

IBM<sup>®</sup> DB2<sup>®</sup> OLAP Server<sup>™</sup> and Starter Kit



# OLAP Setup and User's Guide

*Version 7*



IBM<sup>®</sup> DB2<sup>®</sup> OLAP Server<sup>™</sup> and Starter Kit



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*Version 7*

**Note**

Before using this information and the product it supports, be sure to read the information in "Notices" on page 239.

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## About this Book

DB2 OLAP Server and the DB2 OLAP Starter Kit (which is part of DB2 Universal Database) are based on products from Hyperion Solutions Corporation. This book was written by IBM and is intended to be used with books and online help written by Hyperion. You will see references to Hyperion and Hyperion's products in the interface and throughout the Hyperion books. Only the relevant Hyperion books are included with the DB2 OLAP Server and the DB2 OLAP Starter Kit; these books and the exceptions are listed in "Related Publications" on page viii.

The DB2 OLAP Starter Kit is included free with DB2 Universal Database and contains limited-function versions of DB2 OLAP Server and DB2 OLAP Integration Server. The full-function version of DB2 OLAP Integration Server is available as an add-on product for DB2 OLAP Server.

This book provides detailed information about using DB2 OLAP Server and the DB2 OLAP Starter Kit with a relational database management system (RDBMS) and with multidimensional data stored in your operating system's file system. It also contains information about how to use standard Structured Query Language (SQL) statements to access the multidimensional data that DB2 OLAP Server stores in relational tables. If you are using DB2 OLAP Server for AS/400, you will also use documentation from ShowCase Corporation.

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## Who Should Read this Book

Read this book if you are a DB2 OLAP Server administrator who is responsible for:

- Installing and configuring DB2 OLAP Server.
- Designing and creating OLAP applications and multidimensional databases using DB2 OLAP Server.
- Setting up security for DB2 OLAP Server.
- Setting up and managing data storage used with DB2 OLAP Server.
- Maintaining OLAP applications and multidimensional databases that are migrated to or created using DB2 OLAP Server.

As the DB2 OLAP Server administrator, you should have experience in networking and system administration, and should understand the analytical requirements of the users who will use the applications created with DB2 OLAP Server.

This book is also for a relational database administrator who is responsible for installing, configuring, and maintaining the relational database that is used by the relational storage manager of DB2 OLAP Server. As a relational database administrator, you should have experience administering relational databases, working with OLAP, and working with multidimensional stores.

You should also read this book if you are an application developer who is responsible for writing applications that use SQL to access multidimensional data tables created using the DB2 OLAP Server relational storage manager.

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## Related Publications

This section lists books that are included with DB2 OLAP Server, DB2 OLAP Starter Kit, and Add-on products. DB2 OLAP Server users can find these books in PDF and HTML format in the `x:\db2 olap\docs` directory, where `x:\db2 olap` is the directory in which you installed DB2 OLAP Server workstation applications. Information about the DB2 library including DB2 OLAP Server can be found in “Appendix B. Using the DB2 Library” on page 221.

Table 1 lists the publications that are included with both DB2 OLAP Server and the DB2 OLAP Starter Kit in DB2 Universal Database.

*Table 1. Publications for both DB2 OLAP Server and the DB2 OLAP Starter Kit*

<b>Publication Name</b>	<b>Description</b>
<i>OLAP Integration Server Model User's Guide (SC27-0783).</i>	Explains how to create OLAP models using the standard OLAP Model interface in the DB2 OLAP Integration Server.
<i>OLAP Integration Server Metaoutline User's Guide (SC27-0784).</i>	Explains how to create OLAP metaoutlines using the standard OLAP Metaoutline interface in the DB2 OLAP Integration Server.
<i>OLAP Integration Server Administration Guide (SC27-0787)</i>	Explains how to use the Administration Manager component of the DB2 OLAP Integration Server.
<i>OLAP Spreadsheet Add-in User's Guide for Excel (SC27-0786)</i>	Explains how to use the Spreadsheet Add-in with Microsoft Excel for Windows to analyze data.
<i>OLAP Spreadsheet Add-in User's Guide for 1-2-3 (SC27-0785)</i>	Explains how to use the Spreadsheet Add-in with Lotus 1-2-3 for Windows to analyze data.

Table 2 on page ix lists the publications that are included only with the DB2 OLAP Server base product.

Table 2. DB2 OLAP Server Publications

<b>Publication Name</b>	<b>Description</b>
<i>AS/400 Administrator's Guide</i> (SC27-1132)	Provides AS/400 database administrators with information about configuring and maintaining DB2 OLAP Server for AS/400 and the DB2 OLAP Server for AS/400 Builder add-on product.
<i>OLAP Database Administrator's Guide, Volume I</i> (SC27-0788) and <i>OLAP Database Administrator's Guide, Volume II</i> (SC27-0789)	Provides administrators with strategies and techniques to implement, design, build, and maintain an optimized multidimensional database. Provides instructions for how to design and build a security system. Provides instructions for how to load, calculate, and report your data. Also provides instructions for performing tasks using the Application Manager.
<i>OLAP Quick Technical Reference</i> (SC27-0790)	Summarizes the syntax of functions, calculator commands, report writer commands, and ESSBASE.CFG settings.
<i>OLAP Technical Reference</i>	Provides reference about writing formulas, calculation scripts, report scripts, and using the ESSCMD command interface.
<i>OLAP SQL Interface Guide</i> (SC27-0791)	Explains how to load data from SQL, relational, and flat-file data sources. The SQL Interface tool is part of the Tools Bundle, which is an add-on product for DB2 OLAP Server.
<i>AS/400 Administrator's Guide</i> (SC26-9677)	Provides AS/400 database administrators with information about configuring and maintaining DB2 OLAP Server for AS/400 and the DB2 OLAP Server for AS/400 Builder add-on product.

Table 3 lists the publications that are included with the DB2 OLAP Server add-on products.

This table does not include the three books for the full-function version of DB2 OLAP Integration Server, which is available as an add-on product for DB2 OLAP Server; those three books are listed in Table 1 on page viii.

Table 3. DB2 OLAP Server Add-on Publications

<b>Publication Name</b>	<b>Description</b>
<i>Objects Programming Guide</i>	Provides instructions for writing applications using DB2 OLAP Server Objects. This book is in PDF only.

Table 3. DB2 OLAP Server Add-on Publications (continued)

<b>Publication Name</b>	<b>Description</b>
<i>API Reference</i>	Provides reference information for functions that are available through the Application Programming Interface, which is part of the DB2 OLAP Server Tools Bundle. This book is in HTML only.
<i>OLAP Allocations Manager Installation Guide (SC27-0792)</i>	Explains how to install the DB2 OLAP Server Allocations Manager. It also describes how to set up the Allocations Manager repository and log file.
<i>OLAP Allocations Manager Administrator's Guide (SC27-0793)</i>	Provides reference information for the DB2 OLAP Server Allocations Manager. The book is for allocation administrators who are responsible for creating, editing, managing, and launching allocations using the Allocations Manager. It describes Allocations Manager features, concepts, procedures, and examples needed to run the software.
<i>OLAP Allocations Manager Quick Reference (SC27-0794)</i>	Provides quick reference information for the DB2 OLAP Server Allocations Manager. The card is for business users who need to use the Launcher module of the Allocations Manager to run allocation processes or calc scripts that have been set up by their allocations administrator.
<i>MERANT (INTERSOLV) DataDirect Connect ODBC Installation</i>	Provides instructions for installing the MERANT (INTERSOLV) ODBC drivers. This book is in PDF format only.
<i>MERANT (INTERSOLV) DataDirect Connect ODBC Reference</i>	Provides reference information for the MERANT (INTERSOLV) ODBC drivers. This book is in PDF format only.

Several IBM Redbooks about DB2 OLAP Server and related topics are available. Visit the IBM Redbook web site at [as400bks.rochester.ibm.com/pubs/html/redbooks/](http://as400bks.rochester.ibm.com/pubs/html/redbooks/) to view OLAP Redbooks online.

The DB2 OLAP Server publications are also available online at:

<http://www-4.ibm.com/software/data/db2/db2olap/library.html>

The books for the Information Catalog Manager, which is included with DB2 OLAP Server, are listed in “Appendix B. Using the DB2 Library” on page 221.

The following Hyperion Essbase and Hyperion Integration Server books are not included with this product. The information in this book supersedes the information in following books:

- *Hyperion Essbase Start Here*
- *Hyperion Essbase New Features*
- *Hyperion Essbase Installation Notes*
- *Hyperion Integration Server Start Here*
- *Hyperion Integration Server Installation Notes*



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## Part 1. Installation





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# Chapter 1. Introduction

This chapter provides an overview of the main components and concepts of DB2 OLAP Server and the DB2 OLAP Starter Kit.

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## The Full DB2 OLAP Server product

The IBM DB2 OLAP Server is an online analytical processing (OLAP) product that you can use to create a wide range of multidimensional planning, analysis, and reporting applications.

DB2 OLAP Server is based on the OLAP technology that was developed by Hyperion Solutions Corporation. DB2 OLAP Server for AS/400 uses Essbase code ported to AS/400 by ShowCase Corporation. Depending on your operating system, you will see references to Hyperion Essbase and ShowCase Strategy software in the interface and throughout the documentation..

DB2 OLAP Server includes all of the capabilities of Hyperion Essbase. In addition, it offers the option of storing multidimensional databases as sets of relational tables. Regardless of the storage management option that you choose, you can use the Essbase Application Manager and Essbase commands to create an Essbase application and its associated databases. You can also use over 70 Essbase-ready tools provided by independent software vendors that can access multidimensional databases transparently.

Additionally, DB2 OLAP Server for AS/400 includes the Warehouse Builder component of ShowCase STRATEGY, but it does not include the following ShowCase STRATEGY components: Query, Report Writer, Warehouse Manager client, Analyzer OLAP Server, Analyzer, Analyzer Designer, Analyzer for the Web, and Data View Manager.

Figure 1 on page 4 shows the main components in the DB2 OLAP Server environment.

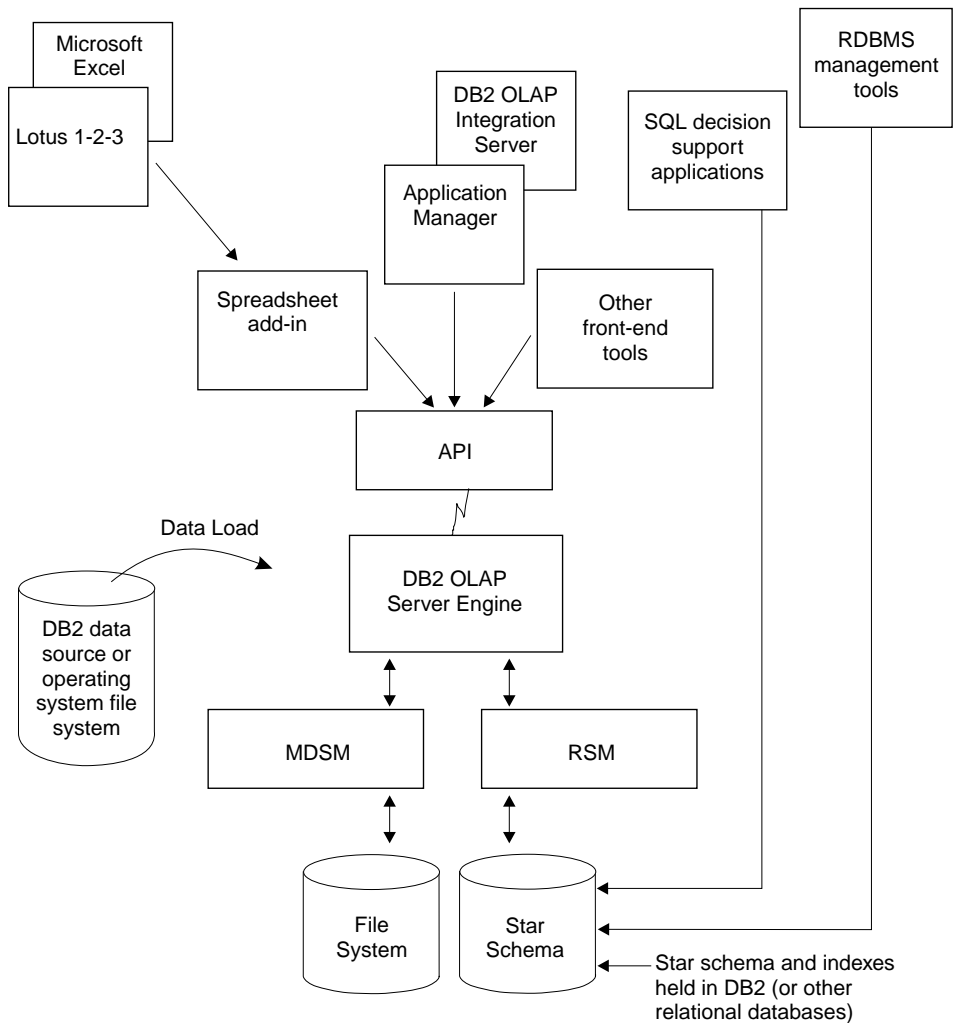


Figure 1. DB2 OLAP Server components

## The DB2 OLAP Integration Server

The DB2 OLAP Integration Server add-on product is based on the Hyperion Integration Server product. It provides a graphical interface for easily mapping relational data sources to OLAP structures to create OLAP applications. DB2 OLAP Integration Server also provides two assistants that guide you through the process of creating OLAP applications.

---

## The DB2 OLAP Starter Kit

The DB2 OLAP Starter Kit is a subset of the function in IBM DB2 OLAP Server and is provided free in DB2 Universal Database. You can use the desktop interface provided by the DB2 OLAP Integration Server to develop OLAP applications, and analyze the applications using the Spreadsheet Add-ins in Microsoft Excel or Lotus 1-2-3. The Spreadsheet Add-ins are included with the Starter Kit.

The applications that you can create are OLAP applications with limited users and scope. If you like the DB2 OLAP Starter Kit and want to expand the use and scope of your OLAP applications, you can purchase the full-function IBM DB2 OLAP Server and the full-function DB2 OLAP Integration Server.

DB2 Universal Database provides a Business Intelligence tutorial that shows you how to use the Starter Kit. The tutorial also shows how to get started with the IBM DB2 Warehouse Manager.

---

## The OLAP Engine

DB2 OLAP Server uses the Essbase OLAP engine for application design and management, data access and navigation, data load, data calculation, and application programming interfaces (APIs).

DB2 OLAP Server is compatible with Essbase, and can be used with all Essbase-ready front-end tools and applications developed by Hyperion and Essbase partners.

You can migrate your existing Essbase applications to DB2 OLAP Server.

---

## The Relational Storage Manager

DB2 OLAP Server augments the multidimensional data storage manger (MDSM) with a relational storage manager (RSM).

Providing improved flexibility, the RSM separates the OLAP engine from the database and provides support for DB2. You can manage the data that is stored by your OLAP applications using familiar database management, backup, and recovery tools.

---

## The Multidimensional Storage Manager

DB2 OLAP Server offers a multidimensional storage manager (MDSM) for applications in which performance is the critical requirement. In the Hyperion documentation, this is also called the *storage manager*, or the Essbase *kernel*.

The multidimensional data storage manager and the relational storage manager can coexist in the same installation of DB2 OLAP Server. For example, using Application Partitioning, you can distribute data across both relational and multidimensional data stores.

---

## Star Schema Tables and Views

Using the RSM, DB2 OLAP Server stores data in a relational database using a star-schema data structure. You can access your data using DB2 OLAP Server clients, and you can access the multidimensional data stored in the star schema using standard SQL statements.

The RSM automatically creates and manages the necessary relational tables, views, and indexes within the star schema, and the star schema can be populated with calculated data to improve the performance of queries.

For detailed information about how to access your multidimensional data using SQL statements, see “Chapter 12. Creating SQL Applications” on page 183.

---

## Terminology

The following terms are used throughout this book. You can find definitions for additional DB2 OLAP Server terms in the glossary on page 243.

### **Application Manager**

Essbase software, included with DB2 OLAP Server, that you can use to create and maintain Essbase applications.

### **OLAP application**

An application that you create using the Essbase Application Manager or Essbase commands (in DB2 OLAP Server) or with the DB2 OLAP Integration Server desktop, which is in the Starter Kit. An Essbase application can contain one or more Essbase databases and any associated calculation scripts, report scripts, and data load rules. You can store many Essbase applications in a single relational database.

### **Metaoutline**

A template that contains the structure and rules for creating a database outline from an OLAP model. Using the metaoutline, you can create a database outline and load data into it. The DB2 OLAP Integration Server desktop includes a tool called OLAP Metaoutline that you can use to create one or more metaoutlines from an OLAP model.

**Model** A logical model (star schema) that you create from tables and columns in a relational database. You can use the OLAP model to create a metaoutline that generates the structure of a multidimensional

database. The DB2 OLAP Integration Server desktop includes a tool called OLAP Metaoutline that you can use to design and create an OLAP model based on a relational data source.

### **Multidimensional data**

The data in a multidimensional database. Data can include basic data values, loaded from an external source, that represent combinations of the lowest level of members in the dimensions of the database; data values that are calculated from the base data values; and rolled-up data values that are created by combining values for members in dimension hierarchies.

### **Multidimensional database**

A database that you create using the Application Manager or commands (in DB2 OLAP Server) or with the DB2 OLAP Integration Server desktop, which is in the Starter Kit. A multidimensional database includes a database outline, data, associated optional calculation scripts, optional report scripts, and data load rules. The relational storage manager stores the actual data and a shadow of the database outline in tables in a relational database. You can store many multidimensional databases in a single relational database. The multidimensional data storage manager stores the outline and data in files in the file system.

### **Relational database**

A database that is organized and accessed according to relationships between data items. A relational database contains a collection of relational tables, views, and indexes. You can store many multidimensional applications and databases in a single relational database.

### **Relational cube**

A set of data and metadata stored in a relational database that together define a multidimensional database. A relational cube is similar to a multidimensional database, but it refers to the portion of a multidimensional database that is stored in a relational database.

### **Star schema**

A fact table and a set of dimension tables. The fact table holds the actual data values for the database, and the dimension tables hold data about members and their relationships. When you use the Application Manager to create a multidimensional database, the relational storage manager creates this type of relational database schema.

### **SQL application**

An application that uses Structured Query Language (SQL) statements. You can use SQL applications to access data in a relational cube.

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## What's New in Version 7.1

The following list provides an overview of the significant changes in DB2 OLAP Server Version 7.1:

### Two New DB2 OLAP Server Add-on Products

DB2 OLAP Server offers two additional add-on products in Version 7.1:

- **DB2 OLAP Integration Server** lets you map and transfer data from relational databases to OLAP cubes quickly and easily. It includes a set of graphical tools and a shared, enterprise OLAP metadata catalog that contains reusable data mappings, dimensions, hierarchies, calculation logic, and business rules. End users and IT professionals can combine and customize objects that are stored in the OLAP metadata catalog and then create new analytic applications that are tailored to satisfy specific business requirements from relational data sources. The Integration Server is not part of DB2 OLAP Server for AS/400.
- **DB2 OLAP Server Allocations Manager** is an analytical application for managing the allocations of shared revenues, costs, and capital across organizations. The Allocations Manager provides a graphical interface and offers several commonly employed allocation methods. The Allocations Manager is not part of DB2 OLAP Server for AS/400.

### Choice of Storage Manager

Now you can choose your storage manager (multidimensional or relational) when you create your OLAP application, not during installation. The DB2 OLAP Starter Kit now includes controls in the DB2 OLAP Integration Server desktop that you can use to select storage managers. In DB2 OLAP Server, you can select a storage manager in either the DB2 OLAP Integration Server or in the Application Manager.

### Tivoli support

DB2 OLAP Server now supports Tivoli systems management solutions to help you control your IT resources. For more information about Tivoli products, go to the Tivoli Web site:  
<http://www.ibm.com/software/sysmgmt/>

### Sophisticated, Economical Attribute Analysis

Attributes are characteristics of your data. For example, products can have attributes such as colors, sizes, or flavors. DB2 OLAP Server provides a number of attribute-related features that help you define and store attribute information and analyze attribute data in meaningful ways:

- You can use attribute dimensions and members in the outline to define attributes. Attribute dimensions and members are

dynamically created with the Dynamic Calc feature. Therefore, attribute data is not stored in the database, and outlines may be smaller.

- Through the system-defined Attribute Calculations dimension, DB2 OLAP Server provides access to five consolidations of all attribute data: sums, counts, averages, minimums, and maximums.
- Flexibility at retrieval time means that viewing attribute data is optional.
- You can create meaningful summaries of the data through crosstabs. Crosstabs are a way of displaying summaries of your data, based on multiple characteristics of that data. For example, you can group different attribute information by columns and rows to see the total sales of grape-flavored soda packaged in 12-ounce cans.
- Through text, numeric, Boolean, and date-based comparisons, you can selectively view only the data that you want to see.
- Optionally, you can use numeric attributes to group and summarize attribute data by ranges of values. For example, you can analyze your data by population ranges such as 0 through 1000000, 1000001 through 2000000, and so on.
- DB2 OLAP Server provides three new attribute-related functions: @ATTRIBUTE, @WITHATTR, and @ATTRIBUTEVAL. In addition, all relevant functions have been enhanced to support attribute processing or calculations.

### **New and Updated ESSCMD Commands**

See the *OLAP Technical Reference* for more information.

### **Parallel Login and Application Startup Tasks**

You can now log in to the DB2 OLAP Server server and load and unload applications in parallel. Parallel login processing is now faster because of a new command-line parameter, `quicklogin`, which caches the security file and writes it to disk at specified time intervals.

### **Enterprise Architecture**

With concurrent agent operations, you can now deploy a larger number of applications, databases, and users on one or more servers. The new multitasking agent executes certain tasks in parallel. You can perform the following tasks simultaneously:

- Start multiple applications.
- Stop multiple applications.
- Log on multiple users. Users can log on when an application is loading or the database is recovering.

### **MERANT (INTERSOLV) ODBC Drivers**

MERANT ODBC drivers Version 3.11 and their documentation are

provided with the SQL Interface add-on product. Note that INTERSOLV Solutions has changed its corporate name to MERANT Solutions.

### **Enhanced Support for Large Outlines**

DB2 OLAP Server has improved support for large outlines by improving performance for the following outline-related operations:

- Outline editing
- Dimension building
- Restructuring
- Calculating

### **New API Features**

New C and Visual Basic APIs, and enhanced functionality of existing C and Visual Basic APIs, that enable attributes. See the *OLAP API Reference* for more information.

### **New Features in the Multidimensional Data Storage Manager (Kernel)**

The DB2 OLAP Server kernel (also known as the multidimensional data storage manager) offers improved performance with direct I/O (input/output) and no-wait I/O on most server platforms and file systems. On OS/390, the multidimensional storage manager now uses linear VSAM data sets to store the multidimensional data. The kernel also adds a data file cache that improves performance. See the *OLAP Database Administrator's Guide, Volume I* for more information.

### **New Features in the ESSBASE.CFG File**

See the *OLAP Technical Reference* for more information.

### **New Features in the Spreadsheet Add-in**

DB2 OLAP Server offers the following new features in the Spreadsheet Add-in:

- The new Query Designer (EQD), which replaces the Retrieval Wizard to create queries for reports.
- Support for Attributes
- Support for Microsoft Excel 2000 and Lotus 1-2-3 Millennium Release 9 and 9.1.

### **New Features in the Calculator**

DB2 OLAP Server offers enhanced function in the following areas:

- Member Set Functions
- Statistical Functions
- Allocation and Forecasting Functions
- Relationship Functions
- Date and Time Functions
- Calculation Method function



See the *OLAP Technical Reference* for more information.

### **New Features in Partitioning**

DB2 OLAP Server can use attribute functions to base partitions on attribute values associated with a base dimension.

### **New Features in Security Filters**

DB2 OLAP Server can define filters on attribute values associated with a base dimension.

### **Large Data Export Capability**

DB2 OLAP Server imposes no limitation on the size of data files you can export. The only limitations are the maximum file size and volume size allowed by your operating and file systems. Import file size remains limited to 2 GB.

### **New Features in Report Writer**

DB2 OLAP Server extends support for attributes to report writing.

### **Improved Performance on AS/400**

When you use the multidimensional storage manager, DB2 OLAP Server for AS/400 provides improved performance for load and calculation operations.

### **Windows NT cubes from AS/400 data**

You can build multidimensional OLAP databases on Windows NT using data from your AS/400 data warehouses using DB2 OLAP Server for AS/400.

### **Improved Control over AS/400 Message Logs**

In DB2 OLAP Server for AS/400, a new Essbase configuration setting, OS400DAYSLOGRETAIN, specifies the number of days that the system keeps log records.

### **Prevention of System Storage Overflow**

In DB2 OLAP Server for AS/400, you can limit how much Auxiliary Storage that the system uses during data load and calculation operations, and automatically stop the operations if the limit is exceeded.

### **New Commands for AS/400**

DB2 OLAP Server for AS/400 offers new Warehouse Manager Server commands. See the *AS/400 Administrator's Guide* for more information.



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## Chapter 2. Hardware and Software Requirements

This chapter describes the hardware and software that you need to run DB2 OLAP Server on various operating systems. DB2 OLAP Server operates in a client/server environment as a server to clients such as the Application Manager, or DB2 OLAP Integration Server. When the relational storage manager is used, it is also a client to a relational database management system (RDBMS). This chapter also tells you what communication protocols you can use between clients and servers on various operating systems.

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### Supported Hardware

For the relational storage manager, the server must run both DB2 and DB2 OLAP Server. Performance is better on a computer that has enough processing power and memory to run both servers.

#### Server Platforms

- At least a Pentium processor or equivalent for Windows NT or Windows 2000
- RS/6000® for AIX
- Sun SPARC or ULTRASPARC for Solaris Operating Environment
- HP PA-RISC for HP-UX (not supported for OLAP Starter Kit)
- AS/400 (V4R4, or later) Advanced RISC Server
- RAM - 64 MB or more (128 MB or more for UNIX platforms)
- Disk space - 35 to 50 MB for the server and sample applications; 15 to 20 MB for the SQL Interface software and samples

#### PC Client Platforms

- Processor:
  - At least a Pentium processor or equivalent for the Spreadsheet Add-in and Application Manager
- RAM:
  - 16 MB or more for Spreadsheet Add-in and Application Manager
  - 32 MB or more on Windows 95, Windows 98, Windows NT 4.0, or Windows 2000; 64 MB is recommended
- Disk space:
  - 24 MB for Application Manager
  - 17.5 MB for the Spreadsheet Add-in for 1-2-3
  - 16.7 MB for the Spreadsheet Add-in for Excel

- 9 MB for Essbase Runtime Client
- 45 MB for the Integration Server desktop
- Display
  - Resolution of at least 640 x 480 (800 x 600 or more recommended)

### **API Client Platforms**

- Processor:
  - At least a Pentium processor or equivalent for Windows 95 or 98, Windows NT, or Windows 2000
  - RS/6000 for AIX
  - Sun SPARC or ULTRASPARC for Solaris Operating Environment
  - HP PA-RISC for HP-UX
- RAM:
  - 16 MB for Windows 95 or 98, Windows NT, or Windows 2000
  - 32 MB (64 MB or more recommended) for UNIX platforms
- Disk space:
  - 15 MB for 32-bit Essbase API on Windows 95, Windows 98, Windows NT, or Windows 2000
  - 6 MB for all UNIX platforms
  - 45 MB for the Integration Server Desktop

### **Server Platforms for the OLAP Integration Server**

- Processor
  - At least a Pentium processor or equivalent for Windows NT or Windows 2000
  - RS/6000 for AIX
  - Sun SPARC or ULTRASPARC for Solaris Operating Environment
  - HP PA-RISC for HP-UX
- RAM
  - 64 MB or more
- Disk space
  - 32 MB for the server
  - 50 MB for the Metadata Catalog and sample applications

### **Web Gateway**

- Processor
  - At least a Pentium or equivalent for Windows NT or Windows 2000
  - Sun SPARC or ULTRASPARC for Solaris Operating Environment
- Disk space

- 15 MB or more

### **Objects**

- Processor
  - At least a Pentium or equivalent
- RAM
  - 32 MB or higher
- Disk space
  - 20 MB

### **Allocations Manager**

- Processor
  - At least a Pentium or equivalent
- RAM
  - 45 MB or higher (64 MB recommended)
- Disk space
  - 25 MB for installation only
- Display
  - Resolution of at least 800 x 600

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## **Supported Software**

### **Server Platforms for the DB2 OLAP Server**

- Operating System
  - Windows NT 4.0 or Windows 2000
  - AIX 4.3.3 or later
  - Solaris Operating Environment 2.6 or 2.7
  - HP-UX 11.0 (not supported for OLAP Starter Kit)
  - OS/400 (V4R4 or later)
- Communications
  - TCP/IP or named pipes

### **Workstation Client Platforms**

- Operating system
  - Windows 95
  - Windows 98
  - Windows NT 4.0
  - Windows 2000
- Spreadsheet

- Excel 97, Excel 2000
- Lotus 1-2-3 Millennium R9 or R9.1
- Communications
  - For servers on Windows: TCP/IP or Named Pipes
  - For servers on UNIX: TCP/IP
  - For servers on AS/400: TCP/IP or APPC

### **API Client Platforms**

- Operating system
  - OS/390 Version 2 Release 5 or later
  - Windows 95
  - Windows 98
  - Windows NT 4.0
  - Windows 2000
  - AIX 4.3.3 or later
  - Solaris Operating Environment 2.6 or 2.7
  - HP-UX 11.0

### **Server Platforms for the DB2 OLAP Integration Server**

- Operating System
  - OS/390 Version 2 Release 5 or later
  - Windows NT 4.0
  - Windows 2000
  - AIX 4.3.3 or later
  - Solaris Operating Environment 2.6 or 2.7
  - HP-UX 11.0
- Communications
- TCP/IP

### **Web Gateway**

- Operating system for the Web server
  - Windows NT Server 4.0 or later
  - Solaris Operating Environment 2.6 or 2.7
- Communications
  - TCP/IP
- Web server qualified with Web Gateway for Solaris Operating Environment
  - Netscape Enterprise Server 3.0 or later
- Web server qualified with Web Gateway for Windows NT or Windows 2000

- Microsoft Internet Information Server 3.0 for Windows NT or later
- Microsoft Merchant Server
- Netscape Enterprise Server 3.0 or later
- Web browsers
  - Microsoft Internet Explorer 3.0 or later
  - Netscape 3.0 or later

### **Objects**

- Operating system
  - Windows 95
  - Windows 98
  - Windows NT 4.0
- Communications
  - TCP/IP or named pipes
- Programming environment
  - Microsoft Visual Basic 4 or later
  - Microsoft Visual C++ 4.2
- Web deployment
  - ActiveX compatible Web browser

### **Allocations Manager**

- Operating system
  - Windows 95
  - Windows 98
  - Windows NT 4.0
  - Windows 2000
- Repository Manager
  - DB2 Universal Database™ Version 6.1 or later
  - Oracle8 Client

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## **Supported Relational Database Management Systems**

DB2 OLAP Server supports these RDBMSs:

- DB2 Universal Database Workgroup Edition Version 5, Version 6, and Version 7.1. The minimum DB2 Universal Database fixpack or DB2 level should be either 9044 or 9045, depending on your national language.
- DB2 Universal Database Enterprise Edition Version 5, Version 6, or Version 7.1. The minimum DB2 Universal Database fixpack (or DB2 level) on your system must be either 9044 or 9045, depending on your national language.

- DB2 UDB Extended Enterprise Edition Version 5, Version 6, or Version 7.1. The minimum DB2 Universal Database fixpack (or DB2 level) on your system must be either 9044 or 9045, depending on your national language.
- DB2 Database Server Version 4.0.1
- DB2 for OS/390<sup>®</sup> Version 5.1 at service level 9802 and Call Level Interface (CLI) PTFs. Refer to the program directory for PTF requirements.
- DB2 for OS/390<sup>®</sup> Version 6.1. Refer to the program directory for PTF requirements.

Additionally, you can access source data in other RDBMSs using ODBC.

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## Multi-Threaded Environments for AIX, Solaris Operating Environment, and HP-UX

DB2 OLAP Server provides a multi-threaded architecture to ensure high performance in a client/server environment, using the following thread software on the AIX, Solaris Operating Environment, and HP-UX operating systems:

**AIX** Kernel threads with pthread API. The thread software is part of AIX; you do not have to purchase it separately.

### **Solaris Operating Environment**

Solaris Operating Environment threads. The thread software is part of Solaris Operating Environment; you do not have to purchase it separately.

### **HP-UX**

DCE thread library, Version 1.4 or later. You have to purchase DCE separately; it is not part of the HP-UX operating system.

On all operating systems, make sure the correct thread software is properly installed before using DB2 OLAP Server. See your operating system documentation for more information.

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## Communications Protocols

You need to establish communications between the workstation on which you will install DB2 OLAP Server and the client workstations on which you will install the Essbase client.

DB2 OLAP Server always listens for incoming requests on port number 1423, regardless of which operating system you use.

Table 4 on page 19 shows the communication protocols that you can use with each supported operating system.



*Table 4. Supported communication protocols*

<b>Operating system</b>	<b>Named pipes</b>	<b>TCP/IP</b>
Windows NT	Yes	Yes
AIX	No	Yes
Solaris Operating Environment	No	Yes
HP-UX	No	Yes
OS/390	No	Yes



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## Chapter 3. Installing on Windows

This chapter tells you how to install server and client components for DB2 OLAP Server Version 7.1, and DB2 Universal Database Version 7.1 Starter Kit on Windows operating systems.

If you are installing DB2 OLAP Server Version 7.1, go to “Installing DB2 OLAP Server”.

If you are installing DB2 OLAP Starter Kit, go to “Installing DB2 OLAP Starter Kit” on page 24.

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### Installing DB2 OLAP Server

You can use DB2 OLAP Server with a new or existing DB2 or DB2 Universal Database, or with a multidimensional storage manager. The Dual Storage Manager component enables you to create applications that use either storage manager, and the ability to switch storage managers for existing applications. See “Selecting a Storage Manager” on page 147.

If you are installing DB2 OLAP Server and you want to use an RDBMS, you must install the RDBMS separately. DB2 and DB2 Universal Database can be installed either before or after you install DB2 OLAP Server. If you install DB2 Universal Database, make sure that you install the latest DB2 Universal Database fixpack, available from the DB2 Service and Support Web page at <http://www.ibm.com/software/data/db2/db2tech/>

If you want to install DB2 OLAP Server and Information Catalog Manager on the same system, we recommend that you install both products at the same time.

#### Information You Need Before You Install

During installation you are asked what edition and options you purchased. This information is used to build a license key for DB2 OLAP Server.

If your installation is new, or if you do not have an existing RDBMS configuration file (`rsm.cfg`), you will be prompted for information about your relational database name, user ID, and password. You can either add this information during installation, or update the `rsm.cfg` file after installation is complete.

If you use DB2 or DB2 Universal Database you will need the following information:

**Relational database name**

The name of the relational database where you want to store your multidimensional data.

**Relational database user ID**

The user ID that you want DB2 OLAP Server to use to log on to your relational database.

**Relational database password**

The password for the user ID that you want DB2 OLAP Server to use to log on to your relational database. This password is stored unencrypted in the relational storage manager configuration file (rsm.cfg). You can choose to leave the user ID and password fields blank. If you do not specify a user ID or password, DB2 OLAP Server will attempt to log on to the relational database using the ID and password you used to log on to your workstation. If this user ID does not have access to the relational database, you will be denied access to the relational database.

**DB2 OLAP Server Components and Add-ons**

Components of DB2 OLAP Server version 7.1:

- Documentation
- Information Catalog Manager
- Client components:
  - Hyperion Essbase Server
  - The ESSCMD command line interface
  - Multidimensional Storage Manager
  - IBM's Relational Storage Manager
  - Application Manager
  - Spreadsheet Add-ins
  - Integration Server Desktop
- Server components:
  - DB2 OLAP Server
  - Sample applications
- Add-on components, that you can purchase:
  - DB2 OLAP Integration Server, including the Administration Manager
  - ODBC drivers for the DB2 OLAP Integration Server
  - SQL Interface, including ODBC drivers
  - API
  - Currency Conversion
  - Extended Spreadsheet Toolkit
  - Web Gateway

- Objects
- Allocations Manager
- Partitioning

## Installation Steps

To install and set up DB2 OLAP Server on Windows:

1. On a server, insert the CD-ROM into the CD-ROM drive to display the installation launchpad. If the launchpad does not appear, you can run `setup.exe` from the root directory.
2. Select Install from the launchpad. To cancel installation at any time, click **Cancel**. To display Help at any time, press F1.
3. When prompted, select the edition of DB2 OLAP Server that you purchased.
4. When prompted, select the optional components that you purchased. For a list of the optional components. See “DB2 OLAP Server Components and Add-ons” on page 22.
5. Recommendation. If you want to install DB2 OLAP Server and Information Catalog Manager on the same system, we recommend that you install both products at the same time.
6. Provide the requested information on the remaining installation windows.
7. Optional. When installation is complete, check your Windows environment variables. See “Manually Updating Environment Variables” on page 29.
8. Restart your server.
9. Optional. Install DB2 OLAP Integration Server add-on. See “Installing DB2 OLAP Integration Server” on page 25.
10. Optional. Install the SQL Interface. The SQL Interface includes the ODBC drivers. See “Loading and Configuring ODBC for the SQL Interface” on page 33.
11. Optional. Install any additional add-on components.
12. If you installed the sample applications, use the Application Manager to load data into them. See the Application Manager online help and Essbase documentation.

The DB2 OLAP Server installation program, performs the following actions:

- Copies the DB2 OLAP Server files to the `c:\program files\essbase\bin` directory (or another directory that you specify) on your hard disk. The installation program creates the directories, if they don't exist. The directory structure is:

```
ESSBASE
  BIN
  APP
```

The BIN subdirectory contains DB2 OLAP Server software.

The APP subdirectory contains a subdirectory for each DB2 OLAP Server application that you create. An activity log file, which tracks all user requests made to the application or to databases within the application, is stored in the top directory for each application.

- Installs communication protocol support.
- Updates the Windows registry and environment variables. Users must remove any outdated entries.
- Ensures that server and client components are installed to the same root Essbase directory on your Windows workstation, and ensures that the ARBORPATH environment variable points to the same directory.

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## Installing DB2 OLAP Starter Kit

DB2 OLAP Server components can be installed as part of DB2 Universal Database Version 7.1. The DB2 base components must be installed in order to install DB2 OLAP Starter Kit. The Starter Kit components that are available with DB2 Universal Database are the Starter Kit Desktop, the Starter Kit Server, and the Spreadsheet Add-in. The Starter Kit supports only three concurrent users. You can easily migrate to DB2 OLAP Server from the OLAP Starter Kit.

