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- ▶ *Monitor and understand your Business Objects deployment*

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Audience: IT Administrators, System Analysts, Application Developers

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Executive Summary

BusinessObjects™ Enterprise has enhanced the auditing functionality that enables BusinessObjects Enterprise administrators to get a better understanding of system use and monitor compliance initiatives. This document is intended to provide supplemental information on this functionality and explore some areas of auditing in greater depth.

Auditing is a critical functionality that provides a historical record of user interaction with products from Business Objects. BusinessObjects Auditor is the packaged Business Objects auditing product that includes a set of prebuilt reports, an audit database, and an audit universe.

Auditing functionality leverages the Central Management Server (CMS) to act as the primary system—the auditor. Each BusinessObjects Enterprise XI Release 2 server that controls actions that can be monitored is referred to as an auditee. To audit an action, the system first determines which server controls that action. It then enables auditing of that action in the Servers Management Console (SMC). The audited BusinessObjects Enterprise XI Release 2 server then begins to record audit actions in a local log file. At regular intervals, the CMS communicates with audited servers to request copies of records and then writes data from the log files to the central auditing database. This audit database is used for analysis of the audit data either via prebuilt reports or customer created ones leveraging the audit universe. The database, universe, and reports are detailed in this whitepaper.

This whitepaper also highlights the differences between auditing and Auditor from previous versions of the Business Objects software and those of BusinessObjects Enterprise XI Release 2. It also details the additional functionality available in BusinessObjects Enterprise XI Release 2.

Introduction

In its simplest form, auditing is a functionality that provides a historical record of user interaction with BusinessObjects. While auditing may mean many things to many different people, and can have many different applications, the primary design goal of the auditing functionality in BusinessObjects Enterprise is to enable you, the system administrators, to have a better understanding of the enterprise system. This capability will allow you to monitor, analyze, and optimize your Business Objects deployments while managing your compliance specific requirements effectively.

Auditing allows you to monitor and record key facts about your BusinessObjects Enterprise system, including the users. Having access to information, such as who is using your system, whose passwords have been modified, and which objects are accessed most frequently, will allow you to answer system-level questions like, “Which groups within the company use our BusinessObjects Enterprise system the most?” or “How many concurrent user licenses are we using at any given time?” Auditing also allows you to better administer individual user accounts and reports by giving you more insight into what actions users are taking and which reports they are accessing. This information lets you be more proactive in managing the operation and deployment of your BusinessObjects Enterprise system, while helping you to better evaluate the value that BusinessObjects Enterprise provides to your organization.

This whitepaper is intended to outline the functionality within the Auditor product for BusinessObjects Enterprise XI Release 2. Auditor allows the auditing of your BusinessObjects Enterprise system through a number of audit reports using a system audit database and an audit universe. It is intended for a general audience with some familiarity with the concepts and architecture of the BusinessObjects XI system. This whitepaper is not intended to be a detailed feature comparison study between this version of Auditor and any prior versions of Auditor. Detailed comparison documents will be available within the migration documentation for BusinessObjects Enterprise XI Release 2. High-level comparisons are included in this document. Also, if you are interested in more detailed information on this release of Auditor including configuration and installation, please consult with the Business Objects XI Release 2 Audit Administration Guide.

What is Auditing/Auditor?

In its simplest form, auditing is a functionality that provides a historical record of user interaction with BusinessObjects. Auditing will produce audit data within a deployment. This audit data can then be used by administrators to monitor, analyze, and optimize their BusinessObjects deployment.

Auditor is the packaged BusinessObjects auditing product that includes a set of prebuilt reports, an audit database, and an audit universe. BusinessObjects Enterprise auditing allows administrators to understand the deployment through a number of predefined reports classified by subject area and ad hoc access to system audit information through a prebuilt universe. Auditing is an administrative function within BusinessObjects XI Release 2. Auditing can only be enabled and the auditor database, universe, and reports will only be installed if Auditor product is licensed.

Auditing in BusinessObjects XI Release 2

How Does Auditor Work

The CMS acts as the auditor. Each BusinessObjects Enterprise XI Release 2 server that controls actions that can be monitored is an auditee. To audit an action, the system first finds out which server controls that action. It then enables auditing of that action in the SMC. The audited BusinessObjects Enterprise XI Release 2 server then begins to record audit actions in a local log file.

