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Introduction
About this guide

This guide provides an overview of the BusinessObjects™ Data Integrator Platform and architecture. It also describes how to upgrade and install Data Integrator.

With Data Integrator you can:
- Easily build and execute batch processing applications that create and update a data warehouse.
- Combine batch capabilities with request-response processing logic and message handling to support e-commerce and its data integration requirements.

This chapter covers the following topics:
- Audience and assumptions
- Data Integrator product documentation

Audience and assumptions

This and other Data Integrator product documentation assumes that:
- You are an application developer, consultant, or database administrator working on data extraction, data warehousing, or data integration.
- You understand your source data systems, RDBMS, business intelligence, and e-business messaging concepts.
- You understand your organization’s data needs.
- You are familiar with SQL (Structured Query Language).
- You are familiar enough with Microsoft Windows or UNIX platforms to effectively install Data Integrator.

Data Integrator product documentation

Data Integrator documentation is provided in PDF format on the Data Integrator CD. You can read PDF files using the latest version of Adobe Acrobat Reader (download instructions at the Adobe website).

After you install Data Integrator, you can view technical documentation from many locations. To view documentation in PDF format, you can:
• If you accepted the default installation, select Start > Programs > Business Objects > Data Integrator > Data Integrator Documentation and select:
  • **Release Notes**—Opens the Release Notes PDF. This document lists supported and unsupported products, details migration considerations, includes known and fixed bugs, and provides last-minute documentation corrections associated with the release.
  • **Release Summary**—Opens the Release Summary PDF. this document describes new Data Integrator features in the release.
  • **Technical Manuals**—Opens the combined Technical Manuals PDF, which contains Data Integrator core documentation and provides searchable cross-book master Contents and master Index.
  • **Technical Manuals**—Opens a “master” PDF document that has been compiled so you can search across the Data Integrator documentation suite
  • **Tutorial**—Opens the Data Integrator Tutorial PDF, which you can use for basic stand-alone training purposes
• Select one of the following from the Designer Help menu:
  • **Release Notes**
  • **Release Summary**
  • **Technical Manuals**
  • **Technical Manuals**
  • **Tutorial**

Other links from the Designer’s Help menu include:
• **DiZone**—Opens a browser window to the DI Zone, an online resource for the Data Integrator user community
• **Knowledge Base**—Opens a browser window to Business Objects’ Technical Support Knowledge Exchange forum (access requires registration)
You can also access Data Integrator documentation from the Start Page that opens automatically when you open the Designer. To open the Designer, choose Start > Programs > Business Objects > Data Integrator > Data Integrator Designer:

You can also view and download PDF documentation, including Data Integrator documentation for previous releases (including Release Summaries and Release Notes), by visiting the Business Objects documentation Web site at http://support.businessobjects.com/documentation/.

You can also open Help, using one of the following methods:

- Choose Contents from the Designer Help menu.
- Click objects in the object library or workspace and press F1.

Online Help opens to the subject you selected.

Use Online Help links and tool bar to navigate.
The following technical documentation is currently available:

- **Data Integrator Release Summary** — Provides the most up-to-date information about the product including information that was not available when the other documents were published.

- **Data Integrator Release Summary** — Provides summarized information highlighting all the newest features in the release.

- **Data Integrator Technical Manuals** includes the following books with a master Table of Contents and master Index for powerful cross-book search capabilities:
  
  - **Data Integrator Getting Started Guide** — Introduces the features and benefits of using Data Integrator. This guide explains Data Integrator architecture and how to install the product including system requirements and pre-installation preparation that will help you understand dependencies between Data Integrator and your computing environment.
  
  - **Data Integrator Designer Guide** — Provides conceptual and procedural information for designing, developing, and implementing applications using the Data Integrator Designer.
  
  - **Data Integrator Management Console: Administrator Guide** — Provides conceptual and procedural information for scheduling and monitoring batch jobs as well as configuring and administering real-time jobs. Explains the Data Integrator Administrator features.
  
  - **Data Integrator Reference Guide** — Provides detailed information about Data Integrator Designer objects, data types and expressions, transforms, functions, and user exits.
  
  - **Data Integrator Advanced Development and Migration Guide** — Discusses how to migrate Data Integrator applications through development phases and includes multi-user development concepts and procedures.
  
  - **Data Integrator Performance Optimization Guide** — Provides information about improving the performance of your Data Integrator environment and the Designer options you can use to reduce job run-times by measuring and tuning performance. Includes documentation on bulk loading and parallel execution.
  
  - **Data Integrator Supplement for J.D. Edwards** — Provides information about using Data Integrator to extract data from J.D. Edwards World and J.D. Edwards OneWorld.
  
  - **Data Integrator Supplement for Oracle Applications** — Provides information about using Data Integrator to extract data from Oracle Applications.
Suggested reading path

Begin by reading the **Data Integrator Getting Started Guide** which includes an introduction to functionality and architecture as well as installation instructions.

Understand how to use Data Integrator Designer by reading the **Data Integrator Designer Guide** and doing the exercises in the **Data Integrator Core Tutorial**. Use the **Data Integrator Reference Guide** to answer specific questions about objects and window options in the Designer.

The **Data Integrator Management Console: Administrator Guide** provides information about how to use the Administrator which is a browser-based graphical user interface used to schedule and monitor batch jobs and to configure real-time jobs and adapter interfaces available with Data Integrator.

Use the **Data Integrator Performance Optimization Guide** for tips about using system and Designer options related to performance optimization. These include measuring and tuning techniques, bulk loading, and parallel processing objects within a data flow.

To install and configure Data Integrator’s pre-packaged adapters, read the individual adapter guides on the adapter product CDs.
Introducing Data Integrator
About this chapter

This chapter introduces Data Integrator and explains its place in the Business Objects product suite. Topics include:

• Data Integrator and the Business Objects Product Suite
• Data Integrator product benefits
• Data Integrator interfaces

Data Integrator and the Business Objects Product Suite

The Business Objects product suite delivers extreme insight through specialized end-user tools on a single, trusted business intelligence platform. This entire platform is supported by BusinessObjects™ Data Integrator. On top of Data Integrator, Business Objects layers the most reliable, scalable, flexible, and manageable BI platform which supports the industry’s best integrated end-user interfaces: reporting, query and analysis, and performance management dashboards, scorecards, and applications.

True data integration blends batch extraction, transformation, and loading (ETL) technology with real-time bi-directional data flow across multiple applications for the extended enterprise.

By building a relational datastore and intelligently blending direct real-time and batch data-access methods to access data from enterprise resource planning (ERP) systems and other sources, Business Objects has created a powerful, high-performance data integration product that allows you to fully leverage your ERP and enterprise application infrastructure for multiple uses.

Business Objects provides a batch and real-time data integration system to drive today’s new generation of analytic and supply-chain management applications. Using the highly scalable data integration solution provided by Business Objects, your enterprise can maintain a real-time, on-line dialogue with customers, suppliers, employees, and partners, providing them with the critical information they need for transactions and business analysis.
Data Integrator product benefits

Use Data Integrator to develop enterprise data integration for batch and real-time uses. With Data Integrator:

• You can share data and metadata with BusinessObjects Enterprise platform.
• You can create a single infrastructure for batch and real-time data movement to enable faster and lower cost implementation.
• Your enterprise can manage data as a corporate asset independent of any single system. Integrate data across many systems and reuse that data for many purposes.
• You have the option of using pre-packaged data solutions for fast deployment and quick ROI. These solutions extract historical and daily data from operational systems and cache this data in open relational databases.

Data Integrator customizes and manages data access and uniquely combines industry-leading, patent-pending technologies for delivering data to analytic, supply-chain management, customer relationship management, and Web applications.

Unification with the platform

Data Integrator provides several points of unification with BusinessObjects Enterprise platform:

• Get end-to-end data lineage and impact analysis
• Create the semantic layer (universe) and manage change within the ETL design environment

Business Objects deeply integrates the entire ETL process with the business intelligence platform so you benefit from:

• Easy metadata management
• Simplified and unified administration
• Lifecycle management
• Trusted information
Introducing Data Integrator

Data Integrator combines both batch and real-time data movement and management to provide a single data integration platform for information management from any information source, for any information use.

Using Data Integrator, you can:
• Stage data in an operational datastore, data warehouse, or data mart.
• Update staged data in batch or real-time modes.
• Create a single graphical development environment for developing, testing, and deploying the entire data integration platform.
• Manage a single metadata repository to capture the relationships between different extraction and access methods and provide integrated lineage and impact analysis.

High availability and performance

Data Integrator’s high-performance engine and proven data movement and management capabilities include:
• Scalable, multi-instance data-movement for fast execution
• Load balancing
• Changed-data capture
• Parallel processing

Data Integrator associated products

Choose from several Business Objects product options to further support and enhance the power of your Data Integrator product.

Composer

Even before you start a data warehouse implementation, Business Objects knows that you need to collect and organize critical data from information users to “compose” a blueprint from which you can start to build your Data Integrator jobs.

The BusinessObjects™ Composer is a stand-alone, web-based application for designing extraction, transformation, and loading (ETL) projects.
Developing higher-level designs for your ETL jobs can make the implementation process more efficient and improve the quality of resulting jobs. Composer complements other ETL tools, providing a platform for creating your design even before you start to build your data warehouse. Use Composer to identify sources of data, implement transformations, and document your designs.

For more information on BusinessObjects™ Composer, contact your Business Objects sales representative.

**Metadata Manager**

Business Objects™ Metadata Manager provides an integrated view of metadata and its multiple relationships for an complete Business Intelligence project spanning some or all of the Business Objects stack of products. Use Metadata Manager to:

- View metadata about Business Objects Reports, Documents, and data sources from a single repository.
- Analyze lineage to determine data sources of Business Objects Documents and Reports.
- Analyze the impact of changing a source table, column, element, or field on existing Business Objects Documents and Reports.
- Track different versions (changes) to each object over time.
- View operational metadata (such as the number of rows processed and CPU utilization) as historical data with a datetime.
- View metadata in different languages.

For more information on Business Objects™ Metadata Manager, contact your Business Objects sales representative.

**Data Integrator interfaces**

Data Integrator provides many types of interface components. Interfaces include:

- Data-level read/write interfaces using SQL:
  - Attunity
  - BusinessObjects Data Federator
  - DB2/UDB
  - DB2/UDB via DB2Connect to MVS
Introducing Data Integrator

Data Integrator interfaces

DB2/UDB via DB2Connect to AS/400
Informix
MS SQL Server
MySQL
Netezza
Oracle
ODBC to generic databases
Sybase ASE
Sybase IQ
Teradata

• Application-level interfaces (read/write and batch/real-time unless otherwise specified):
  J.D. Edwards One World or World (batch)
  Oracle Application (batch)
  PeopleSoft interface (batch)
  Salesforce.com
  SAP R/3 ABAP (batch, read only)
  SAP R/3 Hierarchy
  SAP R/3 IDoc
  SAP R/3 RFC/BAPI
  SAP BW (batch)
  Siebel Application (batch)

• Technology read/write real-time interfaces:
  HTTP/HTTPS
  Java Message Service (JMS)
  SNMP
  Web Services

• Files read/write connectivity interfaces:
  ASCII
  COBOL (read only)
  Excel (read only)
  XML
You can use the Data Integrator Interface Development Kit to develop adapters that read from and/or write to other applications.

In addition to the interfaces listed above, the Data Integrator Nested Relational Data Model (NRDM) allows you to apply the full power of SQL transforms to manipulate, process, and enrich hierarchical business documents. For more information, see Chapter, "Nested Data," in the Data Integrator Designer Guide.

To learn more about which products and components are supported by your version of Data Integrator, see your Data Integrator Release Notes and Supported Platform documents.
Data Integrator Architecture
About this chapter

This chapter describes Data Integrator components and their distribution on your network.

This chapter contains the following topics:

• Standard Data Integrator components
• Optional Data Integrator components
• Data Integrator management tools
• Data Integrator operating system platforms
• Data Integrator distributed architecture

The Data Integrator architecture is layered to allow data integration to occur over a variety of open, industry-standard APIs for optimal data and metadata management.

Standard Data Integrator components

Standard Data Integrator components include:

• Data Integrator Designer
• Data Integrator repository
• Data Integrator Job Server
• Data Integrator engine
• Data Integrator Access Server
• Data Integrator Administrator
• Data Integrator Metadata Reports applications
• Data Integrator Web Server
• Data Integrator Service
• Data Integrator SNMP Agent
• Data Integrator Adapter SDK

The following diagram summarizes the relationships among Data Integrator components.
Data Integrator Designer

The Designer is a development tool with an easy-to-use graphical user interface. It enables developers to define data management applications that consist of data mappings, transformations, and control logic.

Use the Designer to create applications containing work flows (job execution definitions) and data flows (data transformation definitions).

To use the Designer, create objects, then drag, drop, and configure them by selecting icons in flow diagrams, table layouts, and nested workspace pages. The objects in the Designer represent metadata. The Designer interface allows you to manage metadata stored in a Data Integrator repository. From the Designer, you can also trigger the Data Integrator Job Server to run your jobs for initial application testing.
Data Integrator Architecture

Standard Data Integrator components

Data Integrator repository

The Data Integrator repository is a set of tables that hold user-created and predefined system objects, source and target metadata, and transformation rules. Set up repositories on an open client/server platform to facilitate sharing metadata with other enterprise tools. Store each repository on an existing RDBMS.

Each repository is associated with one or more Data Integrator Job Servers which run the jobs you create. There are two types of repositories:

- A local repository is used by an application designer to store definitions of Data Integrator objects (like projects, jobs, work flows, and data flows) and source/target metadata.
- A central repository is an optional component that can be used to support multi-user development. The central repository provides a shared object library allowing developers to check objects in and out of their local repositories.

Data Integrator Job Server

The Data Integrator Job Server starts the data movement engine that integrates data from multiple heterogeneous sources, performs complex data transformations, and manages extractions and transactions from ERP systems and other sources. The Data Integrator Job Server can move data in either batch or real-time mode and uses distributed query optimization, multi-threading, in-memory caching, in-memory data transformations, and parallel processing to deliver high data throughput and scalability.

While designing a job, you can run it from the Designer which tells the Job Server to run the job. The Job Server gets the job from its associated repository, then starts a Data Integrator engine to process the job. In your production environment, the Job Server runs jobs triggered by a scheduler or by a real-time service managed by the Data Integrator Access Server. In production environments, you can balance job loads by creating a Job Server Group (multiple Job Servers) which executes jobs according to overall system load.

Data Integrator engine

When Data Integrator jobs are executed, the Job Server starts Data Integrator engine processes to perform data extraction, transformation, and movement. Data Integrator engine processes use parallel processing and in-memory data transformations to deliver high data throughput and scalability.
Data Integrator Access Server

The Access Server is a real-time, request-reply message broker that collects message requests, routes them to a real-time service, and delivers a message reply within a user-specified time frame. The Access Server queues messages and sends them to the next available real-time service across any number of computing resources. This approach provides automatic scalability because the Access Server can initiate additional real-time services on additional computing resources if traffic for a given real-time service is high. You can configure multiple Access Servers.

Data Integrator Administrator

The Administrator provides browser-based administration of Data Integrator resources including:

- Scheduling, monitoring, and executing batch jobs
- Configuring, starting, and stopping real-time services
- Configuring Job Server, Access Server, and repository usage
- Configuring and managing adapters
- Managing users
- Publishing batch jobs and real-time services via Web services

Data Integrator Metadata Reports applications

The Metadata Reports applications provides browser-based analysis and reporting capabilities on metadata that is associated with:

- your Data Integrator jobs
- other Business Objects applications associated with Data Integrator

Metadata Reports provide four applications for exploring your metadata:

- Impact and lineage analysis
- Operational dashboards
- Auto documentation
- Data validation
Impact and Lineage Analysis reports

Impact and Lineage Analysis reports include:

- **Datastore Analysis** — For each datastore connection, view overview, table, function, and hierarchy reports. Data Integrator users can determine:
  - What data sources populate their tables
  - What target tables their tables populate
  - Whether one or more of the following Business Objects reports uses data from their tables:
    - Business Views
    - Crystal Reports
    - Universes
    - Web Intelligence documents
    - Desktop Intelligence documents

- **Universe analysis** — View Universe, class, and object lineage. Universe users can determine what data sources populate their Universes and what reports use their Universes.

- **Business View analysis** — View the data sources for Business Views in the Central Management Server (CMS). You can view business element and business field lineage reports for each Business View. Crystal Business View users can determine what data sources populate their Business Views and what reports use their views.

- **Report analysis** — View data sources for reports in the Central Management Server (CMS). You can view table and column lineage reports for each Crystal Report and Web Intelligence Document managed by CMS. Report writers can determine what data sources populate their reports.

- **Dependency analysis** — Search for specific objects in your repository and understand how those objects impact or are impacted by other Data Integrator or Business Objects Universe objects and reports. Metadata search results provide links back into associated reports.

To view impact and lineage analysis for Business Objects applications, you must configure the Metadata Integrator. To learn more about Metadata Integrator, see “Installing and Configuring the Metadata Integrator” on page 91.
Operational Dashboard reports

Operational dashboard reports provide graphical depictions of Data Integrator job execution statistics. This feedback allows you to view at a glance the status and performance of your job executions for one or more repositories over a given time period. You can then use this information to streamline and monitor your job scheduling and management for maximizing overall efficiency and performance.

Auto Documentation reports

Auto documentation reports provide a convenient and comprehensive way to create printed documentation for all of the objects you create in Data Integrator. Auto documentation reports capture critical information for understanding your Data Integrator jobs so you can see at a glance the entire ETL process.

After creating a project, you can use Auto documentation reports to quickly create a PDF or Microsoft Word file that captures a selection of job, work flow, and/or data flow information including graphical representations and key mapping details.

Data Validation dashboard

Data Validation dashboard reports provide graphical depictions that let you evaluate the reliability of your target data based on the validation rules you created in your Data Integrator batch jobs. This feedback allows business users to quickly review, assess, and identify potential inconsistencies or errors in source data.

Data Integrator Metadata Integrator

The Metadata Integrator allows Data Integrator to seamlessly share metadata with Business Objects Intelligence products. Run the Metadata Integrator to collect metadata into the Data Integrator repository for Business Views and Universes used by Crystal Reports, Desktop Intelligence documents, and Web Intelligence documents.
Data Integrator Web Server

The Data Integrator Web Server supports browser access to the Administrator and the Metadata Reporting tool. The Windows service name for this server is Data Integrator Web Server. The UNIX equivalent is the AL_JobService. Both use a Tomcat servlet engine to support browser access.

Tomcat servlet engine

Although the Data Integrator Web Server Tomcat servlet engine is automatically installed, you can also select an existing (previously installed) Tomcat instance for the Administrator rather than installing a new one with Data Integrator. This option enables Data Integrator web applications to use an existing Tomcat instance if one is already installed, thereby eliminating the need to manage more than one Tomcat instance if one is already installed for BusinessObjects Metadata Manager or BusinessObjects Composer. See the Note in step 10 in "Running the installation program" on page 76.
Data Integrator Service

The Data Integrator Service is installed when Data Integrator Job and Access Servers are installed. The Data Integrator Service starts Job Servers and Access Servers when you restart your system. The Windows service name is Data Integrator Service. The UNIX equivalent is a daemon named AL_JobService.

Data Integrator SNMP Agent

Data Integrator error events can be communicated using applications supported by simple network management protocol (SNMP) for better error monitoring. Install a Data Integrator SNMP agent on any computer running a Job Server. The Data Integrator SNMP agent monitors and records information about the Job Servers and jobs running on the computer where the agent is installed. You can configure network management software (NMS) applications to communicate with the Data Integrator SNMP agent. Thus, you can use your NMS application to monitor the status of Data Integrator jobs.

Data Integrator Adapter SDK

The Data Integrator Adapter SDK provides a Java platform for rapid development of adapters to other applications and middleware products such as EAI systems. Data Integrator adapters use industry-standard XML and Java technology to ease the learning curve. Adapters provide all necessary styles of interaction including:

• reading, writing, and request-reply from Data Integrator to other systems
• request-reply from other systems to Data Integrator

For detailed information, see the Data Integrator Adapter SDK User’s Guide in your Data Integrator installation directory/adapters/sdk/doc.

Optional Data Integrator components

Optional extra components include:

• Data Integrator Multi-user
Data Integrator Multi-user

Data Integrator Multi-user is an advanced optional component that enables your development team to work together on interdependent parts of an application through all phases of development. While each user works on applications in a unique local repository, the team uses a central repository to store the master copy of the entire project. The central repository preserves all versions of an application's objects, so you can revert to a previous version if needed.