After you install DB2 OLAP Starter Kit you can use the First Steps window to create the OLAP sample and work with the tutorial.

### Components of DB2 OLAP Starter Kit

The following components are included with the OLAP Starter Kit:

- DB2 OLAP server, including:
  - Spreadsheet Add-ins
  - Multidimensional Storage Manager
  - Relational Storage Manager
  - DB2 OLAP Integration Server, which includes the OLAP Model Desktop, the OLAP Metaoutline Desktop, and the Administration Manager
  - Sample Databases

The DB2 OLAP Starter Kit does not include the Application Manager, ESSCMD command line interface, or calc scripts.

### Installation Steps for OLAP Starter Kit on Windows

DB2 OLAP Starter Kit is installed as a component of DB2 Universal Database. To install DB2 OLAP Starter Kit:

1. On a server, insert the DB2 Universal Database CD-ROM into the CD-ROM drive to display the installation launchpad. If the launchpad does not appear, you can run `setup.exe` from the root directory.
2. Follow the prompts on the installation windows, and provide the information requested.

DB2 OLAP Starter Kit is automatically installed during a typical or custom install. It is not available in a compact install.

3. After DB2 Universal Database is successfully installed, you will be prompted to insert the DB2 OLAP Starter Kit CD-ROM to complete the installation.
4. When the installation is complete, restart your server.
5. Optional. You can use the tutorial learn how to work with DB2 OLAP Starter Kit.

To use the tutorial, you must first load the OLAP sample using the First Steps window in the DB2 Universal Database:

- a. Launch the First Steps window by clicking **Start** → **DB2 for Windows** → **First Steps**. You can also launch the First Steps window by entering `db2fs.cmd` on the command line.
- b. In the DB2 First Steps Launchpad, select Create Sample Databases.
- c. In the Create Sample Databases window, select OLAP sample. Click **OK**.
- d. When the OLAP sample has been created, you can use the tutorial. You can also use OLAP Integration Server to create an application to work with the OLAP sample. See “Using DB2 OLAP Integration Server to Load Data” on page 32.

---

## Installing DB2 OLAP Integration Server

DB2 OLAP Integration Server is installed as a component of the OLAP Starter Kit, but is an optional add-on for the DB2 OLAP Server.

To install the DB2 OLAP Integration Server as an add-on component:

1. Install the OLAP Integration Server from the CD-ROM.  
If you selected the OLAP Integration Server component during installation, it will automatically be installed to the default directory, `x:\hyperion\is` unless you specify a different drive or directory. The environment settings can be updated automatically, or you can update them manually. See “Manually Updating Environment Variables” on page 29.
2. Configure a data source using ODBC. See “Loading and Configuring ODBC for the SQL Interface” on page 33 .

3. Create an OLAP Metadata catalog. See “About OLAP Metadata Catalogs”.
4. Connect to servers and relational data sources. See “Connecting to Servers and Relational Data Sources”.

## Connecting to Servers and Relational Data Sources

To use the OLAP Integration Server to create OLAP models and metaoutlines, you must connect the client software to the servers: OLAP Integration Server and DB2 OLAP Server. You must also connect to a relational data source, and to an OLAP metadata catalog where you want to store the OLAP models and metaoutlines that you create. Two metadata catalogs are created and configured as a relational data source during installation:

OLAPCATP (for production)  
OLAPCATD (for development)

On the OLAP Starter Kit, these two metadata catalogs are created automatically during a typical or custom install.

To use OLAP Integration Server on Sybase, you must have execute permission for sp-fkeys in Sybssystemprocs.

### Summary of SQL Scripts to Manage Catalogs and Tables

Use the following SQL scripts to create, drop, or upgrade the OLAP metadata catalog and tables:

To build catalogs use: ocdb2.sql  
To drop catalogs use: ocdrop\_db2.sql  
To upgrade catalogs use: ocdb2\_upgrd20.sql

If you need to rebuild tables, you must first drop the tables before rebuilding them.

## About OLAP Metadata Catalogs

An OLAP metadata catalog is a relational database that contains tables in which OLAP Integration Server stores OLAP models and metaoutlines. An OLAP metadata catalog must be configured before you can connect to it.

The RDBMS for an OLAP metadata catalog can run on any supported platform as long as you have the Open Database Connectivity (ODBC) driver and database client software to connect to it from the workstation that runs OLAP Integration Server. The RDBMS for the relational data source that you use to create OLAP models and build metaoutlines also can run on any supported operating system, if you have the ODBC driver and database client software to access it. The RDBMS for the OLAP metadata catalog can be different from the RDBMS for the relational data source, and the platforms for the two RDBMSs do not need to be the same. You can have more than one



OLAP metadata catalog, but you cannot move OLAP models and metaoutlines from one OLAP metadata catalog to another.

To make these connections, you must first map each data source to a supported ODBC driver. All configuration of ODBC data sources is done only on the workstation that runs OLAP Integration Server. On Windows, configure ODBC drivers using the ODBC Administrator. If a supported ODBC driver is already mapped to the relational data source, do not map it again. Simply map a supported ODBC driver to the OLAP metadata catalog.

The following RDBMSs are supported by DB2 OLAP Server, but not by the DB2 OLAP Starter Kit:

- DB2 Client or Client Application Enabler (CAE)
- Informix ODBC Driver or Call Level Interface (CLI)
- Oracle Net8 or SQL\*Net
- SQL Server Client or Microsoft Data Access Components (DAC)
- Sybase Open Client

Configure the ODBC connections to the relational data source and the OLAP metadata catalog only on the workstation that is running OLAP Integration Server. You do not need to configure ODBC connections on OLAP Integration Server client workstations.

### **Manually Creating an OLAP Metadata Catalog for DB2**

You must have database administrator or similar access privileges required by the RDBMS to create a database.

To create an OLAP metadata catalog:

1. Create a database for the OLAP metadata catalog tables
  - a. Create a database with 30 MB for storage.
  - b. Create user names and passwords for the database.
  - c. Grant user privileges for the database.
2. Create tables for the OLAP metadata catalog

The SQL scripts that you use to create tables for the OLAP metadata catalog are in the `ocscript` directory where you installed OLAP Integration Server. In the DB2 Command Center, run the ***db2 -tvf*** utility to perform the following steps:

- a. Connect to the database that you created for the OLAP metadata catalog.
- b. Run the `ocdb2.sql` SQL script to build the catalog.
- c. Run the `ocdatabase_name.sql` to build the tables in the catalog.

- d. Verify that the tables have been created by either starting the RDBMS and verifying that the OLAP metadata catalog contains the new tables, or enter a select command such as `SELECT * FROM JOIN_HINTS`.
- e. Close the utility.
- f. Map the catalog to an ODBC driver. See “Loading and Configuring ODBC for the SQL Interface” on page 33.

If you try to access an SQL Server database with the Microsoft native ODBC driver without access permission, Microsoft SQL Server connects you to the default database without notifying you.

## Updating the Environment for the Database Client

For the OLAP Integration Server, you need to set the environment variables required for database client software in the login script of the user who runs OLAP Integration Server. These environment settings are required for ODBC access to the databases in the RDBMS that you are using. The database vendor typically supplies a shell script to set any environment variables required by the database client. Add this shell script to the login script for the user who runs the OLAP Integration Server software. For more information about how to set environment variables for the database client, see the database client installation documentation.

To verify that the database client software is set up correctly, log on as the user who runs OLAP Integration Server, and use a database utility to connect to the databases that you use with OLAP Integration Server.

## OLAP Integration Server Directory Structure

*Table 5. OLAP Integration Server directory structure*

Directory Structure	Description
<i>\&lt;installation directory&gt;\IS\</i>	
bin	OLAP Integration Server and OLAP Command Interface software. If you also install client software, the OLAP Integration Server Desktop software is in the bin directory. A server log file, created when you first run OLAP Integration Server, is also in the bin directory.
esscript	Empty. The esscript directory will contain calculation and ESSCMD scripts you create.
esslib	Three subdirectories: <code>esslib\bin</code> , <code>esslib\client</code> , and <code>esslib\locale</code> .
loadinfo	Empty. The loadinfo directory will contain folders that represent session IDs, which will contain the reject files created during a member load or data load.

Table 5. OLAP Integration Server directory structure (continued)

locale	National Language support files.
ocscript	SQL script files to create, drop, and upgrade tables for an OLAP metadata catalog in each of the supported databases. For example, you can use <code>ocdb2.sql</code> to create OLAP metadata catalog tables.
samples	Two subdirectories: <code>samples\tbcdbase</code> and <code>samples\tbcmodel</code> .
samples\tbcdbase	SQL script files, batch files, and text files to create tables and load data for the TBC sample application database.
samples\tbcmodel	SQL script files, batch files, and text files to load data for OLAP model (TBC Model) and metaoutline (TBC Metaoutline) for the TBC_MD sample application OLAP metadata catalog database. You create tables for TBC_MD with an SQL script file in the <code>ocscript</code> directory.

## Manually Updating Environment Variables

When you install DB2 OLAP Server, the environment variables are automatically updated for you. Use this section if you need to modify the environment variables manually.

To update your environment variables:

1. Start Windows.
2. Click **Start** → **Control Panel** → **Settings**
3. Double-click the System icon.  
The System Properties window opens.
4. Click the **Environment** tab.
5. In the **Variable** field, type `ARBORPATH`
6. In the **Value** field, type the drive and directory where you installed DB2 OLAP Server. For example, type `c:\essbase`
7. Click **Set**.
8. Select the Path variable from the **System Variables** list.  
The Path variable and its value are displayed in the **Variable** and **Value** fields.
9. In the **Value** field, append `c:\essbase\bin` to the existing value, where `c:\essbase` is the drive and directory specified by the `ARBORPATH` environment variable.
10. Click **Apply**.

11. Click **Set**.
12. Click **OK**.

The System Properties window closes.

13. Restart your workstation.

Environment variables for DB2 OLAP Server are:

```
ARBORPATH = <target installation directory>
ISHOME = <target installation directory>/is
PATH = %ARBORPATH%/bin;%ISHOME%/bin
```

The environment variables for DB2 OLAP Starter Kit are:

```
ARBORPATH = <target installation directory>/sqllib/essbase
ISHOME = <target installation directory>/sqllib/is
PATH = %ARBORPATH%/bin;%ISHOME%/bin
```

---

## Starting DB2 OLAP Server on Windows

DB2 OLAP Server is automatically started as a service on your workstation. If you should need to start it manually by using the command line, follow these steps:

1. At the command prompt, enter:

```
Essbase
```

If an error occurs during startup, check your path and environment settings. If your path and environment settings are correct, ensure that the appropriate communications protocol is installed and running on your Windows workstation.

2. The first time you use DB2 OLAP Server, you are prompted to enter the following information:

### **Company name**

The company name that you want to use in your server license registration.

### **Your name**

The name to use as the DB2 OLAP Server supervisor ID. Use this name for your initial login from the Application Manager.

### **System password**

This password is required whenever you start DB2 OLAP Server. It is also required to gain access to the server from the Application Manager when you use the supervisor account.

### **Verification of the correctness of the information you entered**

Enter Y to verify the entries, or N to retype your entries.

When you enter Y, the information will be saved. At subsequent logins, you will be prompted for the system password only.

DB2 OLAP Server displays this message when the server is started and ready for use:

```
Waiting for Client Requests. . .
```

## Automating Server Startup

DB2 OLAP Server is started automatically. The following information is provided in case you should ever need to manually setup the server to start automatically. You can automate the server startup by using either the command line, or Windows Services.

To use the command line:

1. Create a DB2 OLAP Server icon on the Windows desktop in the Startup folder. See your Windows documentation for information about creating icons.
2. Define the Command Line option as follows:

```
c:\essbase\bin\essbase.exe
```

where c:\essbase\bin is the directory you used to install DB2 OLAP Server/

You can also supply the DB2 OLAP Server system password if you do not want to enter it each time you start the server. Specify the password after `essbase.exe` in the Command Line option of the icon definition. For example:

```
c:\essbase\bin\essbase.exe password
```

3. Type the title of the icon in the **Description** field.

To use Windows Services:

1. Click Start → **Settings** → **Control Panel** → **Services**
2. On the Services window, select the Essbase server.
3. Click **Start**.

## Automating Application Startup

You can start applications automatically. After DB2 OLAP Server is started, any application or database that is defined with an automatic startup setting is started.

You define startup settings in the Application Manager using the Application Settings window and Database Settings window. See the Application Manager online help for more information.

## Stopping DB2 OLAP Server and Starter Kit

To stop the server from any workstation that is connected to it, use one of the following two methods:

- For DB2 OLAP Server and OLAP Starter Kit, you can use Windows Services:
  1. Click **Start** → **Settings** → **Control Panel** → **Services**
  2. On the Services window, select the Essbase server.
  3. Click **Stop**.
- For DB2 OLAP Server, you can use the SHUTDOWNSERVER command in ESSCMD. See the *Hyperion Essbase Database Administrator's Guide, Volumes 1 and 2*, and the ESSCMD online help for more information.

---

## Using DB2 OLAP Integration Server to Load Data

You can use DB2 OLAP Integration Server to load the model and metaoutline that you use the with the OLAP sample. See “Installing DB2 OLAP Starter Kit” on page 24 to create an application and load it from the model defined in the OLAP Starter Kit sample.

To use DB2 OLAP Integration Server to load data:

1. Launch the DB2 OLAP Integration desktop.
2. In the OLAP Metadata Catalog field, select TBC\_MD
3. Type your user ID and password. Click **OK**.
4. On the OLAP Integration Server Desktop, click the **Existing** tab.
5. Expand TBC\_Model, and select TBC Metaoutline. Click **Open**, or double click on TBC Metaoutline. The Data Source window opens.
6. Select TBC from the pull down menu. Click **OK**.
7. On the menu bar, click **Outline ► Member and Data Load**. The Essbase Application and Database window opens.
8. Type a name for your application; for example, TBC.
9. Type a name for your database; for example, TBC.
10. In the **Calc Script** box, select Use Default Calc Script. Click **Next**. The Schedule Essbase Load window opens.
11. Select **Now**.
12. Click **Finish**.
13. You should see a message that the data has loaded successfully. To verify that the data is loaded, you should be able to launch a spread sheet, and view the data.

---

## Upgrading DB2 OLAP Server or DB2 OLAP Starter Kit

You cannot install or upgrade OLAP Starter Kit on top of an existing version. You must uninstall the existing version of OLAP Starter Kit before attempting to reinstall or upgrade to a new version.

When you install a new version of DB2 OLAP Server you can use the same directory as the old version. Your OLAP applications will be available to the new or upgraded version. When you install a new version to the same directory, you should take the following steps as a precaution:

- Back up the following files:
  - Your data
  - rsm.cfg
  - Essbase.sec
  - license.\*
- Stop any OLAP services.
- Install DB2 OLAP Server as a new installation, using the existing directory path.

---

## Enabling the DB2 OLAP Server License

The DB2 OLAP Server installation program prompts you for the edition and options that you have purchased, and uses that information to enable DB2 OLAP Server and add-on components.

If you install a license of DB2 OLAP Server and later want to add more features or additional users, you use one of the following methods:

- Run the SETUP.EXE program either from the root directory, or from the CD-ROM. The setup program will automatically update the license.
- Use the Windows Add/Remove utility:
  1. Click **Start** → **Settings** → **Control Panel** → **Add/Remove Programs**.
  2. Select IBM DB2 OLAP Server.
  3. Select License Update (or License Modify).
  4. You can now modify the license to include the new options you are installing.

---

## Loading and Configuring ODBC for the SQL Interface

The installation program does not load and configure the open database connectivity (ODBC) drivers. To use the SQL Interface add-on, you need to set up ODBC for DB2 and Merant database driver managers manually.

## Setting Up the IBM DB2 ODBC Driver

To load and configure ODBC for IBM DB2 using the DB2 sample application:

1. Add the IBM DB2 ODBC driver to your system:
  - a. Open the ODBC Data Source Administrator tool by running  
`c:\essbase\bin\odbcad32.exe`  
  
where `c:\essbase` is the drive and directory where you installed DB2 OLAP Server.
  - b. Click the **System DSN** tab, and then click **Add**.
  - c. On the Create New Data Source window, select **IBM DB2 ODBC driver** and click **Finish**.
  - d. On the ODBC IBM DB2 Driver - ADD window, click **Sample** from the **Data Source Name** field, and click **OK**.
  - e. Click **OK** on the ODBC Data Source Administrator window.
2. To test the ODBC connection, first bind an application to the database, then open an SQL data source. To bind the application:
  - a. Open the DB2 Client Configuration Assistant tool.
  - b. Select the SAMPLE database, and click **Bind**.
  - c. On the Bind Database - Sample window, make sure the **Bind user applications** radio button is selected, and click **Continue**.
  - d. In the Connect to DB2 Database window, type your user ID and password, and click **OK**.
  - e. In the Bind Applications window, click **Add**.
  - f. In the Bind Applications - Add File window, select all the \*.bnd files from the `c:\essbase\bin` directory (`qecsvi.bnd`, `qecswwhvi.bnd`, `qerrvi.bnd`, `qerrwhv1.bnd`, `qeurv1.bnd`, `qeurwhv.bnd`). Click **OK**.
  - g. In the Bind Applications window, click **OK**. Make sure that there are no errors with the bind. Click **Close**.
3. Open the SQL data source in the Application Manager. This example uses the SALES table in the SAMPLE database:
  - a. Open the Application Manager and log on to the server.
  - b. Click **File** → **New** → **Data Load Rules**. The Data Prep Editor window opens.
  - c. Click **File** → **Open SQL**. The Select Server, Application, and Database window opens.
  - d. Click **OK**. The Define SQL window opens.
  - e. In the **From** field, select the SAMPLE database, and type SALES. Click **OK/Retrieve**.



- f. On the next window, type your user ID and password, and click **OK**. The contents of the SALES table are displayed in the Data Prep Editor window.

## Setting Up the Merant ODBC Driver

To load and configure ODBC for Merant using the sample application:

1. Add the Merant ODBC driver to your system:
  - a. Open the ODBC Data Source Administrator tool by running `c:\essbase\bin\odbcad32.exe`, where `c:\essbase` is the drive and directory where you installed DB2 OLAP Server.
  - b. Click the **System DSN** tab, and then click **Add**.
  - c. On the Create New Data Source screen, select the **Merant DB2 ODBC** driver and click **Finish**.
  - d. On the ODBC Merant DB2 Driver setup window, make sure the data source name is `SAMPINT` and the database name is `SAMPLE`, and click **OK**.
  - e. Click **OK** on the ODBC Data Source Administrator window.
2. To test the ODBC connection, first bind an application to the database, then open an SQL data source. To bind the application:
  - a. Open the DB2 Client Configuration Assistant tool.
  - b. Select the `SAMPLE` database and click the **Bind** button.
  - c. On the Bind Database - Sample window, make sure the **Bind user applications** radio button is selected, and click **Continue**.
  - d. In the Connect to DB2 Database window, enter your user ID and password, and click **OK**.
  - e. In the Bind Applications window, click **Add**.
  - f. In the Bind Applications - Add File window, select all the `*.bnd` files from the `\essbase\bin` directory: `qecsvi.bnd`, `qecswwhvi.bnd`, `qerrvi.bnd`, `qerrwhv1.bnd`, `qeurv1.bnd`, `qeurwhv.bnd`. Then click **OK**.
  - g. In the Bind Applications window, click **OK**. Make sure there are no errors with the bind. Click the **Close** button.
3. Open the SQL data source in the Application Manager. This example uses the SALES table in the SAMPLE database:
  - a. Open the Application Manager and log on to the server.
  - b. Click **File** → **New** → **Data Load Rules**. The Data Prep Editor window opens.
  - c. Click **File** → **Open SQL**. The Select Server, Application, and Database window opens.
  - d. Click **OK**. The Define SQL window opens.
  - e. In the **From** field, select the `SAMPINT` data source, and type `SALES` in the **From** field. Click **OK/Retrieve**.

- f. On the next window, enter your user ID and password. The contents of the SALES table are displayed in the Data Prep Editor window.

---

## Managing Server Operations

The following table shows the commands that are used to manage DB2 OLAP Server.

When you start DB2 OLAP Server, the Agent window opens. The Agent window is the console for high-level server operations. Press Enter to view the following list of all available commands.

*Table 6. Agent Commands*

<b>Command</b>	<b>Description</b>
START <i>appname</i>	Starts the specified application.
STOP <i>appname</i>	Stops the specified application.
USERS	Displays a list of all users that are connected to the server, the total number of connections, and the number of ports that are available.
LOGOUTUSER <i>username</i>	Disconnects a user from the server and frees a port. This command requires the DB2 OLAP Server password.
PASSWORD	Changes the system password that is required to start DB2 OLAP Server.
VERSION	Displays the server version number.
HELP	Lists all valid commands and their respective functions.
PORTS	Displays the number of ports that are installed on the server and how many are in use.
DUMP <i>filename</i>	Copies information from the Essbase security system to a specified file in ASCII format. This command requires the DB2 OLAP Server password.
QUIT/EXIT	Shuts down all open applications and stops DB2 OLAP Server.

---

## Chapter 4. Installing on AIX, Solaris Operating Environment, and HP-UX

This chapter tells you how to install server components for DB2 OLAP Server Version 7.1, and DB2 Universal Database Version 7.1 Starter Kit on AIX, Solaris Operating Environment, and HP-UX operating systems.

If you are installing DB2 OLAP Server Version 7.1, go to “Installing DB2 OLAP Server”.

If you are installing DB2 OLAP Starter Kit, go to “Installing DB2 OLAP Starter Kit” on page 41.

---

### Installing DB2 OLAP Server

You can use DB2 OLAP Server with a new or existing DB2 RDBMS installation, or with a multidimensional storage manager. The Dual Storage Manager component enables you to create applications that use either storage manager, and the ability to switch storage managers for existing applications. See “Selecting a Storage Manager” on page 147.

If you are installing DB2 OLAP Server and you want to use an RDBMS, you must install the RDBMS separately. DB2 and DB2 Universal Database can be installed either before or after you install DB2 OLAP Server. If you install DB2 Universal Database, make sure that you install the latest DB2 Universal Database fixpack, available from the DB2 Service and Support Web page at <http://www.ibm.com/software/data/db2/db2tech/>

If you want to install DB2 OLAP Server and Information Catalog Manager on the same system, we recommend that you install both products at the same time.

#### Information You Need Before You Install

During installation you are asked what edition and options you purchased. This information is used to build a license key for DB2 OLAP Server.

If your installation is new, or if you do not have an existing RDBMS configuration file (`rsm.cfg`), you will be prompted for information about your relational database name, user ID, and password. You can either add this information during installation, or update the `rsm.cfg` file after installation is complete.

You need the following information about your RDBMS:

**Relational database name**

The name of the relational database where you want to store your multidimensional data.

**Relational database user ID**

The user ID that you want DB2 OLAP Server to use to log on to your relational database.

**Relational database password**

The password for the user ID that you want DB2 OLAP Server to use to log on to your relational database. This password is stored unencrypted in the relational storage manager configuration file (rsm.cfg). You can choose to leave the user ID and password fields blank. If you do not specify a user ID or password, DB2 OLAP Server will attempt to log on to the relational database using the ID and password you used to log on to your workstation. If this user ID does not have access to the relational database, you will be denied access to the relational database.

**DB2 OLAP Server Components and Add-ons**

Components of DB2 OLAP Server version 7.1:

- Documentation
- Information Catalog Manager
- Client components:
  - Hyperion Essbase Server
  - The ESSCMD command line interface
  - Multidimensional Storage Manager
  - IBM's Relational Storage Manager
  - Application Manager
  - Spreadsheet Add-ins
  - Integration Server Desktop
- Server components:
  - DB2 OLAP Server
  - Sample applications
- Add-on components, that you can purchase:
  - DB2 OLAP Integration Server, including the Administration Manager
  - ODBC drivers for the DB2 OLAP Integration Server
  - SQL Interface, including ODBC drivers
  - API
  - Currency Conversion
  - Extended Spreadsheet Toolkit
  - Web Gateway

- Objects
- Allocations Manager
- Partitioning

## Installation Steps for DB2 OLAP Server

To install DB2 OLAP Server:

1. Log on to the server as a user ID that has root privileges.
2. If you are installing on Solaris Operating Environment, set your locale to C. When you have finished installing, make sure the locale is still C when you start the server for the first time. Using the correct locale ensures that the administration user ID will be configured correctly.
3. If your workstation has a CD-ROM drive, follow these steps:
  - a. Insert the DB2 OLAP Server CD into your CD-ROM drive.
  - b. Use the `ls` command to find `olapinst` on the CD. The file name is either uppercase or lowercase, depending on your operating system.
  - c. Enter `olapinst` to run the setup script from the DB2 OLAP Server CD. If a multi-threaded environment is not detected, you will receive an error.
  - d. Continue at step 5.
4. If your workstation does not have a CD-ROM drive, follow these steps:
  - a. Create a temporary directory for use during installation.
  - b. Use FTP, NFS, or any similar utility to copy the DB2 OLAP Server files into your temporary directory.
  - c. Change to the temporary directory.
  - d. Use the `ls` command to find `olapinst` in the temporary operating system subdirectory, for example, look in `/temp/aix` for the AIX installation file. The file name is either uppercase or lowercase, depending on your operating system.
  - e. Enter `olapinst` to run the setup script from the temporary directory. If a multi-threaded environment is not detected, you will receive an error.
5. When prompted, specify the directory to which you want to install DB2 OLAP Server. In order to access your current licensing information, you can enter a directory that already exists. If you enter a new directory, you will receive a message asking if you want to enter your existing directory in order to access your current license files. You can either specify a new directory name or use the existing one. DB2 OLAP Server will be installed to whatever directory you specify.
6. When prompted for licensing information, select the add-on features that you purchased. Information about the add-on features is used to build the license key for DB2 OLAP Server.

7. You will be presented with a list of components to install. The components in the list are the ones that you are licensed to install. Select the components that you want to install.
8. Recommendation. If you want to install DB2 OLAP Server and Information Catalog Manager on the same system, we recommend that you install both products at the same time.
9. Optional. Select the Sample applications.  
You can load data into the sample applications using the Application Manager.
10. If you are installing the server, and the installation program does not detect an existing `rsm.cfg` file, you will be asked to supply the relational database name, the relational database user ID and password, and the database table space clause. These values are used to update the parameters in the relational configuration file.
11. If you are installing the SQL Interface, see “Loading and Configuring ODBC for the SQL Interface” on page 51 to set up ODBC.
12. **For Solaris Operating Environment only:** Run the Bourne shell script `root.sh` from the root account. The script is in the `$ARBORPATH/bin` directory and performs additional installation tasks, such as setting sticky bits on binaries and shared libraries. For example, to log in as the root user and run `root.sh`, type the following commands:

```
$ su -
PASSWORD: (enter your password)
# cd /home/essbase/bin
# sh root.sh
# exit
```

The `root.sh` script asks whether you installed the SQL Interface module. If you installed it, `root.sh` prompts you for the full path of the `libodbc.so` shared library. Enter the full path name, such as `/home/essbase/dlls/`. The `root.sh` scripts automatically append the file name `libodbc.so` to the path name entered.

13. **For HP-UX only:** Enter the following command in the `$ARBORPATH/bin` directory:

```
ln -f -s /opt/IBMDB2/V5.0/lib/libdb2.sl libesssql.sl
```

where `/opt/IBMDB2/V5.0/` is the installation directory for DB2 UDB.

14. Use the information in the `essbaseenv.doc` file to update the environment variables. The `essbaseenv.doc` file is created by the installation program. See “Updating the Environment Variables” on page 46 for more information.

The installation program creates the following directory structure:

```
<installation directory>
  bin
  app
  locale
  is
```

The bin directory contains the DB2 OLAP Server program.

The app directory contains a subdirectory for each Essbase application you create. An activity log file, which tracks all user requests made to the application or to databases within the application, is stored in the top directory for each application.

---

## Installing DB2 OLAP Starter Kit

DB2 OLAP Server components can be installed as part of DB2 Universal Database Version 7.1. The DB2 base components must be installed in order to install DB2 OLAP Starter Kit. The Starter Kit supports only three concurrent users. You can easily migrate to DB2 OLAP Server from the OLAP Starter Kit.

DB2 OLAP Starter Kit is not available for HP-UX

### Components of DB2 OLAP Starter Kit

The DB2 OLAP Starter Kit does not include the Application Manager, ESSCMD command line interface, or calc scripts. The following components are included with the OLAP Starter Kit:

- DB2 OLAP server, including:
  - Multidimensional Storage Manager
  - Relational Storage Manager
  - DB2 OLAP Integration Server, which includes the OLAP Metaoutline Desktop, and the Administration Manager
  - Sample multidimensional applications
  - Sample databases

### Installation Steps for DB2 OLAP Starter Kit

DB2 OLAP Starter Kit is installed as a component of DB2 Universal Database. To install DB2 OLAP Starter Kit, you must logon as a user who has root privileges. To install DB2 OLAP Starter Kit:

1. On a server workstation, insert the DB2 Universal Database CD-ROM into the CD-ROM drive. From the root directory on the CD-ROM, type `./db2setup`.
2. Follow the prompts on the installation windows, and provide the information requested.
3. After DB2 Universal Database is successfully installed, insert the Starter Kit CD-ROM. From the root directory of the CD-ROM, type `./db2setup`

4. Follow the prompts on the installation windows, and provide the information requested.
5. Optional. You can use the tutorial learn how to work with DB2 OLAP Starter Kit.

To use the tutorial, you must first load the OLAP sample using the First Steps window in the DB2 Universal Database:

- a. Launch the First Steps window by clicking **Start** → **DB2 for AIX, Solaris Operating Environment** → **First Steps**. You can also launch the First Steps window by entering `db2fs.cmd` on the command line.
- b. In the DB2 First Steps Launchpad, select Create Sample Databases.
- c. In the Create Sample Databases window, select OLAP Sample. Click **OK**.
- d. When the OLAP sample has been created, you can use the tutorial. You can also use OLAP Integration Server to create an application to work with the OLAP sample. See “Using DB2 OLAP Integration Server to Load Data” on page 32.

---

## Installing DB2 OLAP Integration Server

DB2 OLAP Integration Server is automatically installed with the OLAP Starter Kit. Follow these instructions if you are installing the OLAP Integration Server as an add-on with DB2 OLAP Server.

To install the DB2 OLAP Integration Server:

1. Install the OLAP Integration Server component from the CD-ROM.  
If you selected the OLAP Integration Server component during installation, it will automatically be installed to the default directory, `x:\hyperion\is` unless you specify a different drive or directory. The environment settings can be updated automatically, or you can update them manually. See “Manually Updating Environment Variables” on page 29.
2. Configure a data source using ODBC. See “Loading and Configuring ODBC for the SQL Interface” on page 33 .
3. Connect to servers and relational data sources. See “Connecting to Servers and Relational Data Sources”.
4. Create an OLAP Metadata catalog. See “Manually Creating an OLAP Metadata Catalog for DB2” on page 44.

## Connecting to Servers and Relational Data Sources

To use the OLAP Integration Server to create OLAP models and metaoutlines, you must connect the client software to two servers: OLAP Integration Server and DB2 OLAP Server. You must also connect to an OLAP metadata catalog where you want to store the OLAP models and metaoutlines that you create.



To use OLAP Integration Server on Sybase, you must have execute permission for sp-fkeys in Sybssystemprocs.

### **Summary of SQL Scripts to Manage Catalogs and Tables**

Use the following SQL scripts to create, drop, or upgrade the OLAP metadata catalog and tables:

To build catalogs use: ocdb2.sql

To drop catalogs use: ocdrop\_db2.sql

To upgrade catalogs use: ocdb2\_upgrd20.sql

If you need to rebuild tables, you must first drop the tables before rebuilding them.

### **About OLAP Metadata Catalogs**

An OLAP metadata catalog is a relational database that contains tables in which OLAP Integration Server stores OLAP models and metaoutlines. An OLAP metadata catalog must be configured before you can connect to it.

The RDBMS for an OLAP metadata catalog can run on any platform as long as you have the ODBC driver and database client software to connect to it from the workstation that runs OLAP Integration Server. The RDBMS for the relational data source that you use to create OLAP models and build metaoutlines also can run on any operating system, if you have the ODBC driver and database client software to access it. The RDBMS for the OLAP metadata catalog can be different from the RDBMS for the relational data source, and the platforms for the two RDBMSs do not need to be the same. You can have more than one OLAP metadata catalog, but you cannot move OLAP models and metaoutlines from one OLAP metadata catalog to another.

To make these connections, you must first map each data source to a supported Open Database Connectivity (ODBC) driver. All configuration of ODBC data sources is done only on the workstation that runs OLAP Integration Server. If a supported ODBC driver is already mapped to the relational data source, do not map it again. Simply map a supported ODBC driver to the OLAP metadata catalog.

For the OLAP Starter Kit server installed to AIX or Solaris Operating Environment, no ODBC configuration is needed, but you can only connect to OLAP Integration Server catalog databases and source relational databases that are cataloged to DB2 on the same UNIX server.

The following RDBMSs are supported by DB2 OLAP Server, but not by the DB2 OLAP Starter Kit:

- DB2 Client or Client Application Enabler (CAE)
- Informix ODBC Driver or Call Level Interface (CLI)

- Oracle Net8 or SQL\*Net
- SQL Server Client or Microsoft Data Access Components (DAC)
- Sybase Open Client

Configure the ODBC connections to the relational data source and the OLAP metadata catalog only on the workstation that is running OLAP Integration Server. You do not need to configure ODBC connections on OLAP Integration Server client workstations.

### **Manually Creating an OLAP Metadata Catalog for DB2**

You must have database administrator or similar access privileges required by the RDBMS to create a database.

To create an OLAP metadata catalog:

1. Create a database for the OLAP metadata catalog tables
  - a. Create a database with 30 MB for storage.
  - b. Create user names and passwords for the database.
  - c. Grant user privileges for the database.
2. Create tables for the OLAP metadata catalog

The SQL scripts that you use to create tables for the OLAP metadata catalog are in the `ocscript` directory where you installed OLAP Integration Server. In the DB2 Command Center, use the ***db2 -tvf*** utility to perform the following steps:

- a. Connect to the database that you created for the OLAP metadata catalog.
- b. Run the `ocdb2.sql` SQL script to build the catalog and tables.
- c. Verify that the tables have been created by either starting the RDBMS and verifying that the OLAP metadata catalog contains the new tables, or enter a select command such as `SELECT * FROM JOIN_HINTS`.
- d. Close the utility.
- e. Map the catalog to an ODBC driver. See “Loading and Configuring ODBC for the SQL Interface” on page 33.

If you try to access an SQL Server database with the Microsoft native ODBC driver without access permission, Microsoft SQL Server connects you to the default database without notifying you.

### **Updating the Environment for the Database Client**

For DB2 OLAP Server, you need to set the environment variables required for database client software in the login script of the user who runs OLAP Integration Server. These environment settings are required for ODBC access to the databases in the RDBMS that you are using. The database vendor typically supplies a shell script to set any environment variables required by the database client. Add this shell script to the login script for the user who

runs the OLAP Integration Server software. For more information about how to set environment variables for the database client, see the database client installation documentation.

To verify that the database client software is set up correctly, log on as the user who runs OLAP Integration Server, and use a database utility to connect to the databases that you use with OLAP Integration Server.

## OLAP Integration Server Directory Structure

*Table 7. OLAP Integration Server directory structure*

Directory Structure	Description
\<your install directory\IS\	
bin	OLAP Integration Server and OLAP Command Interface software. If you also install client software, the OLAP Integration Server Desktop software is in the bin directory. A server log file, created when you first run OLAP Integration Server, is also in the bin directory.
esscript	Empty. The esscript directory will contain calculation and ESSCMD scripts you create.
esslib	Three subdirectories: \bin, \client, and \locale.
loadinfo	Empty. The loadinfo directory will contain folders that represent session IDs, which will contain the reject files created during a member load or data load.
locale	National Language support files.
ocscript	SQL script files to create, drop, and upgrade tables for an OLAP metadata catalog in each of the supported databases. For example, you can use ocsybase.sql to create OLAP metadata catalog tables.
samples	Two subdirectories: samples\tbcdbase and samples\tbcmodel.
samples\tbcdbase	SQL script files, batch files, and text files to create tables and load data for the TBC sample application database.
samples\tbcmodel	SQL script files, batch files, and text files to load data for OLAP model (TBC Model) and metaoutline (TBC Metaoutline) for the TBC_MD sample application OLAP metadata catalog database. You create tables for TBC_MD with an SQL script file in the ocscript directory.

---

## Updating the Environment Variables

On DB2 OLAP Starter Kit, you can set up an instance as an OLAP instance. When you set up an OLAP instance, the following environment variables are set for the OLAP Integration Server:

```
ISHOME = <DB2 instance directory>/sqllib/is  
LIBPATH = $ISHOME/bin,$ISHOME/odbclic  
PATH = $ARBORPATH/bin,$ISHOME/bin,$ISHOME/odbclic
```

On DB2 OLAP Server, the installation program does not update the `.cshrc` or `.profile` environment files. Because the format of these files varies depending on the shell you use, you need to manually update the appropriate file for your system.

Refer to the `essbaseenv.doc` file when setting environment variables. This file contains the shared library information that you need to add to your global environment.

### Setting the ARBORPATH Variable

If you installed DB2 OLAP Server to `/home/essbase`, the `essbaseenv.doc` file contains this statement: `ARBORPATH=/home/essbase`

where *home* is the name of your home directory, and *essbase* is the name of the drive and directory where you installed DB2 OLAP Server.

Add this setting to your environment in the appropriate format for your system.

For example, in the C shell or Korn shell environment, you might add the following statement to your `.cshrc` environment file:

```
setenv ARBORPATH "/home/essbase"
```

In the Bourne shell environment, add this statement to your `.profile` environment:

```
ARBORPATH=/home/essbase; export ARBORPATH
```

### Setting the Library Path Variable

Update your system's library path setting to include the `$ARBORPATH/bin` directory.

#### In AIX

In the C shell or Korn shell environment, you might add the following statement to your `.cshrc` environment file:

```
setenv LIBPATH "$LIBPATH:$ARBORPATH/bin"
```

In the Bourne shell environment, add this statement to your `.profile` environment:

```
LIBPATH=$LIBPATH:$ARBORPATH/bin; export LIBPATH
```

### **In Solaris Operating Environment**

In the C shell or Korn shell environment, you might add the following statement to your `.cshrc` environment file:

```
setenv LD_LIBRARY_PATH "/usr/openwin/lib:/usr/lib:$ARBORPATH/bin:$ARBORPATH/dlls"
```

In the Bourne shell environment, add this statement to your `.profile` environment:

```
LD_LIBRARY_PATH=/usr/openwin/lib:/usr/lib:$ARBORPATH/bin:$ARBORPATH/dlls  
export LD_LIBRARY_PATH
```

### **In HP-UX**

In the C shell or Korn shell environment, you might add the following statement to your `.cshrc` environment file:

```
setenv SHLIB_PATH "$SHLIB_PATH:ARBORPATH/bin"
```

In the Bourne shell environment, add this statement to your `.profile` environment:

```
SHLIB_PATH=$SHLIB_PATH:$ARBORPATH/bin  
export LIBPATH
```

## **Kernel Configuration Parameters**

For HP-UX and Solaris Operating Environment, you might need to update the kernel configuration to a value of 64 or more. For example:

```
set shmsys:shminfo_shmseg=64  
set semsys:seminfo_semume=64
```

Refer to *Quick Beginnings for DB2 Universal Database for UNIX* for information about updating kernel configuration parameters.