Overall control of the audit process is managed by CMS and each server writes audit records to a log file local to the server. At regular intervals (set by the administrator, see admin guide for further details), the CMS communicates with audited servers (auditees) to request copies of records and then writes the data from the log files to the central auditing database.

CMS controls the synchronization of audit actions occurring on different machines. Each auditee provides time stamp for audit actions recorded in its log file. To ensure consistency of time stamps on different servers, CMS periodically broadcasts system time to auditees—audited servers record this and make corrections to internal time, if necessary.

Administrators can run preconfigured reports against the audit database and universe or create custom reports to suit their own needs. The CMS can act both as an auditor and auditee if you need to audit actions controlled by the CMS.

Cluster failover—within a cluster, one specific server is nominated to act as the system auditor. If that machine fails for any reason, another CMS from the same cluster will take over as the auditor system.

Auditor to Auditee Relationship

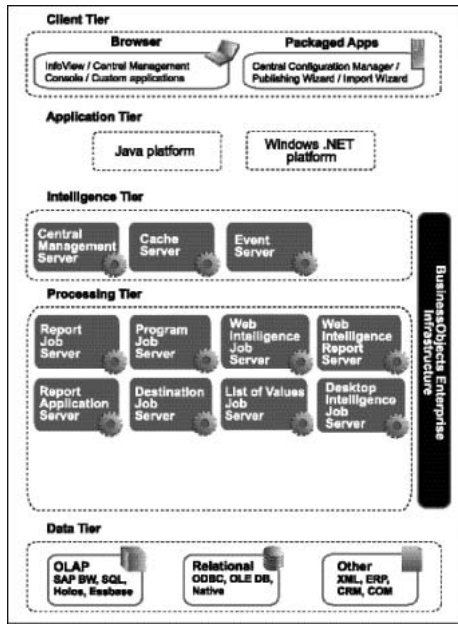
As outlined in the previous section, the CMS acts as the auditor for the system. The CMS is responsible for collecting and collating the auditing data from the auditees and writing this information in a usable form to the auditing database.

In an environment where a clustered CMS is used, each node of the CMS cluster must be identically configured to connect to the same auditing database. The CMS cluster elects a node in the cluster to act as the primary auditor and in the event of a failover, this responsibility is passed along to another node in the cluster. It should be noted that while the CMS acts as the system auditor, it also serves its role as an auditee, exposing events that can be audited.

Each service that exposes auditing functionality is considered to be an auditee. Each auditee exposes events which can be selected for auditing. Event information is written to log files local to each service and then consumed by the auditor. When the service first initiates, it exposes an auditing interface to announce its existence to the CMS. The CMS then interacts with the auditee to receive the audit data.

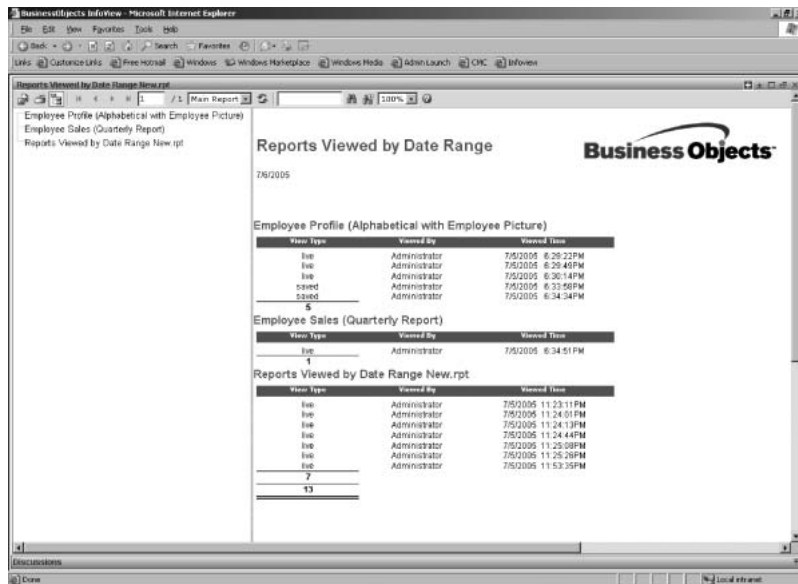
The setting of events to be audited is done on a per-service basis from within the Central Management Console (CMC) as well as through each server that is an auditee. Services that have auditing functionality will have an “auditing” tab when looking at the server.

The following diagram illustrates the components (services) within BusinessObjects Enterprise XI Release 2 that are involved with the auditing functionality.