Multi-user development includes other advanced features such as labeling and filtering to provide you with more flexibility and control in managing application objects.

See the *Data Integrator Advanced Development and Migration Guide* for more details.

Data Integrator management tools

Data Integrator has several management tools to assist you in managing your Data Integrator components.

License Manager

The License Manager displays the Data Integrator components for which you currently have a license.

Repository Manager

The Repository Manager allows you to create, upgrade, and check the versions of local and central repositories.

Server Manager

The Server Manager allows you to add, delete, or edit the properties of Job Servers and Access Servers. It is automatically installed on each computer on which you install a Job Server or Access Server.

Use the Server Manager to define links between Job Servers and repositories. You can link multiple Job Servers on different machines to a single repository (for load balancing) or each Job Server to multiple repositories (with one default) to support individual repositories (separating test from production, for example).
You can also specify a Job Server as SNMP-enabled. For more information see “SNMP support” on page 548 of the Data Integrator Designer Guide.

The Server Manager is also where you specify SMTP server settings for the smtp_to email function. For details, see “To define and enable the smtp_to function” on page 558 of the Data Integrator Reference Guide.

### Data Integrator operating system platforms

Data Integrator Designer runs on the following Windows platforms:

- 2000 Professional
- 2000 Server
- 2000 Advanced Server
- 2000 Datacenter Server
- XP
- 2003

All other Data Integrator components run on the above Windows platforms and the following UNIX platforms:

- Solaris SPARC 64-bit, 2.9 and 2.10 (Sun OS 64-bit releases 5.9, 5.10)
- HP-UX PA-RISC 32-bit, 11.00 and 11.1
- HP-UX Itanium 64-bit, 11.23
- IBM AIX 64-bit, 5.2, and 5.3
- Red Hat Enterprise Linux AS 32-bit 4.0
- SuSE Linux Enterprise 32-bit 9

For the latest list of Data Integrator Operating System platforms as well as the latest list of supported databases (with version and OS platform requirements), see the Business Objects Supported Platforms Web site at [http://support.businessobjects.com/documentation/supported_platforms/default.asp](http://support.businessobjects.com/documentation/supported_platforms/default.asp).

### Data Integrator distributed architecture

Data Integrator has a distributed architecture. An Access Server can serve multiple Job Servers and repositories. The multi-user licensed extension allows multiple Designers to work from a central repository. The following diagram illustrates both of these features.
You can distribute Data Integrator components across multiple computers, subject to the following rules:

- Engine processes run on the same computer as the Job Server that spawns them
- Adapters require a local Job Server

Distribute Data Integrator components across a number of computers to best support the traffic and connectivity requirements of your network. You can create a minimally distributed system, designed for developing and testing or a highly distributed system designed to scale with the demands of a production environment.

**Host names and port numbers**

Communication between a Web application, the Data Integrator Access Server, the Data Integrator Job Server, and real-time services occurs through TCP/IP connections specified by IP addresses (or host names) and port numbers.

If your network does not use static addresses, use the name of the computer as the host name. If connecting to a computer that uses a static IP address, use that number as the host name for Access Server and Job Server configurations.
To allow for a highly scalable system, each component maintains its own list of connections. You define these connections through the Server Manager, the Data Integrator Administrator, Repository Manager, and the Message Client library calls (from Web client). For details, see “Check port assignments” on page 53.
Data Integrator Architecture

Data Integrator distributed architecture
chapter 4

Preparing to Install Data Integrator
About this chapter

This chapter discusses information to consider before installing Data Integrator including:

- System installation overview
- System requirements
- Pre-installation tasks
- Data Integrator licenses
- Repository database information
System installation overview

There are several installation process stages. The following flowchart outlines steps and associated chapters in this manual:

Chapter 4
Pre-installation tasks
Component distribution, license information/keys, ports, repositories, network...

Is a previous version of Data Integrator already installed?

Yes
Chapter 5
Upgrading Data Integrator

No

Chapter 6
Installing Data Integrator on Windows Systems (mandatory for Designer)

Installing components on UNIX platforms?

Yes
Chapter 7
Installing Data Integrator on UNIX Systems

No
Preparing to Install Data Integrator

System installation overview

To prepare for Data Integrator installation

2. Decide which Data Integrator components you need to upgrade or install.

<table>
<thead>
<tr>
<th>Component</th>
<th>Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>Designer</td>
<td>Use to develop and test batch, SAP R/3, and real-time jobs</td>
</tr>
<tr>
<td>Job Server</td>
<td>Processes jobs and real-time messages</td>
</tr>
<tr>
<td>Administrator</td>
<td>Use to monitor jobs, Access Servers, and adapters</td>
</tr>
<tr>
<td>Access Server</td>
<td>Provides real-time access to Data Integrator server components</td>
</tr>
</tbody>
</table>

3. Determine the computers on which to upgrade or install these components.

You may choose to upgrade or install components on one or more computers based on available resources and amount of system traffic.

You must install the Designer on a supported Windows platform. You can install the other components on Windows or UNIX platforms (see "Data Integrator operating system platforms" on page 35).

4. Determine the locale for each Job Server installation.

Locales support the processing of data stored in different human languages such as rules for capitalization, time and date formats, and basic character sets.

The Data Integrator installation program prompts you to specify a locale in terms of language, territory, and code page for each Job Server installation. Data Integrator obtains the default information from the host computer's operating system. When you install the Job Server, you are also installing Data Integrator's engine; the processing that occurs within Data Integrator will use this locale.

Data Integrator supports both single and multi-byte code pages. Many Asian scripts require multi-byte code pages. Data Integrator also supports UTF-8, a unicode, multi-byte code page that includes most of the world's languages.

In a production environment, carefully selecting code pages is especially important. Data Integrator supports and will transcode unique code pages when data passes from sources, through the engine, to targets. However for best performance, avoid transcoding by using the same code pages or the UTF8 unicode for objects in a job.

For more information, see the Data Integrator Reference Guide.
5. Decide if you want to take advantage of Windows clustering fail-over support which attempts to automatically restart your Data Integrator services in the event of a hardware or Windows software failure. To use Windows clustering fail-over support you must first set up a Windows cluster (refer to your Microsoft documentation for details). See “Create a Windows cluster (optional)” on page 55 for more information.

6. Update or install your Data Integrator components.
   See detailed installation steps for updating or installing Data Integrator in the remaining chapters of this guide.

7. Test connectivity. Populate a data warehouse by creating and testing a batch job in Data Integrator. See “Verifying connectivity” on page 100 for step-by-step instructions and the location of sample files for testing your Data Integrator installation.

8. Connect to source or target applications:
   • Use the Message Client library. See “Installing Message Client libraries” on page 107 and “Using the Message Client library” on page 108.
   • Use a Data Integrator adapter. Find installation and configuration instructions for individual adapters and the Adapter SDK in the Adapters subdirectory of the Data Integrator package you install.

9. Implement and test data flows to support analytic or Web application needs.
   • For analytic applications, schedule batch jobs using the Data Integrator Administrator as described in the Data Integrator Management Console: Administrator Guide.
   • For Web applications, configure real-time jobs as services in the Data Integrator Administrator as described in the Data Integrator Management Console: Administrator Guide.

System requirements

Before installing Data Integrator, ensure that your system has compatible hardware and software. This section discusses:

• Data Integrator repository requirements
• Database requirements
• Data Integrator Designer requirements
• Data Integrator Job Server requirements
• Data Integrator Access Server requirements
Preparing to Install Data Integrator

System requirements

- Data Integrator Management Console requirements
- Web applications communicating with Data Integrator

**Data Integrator repository requirements**

Data Integrator stores your design metadata for source and target tables as well as database functions and definitions of built-in Data Integrator objects in database tables. This set of database tables is called the Data Integrator repository. You must create space for local and/or central repositories on an existing database before you run the Data Integrator installation program. The Data Integrator installation program connects to the repository and populates it.

To open the Data Integrator Designer, launch the Designer application from the computer on which it is installed and log in to the repository. When you execute Data Integrator jobs from the Designer, the Data Integrator Job Server connects to this local repository to read application information.

A Data Integrator repository requires a minimum of 20 MB of free disk space on the database server. Built-in Data Integrator objects require less space. Sizing requirements depend on the scale of your planned operations.

**Database requirements**

Data Integrator supports several database connections for repositories, data sources, and data targets. Database client and server software versions must be compatible.

For the latest list of supported databases (with version and OS platform requirements), see the Business Objects Supported Platforms Web site at http://support.businessobjects.com/documentation/. Also refer to the *Data Integrator Release Notes* for updates and requirements specific to this release.
Preparing to Install Data Integrator

System requirements

Some supported databases include:

<table>
<thead>
<tr>
<th>OS platforms</th>
<th>Database connection</th>
<th>Repository</th>
<th>Source</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows and UNIX</td>
<td>Oracle¹</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>DB2/UDB²</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>ODBC³</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Sybase ASE⁴</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Sybase IQ</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Teradata</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Netezza</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Informix</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>MySQL</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Windows</td>
<td>Microsoft SQL Server</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>BusinessObjects Data Federator</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

Notes

1. Data Integrator 32-bit and 64-bit applications are supported on a variety of operating systems.

When using a database client with the Data Integrator 32-bit application, the 32-bit database client libraries must be installed and referenced in the library paths. For example, the default installation of the Oracle 64-bit client includes installation of the 32-bit client. For non-standard installations, these libraries must be specified as part of the installation. After installation, the libraries should be in the $ORACLE_HOME\lib32 directory.

If these 32-bit libraries are not present, you will receive an error message stating that Data Integrator cannot load the client library. Examples of error messages include:

(5.2) 02-05-02 14:55:23 (E) (26797:0001) CON-120103: System call <dlopen> to load and initialize functions failed for <libclntsh.a>. Make sure the SHARED LIBRARY is installed and resides in the correct location.

(5.2) 02-05-02 14:55:23 (E) (26797:0001) REP-100108: Cannot perform operation on Repository<Default Repository> because a connection to the repository was never opened. A connection must be opened to the repository before performing any operation.
When using a database client with the Data Integrator 64-bit application, the 64-bit client libraries must be installed and referenced in the library paths.

2. Data Integrator supports a native DB2 interface. You can connect to MVS or AS/400 through DB2 Connect with the DB2 Client Enterprise Edition. If you plan to use template tables on DB2 on MVS, ensure that the database Create schema implicitly setting is on. However, you cannot create a template table with a primary key.

You can use the Attunity Connector datastore as an alternative to access through IBM iSeries Access Driver (native) or IBM DB2 Connect (via ODBC). However, Attunity Connector connections are read-only.

<table>
<thead>
<tr>
<th>Client Driver (connection)</th>
<th>Datastore Editor option</th>
<th>Data Source</th>
<th>Client Operating System</th>
<th>Source Operating System</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBM iSeries Access DB2 Connect</td>
<td>ODBC DB2</td>
<td>Windows only</td>
<td>OS/400</td>
<td></td>
</tr>
<tr>
<td>Attunity Connector</td>
<td>Attunity Connector DB2</td>
<td>Windows and UNIX</td>
<td>OS/400, MVS (tested)</td>
<td></td>
</tr>
</tbody>
</table>

3. You can connect to any ODBC-compliant database through an ODBC driver using Data Integrator’s built-in driver manager (see “UNIX ODBC driver manager configuration file” on page 76 of the Data Integrator Reference Guide). You can load DataDirect Technologies’ ODBC drivers using either Data Integrator’s built-in driver manager or Data Direct’s ODBC driver manager.

4. If you are using both Sybase ASE and Microsoft SQL Server on a Windows platform, ensure the Sybase path precedes the Microsoft SQL Server path in the environment variables %PATH% statement.

5. When using MySQL as a source and/or target, note that MySQL 4.1 does not support stored procedures; however, the Designer does not differentiate between the two versions because the most recent ODBC driver (3.51) does not support stored procedures and Data Integrator uses the MySQL ODBC driver to access MySQL databases.

6. BusinessObjects Data Federator cannot be used as a target database.
Data Integrator Designer requirements

The Data Integrator Designer requires specific Windows software and hardware.

Note: Windows support is limited to AMD/Intel chipsets. BusinessObjects Data Integrator software for Windows is not warranted or supported for use on other chipsets. BusinessObjects Data Integrator software for Windows can be run on Windows 64-bit operating systems on Intel chipsets if it can reference the 32-bit operating system libraries as well as the 32-bit database and application client libraries.

Hardware

- Pentium processor with a minimum of 512 MB (1 GB recommended) RAM and 800 MB free disk space.
- Screen resolution of 1024 x 768 pixels with 16-bit or 65536 colors recommended (minimum 256 colors).
- Paging file with a minimum setting of 512 MB (1 GB recommended).

Software

- Operating systems: see “Data Integrator operating system platforms” on page 35.
- Desktop Development Kit (DDK) option for extraction from SAP R/3 sources.
- Database client library software for the database serving as your Data Integrator repository.

Data Integrator Job Server requirements

You can install the Data Integrator Job Server on the same computer as the Data Integrator Designer or on a different computer. If you choose to install the Designer and Job Server on the same computer, you must add the RAM and free disk space for the second component to the requirements of the first. See also: “Additional system requirements for UNIX” on page 120.

Hardware

- Pentium processor with a minimum of 512 MB (1 GB recommended) RAM.
- Minimum free disk space of 1 GB.
- Minimum 1 GB virtual memory (2 GB recommended).
Preparing to Install Data Integrator

System requirements

- Recommended for best performance: dual processors (minimum 500 Mhz) with at least 512 MB physical memory.
- Recommended 2 GB pageable cache directory.
- Operating system paging file with a minimum setting of 256 MB.

Software

- Operating systems: see “Data Integrator operating system platforms” on page 35.
- If you plan to run scheduled jobs in a Windows environment, enable the Windows Task Scheduler on the Job Server computer.
- Install database connectivity software for the database(s) serving as your repository, sources, and targets.
  - For Oracle bulk loading, install the Oracle bulk loading utility sqlldr on the Job Server computer.
  - For DB2 bulk loading, Data Integrator installs a proprietary executable, db2bulkload, in the Business Objects/Data Integrator/bin directory. To use DB2 bulk loading utility, the DB2 user specified in the datastore for the job must have system privileges. DB2 database or DB2 client application enabler software installations create a default user called db2user. Before you install a Job Server, you must know the password for db2user. The Job Server requires path information for the client application enabler software included in the alias for this user. For more information, see your DB2 database documentation.

Data Integrator Access Server requirements

You can install the Access Server independently of other Data Integrator components.

You can configure a single Access Server to serve one or more Web applications, regardless of the load-balancing configuration. However, if request processing requires more resources, you can configure multiple Access Servers.

Hardware

- Pentium processor with at least 512 MB (1 GB recommended) RAM and 600 MB free disk space.
- Minimum 1 GB virtual memory (2 GB recommended).
Preparing to Install Data Integrator

System requirements

• Recommended for best performance: dual processors (minimum 500 Mhz) with at least 512 MB physical memory.
• Operating system paging file with a minimum setting of 256 MB.
• Recommended pageable cache directory size 2 GB.
• See also: “Additional system requirements for UNIX” on page 120.

Software

• Operating systems: see “Data Integrator operating system platforms” on page 35.

Data Integrator Management Console requirements

You can install the Management Console independently of other Data Integrator components. You install the Web Server when you install the Management Console. The Web Server supports web browser capabilities for the Management Console (which includes the Administrator and Metadata Reporting tool).

You can configure a single Administrator to serve one or more Access Servers, repositories and the Job Servers connected to them. You can also configure multiple Administrators.

See also: “Additional system requirements for UNIX” on page 120.

Hardware

• Pentium processor with at least 512 MB (1 GB recommended) RAM.
• Screen resolution of 1024 x 768 pixels with 16-bit or 65536 colors recommended (minimum 256 colors).

Software

• Operating systems: see “Data Integrator operating system platforms” on page 35.
• Microsoft Internet Explorer.

Web applications communicating with Data Integrator

To send messages to the Access Server for processing, a Web application must:

• Be able to generate XML-formatted strings
Preparing to Install Data Integrator

Pre-installation tasks

- Connect to the Access Server using Message Client library calls in C++, Java, or COM

Data Integrator Profiler requirements

The Data Profiler installs automatically when you install Data Integrator. If you plan to use Detailed profiling or Relationship profiling, specify a pageable cache directory that contains enough disk space for the amount of data you plan to profile and that you place on a separate disk or file system. For more details, see “Configuring Job Server run-time resources” on page 86.

To use the Data Profiler, follow the steps in “Connecting the Data Profiler” on page 90.

Pre-installation tasks

Before installing Data Integrator components you must:

- Determine component distribution
- Obtain license keys
- Check port assignments
- Create a database for each repository
- Check network connections

Determine component distribution

The installation program can install multiple Data Integrator components:

<table>
<thead>
<tr>
<th>Component</th>
<th>Function</th>
<th>Number installed per computer</th>
<th>Always installed with the following components</th>
</tr>
</thead>
<tbody>
<tr>
<td>Designer</td>
<td>Develop and test data flows</td>
<td>One (Windows only)</td>
<td>Repository Manager and the License Manager tools</td>
</tr>
<tr>
<td>Job Server</td>
<td>Process batch jobs and real-time messages</td>
<td>One (Windows or UNIX)</td>
<td>Server Manager tool, Data Integrator Service, HTTP adapter, SNMP Agent and Web Services adapter</td>
</tr>
</tbody>
</table>
Preparing to Install Data Integrator

Pre-installation tasks

You can configure several Job Server and Access Server instances from one Job Server or Access Server installation. Configure Job Server and Access Server instances using the Server Manager.

You can install Data Integrator components on one or more computers based on available resources and the amount of traffic the system processes. Before installing Data Integrator components, consider the following restrictions:

- If you plan to use Data Integrator in a multi-user development environment, the computers containing the local repositories for each user must be able to connect to the computer containing the central repository.
- A local Data Integrator repository connects a Data Integrator Designer with a Data Integrator Job Server. You can install a Job Server on the same computer as the repository, on a stand-alone computer (with repository database client software), or on the same computer as a Data Integrator Designer.
- Any Data Integrator Designer can access any local repository and Data Integrator Job Server. Business Objects does not recommend that multiple Data Integrator Designers simultaneously access the same local repository and Job Server. Using simultaneous access risks metadata corruption in the repository. Also, you cannot link Data Integrator Designer to more than one local repository at any given time.
- Install database client software on the computer containing the Job Server to support the repository associated with that Job Server. For example, if the repository associated with a Job Server named “oradev” is an Oracle database, then Oracle client software must be installed on the computer containing the “oradev” Job Server.

The following diagram depicts a simple distribution of Data Integrator components among computers in a network. Note that you can install each Data Integrator on one or more computers. Also note that there are many possible connections between Data Integrator components. Each of the boxes in the diagram represents a different computer.

<table>
<thead>
<tr>
<th>Component</th>
<th>Function</th>
<th>Number installed per computer</th>
<th>Always installed with the following components</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administrator</td>
<td>Monitor: jobs, Access Servers, and adapters</td>
<td>One (Windows or UNIX)</td>
<td>Data Integrator Web Server and Data Integrator Web Server service</td>
</tr>
<tr>
<td>Access Server</td>
<td>Provide network access to Data Integrator</td>
<td>One (Windows or UNIX)</td>
<td>Server Manager Tool and Data Integrator Service</td>
</tr>
</tbody>
</table>

Note: You can configure several Job Server and Access Server instances from one Job Server or Access Server installation. Configure Job Server and Access Server instances using the Server Manager.
Preparing to Install Data Integrator

Pre-installation tasks

You can install the Administrator on any computer with or without other Data Integrator components. No license is required. It is Java-based. You also install the Data Integrator Web Server and Data Integrator Web Server service when you install the Administrator. The Data Integrator Web Server starts automatically on restart. See also the discussion under “Data Integrator distributed architecture” on page 35.

Obtain license keys

You must obtain the appropriate license key for each Data Integrator component. To do this, send your host ID information and a list of components to licensing@businessobjects.com. Business Objects will generate a license file and contact you when it is available for access at webkey.businessobjects.com. For more information on licenses, see “Data Integrator licenses” on page 57.
Check port assignments

Verify that default ports for Data Integrator components are available and not in use by other programs on each computer.

For a development system, you can install many components on the same computer. This simplifies many connections between components (the host name is always the same), but you must still define connections based on TCP/IP protocol. The following example configuration diagram shows default port numbers.