## **Verifying the AIX Environment**

The following tips help you verify that your AIX environment variables in the `.profile` file are set correctly to run DB2 OLAP Server:

### **INSTHOME**

Set to the DB2 instance directory, such as `/home/dbinst1`.

### **DB2INSTANCEPATH**

Set to `$INSTHOME`.

### **DB2INSTANCE**

Set to the instance name DB2 OLAP Server is using, such as `db2inst1`.

## LIBPATH

Include an entry for \$ARBORPATH/dlls. Following this entry, include entries for \$INSTHOME/sqllib/odbc/lib and \$INSTHOME/sqllib/lib.

### Using the Set Path Command (Optional)

For convenience, you might want to issue a set path command so that you can quickly get to the DB2 OLAP Server directory.

For example, in the C shell or Korn shell environment:

```
set path=($path $ARBORPATH/bin)
```

In the Bourne shell environment:

```
PATH=$PATH:$ARBORPATH/bin; export PATH
```

---

## Using DB2 OLAP Server to Load Data

DB2 OLAP Integration Server is installed as a component of the OLAP Starter Kit, but is an optional add-on for the DB2 OLAP Server. You can use DB2 OLAP Integration Server to load the model and metaoutline that you use the with the OLAP sample. See “Installing DB2 OLAP Starter Kit” on page 41.

To use DB2 OLAP Integration Server to load data:

1. From a supported client, launch the DB2 OLAP Integration Server desktop.
2. In the OLAP Metadata Catalog field, select TBC\_MD
3. Type your user ID and password. Click **OK**.
4. On the OLAP Integration Server Desktop, click the **Existing** tab.
5. Expand TBC\_Model, and select TBC Metaoutline. Click **Open**, or double click on TBC Metaoutline. The Data Source window opens.
6. Select TBC from the pull down menu. Click **OK**.
7. On the menu bar, click **Outline** → **Member and Data Load**. The Essbase Application and Database window opens.
8. Type a name for your application; for example, TBC.
9. Type a name for your database; for example, TBC.
10. In the **Calc Script** box, select Use Default Calc Script. Click **Next**. The Schedule Essbase Load window opens.
11. Select **Now**. Click **Finish**.
12. You should see a message that the data has loaded successfully. To verify that the data is loaded, you should be able to launch a spread sheet, and view the data.

---

## Starting DB2 OLAP Server for AIX, Solaris Operating Environment, and HP-UX

Before you can access DB2 OLAP Server:

- Log off from the DB2 OLAP Server account that is pointed to be the environment variables, so that the updates to the environment variables take effect. Then log back on to that account or another account that has at least read/write/execute access to the DB2 OLAP Server directories.
- Ensure that the proper communications protocol is installed and running on your workstation.

You can start DB2 OLAP Server in the foreground or in the background.

### Starting DB2 OLAP Server in the Foreground

To start DB2 OLAP Server in the foreground:

1. From the command prompt, type:

```
$ARBORPATH/bin/ESSBASE
```

Or, if your path already includes \$ARBORPATH/bin, type:

```
ESSBASE
```

Tip: If you encounter any errors during startup, check your path and environment settings. If you still encounter problems after verifying your settings, ensure that the appropriate communications protocol is installed and running on your server.

2. The first time that you use DB2 OLAP Server, you are prompted to enter the following information:

#### **Company name**

The company name that will be added to your server license registration.

#### **Your name**

The name to use as the DB2 OLAP Server supervisor ID. Use this name for your initial login from the Application Manager.

#### **System password**

This password is required whenever you start DB2 OLAP Server. It is also required to gain access to the server from the Application Manager when you use the supervisor account.

#### **Verification of the correctness of the information you entered**

Answer Y to verify the entries or N to retype your entries.

After you verify the information, it will be saved. From then on, you will only be prompted for the system password.

DB2 OLAP Server displays this message when the server is started and ready for use:

```
Waiting for Client Requests. . .
```

## Starting DB2 OLAP Server in the Background

To start DB2 OLAP Server in the background, type:

```
ESSBASE password -b &
```

If you use Korn shell (ksh), and want to detach the server process (which lets the server continue to run after you log off), prefix the ESSBASE command with the *nohup* command. See your operating system documentation for more information.

It is recommended that you run DB2 OLAP Server in the foreground until your installation is running smoothly. This lets you see any error messages displayed by the server.

## Stopping DB2 OLAP Server and OLAP Starter Kit

To stop DB2 OLAP Server when it is running in the foreground, either:

- Type EXIT.
- Use the SHUTDOWN SERVER command in ESSCMD.

To stop DB2 OLAP Server when it is running in the background, use the SHUTDOWN SERVER command in ESSCMD.

To stop OLAP Starter Kit when it is running in the foreground, type EXIT.

To stop OLAP Starter Kit when it is running in the background, use the KILL command from another process.

---

## Upgrading DB2 OLAP Server or DB2 OLAP Starter Kit

You cannot install or upgrade OLAP Starter Kit on top of an existing version. You must uninstall the existing version of OLAP Starter Kit before attempting to reinstall or upgrade to a new version.

When you install a new version of DB2 OLAP Server you can use the same directory as the old version. Your OLAP applications will be available to the new or upgraded version. When you install a new version to the same directory, you should take the following steps as a precaution:

- Back up the following files:
  - Your data
  - rsm.cfg
  - Essbase.sec



- license.\*
- Stop any OLAP processes.
- Install DB2 OLAP Server as a new installation, using the existing directory path.
- 

---

## Enabling the DB2 OLAP Server License

The DB2 OLAP Server installation program prompts you for the edition and options that you have purchased, and uses that information to enable DB2 OLAP Server and add-on components.

If you install a license of DB2 OLAP Server and later want to add more features or additional users, run the `SETUP.SH` program either from the root directory, or from the CD-ROM. The setup program will automatically update the license.

---

## Loading and Configuring ODBC for the SQL Interface

If you selected the SQL interface add-on, you must ensure that your RDBMS environment is set correctly. You must also set up the environment and the ODBC drivers for the SQL interface

The installation program does not load and configure the open database connectivity (ODBC) drivers. To be able to use the SQL Interface add-on, you need to set up the ODBC for IBM DB2 manually.

When you use the SQL Interface, make sure the password for the account you use for SQL access is uppercase.

The following scenario shows how to load and configure ODBC for IBM DB2. This scenario assumes you have installed the SQL Interface.

1. In the `$ARBORPATH/bin` directory, create a text file called `esssql.cfg` that contains the following:

```
[
Description "IBM DB2 ODBC Driver"
DriverName db2.o
Database 0
Userid 1
Password 1
SingleConnection 0
UpperCaseConnection 0
IsQEDriver 0
]
```
2. Run the `inst-sql.sh` file from the `/home/essbase ($ARBORPATH)` directory. This file links the SQL Interface to the driver library.

3. Create two files called `.odbcinst.ini` and `.odbc.ini` in the `$ARBORPATH` directory. Also, remember that `/home/db2inst1/` equals the contents of your `$INSTHOME` environment variable.
4. Edit the `.odbcinst.ini` file and set the correct path for the driver. For example:

```
[ODBC Drivers]
IBM DB2 ODBC DRIVER=Installed

[IBM DB2 ODBC DRIVER]
Driver=/home/db2inst1/sqllib/lib/db2.o
```

5. Edit the `.odbc.ini` file and set the correct path for the driver and installation directory. You must put entries in this file for each databases that is listed by the DB2 List Database Directory function. For example, if you have two databases, `SAMPLE` and `OLAPSRC`, your file might look like this:

```
[ODBC Data Sources]
SAMPLE=IBM DB2 ODBC DRIVER
OLAPSRC=IBM DB2 ODBC DRIVER

[SAMPLE]
Driver=/home/db2inst1/sqllib/lib/db2.o
Description=Sample DB2 ODBC Database

[OLAPSRC]
Driver=/home/db2inst1/sqllib/lib/db2.o
Description=DB2 OLAP SERVER Source Database

[ODBC]
Trace=0
TraceFile=odbctrace.out
InstallDir=/home/db2inst1/sqllib/odbc/lib
```

If you want to access remote data sources, add them to the ODBC Data Sources list.

6. Log into your system as the DB2 UDB instance owner and take the following steps:
  - a. Grant select authority for all relevant tables to the account you want to use for SQL access. For example, from the DB2 command line processor, run this command to grant authority to the `arbsql` account:
 

```
GRANT SELECT ON STAFF TO arbsql
```
  - b. Run the DB2 `TERMINATE` to flush the catalog buffers.

Follow these steps to test the SQL Interface:

1. Log into your system using the account you want to use for SQL access. Make sure you can access your tables with the DB2 command line processor.

2. From a client machine, use the Application Manager to create an application and a database.
3. Open the outline and add some dummy dimensions and members, and save the outline.
4. Open a new rules file.
5. From the **File** menu, select **Open SQL**. Verify the server, application, and database names and click **OK**.
6. On the **Define SQL** panel, the **SQL Data Sources** box lists each data source you have cataloged. Make sure the table name is qualified. Complete the **SELECT**, **FROM**, and **WHERE** fields and click **OK/Retrieve**.
7. On the **SQL Connect** panel, enter your DB2 user ID and password, and verify the Server, Application, and Database names, and click **OK**. If your database is on a remote machine, enter a user ID and password for that machine.

---

## Agent Commands

The following table shows the commands that are used to manage DB2 OLAP Server.

When you start DB2 OLAP Server, the Agent window opens. The Agent window is the console for high-level server operations. Press Enter to view the following list of all available commands.

*Table 8. Agent Commands*

<b>Command</b>	<b>Description</b>
START <i>appname</i>	Starts the specified application.
STOP <i>appname</i>	Stops the specified application.
USERS	Displays a list of all users that are connected to the server, the total number of connections, and the number of ports that are available.
LOGOUTUSER <i>username</i>	Disconnects a user from the server and frees a port. This command requires the DB2 OLAP Server password.
PASSWORD	Changes the system password that is required to start DB2 OLAP Server.
VERSION	Displays the server version number.
HELP	Lists all valid commands and their respective functions.

Table 8. Agent Commands (continued)

<b>Command</b>	<b>Description</b>
PORTS	Displays the number of ports that are installed on the server and how many are in use.
DUMP <i>filename</i>	Copies information from the Essbase security system to a specified file in ASCII format. This command requires the DB2 OLAP Server password.
QUIT/EXIT	Shuts down all open applications and stops DB2 OLAP Server.

---

## Chapter 5. Installing DB2 OLAP Server for AS/400

This chapter describes how to install and set up DB2 OLAP Server for AS/400. The material in this chapter was supplied by ShowCase Corporation and refers to the ShowCase STRATEGY product and the Essbase/400 component, upon which DB2 OLAP Server for AS/400 is based. You can ignore references to ShowCase STRATEGY components that are not included with DB2 OLAP Server for AS/400.

---

### Release Notes

This section contains important notes and special considerations regarding this version of DB2 OLAP Server for AS/400.

- On the AS/400, see the Readme file in the root directory where you installed DB2 OLAP Server for AS/400 for the latest Release Notes.
- The CHGAOSA, STRSCTCP, and ENDSCTCP commands have been replaced with the CHGSCSVRA command. The replaced commands still function as normal and no changes are required to continue normal operations. Two CHGAOSA parameters, TCPIPPORT and SUBSYS, have been removed.
- The Sample Basic outline has changed to reflect attribute-related features. If you are upgrading to Version 7.1, you must clear existing data from Sample Basic and reload from CALCDAT after installing the DB2 OLAP Server for AS/400 and the sample applications, which are located on the **Server** installation compact disc. See “Chapter 6. Installing Sample OLAP Applications on AS/400” on page 89 for how to load data into Sample Basic.

---

### Environment Requirements

This section describes the environment requirements necessary for a successful installation and setup of DB2 OLAP Server for AS/400. Review the following items to verify that your environment is prepared for DB2 OLAP Server for AS/400.

#### General AS/400 Requirements

The following requirements and recommendations apply to all DB2 OLAP Server for AS/400 software.

#### AS/400 Requirements

The following requirement applies to all DB2 OLAP Server for AS/400 software:

- OS/400 Version 4, Release 4 (V4R4) or higher.

### **AS/400 PTFs**

Please see the Readme file (available from the **IMPORTANT: Before You Begin** button on the Warehouse Builder client installation program) for information about IBM AS/400 PTFs that are required to run DB2 OLAP Server for AS/400. In addition, we recommend installation and application of the most recent cumulative PTF package.

After installing the PTFs, use the DSPPTF command to verify that the PTFs were successfully applied.

We also recommend you install the latest fixpack level for the database.

### **Back up Existing Libraries**

You must install Warehouse Manager and OLAP servers into separate installation libraries. If you plan to install into an existing ShowCase library, you must first end the server in that library and verify that no users are connected. For instructions on stopping the servers, see the *AS/400 Administrator's Guide*.

In addition, always back up your Warehouse Manager and OLAP libraries before starting an installation. Although DB2 OLAP Server for AS/400 will install over the top of existing ShowCase libraries (of the correct type specified in the requirements) and will not change any settings unless you specify new values, we recommend that you back up your libraries to guard against the unlikely event of an installation failure. For information on backing up DB2 OLAP Server for AS/400, see the *AS/400 Administrator's Guide*.

### **Disk Space**

Before installing the AS/400 software, be sure you have enough free disk space:

- Warehouse Manager server component: 100 MB
- OLAP server component: 110 MB
- Temporary space: 110 MB (After install, this space is freed when installer signs off)

### **Configure and Start TCP/IP**

If you are planning to install DB2 OLAP Server for AS/400 or use TCP/IP connectivity for other products that use Warehouse Manager as their server, AS/400 TCP/IP must be configured and started prior to installation. For more information on choosing a communications protocol and configuring TCP/IP, see the *AS/400 Administrator's Guide*.

## Warehouse Manager Server Requirements

The Warehouse Manager server component is required to use the DB2 OLAP Server for AS/400 Builder add-on product. The following are the requirements for Warehouse Manager server.

### System Requirements

- OS/400 V4R4 or higher.

If you are planning to install the Warehouse Manager server and use TCP/IP connectivity for products that use Warehouse Manager as their server, AS/400 TCP/IP must be configured and started.

### Additional Considerations

- You must install Warehouse Manager into a new server library, or into a library containing a previous version of a Warehouse Manager server. Do not install Warehouse Manager into an existing user library or an OLAP library.
- The default setting for the QALWUSRDMN system value is \*ALL. If that setting is not acceptable for your environment, before you install Warehouse Manager, you must at least specify the following libraries for QALWUSRDMN: QSYS, QRPLOBJ, QTEMP, and the Warehouse Manager server library (e.g., SCSERVER).
- During installation of Warehouse Manager, you will be prompted to add the Warehouse Manager library to QALWUSRDMN if it isn't already there. These libraries will help ensure that Warehouse Manager installs correctly and will help prevent unpredictable results from occurring when you run client products that access the Warehouse Manager server. To work with system values, use the AS/400 command WRKSYSVAL and choose option 2 for QALWUSRDMN to change it.
- The Warehouse Manager server is installed with \*PUBLIC Exclude as the default authority to the applications Warehouse Manager client, Warehouse Builder, and Query. This means that only users with \*ALLOBJ authority can initially use these products. With a profile that has \*ALLOBJ authority, you can use Warehouse Manager client to authorize users (without \*ALLOBJ authority) to these applications.
- The user profile QUSER should have the Maximum Allowed Storage (MAXSTG) parameter set to the default value \*NOMAX in order for Warehouse Manager Server to function properly. Otherwise, problems may occur with connecting through TCP/IP and running large queries in batch.

If a user runs commands and utilities provided with Warehouse Manager, the commands will mark the library as *in use* until the user signs off the system. If you attempt to install over a library that users currently have marked as *in use*, installation is prevented. If you plan to install into an existing Showcase

library, you must first end the TCP/IP server in that library and verify that no users are connected. For instructions on stopping the servers, see the *AS/400 Administrator's Guide*.

### **Additional Installation Tips**

- If you plan to use the APPC communications protocol, remember the library names for each installation.
- Remember the TCP/IP address of your AS/400 and the port number assigned to each library. You will need this information to complete the communications set up on the PC. Additionally, be sure that your PC users are aware of these names or numbers.
- You cannot manage DB2 OLAP Server for AS/400 authority for supplemental groups in Warehouse Manager server, but you can specify supplemental groups for users. Any authorities which apply to a user profile as a result of supplemental groups will apply when the user is running any client that connects to Warehouse Manager server.
- DO NOT enable ShowCase TCP/IP unless you have configured and started AS/400 TCP/IP. You do not have to enable ShowCase TCP/IP support at install time. Instead, you can enable it later using the CHGSCTCP command.
- You can enable prestarted jobs later by using the ADDSCPJE command. See the *AS/400 Administrator's Guide* for details.

## **OLAP Server Component Requirements**

Following are the requirements for OLAP server component of DB2 OLAP Server for AS/400.

### **System Requirements**

- OS/400 V4R4 or higher
- TCP/IP configured and started on the AS/400.

Before you begin installation, AS/400 TCP/IP must be configured and started. You should be able to successfully "ping" from the client workstation to the AS/400, or use TCP/IP applications such as Telnet or FTP. If you are unable to successfully ping, contact your client TCP/IP vendor or IBM AS/400 software support for assistance.

Additionally, if you have more than one copy of the server component installed on a single AS/400, each server must have its own TCP/IP address. See "IP Address" on page 70 for more information.

A list of PTFs required for installing and running DB2 OLAP Server for AS/400 is in the Readme file available from the **IMPORTANT: Before You Begin** button on the Warehouse Builder client installation program.



For additional information on requirements, see “Installing the Servers” on page 62 .

### **Additional Considerations**

- You must install DB2 OLAP Server for AS/400 into an existing DB2 OLAP Server for AS/400 library, or a library for ShowCase Strategy version 2.5 or higher, or a new library. Do not install DB2 OLAP Server for AS/400 into an existing user library or into a Warehouse Manager library, or ShowCase Server library at version 2.0 or lower.
- If you are reinstalling an existing DB2 OLAP Server for AS/400 library that is currently in use, you must shut down the server component before installation. If you do not shut the server down, installation is prevented. For information on shutting down the server, see the *AS/400 Administrator's Guide*.
- During installation, you will be prompted to add the DB2 OLAP Server for AS/400 library to QALWUSRDMN if it isn't already there. The default setting for the QALWUSRDMN system value is \*ALL. If that setting is not \*ALL, before you install DB2 OLAP Server for AS/400, you must at least specify the following libraries for QALWUSRDMN: QSYS, QRPLOBJ, QTEMP, the Warehouse Manager server library (e.g., SCSESERVER), and the OLAP server library. These libraries are important and should not be excluded or deleted; they will ensure that DB2 OLAP Server for AS/400 installs correctly and will prevent unpredictable results from occurring when you run client products that access the server. To work with system values, use the AS/400 command WRKSYSVAL and choose option 2 for QALWUSRDMN to change it.
- On double-byte machines, if you are using \*HEX CCSID value 65535, the language identifier for the job may cause a default CCSID value of 5026 to be selected that does not support lowercase English characters. If you must run the job under the \*HEX CCSID, change the language ID of the job so that OS/400 does not calculate 5026 as the default CCSID. For example, change the job to use ENP as the language ID. OS/400 will calculate a default CCSID value of 37, which is supported by DB2 OLAP Server for AS/400. For more information, see “Installing and Running on a Double Byte System” on page 71.
- DB2 OLAP Server for AS/400 data load and dimension build operations are most efficient with SQL interface support. The SQL interface support is shipped as part of the base package; you do not need to install a separate SQL interface module.
- To Set Up Your AS/400 to Allow SQL Loads, type WRKRDBDIRE and press Enter. If you do not see an entry for \*LOCAL, use option 1 to add a \*LOCAL entry.

## Warehouse Builder Requirements

This section contains the installation requirements and recommendations for Warehouse Builder.

### General Requirements

- An AS/400 for a control server.
- The Authorized Users Privileges setting for Warehouse Builder is set to \*EXCLUDE by default. This provides a more secure default environment. By default only users with \*ALLOBJ authority can use Warehouse Builder to create tables on an AS/400. For users without \*ALLOBJ authority to use Warehouse Builder, they must have their authority changed to \*ALLOBJ or they must be added to the user list.
- Distribution performance is better if the target table is not journaled. To avoid using journaled tables, verify that the target collection is created using the CRTLIB command rather than the SQL command CREATE COLLECTION. (If you want to change this to use journaling, on the **Tools** menu, click **Options**, and on the **Defaults** tab select the **Create Target SQL Collection** option.)
- By default, the job queue SCDDJOBQ is added to the subsystem you choose during installation or QCMN or QBASE. For Warehouse Builder to operate properly, the maximum number of jobs on the Job Queue entry of the subsystem is set to \*NOMAX by default.
- A routing entry, if it does not exist, is added to the subsystem you choose during installation. It uses the class QGPL/QWCPLSUP. If you want to use a different class, you can change it after the installation is complete. See the *AS/400 Administrator's Guide* for details.

### DB2 Requirements

- You must enable the DRDA-compliant communications between your control server and any remote servers. Either SNA or TCP/IP communications for your DRDA connections may be used if your control servers are on V4R4 or higher.
- Each remote AS/400 must have an entry in the Warehouse Manager Server control server's Relational Database Directory for that remote AS/400. To add the entry, use the ADDRDBDIRE command on your control server.
- If you are using a remote AS/400, verify that the required IBM PTFs are on both the control and remote servers.
- If either of the Warehouse Manager server options "Exclude users from libraries by default" or "Exclude users from tables by default" is selected, then Warehouse Builder users must have \*ALLOBJ or ShowCase Data Administrator authority to access all information correctly.

### **Remote AS/400 Setup for Warehouse Builder**

To use Warehouse Builder with remote AS/400s, Distributed Relational Database Architecture (DRDA) communication is required between each remote AS/400 and the warehouse server.

If your AS/400s are not currently connected and you need help configuring DRDA, consult the book *Distributed Database Programming*. The book provides information on preparing and managing an AS/400 system in a distributed relational database environment using DRDA. It also describes planning, setting up, programming, administering, and operating a distributed relational database on more than one AS/400 system in a like-system environment.

### **PC Requirements**

For the software requirements for PC clients other than Warehouse Builder, see “Chapter 2. Hardware and Software Requirements” on page 13.

### **Communications Protocol Requirements (APPC, TCP/IP)**

To enable the proper operation and use of DB2 OLAP Server for AS/400 between your PCs and AS/400s, check that you have a supported communications package. The appropriate communications protocol will vary depending upon which PC and AS/400 software you want to use.

#### **Choosing a Communications Protocol**

You can use TCP/IP to run communications for all the components of DB2 OLAP Server for AS/400. Optionally, you can also use APPC to run Warehouse Builder. Both TCP/IP and APPC communications support are installed by default.

#### **Communications Protocol Setup Guidelines**

Before installing any software, verify that you have the correct communications protocol based on the PC and AS/400 software you intend to use as outlined in the preceding section.

For APPC verify that you have a 32-bit router installed, and test the router to make sure it is working. A detailed description of setup and management of APPC is beyond the scope of this document. For more information, consult the documentation for your router.

For TCP/IP, work is required on both the AS/400 and the PC. It is recommended that a person trained in TCP/IP network administration be responsible for these tasks to ensure the proper setup, use, and maintenance of TCP/IP.

You must configure AS/400 TCP/IP before trying to enable the Warehouse Manager server or the OLAP server component. A detailed description of setup and management of the TCP/IP network is beyond the scope of this

document. However, additional information on using TCP/IP on the AS/400 is available in the following documents:

- *OS/400 TCP/IP Configuration and Reference Version V4R4*
- *TCP/IP Fastpath Setup Version V4R1*
- *TCP/IP Tutorial and Technical Overview*

When using third-party routers with Windows 95, 98, Windows NT, or Windows 2000 (32-bit operating systems), it is generally recommended to use a 32-bit communications protocol with a 32-bit application.

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## Installing the Trial Version of DB2 OLAP Server for AS/400

DB2 OLAP Server for AS/400 offers a free trial version that lets you use the product for a limited time.

The **DB2 OLAP Server for AS/400 Trial CD** contains the same components as the **Server** and **Clients** CDs for the full product. The installation process for the Trial version is the same as for the full product, but with one exception. On the **DB2 OLAP Server for AS/400 Trial CD**, the installation program for the OLAP clients (other than the Warehouse Builder) are in the **DB2OLAP** subdirectory, not the root directory. “Installing the Other OLAP Clients” on page 75 includes additional the instructions that are specific to the Trial CD. All of the other instructions in this chapter apply to the Trial version as well.

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## Installing the AS/400 Components

This section describes how to install the Warehouse Manager server component and the OLAP server component.

### Installing the Servers

If you have not read “Environment Requirements” on page 55, it is highly recommended that you do so before continuing. If you are installing on a system with Double Byte Character Set (DBCS) support, see “Installing and Running on a Double Byte System” on page 71 for special considerations.

Also, if you plan to use TCP/IP, you must use valid TCP/IP port numbers. The installation wizard will select an available port for you. If you do not know what port numbers are available and want to check, run the AS/400 command `WRKSRVTBLE` before you begin installation of DB2 OLAP Server for AS/400.

To install the Warehouse Manager server or the OLAP server component or both:

1. Load the DB2 OLAP Server for AS/400 **Server** CD into the AS/400 media drive.

2. Log on as QSECOFR or with equivalent authority (\*ALLOBJ, \*IOSYSCFG, \*SAVSYS, \*JOBCTL, and \*SECADM special authorities are needed).
3. Type LODRUN and press **F4**. You will be asked for the media device name. Enter or choose the name of the device where the media is loaded and press **Enter**. (For a CD install, you will be prompted for a path name before this screen appears; accept the default path '/')
4. The installation wizard will guide you through the setup options, gathering information from the AS/400 and prompting you to specify parameters as necessary. Change the parameters as required and follow the on-screen instructions.

### **Setting Installation Parameters for Warehouse Manager Server**

This section briefly explains each of the installation parameters you may be asked to specify during installation of DB2 OLAP Server for AS/400 server software. The screens and parameters displayed during installation will vary with the software and options you select.

The installation displays recommended values for the parameters. If you are upgrading DB2 OLAP Server for AS/400 server software, existing values are retrieved.

**Product Servers:** This screen identifies which DB2 OLAP Server for AS/400 servers can be installed. Select one or both servers to be installed.

- The Warehouse Manager server enables support for Warehouse Builder. If you plan to use Builder, you must install Warehouse Manager server.
- DB2 OLAP Server for AS/400 installs the OLAP server component and enables support for Application Manager, Spreadsheet add-ins for Excel and 1-2-3, and other PC software that works with DB2 OLAP Server for AS/400.

You cannot install Warehouse Manager and DB2 OLAP Server for AS/400 into the same server library.

**National Language Support:** Specify the primary and secondary languages to be used by the DB2 OLAP Server for AS/400 products. The only values allowed for each language ID are ENU for English lowercase or ENP for English uppercase. DB2 OLAP Server for AS/400 commands are always displayed using the primary language.

If you selected Warehouse Manager, continue with the next section. Otherwise, skip to “Setting Installation Parameters for the OLAP Server Component” on page 67.

**Product Installation Library:** This parameter specifies the library into which Warehouse Manager is installed. The wizard will display any installed ShowCase libraries found for Warehouse Manager server. You can select a

library to upgrade, or press F6 to install a new library. If you select a library to upgrade, that library must not be in use.

Save your library name for later client software configuration if you're going to use APPC.

The default library name is SCSEVER. In addition, the root Integrated File System (IFS) path used for the installation is based on the specified library name (the default is /SCSEVER).

*Auxiliary Storage Pool ID:* If you add a library, you will be prompted to enter the Auxiliary Storage Pool ID. Enter the number of the Auxiliary Storage Pool (ASP) from which the system should allocate storage for the Warehouse Manager server installation library. (IFS information that is installed with Warehouse Manager is always placed in the system ASP.)

*To Change the Library Name After Installation:* To change the library name, you must reinstall into the desired library. Before you install into the new library, we recommend that you save the catalog files from the old library using the SAVSRVRINF command and then restore into the new library using the RSTSRVRINF command. For information on these commands, see the *AS/400 Administrator's Guide*.

**Communication Protocol Support:** The Communication Protocol Support parameter enables the STRATEGY communications protocol. You can use TCP/IP to run communications for all the components of DB2 OLAP Server for AS/400. Optionally, you can also use APPC to run Warehouse Builder. Both TCP/IP and APPC communications support are installed by default.

If you are performing a new installation, enter your port number, or use the port number selected by the wizard. If you are installing over an existing DB2 OLAP Server for AS/400 Version 1.1 Warehouse Manager Server library with STRATEGY TCP/IP support configured, the port setting for the current Warehouse Manager Server library is displayed.

The Warehouse Manager Server port is used by Warehouse Builder. You can change the Warehouse Manager Server port via ODBC setup; see "Setting Up an ODBC Data Source" on page 81.

Make sure you record the TCP/IP port number that you use for the Warehouse Manager Server. You will need the number when installing the Warehouse Builder client software.

*To Change TCP/IP Configuration After Installation:* To change the TCP/IP port configuration:

1. Add the server library name to your library list.

2. Type the WRKSRVTBLE command to find an available port number.
3. Type the CHGSCSVRA command, and add the new port number, subsystem, and library.

This command stops the server, disconnects all current users, and stops any jobs that are running. It also starts the server after changes have been made.

**TPC/IP Configuration:** There are two main parameters you must specify:

#### **Relational Subsystem**

Defines the subsystem where the Warehouse Manager TCP/IP jobs will run. Your current communications subsystem, as determined by the QCTLSBSD system value, is displayed and should not be changed. If the controlling subsystem is QBASE, then QBASE is the default. If the controlling subsystem is QCTL, then QCMN is the default. To find the controlling subsystem, type DSPSYSVAL SYSVAL(QCTLSBSD).

#### **Library**

Specifies the name of the library in which the current Warehouse Manager communications subsystem description resides. QSYS is the default.

You will see parameters for OLAP Analyzer, which is not part of DB2 OLAP Server for AS/400. To continue with the installation, accept the installation defaults for the Analyzer OLAP parameters.

**Security Settings:** Specify an initial security level. This parameter determines whether your Warehouse Manager users will have access to only libraries and files in their AS/400 library list (\*LIBL) or if they can see all libraries (\*ALL) on the AS/400 to which they are authorized. It applies only to DB2 OLAP Server for AS/400 applications that use Warehouse Manager as their server.

*To Change Security Settings After Installation:* To change this or other security options in the future, use Warehouse Manager Client: On the Manage menu, click Server Options. Then click the Security tab.

Alternately, on an AS/400 command line, you can use the commands SETLIBACC and CHGSRVRDFT located in the Warehouse Manager installation library. SETLIBACC determines library access. CHGSRVRDFT defines default server security options. To run these commands, you must first add the Warehouse Manager Server library (for example, SCSEVER) to your library list.

**Storage CCSID Configuration:** The storage CCSID value specifies the coded-character set identifier in which library, file, and column alias names are stored. Data views and Warehouse Builder distribution sets and definitions and Shared Queries information are also stored using this CCSID.

This value must be a supported, single-byte EBCDIC CCSID value. If you are installing on a double-byte system, use 65535 (\*HEX). For more information, see “Installing and Running on a Double Byte System” on page 71.

Enter the five-digit CCSID value, or use either \*CALC or \*HEX to let the installation wizard calculate the default value based on your AS/400 system settings. If you need to change this value after installing Warehouse Manager, you must reinstall Warehouse Manager and reconfigure the storage CCSID.

The following EBCDIC CCSIDs are supported for the Warehouse Manager storage CCSID value:

*Table 9. Supported Warehouse Manager/Storage EBCDIC CCSIDs*

Country, Geographic Region, or Language Group	EBCDIC CCSID
United States/Canada/Brazil	37
Multi-national #1	256
Germany/Austria	273
Denmark/Norway	277
Finland/Sweden	278
Italy	280
Spain/Latin America	284
United Kingdom	285
France	297
Arabic	420
Greece	423, 875
Hebrew	424
Multi-national #5	500
Korea	833
Chinese Simplified	836
Chinese Traditional	37, 28709
Thailand	838
Central Europe (Bosnia, Croatia, Czech Republic, Hungary, etc.)	870
Iceland	871
Cyrillic Multinational	880, 1025
Japan	1027
Iran	1097
Hexadecimal (*HEX)	65535



For general information about AS/400 CCSIDs, including complete language/country settings, see the *IBM AS/400 National Language Support* manual.

**Configure the Builder Add-on Product:** The subsystem parameter defines the Warehouse Builder subsystem in which distribution jobs run. Your current communications subsystem, as determined by the QCTLSBSD system value, is displayed and should not be changed. If the controlling subsystem is QBASE, then QBASE is the default. If the controlling subsystem is QCTL, then QCMN is the default. To work with system values, use the AS/400 command WRKSYSVAL.

If you chose to install STRATEGY TCP/IP support, the subsystem entered on that screen is typically what you would use for Warehouse Builder as well.

The library parameter specifies the name of the library in which the current communications subsystem description resides.

**Sample Database:** DB2 OLAP Server for AS/400 contains a sample database called SCSAMPLE40, which is used with the tutorials for learning DB2 OLAP Server for AS/400 Builder. To install the database, make sure the option is checked during setup. It will be installed in the SCSAMPLE40 library and used in the product tutorials. For more information about SCSAMPLE40 see the *AS/400 Administrator's Guide*.

The sample database can be installed/reinstalled at a later time by using the RSTSMPLB command.

**Completing the Warehouse Manager Server Installation:** At this point, you are finished setting the Warehouse Manager server installation options. If you chose to install the OLAP server component (called Essbase/400 in the installation program), the installation options for the OLAP server component will follow. If not, the Warehouse Manager server installation will begin. An information screen is displayed. Read this screen carefully (or print it) and then press **Enter** to finish the Warehouse Manager server installation.

### **Setting Installation Parameters for the OLAP Server Component**

This section briefly explains each of the OLAP server component installation parameters. The recommended values are displayed; change any parameters as required.

The default library name is ESSBASE. In addition, the root Integrated File System (IFS) path used for the installation is based on the specified library name (the default is ESSBASE).

**Auxiliary Storage Pool ID:** If you add a library, you will be prompted to enter the Auxiliary Storage Pool ID. Enter the number of the Auxiliary Storage Pool (ASP) from which the system should allocate storage for the installation library. IFS information that is installed with the OLAP server component is placed in the specified ASP.

**EBCDIC CCSID:** This parameter specifies the EBCDIC CCSID that the OLAP server component should use when performing AS/400-based operations. DB2 OLAP Server for AS/400 must interact with DB2/400 and OS/400 using an EBCDIC CCSID to represent character data.

If you are installing into a new library, this value will be calculated for your system. If you are installing over an existing, the existing value is retrieved. DB2 OLAP Server for AS/400 converts all character data to the EBCDIC CCSID specified for the following operations:

- Using an OS/400 interface or command (these interfaces include the OLAP server component, the ESSCMD command interface, and the Warehouse Builder run-time interface).
- SQL data load using SQL and referencing AS/400 physical or logical files
- Putting messages into the OS/400 job log

You can only specify one EBCDIC CCSID for each OLAP server component. The OLAP server component supports single-byte and mixed-byte (i.e., contains single-byte and double-byte characters) CCSIDS. If your environment requires support for double-byte characters, see “Installing and Running on a Double Byte System” on page 71.

If you installed the Warehouse Manager Server, the EBCDIC CCSID for OLAP function must match the EBCDIC CCSID for all OLAP servers it uses.

For the supported EBCDIC values, see Table 9 on page 66.

**ASCII CCSID:** This parameter specifies the ASCII CCSID that the OLAP server component should use when performing PC-based operations. The OLAP server component must interact with DB2 OLAP Server for AS/400 client software (such as the Spreadsheet Add-ins) using an ASCII CCSID to represent character data. The installation will calculate this value for you based on the specified EBCDIC CCSID value. For example, if the EBCDIC CCSID is 00037, the matching ASCII CCSID is 01252, which supports Western European languages.

You can only specify one ASCII CCSID for each OLAP server component. Therefore, all PC clients that access the OLAP server component must use the same ASCII CCSID as specified for this prompt. Moreover, the ASCII CCSID should be one of those supported by Windows (i.e., ANSI code). If you do not

use an ANSI-equivalent CCSID, characters sent from the OLAP server component may be displayed incorrectly.

DB2 OLAP Server for AS/400 converts all character data to the ASCII CCSID you specify for the following operations:

- Communicating with an PC client (e.g., Spreadsheet Add-ins)
- Saving and loading OLAP outlines (.OTL), load/build rule files (.RUL), and calculation script files (.CSC) to the Integrated File System (IFS)

For details about changing CCSID values once DB2 OLAP Server for AS/400 is installed, see the *AS/400 Administrator's Guide*. For general information about AS/400 CCSIDs, including complete language/country settings, see the *IBM AS/400 National Language Support* manual.

Table 10. EBCDIC and ASCII CCSID Pairs Supported by the OLAP Server Component

Country, Geographic Region, or Language Group	EBCDIC CCSID	Matching ASCII CCSID
United States/Canada/Brazil	37, 1140	1252
Multi-national #1	256	1252
Germany/Austria	273, 1141	1252
Denmark/Norway	277, 1142	1252
Finland/Sweden	278, 1143	1252
Italy	280, 1144	1252
Spain/Latin America	284, 1145	1252
United Kingdom	285, 1146	1252
France	297, 1147	1252
Greece	423, 875	1253
Hebrew	62235	1255
Multi-national #5	500, 1148	1252
Korea (single-byte)	833	1040 or 1088
Korea (double-byte)	933	944 or 949
Chinese Simplified (single-byte)	836	1115
Chinese Simplified (double-byte)	935	1381
Chinese Traditional (double-byte)	937	938
Chinese Traditional (single-byte)	37, 28709	904
Thailand	838, 9030	874
Baltics	1112, 1122	1257
Central Europe (Bosnia, Croatia, Czech Republic, Hungary, etc.)	870	1250
Iceland	871, 1149	1252

Table 10. EBCDIC and ASCII CCSID Pairs Supported by the OLAP Server Component (continued)

Cyrillic Multinational	880, 1025	1251
Baltics	1112, 1122	1250
Japan (double-byte)	939, 5035	932 or 942
Japan (single-byte)	1027	932
Iran	1097	1256

**Server Threads:** Enter the maximum number of server threads that should be created by the OLAP agent process when an application is started. The default is 5. This value should be configured to the average number of concurrent report requests that you expect for each application.