What is Installed with Auditor

Any installation of BusinessObjects Enterprise XI Release 2 Premium will include everything related to Auditor and auditing. With BusinessObjects Enterprise XI Release 2, Auditor does not require a separate machine for installation, or its own application server or web infrastructure. No additional installation is required, since all Auditor functionality is available through the standard Infoview infrastructure. This makes better use of the shared facilities of InfoView, including the Encyclopedia, Discussions, Search, and the new Report Engine and Viewer capabilities. The auditing reports are also included with the installation, in both Crystal Reports® and Web Intelligence™ format. Both formats will use an audit universe, also included with the installation. An example of an installed audit report is shown below.



Sample Auditor report.

Configuration

In a default installation, auditing will be allowed with the correct license keys and an audit database will be created within the same database program used to create the CMS repository database. The connection to this database will also be created and the Universe and reports exported to the CMS repository database. The CMS auditing events will be enabled after a default install.

The remaining servers in the cluster will not have auditing enabled automatically at the time of install. Auditing will need to be enabled manually in these cases.

- ▶ Cache Server
- ▶ Desktop Intelligence™ Job Server
- ▶ Destination Job Server
- ▶ Event Server
- ▶ List of Values Job Server
- ▶ Program Job Server
- ▶ Report Application Job Server (RAS)
- ▶ Report Job Server (Crystal Reports)
- ▶ Web Intelligence Job Server
- ▶ Web Intelligence Report Server

If your installation does not use the system default CMS repository database, you will be prompted during install for details of your chosen CMS repository database. You will also be prompted for details of your audit database. The audit database can be created in any of the database types supported for the CMS repository database. Detailed configuration information is documented in the BusinessObjects XI Release 2 Administrators guide for these types of deployment.

New Features

Some new features not previously available with auditing are now available with BusinessObjects XI Release 2. The addition of the Desktop Intelligence Job Server means that all of its auditing functionality is new. A complete list of the new auditing features by server is as follows:

▶ Central Management Server (CMS)

Previously only folder changes were tracked. In Release 2, this is broadened to include:

- An object is created
- An object is deleted
- An object is modified

In addition, the following new audit feature is available for the CMS:

- Rights on an object have been modified

Note: an object will include any entity that is recorded in the CMS system database.

▶ Crystal Reports Cache Server

No new auditing features.

▶ Desktop Intelligence Job Server

- A job has been run successfully
- A job has failed to run
- A job failed but will try to run again

▶ Destination Job Server

No new auditing features.

▶ Event Server

No new auditing features.

▶ List Of Values Job Server

No new auditing features.

▶ Program Job Server

No new auditing features.

▶ Report Application Job Server (RAS)

No new auditing features.

▶ Report Job Server (Crystal Reports)

No new auditing features.

▶ Web Intelligence Job Server

No new auditing features.

▶ Web Intelligence Report Server

- Drill out of scope
- Select Prompt

Additionally, the audit option, “A report has been viewed successfully” has been removed.