This table details Data Integrator default ports:

<table>
<thead>
<tr>
<th>Component</th>
<th>Port</th>
<th>Description</th>
<th>Default</th>
<th>To set</th>
</tr>
</thead>
<tbody>
<tr>
<td>Job Server</td>
<td>Job Server port or TCP/IP port</td>
<td>Receives commands from Designer, Access Server, and schedulers</td>
<td>3500</td>
<td>Use Server Manager</td>
</tr>
<tr>
<td>Adapter and SNMP communication port</td>
<td></td>
<td>Receives commands and sends data to adapters</td>
<td>4001</td>
<td>Use Server Manager</td>
</tr>
</tbody>
</table>
Preparing to Install Data Integrator

Pre-installation tasks

Create a database for each repository

There are two types of repositories: local and central. Local repositories are working repositories where you create and modify applications. Central repositories serve as historical libraries, storing version-controlled master copies of applications you create and modify in local repositories.

You associate each local repository with one or more Data Integrator Job Servers. If you choose to install Job Servers on more than one computer, you must create a local repository to support each Job Server. There is no relationship between central repositories and Job Servers.

Create local repositories before installing each Job Server. For more information, see “Repository database information” on page 62.

Component

<table>
<thead>
<tr>
<th>Port</th>
<th>Description</th>
<th>Default</th>
<th>To set</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Integrator Web Server</td>
<td>Supports communication between Access Servers, the Administrator, and the Metadata Reporting tool</td>
<td>28080</td>
<td>In UNIX, use Server Manager</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>In Windows, edit configuration files manually (see “To reset the ports for the Data Integrator Web server” on page 89)</td>
</tr>
<tr>
<td>Shutdown port</td>
<td>Connects to Data Integrator Web Server service. The Web Server service uses this port to start and shutdown the Web Server which supports the Administrator and the Metadata Reporting tool.</td>
<td>22828</td>
<td>In UNIX, use Server Manager</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>In Windows, edit configuration files manually (see “To reset the ports for the Data Integrator Web server” on page 89)</td>
</tr>
<tr>
<td>Access Server</td>
<td>Communication port</td>
<td>4000</td>
<td>Use Server Manager</td>
</tr>
<tr>
<td></td>
<td>Communicates with the Administrator and the Metadata Reporting tool. Receives and sends messages from clients and services</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Designer</td>
<td>Interactive Debugger port</td>
<td>5001</td>
<td>Contact Business Objects Technical Support</td>
</tr>
<tr>
<td></td>
<td>Supports communication for the debugging feature</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Create a database for each repository

There are two types of repositories: local and central. Local repositories are working repositories where you create and modify applications. Central repositories serve as historical libraries, storing version-controlled master copies of applications you create and modify in local repositories.

You associate each local repository with one or more Data Integrator Job Servers. If you choose to install Job Servers on more than one computer, you must create a local repository to support each Job Server. There is no relationship between central repositories and Job Servers.

Create local repositories before installing each Job Server. For more information, see “Repository database information” on page 62.
Preparing to Install Data Integrator

Pre-installation tasks

- To set up a single-user development environment, create a database for the local repository.
- To set up a multi-user development environment, create databases for each local repository (one per user) and a database for the central repository. See Chapter 5, "Multi-user development," in the Data Integrator Advanced Development and Migration Guide for more information about using the multi-user development features.

Check network connections

Before installing Data Integrator components, prepare the computers involved and verify network connections by executing the Ping command on each computer.

For example, if the Designer will be on a Windows computer and your Job Server will be on a UNIX computer, from the Windows computer open the DOS prompt and enter:

```
C:\> ping <hostname>
```

where hostname is the host name of the UNIX computer.

Then from the UNIX computer, log in as root and from the prompt, enter:

```
$ ping <hostname>
```

where hostname is the host name of the Windows computer.

Create a Windows cluster (optional)

To take advantage of fail-over support for Data Integrator Services in a Windows Clustering Environment, you must create a Windows cluster before installing Data Integrator. If you choose this option, in the event of a hardware failure or Windows software failure, the Windows Cluster Manager will attempt to restart your Data Integrator Services.

After creating a Windows cluster:

1. Install Data Integrator on a shared drive from the first cluster computer. For details, see Chapter 6: Installing Data Integrator on Windows Systems.
2. After installing Data Integrator, create a new resource for the Data Integrator Service as a Generic Service.
   a. Open the Cluster Administrator.
   b. Under Active Resources, add a new resource. Enter a Name, Description and choose Generic Service for the Resource Type.
Preparing to Install Data Integrator

Pre-installation tasks

c. Configure resource dependencies. Since Data Integrator is a Generic Service, it requires a file share, IP address, Network Name, and available physical disk resources.

d. Configure Generic Service Parameters. Enter DI_JOBSERVICE as the Service name.

3. Create a new resource for the Data Integrator Web Server Service as a Generic Service. (If you did not install the Data Integrator Management Console, skip this step.)

a. Under Active Resources, add a new resource. Enter a Name, Description and choose Generic Service for the Resource Type.

b. Configure Generic Service Parameters. Enter DataIntegratorWebServer as the Service name and click to select the Use Network Name for computer name option.

4. Run the Data Integrator cluster install utility (js_cluster_install.exe located in the bin directory of your Data Integrator installation) on the other cluster computers to populate them with the Data Integrator Service-related information.

a. Copy the js_cluster_install.exe and bodi_cluster_conf.txt files from the Data Integrator bin directory on your primary cluster computer.

b. Paste these files to each non-primary cluster computer and run the following commands to install the Data Integrator Service and Data Integrator Web Server Service, and to replicate the shortcuts set up on the primary cluster computer:

   js_cluster_install.exe -install if using system account
   js_cluster_install.exe -install -Uuser -Ppasswd -Ddomain when not using system account on primary node
   js_cluster_install.exe -remove

c. Data Integrator components will use a Cluster Network Name to communicate with other Data Integrator components over your network. Open the Data Integrator Server Manager, enter the Cluster Network Name and click Apply.

   Note: If Job Servers are already configured before you enter the Cluster Network Name, the Server Manager will prompt you to enter a password for each currently configured repository associated with each configured Job Server.

   Click Restart.
Data Integrator licenses

This section explains:

• License types
• Optional license-controlled features
• Managing your licenses
• Obtaining your license files
• Repository database information

License types

Data Integrator licenses can be:

• Unrestricted or restricted
• Evaluation, emergency, or permanent

Unrestricted

Business Objects generates unrestricted licenses for components not tied to a specific computer. Data Integrator verifies that the appropriate license exists each time a licensed component starts. The Data Integrator Designer component has an unrestricted license.

Restricted

Business Objects generates and uses restricted licenses for components tied to a specific computer. Restricted licenses use the ethernet/MAC address from the computer on which you installed the component. This value appears in the Data Integrator installation as “Host ID.”

When a Data Integrator component starts, it searches for the license and validates it against the Host ID.

Note: Data Integrator components using a restricted license require a new license file if:

• You transfer the installation to another computer, or
• You install a new network card on the computer

In either case, contact licensing@businessobjects.com to submit your old and new host ID information along with a list of affected components. Business Objects will generate a new file and contact you when it is available for you to access at webkey.businessobjects.com.

Note: You cannot reset your license key to a NULL value.
Preparing to Install Data Integrator

*Data Integrator licenses*

### Evaluation

An evaluation license allows you to run Data Integrator for a specific period of time. You can use this license on any computer until the license expires. An evaluation license is unrestricted for all Data Integrator components.

### Emergency

Similar to evaluation licenses, the emergency license allows you to run Data Integrator for a limited period of time. Emergency licenses differ from evaluation licenses only in that the limited period of use is significantly shorter. Contact Business Objects Customer Support Online should you require an emergency license.

### Permanent

A permanent license allows you to run Data Integrator components indefinitely. You purchase unrestricted permanent licenses for Data Integrator Designers and restricted permanent licenses for Data Integrator Job Servers. No license is required for the remaining core Data Integrator components.

Data Integrator component licenses:

<table>
<thead>
<tr>
<th>Data Integrator component</th>
<th>Evaluation license</th>
<th>Emergency license</th>
<th>Permanent license</th>
</tr>
</thead>
<tbody>
<tr>
<td>Designer</td>
<td>Unrestricted</td>
<td>Unrestricted</td>
<td>Unrestricted</td>
</tr>
<tr>
<td>Job Server</td>
<td>Restricted</td>
<td>Restricted</td>
<td>Restricted</td>
</tr>
</tbody>
</table>

Business Objects may bundle several features with Data Integrator depending on what you purchase. These features include:

<table>
<thead>
<tr>
<th>Multi-user capability</th>
<th>Supports multiple users for secure collaboration on ETL projects.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SNMP agent</td>
<td>Supports SNMP protocol to communicate between (network management software) applications and Data Integrator Job Servers. With SNMP, you use your NMS application to monitor the status of Data Integrator jobs. Included with Job Server installation.</td>
</tr>
</tbody>
</table>

### Optional license-controlled features

Extend Data Integrator functionality with the following licensed-controlled components. The license for each component is tied to your Data Integrator Designer license. Purchase this additional functionality through your Business Objects Sales Representative.
Preparing to Install Data Integrator

Data Integrator licenses

Managing your licenses

Easily manage your Data Integrator licenses using local license control. Simply obtain licenses from the licensing Web site and save them to the local host where you will install your licensed components.

Obtaining your license files

The Business Objects licensing web site http://webkey.businessobjects.com allows you to generate your license files and display your license information.

To obtain your license files prior to installation

1. Decide which Data Integrator components to install on which computers.
3. On the Login page, enter the License Authorization Code found in your License Authorization Code email and click Login.
4. Click Generate Licenses.

Business Objects generates a License Certificate page. This page contains product component names, effective date, license type, license key information, and Host ID information. When saved, this page becomes your license file.

Table 4-1: Optional license-controlled features

<table>
<thead>
<tr>
<th>Name</th>
<th>License Extension to Data Integrator that:</th>
</tr>
</thead>
<tbody>
<tr>
<td>JD Edwards</td>
<td>Supports a batch interface to JD Edwards World and OneWorld sources and targets.</td>
</tr>
<tr>
<td>Oracle Applications</td>
<td>Supports an interface to Oracle Applications eBusiness Suite software for batch data integration.</td>
</tr>
<tr>
<td>PeopleSoft</td>
<td>Supports an interface to PeopleSoft ERP and HRMS software.</td>
</tr>
<tr>
<td>Siebel</td>
<td>Supports an interface between Data Integrator and a third-party database running Siebel Applications. MS SQL Server is supported.</td>
</tr>
<tr>
<td>SAP BW</td>
<td>Supports an interface between Data Integrator and SAP Business Information Warehouse by using SAP BW’s Staging BAPIs.</td>
</tr>
<tr>
<td>SAP R/3 ABAP</td>
<td>Supports R/3 data flow and data transport objects which allow Data Integrator to process batch data warehouse updates from SAP R/3.</td>
</tr>
<tr>
<td>SAP R/3 BAPI</td>
<td>Supports BAPI function calls from Data Integrator to SAP R/3 for transactions and queries. Includes BAPIs with table parameters.</td>
</tr>
<tr>
<td>SAP R/3 IDoc</td>
<td>Supports translation of IDoc messages sent from SAP R/3 to Data Integrator.</td>
</tr>
</tbody>
</table>
Preparing to Install Data Integrator

Data Integrator licenses

The License Fulfillment page lists products in your order for which you can generate license files. This page allows you to generate license files one at a time, at your convenience. Only the Job Server licenses require a Host ID for versions 6.5 and higher.

If your computer has more than one network card, include the Host ID for each, separated by a space, to create a node locked license file.

Determining the Host ID for your platform

There are many ways to determine Host ID depending on your computer platform.

<table>
<thead>
<tr>
<th>Platform</th>
<th>Sample instructions for determining Host ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows</td>
<td>Run autorun.exe from the CD or the Data Integrator directory and click Install. When autorun.exe starts the InstallShield wizard, click Yes to continue. The Host ID displays in the User Information window. From the installation CD, navigate to the fscommand directory and run lmhostid.exe.</td>
</tr>
<tr>
<td>HP</td>
<td>Run \unix\hpux1100\lmhostid from the mounted CD or the Data Integrator directory. You can also use the lmhostid -long command for HP-Itanium.</td>
</tr>
<tr>
<td>Sun</td>
<td>Run \unix\sunos\lmhostid from the mounted CD or the Data Integrator directory.</td>
</tr>
<tr>
<td>AIX</td>
<td>Run \unix\aix530\lmhostid from the mounted CD or the Data Integrator directory.</td>
</tr>
<tr>
<td>Linux</td>
<td>Run unix/rh-linux/lmhostid from the mounted CD or the Data Integrator directory.</td>
</tr>
</tbody>
</table>

**Note:** For Windows installations, select the Ethernet Host ID type and for UNIX installations, select Long Host ID type.

Save each license file with a *.lic extension in the planned location.

**Note:** For the Data Integrator installation program to complete successfully, you must point it to the location of the license files associated with the components you are installing.
Preparing to Install Data Integrator

Data Integrator licenses

Viewing previously-generated license files
You can view previously-generated license files to find key information such as the current Host ID.

► To view previously generated license files
1. From your browser window, go to the Business Objects licensing web site at [http://webkey.businessobjects.com](http://webkey.businessobjects.com), re-enter your License Authorization code, and click Login.
2. Click View Licenses
The Select Items to View page appears, showing all previously-generated licenses against the order you placed. Previously-generated licenses display in a table with associated product name and component information, the number of days the license is valid (if temporary), the Host ID number, and the effective date.
3. Select a license and click View. The License Certificate page appears, containing product component names, the effective date, license type, license key information, and Host ID information.

Re-hosting previously-generated license files
You can change a previously-generated license file to associated it with a different host computer. This process is called re-hosting.

► To re-host previously-generated license files
1. Log in to the webkey site at [http://webkey.businessobjects.com](http://webkey.businessobjects.com).
2. Select the Re-host Licenses tab.
3. Put a check mark next to the server license to re-host. Only components with a specific Host ID can be re-hosted.
   
   **Note:** You cannot re-host a license with Host ID type = ANY. Files with Host ID type = ANY download for all installations of that component only.
4. Click Return at the bottom of the page.
5. Click Confirm.
6. Enter the new Host ID (hostid) on the Select Items to Re-host page.
7. Click Generate.
8. Click Confirm.
9. Save the file.
Repository database information

This section describes information necessary for you to create either local or central repositories in various types of databases.

For DB2

A local or central Data Integrator repository requires that you create a dedicated database and define a user with the right to:

• Create a table
• Start a session
• Create a sequence

Required Data

| DB2 data source: | ______________________________ |
| User name/password: | ____________________________ |

Install the DB2 application enabler software and use DB2 Control Center and DB2 Script Center to verify the connection between the Designer computer and the Data Integrator repository computer.

For Microsoft SQL Server

When creating a repository on Microsoft SQL Server, choose between Windows authentication (by selecting the check box) or Microsoft SQL Server authentication (by completing the Microsoft SQL Server user name and password fields):

• **Windows authentication** — Microsoft SQL Server validates the login account name and password using information from the Windows operating system
• Microsoft SQL Server authentication — Microsoft SQL Server authenticates the existing Microsoft SQL Server login account name and password

Required Data

| Database server name: | ______________________________ |
| Database name: | ______________________________ |
| Windows authentication or User name/password: | _____________ |
Install Microsoft SQL Server client software and use Microsoft SQL Server’s SQL Query Tool to verify the connection between the Designer computer and the Data Integrator repository computer.

**For MySQL**

When creating a repository on MySQL, you must supply the following information in order to later login to the Repository Manager and the Designer:

- ODBC (MySQL) Data Source Name
- Username
- Password

The ODBC name is either the user Data Source Name (DSN), or the system DSN.

**Note:** ODBC driver version 3.51.12 is recommended for use with MySQL.

**For Oracle**

A local or central Data Integrator repository requires that you create a dedicated database and define a user with the right to:

- Create a table
- Start a session
- Create a sequence

Grant the user the `connect` and `resource` roles. For Oracle 10G/R2, also grant the `create view` role.

**Required Data**

| Database connection name: ________________________________ |
| User name/password: ________________________________ |

Install the Oracle client software and use SQL*Plus to verify the connection between the Designer computer and the Data Integrator repository.

**Note:** To store multi-byte characters in a Data Integrator repository table when the repository is on an Oracle database, you must change the Oracle database character set to a codepage that supports the multi-byte language you plan to use or you risk corrupting your metadata. For example, to store Japanese characters, change the Oracle database character set to either `SHIFT_JIS` or `UTF8`. For more information see the Locales and Multi-Byte Functionality chapter of the *Data Integrator Reference Guide*. 
For Sybase ASE

A local or central Data Integrator repository requires that you create a dedicated database and define a user.

**Required Data**

```
Database server name: ________________________________
Database name: ________________________________
User name/password: ________________________________
```

Install Sybase ASE and verify the connection between the Designer computer and the Data Integrator repository computer.

**Note:** For UNIX Job Servers, when logging in to a Sybase repository in the Designer, the case you type for the database server name must match the associated case in the SYBASE_HOME/interfaces file. If the case does not match, you might receive an error because the Job Server cannot communicate with the repository.
Chapter 5

Upgrading Data Integrator
About this chapter

This chapter provides information required to upgrade from previous product versions. This chapter includes:

- Upgrade paths
- Upgrading your Data Integrator system
- Before upgrading repositories with the Repository Manager:
- After upgrading Data Integrator

Upgrade paths

To upgrade Data Integrator, install the new Data Integrator components then upgrade your repositories. This section discusses:

- Data Integrator component upgrades
- Repository upgrades
- Upgrading to a multi-user development environment

Data Integrator component upgrades

In addition to upgrading repositories, you must upgrade all Data Integrator components to the same version.

Business Objects recommends that after you back up existing repositories (using your database’s backup utility) and read the release notes, you upgrade components in the following order:

1. Data Integrator Designer
2. Data Integrator repository
3. Data Integrator Job Server
4. Data Integrator Access Server
5. Data Integrator Message Client libraries
6. If you are using the SAP R/3 ABAP interface, re-install the Data Integrator functions for SAP R/3. For more information, see “Installing Data Integrator functions on SAP R/3” on page 24 of the Data Integrator Supplement for SAP.
Repository upgrades

Minor releases do not require a repository upgrade. For example, if 11.0 is a major release and 11.1 is a minor release, then when upgrading from 11.0 to 11.1, it would not be necessary to upgrade your repository. However, product features introduced in the latest product version might not be available without the repository upgrade. To see whether you need to upgrade your repository for a particular release, see the Release Summary document.

Using database backup utilities, always make a copy of your existing repository before upgrading. Note that you will upgrade using the original repository (not your backup copy).

The following repository upgrade paths are available:

<table>
<thead>
<tr>
<th>To upgrade from</th>
<th>Procedure</th>
</tr>
</thead>
</table>
| Version 6.5.1, 11.0, 11.0.2, 11.5 | Install this release using one of the following methods:  
• Upgrade your repository during the installation process  
• Upgrade your repository after installing the Designer by running the Repository Manager utility and choosing the Upgrade option. See “Upgrading repositories” on page 72 if you choose this second option. |

Upgrading to a multi-user development environment

To use Data Integrator for controlling changes in a multi-user environment, you must create a central repository in addition to local repositories for each Data Integrator Designer user. However, you do not need to create or link these repositories during the installation process. You can create and link central and local repositories at any time using the Repository Manager and Data Integrator Designer.

For more information on central repository connection restrictions, see “Determine component distribution” on page 50. For information about the multi-user development environment and how local and central repositories are used, see Chapter 5, “Multi-user development,” in the Data Integrator Advanced Development and Migration Guide.
Upgrading your Data Integrator system

When moving to a new product version, upgrade your test or development environment before upgrading your production environment.

To install a new product version on a computer hosting an existing version, first uninstall the old version. Note that uninstalling does not remove your custom files (configuration files, job logs, and job launch files), so after you install the new version, you have two options for handling the old directory and custom files:

• To create new configurations in your new version, manually delete the old directory and its files
• To use old configurations in the new version, transfer specific files from the old directory to your new Data Integrator directory

See “Using configurations from a previous version” on page 68 for details.

Note: The procedure in the following section directs you to follow instructions in “Running the installation program” on page 76. These instructions explain how to use the Data Integrator installation program (Setup.exe).
Business Objects recommends that while upgrading Data Integrator you do not use the installation program to reconfigure an Access Server. Instead, after installing the Designer and required repositories, Job Servers, and Access Servers, return to this chapter and continue. Use the explicit instructions in this chapter as your guide for upgrading Data Integrator.

Using configurations from a previous version

If you want to use custom configurations from a prior version of the product:

1. Move the DSConfig.txt file, from the bin subdirectory, into a newly created “dummy” installation directory structure before installing the new version.