**IP Address:** Enter the IP address that the OLAP server should use to listen for incoming client requests. You must enter a value for this parameter. If you do not know the value, enter \*DEFER. However, before using DB2 OLAP Server for AS/400, you must specify an IP address using the CHGESSENV command. The value must be unique for each DB2 OLAP Server for AS/400 installation library.

- The current IP address will be displayed if you are installing over an existing library.
- To display the TCP/IP addresses configured on your AS/400, enter the AS/400 command CFGTCP and choose option 1.
- Enter \*ALL if you only have one OLAP installation library and that library listens for incoming client TCP/IP requests using all IP interfaces which are configured on the AS/400. \*ALL is useful when your AS/400 is configured with multiple TCP/IP interfaces that connect to different IP sub-networks. Specifying \*ALL prevents you from running multiple copies of the product on a single AS/400.

*To Change the OLAP Server Parameters After Installation:*

**To Change CCSID Values**

For details about changing CCSID values after the product is installed, see the *AS/400 Administrator's Guide*.

**To Change Server Threads**

You can change the server threads number with the CHGESSENV command.

**To Change the IP Address**

You can specify an IP address using the CHGESSENV command. The value must be unique for each OLAP installation library.

**Start the OLAP Server Component:** Enter \*YES if you are installing the OLAP server component into a new library and you wish to initialize the company name, user ID, and password, and did not choose \*DEFER for the IP address.

The only time the OLAP server component is started automatically is right after the install and then only if the user chooses \*YES at this prompt.

The following information must be entered when OLAP server component is being started:

- **Company Name:**

Enter the name of the company (your company name) that licensed DB2 OLAP Server for AS/400. This information is displayed in the registration message when the product is started. The company name must be at least three letters long.

- **User ID:**

Enter the name for the OLAP administrator user ID, which is needed for administration of security on the server and for ending the server. The OLAP administrator's user ID is not the OS/400 user ID. The OLAP user ID must be at least three characters long. Write down your user ID as you will need it later.

- **Password:**

Enter the password of the user ID that will control the server. The password must be at least six characters long and can not be the same as the user ID. Write down your password as you will need it later.

### **Completing the Installation**

At this point, you are finished setting OLAP installation options. If you deferred specifying any options, you can configure them later with the command CHGESSENV. Press **ENTER** to start the installation. If you also selected to install the Warehouse Manager server, an information screen will appear. Read this screen carefully (or print it) and then press **ENTER** to finish the installation.

## **Installing and Running on a Double Byte System**

This section only applies to those countries (e.g., Japan) that use a Double Byte Character Set (DBCS) to represent character data.

### **Double Byte Install Issues**

If you are installing on a system with DBCS support, the AS/400 *job* used to perform the installation should use a CCSID which supports lowercase English characters or 65535 (\*HEX). If the CCSID value is set to 65535, the AS/400 operating system dynamically chooses a default CCSID for the job based on the language identifier of the job. You must ensure that if you choose to use 65535 as the job CCSID value that OS/400 chooses a default

CCSID which supports lowercase English characters (ENU). For example, for a job with the job CCSID set to 65535 (\*HEX) and a language identifier of JPN, OS/400 chooses 5026 as the default CCSID.

For the OLAP server component, however, the 5026 CCSID does not support standard lowercase English characters and is not supported by this product for either installation or operation. A job with the above attributes is not acceptable for performing the installation. If you must run the job under a \*HEX CCSID, change the language ID of the job so that OS/400 does not calculate 5026 as the default CCSID. For example, change the job to use ENP (English uppercase) as the language ID. OS/400 will calculate a default CCSID of 37.

### **Double Byte Run-time Issues**

The CCSID of the AS/400 job running the OLAP server component or command interface must use the same CCSID as specified for the OLAP server component EBCDIC CCSID value or the special value of 65535 (\*HEX). Unpredictable results will occur if the job CCSID is not correctly set to be compatible with the CCSID specified for the EBCDIC CCSID value. Any job that performs OLAP operations (e.g., starts the server, ESSCMD, Warehouse Builder) must also use the same EBCDIC CCSID value that the OLAP server component is configured to use or must use the special value of 65535 (\*HEX).

CCSID 65535 is appropriate only when data stored in DB2/400 tables used for dimension building or data loading have the wrong CCSID for the data stored in them. When using 65535 for the OLAP server job CCSID, the data contained in the DB2 files must be in the CCSID that was specified as the EBCDIC CCSID for the server. See “National Language Support” on page 63 for more information .

### **Changing CCSIDs for Profiles and Jobs**

The CCSID can be changed once for each OS/400 user by changing the OS/400 user profile, or each time a user signs on by changing the current job.

To change the CCSID for a user profile, a user with security officer authorities can use the following command (after which the user specified by *userid* should sign off the system and then back on). The *ccsidvalue* should be a CCSID value which supports lowercase English characters or 65535 (\*HEX).

```
CHGUSRPRF USRPRF(userid) CCSID(ccsidvalue)
```

To change the CCSID for a job, a user can use the following command each time he/she signs on to the system.

```
CHGJOB JOB(*) CCSID(ccsidvalue)
```

## Creating an AS/400 Installation Tape from the Compact Disc

If necessary, DB2 OLAP Server for AS/400 clients can create AS/400 installation tapes from the AS/400 server compact disc. Use the following procedure:

1. Load the DB2 OLAP Server for AS/400 **Server** CD into an AS/400 CD-ROM drive.
2. Load an empty target tape that is not write-protected into the tape device on the same AS/400 as the CD-ROM drive.

You should pre-initialize the tape cartridge if the density is different than the default density (highest density allowed) for the cartridge type and device combination. For example, if you require your installation media to be usable in a tape device that only supports QIC-120 density tapes, but you are using a tape cartridge that can be formatted as QIC-525 (a higher density), you should pre-initialize the cartridge to QIC-120.

You do not need to pre-initialize the tape cartridge if the highest density allowed for the cartridge type and device combination is acceptable. In that case, you will initialize the cartridge as the last step in the installation process using the special value of \*CTGTYPE.

3. Log on as QSECOFR or with equivalent authority (\*ALLOBJ, \*IOSYSCFG, \*SAVSYS, \*JOBCTL, and \*SECADM special authorities are needed).
4. If the QTEMP library is not in your library list, use the following command to add the QTEMP library to the library list: ADDLIB QTEMP
5. Type LODRUN DEV(\*OPT) DIR('/MAKETAPE') and press **ENTER**.
6. After a few seconds, you will receive the message ENTER THE NAME OF THE TARGET TAPE DEVICE. Specify the name of the tape device (e.g., TAP01) where the target tape is loaded and press **ENTER**. (To cancel the operation, press **ENTER** on the reply line without specifying a tape device.)
7. After you press **ENTER**, you will receive the message INITIALIZE THE TARGET TAPE, DENSITY = \*CTGTYPE (Y/N). If you pre-initialized your tape cartridge to a specific density, type N on the reply line and press **ENTER**. If you did not pre-initialize your tape cartridge, type Y on the reply line and press **ENTER** to accept the highest density allowed for the cartridge type and device.

Several status messages are provided while the tape is created. After a few minutes, the process should end. The amount of time required to make the tape will vary with the target tape device and cartridge type being used. When the process is finished, you will receive a completion message and be returned to an AS/400 command line.

---

## Installing the Workstation Clients

This section describes how to install and remove the DB2 OLAP Server for AS/400 Builder client software, also called PC software in this section, on a Windows workstation.

### Before You Begin

Consider the following points before you begin:

- The installation program will allow you to (optionally) automatically remove the DB2 OLAP Server for AS/400 Version 1.1 level of Warehouse Builder and install Version 7.1. If the setup detects a Version 1.1 installation, you will be asked if you want it uninstalled. The program will display the Version 1.1 installation path and previously installed products as defaults. If you choose not to uninstall the Version 1.1 Warehouse Builder, an installation folder other than the existing Version 1.1 path will have to be chosen. If you are performing a "silent installation," the Version 7.1 installation will automatically remove any Version 1.1 version.
- Verify that your communications protocol matches the 32-bit version of ShowCase software. For more information, see "Communications Protocol Requirements (APPC, TCP/IP)" on page 61.
- It is recommended that you disable all anti-virus software before installing Builder.
- When you install any DB2 OLAP Server for AS/400 components, you are asked whether the new files should be installed into the default directory. It is recommended that you choose to install into the default directory.
- If you choose to install into the default directory, all server files will be installed there and the environment settings will be updated to point to that directory. After installation, it is safe to delete the old directories.
- After you install the other clients, you can install SQL Drill-Through. On the **Clients** CD, go to the `\SqlDrill` directory, and run `Setup.exe`.

### Selecting an Installation Method

There are three ways to deploy DB2 OLAP Server for AS/400:

#### Compact Disc Installation

Installs DB2 OLAP Server for AS/400 from the compact disc onto user PCs. Load the **Clients** CD into a single or shared CD-ROM drive. If a CD-ROM drive is not available to all users, you can copy the contents of the CD to a network drive and have users install from there. This procedure is described in this section.

#### Network Installation

Installs DB2 OLAP Server for AS/400 from the CD to the network so users can install or run the clients on their PCs. This procedure is described in this section.



### **Silent Installation**

installs to the user PCs setup options that the administrator records. This method requires no user intervention; message dialogs inform the user of the installation progress. This procedure is described in “Setting Up Silent Installations” on page 76.

### **Running Setup Multiple Times**

If you run setup and install a portion of the product and later run setup again to install additional components, setup will install to the same directory the product was first installed to. This will allow setup to keep a running log of installed software. Thus, if you eventually choose to uninstall the product, the uninstall program will remove all installed components.

### **Accessing the CD via a Network**

When using Windows 95, Windows 98, or Windows NT and accessing the compact disc via a network, it is recommended that you map a drive that points to the appropriate network location rather than accessing the location via Network Neighborhood. Network Neighborhood uses the Universal Naming Convention which may occasionally cause path errors in various products, including Adobe Acrobat.

## **Installing OLAP Clients from Compact Disk**

The easiest way to install the PC software for DB2 OLAP Server for AS/400 is to load the compact disc into a shared CD-ROM drive.

Do not use the Microsoft Add/Remove Programs application to initiate the ShowCase STRATEGY installation.

### **Installing the Warehouse Builder Client**

To install the Warehouse Builder client of DB2 OLAP Server for AS/400:

1. Load the DB2 OLAP Server for AS/400 **Server** CD or connect to the CD-ROM drive on the network that contains the compact disc.
2. If auto-detect is enabled, the installation screen will appear. Otherwise, run the command `e:\SETUPCD.EXE`, where `e` is the name of the local or network CD-ROM drive.

DO NOT use the Microsoft Add/Remove Programs control panel to initiate the installation.

3. Click **IMPORTANT: Before You Begin** to read important information regarding the installation of Builder.
4. Click **Install DB2 OLAP Server for AS/400**. The setup wizard will appear and guide you step-by-step through the rest of the installation.

### **Installing the Other OLAP Clients**

The rest of the OLAP clients of DB2 OLAP Server for AS/400, such as the Application Manager and the Spreadsheet Add-ins, are installed using an

installation program that is separate from the one that installs Warehouse Builder. To install these other OLAP clients:

1. Load the DB2 OLAP Server for AS/400 **Clients** CD or connect to the CD-ROM drive on the network that contains the compact disc.
2. From the **Start** menu, select **Run** and then enter:  
x:\setup  
where x is the drive letter for your CD-ROM drive. If you are installing from **DB2 OLAP Server for AS/400 Trial CD**, the setup.exe program is in the DB2OLAP subdirectory.
3. Follow the prompts and provide the information requested. At any time during the installation, you can click the **Cancel** button to stop the installation.

## Installing Clients from a Network

Network installations involve two steps:

1. The network administrator installs the setup and client files to the network and stores files in a shared location. Follow the instructions in “Installing OLAP Clients from Compact Disk” on page 75. When the wizard for the Warehouse Builder displays the Install Type dialog box, be sure to choose the **Install to the network** option.

If you plan to retain multiple versions of the ShowCase STRATEGY software to the network, you may want to keep the release version in the directory path.

If you are performing a network installation onto a shared Windows 95 operating system used as a server, you must install using a short name installation path (eight character format). Replace the default path (G:\ShowCase STRATEGY\4.0) with a short name path (i.e., G:\STRATEGY where G is the network drive).

2. End users install client files from the network to their PC. Using Windows Explorer, find the network folder where the product was installed and double-click the Setup.exe icon or file to start the installation. Alternatively, from the **Start** menu, click **Run**. Browse to the network folder where the Setup.exe file is located. Open the Setup.exe file, and click **OK**.

---

## Setting Up Silent Installations

“Silent installations” allow users to automatically install DB2 OLAP Server for AS/400 with the installation options specified in advance by a system administrator and saved in a batch file (\*.ISS). Silent installations are a convenient way to deploy the product to a large number of users and ensure

the same software is installed on each PC. During the silent installation, users see messages about the progress. However, users cannot make any installation choices.

- If you are performing a silent installation, the installation program will automatically remove Version 1.1.
- Only users running Windows 95, Windows 98, Windows 2000, or Windows NT 4.0 can perform silent installations.  
The Scheduled Report Server component can be silently installed only on Windows NT computers. If a silent installation attempts to install the Scheduled Report Server component on a Windows 95/98 machine, the installation will fail.
- To begin recording silent installation options, you do not have to have DB2 OLAP Server for AS/400 installed on your PC.
- When you record the silent installation options, DB2 OLAP Server for AS/400 does not get installed onto your computer. However, when you run the silent installation, it will be installed onto the PC you are using.
- The **Back** button is not active when you record a silent installation. If you need to go back and change something, you must restart recording the installation from the beginning.
- A silent installation can only be done after you have installed DB2 OLAP Server for AS/400 to the network. It cannot be done after simply copying the CD to the network.
- Be certain that each PC using silent installation has a unique PC name.
- If you use Microsoft Networking, DB2 OLAP Server for AS/400 will auto-detect the PC name.
- If your organization does not use Microsoft Networking, the PC name remains undefined. In this situation, name your PC this way:
  1. From the **Start** menu, click **Programs -> ShowCase STRATEGY 4.0 ->AS/400 Test Connection**.
  2. Click **Global Settings**.
  3. On the **Licensing** tab, enter a name for your PC.

You can also use these instructions to check a PC name after installing DB2 OLAP Server for AS/400.

### Creating a Single Silent Installation

1. Install the software for which you want to create a silent installation from your network. You do not have to install STRATEGY on the PC you are using to create the silent installation.
2. Run the command  
e:\source\_directory\setup.exe -r

Where *e:\source\_directory* is the path of the network directory into which you installed software in step 1. You can run this command from any PC running Windows 95 or later, or Windows NT 4.0. However, be aware that the command does not install DB2 OLAP Server for AS/400 software onto the PC.

If you do not use the SETUP command, the products will be installed onto your system and the resulting SETUP.ISS file will not work as a silent install.

3. Follow the on-screen instructions to select the installation options you want to specify for users who conduct the silent installation. The installation path and options you select are recorded in a file named SETUP.ISS located in your c:\WINDOWS directory.
4. Copy the SETUP.ISS file to the network directory into which you installed software.

Once the SETUP.ISS file is copied to the network directory, all remaining steps will be performed from the network directory and not from the CD.

5. To perform the silent installation, instruct your users to run one of these commands, depending on whether they have write-access to source directory:

- If users have Write authority to the source directory, give them these instructions:

```
e:\source_directory\setup.exe /s
```

Where *e:\source\_directory* is the path of the network directory into which you installed the software.

- If users do not have write authority to the source directory, create the SETUP.LOG file on each PC, and run the following command:

```
e:\source_directory\setup.exe /s -f2<path>\logfilename
```

Where *e:\source\_directory* is the path of the network directory into which you installed the software, *path* specifies where the log file should be created, and *LogFileName* is the name of the log file. Using the command example above, this would be:

```
e:\source_directory\setup.exe /s -f2c:\temp\setup.log
```

Alternately, you can create a batch file that, when called, automatically runs the command. Remember that only users running Windows 95 or later, or Windows NT 4.0 can perform silent installs.

A file called SETUP.LOG is created in the source directory when the silent installation is performed. If the installation is successful, the value of the ResultCode = parameter in the log is 0.

## Creating Multiple Silent Installations

It is also possible to create multiple silent installations that allow you to install specific applications from the same network location. To do this you must create a separate response file (\*.ISS) to initiate each unique silent install.

1. Follow steps 1-4 of “Creating a Single Silent Installation” on page 77.
2. After the SETUP.ISS file is copied to the network directory into which you installed the software, rename the file using a unique name and retaining the .ISS extension. For example, you could rename the SETUP.ISS file to NEW.ISS.

If you choose to rename the .ISS file, DB2 OLAP Server for AS/400 requires the path to the new .ISS file to be used as an argument and command line switch in the command line call.

```
<Path to Setup.exe> <Path to new .ISS> /s -f1<Path to new .ISS>  
(optional -f2<Path to Setup.log >)
```

Using the command example above this would be:

```
e:\source_dir\setup.exe e:\source_dir\NEW.ISS /s -f1e:\source_dir\NEW.ISS  
-f2c:\temp\setup.log
```

This allows the setup program to receive the name of the NEW.ISS file as an argument and then look for recorded results in the file in case your user's PC environment requires different actions than the PC used to record the install.

## Silent Setup Log File

SETUP.LOG is the default name for the silent setup log file. This file will be created in the source directory when the silent installation is performed. If users do not have write authority to the source directory, the user should create a SETUP.LOG file on each PC.

The SETUP.LOG file contains three sections. The first section, [InstallShield Silent], identifies the version of InstallShield Silent used in the silent setup. It also identifies the file as a log file.

The second section, [Application], identifies the installed application name and version, and the company name.

The third section, [ResponseResult], contains the result code indicating whether or not the silent setup succeeded. An integer value is assigned to the ResultCode keyname in the [ResponseResult] section.

InstallShield places one of the following return values after the ResultCode keyname:

- 0 Success
- -1 General error

- -2 Invalid mode
- -3 Required data not found in the Setup.iss file
- -4 Not enough memory available
- -5 File does not exist
- -6 Cannot write to the response file
- -7 Unable to write to the log file
- -8 Invalid path to the Silent response file
- -9 Not a valid list type (string or number)
- -10 Data type is invalid
- -11 Unknown error during setup
- -12 Dialog boxes are out of order
- -51 Cannot create the specified folder
- -52 Cannot access the specified file or folder
- -53 Invalid option selected

An example of Setup.log file for a successful silent setup of InstallShield is shown below.

```
[InstallShield Silent]
Version=v5.1.000
File=Log File
```

```
[Application]
Name=STRATEGY
Version=4.0
Company>ShowCase Corporation
Lang=0009
```

```
[ResponseResult]
ResultCode=0
```

---

## Setting up the OLAP Configuration File

This file contains configuration information required to create DB2 OLAP Server applications. The configuration file resides in an AS/400 file as a member. It is initially created in the installation library with a file name 'CFG' and member name 'RSM'. The member is empty at creation time and should be updated before the server is started. The RSM configuration member is copied into the IFS installation directory each time the Essbase server is started. Changes made to the RSM configuration file while the server is active will only be picked up once the server is ended and started again.

On most operating systems, the section headings (for RSM, Application and Database) must be surrounded by square brackets. But some AS/400 5250

emulators do not support square brackets. Therefore, DB2 OLAP Server on AS/400, you can use either square brackets or parentheses to surround section headings.

See “Chapter 10. Configuring DB2 OLAP Server” on page 157 for more information.

---

## Setting Up an ODBC Data Source

This chapter describes how to set up a ShowCase ODBC data source. It includes instruction on how to add a new ShowCase ODBC data source and how to modify an existing ShowCase ODBC data source. For PCs that are set up to only be using multi-dimensional query components (such as the Spreadsheet Add-ins for 1–2–3 and Excel), no ODBC data source is required.

For applications that access the AS/400 Warehouse Manager server, you must set up a ShowCase ODBC data source on each PC to reference your Warehouse Manager installation. For PCs that use only multidimensional query components, such as the Spreadsheet Add-ins, no ODBC data source is required.

ShowCase ODBC data sources are created with the ODBC Administrator program (ODBCAD32.EXE). The program is installed on your PC when you install ShowCase PC software. Desktop icons are created in the DB2 OLAP Server for AS/400 program group or folder.

You will need the name of the AS/400 library containing Warehouse Manager, or if you are using TCP/IP, the AS/400 IP address and the Warehouse Manager library port number. If you do not know this information, contact your system administrator.

### Adding a New ShowCase ODBC Data Source

You may need to add a new ShowCase ODBC data source if:

- This is your first installation and setup of ShowCase software and/or you received a message at the end of the PC installation that “Setup has not created a sample ShowCase ODBC data source.”
- The Warehouse Manager server has been installed to a new library and you want to access both the new and old Warehouse Manager libraries.

To add a new ShowCase ODBC data source:

1. Run the Microsoft ODBC Administrator tool.
2. Click **Add**.
3. In the **Create a New Data Source** dialog box, select ShowCase ODBC and click **Finish**. A **ShowCase ODBC Setup** dialog box is displayed. The

ShowCase ODBC option also lets you connect to non-DB2 data sources, if they are supported by Warehouse Builder.

4. Enter the data source name. Adding a description is optional.  
If you are sharing queries, try to use the same data source name on all PCs. This will make sharing queries easier for novice users.
5. Choose a communications protocol (APPC or TCP/IP) from the **Communications Type** box.
6. Depending on the communications type selected, enter either:
  - **APPC information:** AS/400 name and library name. When using APPC, ensure you have selected the correct router in the **Communications Type** drop-down list box.
  - **TCP/IP information:** AS/400 IP address and TCP (library) port number. The default port number is 43419. If you do not know the TCP port number, enter the WRKSRVTBLE command at an AS/400 command line, and search for SCSEVERxxx where xxx is the Warehouse Manager library name.
7. To create the data source, click **OK**.

### Modifying an Existing ShowCase ODBC Data Source

You may want to modify an existing ShowCase ODBC data source if:

- The Warehouse Manager server was installed to a new library and you do not want to access the old library
- You have enabled TCP/IP for the Warehouse Manager server and need to change your communications protocol to add the TCP/IP address and port number for Warehouse Manager

To modify an existing ShowCase ODBC data source:

1. Run the Microsoft ODBC Administrator found in the ShowCase STRATEGY program group or folder.
2. Select the data source you want to modify and click Configure (or **Setup**). A **ShowCase ODBC Setup** dialog box is displayed.
3. Modify the ODBC setup information as necessary.
4. To save your modifications, click **OK**.

---

## Connecting to the Warehouse Manager Server

There are two ways to connect to the AS/400:

- Using the AS/400 Test and Configure application
- Using the Warehouse Builder



## Using the AS/400 Test and Configure Application

The AS/400 Test and Configure Application tests the ODBC data source setup. You can use the AS/400 Test Connection icon in the DB2 OLAP Server for AS/400 folder or program group to verify your connection to the correct system and library.

The Test and Configure application does not test the special checks made when DB2 OLAP Server for AS/400 connects to the AS/400. That is, there are times when Test and Configure will connect and Warehouse Builder will not connect, such as when a user is not authorized to use a given product or when an application password has expired.

## Connecting to the AS/400 from Warehouse Builder

1. Open Warehouse Builder. Warehouse Builder asks you to select the control server. This is the Warehouse Manager Server library where you want to store your distribution definitions. Click **OK**.
2. If you have not specified a default data source, Warehouse Builder will ask you to select a data source. Select a data source, and click **OK**.
3. In the **ShowCase ODBC Logon** dialog box, enter your AS/400 user ID and password and click **OK**.
4. If the logon is successful, the **Warehouse Builder Assistant** dialog box appears and your PC is connected to Warehouse Manager Server. If it is not connected, see “Troubleshooting Connection Failures to the Warehouse Manager Server”.

## Troubleshooting Connection Failures to the Warehouse Manager Server

If your connection to the AS/400 fails, check the following:

### General

Verify your ODBC communications type for the data source.

### TCP/IP

1. Verify that you have installed the TCP/IP device drivers and configured your PC for TCP/IP.
2. Verify your ODBC communications type.
3. Verify the IP address: At an MS-DOS prompt type:

```
PING IP_ADDRESS
```

Where IP\_ADDRESS is the IP address you are trying to use. If you receive a reply similar to the following example, then your IP address is valid and the TCP/IP connection is working:

```
Reply from 172.16.1.84: bytes=32 time=84ms TTL=64
```

If you receive a message that the request timed out, then it is likely the IP address is not correct or TCP/IP is not configured correctly on either the PC or the server.

4. Verify your library port number. At an AS/400 command line, type the command `WRKSRVTBLE` and press **Enter**. Look for the port number you are trying to use in the Port column. If you find it, the Service entry for that port should be `SCSERVER library`, where `library` is the name of the library where Warehouse Manager Server is installed. If you do not find it, look for the correct library name under Service and check what the correct port number is for that library.
5. Verify that IBM TCP/IP is active on your AS/400. At an AS/400 command line, type `WRKACTJOB JOB(QTCPIP)` and press **Enter**. If you cannot find the job, type the `STRTCP` command and press **Enter** to start TCP/IP on the server.

For more information on starting and stopping the ShowCase TCP/IP, see the *AS/400 Administrator's Guide*.

6. Verify that the ShowCase TCP/IP master job is started on the server. At an AS/400 command line, type `WRKACTJOB JOB(server_name)` where `server_name` is the name of the server library installed on the AS/400, and press **Enter**.

There should be an entry in the subsystem/job column with the same name as the library in which Warehouse Manager Server is installed. Use Option 5 to work with this job, then Option 11 to display the call stack. The program `TCPMASTER` in the library containing the installation should be the first program on the stack; use F11 to change the display until you see the program name and library name.

For more information on starting and stopping the ShowCase TCP/IP, see the *AS/400 Administrator's Guide*.

7. If IBM TCP/IP and the ShowCase TCP/IP master job are both determined to be active, complete the steps listed below:
  - a. At the AS/400 command line, type the following command:

```
CHGJOB JOB(server_library/SCTCPSRV) LOG(4 00 *SECLVL)
LOGCLPGM(*YES)
```

Where `server_library` is the name of the library where the Warehouse Manager Server is installed.

- b. Attempt the connection test and make note of the AS/400 current system date and time. You can do this by running the following commands from an AS/400 command line:

```
DSPSYSVAL SYSVAL(QDATE) DSPSYSVAL SYSVAL(QTIME)
```

- c. To view spooled files in the QUSER spooled file list, type the following command:  
WRKSPLF SELECT(QUSER)
- d. Press F6 to go directly to the bottom of the spooled list. There should be a spooled file named QPJOBLOG with a user data attribute of SCTCPSRV. Press F11 until the display shows the creation date and time. Look for the date and time of the connection failure. If you find a matching spooled file, skip steps 7e and 7f and resume the process at step 7g. Almost all connection failure job logs can be found in the QUSER spooled file list. However, certain types of errors may suddenly terminate the connection directly after the initial connection was complete.
- e. If you do not see a spooled file that matches the date and time of the connection failure in the QUSER spooled file list, use the following AS/400 command:  
WRKSPLF SELECT(odbc profile)

Where odbc profile is the AS/400 user profile used in the connection dialog.

- f. Repeat step 7d.
- g. Use option 5 to display the spooled file from the spooled file list. Scroll through the job log by paging down and look for any messages that may indicate to you the cause of the connection failure.
- h. If you need assistance in determining the cause of the connection failure, please your IBM Service representative. Be sure to have a copy of the job log for the failing connection; this job log will be needed in order to begin the diagnostic process for the connection failure.

Once the connections are working, run the following command so that the system does not generate job logs for all connections:

```
CHGJOB JOB(server_library/SCTCPSRV) LOG(4 00 *NOLIST)
LOGCLPGM(*NO)
```

Where server library is the name of the library where the server is installed.

## APPC

1. Verify that your system name and library name are correct.
2. Verify the APPC system name. At an AS/400 command line, type the command DSPNETA and press **Enter**. The system name you are using should match the Current System Name shown.

3. Verify that your router is started.
4. At an AS/400 command line, type DSPMSG QSYSOPR and press **Enter**. Scroll through the messages that appear to see if one might be related to the problem you are experiencing.
5. Work with the spooled files for the user ID that is trying to connect to see if there is additional information about the problem you are experiencing. However, there will only be a spooled file if an error occurs after the connection, so if there is no spooled file, it is likely the connection is not being made.

---

## Connecting to the OLAP Server

Before trying to connect to the OLAP server component, ensure that the server is running.

To connect to the OLAP server component from Application Manager:

1. On the **Server** menu, click **Connect**.
2. In the **System Login** dialog box, type or select the TCP/IP address or the host alias name of the OLAP server component in the Server box.
3. In the **Username** box, type your user ID.
4. In the **Password** box, type your password.
5. Click **OK**.
6. If the login is successful, you have completed setting up your PC to use the OLAP server component. If it is not, see the *AS/400 Administrator's Guide* for more information.

## Troubleshooting Connection Failures to the OLAP Server

1. **Problem:** Trying to connect with Application Manager but no servers show up in the **System Login** -> **Server** drop-down box.  
Originally the server IP or host name must be manually entered into the Essbase **System Login** -> **Server** drop-down box. After a valid connection has been made, the server IP and host name will be stored.
2. **Problem:** Network Error (10060): Unable to Connect to (x.x.x.x). The client timed out waiting to connect to the Essbase Agent using TCP/IP.  
Make sure you are using the proper TCP/IP address. Run the DSPESSENV INFO(\*ALL) command in an OLAP server library, and check the second level text of the error message for Essbase/400 Server attributes. This will display the TCP/IP address that the OLAP Server is using.
3. **Problem:** Error 1042017: The client or server timed out waiting to receive data using TCP/IP.

Create or edit the NETDELAY & NETRETRYCOUNT settings in the CFG file to override the default settings. The CFG file resides in the OLAP library on the server or in the /bin directory on the PC (e.g., ShowCase STRATEGY\bin). The file may reside on both the server and PC.

NETDELAY dictates how long (in milliseconds) the OLAP server waits before retrying an unsuccessful operation. NETRETRYCOUNT dictates how many times the network tries to connect to the host.

The defaults as listed in the *Quick Technical Reference* are:

```
NETDELAY 200  
NETRETRYCOUNT 600
```

Use the above syntax to create settings. Increase the sizes based on the frequency of the error (the more frequent it occurs, the higher the desired size). For instance, increase the size of a less frequent error by hundreds. Increase the size of a more frequent error by thousands.

Also consider how many users experience the problem. If only a few users are affected, change the PC file; if more users are affected, change the AS/400 file. After editing the file, shut down and restart the OLAP Server.



---

## Chapter 6. Installing Sample OLAP Applications on AS/400

The AS/400 server installation program can install up to six sample OLAP applications, but only four of those applications apply to DB2 OLAP Server for AS/400.

- The first application, called Sample, contains one database referred to throughout the DB2 OLAP Server for AS/400 documentation set as Basic. In particular, the spreadsheet user guides provide a step-by-step tutorial through the spreadsheet clients.
- The second application, called Demo, contains one database, Basic, referred to in the *Technical Reference*.
- The third application, called Samppart, is the first of two applications designed to show the features of DB2 OLAP Server for AS/400 Partitioning. Samppart contains a Company database that is the target of a partitioned database.
- The fourth application, called Sampeast, is the second of two applications designed for DB2 OLAP Server for AS/400 Partitioning. Sampeast contains an East database that is the source of data for a partitioned database.

To use the Samppart and Sampeast applications, your DB2 OLAP Server for AS/400 server must be licensed to support Partitioning.

When you conduct a typical client installation of the Application Manager, the files required to create the sample databases will be copied into the ShowCase STRATEGY\Client directory on your hard drive. If you conduct a custom installation, you have the option of whether to install the samples files. Once the files are installed, you must create the sample applications and databases and prepare them for use. This appendix explains the procedures.

The samples and the references to the sample applications in the DB2 OLAP Server for AS/400 documentation set assume that the sample applications are installed from a server. However, the sample applications are installed from a client PC. Therefore, be sure to specify the location of the applications accordingly. In most cases, this is accomplished by selecting the Client option in the Location group box of a given dialog box.

---

### Creating the Sample Applications on the OLAP Server

This section explains how to create each of the sample applications on the OLAP server component: Sample, Demo, Samppart, and Sampeast.

## Creating the Application Sample

This section explains how to set up the framework of the application Sample. The following instructions do not load or calculate the databases. For information on loading and calculating the databases, see “Preparing the Sample Basic Database” on page 98.

1. Ensure that the OLAP server is running and that you know the server's TCP/IP address and a valid user ID and associated password.
2. In the Application Manager, on the **Server** menu, click **Connect** and connect to the OLAP server. The connect dialog box requires the TCP/IP alias name or a specific TCP/IP address, and a user ID and password.
3. On the **File** menu, point to **New** and click **Application** to create a new application named Sample on the specified server.
4. On the **File** menu, point to **New** and click **Database** to create a new database named Basic for the Sample application.
5. Move each outline of each Sample database to the OLAP server. For instructions, see “Moving an Outline” on page 92. Where the instructions reference object name, insert the actual outline name.
6. Move the rule object of the Sample Basic database to the OLAP server. For instructions, see “Moving a Rule Object” on page 93. Where the instructions reference object name, insert the actual rule object name.

## Creating the Application Demo

This section explains how to set up the framework of application Demo. The following instructions do not load or calculate the databases. For information on loading and calculating the databases, see “Preparing the Demo Basic Database” on page 99.

1. Ensure that the OLAP server component is running and that you know the server's TCP/IP address and a valid user ID and associated password.
2. In the Application Manager, on the **Server** menu, click **Connect** and connect to the OLAP server. The connect dialog box requires the TCP/IP alias name or a specific TCP/IP address, and a user ID and password.
3. On the **File** menu, point to **New** and click **Application** to create a new application named Demo on the specified server.
4. On the **File** menu, point to **New** and click **Database** to create a new database named Basic for the Demo application.
5. Move the outline of the Demo Basic database to the OLAP server. For instructions, see “Moving an Outline” on page 92. Where the instructions reference object name, insert the actual outline name.
6. Move the report script of the Demo Basic database to the OLAP server. For instructions, see “Moving a Report Script” on page 94. Where the instructions reference object name, insert the actual report script name.



## Creating the Application Samppart

This section explains how to set up the framework of application Samppart. The following instructions do not load or calculate the databases. For information on loading and calculating the databases, see “Preparing the Sampeast East Database” on page 100.

1. Ensure that the OLAP server is running and that you know the server’s TCP/IP address and a valid user ID and associated password.
2. In the Application Manager, on the **Server** menu, click **Connect** and connect to the OLAP server. The connect dialog box requires the TCP/IP alias name or a specific TCP/IP address, and a user ID and password.
3. On the **File** menu, point to **New** and click **Application** to create a new application named Samppart on the specified server.
4. On the **File** menu, point to **New** and click **Database** to create a new database named Company for the Samppart application.
5. Move the outline of the Samppart Company database to the OLAP server. For instructions, see “Moving an Outline” on page 92. Where the instructions reference object name, insert the actual outline name.
6. Before you can load or calculate the Samppart Company database, you need to perform the tasks in the section “Setting Up the Environment for the Samppart and Sampeast Applications” on page 95.

## Creating the Application Sampeast

This section explains how to set up the framework of Essbase/400 application Sampeast. The following instructions do not load or calculate the databases. For information on loading and calculating the databases, see “Preparing the Sampeast East Database” on page 100.

1. Ensure that the OLAP server is running and that you know the server’s TCP/IP address and a valid user ID and associated password.
2. In the Application Manager, on the **Server** menu, click **Connect** and connect to the OLAP server. The connect dialog box requires the TCP/IP alias name or a specific TCP/IP address, and a user ID and password.
3. On the **File** menu, point to **New** and click **Application** to create a new application named Sampeast on the specified server.
4. On the **File** menu, point to **New** and click **Database** to create a new database named East for the Sampeast application.
5. Move the outline of the Sampeast East database to the OLAP server. For instructions, see “Moving an Outline” on page 92. Where the instructions reference object name, insert the actual outline name.
6. Before you can load or calculate the Sampeast East database, you need to perform the tasks in the section “Setting Up the Environment for the Samppart and Sampeast Applications” on page 95.

---

## Moving Objects from the Client to the OLAP server

This section explains the steps necessary to move outlines, calculation scripts, rules objects, and report scripts from the client to the OLAP server.

### Moving an Outline

To move an outline:

1. In the Application Manager, on the **File** menu, click **Open**.
2. In the **Location** group of the **Open Object** dialog box, select **Client**.
3. In the **Application** box, select the application for which you want to move an outline.
4. In the **Database** box, select the database for which you want to move an outline.
5. In the **List Objects of Type** box, select **Outlines**.
6. In the **Objects** list, select the *object name* of the outline you want to move and click **OK**.
7. On the **File** menu, click **Save As**.
8. In the **Location** group of the **Save Object** dialog box, select **Server**.
9. In the **Server** box, select the TCP/IP name or address of the server to which you want to move the outline.
10. In the **Application** box, select the application for which you are saving an outline.
11. In the **Database** box, select the database for which you are saving an outline.
12. In the **List Objects of Type** box, select **Outlines**.
13. In the **Object Name** box, type the *object name* of the outline you are saving.
14. Click **OK**.
  - If Essbase/400 displays a message indicating that the object already exists and asks if you would like to replace the existing object, click **Yes**.
  - If Essbase/400 displays a message indicating that the object is unlocked and asks if you would like to replace the existing object, click **Yes**.
  - If Essbase/400 displays a message indicating that the object did not originate from the latest version of the server and that you could lose data and asks if you want to continue, click **Yes**.
15. Close the outline viewer window.

### Moving a Calculation Script

To move a calculation script:

1. In the Application Manager, on the **File** menu, click **Open**.

2. In the **Location** group of the **Open Object** dialog box, select **Client**.
3. In the **Application** box, select the application for which you want to move a calculation script.
4. In the **Database** box, select the database for which you want to move a calculation script.
5. In the **List Objects of Type** box, select **Calc Scripts**.
6. In the **Objects** list, select the *object name* of the calculation script you want to move and click **OK**.
7. On the **File** menu, click **Save As**.
8. In the **Location** group of the **Save Object** dialog box, select **Server**.
9. In the **Server** box, select the TCP/IP name or address of the server to which you want to move the calculation script.
10. In the **Application** box, select the application for which you are saving a calculation script.
11. In the **Database** box, select the database for which you are saving a calculation script.
12. In the **List Objects of Type** box, select **Calc Scripts**.
13. In the **Object Name** box, type the *object name* of the calculation script you are saving.
14. Click **OK**.
  - If Essbase/400 displays a message indicating that the object already exists and asks if you would like to replace the existing object, click **Yes**.
  - If Essbase/400 displays a message indicating that the object is unlocked and asks if you would like to replace the existing object, click **Yes**.
  - If Essbase/400 displays a message indicating that the object did not originate from the latest version of the server and that you could lose data and asks if you want to continue, click **Yes**.
15. Close the calc script editor window.