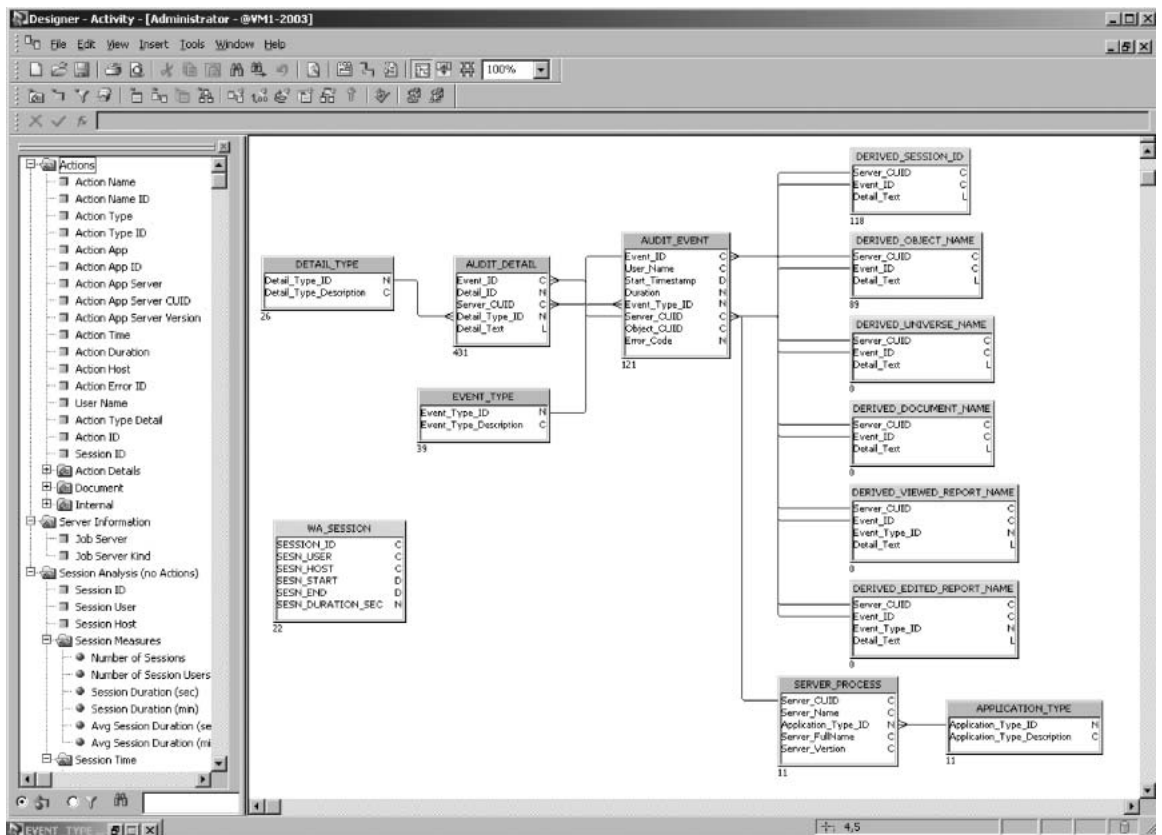
The Audit Database and Universe

The Audit Database

This is the database that collects all of the information necessary for the Auditor reports. This database is also known as the business intelligence (BI) warehouse. The CMS is the only component that writes data to this database. The schema and details of the table columns of the auditing database is documented in the Administrators guide.

The Audit Universe

The Auditor universe maps onto the Auditor audit database. This universe is used for all Auditor reports and any custom created ones. The universe and details pertaining to the objects and classes of the auditing universe are documented in the Administrators guide.



Sample screenshot of an Auditor universe.

Events Tracked

The following table details the events tracked in both BusinessObjects Enterprise XI and BusinessObjects Enterprise XI Release 2 to provide a comparative analysis. These are the events collected and recorded in the audit database. "Y" signifies that a specific feature is present while "N" signifies that it is not.

	XI Release			Comments
	Xir1	2	Delta	
Output File Repository				
None				
Input File Repository				
None				
Crystal Reports Cache Server				
A report has been viewed successfully.	Y	Y		
A report could not be viewed.	Y	Y		
Crystal Reports Job Server				
A job has been run successfully.	Y	Y		
A job has failed to run.	Y	Y		
A job failed but will try to run again.	Y	Y		
Report Application Server				
A report is opened successfully.	Y	Y		
A report is saved successfully.	Y	Y		
A report has been created successfully.	Y	Y		
A report fails to open.	Y	Y		
A report fails to save.	Y	Y		
A report fails to get created.	Y	Y		
Central Management Server				
A concurrent user logon succeeds.	Y	Y		
A named user logon succeeds.	Y	Y		
A user logon fails.	Y	Y		
A user logs off.	Y	Y		
A user's password is changed.	Y	Y		
An object is created.	N	Y	Y	
An object is deleted.	N	Y	Y	
An object is modified.	N	Y	Y	
Communication with a running instance is lost.	Y	Y		
Rights on an object have been modified.	N	Y	Y	
A folder is created.	Y	N	Y	
A folder is deleted.	Y	N	Y	
A folder is modified.	Y	N	Y	
Desktop Intelligence CacheServer				
None				
Desktop Intelligence Job Server				
A job has been run successfully.	N	Y	Y	
A job has failed to run.	N	Y	Y	
A job failed but will try to run again.	N	Y	Y	
Desktop Intelligence Report Server				
None				
Destination Job Server				
A job has been run successfully.	Y	Y		
A job has failed to run.	Y	Y		
A job failed but will try to run again.	Y	Y		
Event Server				
An event is registered.	Y	Y		
An event is unregistered.	Y	Y		
An event is updated.	Y	Y		
An event is triggered.	Y	Y		
List Of values Job Server				
A job has been run successfully.	Y	Y		
A job has failed to run.	Y	Y		
A job failed but will try to run again.	Y	Y		
Page Server				
None				
Program Job Server				
A job has been run successfully.	Y	Y		
A job has failed to run.	Y	Y		
A job failed but will try to run again.	Y	Y		
Web Intelligence Job Server				
A job has been run successfully.	Y	Y		
A job has failed to run.	Y	Y		
A job failed but will try to run again.	Y	Y		
Web Intelligence Report Server				
Get list of universes	Y	Y		
Save document to repository	Y	Y		
Read Document	Y	Y		
Selection of universe	Y	Y		
Document refresh	Y	Y		
List of values	Y	Y		
Edit document	Y	Y		
Apply format	Y	Y		
Get page	Y	Y		
Generate SQL	Y	Y		
Drill out of scope	Y	Y		
Select prompt	N	Y	Y	