   Example “dummy” directory structure:
   
   D:/Program Files/Business Objects/Data Integrator 6.1/bin/DSConfig.txt

   During the installation process, Data Integrator will overwrite the “dummy” directory structure with the new installation structure, merging custom settings (such as repository and Access Server connections added to the Administrator) from your old DSConfig.txt file into the new DSConfig.txt file.

2. Also, before installing the new version, manually move the following subdirectories out of your installation directory.
Upgrading your Data Integrator system

3. If your current installation includes support for real-time message handling, then when you configured an Access Server (using the Data Integrator Server Manager) you specified a location for each Access Server configuration directory. If those directories are in the Data Integrator installation directory make a copy of each Access Server configuration directory.

Save your current copy until after you test the upgrade and confirm that your new system is working as expected. When you merge the old DSConfig.txt file with the new one, Data Integrator should find the Access Server configuration directories. If not, use the Server Manager to point to the backup Access Server directories.

4. Uninstall the existing product.
   - In Windows, use the Add/Remove Programs utility.
   - In UNIX see “Uninstalling Data Integrator” on page 147.

5. Install the new product then move the content of the old Conf and Log subdirectories into the new subdirectories.

Uninstall existing product version(s)

Before installing Data Integrator on a system, make sure to remove all previously installed versions of the product from that computer. If this is a new installation, skip this section and go to “Install a new version” on page 70.

► Before installing a new version

1. Review Release Notes for the version of Data Integrator you will be installing.

2. Use your database backup utilities program to back up all existing repositories.

3. Open the Server Manager tool.

4. Make note of the port number used by each existing Access Server and Job Server.
Because these port numbers are part of the server configuration, use the same port numbers to configure Job Servers and Access Servers after the upgrade. If running more than one Job Server or Access Server on a single machine, assign different port numbers to each. Port numbers for each installed component must be unique.

<table>
<thead>
<tr>
<th>Server instance</th>
<th>Default communication port</th>
<th>Example configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access Server #1</td>
<td>4000</td>
<td>4000</td>
</tr>
<tr>
<td>Access Server #2</td>
<td>4000</td>
<td>4001</td>
</tr>
<tr>
<td>Administrator</td>
<td>28080</td>
<td>28080</td>
</tr>
<tr>
<td>Job Server #1</td>
<td>3500</td>
<td>3500</td>
</tr>
<tr>
<td>Job Server #2</td>
<td>3500</td>
<td>3501</td>
</tr>
<tr>
<td>Job Server #3</td>
<td>3500</td>
<td>3502</td>
</tr>
</tbody>
</table>

5. Close the Server Manager tool.

6. Open your Windows Services panel and stop all Data Integrator Services (Data Integrator Service and the Data Integrator Web Server).
   You can use the Task Manager to verify that no Data Integrator-related processes (processes beginning with “al_”) are running.

7. Uninstall the existing version of the product.
   To uninstall Data Integrator from a Windows operating system, go to Start > Settings > Control Panel > Add/Remove Programs (or Change/Remove Programs), select the product application, and click Remove.

8. Log off of your computer then log back on to refresh the environmental variable.

9. Follow the instructions in the next section, “Install a new version”.

Install a new version

Log off of your computer then log back on (or restart the computer) to refresh the environmental variable before installing this product.

► To install a new version of Data Integrator

1. Review Release Notes for the version of Data Integrator you will be installing.
2. Use the Data Integrator installation program to install the new Data Integrator version. Do not configure an Access Server at this time. Follow the instructions in “Installing the Designer and Servers” on page 77. When finished, return to this page and proceed with step 3.

3. Restart the computer when prompted by the installation program.

   a. From the Start menu, select Programs > Business Objects > Data Integrator > Server Manager.
   b. In the Data Integrator Server Manager Utility window, click Edit Access Server Config.
   c. In the Access Server Configuration Editor window, click Add.
   d. In the Access Server Properties window, enter the name of the Access Server directory from step 5; refer to the port numbers mentioned in step 4. No parameters are required. Click OK.
   e. To configure more than one Access Server on this computer, repeat the previous step. When you are finished adding Access Servers, click OK.
   f. In the Data Integrator Server Manager Utility window, click Restart.

5. Verify that Data Integrator processes are running.
   In the Windows Task Manager, click the Processes tab, and look for:
   - al_jobserver.exe
   - al_jobservice.exe
   - AL_AccessServer

6. Install the new version of Business Objects Client libraries on the computers where they are used.
   See “Installing Message Client libraries” on page 107.
   If you are upgrading your Message Client library, you must stop your Web application, install the Message Client library files, then restart your Web application computer.

7. Upgrade or create a repository in the Repository Manager.
   Go to Start > Programs > Business Objects > Data Integrator > Repository Manager.
   See “Upgrading repositories” on page 72 for details.
Upgrading repositories

After installing a new version of Data Integrator, you can create new repositories or upgrade existing repositories. To associate an existing repository with your new installation of Data Integrator, you must upgrade that repository.

Before upgrading repositories with the Repository Manager:

- Back up each repository that you intend to upgrade using an external database backup utility. For more information, see your database documentation.
- Install the new version of Data Integrator Designer

To upgrade a repository

1. From the Start menu on the computer where you installed the Designer, select Programs > Business Objects > Data Integrator > Repository Manager.
2. Enter the repository connection information for your original repository in the Repository Manager window.
   
   **Note:** Do not attempt to upgrade the backup copy of your repository or you will experience upgrade errors.
3. Click **Get Version**.
   The Repository Manager displays the version number recorded in the repository.
4. Click **Upgrade**.
   The Repository Manager converts the pre-existing repository to the format required by the new version of Data Integrator and adds metadata for new and changed objects.
5. Repeat steps 2 through 4 for each repository you want to upgrade.
   
   **Note:** Corresponding local and central repositories must have the same Data Integrator version.
6. Click **Close**.
   
   **Note:** If you need to create or upgrade multiple repositories, use the RepoManBatch.exe utility. For more information, see “Creating or upgrading repositories in batch mode” on page 97.
After upgrading Data Integrator

Upgrading requires you to re-establish the overflow directory for your bulk loader options. Overflow directories may have been specified as target table options or as part of the datastore definitions.

In addition, run tests of your production jobs to ensure that your existing designs continue to run as expected in the new version of Data Integrator. When you are confident that the new version of Data Integrator performs as well as or better than the previous version, consider upgrading your production environment.

For tips, tricks, and solutions to any recent upgrade issues, go Business Objects Customer Support Online, and see the Data Integrator Advanced Development and Migration Guide.

Unsuccessful upgrade

Errors that prevent installation progress (for example an incorrect server name, user name, or password) yield immediate error messages.

For more information about troubleshooting installation problems, see “Recovering from installation errors” on page 99.

Successful upgrade

A “successful completion” message verifies successful Data Integrator installation.

The LINK_DIR system variable is defined during the Data Integrator installation. Its value is set to the location of the directory in which you installed Data Integrator.
Installing Data Integrator on Windows Systems
Installing on Windows

The Windows installation program:

- Copies the files from the installation CD to their designated locations
- Installs Data Integrator Service as a Windows service
- Prompts you to configure repositories, Access Servers, and Job Servers (although these can also be configured after installation)

This chapter contains the following topics:

- Running the installation program
- JMS and SalesForce Interface Integration
- Connecting the Data Profiler
- Installing and Configuring the Metadata Integrator
- Configuring repositories after installation
- Configuring Job Servers or Access Servers after installation
- Recovering from installation errors
- Verifying connectivity
- Updating licenses
- Installing Message Client libraries
- Using the Message Client library

Running the installation program

You can install the following components on Windows systems:

- Data Integrator Designer
- Data Integrator Job Server
- Data Integrator Access Server
- Data Integrator Administrator

Run the installation program to install all components or a subset. What you choose to install will depend on how you distribute the components across computers. See "Determine component distribution" on page 50. You can run the program for Installing the Designer and Servers.

Errors that prevent installation progress (for example, an incorrect server name, user name, or password) yield immediate error messages. For information about solving installation problems, see "Recovering from installation errors" on page 99.
Installing the Designer and Servers

Before installing Data Integrator components:

- Review the Release Notes.
- Save your license file to an appropriate directory.
- On Job Server hosts, ensure you can connect from an RDBMS SQL tool (such as Oracle SQL*Plus or DB2 Script Center) to the repositories that the Job Servers on that host will access.
- On Data Integrator Administrator hosts, identify a free port number for the Data Integrator Administrator browser interface. By default, the installation program uses port number 28080.

**Note:** The Data Profiler installs automatically when you install Data Integrator. To use the Data Profiler, you must define the profiler repository and configure the profiler server. For details, see “Connecting the Data Profiler” on page 90.

To select installation options and copy files

1. Log on to your computer using an account with local Windows administrator privileges and access to your network.

2. Insert the product Installation CD into your CD-ROM drive (if the installer does not automatically open, open Autorun.exe from the top level of the CD contents).
   
   Or, if you downloaded Data Integrator from Electronic Software Delivery, open the Setup.exe file.
   
   The main installation window appears with several options.

3. Click **Install Data Integrator**.

   If a previous version of the product exists on your computer, a message appears reminding you to stop all Data Integrator components and stop the Data Integrator services (from the Windows Services dialog box) before continuing.

4. If existing Data Integrator components and/or services are running, stop them and click **Yes** to continue the installation.

   The User Information window appears showing your computer’s host ID. You may want to note your host ID.

5. Enter your information in the **Name** and **Company** boxes. Click **Next**.

6. In the License Agreement window, read the software license agreement.

7. Click **Yes** if you agree to the terms. You can also **Print** the document for your records.
8. In the Data Integrator Location window, indicate a directory into which Data Integrator will be installed.
   The default is C:\Program Files\Business Objects\Data Integrator. Accept the default or browse to choose a different directory. Click **Next**.
   **Note:** This documentation assumes the Data Integrator Directory is C:\Program Files\Business Objects\Data Integrator.

9. In the Data Integrator License Information window, enter or **Browse** to select the folder that contains your Data Integrator license file. (See “Data Integrator licenses” on page 57 for information on obtaining your Data Integrator license file.)
   Click **Next**.

10. In the Select Components window, select one or more of the following Data Integrator components to install on your computer:
   - Designer (includes the license extensions that you purchased)
   - Interfaces (Includes JMS and Salesforce.com. For complete details on installing this integrated component, see “JMS and SalesForce Interface Integration” on page 79 of this section.)
   - Job Server (includes the adapter options that you purchased)
   - Access Server
   - Management Console (includes Administrator, Impact and Lineage Analysis, Operational Dashboards, Data Quality Dashboards, and Auto Documentation). metadata reporting tool, Web server and Tomcat server options.)
   - Data Integrator Metadata Integrator (only selectable if you have Central Management System installed on your computer)
   - Technical Manuals (includes the Release Summary, Release Notes, and Tutorial)

   **Note:**
   - To use the Data Profiler, you must install a Job Server (to which you associate the profiler server), the Administrator (that manages the profile data and tasks), and the Designer (from which you submit profile tasks and view the profile data).
   - The Data Integrator Web Server Tomcat servlet engine automatically installs to run Web Services. However, you can also select an existing (previously installed) Tomcat instance for the Administrator rather than installing a new one with Data Integrator. With this option, Data Integrator web applications can use a previously-installed Tomcat instance and you need not manage multiple Tomcat
instances (For example, you may already have a Tomcat instance installed for BusinessObjects Metadata Manager or BusinessObjects Composer). If you want to use an existing instance of the Tomcat server, choose the **User installed Tomcat** option and browse for your Tomcat directory. Data Integrator automatically validates the location of your existing Tomcat server. If the Tomcat server location is invalid, the install program displays an error message.

Click **Next**.

11. In the Select Program Folder window, accept or edit the program directory, and click **Next**.

12. In the Start Copying Files window, review your configuration settings and if correct, click **Next**.

   The Setup Status window displays progress in copying files. The installer creates a system variable, LINK_DIR, that defines the path used by the Data Integrator components.

13. In the Data Integrator Repository Manager window, decide if you want to create or upgrade a Local, Central, or Profiler repository now or later.

   - To defer creating or upgrading repositories, click the second option to continue.
   - Otherwise click the first option and proceed to "To create or upgrade repositories" on page 81.

14. If Central Management Server (CMS) exists on the same computer that you are installing Data Integrator, the Metadata Integrator window appears. This window asks if you want to configure the Metadata Integrator now or later. Note that you can configure the Metadata Integrator later with the **Start > Programs > Business Objects > Data Integrator > Metadata Integrator** option.

   - To keep the default option that skips configuring the Metadata Integrator, click **Next** and proceed to "To enter locale information" on page 82.
   - To configure Metadata Integrator now, select **Configure Metadata Integrator**, click **Configure**, and proceed to "Configuring the Metadata Integrator" on page 94.

**JMS and SalesForce Interface Integration**

In previous versions of Data Integrator, the JMS and SF.com Interfaces were installed via a separate installation process from your Data Integrator installation. Hence, if you wished to use the JMS and SF.com Interfaces, these Interfaces were installed after you installed Data Integrator. However,
the installation of these interfaces is now an option you may choose during the installation of Data Integrator. These interfaces are now integrated with Data Integrator as optional components you select during installation.

Thus, during your Data Integrator installation, you can choose to keep your existing, previously-installed interfaces, or, when you select the Data Integrator, you may now choose the new, integrated interfaces as component from the appropriate install screen.

Following are all of the different Interface scenarios you will encounter when installing Data Integrator:

1. The Interface component is selected by default along with the other components:
   a. If you have the Interfaces previously installed on the machine, then a message box appears that prompts you to either retain the existing, previously-installed Interfaces or to install the new interfaces that are now integrated with Data Integrator.
   b. Or, alternatively, if the Interfaces are not already installed, the installer will automatically install them.

2. The Interface component is not selected while all the other components are selected:
   a. The Interfaces are not installed, and the installer will not check to see if the Interfaces already exist (since as Interface component is not selected).
   b. If the Interfaces are already installed, Data Integrator will retain them on your machine.
   c. If the Interfaces are not installed, the Interface component is not available after installation (as they were in previous versions of Data Integrator).

3. The Interface component is selected. The installer automatically selects the Job Server, Management Console, and Access Server options, since they are dependent components of the Interfaces. If you unselect any of these dependent components, the installer will not force their select.
   a. If the Interfaces are already installed, a message box prompts you to select YES or NO to decide to retain the existing, previously-installed interfaces or to install the new, integrated component interfaces.
   b. If the Interfaces are not already installed, then the Interfaces and the selected, dependent components are installed.

4. The Interface component is the only selected component:
a. If the Interfaces are already installed, a message box prompts you to select YES or NO. “Yes” installs the new set of Interface, while “No” invokes the message box: “Component not selected” since you chose to retain the existing interfaces and chose no to install any other components. The Installer then returns to the component selection screen.

b. If the Interfaces are not previously installed, then only the Interface component is installed.

For the complete documentation see the Data Integrator Adapter for JMS User Guide and the Data Integrator Salesforce.com Adapter Interface Guide.

Creating or upgrading repositories

To create or upgrade repositories

1. If you are creating a new repository, ensure that you created a database to use for each repository. (See “Repository database information” on page 62 for information to create local, central, or profiler repositories in various types of databases.)

2. In the Repository Manager window, select the database type of your repository.

3. Complete the information for your database type.

4. Enter the user name and password that you want to use for your repository.

5. For Repository type, select one of the following:
   - Local — Keep this default value to store definitions of Data Integrator objects in your local repository.
   - Central — Select this value to store definitions of Data Integrator objects in a central repository for multiple user users.
   - Profiler — Select this value to store information generated by the Data Profiler for determining the quality of your data.

6. If you are creating a new repository, click Create. If you are upgrading an existing repository, click Upgrade.

7. If you want to create another repository, repeat steps 1 through 6.

8. When you are done creating repositories, click Close.

Note: If you created a profiler repository, you must associate it to a Job Server (see “Configuring Job Servers” on page 82 or “Configuring Job Servers or Access Servers after installation” on page 98) and connect it
Running the installation program

to the Administrator (see “Connecting repositories to the Administrator” on page 109 of the Data Integrator Management Console: Administrator Guide).

Entering locale information

► To enter locale information

1. In the Locale window, accept the default language, territory, and code page settings (same as the host’s computer) or select others and click OK.

   Note: Here the locale (language, territory, and code page) determines how the Data Integrator Job Server and engine process data. Data Integrator uses international standards for language and territory codes. A code page specifies the encoding for a particular character set. Asian scripts require multi-byte code pages (typically two-byte characters). For more information, see Chapter 9, “Locales and Multi-Byte Functionality,” in the Data Integrator Reference Guide.

2. The installation program displays the Data Integrator Server Manager Utility window:

   • If you did not select Data Integrator Job Server in the Product Components window or do not want to configure Job Servers now, skip to “Configuring Access Servers” on page 87.
   • If you selected Data Integrator Job Server in the Product Components window and want to configure Job Servers now, proceed to the next section, “Configuring Job Servers”.
   • If you want to configure run-time resources for Job Servers now, proceed to section “Configuring Job Server run-time resources” on page 86.

Configuring Job Servers

► To configure Job Servers

1. In the Data Integrator Server Manager window, click Edit Job Server Config.

2. In the Job Server Configuration Editor window, click Add to add a Job Server.
3. In the Job Server Properties window, enter information about the Job Server.

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Job Server name</td>
<td>Enter a name that uniquely identifies the Job Server. The Job Server name cannot be changed.</td>
</tr>
<tr>
<td>Job Server port</td>
<td>Enter the TCP/IP port that the Job Server uses to receive commands from the Designer and the Access Server. If a computer hosts multiple Job Servers, each Job Server must have a unique port number. Choose a port number for a server that is not used by another process on the computer. If you are unsure of which port number to use, use the default port number and increment it for each additional Job Server you configure.</td>
</tr>
<tr>
<td>Support Adapter and SNMP communication</td>
<td>Select this check box if the Job Server manages adapters or if this Job Server will be the one to communicate with an SNMP agent. Each computer that hosts adapters and an SNMP agent must have exactly one Job Server designated to manage them.</td>
</tr>
<tr>
<td>Communication port</td>
<td>Enter the port number that the Job Server uses for communicating with adapters or an SNMP agent. The default is 4001.</td>
</tr>
<tr>
<td>Enable SNMP</td>
<td>Enables this Job Server to send events to the SNMP agent. For more information, see &quot;SNMP support&quot; on page 548 of the Data Integrator Designer Guide.</td>
</tr>
</tbody>
</table>

4. Under **Associated Repositories**, enter the local and profiler repositories to associate with this Job Server. Every Job Server must be associated with at least one local repository.
   a. Click **Add** to associate a new local or profiler repository with this Job Server.
   b. Under **Repository Information**, select the **Database type** and enter the required information for your database type.
   c. Enter the user name and password that you want to use for your repository.
      
      **Note:** Do not enter a blank or invalid password; this may prohibit you from logging on to Data Integrator.
   d. Select the **Default repository** check box if this is the default repository for this Job Server. You must specify exactly one default repository.
      
      **Note:** Do not select the **Default repository** check box if this is a profiler repository.
e. Click Revert to undo these entries.

f. Click Apply to save your entries and associate the repository with the Job Server.
   The associated repository updates with the Job Server's computer name and port number.

5. Edit and delete associated repositories as necessary.
   a. Select a repository and click Edit to change the repository's default setting.
      • Under Repository Information, enter the password.
      • Select or clear the Default repository check box, indicating whether this is the default repository for the Job Server.
      • Click Apply to save the change, or click Revert to make no changes.

   b. Select a repository and click Delete to remove an associated repository.
      • Under Repository Information, enter the password.
      • Click Apply to remove this associated repository, or click Revert to make no changes.

6. When you are finished adding all associated repositories, including one default, click OK.

7. From the Job Server Configuration Editor window, complete any other necessary steps. You can:
   • Add another Job Server
      a. Click Add.
      b. Repeat steps 3 through 6.
   • Change a Job Server's configuration
      a. Select the Job Server.
      b. Click Edit.
      c. Repeat steps 3 through 6.
   • Remove a Job Server
      a. Select the Job Server.
      b. Click Delete.
Installing Data Integrator on Windows Systems

Running the installation program

**Note:** If the Job Server has associated repositories, you must first delete those and then click **OK** before you can delete the Job Server.

- Resynchronize your Job Server configuration with a local repository
  - a. Select the Job Server.
  - b. Click **Resync with Repository**.
  - c. In the Job Server Properties window, select an associated local repository.
  - d. Click **Resync**.
  - e. Click **Yes** when the message appears to update this associated repository with this local machine information.
  - f. Under **Repository Information**, enter the local repository password.
  - g. Click **Apply**.
  - h. Click **OK** on the Job Server Properties window.