### **Moving a Rule Object**

To move a rule object:

1. In the Application Manager, on the **File** menu, click **Open**.
2. In the **Location** group of the **Open Object** dialog box, select **Client**.
3. In the **Application** box, select the application for which you want to move a rule object.
4. In the **Database** box, select the database for which you want to move a rule object.
5. In the **List Objects of Type** box, select **Rule Objects**.

6. In the **Objects** list, select the *object name* of the rule object you want to move and click **OK**.
7. On the **File** menu, click **Save As**.
8. In the **Location** group of the **Save Object** dialog box, select **Server**.
9. In the **Server** box, select the TCP/IP name or address of the server to which you want to move the rule object.
10. In the **Application** box, select the application for which you are saving a rule object.
11. In the **Database** box, select the database for which you are saving a rule object.
12. In the **List Objects of Type** box, select **Rule Objects**.
13. In the **Object Name** box, type the *object name* of the rule object you are saving.
14. Click **OK**.
  - If Essbase/400 displays a message indicating that the object already exists and asks if you would like to replace the existing object, click **Yes**.
  - If Essbase/400 displays a message indicating that the object is unlocked and asks if you would like to replace the existing object, click **Yes**.
  - If Essbase/400 displays a message indicating that the object did not originate from the latest version of the server and that you could lose data and asks if you want to continue, click **Yes**.
15. Close the rule object editor.

## Moving a Report Script

To move a report script:

1. In the Application Manager, on the **File** menu, click **Open**.
2. In the **Location** group of the **Open Object** dialog box, select **Client**.
3. In the **Application** box, select the application for which you want to move a report script.
4. In the **Database** box, select the database for which you want to move a report script.
5. In the **List Objects of Type** box, select **Report Scripts**.
6. In the **Objects** list, select the *object name* of the report script you want to move and click **OK**.
7. On the **File** menu, click **Save As**.
8. In the **Location** group of the **Save Object** dialog box, select **Server**.
9. In the **Server** box, select the TCP/IP name or address of the server to which you want to move the report script.

10. In the **Application** box, select the application for which you are saving a report script.
11. In the **Database** box, select the database for which you are saving a report script.
12. In the **List Objects of Type** box, select **Report Scripts**.
13. In the **Object Name** box, type the *object name* of the report script you are saving.
14. Click **OK**.
  - If Essbase/400 displays a message indicating that the object already exists and asks if you would like to replace the existing object, click **Yes**.
  - If Essbase/400 displays a message indicating that the object is unlocked and asks if you would like to replace the existing object, click **Yes**.
  - If Essbase/400 displays a message indicating that the object did not originate from the latest version of the server and that you could lose data and asks if you want to continue, click **Yes**.
15. Close the report script editor window.

---

## Setting Up the Environment for the Samppart and Sampeast Applications

Essbase/400 includes two sample applications and databases that show the features of Partitioning: Samppart Company and Sampeast East. These applications and databases include partition definitions stored in .DDB files.

The .DDB files define the map between member combinations in the target database, Company, and the source database, East. See the *Database Administrator's Guide* for how to set up partitions. This guide will also explain member combinations and the differences between target and source databases.

For these applications to work in your environment, you need to match or change the information contained in the .DDB files. To use the applications, you must do the following:

- Create the user name that designed the applications.
- Change the server name that is embedded in the applications.

Do not physically change the .DDB files' information. Instead, complete the steps in the following sections. "Creating the Partition User" on page 96 describes how to create the required user name so that your users can use these applications. "Changing the Server Name in the Sample Partition Definitions" on page 96 describes how to change the embedded server name to the name of your OLAP server.

## Creating the Partition User

Because the Samppart and Sampeast applications were designed by a user called `partitionuser`, you must create a user called `partitionuser` to work with these applications. `Partitionuser` must have Application Designer access to these applications on the server in which they are installed. If you are unsure how to create a user and you use the Integrated Security feature of DB2 OLAP Server for AS/400, see the *AS/400 Administrator's Guide* for more information. If you do not use this feature, complete the following steps:

1. In the Application Manager, on the **Server** menu, click **Connect** and connect to the server on which the Samppart and Sampeast applications are installed. Log in with a user that has supervisor privilege.
2. On the **Security** menu, click **Users/Groups**. The **User/Group Security** dialog box appears.
3. Click the **New User** button. The **New User** dialog box appears.
4. In the **Username** text box, enter `partitionuser`. Be sure to use all lowercase letters.
5. In the **Password** text box, enter a password. For example, type `password`. Asterisks appear in place of the characters you type.
6. In the **Confirm Password** text box, type your password again. Again, asterisks appear in place of the characters you type.
7. Click the **App Access** button. The **User/Group Application Access** dialog box.
8. Select the Sampeast application, and then click **App Designer** in the **Access** group box.
9. Select the Samppart application, and then click **App Designer** in the **Access** group box.
10. Click OK twice to return to the **User/Group Security** dialog box, and then click **Close**.
11. On the **Server** menu, click **Disconnect** to log out of the server. Click OK to log out.
12. On the **Server** menu, click **Connect** and log in as `partitionuser`. The Application Desktop window appears. You are ready to continue setting up the Samppart and Sampeast applications. See “Changing the Server Name in the Sample Partition Definitions”

## Changing the Server Name in the Sample Partition Definitions

The following steps change the embedded server name in the partition definition files (.DDB) to the OLAP server name. The .DDB files shipped with Samppart and Sampeast are based on the server name `localhost`.

If you haven't already, you must complete the steps in “Creating the Partition User” before continuing.

### Changing the Server Name for the Samppart Company Database

The following steps change the server name in the Samppart Company .DDB file.

1. In the Application Desktop window, select the **Samppart** application and **Company** database.
2. On the **Database** menu, click **Partition Manager**. After a brief pause, the **Partition Manager** dialog box appears.  
If the Partition Manager dialog box doesn't appear or if it doesn't contain any definition entries, contact your Essbase/400 System Administrator. Your OLAP server must be registered with a license number supporting Partitioning.
3. In the **Source Cube** list, select the first definition entry, **Localhost:Sampeast:East**.
4. Click **Edit**. The **Dangling Remote Reference** dialog box appears. Because you are not connected to a server named Localhost, Essbase/400 is warning you before it allows you to edit the definition.
5. Click **Advanced**. The **Fix Dangling Partition Reference** dialog box appears.
6. In the **Action** group, click **Correct the invalid partition reference**.
7. In the **Reconnect** group, in the **Server** text box, replace Localhost with the name of your OLAP server (e.g., ESSBASE).
8. Click **Apply**. You are returned to the **Partition Manager** dialog box.
9. In the **Source Cube** list, select the second definition entry, **Localhost:Sampeast:East**.
10. Repeat steps 4-8 for this definition.
11. In the **Target Cube** list, select the first definition entry, **Localhost:Sampeast:East**.
12. Repeat steps 4-8 for this definition.
13. On the **Partition** menu, click **Close** to return to the Application Desktop window.

You have successfully changed the server name in the Samppart Company.DDB file.

### Changing the Server Name for the Sampeast East Database

The following steps change the server name in the Sampeast East .DDB file.

1. In the Application Desktop window, select the **Sampeast** application and **East** database.
2. On the **Database** menu, click **Partition Manager**. After a brief pause, the **Partition Manager** dialog box appears.
3. In the **Source Cube** list, select the first definition entry, **Localhost:Samppart:Company**.

4. Click **Edit**. The **Dangling Remote Reference** dialog box appears. Because you are not connected to a server named Localhost, Essbase/400 is warning you before it allows you to edit the definition.
5. Click **Advanced**. The **Fix Dangling Partition Reference** dialog box appears.
6. In the **Action** group, click **Correct the invalid partition reference**.
7. In the **Reconnect** group, in the **Server** text box, replace Localhost with the name of your OLAP server (e.g., ESSBASE).
8. Click **Apply**. You are returned to the **Partition Manager** dialog box.
9. In the **Target Cube** list, select the first definition entry, **Localhost:Samppart:Company**.
10. Repeat steps 4-8 for this definition.
11. In the **Target Cube** list, select the second definition entry, **Localhost:Samppart:Company**.
12. Repeat steps 4-8 for this definition.
13. On the **Partition** menu, click **Close** to return to the Application Desktop window.

You have successfully changed the server name in the Sampeast East .DDB file.

---

## Preparing the Sample Basic Database

The first database in the Sample application is called Basic. To prepare it for use, you must load data into it.

To load the data:

1. In the Application Manager, on the **Server** menu, click **Connect** and connect to the server on which the Sample application is installed.
2. In the **Applications** box, select Sample.
3. In the **Databases** list, select Basic.
4. On the **Database** menu, click **Load Data**. The **Data Load** dialog box appears.
5. Click **Find** to locate a data file to load. The **Open Server Data File Objects** dialog box appears.
6. In the **Location** group of the **Open Server Data File Objects** dialog box, select **Client**.
7. Ensure that Text files is selected in the **List Objects of Type** box.
8. In the **Objects** list box, select CALCDAT.
9. Click **OK**. The **Data Load** dialog box is updated to display the data file you chose.



10. Click **OK** to load the selected file. The data file is a large data set that is approximately 3 MB. It will take several minutes to load, and then the **Data Load Completed** dialog box appears. Click **Close**.

Once the data is loaded into the database, Essbase/400 automatically commits the data to the disk. You can safely stop the application or server and then restart it.

When loaded, the Sample Basic database uses approximately 5 MB of disk space on the server, in addition to the size of the data source file.

---

## Preparing the Demo Basic Database

The Demo application contains one database called Basic. To prepare it for use, you must load data into it.

To load the data:

1. In the Application Manager, on the **Server** menu, click **Connect** and connect to the server on which the Demo application is installed.
2. In the **Applications** box, select Demo.
3. In the **Databases** list, select Basic.
4. On the **Database** menu, click **Load Data**. The **Data Load** dialog box appears.
5. Click **Find** to locate a data file to load. The **Open Server Data File Objects** dialog box appears.
6. In the **Location** group of the **Open Server Data File Objects** dialog box, select **Client**.
7. Ensure that Text files is selected in the **List Objects of Type** box.
8. In the **Objects** list, select DATA.
9. Click **OK**. The **Data Load** dialog box is updated to display the data file you chose.
10. Click **OK** to load the selected file. The data file is approximately 660 KB. It will take a minute or two to load, and then the **Data Load Completed** dialog box appears. Click **Close**.

Once the data is loaded into the database, Essbase/400 automatically commits the data to the disk. You can safely stop the application or server and then restart it.

When loaded, the Demo Basic database uses approximately 2 MB of disk space on the server, in addition to the size of the data source file.

---

## Preparing the Samppart Company Database

After setting up the environment for the Samppart and Sampeast applications (as described in “Setting Up the Environment for the Samppart and Sampeast Applications” on page 95”), you need to load data into the database of each application. This section explains how to load Samppart Company.

To load the data:

1. In the Application Manager, on the **Server** menu, click **Connect** and connect to the server on which the Demo application is installed. Log in as partitionuser or as a user with supervisor privilege.
2. In the **Applications** box, select Samppart.
3. In the **Databases** list, select Company.
4. On the **Database** menu, click **Load Data**. The **Data Load** dialog box appears.
5. Click **Find** to locate a data file to load. The **Open Server Data File Objects** dialog box appears.
6. In the **Location** group of the **Open Server Data File Objects** dialog box, select **Client**.
7. Ensure that Text files is selected in the **List Objects of Type** box.
8. In the **Objects** list, select CALCCOMP.
9. Click **OK**. The **Data Load** dialog box is updated to display the data file you chose.
10. Click **OK** to load the selected file. The data file is a large, fully calculated data set. It should take about a minute to load, and then the **Data Load Completed** dialog box appears. Click **Close**.

Once the data is loaded into the database, Essbase/400 automatically commits the data to the disk. You can safely stop the application or server and then restart it.

When loaded, the Samppart Company database uses approximately 2 MB of disk space on the server in addition to the size of the data source file.

---

## Preparing the Sampeast East Database

After setting up the environment for the Samppart and Sampeast applications (as described in “Setting Up the Environment for the Samppart and Sampeast Applications” on page 95), you need to load data into the database of each application. This section explains how to load Sampeast East.

To load the data:

1. In the Application Manager, on the **Server** menu, click **Connect** and connect to the server on which the Demo application is installed. Log in as `partitionuser` or as a user with supervisor privilege.
2. In the **Applications** box, select `Sampeast`.
3. In the **Databases** list, select `East`.
4. On the **Database** menu, click **Load Data**. The **Data Load** dialog box appears.
5. Click **Find** to locate a data file to load. The **Open Server Data File Objects** dialog box appears.
6. In the **Location** group of the **Open Server Data File Objects** dialog box, select **Client**.
7. Ensure that `Text files` is selected in the **List Objects of Type** box.
8. In the **Objects** list, select `CALCEAST`.
9. Click **OK**. The **Data Load** dialog box is updated to display the data file you chose.
10. Click **OK** to load the selected file. The data file is a small, fully calculated data set. It should take about a minute to load, and then the **Data Load Completed** dialog box appears. Click **Close**.

Once the data is loaded into the database, Essbase/400 automatically commits the data to the disk. You can safely stop the application or server and then restart it.

When loaded, the `Sampeast East` database uses approximately 1.5 MB of disk space on the server in addition to the size of the data source file.

---

## Providing User Access to the Sample Applications

Essbase/400 provides a comprehensive security system for a secure multi-user environment. By default, the sample applications are created with a security access level of `No Access`, which means that no users can connect to the database unless he/she is defined as a supervisor.

The first user on the client is the user name defined when the OLAP server was installed. This user automatically has supervisor privilege.

To provide all users with `Write` access to the database:

1. In the Application Manager, on the **Server** menu, click **Connect** and connect to the server on which the sample application is installed.
2. In the **Applications** box, select the sample application to which you want to grant access.
3. On the **Application** menu, click **Settings**. The **Application Settings** dialog box appears.

4. In the **Minimum Database Access** group, select **Write**.
5. Click **OK**.
6. Repeat the above steps for each sample application to which you want to give your users access.

At this point, the sample applications are ready for use. Next, create the appropriate user IDs and security settings so that your users can log in to DB2 OLAP Server for AS/400. For more information on Essbase/400 security, see “Integrated Security” in the *AS/400 Administrator’s Guide*.

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## Chapter 7. Installing Information Catalog Manager

This chapter describes the installation process for the Information Catalog Manager Tools component, the Information Catalog Administrator component, the Information Catalog User component, and the Information Catalog Manager for the Web.

If you want to install Information Catalog Manager and DB2 OLAP Server on the same system, we recommend that you install both products at the same time.

---

### Introducing Information Catalog Manager

The Information Catalog Manager provides a powerful, business-oriented solution to help users locate, understand, and access enterprise data. It enables business users to view aggregations, histories, data derivations, data sources, and descriptions of data.

The Information Catalog Manager consists of the following components: Information Catalog Manager Tools, Information Catalog Administrator, Information Catalog User, and the Information Catalog Manager for the Web.

The Information Catalog Manager Tools component includes the Information Catalog Administrator component and the information catalog initialization utility. You must run the information catalog initialization utility to create your information catalogs.

You can use the Information Catalog Administrator component to enable metadata exchange and to keep your information catalog current with the warehouse control database. The Information Catalog Administrator component includes utilities that extract descriptive data from many popular data and information sources, such as Oracle and Microsoft Excel. The Information Catalog Administrator component also includes a sample information catalog with data. See the *Information Catalog Manager Administration Guide* for more information about extractors and the sample information catalog.

After you install the Information Catalog Administrator component, you can access functions for both the Information Catalog Administrator component and the Information Catalog User component. The Information Catalog User component helps the business user understand the warehouse data through a browse-and-search interface. Using this interface, business users can launch any program or command file required to display the data or business object.

You can use the Information Catalog Manager for the Web to access information catalogs and obtain descriptions of available data, including format, currency, owner, and location. From any Web browser, users can run available helper applications to view data.

---

## Information Catalog Manager components

This section describes the software requirements for the following components: Information Catalog Manager Tools, Information Catalog Administrator, Information Catalog User, and the Information Catalog Manager for the Web.

### Information Catalog Manager Tools component

To install the Information Catalog Manager Tools component, you need 50 MB of fixed disk space.

### Information Catalog Administrator component

To install the Information Catalog Administrator component, you need 47 MB of fixed disk space.

The Information Catalog Administrator component requires one of the Windows 32-bit operating systems (Windows NT, Windows 95, Windows 98, or Windows 2000).

Information catalogs can be hosted on DB2 Universal Database Version 5.2 (including fixpacks or CSDs) for OS/2<sup>®</sup>, AIX, or Windows NT, if those information catalogs are not included in the same database as the warehouse control database.

Information catalogs can also be hosted on Version 6.1 or later of the following DB2 family databases:

- DB2 Universal Database for Windows NT
- DB2 Universal Database for AIX
- DB2 Universal Database for OS/2
- DB2 Universal Database for OS/390
- DB2 Universal Database for AS/400<sup>™</sup>
- DB2 Universal Database for Solaris Operating Environment

If your information catalog is located remotely in an OS/390 or an AS/400 database, you must install DB2 Connect.

You also need a connection to your LAN.

## Information Catalog User component

To install the Information Catalog User component, you need 26 MB of fixed disk space.

The Information Catalog User component requires one of the Windows 32-bit operating systems (Windows NT, Windows 95, Windows 98, or Windows 2000).

## Information Catalog Manager for the Web

To install the Information Catalog Manager for the Web, you need 500 KB of fixed disk space.

The following products are required on the Web server onto which you will install the Information Catalog Manager for the Web:

- Web server software
- Net.Data<sup>®</sup> Version 2 or later (and the latest fixpack for languages other than English)
- Perl 5 Interpreter

You can download Perl executable files for many operating systems from <http://www.perl.com/reference/query.cgi?binaries>

You must also install the appropriate software to establish connectivity from your Web server to the workstation where your information catalogs reside.

The Web server can be the same workstation as the database server, or a different workstation.

To access the Information Catalog Manager for the Web, the client workstation must have a Web browser that is enabled for HTML 3.2, such as Netscape Navigator 3.0 or Microsoft Internet Explorer 3.0.

---

## Before you begin

You need to install the Information Catalog Manager Tools component, which includes the Information Catalog Administrator component, on Windows NT workstations that your administrators will use to create an information catalog or to migrate existing information catalogs. You can install the Information Catalog Administrator component or the Information Catalog User component on additional workstations running any Windows 32-bit operating systems (Windows NT, Windows 95, Windows 98, or Windows 2000). These workstations must have connectivity to the workstation where your DB2 Universal Database is located.

The installation program installs the Information Catalog Manager Tools, Information Catalog Administrator, and Information Catalog User components

all together. You cannot install just one or two components; if you want one component on a workstation, then you must install all three components on that workstation.

After you install the Information Catalog Administrator component or the Information Catalog User component, you must register the server node and any remote information catalogs. See the *Information Catalog Manager User's Guide* for more information.

You can use the Information Catalog Manager for the Web to access metadata in your information catalogs from any operating system that supports DB2 Universal Database and Net.Data. The workstation where you install the Information Catalog Manager for the Web must also have Net.Data Live Connection Manager and Net.Data Perl Language Environment (LE) installed.

---

## Installing the Information Catalog Manager Tools, Administrator, and User components

You can install the following Information Catalog Manager components:

- Information Catalog Manager Tools component, which you can install on a Windows NT or Windows 2000 workstation that has connectivity to your DB2 Universal Database.
- Information Catalog Administrator component, which you can install on any Windows 32-bit operating systems (Windows NT, Windows 95, Windows 98, or Windows 2000).
- Information Catalog User component, which you can install on any Windows 32-bit operating systems (Windows NT, Windows 95, Windows 98, or Windows 2000).

### Installing the Information Catalog Manager components

To install the Information Catalog Manager components:

1. Insert the DB2 OLAP Server CD-ROM into your CD-ROM drive. The launchpad opens.
2. Click **Install** from the launchpad.
3. Accept the license conditions for the Personal Edition. This does not affect your license for DB2 OLAP Server or Information Catalog Manager.
4. Click **No** on the Spreadsheet-only message prompt.
5. Click **Next** on the Options window.
6. In the Destination window, select the drive and directory you want to install Information Catalog Manager on, or accept the default driver and directory, and then click **Next**.
7. In the Select Type of Install window, click **Custom**, then click **Next**.



8. Deselect the **DB2 OLAP Server** components that are already selected, and select the **Information Catalog Manager** components.
9. In the Select Folder window, enter the name of the Windows folder you want for Information Catalog Manager or accept the default, and then click **Next**.
10. In the Start Copying Files window, review the information and click **Next** to continue the installation program.
11. When the installation program completes, register the server node and any remote information catalogs. See the *Information Catalog Manager User's Guide* for more information.
12. If you are installing the Information Catalog Manager Tools component on AS/400 or OS/390, locate the files createic.bak and flgnmwcr.bak and rename them to createic.exe and flgnmwcr.exe, respectively.
13. Run the information catalog initialization utility. See "Running the information catalog initialization utility" for more information.

### Running the information catalog initialization utility

Before you can use the Information Catalog Administrator component, you must create an information catalog or migrate existing information catalogs. You do this by running the information catalog initialization utility.

To run the information catalog initialization utility:

1. Create a database in DB2 Universal Database, or locate an existing database that contains an information catalog.
2. Click **Start** → **Programs** → **IBM DB2** → **Information Catalog Manager** → **Initialize Information Catalog**. The Initialize Information Catalog window opens.
3. Select a type of information catalog, then click **OK**. The Define Catalog on DB2 UDB for Windows NT window opens.
4. Type the necessary information, then click **Define**. The Connect to Information Catalog window opens.
5. Type the user ID and password for the information catalog that you specified, then click **Connect**.

---

### Installing the Information Catalog Manager for the Web

You can install the Information Catalog Manager for the Web on any operating system that supports DB2 Universal Database and Net.Data. The operating system must also support Net.Data Live Connection Manager and Perl LE. These operating systems include Windows NT, OS/2, AIX, and the Solaris Operating Environment.

For information about setting MIME types to launch programs, see the *Information Catalog Manager Administration Guide*.

## Security considerations

You must enable authentication on the Web server. After you enable authentication, each user must enter a user ID and password to access the Information Catalog Manager for the Web. Because the Net.Data Live Connection Manager manages the database connections, users do not need to know the database user ID and password.

Depending on the sensitivity of the information in the information catalog, you need to implement the appropriate level of security for your Web server. For additional security beyond the authentication function in the Web server, you can install security packages with encryption and keys. For information about advanced Web server security, see the documentation for IBM SecureWay (part of the Websphere family).

## Installing the Information Catalog Manager for the Web on a Windows NT Websphere IBM HTTP Web server

Before you begin to install the Information Catalog Manager for the Web:

1. Make sure that the IBM HTTP Web server is installed.
2. Check the Web server port number. If the Web server has a port other than 80 (the usual default), append the port number to the host name in the Web address when you configure the domain name. For example:  
`http://hostname:portnumber/`
3. Create a directory named `icm` on the Web server to contain the Net.Data executable files (for example, `\IBM HTTP Server\icm`). Point to this directory as the Net.Data `cgi-bin` directory. Place the executable file `db2www.exe` in this directory.

To install the Information Catalog Manager for the Web:

1. Install the Information Catalog Manager for the Web files onto your Web server:
  - a. Insert the DB2 Universal Database CD-ROM into the CD-ROM drive on the Web server workstation. The launchpad opens.
  - b. Click **Install** from the launchpad.
  - c. In the Select Products window, select the **DB2 Administration Client** check box, then click **Next**.
  - d. In the Select Type of Install window, click **Custom**, then click **Next**.
  - e. In the Select DB2 Components window, clear the check boxes for all components except the **Data Warehousing Tools** component.
  - f. Click **Subcomponents**.

- g. In the Select Subcomponents window, ensure that the check box for the **Information Catalog Manager for the Web** is selected and that all other check boxes are cleared.
- h. Click **Continue**.
- i. In the Select Components window, clear the check boxes for the **Communication Protocols** component, the **Application Development Interfaces** component, and the **Administration and Configuration Tools** component. Make sure that the **Data Warehousing Tools** component remains selected.
- j. Click **Next** to continue with the installation. The installation program creates files in the following directories:
  - \sqllib\icmweb\macro
  - \sqllib\icmweb\html
  - \sqllib\icmweb\icons
2. Copy all the \*.mac and \*.hti files from the \sqllib\icmweb\macro directory to the Net.Data macro directory (usually \db2www\macro).
3. Copy all the \*.htm and \*.gif files from the \sqllib\icmweb\html to the document root directory on the Web server (usually \IBM HTTP Server\htdocs).
4. Copy all the dg\*.gif files from the \sqllib\icmweb\icons directory to the image directory on the Web server (usually \IBM HTTP Server\icons). This directory will be the value for the image\_path variable in the dg\_config.hti file.
5. Edit the dg\_config.hti file to include the directories where you copied the files and the server name. The macro\_path variable uses the alias that is set up on your Web server to control user access. The dg\_config.hti file should look like this:

```
%DEFINE {
    server_name="http://winntserver.ibm.com/"
    image_path="$(server_name)icons/"
    macro_path="$(server_name)icm/db2www.exe/"
    help_path="$(server_name)"
%}
```

6. Add a link to an existing Web page, or create a Web page with a link to the Information Catalog Manager for the Web home page.

To create a Web page, edit the file icm.html and add the following lines:

```
<html><head>
<title>Information Catalog Manager for the Web</title>
</head>
<body bgcolor=white>
<p><a href=/icm/db2www.exe/dg_home.mac/Logon>
Information Catalog Manager for the Web</a>
</body>
</html>
```

Place the file in the HTML default directory (usually \IBM HTTP Server\htdocs).

7. Enable basic user authentication on your Web server for each Information Catalog Manager for the Web user.

When users access the Information Catalog Manager for the Web home page, they are prompted for their user ID and password. When they enter these values, the HTTP environment variable REMOTE\_USER is set. This variable is used to prompt users for their user ID and password and to create, update, and delete comments.

- a. Set up an alias.

Create an alias named `icm` for the directory where the Net.Data CGI program `DB2WWW` is located. The `macro_path` variable that is defined in the `dg_config.hti` file uses this alias:

```
macro_path="$(server_name)icm/db2www.exe/"
```

The alias directory `icm` should have the user ID and password authentication enabled. To enable authentication, edit the `httpd.conf` file. This file is usually located in \IBM HTTP Server\conf directory. Add a `ScriptAlias` directive, like this:

```
ScriptAlias /icm/ "c:/IBM HTTP Server/icm/"
```

Also make sure that the `httpd.conf` file contains a directive that defines the access file name, like this:

```
AccessFileName .htaccess
```

- b. Create a password file that will contain the authorized user ID and password for each Information Catalog Manager for the Web user. Use the `htpasswd` command to create and edit the password file.

For example, to create the password file `c:/IBM HTTP Server/icmweb.pwd` for the user ID `ADMIN`, enter the following command:

```
htpasswd -c c:/IBM HTTP Server/icmweb.pwd ADMIN
```

Specifying the `-c` option ensures that you enter a password when you create a password file.

When you are prompted for the password, enter `ADMINPW`.

To add another user ID, `ADMIN2`, with the password `ADMINPW2`, enter the following command:

```
htpasswd c:/IBM HTTP Server/icmweb.pwd ADMIN2 ADMINPW2
```

The user ID must be 8 characters or less in length, because it is stored in the information catalog tables when a comment is created.

c. Restrict access to the \IBM HTTP Server\icm\ directory.

- 1) To require authentication when users access the \IBM HTTP Server\icm\ directory, edit the httpd.conf file. This file is usually located in the \IBM HTTP Server\conf directory. Add a directory directive for the \IBM HTTP Server\icm directory, like this:

```
<Directory "c:/IBM HTTP Server/icm">
AllowOverride AuthConfig
Options None
</Directory>
```

- 2) Create a file that is named .htaccess in the \IBM HTTP Server\icm directory with the AuthName, AuthType, AuthUserFile, and require directives that are set like this:

```
AuthName ICMWeb
AuthType Basic
AuthUserFile "c:/IBM HTTP Server/icmweb.pwd"
require valid-user
```

Because some editors require a file name and a file extension, you might need to create the file with the name htaccess.txt and rename it to .htaccess after you save it.

You must stop and restart the Web server for these changes to take effect.

**Note:** This is one way that you can enable authentication on an IBM HTTP Web server. You can set up more complex directory structures, user groups, and permissions, if necessary, along with additional security packages. More information about setting up basic authentication is available in the IBM HTTP Web server documentation. For information about advanced Web server security, see the documentation for IBM SecureWay (part of the Websphere family).

8. Set up Net.Data to run Live Connection Manager for the databases that are used by the Information Catalog Manager for the Web.

- a. Edit the Net.Data file \db2www\connect\dtwcm.cnf, and add a CLIETTE DTW\_SQL block for each database that the Information Catalog Manager for the Web will use.

To add the database ICMSAMP with a minimum of one process, a maximum of three processes, starting with private port number 7100, and starting with public port number 7110, add the following block:

```
CLIETTE DTW_SQL:ICMSAMP{
MIN_PROCESS=1
MAX_PROCESS=3
START_PRIVATE_PORT=7100
START_PUBLIC_PORT=7110
EXEC_NAME=./dtwddb2
```

```

DATABASE=ICMSAMP
BINDFILE=NOT_USED
LOGIN=*USE_DEFAULT
PASSWORD=*USE_DEFAULT
}

```

Six ports (7100, 7101, 7102, 7110, 7111, 7112) are allocated to the ICMSAMP database. Make sure that these ports are free and not in use by another application. You must use different port number ranges for each CLIETTE DTW\_SQL block. See the *Net.Data Administration and Programming Guide* for more information.

- b. Set the LOGIN value to the user ID for the database, and set the PASSWORD value to the password for the database. If the database is local, you can use \*USE\_DEFAULT.
- c. Set up the Net.Data initialization file to use Live Connection Manager for the SQL calls. Edit the DB2WWW.INI file in the document root directory on the Web server. Make sure that the ENVIRONMENT DTW\_SQL statement ends with CLIETTE "DTW\_SQL:\$(DATABASE)".

For example:

```

ENVIRONMENT (DTW_SQL) DTWSQL(IN DATABASE,LOGIN,PASSWORD,
    TRANSACTION_SCOPE,SHOWSQL,ALIGN,START_ROW_NUM)
    CLIETTE "DTW_SQL:$(DATABASE)"

```

- d. Start Live Connection Manager by using the executable file /DB2WWW/CONNECT/dtwcm.exe. Live Connection Manager must be running so that the Information Catalog Manager for the Web can access the databases. After Live Connection Manager is started, you can minimize the Live Connection Manager window on the Web server. See the *Net.Data Administration and Programming Guide* for more information.

Follow the steps in “Post-installation customization” on page 121 before using the Information Catalog Manager for the Web.

## **Installing the Information Catalog Manager for the Web on an AIX Websphere IBM HTTP Web server**

Before you begin to install the Information Catalog Manager for the Web:

1. Make sure that IBM HTTP Web server is installed.
2. Check the Web server port number. If the Web server has a port other than 80 (the usual default), append the port number to the host name in the Web address when you configure the domain name. For example:  
http://hostname:portnumber/
3. Create a directory named icm on the Web server to contain the Net.Data executable files (for example, /usr/lpp/HTTPServer/share/icm/). Point to

this directory as the Net.Data cgi-bin directory. Place the executable file db2www (usually found in the /usr/lpp/internet/server\_root/cgi-bin directory) into this directory.

4. Copy the db2www.ini file (usually found in the /usr/lpp/internet/server\_root/pub/ directory) to the document root directory (usually /usr/lpp/HTTPServer/share/htdocs). Edit the db2www.ini file and update the DB2 instance and path:

```
DB2INSTANCE db2
MACRO_PATH /usr/lpp/internet/db2www/macro
INCLUDE_PATH /usr/lpp/internet/db2www/macro
HTML_PATH /usr/lpp/HTTPServer/share/htdocs
EXEC_PATH /usr/lpp/internet/db2www/macro
DTW_LOG_DIR /usr/lpp/internet/db2www/logs
```

To install the Information Catalog Manager for the Web:

1. Log in as a user with root authority.
2. Insert and mount the DB2 Universal Database CD-ROM. For information about mounting a CD-ROM, see *DB2 for UNIX Quick Beginnings*.
3. Change to the directory where the CD-ROM is mounted by entering `cd /cdrom`, where *cdrom* is the mount point of your product CD-ROM.
4. Enter the `./db2setup` command. After a few moments, the Install DB2 V7 window opens.
5. Select the products that you want to install and are licensed to install. Press the Tab key to change the highlighted option. Press the Enter key to select or deselect an option. When you select an option, an asterisk is displayed next to it.

To select or deselect optional components for a DB2 product that you want to install, select the **Customize** option. To go back to a previous window at any time, select the **Cancel** option.

6. When you have finished selecting the DB2 product and its components, select **OK** to continue with the installation.

For more information or assistance during the installation of any DB2 product or component, select the Help option.

The installation program creates files in the following directories:

- \sqllib\icmweb\macro
- \sqllib\icmweb\html
- \sqllib\icmweb\icons

7. Copy all the \*.mac and \*.hti files from the \sqllib\icmweb\macro directory on the Windows NT workstation to the Net.Data macro directory on the Web server (usually /usr/lpp/internet/db2www/macro). To set the permissions on these files to public read, enter `chmod ugo+r *`.
8. Copy all the \*.htm and \*.gif files from the \sqllib\icmweb\html directory on the Windows NT workstation to the document root directory on the

Web server (usually /usr/lpp/HTTPServer/share/htdocs). To set the permissions on these files to public read, enter `chmod ugo+r *`.

9. Copy all the `dg*.gif` files from the `\sql1lib\icmweb\icons` directory on the Windows NT workstation to the image directory on the Web server (usually /usr/lpp/HTTPServer/share/icons). This directory will be the value for the `image_path` variable in the `dg_config.hti` file. To set the permissions on these files to public read, enter `chmod ugo+r *`.
10. Edit the `dg_config.hti` file to include the directories where you copied the files and the server name. The `macro_path` variable uses the alias that is set up on your Web server to control user access. The `dg_config.hti` file should look like this:

```
%DEFINE {
    server_name="http://aixserver.ibm.com/"
    image_path="$(server_name)icons/"
    macro_path="$(server_name)icm/db2www/"
    help_path="$(server_name)"
%}
```

11. Add a link to an existing Web page, or create a Web page with a link to the Information Catalog Manager for the Web home page.

To create a Web page, edit the file `icm.html` and add the following lines:

```
<html><head>
<title>Information Catalog Manager for the Web</title>
</head>
<body bgcolor=white>
<p><a href=/icm/db2www/dg_home.mac/Logon>
Information Catalog Manager for the Web</a>
</body>
</html>
```

Place the file in the document root directory (usually /usr/lpp/HTTPServer/share/htdocs).

12. Enable basic user authentication on your Web server for each Information Catalog Manager for the Web user.

When users access the Information Catalog Manager for the Web home page, they are prompted for their user ID and password. When they enter these values, the HTTP environment variable `REMOTE_USER` is set. This variable is used to prompt users for their user ID and password and to create, update, and delete comments.

- a. Set up an alias.

Create an alias named `icm` for the directory where the Net.Data CGI program `DB2WWW` is located. The `macro_path` variable that is defined in the `dg_config.hti` file uses this alias:

```
macro_path="$(server_name)icm/db2www/"
```



The alias directory `icm` should have the user ID and password authentication enabled. To enable authentication, edit the `httpd.conf` file. This file is usually located in the `/usr/lpp/HTTPServer/etc/` directory. Add a `ScriptAlias` directive, like this:

```
ScriptAlias /icm/ /usr/lpp/HTTPServer/share/icm
```

Also make sure that the `httpd.conf` file contains a directive that defines the access file name, like this:

```
AccessFileName .htaccess
```

- b. Create a password file that will contain the authorized user ID and password for each Information Catalog Manager for the Web user. Use the `htpasswd` command to create and edit the password file.

For example, to create the password file

`/usr/lpp/HTTPServer/share/icmweb.pwd` for the user ID `ADMIN`, enter the following command:

```
htpasswd -c /usr/lpp/HTTPServer/share/icmweb.pwd ADMIN
```

Specifying the `-c` option ensures that you enter a password when you create a password file.

When you are prompted for the password, enter `ADMINPW`.

To add another user ID, `ADMIN2`, with the password `ADMINPW2`, enter the following command:

```
htpasswd /usr/lpp/HTTPServer/share/icmweb.pwd ADMIN2 ADMINPW2
```

The user ID must be 8 characters or less in length, because it is stored in the information catalog tables when a comment is created.

- c. Restrict access to the `/usr/lpp/HTTPServer/share/icm` directory.
  - 1) To require authentication when users access the `/usr/lpp/HTTPServer/share/icm` directory, edit the `httpd.conf` file. This file is usually located in the `/usr/lpp/HTTPServer/etc/` directory. Add a directory directive for the `/usr/lpp/HTTPServer/share/icm` directory, like this:

```
<Directory /usr/lpp/HTTPServer/share/icm>
AllowOverride AuthConfig
Options None
</Directory>
```
  - 2) Create a file that is named `.htaccess` in the `/usr/lpp/HTTPServer/share/icm` directory with the `AuthName`, `AuthType`, `AuthUserFile`, and require directives that are set like this:

```
AuthName ICMWeb
AuthType Basic
AuthUserFile /usr/lpp/HTTPServer/share/icmweb.pwd
require valid-user
```

Because some editors require a file name and a file extension, you might need to create the file with the name `htaccess.txt` and rename it to `.htaccess` after you save it.

You must stop and restart the Web server for these changes to take effect.

**Note:** This is one way that you can enable authentication on an IBM HTTP Web server. You can set up more complex directory structures, user groups, and permissions, if necessary, along with additional security packages. More information about setting up basic authentication is available in the IBM HTTP Web server documentation. For information about advanced Web server security, see the documentation for IBM SecureWay (part of the Websphere family).

13. Set up `Net.Data` to run Live Connection Manager for the databases that are used by the Information Catalog Manager for the Web.
  - a. Edit the `Net.Data` file `/usr/lpp/internet/db2www/db2/dtwcm.cnf`, and add a `CLIETTE DTW_SQL` block for each database that the Information Catalog Manager for the Web will use.