Note: You can get this information in XI Release 2 using the object change events

Note: There was no Desktop Intelligence server in XIR1

Auditing Performance Impact

Enabling auditing should have minimal effect on the performance of BusinessObjects Enterprise. The Auditor CMS is designed in such a way that it can handle a large number of events without significantly loading the system. However, you can optimize system performance by fine-tuning a number of parameters. These are documented in the BusinessObjects XI Release 2 Administrators guide, Managing Auditing section.

For example, if you frequently need up-to-date information about audited actions, you can choose a short audit interval and a large audit batch size. In this case, all audit records are quickly transferred to the auditing database and you can always report accurately on the latest audit actions. Alternatively, you may only need to review audit results periodically (weekly, for example). In this case you can choose to increase the audit interval and decrease the number of audit records in each batch.

Audit Reports

The following section details the audit reports planned to be released with BusinessObjects Enterprise XI Release 2.

Scheduling

Jobs per Scheduler	Jobs (sent documents) per Scheduler component, within a given time period. For each job, the following details are shown: <ul style="list-style-type: none">• Batch ID• Script options• Document name• Document size• Repository name• Start date• Job status (Success or Failure).
Jobs per user	A breakdown of Scheduler jobs according to user.
Pending jobs	An overview of pending Scheduler jobs, including successful and failed jobs. <ul style="list-style-type: none">• How many tasks are pending on Scheduler?• What is the success rate of Scheduler jobs?
Schedulers on the system	The duration of jobs per Scheduler. <ul style="list-style-type: none">• How many Schedulers do I have?

Document Management

Most popular actions per document (thin client)	Most popular actions taken for a given document. Drill is available for time period.
Average refresh time	What is the average time needed for reports to refresh? <ul style="list-style-type: none"> • Average refresh time in seconds for each document. • Average refresh time for each type of document (such as *.rep). • Average refresh time for documents, broken down by user. • Average refresh time for documents, broken down by node.
Ten most accessed documents	What are my 10 most popular documents? <ul style="list-style-type: none"> • Number of times the 10 documents most frequently exported to Excel. • Number of times the 10 documents most frequently sent to users
Ten least accessed documents	What are my 10 least popular documents? <ul style="list-style-type: none"> • Number of times the 10 least read documents were read. • Number of times the 10 least refreshed documents were refreshed. • Number of times the 10 least edited documents were edited.
Document Scheduling and Viewing Status	How often have documents been scheduled and viewed? <ul style="list-style-type: none"> • List of all reports that have attempted to be scheduled with successes and failures – by date time-stamp and grouped by report name • List of all Crystal Reports that have attempted to be viewed with successes and failures – by date time-stamp and grouped by report name • List of all WebI reports that have been viewed and the number of times it has been viewed – by date time-stamp and grouped by report name
Document information detail	Total number of documents (past and present) in the repository. Alphabetical list of documents and their types. For each document: <ul style="list-style-type: none"> •Document ID and domain •Category and type •Whether document is persistent •Owner/sender •Creation date •Size (KB) •Data provider names and sources •Last refresh date •Number of rows •Duration •Whether partial or total indicator •Total number of data providers Actions performed on a given document, classified by type of action. For each action, the following are shown: <ul style="list-style-type: none"> •User name •Action time and ID Batch jobs performed per document. Overall number (and percentage) of successes and failures for each Broadcast Agent is shown. Then, for each batch:

System Management

Peak usage	<p>For a given day:</p> <ul style="list-style-type: none"> •Peak number of users logged in during each hour •Peak number of sessions during each hour •Peak number of actions during each hour
Servers	<p>How many servers do I have?</p> <ul style="list-style-type: none"> • For each cluster, the number of active modules. • For each module, the last known status and the date and time of the last update.
Average number of users concurrently logged in	<p>How many users are accessing my system daily and when is the most popular time?</p> <p>For a given month:</p> <ul style="list-style-type: none"> •Average number of concurrent sessions during each hour •Names and number of users concurrently logged in during each hour
Average session duration per host	For each host machine during a given year, the average session duration (in minutes) per time period.
Average session duration per user	For each user during a given year, the average session duration (in minutes) per time period.
Average session duration (thin-client)	<p>For any selected group of users, the average session duration (in minutes) per user.</p> <p>Filters available for:</p> <ul style="list-style-type: none"> •User •Session Year •Session Quarter •Session Month •Session Week •Session Day •Session Hour •Session Minute <p>Drill is available on time period.</p>
Total users concurrently logged in by day	<p>How many users are on my system?</p> <p>For a given day:</p> <ul style="list-style-type: none"> •Total number of concurrent sessions during each hour •The names and total number of the users concurrently logged in during each hour
Rights Modification	<p>What objects have had their rights changed?</p> <ul style="list-style-type: none"> • Grouped by user name, list the objects modified (for each type) and the date time-stamp and total number of times modified • Grouped by type and object name, list of all users that modified that specific object with date-time information and total number of times modified

User Management

Most popular actions	<p>What are the most popular actions?</p> <ul style="list-style-type: none"> Quantity of the most popular actions during a given time period.
Users who logged off incorrectly	<p>Of the users who logged in during a given year:</p> <ul style="list-style-type: none"> Total number of users Total number of logins Number of logoff actions Number of users who logged off incorrectly Percentage of users who logged off incorrectly Breakdown of above information by user <p>Who does not log out correctly?</p>
User activity per session (thin-client)	<p>Number of actions performed by any given user. Filters are available for:</p> <ul style="list-style-type: none"> User name Session ID Action name Action time period (quarter, month, week, hour) <p>Drill is available between user, session, and action.</p>
User activity	<p>What is my user activity by month, week, and day?</p> <ul style="list-style-type: none"> Number of users using the system, for each month, week, or day within a given time period. You are prompted for the start and end dates of the time period.
Refresh and edit activity	<p>Number of times each user refreshed a document and edited a document.</p> <ul style="list-style-type: none"> Are my users editing reports or only refreshing them? Who uses my system the most?
Number of users in the repository	<p>Number of users in the repository, along with the following information about them:</p> <ul style="list-style-type: none"> How many have logged in at least once How many occurrences are there for each one How many have never logged in
Most active users	<p>Number of logins for each of the top ten users and the number of refreshes for each of the top ten users.</p>
Last login for user	<p>When was the last time users logged in?</p> <ul style="list-style-type: none"> Last date and time (to the second) that a given user logged in to the system.
Password Modifications	<p>Whose passwords have been modified?</p> <ul style="list-style-type: none"> Monthly password change report (preferably chart) – grouped by user Weekly password change report (preferably chart) – grouped by user Password modification details
Number of user sessions	<p>How many users logged in to the system?</p> <ul style="list-style-type: none"> Total number of users who logged in to the system during a given time period.

Appendix A

The following table outlines the differences between audited events in Crystal Enterprise™ V10 and BusinessObjects Enterprise XI Release 2.