Cases when you must resynchronize the Job Server and local repository include:

- You have uninstalled Data Integrator and are reinstalling the same Data Integrator version without creating a new local repository.
- You created a new local repository using the Repository Manager after installing Data Integrator.

If you resynchronize your Job Server configuration with a local repository, you must reassociate this repository with the Administrator and the metadata reporting tool. See “Connecting repositories to the Administrator” on page 109 of the Data Integrator Management Console: Administrator Guide.

8. When you have configured all the Job Servers you want, click **OK**.

9. You return to the Data Integrator Server Manager window:

- If you want to configure run-time resources for Job Servers now, proceed to the next section “Configuring Job Server run-time resources”.
- If you did not select Data Integrator Administrator in the Select Components window or do not want to configure Access Servers now, skip to “To restart servers” on page 88.
- If you selected Data Integrator Administrator in the Select Components window and want to configure Access Servers now, proceed to the section “To configure Access Servers” on page 87.
Configuring Job Server run-time resources

1. Open the Data Integrator Server Manager and find Runtime resources configured for this computer.

2. For the Specify a directory with enough disk space for pageable cache option, you can accept the default directory (LINK_DIR\Log\PCache) or click the ellipses button to browse to a different directory.

   **Note:** For memory-intensive operations such as Group By, Order By, and Detailed profiling, specify a pageable cache directory that:
   - Contains enough disk space for your data. To estimate the amount of space required for pageable cache, consider factors such as:
     a. Number of concurrently running jobs or data flows
     b. Amount of pageable cache required for each concurrent data flow
   - Exists on a separate disk or file system from the Data Integrator system and Operating system (such as C: drive on Windows, root file system on UNIX).
   - Limits the disk space Data Integrator data flows consume. The Data Integrator pageable cache uses all available disk space on the file system that contains the pageable cache directory. So, to limit the disk space that Data Integrator data flows consume, create a file system (or partition on Windows) with a limited size. Use the new file system (partition on Windows) as the pageable cache directory. Data Integrator uses this directory:
     - For pageable caching, the default cache type for data flows. For more information, see "Caching data" on page 58 of the Data Integrator Performance Optimization Guide.
     - When Data Integrator selects a file transfer type and Automatic is specified in the Data_Transfer transform. For details, see "Data_Transfer" on page 273 of the Data Integrator Reference Guide.

3. For the Peer-to-peer options, change the values for Start port and End port to restrict the number of ports used by Data Integrator. The default values for Start port and End port are 1025 and 32767, respectively.
Data Integrator uses these ports for peer-to-peer communications when sending data between data flows or sub data flows that are running on different Job Servers. For more information, see “Using grid computing to distribute data flows execution” on page 104 of the Data Integrator Performance Optimization Guide.

4. After you configure run-time resources:
   - If you did not select Data Integrator Administrator in the Select Components window or do not want to configure Access Servers now, skip to “To restart servers” on page 88.
   - If you selected Data Integrator Administrator in the Select Components window and want to configure Access Servers now, proceed to section “To configure Access Servers” on page 87.

**Configuring Access Servers**

**To configure Access Servers**

When you configure the location for an Access Server installation, Data Integrator creates space for the Access Server log files.

1. In the Data Integrator Server Manager window, click **Edit Access Server Config**.
2. In the Access Server Configuration Editor window, click **Add**.
3. In the Access Server Properties window, enter the Access Server configuration information.

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Directory</td>
<td>The location of the log files for this instance of the Access Server. Click the ellipses button to browse to the Log directory under the directory where you installed Data Integrator. Do not change this value after the initial configuration.</td>
</tr>
<tr>
<td>Communication Port</td>
<td>The port on this computer that the Access Server uses to listen for incoming messages from clients. Make sure that this port number is unused and is unique for each Access Server.</td>
</tr>
<tr>
<td>Parameters</td>
<td>You can leave this box blank. Access Server parameters are described in .</td>
</tr>
<tr>
<td>Enable Access Server</td>
<td>An option to control the automatic start of the Access Server when the Data Integrator Service starts.</td>
</tr>
</tbody>
</table>
Installing Data Integrator on Windows Systems

Running the installation program

Click OK. You return to the Access Server Configuration Editor window:

4. Optionally, perform further actions:
   • To change an Access Server’s configuration:
     In the Access Server Configuration Editor window, highlight the Access Server, click Edit, and repeat step 3.
   • To remove an Access Server:
     In the Access Server Configuration Editor window, highlight the Access Server and click Delete.

5. After you configure your Access Servers, click OK to return to the Data Integrator Server Manager window.

Continue with the next section, “To restart servers”.

Restarting Servers

To restart servers

1. In the Data Integrator Server Manager window, identify the account information that the Data Integrator Service uses to access system services. Click Restart. The Data Integrator Service starts.

   Note: You must specify a Windows user account and password to start the Data Integrator Service and access other Data Integrator-related applications on your network. The installation process automatically uses the current Windows user account to install the service. However, Business Objects recommends that you not use your personal Windows user account to run the Data Integrator Service. You must configure this account with the right to “log on as a service.”

2. In the Information window, click OK.

   The Data Integrator Web Server starts. When the Installation window informs you that installation is complete, click OK.

3. If your product CD is still in the CD-ROM drive, remove it.

4. In the Install Shield Wizard Complete window, click Yes to restart your computer, or click No to restart your computer later. Click Finish.

   Note: To ensure that items like Web Services and adapter instances work properly with Data Integrator, Business Objects recommends that you restart your computer as soon as possible after completing the installation process.

To configure SMTP e-mail

The Server Manager is also where you specify SMTP server settings for the smtp_to e-mail function. For details, see “To define and enable the smtp_to function” on page 558 of the Data Integrator Reference Guide.
To reset the ports for the Data Integrator Web server

**Note:** The Data Integrator Web Server uses a Tomcat server as a servlet engine. When you install the Administrator, you also automatically install the Data Integrator Web Server and its service. The Web Server service uses port 22828 to communicate with the Web Server. The Web Server uses port 28080 as its HTTP port. If either port is used by another application, you must change them.

1. Go to the Data Integrator Directory\ext\WebServer\conf directory and open the server-di.xml file.
2. Locate the tag:
   ```xml
   <Server port="22828", shutdown = "shutdown" debug = "0">
   Change the value of this port.
   </Server>
   ``
3. Locate the tag:
   ```xml
   <Connector className="org.apache.catalina.connector.http.Http.service.Connector" port ="28080"/>
   Change the value of this port.
   ```
4. Restart the Data Integrator Service and Data Integrator Web Server.

**Note:** You can select an existing (previously installed) Tomcat instance for the Administrator rather than installing a new one with Data Integrator. Most EIM Web applications including Management Console Administrator, Metadata Manager, and Composer can now use the same Tomcat server.

---

**Verifying that Job and Access Servers are running**

To verify that Job Servers are running, check in the Windows Task Manager **Processes** tab for:
- `al_jobservice.exe` (represents the Data Integrator service)
- `al_jobserver.exe` (one per Job Server)
- `aL_AccessServer` (one per Access Server)

If you do not see all the processes expected, check for error messages in these log files:
- **Job Server logs are in**
  
  Data Integrator Directory\log\JobServerName\server_eventlog.txt

- **Access Server logs are in**
  
  AccessServerPathName\error_mm_dd_yyyy.log

To perform a connectivity test for the Access Server, see “Verifying connectivity” on page 100.
Installing Data Integrator on Windows Systems

Connecting the Data Profiler

Starting Data Integrator services automatically

The Data Integrator Service and Data Integrator Web Server service start automatically when the computer restarts. The Data Integrator Service then starts Job Servers and Access Servers on the restarted computer.

You can change service startup to Manual in the Windows Services window.

Logging in to the Administrator

After an Access Server is running, you can configure it using the Data Integrator Administrator. From the Start menu, select Programs > BusinessObjects Data Integrator version > Data Integrator Management Console.

Log in to Data Integrator Administrator using the default name (admin) and password (admin). See the Data Integrator Administrator Guide for more information.

Connecting the Data Profiler

The Data Profiler installs automatically when you install Data Integrator. To use the Data Profiler, perform the following steps:

• Define a profiler repository in which the Data Profiler will store the generated profile data. See “Creating or upgrading repositories” on page 81.

• Associate the profiler repository with a Job Server on which the profiler tasks will run. See “Configuring Job Servers” on page 82.

• Connect the profiler repository to the Data Integrator Administrator which will manage the profile data and profiler tasks. See “Connecting repositories to the Administrator” on page 109 of the Data Integrator Management Console: Administrator Guide.

• Connect the profiler server to the Designer from which you submit profiler tasks and view the generated profile data. See “Connecting to the profiler server” on page 336 of the Data Integrator Designer Guide.

• If you plan to use Detailed profiling or Relationship profiling, ensure that you specify a pageable cache directory that contains enough disk space for your data and that you place on a separate disk or file system from the Data Integrator system. See “Configuring Job Server run-time resources” on page 86.
Installing and Configuring the Metadata Integrator

The Metadata Integrator reads through Crystal Reports, Business View, Universe, Desktop Intelligence document, and Web Intelligence document definitions on a Central Management Server (CMS) to find the tables and columns used by the reports, views, and documents. The Metadata Integrator stores the information in Data Integrator repository for impact analysis and lineage analysis. You can install the Metadata Integrator on multiple CMS systems and store the report information in one Data Integrator repository.

This section describes the following topics:
- Installing Metadata Integrator
- Installation tips and troubleshooting
- Configuring the Metadata Integrator

Installing Metadata Integrator

You can install the Metadata Integrator on multiple CMS systems and store the report information in one Data Integrator repository.

Prerequisites

Metadata Integrator requires the following prerequisites:
- Runs on Windows only
- Must have the BusinessObjects Enterprise client installed

Installing on the same computer as Data Integrator

If the Central Management Server (CMS) exists on the same computer as Data Integrator, the Data Integrator installation wizard installs the Metadata Integrator by default.

You have the option to configure the Metadata Integrator during Data Integrator installation, or you can defer configuration. For configuration details, see “To configure the Metadata Integrator” on page 94”.

Installing on a different computer than Data Integrator

In many cases, your Central Management Server resides on a separate computer than Data Integrator. Use the following procedure to install the Metadata Integrator when Data Integrator is not on the same computer.
To install Metadata Integrator on a different computer than Data Integrator

1. Insert the Data Integrator Installation CD into your CD-ROM drive (or download from the Business Objects web site).

   The main installation window appears with several options.

2. Click **Install Data Integrator**.

3. In the Location window, indicate a directory into which Metadata Integrator will be installed. The default is:

   c:\Program Files\Business Objects\Metadata Integrator

   Accept the default or browse to choose a different directory. Click **Next**.

4. In the License Agreement window, click Yes.

5. In the Data Integrator License Information, browse to the directory where you stored your license key.

6. In the Data Integrator Components window, keep the check mark for Metadata Integrator and remove the check marks for all of the other Data Integrator components.

7. In the Metadata Integrator Manager window, decide if you want to configure the Metadata Integrator now or later.

   • The default option is to skip configuring the Metadata Integrator. You can configure the Metadata Integrator later with the **Start > Programs > Business Objects > Data Integrator > Metadata Integrator** option. If you want to keep the default option, click **Next**.

   • Otherwise, select the first option, click **Configure**, and proceed to To configure the Metadata Integrator.

### Installation tips and troubleshooting

Below are several Metadata Integrator installation tips and problems that you can troubleshoot:

#### Configuration fails during installation

If the CMS is unavailable during the Metadata Integrator installation, or if the CMS version has changed since installation, the Metadata Integrator will not run successfully. In these cases, the Metadata Integrator will report an error such as the following when launched:

java.lang.NoClassDefFoundError:
com/crystaldecisions/sdk/exception/SDKException
at com.acta.crystalrepo.config.crConfigFrame.setupWizardPages(crConfigFrame.java:84)
at com.acta.crystalrepo.config.crConfigFrame.run(crConfigFrame.java:73)
Installing Data Integrator on Windows Systems

Installing and Configuring the Metadata Integrator

6

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at com.acta.crystalrepo.config.crConfigLaunch.main(crConfigLaunch.java:68)Exception in thread "main"

To reconfigure the Metadata Integrator environment

1. In <LINK_DIR>/ext/cmsCollector, run cmsSetEnv.cmd to reset all command files to point to the installed version of CMS.
2. Run cmsConfig.cmd to update any configured Metadata Integrators to point to the installed version of CMS.

Changing Data Integrator repository connection information

To change the Data Integrator repository connection information supplied during configuration, run the configuration utility:

LINK_DIR/ext/cmsCollector/cmsConfig.cmd

Metadata Collector fails to start with java version error

If the Metadata collector indicates the run has failed, click the run instance to view the error log. If the error indicates the java run-time environment cannot be found or is the wrong version, you must define the JAVA_HOME environment variable.

To define the JAVA_HOME environment variable, add the environment variable and reboot your machine for it to take effect. Java 1.3.1 or higher is required. JAVA_HOME must be set to the java run-time root directory. For example:

JAVA_HOME=C:\Program Files\Java\j2re1.4.2_03

Metadata Collector fails to start

If the Metadata collector indicates the run has failed, click the run instance to view the error log. The error indicates you do not have the permission to run the program.

Press the Process tab and select Logon to determine the user name and password used to run the collector. To check the permissions, press the Rights tab to see what permissions are set. If you do not have permission to run programs, check with your Crystal Administrator to get the correct permission.

Metadata Integrator runs but report information is missing

From the Crystal Administrator console, click the run instance for the Metadata Integrator even though it says the run was successful. The collector will only be in a failed state if Crystal is unable to start the program. There is no mechanism to get run-time errors listed as a failed run. The work around is to look at successful runs to see if any errors are reported.
Configuring the Metadata Integrator

Invoke the Metadata Integration Configuration window with one of the following actions:

- During Data Integrator installation on the computer where CMS resides, click **Configure** on the Metadata Integrator Manager window.
- During installation for the Metadata Integrator when CMS is installed on a different computer than Data Integrator, click **Configure** on the Metadata Integrator Manager window.
- If you deferred the configuration or you want to modify the configuration, use the **Start > Programs > Business Objects > Data Integrator > Metadata Integrator** option. This **Start** menu option exists when you install either Data Integrator or the Data Integrator Metadata Integrator. For more information, see “Installing on a different computer than Data Integrator” on page 91.

To configure the Metadata Integrator

1. When the Metadata Integrator Configuration window displays, choose one of the following options:
   a. To add a new Metadata Integrator, select the **Add Metadata Integrator** option and click **Next**.
      Configure multiple Metadata Integrators when you have multiple CMS servers. For example, one CMS server might manage your Crystal Reports, and a different CMS server manages your Business Objects Documents (Desktop Intelligence or Web Intelligence).
   b. To change an existing Metadata Integrator, select the **Edit Metadata Integrator** option, select the name of the Metadata Integrator in the drop-down list, and click **Next**.
   c. To delete a Metadata Integrator, select the name of the Metadata Integrator in the drop-down list, select the **Delete** option, and click **Next**.
2. On the Business Objects Enterprise window, enter the following CMS connection information. Consult your Business Objects administrator if you need assistance with these values.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configuration Name</td>
<td>Name for this Metadata Integrator configuration. The default name is “Metadata Integrator” followed by a sequential number. For example: Metadeta Integrator 2</td>
</tr>
<tr>
<td>CMS Server Name</td>
<td>Host name of the Central Management Server (CMS) server.</td>
</tr>
<tr>
<td>CMS User Name</td>
<td>The user name to connect to the CMS server to register and execute the Metadata Integrator. If you want a different user to execute the Metadata Integrator, use the Central Management Console to change the rights for the user. See the Business Objects Administrator’s Guide for details.</td>
</tr>
<tr>
<td>CMS Password</td>
<td>The password to connect to the CMS server to register and execute the Metadata Integrator.</td>
</tr>
<tr>
<td>CMS Authentication Mode</td>
<td>The CMS authentication mode. See the Business Objects Administrator’s Guide for available modes.</td>
</tr>
<tr>
<td>CMS Folder Name</td>
<td>The folder in which the CMS system adds the Metadata Integrator as a program object. This folder is only visible in the Business Objects Central Management Console. The default value is Data Integrator (the wizard creates this folder if it does not exist).</td>
</tr>
</tbody>
</table>

3. Click **Next**.
4. On the Metadata Repository window, enter the following information to connect to the Data Integrator repository. Consult your database administrator if you need assistance with these values.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
</table>
| Database type | The database type of the Data Integrator repository. The available database types are:  
  • DB2  
  • Informix  
  • Microsoft SQL Server  
  • Oracle  
  • Sybase ASE  
  • MySQL |
| Computer Name | Host name on which the Data Integrator repository resides. |
| Database Port | Port number that the Central Management Server (CMS) uses to connect to the Data Integrator repository. |
| Service Name/SID, Database name, Database Name, Connection String, or Database Port and Server | This field requires additional information based on the Database type you select. |
| User name | The login name to connect to the Data Integrator repository. |
| Password | The login password to connect to the repository. |

5. (Optional) Click Test to check the connection to the metadata repository.
6. Click Next.
   The status window for Metadata Integrator Configuration displays.
7. Click Finish.

### Configuring repositories after installation

To check the version, to upgrade, or to create a repository after installation:

1. From the Start > Programs > Business Objects > Data Integrator menu, choose Repository Manager.
2. To check the version of an existing repository, select **Get version**.

3. To create or upgrade repositories, follow the procedure in “Creating or upgrading repositories” on page 81 or in “Creating or upgrading repositories in batch mode” on page 97.

4. To associate a new repository to a Job Server, follow the procedure in “Configuring Job Servers or Access Servers after installation” on page 98.

### Creating or upgrading repositories in batch mode

You can use the executable called `RepoManBatch.exe` (stored in the Data Integrator installation/bin directory) to create or update repositories in batch mode. Specify parameters using a command prompt.