To add the database `ICMSAMP` with a minimum of one process, a maximum of three processes, starting with private port number 7100, and starting with public port number 7110, add the following block:

```
CLIETTE DTW_SQL:ICMSAMP{
MIN_PROCESS=1
MAX_PROCESS=3
START_PRIVATE_PORT=7100
START_PUBLIC_PORT=7110
EXEC_NAME= ./dtwddb2
DATABASE=ICMSAMP
BINDFILE=NOT_USED
LOGIN=*USE_DEFAULT
PASSWORD=*USE_DEFAULT
}
```

Six ports (7100, 7101, 7102, 7110, 7111, 7112) are allocated to the `ICMSAMP` database. Make sure that these ports are free and not in use by another application. You must use different port number ranges for each `CLIETTE DTW_SQL` block. See the *Net.Data Administration and Programming Guide* for more information.

- b. Set the LOGIN value to the user ID for the database, and set the PASSWORD value to the password for the database. If the database is local, you can use \*USE\_DEFAULT.
- c. Set up the Net.Data initialization file to use Live Connection Manager for the SQL calls. Edit the DB2WWW.INI file in the document root directory on the Web server (usually /usr/lpp/HTTPServer/share/htdocs). Make sure that the ENVIRONMENT DTW\_SQL statement ends with CLIETTE "DTW\_SQL:\$(DATABASE)".

For example:

```
ENVIRONMENT (DTW_SQL) DTWSQL(IN DATABASE,LOGIN,PASSWORD,
TRANSACTION_SCOPE,SHOWSQL,ALIGN,START_ROW_NUM)
CLIETTE "DTW_SQL:$(DATABASE)"
```

- d. Start Live Connection Manager by using the executable file /usr/lpp/internet/db2www/db2/dtwcm. Live Connection Manager must be running so that the Information Catalog Manager for the Web can access data from the databases. After Live Connection Manager is started, you can minimize the Live Connection Manager window on the Web server. See the *Net.Data Administration and Programming Guide* for more information.

**Note:** Live Connection Manager must be started with the DB2 instance that is specified in the db2www.ini file. The DB2 environment must be set up before you run the dtwcm executable file.

#### 14. Log out.

Follow the steps in “Post-installation customization” on page 121 before using the Information Catalog Manager for the Web.

### **Installing the Information Catalog Manager for the Web on any Web server**

Before you begin to install the Information Catalog Manager for the Web:

1. Make sure that the Web server software is installed on the Web server.
2. If the Web server has a port number other than 80 (the usual default), append the port number to the host name in the Web address:  
http://hostname:portnumber/
3. When you install Net.Data, you are prompted for the Web server’s CGI-BIN and HTML directories. Make sure that you specify the Web server’s directory where the CGI programs are run, and the document root directory for HTML files. The Net.Data CGI program db2www is placed in this CGI-BIN directory. The Net.Data DB2WWW.INI file is placed in the document root directory.

To install the Information Catalog Manager for the Web:

1. Install the Information Catalog Manager for the Web files onto your Web server or Windows NT workstation:
  - a. Insert the DB2 Universal Database CD-ROM into the CD-ROM drive on the Web server workstation. The launchpad opens.
  - b. Click **Install** from the launchpad.
  - c. In the Select Products window, select the **DB2 Administration Client** check box, then click **Next**.
  - d. In the Select Type of Install window, click **Custom**, then click **Next**.
  - e. In the Select DB2 Components window, clear the check boxes for all components except the **Data Warehousing Tools** component.
  - f. Click **Subcomponents**.
  - g. In the Select Subcomponents window, ensure that the check box for the **Information Catalog Manager for the Web** is selected and that all other check boxes are cleared.
  - h. Click **Continue**.
  - i. In the Select Components window, clear the check boxes for the **Communication Protocols** component, the **Application Development Interfaces** component, and the **Administration and Configuration Tools** component. Make sure that the **Data Warehousing Tools** component remains selected.
  - j. Click **Next** to continue with the installation. The installation program creates files in the following directories:
    - \sqllib\icmweb\macro
    - \sqllib\icmweb\html
    - \sqllib\icmweb\icons
2. Copy or use FTP to transfer as binary all the \*.mac and \*.hti files from the \sqllib\icmweb\macro directory to the \db2www\macro directory on the Web server. Set the file permissions to allow public read access.
3. Copy or use FTP to transfer as binary all the \*.htm and \*.gif files from the \sqllib\icmweb\html directory to the document root directory on the Web server. Set the file permissions to allow public read access.
4. Copy or use FTP to transfer as binary all the dg\_\*.gif files from the \sqllib\icmweb\icons directory to the icons directory on the Web server. Set the file permissions to allow public read access.
5. Edit the dg\_config.hti file. Add the names of the directories where you copied the files and the server name. The macro\_path variable can be set to an alias that is set up on your Web server to control user access.
  - Use the server\_name variable to identify your Web server.
  - Map the value for the image\_path variable to the ICONS directory that is defined in the Web server configuration file.
  - Use the value of the macro\_path variable to specify the path icm/db2www.

On UNIX operating systems, the dg\_config.hti file will look like this:

```
%DEFINE {
    server_name="http://server.ibm.com/"
    image_path="$(server_name)icons/"
    macro_path="$(server_name)icm/db2www/"
    help_path="$(server_name)"
%}
```

On Windows NT and OS/2 operating systems, the dg\_config.hti file will look like this:

```
%DEFINE {
    server_name="http://server.ibm.com/"
    image_path="$(server_name)icons/"
    macro_path="$(server_name)icm/db2www.exe/"
    help_path="$(server_name)"
%}
```

6. Add a link to an existing Web page, or create a Web page with a link to the Information Catalog Manager for the Web home page.

To create a Web page, edit the file `\document_root\icm.html` (where *document\_root* is the Web server's document root directory). Set the file permission to allow public read access.

- On UNIX operating systems, add the following lines:

```
<html><head>
<title>Information Catalog Manager for the Web</title>
</head>
<body bgcolor=white>
<p><a href=/icm/db2www/dg_home.mac/Logon>
Information Catalog Manager for the Web</a>
</body>
</html>
```

- On Windows NT and OS/2 operating systems, add the following lines:

```
<html><head>
<title>Information Catalog Manager for the Web</title>
</head>
<body bgcolor=white>
<p><a href=/icm/db2www.exe/dg_home.mac/Logon>
Information Catalog Manager for the Web</a>
</body>
</html>
```

7. Enable basic user authentication on your Web server for each Information Catalog Manager for the Web user.

When users access the Information Catalog Manager for the Web home page, they are prompted for their user ID and password. When they enter these values, the HTTP environment variable `REMOTE_USER` is set. This variable is used to prompt users for their user ID and password and to create, update, and delete comments.

The user ID must be 8 characters or less, because it is stored in the information catalog tables when a comment is created.

- a. Create an alias named `icm` for the directory where the `Net.Data` CGI program `db2www` is located.
  - On UNIX operating systems, the `macro_path` variable that is defined in the `dg_config.hti` file uses this alias:
 

```
macro_path="$(server_name)icm/db2www/"
```
  - On Windows NT and OS/2 operating systems, the `macro_path` variable that is defined in the `dg_config.hti` file uses this alias:
 

```
macro_path="$(server_name)icm/db2www.exe/"
```
- b. Enable user ID and password authentication for the alias directory `icm` and set the proper permissions.

See the Web server documentation for more information about enabling authentication.

8. Set up `Net.Data` to run Live Connection Manager for the databases that are used by the Information Catalog Manager for the Web.
  - a. Edit the `Net.Data` file `dtwcm.cnf`, and add a `CLIETTE DTW_SQL` block for each database that will be used by the Information Catalog Manager for the Web.

To add the database `ICMSAMP` with a minimum of one process, a maximum of three processes, starting with private port number 7100 and starting with public port number 7110, add the following block:

```
CLIETTE DTW_SQL:ICMSAMP{
MIN_PROCESS=1
MAX_PROCESS=3
START_PRIVATE_PORT=7100
START_PUBLIC_PORT=7110
EXEC_NAME=./dtwcd2
DATABASE=ICMSAMP
BINDFILE=NOT_USED
LOGIN=*USE_DEFAULT
PASSWORD=*USE_DEFAULT
}
```

This block allocates six ports (7100, 7101, 7102, 7110, 7111, 7112) to the database `ICMSAMP`. Make sure that these ports are free and not in use by another application. You must use different port number ranges for each `CLIETTE DTW_SQL` block. See the *Net.Data Administration and Programming Guide* for more information.

- b. Set the `LOGIN` value to the user ID and `PASSWORD` value to the password for the database. If you are using a local database, then you can use the `*USE_DEFAULT` value.
- c. Set the `Net.Data` initialization file to use Live Connection Manager for the SQL calls. Edit the `db2www.ini` file in the Web server's document root directory. Make sure that the environment `DTW_SQL` statement has `CLIETTE "DTW_SQL:$(DATABASE)"` at the end.

For example:

```
ENVIRONMENT (DTW_SQL) DTWSQL(IN DATABASE,LOGIN,PASSWORD,  
TRANSACTION_SCOPE,SHOWSQL,ALIGN,START_ROW_NUM)  
CLIETTE "DTW_SQL:$(DATABASE)"
```

- d. Start Live Connection Manager by using the executable file dtcmf in the Net.Data directory. Live Connection Manager must be running so that the Information Catalog Manager for the Web can access data in the databases. After Live Connection Manager is started, you can minimize the Live Connection Manager window on the Web server. See the *Net.Data Administration and Programming Guide* for more information.

Follow the steps in “Post-installation customization” before using the Information Catalog Manager for the Web.

### Post-installation customization

After you install the Information Catalog Manager for the Web, complete the following steps to customize the Information Catalog Manager for the Web for your users:

1. Edit the file dg\_home.hti. Add a link for each information catalog that you want users to access from the Information Catalog Manager for the Web. Use the following format for the links:

```
<LI><A HREF=$(macro_path)dg_frame.mac/frame?DATABASE=xxxx> zzzz </A>
```

xxxx The information catalog database name (for example, ICMSAMP)

zzzz A descriptive comment that is displayed on the Web page (for example, CeIDial sample catalog)

You can add HTML tags to the dg\_home.hti file either before or after the information catalog list. These tags can include links, images, text, or other valid HTML 3.2 tags that you want to add.

2. Catalog the server node and databases by using the necessary DB2 client function. See the *Installation and Configuration Supplement* for more information. From the DB2 Command Line Processor, verify that the Web server can connect successfully to the databases.

Before you access information catalogs through the Information Catalog Manager for the Web, make sure that the database manager is started on the database servers, Live Connection Manager is started on the Web server, and the Web server is started.

Notify users of their user IDs and passwords, and inform them of the Web address that they can use to access the Information Catalog Manager for the Web.

---

## Creating a sample information catalog

The Information Catalog Administrator provides a sample program to help you verify that the installation was successful. The program installs the sample data that is included with the Information Catalog Administrator. This sample data is used in the scenarios in the *Information Catalog Manager User's Guide*.

The *Information Catalog Manager Administration Guide* describes how to create the sample information catalog.



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## Part 2. Using DB2 OLAP Server



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## Chapter 8. Managing Storage

This chapter provides information to help you manage relational and multidimensional storage on UNIX, Windows NT, and OS/390 operating systems, and includes the following topics:

- Security
- Creating and deleting databases in relational storage
- Cataloging databases for AIX and HP-UX
- Changing relational database settings
- Managing database log files
- Managing table spaces on UNIX and Windows NT servers
- Setting database bufferpool size
- Data integrity
- Making changes to multidimensional databases
- Defragmenting databases on Windows NT and UNIX
- Backing up data
- Restoring data
- Troubleshooting

This chapter applies to both DB2 OLAP Server and DB2 OLAP Starter Kit. If you are using the DB2 OLAP Starter Kit, disregard any references in this chapter to the Application Manager, which is not included in the Starter Kit. DB2 OLAP Starter Kit includes an Administration Manager component that performs the functions of the Application Manger.

---

### Setting up Security for DB2 OLAP Server

The DB2 OLAP Server provides a comprehensive, multilayered security system. Security elements and tasks are associated with the OLAP data and the data that is stored in databases. The OLAP security system manages DB2 OLAP Server user access to specific OLAP applications, cubes, and individual data cells.

For detailed information about setting up security using the DB2 OLAP Server security system, see the *Database Administrator's Guide*.

Access from DB2 OLAP Server to the relational database in which your multidimensional data is stored is controlled by your relational database security features.

Figure 2 shows where the security layer fits in the DB2 OLAP Server environment.

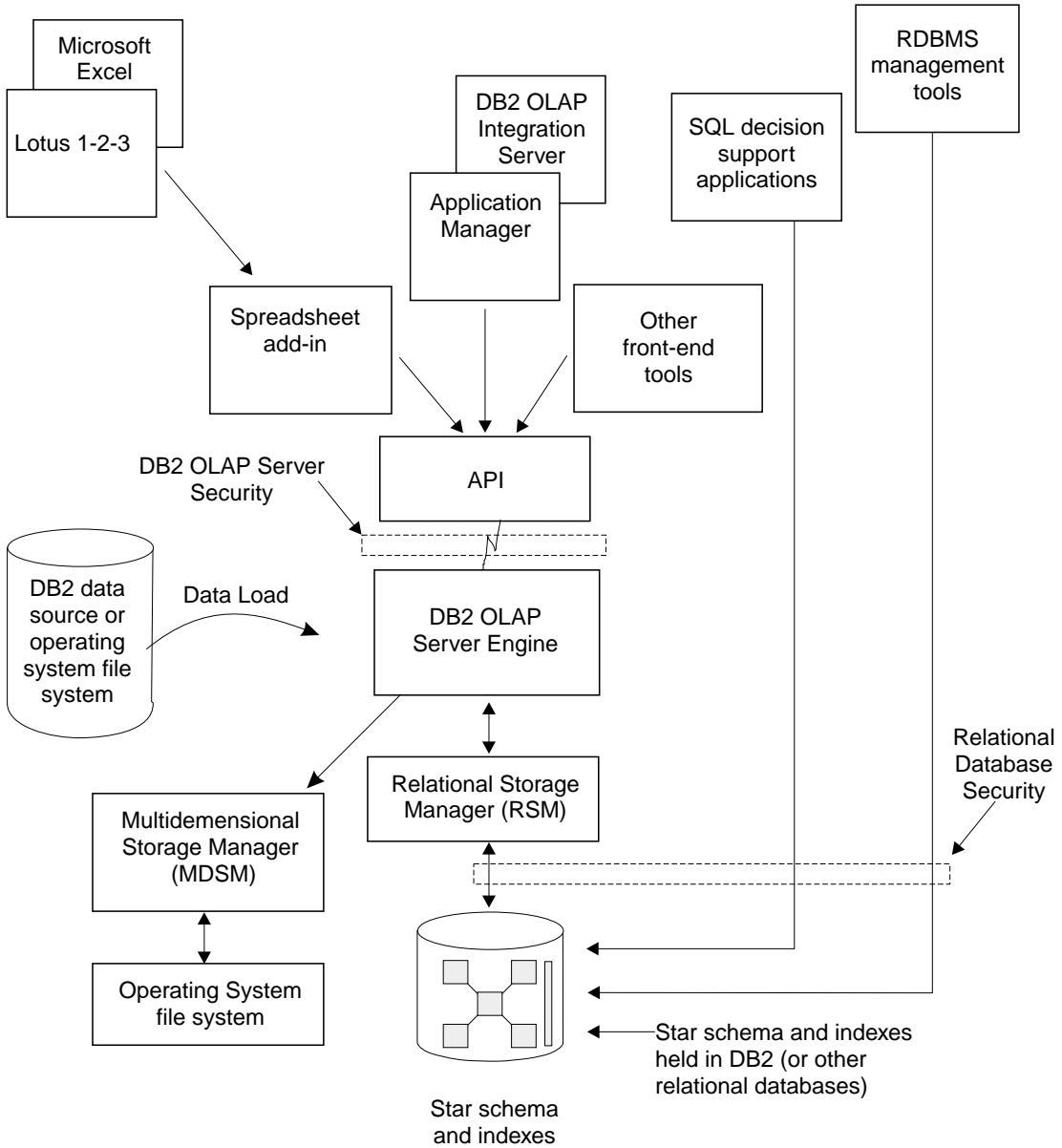


Figure 2. Security Layer in DB2 OLAP Server Components

To set up access for DB2 OLAP Server on a relational database, you must assign a valid relational database logon ID and password to DB2 OLAP Server, and grant the appropriate authority to the relational database logon ID

### **Assigning a Relational Database Logon ID for DB2 OLAP Server on Windows NT and UNIX**

To allow DB2 OLAP Server to log on to your relational database, you must assign a valid relational database logon ID and password to it. You can do this in one of two ways:

- Make your OLAP supervisor ID and password the same as your relational database ID and password.
- Enter the ID and password in the `rsm.cfg` file.

The logon ID that you assign to DB2 OLAP Server to log on to your relational database cannot be used for any other purpose. It must always be available for use by DB2 OLAP Server.

### **Granting Authority to DB2 OLAP Server**

After you assign a logon ID and password to allow DB2 OLAP Server to log on to your relational database, you must grant DB2 OLAP Server authority to perform these tasks:

- Create tables
- Create views
- Create index
- Drop tables
- Drop views
- Drop index
- Alter tables
- Select or update

See your relational database documentation for instructions on granting authority to a specific logon ID.

---

## **Creating and Deleting a Relational Database**

DB2 OLAP Server does not create and delete relational databases. You must use functions of your relational database to perform these tasks.

Before you create OLAP applications using DB2 OLAP Server, you must create or identify the relational database where you want to store the tables and views that DB2 OLAP Server creates. By default, DB2 OLAP Server will use the relational database that you identify when you install the program. You can use an existing relational database or create a new one.

---

## Managing Storage on AS/400

Data storage management for DB2 OLAP Server on AS/400 differs from other supported operating systems, mainly in its use of an installation library and the logging of journal files for committing data.

### Installation Library

Each saved outline will cause DB2 OLAP to create a star schema. The SQL tables that belong to these star schemas are created in the DB2 OLAP Server installation library. Only tables, views, indexes, journals, and journal receivers created by the RSM should reside in this library.

### Journaling (Logging)

DB2 OLAP Server uses commitment control during internal processing for outline updates, data loads, and calculating the database. On AS/400, this requires the creation of two logging objects known as the Journal and Journal Receiver. These objects are created automatically when DB2 OLAP Server is installed and reside in the installation library.

The Journal and journal receiver are created using AS/400 features that allow these objects to be managed by the operating system. Each time a receiver reaches the default size threshold of 30 megabytes, the system generates a new journal receiver to be used by the journal. The old journal receiver is automatically deleted allowing the system to recapture space. This prevents the required logging objects from monopolizing excessive disk space.

The relational storage manager and DB2/400 automatically start journaling for all necessary files. Do not use the journal QSQJRN in the installation library to journal other objects not managed by the relational storage manager. Since the system frequently changes and discards the journal receivers to recapture space, the user has no way to retain the logged data in the journal receivers. Manually ending journaling for any DB2 OLAP Server objects will cause the relational storage manager to fail.

---

## Cataloging Databases as Remote on AIX and HP-UX

On AIX and HP-UX systems, databases must be cataloged as remote, regardless of whether they are local or remote. To catalog a local database as remote:

1. Gather the following information:

**db2node**

The local alias for the server node.

**hostname**

The TCP/IP name of the server node. You can find this name by running the HOSTNAME command on the server.

**service\_name**

The TCP/IP service name for the server instance. You can find this name by running the following DB2 command:

```
get database manager configuration
```

The service\_name is in the SVCENAME field, and is case sensitive.

**database\_name**

The name of the database that you want to access.

**database\_alias**

The local alias that you choose for the database.

2. Make sure that the DB2COMM variable is set for TCP/IP on the server, and make sure your /etc/services file contains entries that identify the connection and interrupt ports for the DB2 instance. For example, if your instance is db2inst1, your entries would look like this:

```
db2cdb2inst1 50000/tcp # Connection port for DB2 instance db2inst1
db2idb2inst1 50001/tcp # Interrupt port for DB2 instance db2inst1
```

3. Catalog the node as remote using the following DB2 command, specifying the information that you gathered in the first step:

```
catalog tcpip node db2node remote hostname server service_name
```

For example:

```
catalog tcpip node olapsrc remote tak3 server db2cdb2inst1
```

4. Catalog the server database from the client using the following DB2 command, specifying the information that you gathered in the first step:

```
catalog database database_name as database_alias at node db2node
```

For example:

```
catalog database SAMPLE as RSAMPLE at node olapsrc
```

5. Flush the catalog buffers using the DB2 TERMINATE command.
6. Use the DB2 command line processor to make sure that you can connect to the database alias.

For example, test the connection by issuing the following commands:

```
connect to remote_db_name
create table t1 (product1 char(3))
insert into t1 values ('100')
select * from t1
drop table t1
connect reset
```

If any failure occurs, check your DB2 setup before starting DB2 OLAP Server.

---

## Changing Relational Database Settings

This section describes how to improve performance and space usage by changing DB2 settings.

You can change the settings using utilities or commands that are supplied with DB2. The settings that you choose depend on the size of your relational cube, the number of users who will access the cube, and the expected loads for activities such as recalculating and querying the cube.

Table 11 shows some of the parameters and values that work well with the sample applications that are included with DB2 OLAP Server.

*Table 11. DB2 parameters to modify*

Parameter Name	New Parameter Value
LOGBUFSZ	16
BUFFPAGE	1000
LOCKTIMEOUT	10 (seconds)
LOGFILSIZ	1000
LOGSECOND	100

You should also use a database-managed space (DMS) table space instead of an system-managed space (SMS) table space for better performance. For more information, see “Managing Table Spaces on UNIX and Windows NT Servers” on page 132.

---

## Managing Your Database Log File

When DB2 OLAP Server loads and calculates data, and is using RSM, rows are inserted into and updated in the fact and key tables. These actions cause DB2 to write records to the DB2 log files. By default, loading and calculating a multidimensional database are single transactions. If the OLAP database is large, many log records will be written, and DB2 will require a large number of log files.

If there is a failure during calculation, DB2 uses the log files to recover the database. After recovery, the database is restored to the state held before the beginning of the transaction. Any calculations from the failed transaction will be lost, and you will need to run the calculation again.

You can enhance performance by following these guidelines when setting up your log file.

- On Windows NT and UNIX, set the log file size to the maximum.



- On Windows NT, UNIX, and OS/390, store log files on separate physical devices.

You can manage the size of your database log file by using one of the following methods:

- Set the Commit Block parameter.
- Allocate enough space in your database log file to hold the entire cube during a recalculation or load operation.

### Setting the Commit Block Parameter

The commit block parameter can be accessed from the Application Manager or the ESSCMD command-line interface. These interfaces are not available with the DB2 OLAP Starter Kit.

The Commit Block parameter uses Commit Block and Commit Row synchronization point settings to enable control over how often DB2 OLAP Server commits changes during data load and calculation transactions. Frequent transactions can adversely affect performance. You can reduce the frequency of transactions by handling several small data load or calculation transactions as a single transaction.

Setting the Commit Block parameter is the recommended method of managing your database log file. Using this method has the following benefits on workstations and OS/390 servers:

- On workstation servers, DB2 needs less log-file space because it needs to hold records only for the actions between commits.
- On workstation and OS/390 servers, if a failure occurs, DB2 returns the database to its state at the last commit. If the problem is corrected, and the data load or calculation is restarted, the time that it takes to complete the task will often be significantly shorter than the time that it would take to start the task again.

Each time a commit is issued, the data and index caches for the multidimensional database are flushed, and the changes are committed in the relational database. Each synchronization point that you set can be time-consuming in terms of performance, so you will need to strike a balance between the need to reduce the log file size and the need to achieve optimum product performance.

By default, the Commit Block parameter is set to 3000. To change this parameter, in the Application Manager window:

1. Click **Database** → **Settings**. The Database Settings window opens.
2. Click the **Transaction** tab.
3. Set the Commit Block parameter to a specific number of blocks.

On AS/400, the default setting of 3000 is recommended. Additionally, on the Transaction page of the Database Setting window, select the **Uncommitted** button for **Isolation Level**. Using these two settings together can prevent DB2 OLAP Server from consuming large amounts of storage.

DB2 OLAP Server issues a commit when the number of blocks specified by the Commit Block parameter are updated. If a problem occurs, you can roll back changes only as far as the last commit.

See the *Database Administrator's Guide* or Application Manager online help for information on the Commit Block and Commit Row settings.

Refer to DB2 documentation to learn how to control the number of primary and secondary log files available to DB2.

### **Allocating Space in Your Database Log Files**

If you choose not to use the Commit Block parameter, you need to allocate enough space in your database log file to hold the entire cube during a recalculation or load operation. When you recalculate a cube or load data into a cube, each of those operations is handled as a single transaction that can be very large. If a problem occurs, DB2 OLAP Server rolls back the entire transaction.

For such transactions, consider increasing the following log settings:

- Log buffer size: set to maximum
- Log file size: set to maximum
- Number of primary log files
- Number of secondary log files

See your database manager documentation for information about how to change log settings.

Other methods to help ensure that your database log file does not run out of space include:

- Creating multiple calculation scripts for a single relational cube, and running the calculation scripts in the appropriate order, one at a time.
- Loading into a relational cube in smaller amounts, choosing only portions of your data to load at one time.

---

## **Managing Table Spaces on UNIX and Windows NT Servers**

When you design storage architecture for DB2 OLAP Server on UNIX and Windows NT servers, follow these guidelines:

- Use multiple table spaces. Each table space should contain multiple containers where each container is a separate physical device. Use database-managed storage (DMS) table spaces.
- Put the fact tables in a different table space than the fact table indexes.
- Put the key and dimension tables in a different table space than the key and dimension table indexes.

The `rsm.cfg` configuration file has two parameters that enable you to control how DB2 OLAP Server uses table spaces on Windows NT and UNIX:

- The `TABLESPACE` parameter specifies the table spaces for the key and dimension tables and indexes that DB2 OLAP Server manages. This parameter appends the clause that you use to a DB2 `CREATE TABLE` command. You can also use the `INDEX IN` clause of the `CREATE TABLE` statement to instruct DB2 OLAP Server to store tables in one table space and indexes in another. For example:

```
TABLESPACE=IN TSMAIN INDEX IN TSMAINI
```

- The `FACTS` parameter specifies the table spaces for the fact tables and indexes. This parameter also uses the `INDEX IN` clause of the `CREATE TABLE` statement to instruct DB2 OLAP Server to store tables in one table space and indexes in another. For example:

```
FACTS=IN TSFACT INDEX IN TSFACT1
```

---

## Setting Database Buffer Pool Sizes

To set buffer pool sizes for the relational database in which DB2 OLAP Server stores your multidimensional data and outlines, use the standard techniques that you use for the relational database that you installed. For detailed information, see your relational database documentation.

---

## Ensuring Data Integrity

To ensure the integrity of your application and cube data, update it only through the Application Manager and other clients and applications. Although it is possible to update the relational tables that DB2 OLAP Server creates using SQL, it is not recommended.

You can set the isolation level that you want DB2 OLAP Server to use when you work with your relational database to control how the relational database locks data and handles concurrent data access. For more information about setting an isolation level, see “ISOLATION” on page 167.

---

## Making Changes to Multidimensional Databases

When you make changes to a multidimensional database that is stored in relational storage, you might need to recalculate or restructure the database. Consider the impact to relational storage when you make the following types of changes:

- If you make a minor change to a database outline, such as changing a member name, the multidimensional database might need to be recalculated or restructured.
- If you change a member formula, your database must be recalculated.
- If you make a change that affects how your data is stored, you must restructure your database. When you restructure a database, the DB2 views might get rebuilt, and you need to recalculate the database and rebind any user applications that previously were bound to any DB2 tables or views.

Table 12 shows operations that affect data values and table structures during restructuring. The first column identifies an action that you perform. The second column describes the impact to the fact table for the database, and the third column describes the impact to the key table for the database.

*Table 12. Actions that affect data values and restructuring*

<b>If you perform this action:</b>	<b>DB2 OLAP Server performs these actions in the fact table:</b>	<b>DB2 OLAP Server performs these actions in the key table:</b>
Add a dense dimension	Adds a new dimension column or reuses an existing one and updates all rows with the base member ID.	Updates all rows.
Add a sparse dimension	Adds a new dimension column or reuses an existing one, and updates column cells with a base member ID. Drops and rebuilds the index. If there are multiple fact tables, then most rows need to be moved to a different fact table.	Updates all rows.
Delete a dense dimension	Removes all rows from the table except those for the base member ID.	Updates all rows.
Delete a sparse dimension	Removes all rows from the table except those for the base member ID. Drops and rebuilds the index. If there are multiple fact tables, then most rows need to be moved to a different fact table.	Updates all rows.
Add an anchor dimension	Adds a column for each member in the specified dimension.	Empties the table, because data cannot be loaded when an anchor dimension is added.

Table 12. Actions that affect data values and restructuring (continued)

<b>If you perform this action:</b>	<b>DB2 OLAP Server performs these actions in the fact table:</b>	<b>DB2 OLAP Server performs these actions in the key table:</b>
Change the anchor dimension	Returns an error if there is data in the cube.	Returns an error if there is data in the cube.
Delete the anchor dimension	Returns an error if there is data in the cube.	Returns an error if there is data in the cube.
Move a dimension	No action.	Updates all rows.
Change a dimension from dense to sparse or sparse to dense	Drops and rebuilds the index. If there are multiple fact tables, then most rows need to be moved to a different fact table.	Creates a new key table and inserts new rows, one for each block.
Rename a dimension	No action.	No action.
Change a dimension in any other way	No action.	No action.
Add a member to a sparse dimension	No action.	Creates a new key table and inserts new rows, one for each block.
Add a member to a dense dimension	No action.	Updates all rows.
Delete a member from a sparse dimension	Deletes rows for the member.	Creates a new key table and inserts new rows, one for each block.
Delete a member from a dense dimension	Deletes rows for the member.	Updates all rows.
Add a member to the anchor dimension	Adds a column or reuses an existing one, and initializes the column to nulls.	Updates all rows.
Delete a member from the anchor dimension	No action.	Updates all rows.
Move a member within a sparse dimension	No action.	Creates a new key table and inserts new rows, one for each block.
Move a member within a dense dimension	No action.	Creates a new key table and inserts new rows, one for each block.
Move a member across dimensions	Performs the same actions as for deleting a member and adding a member.	Performs the same actions as for deleting a member and adding a member.
Update a nonshared member to be shared	Deletes rows that correspond to the member to be shared.	Updates all rows.

Table 12. Actions that affect data values and restructuring (continued)

If you perform this action:	DB2 OLAP Server performs these actions in the fact table:	DB2 OLAP Server performs these actions in the key table:
Alter a member's virtual storage status	Deletes rows that correspond to the member being altered.	Updates all rows.
All other member updates	No action.	No action.
Rename a member	No action.	No action.
All other outline changes	No action.	No action.

**Note:** "No action" means only that no change is made to the fact table or key table. Some restructuring will take place to ensure that changes to the outline are saved.

## Defragmenting Relational Databases on Windows NT and UNIX

Over time, the tables used by DB2 OLAP Server, especially the fact and key tables, need to be reorganized or defragmented to reclaim unused space. Your database administrator should do this using the appropriate tool for your database manager.

If you are using DB2, use the REORG command, as shown in the following procedure:

1. Select a row from the CUBECATALOG table and determine the RELCUBEID and FACTTABLECOUNT values for the application and database that you want to reorganize. The SQL statement to do this might be:

```
SELECT RELCUBEID, FACTTABLECOUNT FROM CUBECATALOG WHERE APPNAME='Myapp'
AND CUBENAME='MyCube'
```

Assume that:

- The RELCUBEID is 6 and FACTTABLECOUNT is 4. You will have 4 fact tables (CUBE6FACT1, CUBE6FACT2, CUBE6FACT3, and CUBE6FACT4).
  - You have 4 indexes (CUBE6FINDEX1, CUBE6FINDEX2, CUBE6FINDEX3, CUBE6FINDEX4).
  - The key table is either CUBE6KEYA or CUBE6KEYB, depending on what restructures were performed. The key table index is CUBE6KINDEX.
2. Run REORGCHK on all of the fact tables and the key table. For example:

```
reorgchk on table userid.cube6fact1
reorgchk on table userid.cube6fact2
reorgchk on table userid.cube6fact3
reorgchk on table userid.cube6fact4
reorgchk on table userid.cube6keya
```

3. Where REORGCHK indicates that a REORG is required, reorganize the table with its index. For example:

```
reorg table userid.cube6fact3 index userid.cube6findex3
```

---

## Backing up Data

Before you back up your data, use the VALIDATE command on each cube in the application to verify that the data is valid. The VALIDATE command checks that the fact tables are consistent with the key tables in a cube. If a cube is invalid, you must restore your data from a backup copy.

Be sure to create and keep backup copies of your data. To ensure consistency of your data and outlines, always back up the following types of data at the same time:

- The multidimensional application directory
- Key DB2 OLAP Server files
- DB2 databases that contain OLAP data

A good time to back up data is after you make changes to your application, such as loading new data and running calculations. After you back up your data, you must also back up your relational database following the guidelines in your relational database documentation.

Use the following steps to back up your data:

1. Validate all cubes.
2. Stop all DB2 OLAP Server applications.
3. Stop the server component of DB2 OLAP Server.
4. Back up the entire DB2 OLAP Server APP directory.
5. Back up the `essbase.sec`, `essbase.cfg`, `rsm.cfg` and `license.id` files in the BIN directory.
6. Back up each database that contains cubes used by your application.
7. Restart the server.

---

## Restoring Data

To restore your applications, you need the files that contain your backed up data, plus any files that were used to change the application since the data was backed up. If you added new data and ran calculations since the last backup, then you must add the new data and run the calculations again after you restore the application.

If you made several incremental updates to the application, you need to run all the updates again to ensure that changes to the data are accurate. For example, if you made three incremental updates, and a member name was

changed during the second update, you must run the second update again to ensure that the third incremental update can find the member with the new name, and load data into it.

Use the following steps to restore your data:

1. Find the previous backup copy that you want to use.
2. Stop all DB2 OLAP Server applications.
3. Stop the server component of DB2 OLAP Server.
4. Restore the entire DB2 OLAP Server APP directory.
5. Restore the `essbase.sec`, `essbase.cfg`, `rsm.cfg` and `license.id` files in the BIN directory.
6. Restore each database that contains cubes.
7. Restart the server.

---

## Troubleshooting

If a problem occurs while you are using DB2 OLAP Server, there are several actions that you and your DB2 OLAP Server system administrator can take to diagnose the problem:

- **Check the error message**

First, make a note of the error message that DB2 OLAP Server displayed, the OLAP application you are using, and the actions that resulted in the error. Refer to “Appendix A. Relational Storage Manager Messages” on page 203 to see if the error is one that you can correct. If you are unable to resolve the problem, consult your DB2 OLAP Server system administrator.

- **Examine the server log and application log**

System administrators can start the troubleshooting process by viewing the server log and application log. See the *Database Administration Guide* for more information about these files. If an error is encountered or information is returned from the relational database, DB2 OLAP Server writes diagnostic information to the log file. For relational database errors, the diagnostics include both the SQLCODE and the associated message text. Refer to “Appendix A. Relational Storage Manager Messages” on page 203 to see if this is a problem that you can correct.

- **Make sure that your relational database is set up correctly**

Your relational database setup is important for DB2 OLAP Server to function correctly. Incorrect settings can cause errors to occur when DB2 OLAP Server connects to and works with your relational database. If the log files contain error messages that indicate problems with your relational database, your database administrator can use the error text and SQLCODE to identify and correct the problem. The standard diagnostic tools for your relational database can also be useful at this stage.



- **Contact your IBM Software Support representative**

If the problem cannot be corrected, contact your IBM Software Support representative. The representative might ask you to produce a diagnostic trace. The DB2 OLAP Server trace function is controlled by settings in the `rsm.cfg` file (see “Chapter 10. Configuring DB2 OLAP Server” on page 157). After you enable the trace facility, repeat the operations that resulted in the error. DB2 OLAP Server will write a low level trace that your representative can use to further diagnose the problem. Diagnostic information is stored in the `rsmtrace.logfile`. The file is stored in the directory defined by the `ARBORPATH` environment variable. Typically, that directory is `c:\essbase`. Turn off the trace facility after you create a trace file.

See “Chapter 11. Enhancing DB2 OLAP Server Performance” on page 175 to troubleshoot performance problems.



---

## Chapter 9. Creating an OLAP Application and Database

This chapter describes how to start creating OLAP applications and multidimensional databases. The tools you use depend on whether you installed the full DB2 OLAP Server product, the full product with the DB2 OLAP Integration Server add-on, or the DB2 OLAP Starter Kit:

- DB2 OLAP Starter Kit customers can use the DB2 OLAP Integration Server desktop interface as described by the DB2 OLAP Integration Server documentation, starting with the *OLAP Integration Server Administration Guide*.
- DB2 OLAP Server users can use the DB2 OLAP Integration Server, the Application Manager, or the ESSCMD command line interface to create OLAP applications. If you use the Application Manager, follow the instructions in the *Database Administrator's Guide*.

If you installed the DB2 OLAP Starter Kit, disregard references to the Application Manager in this chapter.

The basic steps for creating an OLAP application are:

1. Create an OLAP application.
2. Create a multidimensional database:
  - a. Create a database outline.
  - b. Define dimensions and members.
  - c. Specify dense and sparse dimensions.
  - d. Specify an anchor dimension (required for DB2 OLAP Server).
  - e. Assign alias names, generation and level names, and attributes.
  - f. Save your outline.

When you create an OLAP database, DB2 OLAP Server also creates a relational cube in your relational database. For detailed information about the contents of a relational cube, see “How Multidimensional Storage Differs from Relational Storage” on page 149.

After you create an OLAP application, you can load and calculate data in its associated database using the same methods and techniques that are described in the *Database Administrator's Guide* and in “Loading Data into a Database” on page 148.

This chapter includes the following topics:

- Information specific to using DB2 OLAP Server and the DB2 OLAP Starter Kit to create applications and databases.
- The differences between multidimensional and relational data storage.
- What relational attributes are and how to use them.

---

## What You Need to Know About Using DB2 OLAP Server

This section describes functional behaviors to consider when you are using DB2 OLAP Server to create an OLAP application and database.

You can identify one of your dense dimensions as an anchor dimension. If you do not choose an anchor dimension, DB2 OLAP Server will automatically choose one for you. See “Criteria for Choosing an Anchor Dimension” on page 144 for more information.

When you use DB2 OLAP Server to create an OLAP database, it creates a relational cube in your relational database. The relational cube includes a fact table that contains the actual data values for the database. The members of the dimension that you identify as the anchor dimension help define the structure of the fact table.

Members that are specified as Dynamic Calc will not have data stored for them in the fact table. The values for these members are recalculated by the DB2 OLAP Server OLAP engine every time the value is queried. Queries can be formulated from a spreadsheet.

