own account on the system in order to set preferences.

► **To set accessible preferences for BusinessObjects Enterprise**

1. Log on to BusinessObjects Enterprise.
2. On the title bar, click **Preferences**.
3. On the General Preferences page, in the “On my desktop, show me” area, select **Action view**.
4. To reduce the number of reports displayed on each page, type a number in the text box next to the Action view option.
5. Click the Crystal Report Preferences link.
6. In the “View my reports using the” area, select the **DHTML viewer**.
7. Click **Apply**.
When you customize Crystal reports or InfoView, or if you incorporate BusinessObjects Enterprise into an existing web site, ensure that your changes follow the accessibility guidelines set forth by the U.S. Access Board in section 508, or the W3C's Web Accessibility Initiative.

If you customize Crystal reports or InfoView extensively, you may encounter other accessibility issues. For online resources that provide comprehensive accessibility guidelines, see “Resources” on page 117.

The following list provides some common accessibility issues that may cause problems when you customize Crystal Reports or BusinessObjects Enterprise content.

- **Frames**
  Frames should be clearly labelled, for easier identification and navigation. Provide text at the top of the frame that describes its purpose. For example, if a frame provides a list of links to different countries, you can clarify its purpose by adding text to the frame, such as a title (“Countries”) or short instructions (“Click a country for details”).

- **Style sheets**
  If you have a visual impairment, you can create a style sheet with specific viewing preferences to accommodate the disability. For example, you could create a style sheet that displays all web pages in a large font with white characters on a black background. Users cannot apply personalized style sheets to Crystal reports, but the viewers provide a Zoom button that enables people with visual impairments to increase the magnification to suit their needs. You can also allow users to choose from different formatting options using conditional formatting. For details, see “Accessibility and conditional formatting” on page 106.

- **Scripts**
  If you modify Business Objects content to include a script that displays content or an interactive object, ensure that the script is identified by text that conveys the purpose of the script. Make sure that pages with scripts are still usable when the scripts are turned off or unsupported. For more information about scripts and accessibility, see “Resources” on page 117.

- **Image maps**
  Server-side image maps identify active regions using coordinates, which are not meaningful to a screen reader. Client-side image maps provide better accessibility because you can assign a link or URL to each active region within the image map.
• Electronic forms
   Electronic forms can present difficulties for screen readers, and must be set up carefully. When you label a component in a form, ensure the label is clearly located next to the form component. For example, for a Search box, ensure that the “Search” title appears alongside the appropriate text box.

• Applets and plug-ins
   If a report needs an applet, plug-in, or other application on the client machine in order to interpret page content, the plug-in or applet must follow accessibility guidelines.

   If you attach multimedia or other additional resource files to your report, such as PDF or Real Audio files, provide a link to install the required plug-ins or software, and ensure that the required software also meets accessibility design standards.

• Flickering
   Flickering images can trigger seizures for people with seizure disorders. The W3C recommends to avoid use of images that flicker or flash between four and 59 times per second.

• Search engine placement
   Do not use hidden text to enhance your web site's placement in search engines. Hidden text reduces readability, because it is read by the screen readers. Also, hidden text is actively discouraged by popular search engines such as Google, and thus offers little benefit.

Resources

This chapter focuses on how you can create and distribute accessible reports with Business Objects software. The report design techniques in the chapter were tested using JAWS 4.5. It is good practice to test all accessible reports using JAWS and other assistive technologies whenever possible.

To make all of your Web communications accessible, consult the detailed guidelines available through the W3C or from your government's web site.

• World Wide Web Consortium's Web Accessibility Initiative: http://www.w3.org/WAI/
• the United States Access Board's web site for Section 508: http://www.access-board.gov/sec508/guide/
Business Objects
Information Resources
Documentation and information services

Business Objects offers a full documentation set covering its products and their deployment. Additional support and services are also available to help maximize the return on your business intelligence investment. The following sections detail where to get Business Objects documentation and how to use the resources at Business Objects to meet your needs for technical support, education, and consulting.

Documentation

You can find answers to your questions on how to install, configure, deploy, and use Business Objects products from the documentation.

What’s in the documentation set?

View or download the Business Objects Documentation Roadmap, available with the product documentation at http://www.businessobjects.com/support/.

The Documentation Roadmap references all Business Objects guides and lets you see at a glance what information is available, from where, and in what format.

Where is the documentation?

You can access electronic documentation at any time from the product interface, the web, or from your product CD.

Documentation from the products

Online help and guides in Adobe PDF format are available from the product Help menus. Where only online help is provided, the online help file contains the entire contents of the PDF version of the guide.

Documentation on the web

The full electronic documentation set is available to customers on the web from support web site at: http://www.businessobjects.com/support/.

Documentation on the product CD

Look in the docs directory of your product CD for versions of guides in Adobe PDF format.
Send us your feedback

Do you have a suggestion on how we can improve our documentation? Is there something you particularly like or have found useful? Drop us a line, and we will do our best to ensure that your suggestion is included in the next release of our documentation: documentation@businessobjects.com.

Note: If your issue concerns a Business Objects product and not the documentation, please contact our Customer Support experts. For information about Customer Support visit: http://www.businessobjects.com/support/.

Customer support, consulting and training

A global network of Business Objects technology experts provides customer support, education, and consulting to ensure maximum business intelligence benefit to your business.

How can we support you?

Business Objects offers customer support plans to best suit the size and requirements of your deployment. We operate customer support centers in the following countries:

• USA
• Australia
• Canada
• United Kingdom
• Japan

Online Customer Support

The Business Objects Customer Support web site contains information about Customer Support programs and services. It also has links to a wide range of technical information including knowledgebase articles, downloads, and support forums.

http://www.businessobjects.com/support/
Looking for the best deployment solution for your company?

Business Objects consultants can accompany you from the initial analysis stage to the delivery of your deployment project. Expertise is available in relational and multidimensional databases, in connectivities, database design tools, customized embedding technology, and more.

For more information, contact your local sales office, or contact us at:
http://www.businessobjects.com/services/consulting/

Looking for training options?

From traditional classroom learning to targeted e-learning seminars, we can offer a training package to suit your learning needs and preferred learning style. Find more information on the Business Objects Education web site:

http://www.businessobjects.com/services/training

Useful addresses at a glance

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http://www.businessobjects.com | Information about the full range of Business Objects products. |
| **Product documentation**  
| **Business Objects Documentation mailbox**  
documentation@businessobjects.com | Send us feedback or questions about documentation. |
| **Online Customer Support**  
http://www.businessobjects.com/support/ | Information on Customer Support programs, as well as links to technical articles, downloads, and online forums. |
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