```
Usage:

Flag            Description

-U Repository login user
-P Repository login password
-S Repositories -ccentral -d

For example:

RepoManBatch -UUsa -P -NMicroSoft_SQL_Server -SServer -QJake -c -tecentral -d
or
RepoManBatch -UJake -PJake -NOOracle -Sdbsvr -v
```

<table>
<thead>
<tr>
<th>Flag</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-U</td>
<td>Repository login user</td>
</tr>
<tr>
<td>-P</td>
<td>Repository login password</td>
</tr>
</tbody>
</table>
Configuring Job Servers or Access Servers after installation

To create, edit, or delete Job Servers and Access Servers after installation:

1. From the Start > Program > Business Objects > Data Integrator menu, choose Server Manager.

   The Data Integrator Server Manager Utility window opens. This window shows the Job Servers and Access Servers currently configured to run on your computer.

<table>
<thead>
<tr>
<th>Flag</th>
<th>Description</th>
</tr>
</thead>
</table>
| -S   | Repository server name:  
         • Microsoft SQL Server: database server name  
         • Oracle: database connection name  
         • DB2: data source  
         • Sybase ASE: server  
         • Informix: data source  
         • MySQL: ODBC data source name |
| -N   | Repository database type:  
         • Microsoft_SQL_Server  
         • DB2  
         • Oracle  
         • Informix  
         • Sybase  
         • MySQL |
| -Q   | Repository database name |
| -t   | Repository Type: local, central, profiler |
| -c   | Repository create |
| -u   | Repository upgrade |
| -v   | Repository version |
| -d   | Show Details |
| -a   | Repository security |
2. To create or edit Job Servers, follow the procedure in “To configure Job Servers” on page 82.

3. To edit run-time resources for a Job Server, follow the procedure in “To configure run-time resources for Job Servers” on page 86.

4. To create or edit Access Servers, follow the procedure in “To configure Access Servers” on page 87.

5. In the Data Integrator Server Manager window, click **Restart**.

6. An information window indicates that the Data Integrator Service will restart. Click **OK**.

To configure the Metadata Integrator after installation, see “Configuring the Metadata Integrator” on page 94.

## Recovering from installation errors

Errors that prevent installation progress (for example an incorrect server name, user name, or password) result in an immediate error message describing the problem.

For help with Metadata Integrator installation issues, see “Installation tips and troubleshooting” on page 92.

### Repository problems

Common installation errors include:

- The DBMS connection was lost while building the repository tables. If this happens, run the installation program again.

- There is not enough space available in the database for the repository tables. If this happens, use your DBMS administration tools to allocate more space for the repository and run the installation program again.

If you experience problems when upgrading or creating a repository, you can select the **Show Details** check box before you click **Update** or **Create** again. This option allows you to view the SQL code that Data Integrator uses to perform these operations. The **Show Details** option can help you diagnose problems.
Installing Data Integrator on Windows Systems

Verifying connectivity

Administrator problems

If you cannot log in to the Administrator using the default user name and password, change the Web Server startup properties to a user account instead of a local system account or verify that the local system account has sufficient privileges to run executable files. Then stop and restart the Web Server’s service and try again.

To locate service startup properties for the Web Server

• On Windows 2000 or XP, go to Start > Settings > Administrative Tools > Services, double-click Data Integrator Web Server, and select the Log On tab.

Verifying connectivity

This section describes specific steps that you can follow to test Data Integrator’s real-time features after installation. These step-by-step procedures use sample files available in the Data Integrator installation.

Distributing the test files

The Data Integrator installation and the installation CD include test files to exercise connectivity between each component of the Data Integrator system. To perform the connectivity test, place test files in the appropriate locations on the various computers used in your application.

In this list, the Data Integrator directory represents the location where you installed Data Integrator.

<table>
<thead>
<tr>
<th>Test file</th>
<th>Copy from</th>
<th>Copy to</th>
</tr>
</thead>
<tbody>
<tr>
<td>ClientTest.exe</td>
<td>Data Integrator\Bin</td>
<td>Web client computer, C:\temp</td>
</tr>
<tr>
<td>mny2412d.dll</td>
<td>Data Integrator\Bin</td>
<td>Web client computer, C:\temp</td>
</tr>
<tr>
<td>functor2312d.dll</td>
<td>Data Integrator\Bin</td>
<td>Web client computer, C:\temp</td>
</tr>
<tr>
<td>functor__list2312d.dll</td>
<td>Data Integrator\Bin</td>
<td>Web client computer, C:\temp</td>
</tr>
<tr>
<td>itc2312d.dll</td>
<td>Data Integrator\Bin</td>
<td>Web client computer, C:\temp</td>
</tr>
<tr>
<td>network1712d.dll</td>
<td>Data Integrator\Bin</td>
<td>Web client computer, C:\temp</td>
</tr>
<tr>
<td>pointer2312d.dll</td>
<td>Data Integrator\Bin</td>
<td>Web client computer, C:\temp</td>
</tr>
<tr>
<td>sync2312d.dll</td>
<td>Data Integrator\Bin</td>
<td>Web client computer, C:\temp</td>
</tr>
<tr>
<td>thread2312d.dll</td>
<td>Data Integrator\Bin</td>
<td>Web client computer, C:\temp</td>
</tr>
</tbody>
</table>
Testing a job

When you execute a real-time job from the Designer, it always executes in “test mode” using a file as input and producing a file as output.

The test files include a sample job and data flow that you can use to verify that a real-time job can successfully execute from the Designer. Test files include the XML test input for the flow (the string Hello World) and the corresponding DTD for flow input and output.

This procedure describes how to import, display, execute, and show output for the test flow.

To test a job

1. Start Data Integrator and log into your repository.
   From the Start menu, choose Programs > Business Objects > Data Integrator > Data Integrator Designer from the program group created by the Data Integrator installation. The Designer prompts you for login information associated with your repository database.

2. From the Tools menu, select Import from File.

3. Navigate in the Data Integrator install directory to \ConnectivityTest.

4. Select the test ATL file TestConnectivity.atl and click Open.

5. In the Project menu, select New > Project.

6. Name the project TestConnectivity and click Create.
7. In the Jobs tab of the object library, expand the Real-time Jobs category; then click, drag, and drop Job_TestConnectivity over the TestConnectivity folder in the Project area.

8. In the workspace, click the name of the data flow.

9. In the project area, right-click Job_TestConnectivity and select Execute.

10. In the Execution Properties window, click OK. Data Integrator reads the sample file C:\Temp\TestIn.XML, inverts the order of the two words in the string, and writes the output to the C:\Temp\TestOut.XML file.

11. Read the information in the Job Log window to verify if the TestOut.XML file is correct. Use the job log information to troubleshoot problems.

12. If the job was successful, navigate to the C:\Temp\ directory on the Designer’s computer and open TestOut.xml.
You can display the file in a browser or text editor.

Testing the path from client to service

When your real-time job runs in a normal production environment, you can use it to process a service request from a Web client. In production, Web clients send messages and real-time services receive and process those messages, triggering real-time jobs. Use the Management Console Administrator to set up real-time services.

To process a service request from a Web client

1. Add and start the service in the Administrator.
   The Access Server starts service providers which are instances of jobs associated with the listed services.
2. Send a request from your Web client to the Access Server.
   The Access Server sends a request to the appropriate service provider, then the service provider sends a response to the Access Server. The Access Server returns the response to the Web client.

The following procedures briefly describe how to connect a repository to the Administrator, start an Access Server, configure interfaces among components, and use the provided test Web client to verify that your configuration works.

For more detailed information about working with the Administrator, see the Data Integrator Administrator Guide.
Configuring the Access Server

The Administrator allows you to view the status of services controlled by the Access Server and to change their configuration.

After you install the Access Server, the Data Integrator service automatically launches the Access Server when your computer restarts or when you stop and start the service.

To start the Administrator
1. From the Start menu, choose Programs > Business Objects > Data Integrator > Data Integrator Management Console.
   The Management Console browser opens.
   If it does not appear:
   • Check that the port number is not being used by another application.
   • Use a static IP address instead of the host name to locate the Administrator computer.
2. Log in to the Management Console using the default name (admin) and password (admin).
3. Click the Administrator icon to open the Web Administrator.

To add your repository for Administrator access
1. In the Administrator, select Management > Repositories > Add.
2. Enter your repository connection information and click Apply.

To configure the Access Server to listen for responses from services
1. In the Administrator, add a connection to an installed Access Server by selecting Management > Access Servers > Add.
2. Enter your Access Server's machine name and communication port, select Ping to test the connection, then click Apply.

To add a service
1. In the Administrator’s navigation tree, select Real-time > “Access Server Machine Name: Port” > Real-time Services > Configuration.
2. Click Add.
   The Access Server adds a service to the list (NewService1) and displays the configuration boxes for the new service.
3. Enter the following sample information in the Configuration section for the service.
Accept the default values for the service parameters.

<table>
<thead>
<tr>
<th>Field</th>
<th>Test Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service Name</td>
<td>TestConnectivity</td>
<td>The message type included in the call from the client.</td>
</tr>
<tr>
<td>Job Name</td>
<td>Job_TestConnectivity</td>
<td>Browse jobs.</td>
</tr>
</tbody>
</table>

4. Click **Apply**. The Administrator prompts you to assign a Job Server to the Service.

5. Under Job Servers for Service, click **Add**.

6. If you have one Job Server, the Administrator automatically selects it for you. Click **Apply**. Otherwise, select a Job Server from the list and click **Apply**.

7. Click the **Status** tab.

The Administrator adds the new service (named after the job) and a service provider to the list for this service. In the status row for each service provider, find the computer name and Job Server port where the service provider is running. The process ID for the service provider is related to this invocation of the Job Server.

8. Verify host name and port number for the new service provider.

In the list of service providers, verify that the host name and port for the new service provider correctly indicate the computer where the Job Server is installed and the port that the Job Server is configured to use.

You specified the Job Server port number when you configured the Job Server at installation.

9. In the navigation tree, click **Real-Time Services** to return to the first Real-Time Service Status page.

The name of the Service should be next to a green icon which indicates that the Service started successfully.

When a service starts, the Administrator triggers the Access Server which triggers the Job Server to get job information from the repository. The job registers as a service with the Access Server. The Administrator displays the service status (started).

If the service did not start, you can start it manually from the current page. If the service still will not start, See “Resolving connectivity problems” on page 195 of the *Data Integrator Management Console: Administrator Guide* for help determining the possible cause of the failure.
Web client to Access Server

A Web client opens a connection to the Access Server using a call in the Message Client library. The call includes the host and port information required to make the connection.

The ClientTest executable file provided in the Data Integrator installation incorporates the library calls so you can easily test the connection between the Web client computer and the Access Server.

To process a test request
1. On the computer where your Web client application is installed, send a request for Data Integrator to process.
   Copy the command, C:\Temp\ClientTest.txt and enter it in a command prompt:
   ClientTest -AHost -pPort -Uuser -Ppassword -STestConnectivity -XC:\Temp\TestIn.XML
   where
   Host Identifies the Access Server host computer by name or IP address.
   Port Identifies the port on which Access Server listens for Web client requests.
   user Indicates the user name you specified in the Security section of the Access Server configuration file. The test configuration does not specify a user, but the Client Test utility expects some value. Enter any character.
   password Indicates the password you specified in the Security section of the Access Server configuration file. The test configuration does not specify a password, but the Client Test utility expects some value. Enter any character.
   TestConnectivity Specifies the name of the service that you want to invoke. C:\Temp\TestIn.XML Indicates the location of the sample XML request that will be sent to the Access Server for processing.

2. Look for the response in the command prompt.
   If the correct response displays, your system is configured properly. If an error occurs, see “Monitoring clients” on page 92 of the Data Integrator Management Console: Administrator Guide for assistance debugging the problem.

3. When you are ready to configure the Access Server to run your own services, first stop the Access Server, then restart it.
Further connectivity tests

There are more tests you can run to define that all the connections you will need. For example, you can use the existing Access Server configuration and make changes to the data flow and input files in the sample real-time job. In particular, consider making simple additions to the data flow in the real-time job to check the following connections:

- From job to ERP system
  
  To test this connection, add a source from the ERP system in a data flow of the real-time job and extract a single value to return as a response to the client.

Updating licenses

You can manage Data Integrator licenses on Windows platforms using local licenses.

- To update a license under local license management
  You might need to update a license or upgrade a license from evaluation to permanent.
  1. Replace the old license file (in the Data Integrator install directory’s \license subdirectory) with the new license file.
  2. If you are adding additional Data Integrator components, reinstall Data Integrator.
  3. If you are not adding additional Data Integrator components, simply stop and restart the Data Integrator service.

Installing Message Client libraries

The Message Client libraries support C++, Java, and COM connections between the Data Integrator Web Server and the Access Server.

If you are updating your Message Client library, you must stop your Web application, install the Message Client library files, then restart your Web application computer.

Note: The Java client library is a single library (rather than .class files); find it in LINK_DIR\lib\acta_broker_client.jar.
To install a Message Client library

1. On the computer running the Web application, insert your product installation CD.
   The main Data Integrator installation program starts automatically. When it does, click Exit.

2. From the Message Client sub-directory on the CD, double-click Setup.exe.

3. Select your interface type.
   The Message Client library supports Java, C++, and COM interfaces.

4. In the Message Client Setup window, use Browse to select a location for the Business Objects Client library.
   If you are installing the Message Client library on a computer with other Data Integrator components, choose the same directory. For example, C:\Data Integrator.
   If you are installing the Message Client library on a computer without Data Integrator, choose any installation location.

5. Click Next to complete the installation.

Using the Message Client library

The Access Server connector supports C++, Java, and COM interfaces to describe the connection between your Web application and Access Server.

This section describes the Message Client components in general terms, gives specific details according to the interface language, and provides examples of how to include these calls in a typical Web application.
Interface components

The interface between the Access Server and your Web application includes these components:

- **Connection definition (Connection)** — A class that defines the connection that your application uses to send and receive messages from the Access Server. Initialize the class (using the connect method) each time you initialize your application.
- **Connection initialization (Connect)** — A method that creates the connection using host and port information supplied by the client.
- **Request (Invoke)** — A method that indicates request type and details. This method is a synchronous call that waits for a return.
- **Exception handlers (DIErrror)** — A class that returns exceptions thrown by the connection object and system exceptions, if available.

Creating the connection

The Connection object creates an active connection to the Access Server. Creating a Connection (calling the Connect method) does the following:

- Authenticates the client as secure
- Produces an open TCP/IP socket between the client and the Access Server
- Encapsulates the connection information into a client identifier (Connection ID)

As soon as you create the Connection, you can use it to send messages to the Access Server. Typically, you would create a single Connection per client. If you attempt to call the Connect method for a Connection that already exists, the Access Server ignores the call.

Sending messages

Send requests from the client application using the Invoke method and the Connection ID.

Each business operation implemented by your Web application can result in a call to the Access Server with a message. The Access Server uses the name of the business operation to determine the path for the message. When you use Data Integrator to process real-time jobs, you pair this business operation name, called a service, with the job and data flow names you defined in Data Integrator to process the message. There is a one-to-one correlation between business operation, service, job, and XML source.
Installing Data Integrator on Windows Systems

Using the Message Client library

Call the Invoke method with a string return value to process a synchronous response.

Closing the connection

The library provides a method (Disconnect) with the Connection object that allows you to systematically close the TCP/IP socket between the client and the Access Server.

Pseudo code example

```java
// Login and authenticate the client
connection = connect(accessServerAddress, // TCP/HTTP address
clientName, // matches Access Server
clientPassword); // IP & Client
// security settings
// Invoke Service
String xmlOut = connection.invoke(
serviceName, // has mapping to RT job
xmlIn); // according to the RT job DTD
// In case of an error returns the error code
// and error message
```
C++ language interface

The Business Objects Client interface implemented in C++ includes the following classes and elements:

<table>
<thead>
<tr>
<th>Class</th>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connection class</td>
<td></td>
<td>Opens a communications link to the Access Server identified by host name and port number.</td>
</tr>
<tr>
<td>Connect method</td>
<td></td>
<td>Creates a new Connection object that can be used to access the connection.</td>
</tr>
<tr>
<td>Invoke method</td>
<td></td>
<td>Sends a message to the Access Server for processing.</td>
</tr>
<tr>
<td>Disconnect method</td>
<td></td>
<td>Closes the connection to the server and removes the Connection object.</td>
</tr>
<tr>
<td>ConnectionException class</td>
<td></td>
<td>Constructs a new connection exception when the Connection needs to throw an exception and include a message about another exception that interfered with the Connection's normal operation.</td>
</tr>
<tr>
<td>ConnectionException constructor</td>
<td></td>
<td>Constructs a new connection exception when the Connection needs to throw an exception and include a message about another exception that interfered with the Connection's normal operation.</td>
</tr>
<tr>
<td>getRootCause method</td>
<td></td>
<td>Returns the throwable system exception that makes this Connection exception necessary.</td>
</tr>
</tbody>
</table>

Java language interface

The Business Objects Client interface implemented in Java includes the following classes and elements:

<table>
<thead>
<tr>
<th>Class</th>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connection class</td>
<td></td>
<td>Opens a communications link to the Access Server identified by host name and port number.</td>
</tr>
<tr>
<td>Connect method</td>
<td></td>
<td>Creates a new Connection object that can be used to access the connection.</td>
</tr>
<tr>
<td>Invoke method</td>
<td></td>
<td>Sends a message to the Access Server for processing.</td>
</tr>
</tbody>
</table>
The connection between a Web application and the Access Server can be accomplished through a COM object.

The object supports the following Message Client interface elements:

- **Connect** — Opens a communications link to the Access Server identified by host name and port number.
- **Invoke** — Sends a message to the Access Server for processing.
- **Disconnect** — Closes the connection to the Access Server and removes the Connection object.
- **ReturnValue** — Retrieves the returned (XML) response from the Access Server.
- **ErrorMessage** — Retrieves the last error message generated by a failure during execution of a Connect or Invoke method.
- **ErrorStatus** — Retrieves the error status generated by a failure during execution of a Connect or Invoke method.

The object also supports the ErrorInfo interface making it possible to retrieve errors through the Visual Basic Err object.

The remainder of this section describes the syntax for each element.
Connect

Opens a communications link to the Access Server identified by host name and port number.

Syntax

Connect (host_name, port, user_name, password)

Where

- **host_name**: An input parameter of type string that indicates the host name of the server on which the Access Server is running.
- **port**: An input parameter of type integer that indicates the number of the port on which Access Server accepts client connections.
- **user_name**: An input parameter of type string that indicates a user login. This is an added level of security that is optional to implement.
- **password**: An input parameter of type string that indicates the encrypted password of the user specified in user_name.

After instantiating the Message Client object, use this method to connect to the Access Server.

If an error is encountered while connecting to the Access Server, use the ErrorStatus and ErrorMessage methods to retrieve the error status from the object properties.

Example

See “Example” on page 118.
Install Data Integrator on Windows Systems

Using the Message Client library

**Invoke**

Sends a message to the Access Server for processing.

**Syntax**

Invoke (ServiceName, InData)

**Where**

- **ServiceName**
  An input parameter of type string that indicates the name of the service to be executed. This is the same service name specified in the Administrator.

- **InData**
  Input parameters of type string that contain the XML string representing the input parameters to the service (the message being processed by the Access Server and corresponding real-time service).

This method submits a request to the Access Server. After a successful call to the `Invoke` method, use the `ReturnValue` call to retrieve the response returned by the Access Server.

If you encounter an error while submitting a request to the Access Server, you can use the `ErrorStatus` and `ErrorMessage` methods to retrieve the error information from the object properties.

**Example**

See “Example” on page 118.
**Disconnect**

Closes the connection to the Access Server and removes the Connection object.

**Syntax**

Disconnect ()
ReturnValue

Retrieves the returned (XML) response from the Access Server.

Syntax

ReturnValue()

Returns

String XML response from the Access Server.

Use this method to retrieve the response to the request sent by a successful call of the invoke method.

Example

See “Example” on page 118.
ErrorMessage

Retrieves the last error message generated by a failure during execution of a Connect or Invoke method.

**Syntax**

ErrorMessage ()

**Returns**

String

The error text returned by the Access Server if an error occurs while executing a COM method.
Installing Data Integrator on Windows Systems

Using the Message Client library

**ErrorStatus**

Retrieves the error status generated by a failure during execution of a Connect or Invoke method.

**Syntax**

```plaintext
ErrorStatus()
```

**Returns**

String The error status returned by the Access Server if an error occurs while executing a COM method.

**Example**

The following example shows how you can use the COM object from within an ASP program using VBScript. The example uses the VB Err object to detect and handle errors.