Members that are specified as Dynamic Calc And Store will have data stored for them in the fact table only after the OLAP engine calculates values for them. The engine will perform this calculation and store the value in the fact table the first time the value is queried. Queries can be formulated from a spreadsheet or a report.

The number of dimensions that a database can contain is limited only by the maximum number of columns allowed in a table by your relational database. The fact table that DB2 OLAP Server creates has one column for each member of the anchor dimension that you specify, and one column for each additional dimension in your multidimensional database. The total number of members in the anchor dimension plus the total number of additional dimensions in your database, minus one, cannot exceed the maximum number of columns allowed in a table by your relational database. That number does not include shared or virtual members.

Settings that are related to compression that you can modify using the Application Manager are ignored. When you use DB2 OLAP Server, compression, data caching, and indexing are handled by your relational database.

Some settings on the Run-time page of the Database Information notebook in the Application Manager are specific to DB2 OLAP Server. Just as some information supplied by the Application Manager applies only when you are using the multidimensional storage manager, some information applies only when you are using the relational storage manager.

Before you load data, you must order your source data by sparse dimensions so that DB2 OLAP Server can load data more efficiently. Ordering your data by sparse dimensions allows DB2 OLAP Server to load data a block at a time. This improves the performance when you load data.

When you design your multidimensional database, follow the steps in “Designing the Multidimensional Database” on page 176 to optimize your design for best performance.

### **Identifying an Anchor Dimension**

An anchor dimension is a dimension that you identify for DB2 OLAP Server to use to help define the structure of the fact table that it creates in the relational cube for a multidimensional database.

The relational cube contains a set of data and metadata that together define the multidimensional database that you create using the Application Manager or ESSCMD commands.

The fact table holds the data values for a multidimensional database. It is the main table in the relational cube and contains the following columns:

- One column for each member in the anchor dimension that you specify
- One column for each additional dimension in the outline for the multidimensional database

Figure 3 on page 144 shows the contents of a sample fact table.

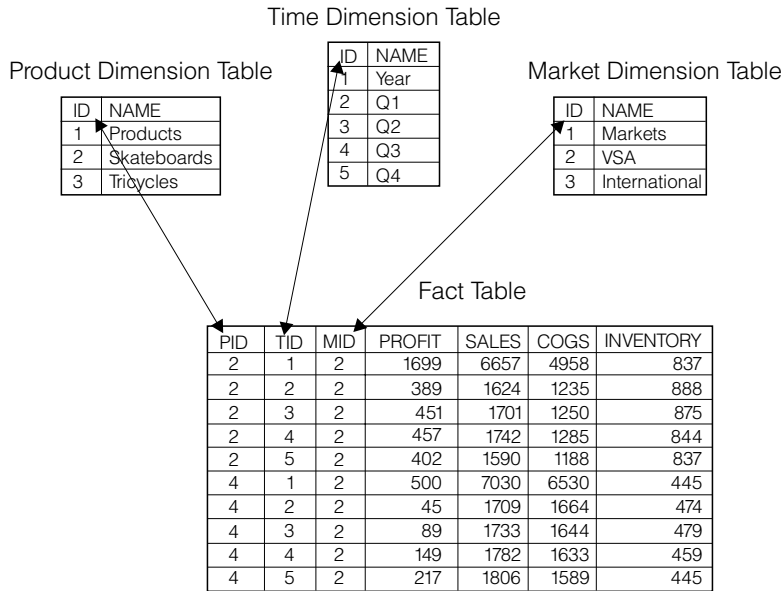


Figure 3. Sample fact table

The PROFIT, SALES, COGS, and INVENTORY columns are members in the Accounts dimension that was specified as the anchor dimension. The PID, TID, and MID columns represent non-anchor dimensions.

Each column that represents a member in the anchor dimension contains data values, and each column that represents a non-anchor dimension contains ID numbers for members in that dimension.

### Criteria for Choosing an Anchor Dimension

You can choose an anchor dimension or let DB2 OLAP Server choose one for you.

Most of the multidimensional databases that you create using DB2 OLAP Server include an Accounts dimension. Choosing the Accounts dimension results in the most easy-to-read and easy-to-understand SQL queries. Because the Accounts dimension contains all the measures of your business, such as sales, expenses, and inventory, it is probably the dimension that you will choose most often for the anchor dimension. You can, however, choose a different dimension.

If you choose your anchor dimension, the dimension must be:

- A dense dimension. The density of the anchor dimension determines how many null characters the product must store in each row of the fact table. Denser data reduces the proportion of null characters that are stored and improves storage efficiency.
- A dimension with a number of members such that:  

$$M = C - (N - 1)$$

where:

M is the number of members in the anchor dimension that store data.

C is the maximum number of columns allowed in a table by your relational database.

N is the total number of dimensions in the outline of your database.

For example, if the column limit imposed by your relational database is 254, and your database has six dimensions, the dimension that you specify as the anchor dimension can contain as many as 249 members. That number does not include shared or virtual members.

Additionally, your anchor dimension should have the following characteristics:

- The dimension should contain the largest number of members possible without exceeding the column limit imposed by your relational database. The more members there are in the anchor dimension, the fewer rows there are in each data block of storage. Processing fewer rows per data block improves performance. Also, the density of the anchor dimension determines how many null characters the product must store in each row of the fact table. Denser data reduces the proportion of null characters that are stored and improves storage efficiency.
- The dimension should not need to expand beyond the column limit in the future.
- The dimension should not require you to delete members in the future.

Choose your anchor dimension carefully, rather than letting DB2 OLAP Server automatically choose one for you. After you load data into a multidimensional database, you cannot change or delete the anchor dimension without first clearing all the data in the database. After you change or delete the anchor dimension, you must reload all of your data. Your choice of an anchor dimension can affect the performance of queries, calculations, and data loads.

If DB2 OLAP Server chooses an anchor dimension for you, it first searches for a dense dimension with an accounts tag with a number of members such that  $M = C - (N - 1)$ . If it does not find a dense dimension using this first method, it

chooses the first dense dimension in an outline with a number of member such that  $M = C - (N - 1)$ . You can view the anchor dimension that is chosen by DB2 OLAP Server. See “Viewing DB2 OLAP Server Run-time Parameters” on page 148.

### **Setting an Anchor Dimension**

To set an anchor dimension, create a user-defined attribute named RELANCHOR for the top-level member of the dimension. The top-level member is the member that is the dimension name.

DB2 OLAP Server uses the member with the RELANCHOR attribute to determine which dimension to use as the anchor dimension when it creates the fact table.

You can assign the RELANCHOR attribute to only one member.

For detailed instructions for creating a user-defined attribute for a member in a dimension, see the *Database Administrator's Guide*.

You can view the setting of the anchor dimension and other run-time parameters using the Application Manager. See “Viewing DB2 OLAP Server Run-time Parameters” on page 148.

### **Limiting the Number of Dimensions in a Database**

When you create a multidimensional database with DB2 OLAP Server, the number of dimensions that the database can contain is limited by the maximum number of columns allowed in a table by your relational database.

The fact table, which is the largest table in your relational database that is created by DB2 OLAP Server, contains one column for each member in the anchor dimension that you specify, and one column for each non-anchor dimension in your database outline. Therefore, the total number of members in your anchor dimension, plus the total number of non-anchor dimensions in your database outline, minus one, cannot exceed the column limit allowed by your relational database. That number does not include shared or virtual members.

To determine the maximum number of dimensions that your relational cube can contain:

1. Decide which dimension will be the anchor dimension.
2. Estimate the maximum number of members that the anchor dimension will contain over the life of the application that you are creating.

Remember to include the top level of the dimension. The highest level of a dimension is counted as a member because it can contain a value that is a consolidation of lower level members.



3. Subtract the maximum number of members that the anchor dimension will contain from the maximum number of columns that are allowed in a table by your relational database.

For example, if your anchor dimension will contain no more than 100 members, and your relational database allows as many as 254 columns in a table, you can have as many as 153 dimensions.

There is no limit on the number of members that each non-anchor dimension can contain.

## Selecting a Storage Manager

DB2 OLAP Server and the DB2 OLAP Starter Kit provide a dual storage manager function, which enables you to choose either a multidimensional storage manager or a relational storage manager when you create an application, or when a client program creates an application. The default storage manager is specified in the ESSBASE.CFG file, using the DATASTORAGETYPE statement. The multidimensional storage manager is the default. If there is no ESSBASE.CFG file, or if there is no DATASTORAGETYPE statement in the file, then the default is used.

If you upgrade from a previous version of DB2 OLAP Server, and you were using the relational storage manager as the default, then the installation program will add an entry to the ESSBASE.CFG file to specify the relational storage manager as the default. After you have finished installing the new version of DB2 OLAP Server, you must start and stop each of your existing applications before changing the DATASTORAGETYPE statement. DB2 OLAP Server uses the storage type specified in ESSBASE.CFG when it starts existing applications. Once applications have been started and stopped, you can change the DATASTORAGETYPE statement, and the change will apply to your applications the next time they are started.

If you use the Administration Manager, you can specify either the multidimensional storage manager or relational storage manager when you create a new application. The storage manager type that you choose will override whatever default is specified in the DATASTORAGETYPE statement.

To edit the ESSBASE.CFG file, follow these steps:

1. Create a file in the x:\essbase\bin directory called ESSBASE.CFG (or essbase.cfg for UNIX), if it does not already exist.
2. To make the multidimensional storage manager the default, add or change the DATASTORAGETYPE statement in the file to:DATASTORAGETYPE MD.
3. To make the relational storage manager the default, add or change the DATASTORAGETYPE statement in the file to:DATASTORAGETYPE DB2.

## Viewing DB2 OLAP Server Run-time Parameters

You can view the following run-time parameters using the Application Manager:

- Current anchor dimension name and number
- Number of blocks currently fixed
- High-water number of blocks fixed
- Number of blocks currently cached
- High-water number of blocks cached
- Block cache hit rate
- Number of keys currently cached
- High-water number of keys cached
- Key cache hit rate
- Percent of wasted fact table space in unused columns
- Number of values per row in the fact table
- Maximum number of rows per block in the fact table
- Current number of connections
- High-water number of connections
- Connection pool size
- Maximum connection pool size

To view the run-time parameters:

1. Click **Database ► Information** menu. The Database Information window opens.
2. Click the **Run-time** tab.

## Loading Data into a Database

The most important consideration when loading data is the ordering of the input data. For best performance, load the data in the reverse order of your outline, if your outline is ordered with dense dimensions first and sparse dimensions second, with the sparse dimensions in increasing size. Load the largest sparse dimension first, then the next largest, and so on. Load the dense dimensions last.

When you order your input data this way, the data loads much faster because all the data for each block is loaded at the same time. Also, the blocks are loaded in the correct index sequence. If the input data is badly ordered, index management is more complex; blocks are written several times when the different data elements are loaded, and all the additional operations are logged.

You can take additional steps to optimize data load performance. Before you start the data load, read “Tuning Data Loads” on page 179. Also, see the *Database Administrator’s Guide* for more information about loading data.

---

## How Multidimensional Storage Differs from Relational Storage

If you use the relational storage manager, when you use DB2 OLAP Server to create an OLAP application, DB2 OLAP Server creates the same components in the file system as when you use the multidimensional storage manager. It also creates a relational cube in your relational database that contains a shadow of the database outline and the actual data for the database.

If you use the multidimensional storage manager, when you create an OLAP application, all of its components are stored in the file system, as shown in Figure 4.

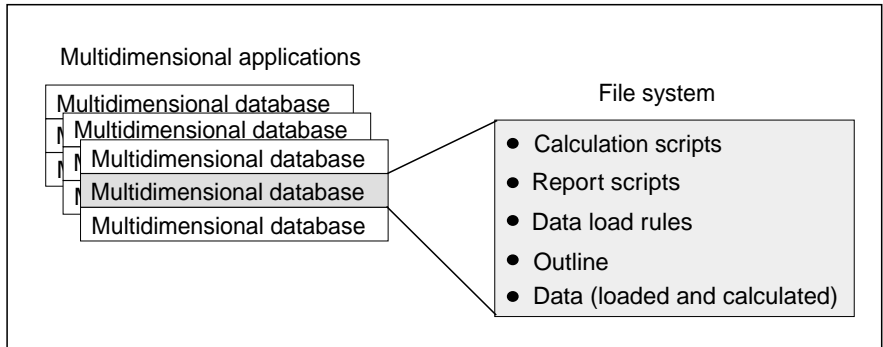


Figure 4. Storage of DB2 OLAP Server application components created by the multidimensional storage manager

If you use the relational storage manager, some of the components are stored in the file system, as shown in Figure 5 on page 150, and some of the components are stored in your relational database.

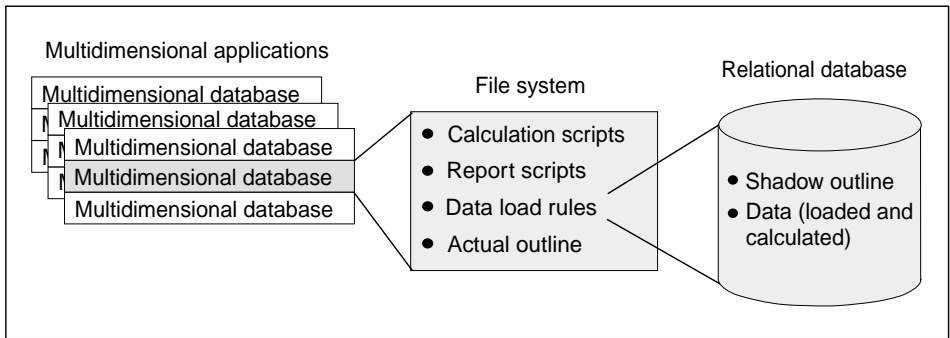


Figure 5. Storage of DB2 OLAP Server application components created by the relational storage manager

Figure 6 shows the relational cube that DB2 OLAP Server creates in your relational database when you create an OLAP application and database using the relational storage manager.

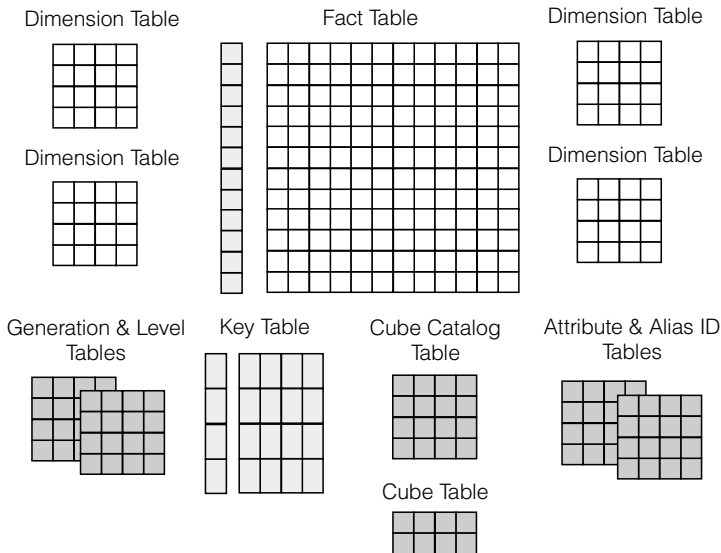


Figure 6. DB2 OLAP Server relational cube

For detailed information about the views that you can use to access the data in a relational cube directly, see “Chapter 12. Creating SQL Applications” on page 183.

The following sections provide an overview of the three events that cause DB2 OLAP Server’s relational storage manager to create tables or views in a relational cube. Those events are:

- Creating your first OLAP application.
- Creating a multidimensional database in an application
- Saving your first outline for a database.

## Creating Your First OLAP Application

An OLAP application consists of one or more multidimensional databases and any calculation scripts, report scripts, and data load rules that you create for each of the databases.

Before you create an OLAP application, ensure that the parameters in your `rsm.cfg` file are updated appropriately. In the `rsm.cfg` file, you can set parameters that determine the relational database in which DB2 OLAP Server stores components of your OLAP applications and the table space in which it stores the relational tables that it creates. For detailed information about updating those and related parameters in your `rsm.cfg` file, see “Chapter 10. Configuring DB2 OLAP Server” on page 157.

The first time that you use DB2 OLAP Server to create an OLAP application, the following table and view are created:

### Cube catalog table

Contains a list of all the multidimensional databases that are stored in your relational database. It also shows which application each cube is associated with. Each time that you create a new multidimensional database, DB2 OLAP Server creates a new row in this table.

### Cube catalog view

Allows an SQL user to access a list of OLAP applications and relational cubes.

### Two SQL log tables

Used for administering SQL statements used by the Relational Storage Manager.

When you use DB2 OLAP Server to create a multidimensional database in an OLAP application, the tables and views shown in Table 13 are created.

*Table 13. Tables and views created when you create a database*

Tables and views	Description
Cube table	Contains a list of dimensions in a relational cube and information about each dimension.
Cube view	Allows an SQL user to access the names of all dimensions in a relational cube and associated information for each dimension. There is one cube view for each relational cube in your relational database.

Table 13. Tables and views created when you create a database (continued)

Tables and views	Description
Alias ID table	Contains a mapping of OLAP alias table names to ID numbers allocated by DB2 OLAP Server.
Alias ID view	Contains one row for each OLAP alias table used with a relational cube. There is one alias ID view for each relational cube.

## Saving the First Outline for a Database

When you save the first outline for a multidimensional database, DB2 OLAP Server creates the tables and views listed in Table 14:

Table 14. Tables and views created when you save the first outline

Tables and views	Description
Key table	Equivalent to the Index for a multidimensional database, as described by the Hyperion Essbase documentation. The key table is a relational table that is created by DB2 OLAP Server after the first successful restructuring.
Fact table	Contains all data values for a relational cube. There are one or more fact tables for each relational cube.
Fact view	Used to directly access multidimensional data from SQL applications that manage the required joins to the dimension views.
Star view	Allows an SQL user to access data from the star schema in a single view with the JOIN already done.
LRO table	Contains a row for each linked object associated with data cells in the relational cube.
LRO view	Allows an SQL user to access the LRO information.

In addition, DB2 OLAP Server creates the tables and views listed in Table 15 for each dimension in the outline.

Table 15. Tables and views created for each dimension

Tables and views	Description
Dimension table	Contains detailed information about the members in a dimension. There is one dimension table for each dimension in an outline.
Dimension view	Allows an SQL user to access information about members contained in a dimension.
User-defined attribute table	Contains a member ID and user-defined attribute name for each named member specified when you created the outline. There is one user-defined attribute table for each dimension in an outline.

Table 15. Tables and views created for each dimension (continued)

Tables and views	Description
User-defined attribute view	Allows an SQL user to access all user-defined attributes for a dimension.
Generation table	Contains generation numbers and names for each named generation specified when you created the outline. There is one generation table for each dimension in an outline.
Level table	Contains level numbers and names for each named level specified when you created the outline. There is one level table for each dimension in an outline.
Relational attribute table	Contains names, data types, and sizes of relational attribute columns added to this dimension.
Relational attribute view	Allows an SQL user to access the relational attribute columns for this dimension.

---

## Using Relational Attributes

You use relational attributes to add attribute columns to the dimension tables, and to add attribute values to those columns. After you create and populate the columns, you can use the contents of the columns to run SQL SELECT statements on the dimension tables. Because the dimension tables can be joined to the fact table, the SELECT statements can retrieve values from the fact table based on attribute values that you define, rather than just on the member name. For information about using SQL to access relational attributes, see “Using Relational Attribute Views” on page 195.

### Adding Relational Attribute Columns to Dimension Tables

You can define relational attribute columns by specifying a special user-defined attribute for the top-level member of the dimension. This user-defined attribute has the following format:

```
RELCOL columnname datatype size
```

The parameters are:

#### **RELCOL**

A keyword

#### **columnname**

The name of the column that is added to the dimension view. This name must conform to the naming conventions for the relational database that is being used. If special characters are required in the name, enclose it with single quotation marks; also, do not use single quotation marks as part of the column name. An index is automatically created for the new relational attribute column.

## **datatype**

The data type of the column. It can be any of the following types:

- CHARACTER
- CHAR
- VARCHAR
- INTEGER
- INT
- SMALLINT

## **sizevalue**

The maximum number of characters allowed in the column, if the data type is CHARACTER, CHAR, or VARCHAR. Do not specify a size value for INTEGER, INT, or SMALLINT.

The following examples show how to add relational attribute columns to dimension tables:

- To add a 10-character column named Color to the dimension table of the Product dimension, enter:

```
RELCOL Color CHAR(10)
```

The following information is displayed for the Product dimension in the outline editor in the application manager:

```
Product (UDAs: RELCOL Color CHAR(10) )
```

- To add an integer column named Size to the dimension table for the Region dimension, enter:

```
RELCOL Size INTEGER
```

The following information is displayed for the Region dimension in the outline editor in the application manager:

```
Region (UDAs: RELCOL Size INTEGER)
```

- To add a 25-character VARCHAR column named Audit status to the dimension table for the Measures dimension, enter:

```
RELCOL 'Audit status' VARCHAR(25)
```

The following information is displayed for the Measures dimension in the outline editor in the application manager:

```
Measures (UDAs: RELCOL 'Audit status' VARCHAR(25))
```

In this example, the column name is surrounded by single quotation marks because the name includes a blank space.

Relational columns cannot be removed from relational tables; after you add a column, it remains part of the dimension table as long as the table exists.



You can remove a relational attribute column from a dimension view by deleting the appropriate RELCOL user-defined attribute, which also deletes the index of the relational attribute column.

## Adding Values to Relational Attribute Columns

To add a value to a relational attribute column, create a user-defined attribute for the member that has the following format:

```
RELVAL columnname datavalue
```

The parameters are:

### **RELVAL**

A keyword

### **columnname**

The name of the column to which you are adding a value. This name must be the same name that you specified in the RELCOL user-defined attribute.

### **datavalue**

Data that is appropriate to the data type that is specified for the relational attribute column. For example, it must be character data enclosed in single quotation marks for CHARACTER, CHAR, or VARCHAR, and a number for INTEGER, INT, or SMALLINT.

The following examples correspond to the examples in “Adding Relational Attribute Columns to Dimension Tables” on page 153:

- To add Blue to the Color column of the Product dimension for the row that corresponds to the Kitchen Sink member, enter:

```
RELVAL Color 'Blue'
```

The following information is displayed for the Kitchen Sink dimension in the outline editor in the application manager:

```
Kitchen Sink (UDAs: RELVAL Color 'Blue')
```

- To add the Size value 42 to the Region dimension table for the California member, enter:

```
RELVAL Size 42
```

The following information is displayed for the California dimension in the outline editor in the application manager:

```
California (UDAs: RELVAL Size 42)
```

- To add the value Checked to the Audit Status column of the Measures dimension table for the Sales member, enter:

```
RELCOL 'Audit status' 'checked'
```

The following information is displayed for the Sales dimension in the outline editor in the application manager:

```
Sales (UDAs: RELCOL 'Audit status' 'checked' )
```

You can automate the process of creating user-defined attributes by building data load rules. This is useful if you want to assign values to many members in a dimension. When you use the data load rules editor, you can add text before and after a column of data values from the external data table. If you prepare a data table that contains all the relational attribute values, the data load rules editor can generate the RELVAL columnname portion of the user-defined attribute. The data load rules editor then restructures the outline and adds the relational attributes to the dimension.

To remove relational attribute values from their corresponding dimension, delete the user-defined attribute that defined the value. This replaces the value with a null in the relational attribute column.

---

## Using DB2 OLAP Server with a Data Warehouse

DB2 OLAP Server can work with a data warehouse that is built from a relational database and configured as a star schema. You can use the star schema as a data source for DB2 OLAP Server, but you cannot use the star schema directly as a DB2 OLAP Server relational cube.

Loading data into DB2 OLAP Server enables you to take advantage of the DB2 OLAP Server calculation capabilities. Using DB2 OLAP Server to calculate summary data is easier than using SQL procedures.

---

## Chapter 10. Configuring DB2 OLAP Server

This chapter provides information to help you set up DB2 OLAP Server access to the relational database using the relational storage manager configuration file. This chapter applies to both DB2 OLAP Server and the DB2 OLAP Starter Kit.

The configuration file (`rsm.cfg`) is created during the installation process. You can update the file by editing it using an editor of your choice. Because the file is read by DB2 OLAP Server only when you start the application, you can edit the file after DB2 OLAP Server is started without affecting the operation of the product.

The configuration file is stored in the `\bin` subdirectory, which is located in the directory that is defined by the `ARBORPATH` environment variable.

On AS/400, this file resides in an AS/400 file as a member. It is initially created in the installation library with a file name 'CFG' and member name 'RSM'. The member is empty at creation time and should be updated before the server is started. The RSM configuration member is copied into the IFS installation directory each time the Essbase server is started. Changes made to the RSM configuration file while the server is active will only be picked up once the server is ended and started again.

---

### Contents of the Configuration File

The relational storage manager configuration file (`rsm.cfg`) contains parameters that determine:

- The relational database in which DB2 OLAP Server stores your multidimensional data.
- The user ID and password that DB2 OLAP Server uses to log on to your relational database.
- The level of detail that is provided by the DB2 OLAP Server trace facility.
- The file in which the trace information is stored.
- The size of the trace file.
- The isolation level that DB2 OLAP Server uses when working with your relational database.
- The maximum number of connections to your relational database that DB2 OLAP Server can own.
- The number of connections that an OLAP application starts when it is activated.

- The table space in which DB2 OLAP Server creates relational tables.
- The table space in which DB2 OLAP Server creates the fact table.
- The table space in which DB2 OLAP Server creates administration tables.
- The addition of a partitioning key clause to the SQL statement that DB2 OLAP Server uses to create the fact table.
- The table space for the relational database index of a fact table when you are using DB2 OLAP Server on a UNIX or Windows NT workstation to access data in DB2 on OS/390.
- The table space for the relational database index of a key table when you are using DB2 OLAP Server on a UNIX or Windows NT platform to access data in DB2 on OS/390. A relational database key table is the equivalent of a multidimensional database index.
- Whether to create a cluster index for a fact table when you are using DB2 OLAP Server to access data in DB2 on OS/390.
- The AS/400 library in which relational storage manager tables are stored.

---

## Editing the Configuration File

This section contains detailed information about the format of the configuration file and the syntax of the parameters that it can contain. It also contains detailed information about the valid values that you can specify for each parameter.

The configuration file has three types of sections in which you specify parameters:

### **RSM section**

This section is created initially using the settings that you specify when you install DB2 OLAP Server.

### **Application section**

You add this section to the file before you create or start an application.

### **Database section**

You add this section to the file before you create or start a database.

These three sections of the `rsm.cfg` file form a hierarchy in which you can specify overriding values at each level. DB2 OLAP Server uses the settings in the RSM section unless overriding values are specified in a database or application section. When you create or start an application, DB2 OLAP Server looks for an application section in the configuration file for that application and overrides values in the RSM section with values that are found in that application section. When you create or start a database, DB2 OLAP Server looks for a database section in the configuration file for that

database within the section for the current application and overrides values in the application section with values that are found in that database section.

The format for parameters in the configuration file is:

```
tag=value
```

where tag is the parameter name, and value is either a value for a variable (such as a database name, a number, or a string), or a value that you select from a list of possible values (for example, a list of isolation levels). Text values are not enclosed in quotation marks.

You can edit the configuration file using the editor of your choice.

### Sample Configuration Files

The following series of examples shows basic and advanced sample configuration files for Windows NT, UNIX, and OS/390.

The sample in Figure 7 is a basic configuration table for Windows NT or UNIX. The system administrator must set up the initial configuration file so that DB2 OLAP Server stores all table data in TSOLAP and all index data in TSOLAPX. Use a basic configuration file like this one when you want to place all your cubes in the same database and table space.

```
/* Config file - system defaults */
[RSM]                               /* Required tag to start the main section */
RDB_NAME      = OLAP                /* Default to using the OLAP database */
RDB_USERID    = ROLAP               /* Specify the userid */
RDB_PASSWORD  = xxxxxxxx           /* Specify the password */
TABLESPACE    = IN TSOLAP INDEX IN TSOLAPX /* All tables will go in this */
                                                    /* one tablespace */
```

Figure 7. Basic configuration file on Windows NT or UNIX

Figure 8 on page 160 shows a basic configuration file for AS/400. On most operating systems, the section headings (for RSM, Application and Database) must be surrounded by square brackets. But some AS/400 5250 emulators do not support square brackets. Therefore, DB2 OLAP Server on AS/400, you can use either square brackets or parentheses to surround section headings. The example shows the RSM section with a heading surrounded by parentheses.

```

/* Config file - system defaults */
(RSM)                /* Required tag; may use brackets or parentheses */
RDB_NAME = AS400Nme  /* Name of AS/400 machine */
RDB_USERID = USERID  /* AS/400 USERID */
RDB_PASSWORD = USERPW /* Valid AS/400 USERID password with appropriate */
                        /* object authorities to create and manage objects */

```

Figure 8. Basic configuration file on AS/400

Figure 9 shows a configuration file for Windows NT and UNIX in which selective parameters are overridden for OLAP applications and multidimensional databases. Use a configuration file like this one if you want to use more table spaces to accommodate a greater number of databases. In this example, payroll data is in TSPR, and the payroll table index is in TSPRX. Profit and loss data is in TSPL, and the profit and loss table index is in TSPLX. All other tables reside in TSOLAP, and their indexes reside in TSOLAPX. There are also separate fact tables and fact table indexes for each multidimensional database.

```

/* Config file - system defaults */
[RSM]                /* Required tag to start the main section */
RDB_NAME = OLAP      /* Default to using the OLAP database */
RDB_USERID = ROLAP   /* Specify the userid */
RDB_PASSWORD = xxxxxxxx /* Specify the password */
TABLESPACE = IN TSOLAP INDEX IN TSOLAPX /* Tables go here unless */
                                           /* overridden below */

/* Application - Accounts */
[ACCOUNTS]
RDB_NAME = ACCTS     /* Application uses its own database */

/* Application - Accounts : Database - Payroll */
<Payroll>
TABLESPACE = IN TSPR INDEX IN TSPRX /* Non-fact tables have their */
                                       /* own tablespaces */
FACTS = IN TSPRF INDEX IN TSPRFX /* Fact table has its own */
                                       /* tablespaces */

/* Application - Accounts : Database - Profit and Loss */
<PandL>
TABLESPACE = IN TSPL INDEX IN TSPLX /* Non-fact tables have their*/
                                       /* own tablespaces */
FACTS = IN TSPLF INDEX IN TSPLFX /* Fact table has its own */
                                       /* tablespaces */

```

Figure 9. Advanced configuration file on Windows NT or UNIX

## Entering Comments in the Configuration File

To enter a comment in the configuration file, follow these rules:

- Begin the comment with the characters `/*` and end it with the characters `*/`

For example:

```
/*This is a valid comment.*/
```

- Begin and end the comment on the same line. For example:

```
/*This is valid.*/
```

```
TAG=VALUE /*And this is valid.*/
```

```
/*This is  
not valid*/
```

## The RSM Section

A configuration file begins with this header tag:

```
[RSM]
```

A configuration file must also contain this parameter:

```
RDB_NAME = databasename
```

where *databasename* is the name of the relational database where you want DB2 OLAP Server to store your OLAP applications and databases.

All of the parameters described in “Configuration File Parameters” on page 162 are valid in the RSM section.

## The Application Section

You can create an application section that contains parameters that override the parameters that are set in the RSM section.

An application section begins with a tag that indicates the name of the application. For example, if the application name is SAMPLE, you might include an application section for that application by using a [ACCOUNTS] tag, as shown in Figure 9 on page 160.

An application section must start after the last parameter of the RSM section.

The following parameters are valid for the application section:

- RDB\_NAME
- RDB\_USERID
- RDB\_PASSWORD
- TABLESPACE
- ADMINSPACE
- KEYSpace
- FACTS
- ISOLATION
- SCHEMALIBRARY

- STARTCONNECTIONS
- MAXPOOLCONNECTIONS
- PARTITIONING
- FINDEX
- KINDEX

See “Configuration File Parameters” for a description of each parameter.

### The Database Section

You can create a database section that contains parameters that override the parameters that are set in the application section.

A database section starts with a <database> tag. For example, if an application named SAMPLE includes a database named BASIC, you would start a database section for that database with <BASIC>.

A database section must start after the last parameter of the corresponding application section.

Only the TABLESPACE, FACTS, PARTITIONING, FINDEX, and KINDEX parameters are valid in the database section. These parameters are described in “Configuration File Parameters”.

---

## Configuration File Parameters

This section provides detailed information about the configuration file parameters:

- RDB\_NAME
- RDB\_USERID
- RDB\_PASSWORD
- ADMINSPACE
- TABLESPACE
- FACTS
- TRACELEVEL
- TRACEFILESIZE
- ISOLATION
- SCHEMALIBRARY
- STARTCONNECTIONS
- MAXPOOLCONNECTIONS
- PARTITIONING
- FINDEX



- KINDEX

## **RDB\_NAME**

On UNIX and Windows NT servers, the RDB\_NAME parameter specifies the name of an existing database in which DB2 OLAP Server stores your OLAP application data. The format of this parameter is:

RDB\_NAME = *dbname*

This parameter is required in the RSM section.

## **RDB\_USERID (for Windows NT and UNIX)**

The RDB\_USERID parameter specifies the user ID that DB2 OLAP Server uses to log on to your relational database. This user ID must be set up on your relational database. This parameter is optional. If the RDB\_USERID and RDB\_PASSWORD parameters are omitted, DB2 OLAP Server logs on to DB2 UDB using the operating system session user ID and password.

The format of this parameter is:

RDB\_USERID = *userid*

## **RDB\_PASSWORD (for Windows NT and UNIX)**

The RDB\_PASSWORD parameter specifies the password for the user ID that DB2 OLAP Server uses to log on to your relational database. This parameter is optional. If the RDB\_USERID and RDB\_PASSWORD parameters are omitted, DB2 OLAP Server logs on to DB2 UDB using the operating system session user ID and password.

The format of this parameter is:

RDB\_PASSWORD = *password*

## **TABLESPACE**

The TABLESPACE parameter specifies a string that is appended to each CREATE TABLE statement that is issued by DB2 OLAP Server. The TABLESPACE parameter determines the table space in which DB2 OLAP Server creates relational tables.

This parameter is optional.

This parameter is not valid on AS/400.

The format of this parameter is:

TABLESPACE = *string*

where *string* is the string that you want to append to each CREATE TABLE statement issued by DB2 OLAP Server to control the table space in which tables are created. Any table space that you specify in this string must be an existing table space.

Because the string is appended to a CREATE TABLE statement, you must specify the full TABLESPACE clause. All options of the clause are available. The default is "" (empty string).

Example for Windows NT and UNIX:

```
TABLESPACE=IN TS1 INDEX IN TSIDX
```

Example for OS/390:

```
TABLESPACE=IN OLAP.TS32
```

See the SQL reference for your relational database for complete syntax of SQL statements.

## ADMINSPACE

The ADMINSPACE parameter determines the table space in which DB2 OLAP Server creates relational tables for administration purposes. For OS/390, the table space must be a 32 KB page table space. The ADMINSPACE parameter specifies a string that is appended to a CREATE TABLE statement issued by DB2 OLAP Server.

This parameter is required when you access data on OS/390 and is optional for other operating systems.

The format of this parameter is:

```
ADMINSPACE = string
```

where *string* is the string that you want to append to each CREATE TABLE statement issued by DB2 OLAP Server to control the table space in which administration tables are created. Any table space that you specify in this string must be an existing table space.

Because the string is appended to a CREATE TABLE statement, you must specify a full TABLESPACE clause. All options of the clause are available. The default is "" (empty string).

For example:

```
ADMINSPACE=IN OLAP.ADMINDATA
```

See the SQL reference for your relational database for complete syntax of SQL statements.

If you do not specify this parameter, the administration tables are stored in the table space named in the TABLESPACE parameter.

## KEYSPACE

The KEYSPEC parameter specifies the table space in which DB2 OLAP Server creates key tables for relational cubes. The KEYSPEC parameter is a string that DB2 OLAP Server appends to the CREATE TABLE statement when you create a key table.

You can improve DB2 OLAP Server performance by specifying a table space that uses a fast storage device.

This parameter is optional.

The format of this parameter is:

```
KEYSPACE = string
```

where *string* is the string that you want to append to each CREATE TABLE statement issued by DB2 OLAP Server when you create a key table. Any table space that you specify in this string must be an existing table space.

Because the string is appended to a CREATE TABLE statement, you must specify the full TABLESPACE clause. All options of the clause are available. If you do not specify this parameter, the key table is stored in the table space named in the TABLESPACE parameter. If you do not specify the TABLESPACE parameter, the default is "" (empty string).

Example for Windows NT and UNIX:

```
TABLESPACE=IN TS1 INDEX IN TSIDX
```

Example for AS/400:

```
KEYSPACE=IN KEYTS INDEX IN KEYIDX
```

See the SQL reference for your relational database for complete syntax of SQL statements.

## FACTS

The FACTS parameter specifies a string that is appended to each CREATE TABLE statement issued by DB2 OLAP Server when it creates a fact table. The FACTS parameter determines the table space in which DB2 OLAP Server creates the fact table for a relational cube.

Because the fact table is the largest and most important table in a relational cube, you can improve performance by specifying a table space that uses a very fast storage device. You can also use a partitioned table space to improve performance if partitioned table spaces are supported by your database.

This parameter is optional.

This parameter is not valid on AS/400.

The format of this parameter is:

```
FACTS = string
```

where *string* is the string that you want to append to each CREATE TABLE statement issued by DB2 OLAP Server when it creates a fact table. Any table space that you specify in this string must be an existing table space. This string is appended directly to the CREATE TABLE statement, so you must specify the full FACTS clause.

All options of the clause are available. If you do not specify this parameter, the fact table is stored in the table space named in the TABLESPACE parameter. If you do not specify the TABLESPACE parameter, the default is "" (empty string).

Example for Windows NT and UNIX:

```
FACTS=IN TS1 INDEX IN TSIDX
```

On OS/390, DB2 OLAP Server supplies the fact table number for you, for example:

```
FACTS=IN OLAP.TSPRF?
```

where ? is the fact table number.

See the SQL reference for your relational database for the complete syntax of SQL statements.

## TRACELEVEL

The TRACELEVEL parameter specifies the level of detail that the DB2 OLAP Server trace facility provides.

**Attention:** Use the TRACELEVEL parameter only at the request of IBM Software Support for diagnosing problems. Because the use of this parameter can severely degrade the performance of DB2 OLAP Server, the parameter should not be used during normal use of the product.

This parameter is optional.

The format of this parameter is:

```
TRACELEVEL = level
```

where *level* is one of the following values:

- 0 Turns the trace facility off. This is the default.
- 1 Records function entry and exit only.
- 2 Records lower level trace inside functions.
- 4 Records dump trace messages from the data load/calc code.
- 8 Prints the contents of the outline restructure information.
- 16 Records detailed information about the fixing and unfixing of blocks, and operation of the data and index caches.
- X An integer that is the sum of any combination of trace types to instruct the trace facility to perform a combination of trace levels. For example, to see function entry/exit trace (1) and the contents of the outline restructure information (8), set the TRACELEVEL parameter to 9.