Server Events	XI Release 2			Comments
	V10		Delta	
Output File Repository				
None				
Input File Repository				
None				
Crystal Reports Cache Server				
A report has been viewed successfully.	Y	Y		
A report could not be viewed.	Y	Y		
Crystal Reports Job Server				
A job has been run successfully.	Y	Y		
A job has failed to run.	Y	Y		
A job failed but will try to run again.	Y	Y		
Report Application Server				
A report is opened successfully.	Y	Y		
A report is saved successfully.	Y	Y		
A report has been created successfully.	Y	Y		
A report fails to open.	Y	Y		
A report fails to save.	Y	Y		
A report fails to get created.	Y	Y		
Central Management Server				
A concurrent user logon succeeds.	Y	Y		
A named user logon succeeds.	Y	Y		
A user logon fails.	Y	Y		
A user logs off.	Y	Y		
A user's password is changed.	Y	Y		
An object is created.	N	Y	Y	
An object is deleted.	N	Y	Y	
An object is modified.	N	Y	Y	
Communication with a running instance is lost.	Y	Y		
Rights on an object have been modified	N	Y	Y	
A folder is created	Y	N	Y	
A folder is deleted	Y	N	Y	
A folder is modified	Y	N	Y	
Desktop Intelligence CacheServer				
None				
Desktop Intelligence Job Server				
A job has been run successfully.	N	Y	Y	
A job has failed to run.	N	Y	Y	
A job failed but will try to run again.	N	Y	Y	
Desktop Intelligence Report Server				
None				
Destination Job Server				
A job has been run successfully.	N	Y	Y	
A job has failed to run.	N	Y	Y	
A job failed but will try to run again	N	Y	Y	
Web Intelligence Report Server				
Get list of universes	N	Y	Y	
Save document to repository	N	Y	Y	
Read Document	N	Y	Y	
Selection of universe	N	Y	Y	
Document refresh	N	Y	Y	
List of values	N	Y	Y	
Edit document	N	Y	Y	
Apply format	N	Y	Y	
Get page	N	Y	Y	
Generate SQL	N	Y	Y	
Drill out of scope	N	Y	Y	
Select prompt	N	Y	Y	

Note:
You can get this information in XI Release 2 using the object change events

Note:
There was no Desktop Intelligence server in V10

Appendix B

The following table outlines the differences between audited events in Crystal Enterprise V10 and BusinessObjects Enterprise XI Release 2.

Auditor Reports

	V6.5	XI RELEASE 2	Delta	Notes
Broadcast Agent (Scheduler)				In XI Release 2 Schedulers
Broadcast Agents on the System	Y	Y		
Jobs per BCA	Y	Y		
Jobs per User	Y	Y		
Pending Jobs	N	Y	Y	
Job Success Rate	Y	N	Y	
Job Summary	Y	N	Y	
Jobs per Frequency	Y	N	Y	
Document Management				
10 Least Accessed Documents	Y	Y		10 Least Read Documents
10 Least Exported Documents	Y	N	Y	
10 Most Accessed Documents	Y	Y		10 Most Read Documents
10 Most Exported Documents	Y	N	Y	
Average Refresh Time	Y	Y		
Document Information Detail	Y	Y		
Document Information Summary	Y	Y		
Document Size in Repository	Y	Y		
Documents Never Read	Y	Y		
Most Popular Actions per Document (thinclient)	Y	Y		
Objects Used in Documents	Y	Y		
Impact Analysis on Documents	Y	N	Y	
Impact Analysis on Data Providers	Y	N	Y	
Document Usage	Y	N	Y	
System Information				
Average Number of Users Concurrently Logged	Y	Y		
Average Session Duration (thin-client)	Y	Y		
Average Session Duration per Host	N	Y	Y	
Average Session Duration per Cluster	Y	N	Y	
Average Session Duration per User	Y	Y		
Cluster Nodes	Y	Y		
IP Addresses Accessing my BI Server	N	Y	Y	
IP Addresses Accessing my Audited Clusters	Y	N	Y	
Peak Usage	Y	Y		
Total Users Concurrently Logged in by Day	Y	Y		
Types of Browsers in Use	Y	Y		

Appendix B (continued)

Universe Management			
Impact Analysis	Y	N	Y
Joins by Universe	Y	N	Y
Most Popular Universes	Y	N	Y
Number of Objects per Universe (thin-client)	Y	N	Y
Objects Accessed	Y	N	Y
Universe Information Detail	Y	N	Y
Universe Information Summary	Y	N	Y
Impact Analysis on Universes	Y	N	Y
Universe Usage	Y	N	Y

Joins per universe

User Information			
Deactivated Users	Y	Y	
Last Login for User	Y	Y	
Most Active Users	Y	Y	
Most Popular Actions	Y	Y	
Number of User Sessions	Y	Y	
Number of Users in the Repository	Y	Y	
Refresh and Edit Activity	Y	Y	
User Activity	Y	Y	
User Activity per Session (thin-client)	Y	Y	
User Information Detail	Y	Y	
User Information Summary	Y	Y	
User Profiles in the Repository	Y	Y	
Users Who Logged Off Incorrectly	Y	Y	
Documents per User	Y	N	Y
Domains per User	Y	N	Y
Externalizable Users	Y	N	Y
Universes per User	Y	N	Y

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