```vbnet
' Instantiate the Message Client COM object
dim ActaConn
' Clear any previous errors and connect to Access Server.
' The parameters are machine, port, user, password
Err.clear
ActaConn.connect "electron", 4000, "user", "password"
if Err.Number <> 0 then
    Response.write("<h4> The connect method returned the following error: " & Err.Description & "</h4>")
else
    Response.write("<h4> The connect method succeeded.</h4>")
' Clear errors and invoke the service needed, pass
' service name, XML input data as parameters
Err.clear
ActaConn.invoke "test1", file_content
if Err.Number <> 0 then
    Response.write("<h4> the invoke method returned the following error:
    " & Err.Description & "</h4>")
else
    Response.write("<h4> The invoke method succeeded</h4>")
    ' Get the return value
dim outData
outData = ActaConn.returnValue
Response.write("<pre>" & outData & "</pre>")
end if
end if
```
Installing Data Integrator on UNIX Systems
Installing Data Integrator on UNIX Systems

About this chapter

All Data Integrator components except the Designer and Repository Manager can run on supported UNIX systems. This chapter discusses the installation of Data Integrator components on supported UNIX systems and contains the following topics:

• Additional system requirements for UNIX
• Kernel parameters and user resource limits
• Installing Job Servers and Access Servers
• Updating licenses
• Uninstalling Data Integrator
• Troubleshooting

Additional system requirements for UNIX

These requirements supplement the generic requirements specified in “System requirements” on page 43.

Hardware requirements

UNIX computers running a Data Integrator Job Server and/or Access Server require the following:

• Pentium processor available to Data Integrator with 512 MB (1 GB recommended) RAM
  For best performance, use dual processors (minimum 500 MHz) with at least 512 MB RAM each. Allow more than 512 MB RAM to cache tables or perform memory-intensive operations such as hierarchy flattening, sorts, or lookups.
• Minimum free disk space 1 GB (1.5 GB recommended for log files).
• Minimum of 1 GB virtual memory (2 GB recommended for best performance)

Software requirements

• Operating systems: see “Data Integrator operating system platforms” on page 35.
• Install database connectivity software on Job Server computers for the
database serving as your repository, source, or target. See “Database
requirements” on page 44. Microsoft SQL Server is not supported on
UNIX.

• For details on requirements for the following systems, see the current
version of the Data Integrator Release Notes:
  • JDK versions and filesets
  • AIX filesets
  • HP-UX patches
  • Solaris patches
  • Linux patches

Cron service

Data Integrator schedules UNIX-based jobs by using the UNIX cron utility. If
cron security uses cron.deny, the account that starts the Job Server must
have an entry in the cron.allow file. These files are located as follows:

<table>
<thead>
<tr>
<th>Operating system</th>
<th>cron.deny location</th>
<th>cron.allow location</th>
</tr>
</thead>
<tbody>
<tr>
<td>HP-UX</td>
<td>/var/adm/cron/cron.deny</td>
<td>/var/adm/cron/cron.allow</td>
</tr>
<tr>
<td>AIX</td>
<td>/var/adm/cron/cron.deny</td>
<td>/var/adm/cron/cron.allow</td>
</tr>
<tr>
<td>Solaris</td>
<td>/usr/lib/cron/cron.deny</td>
<td>/usr/lib/cron/cron.allow</td>
</tr>
<tr>
<td>Linux</td>
<td>/etc/cron.deny</td>
<td>/etc/cron.allow</td>
</tr>
</tbody>
</table>

See your cron man pages for more information.

Installing the Data Integrator Job Server without access to cron causes the
following Job Server behavior:

• Job Server can operate normally
• Data Integrator cannot schedule a job to run on the Job Server
• You can manually execute and monitor jobs from the Designer

User IDs and permissions

If your design, test, or production environment uses tightly controlled root-
level administration, Business Objects recommends that you install the Job
Server while logged on as a user without root-level access. Installing the Job
Server without root-level access ensures that root-level access is not required
to administer files and processes created by the Job Server.
There are two administration functions that require root-level access as described in the following table:

<table>
<thead>
<tr>
<th>Functions</th>
<th>Permissions required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scheduling jobs through Data Integrator</td>
<td>Permission to access cron</td>
</tr>
<tr>
<td>Automatically restarting the Job Service on restart</td>
<td>Autostart configuration edits need to be made by a user with system-level authority</td>
</tr>
</tbody>
</table>

**High-availability support**

If you run Data Integrator on AIX and you have High Availability Clustered Multi-Processing (HACMP) software version 4.4.0, use HACMP software to minimize downtime of your Data Integrator system. Data Integrator includes start and stop scripts that support HACMP software.

**About HACMP software**

HACMP software makes applications and software systems “highly available,” restoring essential services when a system component or application fails. To support HACMP software, you replicate software and hardware systems to guarantee backup of essential services. Within HACMP software, you define each complete system as a resource group. When a component fails in a resource group, HACMP software quickly restores essential services by starting the failed system on an alternate computer, called a node, or group of networked computers, called a cluster.

To use HACMP software to make a system “highly available”:

- Define the system as a resource group (a logical group that the HACMP software and AIX operating system manages)
- Install the necessary components to support the system on duplicate hardware systems, creating clusters or nodes that can support identical services that the system processes
- Define takeover relationships that determine which cluster or node supports the resource group at any given time

There are three types of takeover relationships:

- Cascading — Clusters are listed along with a priority rank. Control of the resource group goes to the active cluster with the highest priority ranking. Control can change due to failure or to the reactivation of a cluster with a higher priority rank.
• Rotating — Clusters are listed along with a priority rank. Control of the resource group goes to the active cluster with the highest priority ranking. Control only changes due to the failure of a cluster.
• Concurrent — Multiple clusters support the resource group at the same time.

Using Data Integrator with HACMP software

Data Integrator contains start and stop scripts that support HACMP software. These scripts run when a new cluster takes control of the Data Integrator resource group. The start script:
• Identifies jobs scheduled before the previous cluster went down and launches those jobs in recovery mode
• Identifies jobs scheduled to start during cluster down time and launches those jobs
• Synchronizes the cron file on the new cluster with the cron file on the previous cluster

There are several requirements and restrictions for using Data Integrator with HACMP software:
• There can be no single point of failure
• You must use the same Data Integrator user ID on all clusters where you install Data Integrator
• The database systems that support Data Integrator jobs—the repository, sources, and targets—must also be “highly available”
• You cannot use a concurrent takeover relationship for the Data Integrator resource group
• Use only with batch jobs
• You must enable automatic recovery for all scheduled jobs
• You must also enable the recurrent option for all scheduled jobs

To use Data Integrator with HACMP software
1. Install the Data Integrator Job Server on a file system in the shared volume group from a single cluster node.
2. On each cluster node, define the same mount point for the file system. Data Integrator and its configuration is thus made available for the rest of the cluster nodes.

3. Copy the Data Integrator start and stop scripts (acta_start.sh and acta_stop.sh) from the LINK_DIR/hacmp directory to the HACMP scripts directory on each of the cluster nodes.

4. In the HACMP software:
   a. Define Data Integrator as a resource group (a logical group that the HACMP software and AIX operating system manages).
   b. Define takeover relationships that determine which cluster or node supports the Data Integrator resource group at any given time.
   c. Designate the Data Integrator start and stop scripts as the start and stop scripts for the Data Integrator resource group.

5. Configure Data Integrator to use HACMP as described in the next procedure.

   ► **To configure Data Integrator to use HACMP**

   1. Run the Server Manager by entering:

      ```
      $ cd $LINK_DIR/bin/
      $ . ./al_env.sh
      $ ./svrcfg
      ```

   2. Select option 1 and stop the Job Service.
3. Select option 8 to configure HACMP.

```
** Data Integrator Server Manager Utility **
1 : Control Job Service
2 : Configure Job Server
3 : Configure Runtime Resources
4 : Configure Access Server
5 : Configure Web Server
6 : Configure SNMP Agent
7 : Configure SMTP
8 : Configure HACMP
x : Exit
```

Enter Option: 7

a. for AIX only

4. Configure HACMP

```
*Current HACMP Configuration for Data Integrator Resource Group*

<table>
<thead>
<tr>
<th>Service IP Label</th>
<th>Domain Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>aixserver1</td>
<td></td>
</tr>
</tbody>
</table>

e: Edit Configuration  y: Re-sync all repos  q: Quit
```

To specify the Service IP Label used while configuring Data Integrator's resource group, enter e.

When you are done, Data Integrator will resynchronize all repositories and the configurations for the Web Server and SNMP agent with the current Service IP Label and domain name. This means that:

- The Job Service must be stopped prior to editing this configuration.
- You must re-add repository connections to the Administrator, reconfigure real-time services and adapters, and reschedule batch jobs.
- To resynchronize all repositories manually, enter y.
Note: Resynchronizing all repositories is not required if you do not see an error message after editing by selecting option c. For example, a repository might not get updated to use the configured Service IP Label if the associated database is unavailable. After correcting the problem, you can use this option to resynchronize the repository.

5. To exit the Server Manager, enter q, then enter x.

Kernel parameters and user resource limits

Business Objects recommends the following kernel parameters and user resource limits when installing Data Integrator on UNIX platforms.

HP-UX for PA-RISC 32-bit kernel configuration

For installations on HP-UX for PA-RISC 32-bit systems, Business Objects recommends the following kernel configuration:

<table>
<thead>
<tr>
<th>Kernel parameter</th>
<th>Value</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>max_thread_proc</td>
<td>256</td>
<td></td>
</tr>
<tr>
<td>maxdsize</td>
<td>0X800000000</td>
<td>At least 2GB.</td>
</tr>
<tr>
<td>maxdsize_64bit</td>
<td>0X800000000</td>
<td>Greater than or equal to maxdsize.</td>
</tr>
<tr>
<td>maxfiles</td>
<td>1024</td>
<td>Anything between 1024 - 2048.</td>
</tr>
<tr>
<td>maxssize</td>
<td>0X05000000</td>
<td>You can increase this value but that</td>
</tr>
<tr>
<td></td>
<td></td>
<td>automatically decrements the maxsize.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Therefore, increase maxdsize.</td>
</tr>
<tr>
<td>maxssize_64bit</td>
<td>0X05000000</td>
<td>Same as maxssize.</td>
</tr>
<tr>
<td>maxtsize</td>
<td>0X05000000</td>
<td>You can increase this value but that</td>
</tr>
<tr>
<td></td>
<td></td>
<td>automatically decrements the maxsize.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Therefore, increase maxdsize.</td>
</tr>
<tr>
<td>maxtsize_64bit</td>
<td>0X05000000</td>
<td>Same as maxtsize.</td>
</tr>
<tr>
<td>maxuprc</td>
<td>512</td>
<td>Anything between 512–1024.</td>
</tr>
<tr>
<td>maxusers</td>
<td>128</td>
<td></td>
</tr>
<tr>
<td>nfile</td>
<td>(16*(NPROC+16+MAXUSERS)</td>
<td>Approximately 1024 (or leave the formula</td>
</tr>
<tr>
<td></td>
<td>/10+32+2*(NPTY+NSTRPTY+NSTRTEL))</td>
<td>and modify nproc).</td>
</tr>
<tr>
<td>nproc</td>
<td></td>
<td>Approximately 1024. Increases the nfile</td>
</tr>
<tr>
<td></td>
<td></td>
<td>limit and other dependent kernel parameters.</td>
</tr>
</tbody>
</table>
HP-UX for Itanium 64-bit kernel configuration

For installations on HP-UX for Itanium 64-bit systems, Business Objects recommends the following kernel configuration:

<table>
<thead>
<tr>
<th>Kernel parameter</th>
<th>Value</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>max_thread_proc</td>
<td>256</td>
<td>Increase this value if you receive <code>Cannot create thread</code> run-time error message from the Data Integrator job.</td>
</tr>
<tr>
<td>maxfiles</td>
<td>2048</td>
<td>Default value of 2048 is appropriate to use with Data Integrator.</td>
</tr>
<tr>
<td>maxdsiz_64bit</td>
<td>0x4000000000</td>
<td>Enter the swap space configured on your system.</td>
</tr>
<tr>
<td>maxssiz_64bit</td>
<td>0x10000000</td>
<td>Default value of 256 MB is appropriate to use with Data Integrator.</td>
</tr>
<tr>
<td>maxtsiz_64bit</td>
<td>0x400000000</td>
<td>Default value of 1 GB is appropriate to use with Data Integrator.</td>
</tr>
<tr>
<td>maxuprc</td>
<td>256</td>
<td>Default value of 256 MB is appropriate to start using with Data Integrator. However, if you expect many jobs to run at the same time, increase this value.</td>
</tr>
<tr>
<td>nfile</td>
<td>((16*(NPROC+16+MAXUSERS)/10)+32+2*(NPTY+NSTRPTY+NSTRTEL))</td>
<td>This value gets calculated by HP-UX automatically.</td>
</tr>
<tr>
<td>nproc</td>
<td>4200</td>
<td>Default value of 4200 is appropriate to use with Data Integrator.</td>
</tr>
</tbody>
</table>

AIX user resource limits

For installations on AIX systems, Business Objects recommends the following user resource limits. You can display these settings by running the `ulimit -a` command from your Data Integrator installation login.

<table>
<thead>
<tr>
<th>User resource limit</th>
<th>Value</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>file (blocks)</td>
<td>4194302</td>
<td>At least 2GB.</td>
</tr>
<tr>
<td>data (kbytes)</td>
<td>2097151</td>
<td>At least 2GB.</td>
</tr>
<tr>
<td>stack (kbytes)</td>
<td>512000</td>
<td>At least 500 MB.</td>
</tr>
<tr>
<td>memory (kbytes)</td>
<td>2097151</td>
<td>At least 2GB.</td>
</tr>
<tr>
<td>nofiles (descriptors)</td>
<td>2000</td>
<td>At least 2000.</td>
</tr>
</tbody>
</table>
Installing Data Integrator on UNIX Systems

Installing Job Servers and Access Servers

Solaris user resource limits

For installations on Solaris systems, Business Objects recommends the following user resource limits. You can display these settings by running the `ulimit -a` command from your Data Integrator login.

<table>
<thead>
<tr>
<th>User resource limit</th>
<th>Value</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>file (blocks)</td>
<td>unlimited</td>
<td></td>
</tr>
<tr>
<td>data (kbytes)</td>
<td>unlimited</td>
<td></td>
</tr>
<tr>
<td>stack (kbytes)</td>
<td>8192</td>
<td>At least 8K.</td>
</tr>
<tr>
<td>time (seconds)</td>
<td>unlimited</td>
<td></td>
</tr>
<tr>
<td>nofiles (descriptors)</td>
<td>1024</td>
<td>At least 1K.</td>
</tr>
<tr>
<td>coredump (blocks)</td>
<td>unlimited</td>
<td></td>
</tr>
<tr>
<td>vmemory (kbytes)</td>
<td>unlimited</td>
<td>Unlimited, at least 2GB.</td>
</tr>
</tbody>
</table>

Linux user resource limits

For installations on Red Hat Linux systems, Business Objects recommends the following user resource limits. You can display these settings by running the `ulimit -a` command from your Data Integrator login.

<table>
<thead>
<tr>
<th>User resource limit</th>
<th>Value</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>file (blocks)</td>
<td>unlimited</td>
<td></td>
</tr>
<tr>
<td>data (kbytes)</td>
<td>unlimited</td>
<td></td>
</tr>
<tr>
<td>stack (kbytes)</td>
<td>10240</td>
<td>At least 10 MB.</td>
</tr>
<tr>
<td>time (cpu-seconds)</td>
<td>unlimited</td>
<td></td>
</tr>
<tr>
<td>nofiles (descriptors)</td>
<td>1024</td>
<td></td>
</tr>
<tr>
<td>coredump (blocks)</td>
<td>unlimited</td>
<td></td>
</tr>
<tr>
<td>memory (kbytes)</td>
<td>unlimited</td>
<td></td>
</tr>
<tr>
<td>lockedmem (kbytes)</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>processes</td>
<td>7168</td>
<td></td>
</tr>
</tbody>
</table>

Installing Job Servers and Access Servers

Before installing any Job Servers or Access Servers on UNIX:
• Use your RDBMS system to create databases for your repository and data warehouse.
• Read the Release Notes.
• Install the Data Integrator Designer on Windows. This installation includes a Repository Manager.
• Use the Repository Manager on Windows to create one or more Data Integrator repositories.

To install a Job Server or Access Server on UNIX
1. Review the Release Notes for the version of Data Integrator you will be installing.
2. Log in as root.
3. Create a user ID, bodi for example, for managing Data Integrator and related files running on the UNIX server.
   (Optional) Create a group for this user ID and for other users accessing the Data Integrator Job Server and related files.
   For multiple Data Integrator installations, each installation requires a unique user ID and unique home directory.
4. Configure the user created in step 3 to log in using the Korn shell.
5. Mount the installation CD on the UNIX server.
   For example, these commands mount the CD into /cdrom:

<table>
<thead>
<tr>
<th>Operating system</th>
<th>Command line</th>
</tr>
</thead>
<tbody>
<tr>
<td>HP-UX⁸</td>
<td>$ mount -F cdfs -o cdcase /dev/dsk/c6t2d0 /cdrom</td>
</tr>
<tr>
<td>AIX</td>
<td>$ mount -v cdrfs -o ro /dev/cd0 /cdrom</td>
</tr>
<tr>
<td>Solaris⁹</td>
<td>$ mount -F hsfs -o ro /dev/dsk/c0t6d0s0</td>
</tr>
<tr>
<td>Linux</td>
<td>$ mount -t udf,iso9660 -o noauto,owner,kudzu,ro /dev/cdrom /cdrom</td>
</tr>
</tbody>
</table>
Installing Data Integrator on UNIX Systems

Installing Job Servers and Access Servers

6. Exit from root login.

7. Log in as `bodi` to install the Data Integrator Job Server.

8. Set database environment variables.

<table>
<thead>
<tr>
<th>Datasource</th>
<th>Environment Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oracle</td>
<td><code>$ORACLE_HOME</code></td>
</tr>
<tr>
<td></td>
<td><code>$ORACLE_SID</code></td>
</tr>
<tr>
<td></td>
<td><code>$ORACLE_LIB</code></td>
</tr>
<tr>
<td>DB2</td>
<td><code>$DB2INSTANCE</code></td>
</tr>
<tr>
<td>Sybase ASE</td>
<td><code>$SYBASE</code></td>
</tr>
<tr>
<td>ODBC</td>
<td><code>$ODBCINI</code></td>
</tr>
<tr>
<td>Attunity Connection</td>
<td><code>$NAVROOT</code></td>
</tr>
<tr>
<td>WebSphere II Classic</td>
<td><code>$CAC_CONFIG</code></td>
</tr>
<tr>
<td>Federation for z/OS Connector</td>
<td></td>
</tr>
</tbody>
</table>

9. Confirm that you can connect to the local Data Integrator repository for Job Server access.

   To verify the connection, use an RDBMS SQL tool such as SQL*Plus.

10. Configure the network on the Designer computer and the Job Server computer so that they can communicate with each other by host names rather than by IP addresses.

11. Navigate to your UNIX directory in the mount point.

   a. For HP-UX at certain patch levels, the installation could fail with the following error message due to an HP-UX issue:
      Placing product files into LINK_DIR
      cp: cannot access /cdrom/unix/hpux1100/AWSybase:
      No such file or directory
      As a workaround, use the `pfs_mount` command to mount the installation CD.
      For example:
      Start `pfs_mountd` and `pfsd`:
      
      # /usr/sbin/pfs_mountd &
      # /usr/sbin/pfsd &

      Edit or create the file `/etc/pfs_fstab` with the following content:
      
      /dev/dsk/cxtydz /ISO_CDROM pfs-iso9660 xlat=unix 0 0
      Create the `/ISO_CDROM` directory if it doesn't exist.
      Mount the installation CD: `# pfs_mount /ISO_CDROM`

   b. Use this command when the Volume Manager daemon is not running. Otherwise, Solaris will automount the CD.
12. Run the installation script: \\
`./install.sh`

13. Enter the information requested by the script.

   The script provides values set for this account as default values. To accept the default at a prompt, press `Enter` or `Return`.

<table>
<thead>
<tr>
<th>Installation prompt</th>
<th>Sample response</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD-ROM mount location</td>
<td>/cdrom</td>
</tr>
<tr>
<td>1) Install Data Integrator</td>
<td>1</td>
</tr>
<tr>
<td>2) Exit</td>
<td></td>
</tr>
<tr>
<td>Enter choice number.</td>
<td></td>
</tr>
<tr>
<td>Do you have JDK (version) installed on this machine?</td>
<td>YES</td>
</tr>
<tr>
<td>Enter the path to the installation location for Data Integrator</td>
<td>/home/BusinessObjects/Data Integrator</td>
</tr>
<tr>
<td>(If Data Integrator has previously been installed:)</td>
<td>Y</td>
</tr>
<tr>
<td>The specified installation location appears to already contain an installation. Do you wish to overwrite it?</td>
<td>(A message indicates that your existing license file will be backed up.)</td>
</tr>
<tr>
<td>License file location</td>
<td>/home/BusinessObjects/al_license.lic</td>
</tr>
<tr>
<td>(If Data Integrator has previously been installed and you chose to overwrite it:)</td>
<td>Y</td>
</tr>
<tr>
<td>You have chosen to overwrite an existing BusinessObjects Data Integrator installation. This action will stop all existing BusinessObjects Data Integrator services. Do you want to continue?</td>
<td></td>
</tr>
<tr>
<td>Note: If you receive an error such as:</td>
<td></td>
</tr>
<tr>
<td>/usr/bin/kill: 12543: No such process</td>
<td></td>
</tr>
<tr>
<td>then create a symbolic link to /usr/bin/kill so Data Integrator can locate the kill executable.</td>
<td></td>
</tr>
<tr>
<td>Enter a Language code</td>
<td>&lt;default&gt; (See “Languages” on page 660 of the Data Integrator Reference Guide.)</td>
</tr>
<tr>
<td>Enter a Territory code</td>
<td>&lt;default&gt; (See “Territories” on page 661 of the Data Integrator Reference Guide.)</td>
</tr>
</tbody>
</table>
### Installation prompt | Sample response
---|---
Enter a Code page | `<default>` (See “Code pages” on page 662 of the Data Integrator Reference Guide.)
Enter a JDK installation directory | `/usr/java`
Enter the database type for the associated repository | 2

**For an Oracle repository:**
Enter the ORACLE_HOME path | `/u01/app/oracle/product/8.1.7`
For HP-UX PA-RISC 32-bit, Oracle version | Enter Oracle Version separated by a period `.`, For example: 9.0.1.0
Enter Oracle connection string for this repository | oraDBS
Enter the Oracle repository user name | bodi

**For a DB2 repository:**
DB2 instance | `db2inst1`
Repository connection string | `db2DBS`
Repository user name | `bodiRepo`

**For a Sybase ASE repository:**
Sybase ASE home path | `/usr/sybase`
Repository server name | `sybDBS`
Repository database name | `bodiRepo`
Repository user name | `sa`

Do you plan to access databases using DataDirect Connect for ODBC drivers for UNIX? | Y
DataDirect Connect for ODBC drivers installation directory | `/usr/odbc`
Full path of odbc.ini file | `/usr/odbc/odbc.ini`

Do you plan to use Firstlogic data cleansing software? | Y
The installer creates a system variable (LINK_DIR) that defines the path used by the Data Integrator components with a message for how to configure the Data Integrator Job Server.

After completing the installation, the “Installation Successful!” message appears.

1. Configure a Data Integrator Web Server (see “Setting Data Integrator environment variables” on page 134).
2. Set Data Integrator environment variables (see “Setting Data Integrator environment variables” on page 134).
3. Configure Job Servers and Access Servers (see “Configuring the Data Integrator Web Server” on page 135).
Locales

The installation script prompts you for a locale for each installed Job Server. This consists of a language code, a territory code, and a code page. For detailed information about using Locales and Multi-byte data types, see Chapter 9, “Locales and Multi-Byte Functionality,” in the Data Integrator Reference Guide.

For a list of possible values, see “List of supported locales and encodings” on page 659 of the Data Integrator Reference Guide.

Setting Data Integrator environment variables

Users who run or administer Data Integrator Job Servers must run a script (al_env.sh) to set up environment variables required by the Job Server.

Run this script with the syntax required by your environment. For example, run the following:

```
$ cd $LINK_DIR/bin/
$ . ./al_env.sh
```

You can also add this command to your login script (“bodi”) so that it is always configured. For example, add the following line to the .profile:

```
$LINK_DIR/bin/al_env.sh
```

No error messages appear if the script fails to run. Check one or more of the following variables to make sure that their values are properly set. Use the `echo` command to verify environment variable settings.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>$LINK_DIR</td>
<td>Data Integrator installation directory (set by the Data Integrator installation program)</td>
</tr>
<tr>
<td>$WEBSERVER_HOME</td>
<td>Home directory for the Web Server. Set to $LINK_DIR/ext/Web Server</td>
</tr>
<tr>
<td>$SHLIB_PATH</td>
<td>For HP-UX. Must include $LINK_DIR/bin and the location of the database libraries. For 64-bit Oracle, $LINK_DIR/bin must be listed before any 64-bit Oracle shared library path.</td>
</tr>
<tr>
<td>$LD_LIBRARY_PATH</td>
<td>For Solaris or Linux. Must include $LINK_DIR/bin and the location of the database libraries. For 64-bit Oracle, $LINK_DIR/bin must be listed before any 64-bit Oracle shared library path.</td>
</tr>
</tbody>
</table>
If the variable settings are not properly configured and you start any Data Integrator utility, error messages will appear to indicate that database server files are missing.

If you see such an error, verify that al_env.sh contains commands to set the appropriate database home locations. Run al_env.sh for the account used by the Job Server, or start the Job Server using an account that has all necessary environment variables defined in its .profile.

### Configuring the Data Integrator Web Server

The Data Integrator Web Server uses a Tomcat server as a servlet engine. The Web Server runs as a separate UNIX daemon. To configure the Data Integrator Web Server:

1. Run the Server Manager. Enter:
   
   ```
   $ cd $LINK_DIR/bin/
   $ . ./al_env.sh
   $ ./svrcfg
   ```

2. Select option 5 to configure Web Server.

3. Configure the Web Server.
Installing Data Integrator on UNIX Systems

Installing Job Servers and Access Servers

The Server Path field displays the Web Server’s home directory:
$LINK_DIR/ext/WebServer
It cannot be changed.

The HTTP Port field displays the default value 28080. The Shutdown port field displays the default value 22828. Keep or modify these port numbers and press Enter.

4. Once the Web Server is configured, the confirmation screen appears as follows:

<table>
<thead>
<tr>
<th>Server Path</th>
<th>HTTP Port</th>
<th>Shutdown Port</th>
</tr>
</thead>
<tbody>
<tr>
<td>/BusinessObj/DI/ext/WebServer</td>
<td>28080</td>
<td>22828</td>
</tr>
</tbody>
</table>

5. Enter e to edit to change the HTTP and shutdown ports, or enter q to quit.

An additional message displays if the Web Server is running while you attempt to change port numbers:

Data Integrator Web Server is running on port [9992].
Are you sure you want to stop this and change port?

Configuring Job Servers and Access Servers

Data Integrator installation on UNIX includes a Server Manager ($LINK_DIR/bin/svrcfg).

Use the Server Manager on UNIX:

• To configure Job Servers
• To configure run-time resources
• To configure an Access Server
• To start or stop the Data Integrator Service
The Server Manager displays the following information:

<table>
<thead>
<tr>
<th><strong>Job Server information</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Server name</strong></td>
</tr>
<tr>
<td><strong>TCP/IP port number</strong></td>
</tr>
<tr>
<td><strong>Supports adapter and SNMP</strong></td>
</tr>
<tr>
<td><strong>Enable SNMP</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Run-time resource information</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pageable Cache Directory</strong></td>
</tr>
<tr>
<td><strong>Start port</strong></td>
</tr>
</tbody>
</table>
## To configure Job Servers

1. Run the Server Manager. Enter:

   ```
   d $LINK_DIR/bin/
   $ . ./al_env.sh
   $ ./svrcfg
   ```

<table>
<thead>
<tr>
<th>Access Server information</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Server number</strong></td>
</tr>
<tr>
<td><strong>Directory</strong></td>
</tr>
<tr>
<td><strong>Communication port</strong></td>
</tr>
<tr>
<td><strong>Parameters</strong></td>
</tr>
<tr>
<td><strong>Enable</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Web Server information</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tomcat home directory</strong></td>
</tr>
<tr>
<td><strong>HTTP port</strong></td>
</tr>
<tr>
<td><strong>Shutdown port</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Data Integrator Service information</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Data Integrator Service executable path</strong></td>
</tr>
<tr>
<td><strong>Status</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SMTP Server Information</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Server</strong></td>
</tr>
<tr>
<td><strong>Sender</strong></td>
</tr>
</tbody>
</table>
Note: The second command is used to set the environment variables before running the Server Manager.

2. Select option 2 to configure a Job Server

** Data Integrator Server Manager Utility **
1: Control Job Service
2: Configure Job Server
3: Configure Runtime Resources
4: Configure Access Server
5: Configure Web Server
6: Configure SNMP Agent
7: Configure SMTP
8: Configure HACMPa
x: Exit

Enter Option: 2

for AIX only

3. Configure or delete a Job Server.

** Current Job Server Information **

<table>
<thead>
<tr>
<th>S#</th>
<th>Job Server Name</th>
<th>TCP Port</th>
<th>Enable SNMP</th>
<th>Repository Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>--</td>
<td>---------------</td>
<td>----------</td>
<td>-------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>1*</td>
<td>Server1</td>
<td>19110 Y</td>
<td>repo1@orasvr1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Server2</td>
<td>19112 N</td>
<td>repo2@orasvr1</td>
<td></td>
</tr>
</tbody>
</table>

*:JobServer <S1> supports adapter and SNMP communication on port:19110

c: Create a new JOB SERVER entry
d: Delete a JOB SERVER entry
e: Edit a JOB SERVER entry
f: Exit
q: Quit
r: Remove a REPO from job server
t: Update a REPO
u: Set default REPO

Enter Option:
Installing Data Integrator on UNIX Systems

Installing Job Servers and Access Servers

• To create a Job Server, enter c. Then enter the Job Server name, Job Server port number, database type (number), repository connection string, repository user name, and repository password. If you enter a port number already in use, an error message appears.
• To edit a Job Server, enter e. Then enter the serial number of the Job Server you want to edit.
• To delete a Job Server, enter d. Then enter the serial number of the Job Server you want to delete.
• To add a repository connection to a Job Server, enter a. Then enter the repository serial number (as displayed), database type (number), repository connection string, repository user name, and repository password.
• To remove a repository connection from a Job Server, enter r. This is used when you have multiple repository connections to a Job Server. Then enter the Job Server serial number and repository serial number (as displayed).
• To set a default repository connection for a Job Server, enter s. Then enter the Job Server serial number and the serial number of a new default repository (from those displayed).
• To resynchronize your Job Server configuration with a repository, enter y.

Cases when you must resynchronize your Job Server and repository include:
• You have uninstalled Data Integrator and are reinstalling the same Data Integrator version without creating a new repository.
• You created a new repository using the Repository Manager after installing Data Integrator.

If you resynchronize your Job Server configuration with a repository, you must re-add a connection for this repository to the Administrator. See the Data Integrator Management Console: Administrator Guide.

• Unlike the Windows Server Manager, the UNIX Server Manager does not prompt for the repository password except when creating a Job Server or adding a repository. To update the repository password in the DSConfig.txt file, enter u. All options use the updated password from DSConfig.txt file.

The Data Integrator SNMP agent is a license-controlled feature. You must purchase this optional interface to view the following SNMP configuration settings. For more information, see “SNMP support” on page 548 of the Data Integrator Designer Guide.
• To enable SNMP for a job server, choose the edit option. Then choose Y when prompted with the following question:
  Do you want to Enable SNMP for this JobServer?
• To disable SNMP for a job server, choose the edit option. Then choose Y when prompted with the following question:
  Do you want to Disable SNMP for this JobServer?

4. To exit the Server Manager, enter q, then enter x.

➤ To configure run-time resources

1. Run the Server Manager. Enter:
   $ cd $LINK_DIR/bin/
   $ . ./al_env.sh
   $ ./svrcfg

2. Select option 3 to configure run-time resources.

   ** Data Integrator Server Manager Utility **
   1 : Control Job Service
   2 : Configure Job Server
   3 : Configure Runtime Resources
   4 : Configure Access Server
   5 : Configure Web Server
   6 : Configure SNMP Agent
   7 : Configure SMTP
   8 : Configure HACMPa
   x : Exit

   Enter Option: 3

   a. for AIX only
3. To edit run-time resources, enter e.:

```
** Current Runtime Resource Information **

<table>
<thead>
<tr>
<th>Pageable Cache Directory</th>
<th>Start Port</th>
<th>End Port</th>
</tr>
</thead>
<tbody>
<tr>
<td>LINK_DIR\Log\PCache</td>
<td>1025</td>
<td>32767</td>
</tr>
</tbody>
</table>

e: Edit Runtime Resources  q: Quit
```

Enter Option:

4. For the **Pageable Cache Directory** option, you can accept the default directory (LINK_DIR\Log\PCache) or type a different directory.

**Note:** For memory-intensive operations such as Group By, Order By, and Detailed profiling, specify a pageable cache directory that:

- Contains enough disk space for your data. To estimate the amount of space required for pageable cache, consider factors such as:
  a. Number of concurrently running jobs or data flows
  b. Amount of pageable cache required for each concurrent data flow
- Exists on a separate disk or file system from the Data Integrator system and Operating System (such as C: drive on Windows, root file system on UNIX).
- Limits the disk space Data Integrator data flows consume. The Data Integrator pageable cache uses all available disk space on the file system that contains the pageable cache directory. So, to limit the disk space that Data Integrator data flows consume, create a file system (or partition on Windows) with a limited size. Use the new file system (partition on Windows) as the pageable cache directory.

Data Integrator uses this directory:

- For pageable caching, the default cache type for data flows. For more information, see “Caching data” on page 58 of the *Data Integrator Performance Optimization Guide*.
- When Data Integrator selects a file transfer type and Automatic is specified in the Data_Transfer transform. For details, see “Data_Transfer” on page 273 of the *Data Integrator Reference Guide*. 
5. Change the values for **Start port** and **End port** to restrict the number of ports used by Data Integrator for peer-to-peer communications. The default values for **Start port** and **End port** are 1025 and 32767, respectively.

Data Integrator uses these ports for peer-to-peer communications when sending data between data flows or sub data flows that are running on different Job Servers. For more information, see "Using grid computing to distribute data flows execution" on page 104 of the Data Integrator Performance Optimization Guide.

6. To exit the Server Manager, enter q, then enter x.

► **To configure an Access Server**

1. Run the Server Manager. Enter:

   ```bash
   $ cd $LINK_DIR/bin/
   $ . ./al_env.sh
   $ ./svrcfg
   ```

2. Select option 4 to configure an Access Server.

   ** Data Integrator Server Manager Utility **
   
   1 : Control Job Service
   2 : Configure Job Server
   3 : Configure Runtime Resources
   4 : Configure Access Server
   5 : Configure Web Server
   6 : Configure SNMP Agent
   7 : Configure SMTP
   8 : Configure HACMP
   x : Exit

   Enter Option: 4

   a. for AIX only
3. Configure, edit, or delete an Access Server.

<table>
<thead>
<tr>
<th>S#</th>
<th>Directory</th>
<th>Communication Port</th>
<th>Enable</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>export/AStest1</td>
<td>7897</td>
<td>Y</td>
</tr>
<tr>
<td>2</td>
<td>export/AStest2</td>
<td>7898</td>
<td>Y</td>
</tr>
</tbody>
</table>

- To configure an Access Server, enter c. Then enter the directory, port numbers, and parameters and indicate whether you want to enable the Access Server.

Access Server parameters can be viewed by typing AL_AccessServer at the command line and are also described in Chapter 8, “Real-Time Performance,” in the Data Integrator Management Console: Administrator Guide.

You can configure more than one Access Server on the same computer, but they must each have separate ports. You later add them using the Data Integrator Administrator.

If you enter a port number already in use, an error message appears.

- To edit an Access Server, enter e. Then enter the number of the Access Server you want to edit.

- To delete an Access Server, enter d. Then enter the number of the Access Server you want to delete.

**Note:** When you delete an Access Server, all Access Servers are stopped. When you exit the Server Manager, the remaining Access Servers restart.

4. To exit the Server Manager, enter q, then enter x.
To start or stop the Data Integrator Service

The Data Integrator Service (AL_JobService) is a daemon associated with $LINK_DIR that starts locally-configured Job Servers, Access Servers, and Data Integrator Web server, then monitors them and attempts to restart them if they are not running.

After exiting the Server Manager, AL_JobService automatically retrieves any changes made to Job Servers or Access Servers. You need not restart AL_JobService.

1. Run the Server Manager. Enter:
   
   $ cd $LINK_DIR/bin/
   $ . ./al_env.sh
   $ ./svrcfg

2. Select option 1 to control the Data Integrator service (Job service).

   ** Data Integrator Server Manager Utility **
   
   1 : Control Job Service
   2 : Configure Job Server
   3 : Configure Runtime Resources
   4 : Configure Access Server
   5 : Configure Web Server
   6 : Configure SNMP Agent
   7 : Configure SMTP
   8 : Configure HACMPa
   x : Exit

   Enter Option: 1
   a. for AIX only

3. Start or stop the Job service.
   
   • To start the Job service, enter s.
   • To stop the Job service, enter o.

4. To exit the Server Manager, enter q, then enter x.

Starting AL_JobService at restart

To start AL_JobService automatically when the server restarts, you must install the actaservices script with root privileges.

Run the $LINK_DIR/bin/autostrt.sh script by entering:

# cd $LINK_DIR/bin/
# autostrt.sh $LINK_DIR
To configure SMTP email

The Server Manager is also where you specify SMTP server settings for the smtp_to email function. For details, see “To define and enable the smtp_to function” on page 558 of the Data Integrator Reference Guide.

Job Servers, Access Servers, SNMP

Determine which Job Servers and Access Servers are running on the computer using the command:

$ ps -fu UnixLoginId | grep AL_JobService
$ ps -fu UnixLoginId | grep al_jobserver
$ ps -fu UnixLoginId | grep AL_AccessServer
$ ps -fu UnixLoginId | grep al_snmpd

UnixLoginId is the user name that you log into UNIX with when installing Data Integrator.

If some are not running, check for error messages in these log files:

<table>
<thead>
<tr>
<th>Component</th>
<th>Log File Locations</th>
</tr>
</thead>
<tbody>
<tr>
<td>AL_JobService</td>
<td>$LINK_DIR/log/service_eventlog.txt</td>
</tr>
<tr>
<td>al_jobserver</td>
<td>$LINK_DIR/log/JobServerName/server_eventlog.txt</td>
</tr>
<tr>
<td>AL_AccessServer</td>
<td>AccessServerPath/error_mm_dd_yyyy.log</td>
</tr>
<tr>
<td>al_snmpd</td>
<td>$LINK_DIR/log/snmpd.PID.log</td>
</tr>
</tbody>
</table>

Updating licenses

To update a license (for example, from evaluation to permanent), copy the license file to $LINK_DIR/License/al_license.lic. To verify the licensing information, run the following sequence of commands:

$ cd $LINK_DIR/bin
$ . /al_env.sh
$ LicenseManager
This will display an output similar to the following.

<table>
<thead>
<tr>
<th><strong>Data Integrator License Information</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Integrator Job Server : Licensed</td>
</tr>
<tr>
<td>Data Integrator Access Server : Licensed</td>
</tr>
<tr>
<td>Data Integrator Multi-Byte : Licensed</td>
</tr>
<tr>
<td>Data Integrator SNMP Agent : Licensed</td>
</tr>
<tr>
<td>Expiration Date : 11 01 2003</td>
</tr>
</tbody>
</table>

**Uninstalling Data Integrator**

- **To uninstall Data Integrator**
  1. Stop the service. See "To start or stop the Data Integrator Service" on page 145.
  2. Remove automatic startup of the Data Integrator Service at restart (if it is enabled) by executing the script as root user: $LINK_DIR/bin/uninstall_root
  3. Remove Data Integrator directories and files recursively in $LINK_DIR by the command:
     
     rm -R $LINK_DIR

**Troubleshooting**

There are several types of problems that you can troubleshoot:

- Designer-Job Server connection
- Server Manager problems
- Administrator connection
- Memory issues
- Threading issues

**Designer-Job Server connection**

If the computer on which the Designer is running is unable to connect to the computer on which the Job Server is running, then verify that you can ping, by name, from the Designer’s computer to the Job Server’s computer. If you cannot ping by name, contact your local network administrator.
Check how long `netstat -a` takes to run and expect at least that amount of time to configure Data Integrator services.

**Server Manager problems**

If you encounter any of the following situations, reset all Data Integrator processes:

- Five to ten minutes after starting the Server Manager, you still receive messages that the AL_JobService is in active mode.
- After starting the Server Manager, the menu does not appear.
- The AL_JobService log states that the server configuration is active when the Server Manager is not running.
- Job Servers, Access Servers, or the AL_JobService continue to run after you stop the Data Integrator Service.

▲ To reset all Data Integrator processes

1. Obtain the process ID of AL_JobService. Enter the command
   
   `$ ps -fu UnixLoginId`  

2. Issue the command:
   
   `$ kill -15 AL_JobServicePID`  

3. Wait at least 30 seconds for the AL_JobService and other Data Integrator processes to shut down. This time period might be longer if there are many instances of Job Servers and Access Servers in the installation.

4. To verify that the AL_JobService, al_jobserver, AL_AccessServer, and httpd processes were stopped, enter the command:
   
   `$ ps -fu UnixLoginId`  

5. For any processes that still exist, enter a specific kill command:
   
   - For each instance of the process al_jobserver, enter the command:
     
     `$ kill -9 al_jobserverPID`  

   - For each instance of the process AL_AccessServer, enter the command:
     
     `$ kill -9 AL_AccessServerPID`  

   - For the process AL_JobService, enter the command:
     
     `$ kill -9 AL_JobServicePID`  

   - For the Web Server, enter the single command:
     
     ```bash
     $WEBSERVER_HOME/bin/shutdown.sh -config \\
     $WEBSERVER_HOME/conf/server-di-1.xml
     ```  

   - For SNMP:
     
     `$ kill -9 al_snmpPID`
6. Remove the file $LINK_DIR/log/AL_JobService.PID.
7. If the process svrcfg exists, enter the command:
   $ kill -9 svrcfg PID

**Administrator connection**

If you cannot connect to the Data Integrator Administrator, stop and restart the AL_JobService process.

**Memory issues**

As with any computer on which a Job Server is running, reserve enough space for the Data Integrator engine to cache tables and extract all data necessary to perform hierarchy flattening, sorts, or lookups.

Consider changing the following system settings if you see memory-related errors:

- **Maximum virtual memory per process**
  If this setting is low enough to interfere with Data Integrator operations, you might see messages describing low-memory errors.

- **Maximum number of files per process**
  If this setting is low enough to interfere with Data Integrator or database server operations, you might see messages describing file open errors.

- **Maximum stack size per process**
  If this setting is low enough to interfere with Data Integrator operations, you might see messages describing segmentation-violation errors.

- **Maximum data segment size per process**
  If this setting is low enough to interfere with Data Integrator operations, you might see messages describing segmentation-violation errors.

For more information, see the your UNIX system administration documentation.

**Threading issues**

If you are running the Data Integrator Job Server on the HP-UX platform and you get an error that reads *Cannot Start Thread*, check the Kernel Parameter (max_thread_proc) on HP-UX. Set the value to 256 on HP-UX for PA-RISC 32-bit and 1024 on HP-UX for Itanium 64-bit. If you encounter additional errors, please contact Business Objects Customer Support.
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