## TRACEFILESIZE

The TRACEFILESIZE parameter specifies the maximum size of the file in which the trace facility stores trace information RSMTRACE.LOG. When the trace file reaches the size specified with this parameter, the file is flushed.

**Attention:** Use the TRACEFILESIZE parameter only at the request of IBM Software Support for diagnosing problems. Because the use of this parameter can severely degrade the performance of DB2 OLAP Server, the parameter should not be used during normal use of the product.

This parameter is optional.

The format of this parameter is:

TRACEFILESIZE = *size*

where *size* is the maximum size in megabytes (MB) to which the trace file can grow before being flushed. The default file size is 1 MB.

## ISOLATION

The ISOLATION parameter specifies the isolation level that DB2 OLAP Server uses when working with your relational database. The isolation level determines how data is locked or isolated from other transactions and processes while the data is being accessed. Higher isolation levels provide greater integrity by isolating more data sooner. However, higher isolation levels might reduce concurrency because transactions and processes might have to wait to access isolated data.

This parameter is optional.

The format of this parameter is:

ISOLATION = *level*

where *level* is one of the following values:

### **CS**

Cursor stability. This is the default, and the recommended isolation level.

Cursor stability locks any row that is accessed by a transaction while the cursor is positioned on the row. This lock remains in effect until the next row is fetched or the transaction is terminated. However, if any data in a row is changed, the lock is held until the change is committed.

No other transaction or process can update or delete a row that a cursor stability application has retrieved while any updatable cursor is positioned on the row. However, other applications can insert, delete, or change a row on either side of the locked row with the following exceptions:

- An insertion before the current row is not permitted when record access occurred using an index.
- A deletion of the previous row is not permitted when record access occurred using an index.

Cursor stability transactions do not recognize uncommitted changes of other applications. Cursor stability is the default isolation level and should be used when you want the maximum concurrency while recognizing only committed rows from other transactions or processes.

### **UR**

Uncommitted read allows a transaction to access uncommitted changes of other transactions. Transactions do not lock other transactions or processes out of the row that is being read unless a transaction attempts to drop or alter the table. Changes made by other transactions can be read before they are committed or rolled back. The uncommitted read isolation level is most commonly used when updates are not possible, or when you do not care whether you see uncommitted data from other transactions. Uncommitted read results in the lowest number of locks and the highest level of concurrency.

### **RS**

Read stability. With read stability, only the rows that are retrieved are isolated. This ensures that any qualifying row that is read during a unit of work is not changed by another transaction or process until the unit of work completes, and that any row changed by another transaction or process is not read until the change is committed by that process. The read stability isolation level provides both a high degree of concurrency and a stable view of the data.

### **RR**

Repeatable read. With repeatable read, every row that is referred to is isolated, including the rows that are not retrieved. Appropriate locking is

performed so that another transaction or application cannot insert or update a row that would be added to the list of rows that are referred to by this transaction.

Repeatable read is not normally recommended for DB2 OLAP Server.

Repeatable read can acquire and hold a considerable number of locks. These locks can quickly escalate to the equivalent of a whole table lock.

Repeatable read provides the highest degree of integrity, but any rows referred that are to by one transaction or process are immediately isolated. This results in the lowest degree of concurrency.

For more information about isolation levels, see your relational database documentation.

## **MAXPOOLCONNECTIONS**

The MAXPOOLCONNECTIONS parameter specifies the maximum number of relational database connections that an OLAP application can hold in its pool. On AS/400, this is the maximum number of QSQSRVR jobs that are allowed to be kept in the connection pool for each application.

This parameter is optional.

The format of this parameter is:

MAXPOOLCONNECTIONS = *maxnumber*

where *maxnumber* is the maximum number of connections that each OLAP application can hold in its pool. The default is 20.

The minimum value that you can specify is 0. If you specify 0, an OLAP application will not hold any connections in its pool and will make a new connection each time it needs one.

The maximum value that you specify must not be greater than the maximum number of concurrent connections supported by your relational database.

## **STARTCONNECTIONS**

The STARTCONNECTIONS parameter specifies the number of connections that an OLAP application establishes with your relational database when the application is started. On AS/400, this is the number of QSQSRVR database server jobs that will be started when the application is initially loaded.

This parameter is optional.

The format of this parameter is:

STARTCONNECTIONS = *number*

where *number* is the number of connections with your relational database that DB2 OLAP Server prestarts when an OLAP application is started. The default is 3.

The minimum value that you can specify is 0. If you specify 0, an OLAP application will not establish any connection with your relational database when the application is started.

The maximum value that you specify must not be greater than the value that you specify for MAXPOOLCONNECTIONS.

## **PARTITIONING**

Use this parameter to partition the DB2 Universal Database table space in which the fact table is stored, or to specify how the OS/390 table space for the fact table is partitioned.

This parameter is applicable only if you are using DB2 Universal Database Extended Enterprise Edition V5 or DB2 for OS/390, and is optional.

This parameter is not valid on AS/400.

**If you are using DB2 Universal Database Extended Enterprise Edition V5 or higher:** The PARTITIONING parameter adds a partitioning key clause to the CREATE TABLE statement when the fact table is created. Then DB2 OLAP Server uses the currently defined sparse dimensions to determine which columns to use as the partitioning key columns.

**If you are using DB2 for OS/390:** The PARTITIONING parameter creates a cluster index for your table space, based on the number of partitions that are specified when the OS/390 table space was created.

The format of this parameter is:

PARTITIONING = *value*

Set *value* to the number of partitions that the OS/390 database administrator created for the table space.

**If you are using DB2 Universal Database:** Set *value* to either 0 or 1. If you set the value to 0, the clause will not be added to the CREATE TABLE statement; 0 is the default value. If you set the value to 1, the clause will be added.

See the documentation for your relational database to learn more about partitioning a databases. See the SQL reference for your relational database for complete syntax of SQL statements.



## FINDEX

Use this parameter to specify the index space for the index of a fact table when you are using DB2 OLAP Server to access data in DB2 for OS/390. DB2 OLAP Server generates the number of the fact table. The FINDEX parameter adds a USING STOGROUP clause to the CREATE INDEX statement for the fact table.

This parameter is optional, and is applicable only if you are accessing data in DB2 for OS/390.

The format of this parameter is: FINDEX =*string*

where *string* is the string that specifies the USING STOGROUP block of the CREATE INDEX statement.

You must use a question mark as the last character in the SGPR parameter. DB2 OLAP Server generates a number from 1 to 4 to replace the question mark. For example:

```
FINDEX = USING STOGROUP SGPR? BUFFERPOOL BP2
```

## KINDEX

Use this parameter to specify the index space for the index of a key table in DB2 for OS/390. The parameter adds a USING STOGROUP clause to the CREATE INDEX statement for the key table. A relational database key table is the equivalent of an index for a multidimensional database.

This parameter is optional, and is applicable only if you are accessing data in DB2 for OS/390.

The format of this parameter is: KINDEX =*string*

where *string* is the string that specifies the USING STOGROUP block of the CREATE INDEX statement.

For example:

```
KINDEX = USING STOGROUP SGPR0 BUFFERPOOL BP2
```

## SCHEMALIBRARY

Use this parameter to specify the AS/400 library where relational storage manager tables for a specific application or database will be created.

This parameter is optional, and is applicable only if you are accessing data in DB2 for AS/400. If you omit this parameter, all databases will be created in the DB2 OLAP Server for AS/400 installation library. For easier management, it is recommended that you specify at least one library as the server default

other than the DB2 OLAP Server for AS/400 installation library. This will minimize storage demands if you install over the existing library at some future time.

The format of this parameter is: SCHEMALIBRARY =*library*

where *library* is the AS/400 library in which the system stores relational storage manager tables.

For example:

```
SCHEMALIBRARY = OLAPALIB
```

The following additional considerations apply to SCHEMALIBRARY:

### **RSM Configuration File Conflicts with Existing Cubes**

If an AS/400 database already exists and you specify SCHEMALIBRARY in the database section of the RSM configuration file, the entry is ignored and the existing library is the one that is used.

### **Changing the Library of an Existing Cube**

If you want to place an existing cube in a different library, delete the cube and recreate it. There is no facility to move an application or database for the RSM.

### **Adding Applications and Databases Without Ending the Server**

The settings in the RSM section cannot be changed unless the server is ended and restarted. However, new application and database sections may be added without ending the server by performing the following steps:

1. Make the desired changes to the RSM configuration file.
2. Copy the file to the IFS directory using the AS/400 CPYTOSTMF command. There will be an IFS directory by the same name as your installation library. In this path, there is a copy of the RSM.CFG file loaded when the server was started. Here is an example:

```
CPYTOSTMF FROMMBR('QSYS.LIB/ essbase_lib.LIB/CFG.FILE/RSM.MBR')  
TOSTMF('/ essbase_lib /BIN/RSM.CFG')
```

Where *essbase\_lib* is the name of the library where you installed the OLAP server.

Client Access and other products allow the user to directly edit the RSM.CFG file in the IFS directory. This is permissible and eliminates the need for step2.

### **Copying Applications and Databases**

A copy does not imply that the copied cube will be created in the same library as the source cube. Application and database copies follow the same rules as creating an application or database since the copied objects are new. The copied star schema will be created in the library specified in the RSM configuration file or default will be selected.

### **Renaming Applications and Databases**

When applications or databases are renamed, they remain in the libraries in which they exist when they are renamed.

### **Uninstalling the OLAP Server Library**

When an OLAP Server Library is uninstalled, all RSM objects created in the installation library are deleted. Make sure you manually delete any user-created libraries that were specified with the SCHEMALIBRARY tag.



---

## Chapter 11. Enhancing DB2 OLAP Server Performance

This chapter contains information about steps that you can take to enhance the performance of DB2 OLAP Server and the DB2 OLAP Starter Kit.

Some of the guidelines in this chapter should be followed as you design your system; other guidelines are part of an iterative tuning process. It is difficult to predict the size and performance of an OLAP application without actually building at least part of the application. Building and tuning a representative subset of the complete application, and then applying some of the guidelines in this chapter, can optimize the performance of your system.

The relational storage manager is more sensitive to performance tuning than the multidimensional storage manager. Many of the performance tuning techniques described in the *Database Administrator's Guide* are valid for the multidimensional storage manager, as well as the guidelines described in this chapter.

---

### Configuring Hardware

When you select your server hardware, remember that the server must run both DB2 and DB2 OLAP Server. Select hardware that has the fastest available processor and bus configuration, and that has I/O characteristics that are optimal for DB2.

Use the following additional guidelines when you configure the hardware for DB2 OLAP Server:

- The computer must have enough physical memory to run both servers. DB2 needs memory to service the DB2 heaps, buffers, and buffer pools. DB2 OLAP Server needs memory to service data and index caches.
- To optimize the use of your disk drives, configure DB2 to use multiple fast physical devices and a fast input/output (I/O) controller. This avoids the contention and excess head movement that occurs when the same physical devices are used for DB2 OLAP Server data. It is especially important that the fact table and the fact table index are stored on separate physical devices.
- Avoid using redundant arrays of independent disks (RAID arrays) and RAID controllers. RAID arrays and controllers can severely impact DB2 I/O performance.

The DB2 OLAP Server calculation process is partly multithreaded; it does not take full advantage of shared multiprocessor (SMP) power during calculation.

You can use the optional Partitioning Option add-on feature to exploit SMP parallelism. One large cube can be split into several smaller cubes that are loaded and calculated in parallel.

Query processing in DB2 OLAP Server is fully multithreaded; after the cube is calculated, multiple users can run concurrent queries with performance that is better than performance you see during calculation.

---

## Setting Up Your Environment

When you set up your Windows NT environment for use with DB2 OLAP Server, use the following guidelines:

- Set the DB2NTNOCACHE environment variable to 1 (DB2NTNOCACHE=1). This prevents DB2 from using Windows NT file system caching for database files; DB2 buffer pools are used to cache relational database data instead. Because DB2 buffer pools are used for caching, this eliminates double buffering and removes contention for memory between DB2 buffer pools and the Windows NT file system, which would degrade performance.

- Ensure that the Windows NT registry entry HKEY\_LOCAL\_MACHINE\SYSTEM\CurrentControlSet\Control\Session Manager\Memory Management\LargeSystemCache is set to 0.

This entry is normally set to 0. However, during installation of the Windows NT server, the value can be set to 1 if the server is configured for serving data rather than for running applications. It is not recommended that you run DB2 OLAP Server on a Windows NT server that is configured for serving data, because, in this situation, Windows NT gives priority to memory usage for caching files at the expense of the working set of applications that is running on the server.

Make sure that your operating system is at the latest service level and is generally well tuned.

---

## Designing the Multidimensional Database

All the considerations for designing a multidimensional database in DB2 OLAP Server are covered in detail the *Database Administrator's Guide*, and in other chapters of this book. The following list summarizes the steps that most often affect performance:

- Choose dimension types carefully, matching dense and sparse dimensions to the data.
- Check the block size and the number of blocks that your outline will generate and tune the dimension types to get a block size in the range of 8 KB to 64 KB. Within this range, larger blocks are optimal for calculation performance, while smaller blocks are optimal for query performance.

- Consider using dynamic calculations. Select some members for dynamic calculation and check the effect that this has on block size.
- Order the outline with dense dimensions first and sparse dimensions second. Order the sparse dimensions in increasing size, with the largest sparse dimension last in the outline. This lets you load data more efficiently.
- When you select an anchor dimension, select the dimension that has the most members. The number of members in the anchor dimension determines how many rows DB2 OLAP Server has to process to read or write a block of data. As the number of members (columns in the fact table) increases, the number of rows that can fit in each data block decreases. Processing fewer rows per block improves performance, so the anchor dimension should be the one with the most members. Also, the density of the anchor dimension determines how many null characters the product must store in each row of the fact table. Denser data reduces the proportion of null characters stored and improves storage efficiency.

---

## Tuning DB2

DB2 OLAP Server stores multidimensional data in DB2 relational storage. DB2 performance must be optimal, and your multidimensional model must be well tuned for relational storage. When you configure DB2, perform any tasks that you would normally perform to tune your DB2 system, such as taking a snapshot using the DB2 database system monitor.

For any DB2 system, use the following guidelines:

- Use multiple physical drives for your data. For example, store your log files on a separate physical drive.
- Make sure that the DB2 locklist value is large enough. If you receive error messages about contention for locks in the database, you might need to increase the value of the locklist database configuration parameter.
- Make sure that the DB2 temporary table spaces are large enough. During some restructuring operations, DB2 might need to access temporary table spaces in the database. If you encounter problems, increase your temporary table space size; the default value might not be large enough for the restructuring.
- When you are done tuning, turn off the call-level interface (CLI) trace and any other DB2 diagnostic facilities that might be active.

If you use DB2 Universal Database on the workstation, follow these additional guidelines:

- Use Database Managed Storage (DMS) table spaces for tables and indexes.
- Put the fact table in a separate table space that has at least 4 containers, each mapped to a separate physical drive. Put the fact table index in another table space. Specify this configuration using the FACTS parameter

in the relational storage manager configuration file. For more information, see “Managing Table Spaces on UNIX and Windows NT Servers” on page 132.

- Configure the number of I/O cleaners to be two more than the number of table spaces used.
- Put the key and dimension tables into one table space, and put their indexes into another table space. You can store the key and dimension tables in the same table space because DB2 OLAP Server uses only a small fraction of the data that is held in the dimension tables. This information is held in memory, so there is no contention for key and dimension table I/O. Specify this configuration using the TABLESPACE parameter in the relational storage manager configuration file. For more information, see “Managing Table Spaces on UNIX and Windows NT Servers” on page 132.
- Allocate as many maximum-sized primary log files as you need. Use the maximum log buffering size.
- Use multiple physical devices with one I/O server and one table space per device. Distributing your data across as many physical storage devices as possible can minimize I/O time.
- Ensure that the number of I/O servers is one more than the number of physical drives for the database.
- Increase the Application Heap value to three or four times the default value.
- Use asynchronous page cleaning. The number of asynchronous page cleaners should be equal to the number of physical drives for the database.
- Put each fact table into a separate table space, and put each fact table index in a separate storage group.
- Put the key and dimension tables in a separate table space, and put the indexes for the key and dimension tables in a separate storage group.

---

## Tuning DB2 OLAP Server

Most of the tuning and configuration information in the *Database Administrator's Guide* is valid for DB2 OLAP Server. The following guidelines are especially important for DB2 OLAP Server:

- Use the Commit Block parameter to set the number of commit blocks as high as possible without exceeding the available DB2 log space. On AS/400, the value of this parameter, along with the Uncommitted Access Transaction Isolation Level, is important for efficient use of memory. See “Setting the Commit Block Parameter” on page 131 for more information about setting a commit block number.
- DB2 OLAP Server has two caches that you can manage. The data cache buffers the data in the fact table, and the index cache buffers the data in the key table. You can either estimate how much memory each cache needs



before loading data, or load the data and then adjust the cache settings. Do not overcommit memory. In either case, you need to tune these settings.

- Turn tracing off by setting the TRACELEVEL parameter in the rsm.cfg file to 0 (TRACELEVEL=0). If you do not turn off tracing, the performance of DB2 OLAP Server can slow significantly, and the trace file will consume large amounts of disk space. See “TRACELEVEL” on page 166 for more information.

---

## Allocating Memory

For optimum performance, the memory in the machine on which you install DB2 OLAP Server should not be over committed. The memory required by the operating system, application working sets, and multidimensional storage manager and DB2 caches and buffer pools should not exceed the physical memory in the workstation.

Each multidimensional database requires memory to be allocated for data cache, index cache, and buffer pools.

Determining the best allocation of memory is often an iterative process. Start with the minimum memory requirements for each component, and then tune them as necessary using the following guidelines as a starting point:

- Allocate 1 MB of memory for the multidimensional database index cache.
- Allocate 40 percent of the remaining memory for the DB2 buffer pools.
- Allocate 20 percent of the remaining memory for the multidimensional data cache.
- Leave the remaining memory as spare memory.

---

## Tuning Data Loads

Before following the steps in this section, read the information about ordering data in “Loading Data into a Database” on page 148. The order of the dimensions in the database, and the order in which you load the data, can greatly affect performance.

It is recommended that you load a subset of the database first, then follow the instructions in this section and in “Calculating the Database” on page 180. After you finish tuning the data load and calculation, you can load the entire database.

Before loading the data, enable the DB2 database system monitor switches to take a snapshot of the system, and reset the counters.

While the data is loading, use an operating system monitor to verify that paging is not occurring and that DB2 OLAP Server is fully utilizing one processor. Less than 100% utilization of one processor indicates a problem with I/O.

When the data load is complete, take the following steps:

1. Take a snapshot using the DB2 database system monitor.
2. Verify that DB2 did not delete or update any rows in the fact and key tables. Deleted or updated rows indicate the data was not ordered correctly during loading.
3. Verify the hit rates for the buffer pools and tune accordingly.
4. Verify that all logging has taken place to the primary log files, and tune accordingly.
5. Verify that physical I/O rates are acceptable.
6. Check the number of commits issued. If the commit block parameter is set correctly, the data load finishes with only one commit. If more than one commit occurs, use the Application Manager to adjust the commit block parameter to use any unused log space.
7. In the Application Manager, use the Information facility from the **Database** menu to get information for the database that you just loaded. Make sure that the index cache is large enough to cache entries for all the loaded data, and tune accordingly.

If you performed any tuning during these steps, clear the loaded data, reset the DB2 database system monitor counters, and repeat the data load.

---

## Calculating the Database

Before performing the steps in this section, see the *Database Administrator's Guide* to decide if the calculation would benefit from a calculator cache. The basic calculator cache is most effective when you are calculating a complete database. If your database has any large flat dimensions, the calculator hash table can be very effective.

Before calculating the database, run the DB2 RUNSTATS utility to update the DB2 statistics that can help you optimize queries. Also, enable the DB2 database system monitor switches to take a snapshot of the system, and reset the counters.

Then take the following steps:

1. Start the calculation.

2. While the database is calculating, use an operating system monitor to verify that paging is not occurring and that DB2 OLAP Server is fully utilizing one processor. Less than 100% utilization of one processor indicates a problem with I/O.
3. When the calculation completes, take a snapshot with the DB2 database system monitor.
4. Verify the hit rates for the buffer pools, and tune accordingly.
5. Verify that DB2 is carrying out asynchronous I/O, and tune accordingly.
6. Verify that the buffer pool cleaners are efficiently triggered, and tune accordingly.
7. Verify that all logging has taken place to primary log files and tune accordingly.
8. Verify that physical I/O rates are acceptable.
9. Check the number of commits issued. If the commit block parameter is set correctly, the calculation finishes with only one commit. If more than one commit occurs, use the Application Manager to adjust the commit block parameter to make use of any unused log space.
10. In the Application Manager, use the Information facility from the **Database** menu to get information for the database that you just loaded. Check the hit rate on the index cache, and tune accordingly; for best results, the index cache should be large enough to cache all the keys. Check the hit rate on the data cache, and tune accordingly.

If you performed any tuning during these steps, reset the DB2 database system monitor counters, and repeat the calculation. You might need to repeat this process several times, making adjustments and verifying the results until tuning is complete. When the system is tuned for calculation, repeat the data load to make sure that the new settings are also effective for loading data.

---

## Tuning the System for Run Time

When you finish calculating the entire database, run the DB2 REORGCHK utility as described in “Defragmenting Relational Databases on Windows NT and UNIX” on page 136. If any of the indicators are set, use the REORG utility on the table and its index. This reclaims unused space in the table and optimally organizes the table storage with respect to the index, which might improve query performance.

Before running queries, enable the DB2 database system monitor switches to take a snapshot of the system, and reset the counters.

When users are querying the data, take the following steps:

1. Use an operating system monitor to check processor and memory utilization.

2. Occasionally take DB2 snapshots and verify the buffer pool hit rates and I/O rates. Adjust the size of the buffer pools as necessary.
3. Monitor page faults on the DB2 database agent processes (db2syscs). If the page fault level is consistently over 30, it is an indication that memory is overcommitted.
4. Adjust the DB2 OLAP Server index cache to achieve a good data hit rate. A good data hit rate is between 0.95 and 1.0.
5. Adjust the DB2 OLAP Server data cache size until returns diminish as measured by the hit rate.
6. Carefully consider the effect of allowing users to make adhoc SQL queries on the fact table, which can affect performance.

When tuning is complete, turn off the DB2 database system monitor switches.

---

## Using the RUNSTATS Utility on a New Multidimensional Database

To maintain good performance of data calculations, use the DB2 RUNSTATS utility after you first load data into a new multidimensional database and before you run your first calculation script.

The RUNSTATS utility updates statistics in the DB2 system catalog tables to help with the query optimization process. Without these statistics, the database manager might make a decision that can adversely affect the performance of an SQL statement. For more information about the RUNSTATS utility, see the *DB2 Administration Guide*.

---

## Chapter 12. Creating SQL Applications

This chapter provides information about creating SQL applications that access the multidimensional data that DB2 OLAP Server stores in a relational database. This chapter applies to both DB2 OLAP Server and the DB2 OLAP Starter Kit.

---

### DB2 OLAP Server Views

When you create an OLAP application and multidimensional database, DB2 OLAP Server catalogs the new application and database and creates a set of relational tables, known as a star schema. In addition, DB2 OLAP Server creates and manages a number of views that simplify SQL application access to the multidimensional data. You can use custom applications and standard query tools to access the multidimensional data using these views. Some applications are designed to take full advantage of data that is stored in the star schema created by DB2 OLAP Server.

DB2 OLAP Server manages the following views:

- Cube catalog
- Cube
- Dimension
- Fact
- Star
- Relational attribute
- User-defined attribute
- Alias ID
- Linked Reporting Object (LRO)

#### Naming Scheme for Views

DB2 OLAP Server stores all of its base tables and views in the *username* schema, where *username* is the user ID assigned to DB2 OLAP Server. For the SQL examples in this chapter, the schema name OLAPSERV is used.

All view names are in uppercase. Do not enclose view names in quotation marks. DB2 OLAP Server constructs view names and stores them in catalog views. Your SQL applications can query the view names from catalog views. Figure 10 on page 184 shows the primary DB2 OLAP Server views.

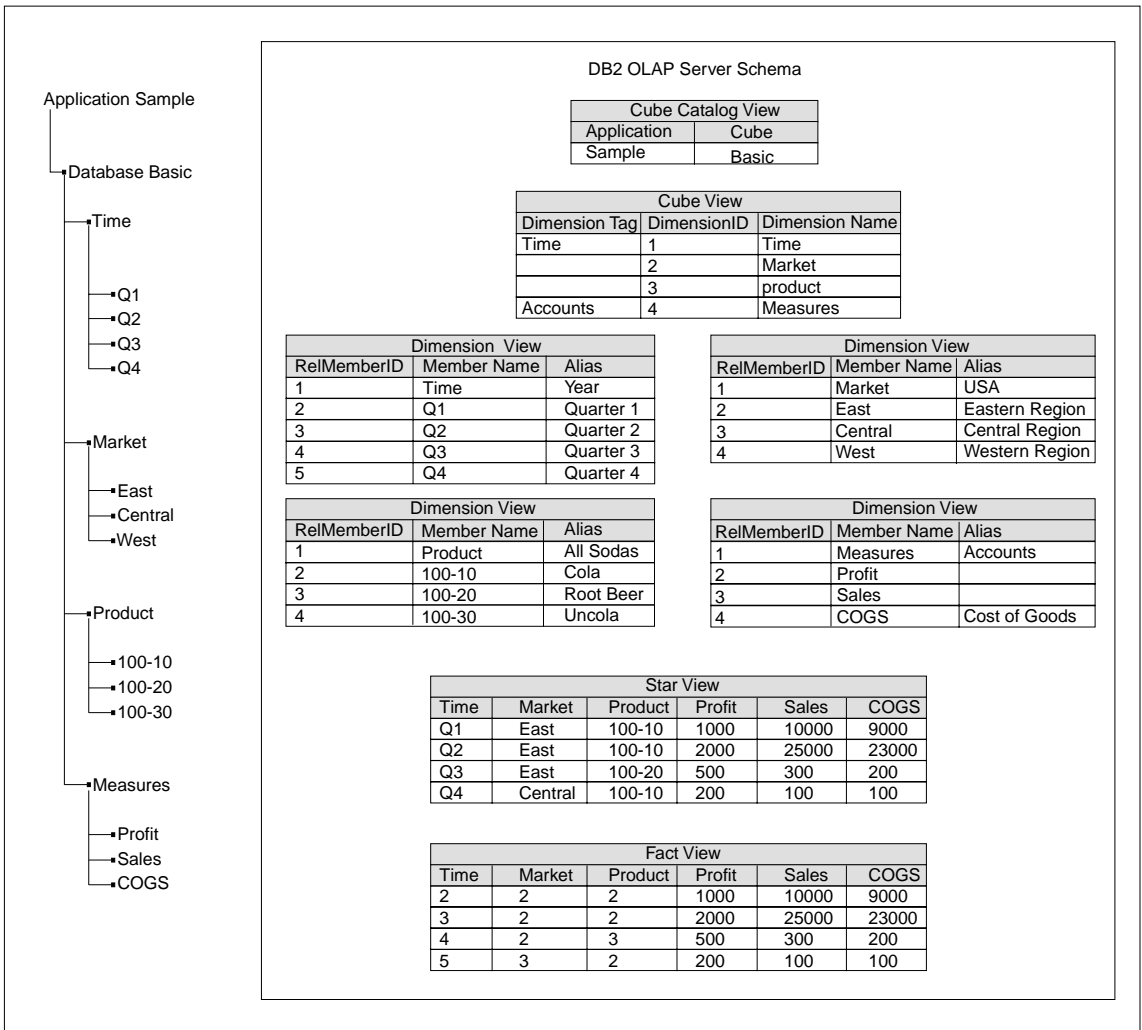


Figure 10. DB2 OLAP Server schema

## Using the Cube Catalog View

DB2 OLAP Server uses one cube catalog view in its *username* schema. This view contains one row for each cube. Use this view to get details about all OLAP applications and cubes that are stored in a schema. The cube catalog view catalogs all the OLAP applications and databases that are managed by DB2 OLAP Server.

### Cube Catalog View Name

The cube catalog view name is CUBECATALOGVIEW. Like all other views, it is owned by the schema that is assigned to DB2 OLAP Server.

## Cube Catalog View Contents

Table 16 shows the columns in the cube catalog view.

Table 16. Contents of cube catalog view

Name	Type	Max Size	Contents
AppName	VarChar	8	The name of the OLAP application that contains the relational cube identified with CubeName.
CubeName	VarChar	8	The name of a multidimensional database.
CubeViewName	VarChar	27	The fully qualified name of the cube view for this multidimensional database.
FactViewName	VarChar	27	The fully qualified name of the fact view for this multidimensional database.
StarViewName	VarChar	27	The fully qualified name of the star view for this multidimensional database.
AliasIdViewName	VarChar	27	The fully qualified name of the alias ID view for this multidimensional database.
LROViewName	VarChar	27	The fully qualified name of the LRO view for the multidimensional database.

### Querying the Cube Catalog View Using SQL Statements

Use this SQL statement to get a list of OLAP applications:

```
SELECT DISTINCT APPNAME FROM OLAPSERV.CUBECATALOGVIEW
```

Use this SQL statement to get a list of multidimensional databases in the application named Sample:

```
SELECT CUBENAME FROM OLAPSERV.CUBECATALOGVIEW WHERE APPNAME='Sample'
```

Use this SQL statement to get the view names for the multidimensional database named Basic in the application named Sample:

```
SELECT CUBEVIEWNAME,FACTVIEWNAME,STARVIEWNAME,ALIASIDVIEWNAME,LROVIEWNAME  
FROM OLAPSERV.CUBECATALOGVIEW WHERE APPNAME='Sample' AND CUBENAME='Basic'
```

### Querying Dimension and Member Information

The cube view and dimension views contain information about the dimensions and members in a relational cube. There is one cube view for each relational cube, and one dimension view for each dimension within a relational cube. These views can be used to query many of the attributes that are assigned to dimensions and members in the OLAP outline.

### Using the Cube View

There is one cube view for each relational cube that DB2 OLAP Server manages. The cube view contains one row for each dimension in the relational cube. Use this view to get information about the dimensions of a cube.

### Cube View Name

The cube view name is obtained from the CubeViewName column of the cube catalog view.

### Cube View Contents

Table 17 shows the columns in the cube view.

Table 17. Contents of Cube View

Name	Type	Size	Contents
DimensionName	VarChar	80	The OLAP dimension name.
RelDimensionName	VarChar	18	The DB2 OLAP Server dimension name. This column contains the name of a column in the star view or the fact view that corresponds to this dimension. The RelDimensionName is a unique name when compared to all other dimension names and the names of members in the anchor dimension of this relational cube. The RelDimensionName is a modified version of DimensionName. Changes that you might need to make to a dimension name are: <ul style="list-style-type: none"><li>• Limit the length of the name.</li><li>• Remove or replace special characters that are allowed in multidimensional names, but not in relational names.</li><li>• Alter characters to create a unique name in the relational cube's name space, after all other changes are made.</li></ul>
DimensionType	Small Integer		The values for this column are: <ul style="list-style-type: none"><li>• 0 = Dense dimension</li><li>• 1 = Sparse dimension</li><li>• 2 = Anchor dimension</li></ul>
DimensionTag	Small Integer		The values for this column are: <ul style="list-style-type: none"><li>• 0x00 for no tag</li><li>• 0x01 for Accounts</li><li>• 0x02 for Time</li><li>• 0x04 for Country</li><li>• 0x08 for Currency Partition</li></ul>
DimensionId	Integer		The dimension ID in the OLAP outline.
DimensionViewName	VarChar	27	The fully qualified name of the dimension view for this dimension.
UDAViewName	VarChar	27	The fully qualified name of the user-defined attribute (UDA) view for this dimension.
RATViewName	VarChar	27	The fully qualified name of the relational attribute view for this dimension.



## Querying the Cube View Using SQL Statements

To access data in the cube view, your application must first determine the name of the cube view from the cube catalog view.

For example, to find the name of the cube view for the Basic database in the Sample application, query the database using the following SQL statement:

```
SELECT CUBEVIEWNAME FROM OLAPSERV.CUBECATALOGVIEW
WHERE APPNAME='Sample' AND CUBENAME='Basic'
```

The result of this query might be:

```
OLAPSERV.SAMPBASI_CUBEVIEW
```

To list the dimension names and the corresponding dimension view names for the Basic database:

```
SELECT DIMENSIONNAME.DIMENSIONVIEWNAME FROM OLAPSERV.SAMPBASI_CUBEVIEW
```

To list the dimension names of the dense dimensions of the Basic database:

```
SELECT DIMENSIONNAME FROM OLAPSERV.SAMPBASI_CUBEVIEW WHERE DIMENSIONTYPE = 0
```

To determine the names of the non-anchor dimensions used to name columns in the star view:

```
SELECT RELDIMENSIONNAME FROM OLAPSERV.SAMPBASI_CUBEVIEW WHERE DIMENSIONTYPE <> 2
```

To return the name of the relational attribute view for the Product dimension:

```
SELECT RATVIEWNAME FROM OLAPSERV.SAMPBASI_CUBEVIEW WHERE DIMENSIONNAME='Product'
```

## Dimension View Name

The dimension view name is obtained from the DimensionViewName column of the cube view.

## Dimension View Contents

Table 18 shows the columns in a dimension view.

Table 18. Contents of a dimension view

Name	Type	Size	Contents
MemberName	VarChar	80	The name of the member.

Table 18. Contents of a dimension view (continued)

Name	Type	Size	Contents
RelMemberName	VarChar	18	<p>Anchor dimension only. The DB2 OLAP Server member name. This name is used to name columns in the Fact and Star views that correspond to the members of the Anchor dimension. It is a unique name when compared to all other Anchor dimension member names and the names of non-anchor dimensions of this relational cube. It is a modified version of MemberName. Changes that you might need to make to MemberName are:</p> <ul style="list-style-type: none"> <li>• Limit the length of the name.</li> <li>• Remove or replace special characters that are allowed in multidimensional, but not in relational names.</li> <li>• Alter characters to create a unique name in the relational cube's name space after previous changes are made</li> </ul>
RelMemberID	Integer	None	<p>The DB2 OLAP Server ID for this member. This ID is used to join the dimension table to the fact table.</p>
ParentRelId	Integer	None	<p>The relational ID of the member's parent in the OLAP outline. The value is null for the top level member.</p>
LeftSiblingRelId	Integer	None	<p>The relational ID of the member's left sibling in the OLAP outline. This value is null for members that do not have a left sibling.</p>

Table 18. Contents of a dimension view (continued)

Name	Type	Size	Contents
Status	Integer	None	<p>The status of this member can contain a combination of:</p> <ul style="list-style-type: none"> <li>• 0x0000= Reserved</li> <li>• 0x0001= For a member set to Never share</li> <li>• 0x0002= For a member set to Label only</li> <li>• 0x0004 = For a member set to Shared member</li> <li>• 0x0008 = Reserved</li> <li>• 0x0010 = For a parent member with a single child or a parent member with only one child with an aggregation operator. (All other children have the no-op operator.)</li> <li>• 0x0020 = For a member where set to Dynamic Calc And Store</li> <li>• 0x0040= For a member set to Dynamic Calc</li> <li>• 0x0080= Reserved</li> <li>• 0x0100= Reserved</li> <li>• 0x0200= For a parent member where one of its children is shared</li> <li>• 0x0400= For a regular member</li> </ul>
CalcEquation	Long VarChar (workstation); VarChar (OS/390)	32700 (workstation); 250 (OS/390)	<p>The default calculation equation for calculated members. The default calculation equation might not be the equation used to calculate the member's value if a different calculation is specified in the calculation script that is used to calculate the relational cube.</p>
UnarySymbol	Small Integer	None	<p>The unary calculation symbol:</p> <ul style="list-style-type: none"> <li>• 0 = Add</li> <li>• 1 = Subtract</li> <li>• 2 = Multiply</li> <li>• 3 = Divide</li> <li>• 4 = Percent</li> <li>• 5 = No op</li> </ul>

Table 18. Contents of a dimension view (continued)

Name	Type	Size	Contents
AccountsType	Integer	None	Used only for the Accounts dimension. It can contain a combination of the following values: <ul style="list-style-type: none"> <li>• 0x0000 = Do not mask on zero or missing value</li> <li>• 0x4000 = Mask on missing value</li> <li>• 0x8000 = Mask on zero value</li> <li>• 0x0001 = Balance First</li> <li>• 0x0002 = Balance Last</li> <li>• 0x0004 = Percent</li> <li>• 0x0008 = Average</li> <li>• 0x0010 = Unit</li> <li>• 0x0020 = Details only</li> <li>• 0x0040 = Expense</li> </ul>
NoCurrencyConv	Small Integer	None	Currency conversion setting: <ul style="list-style-type: none"> <li>• 0x0000 = Use currency conversion</li> <li>• 0x0001 = No currency conversion</li> </ul>
CurrencyMemberName	VarChar	80	A member name from the currency cube associated with this member.
GenerationNumber	Integer	None	The generation number for this member.
GenerationName	VarChar	80	The generation name for this member.
LevelNumber	Integer		The level number for this member.
LevelName	VarChar	80	The level name for this member.
<i>alias table name</i> There is one alias column for each OLAP alias table used in the outline.	VarChar	80	The alias for this member in an associated OLAP alias table. If an alias is not provided for a member, this value is null. See “Using Alias ID Views” on page 197.
<i>relational attribute column name</i> There is one relational attribute column for each RatCol user-defined attribute.	The data type specified when the relational attribute column was created.	The size specified when the relational attribute column was created.	The value of the relational attribute for this member.

## Querying a Dimension Name Using SQL Statements

To access data in a dimension view, your application must first determine the name of the dimension view from the cube view.

For example, to find the name of the dimension view for the Time dimension in the Basic database, you query the database using the following SQL statement:

```
SELECT DIMENSIONVIEWNAME FROM OLAPSERV.SAMPBASI_CUBEVIEW WHERE DIMENSIONNAME='Time'
```

The result of the query might be:

```
OLAPSERV.SAMPBASID_TIME
```

## Listing Member Names Using SQL

To list the member names for the Time dimension:

```
SELECT MEMBERNAME FROM OLAPSERV.SAMPBASID_TIME
```

## Fact and Star Views

DB2 OLAP Server creates and maintains two views of the fact table of the star schema:

### Fact view

There is one fact view for each cube that DB2 OLAP Server manages. The fact view is a simple view of the fact table. The fact table contains the multidimensional data. Use this view to directly access multidimensional data from SQL applications that manage the required joins to the dimension views.

### Star view

There is one star view for each cube that DB2 OLAP Server manages. The star view joins the fact table to each of the dimension views of the star schema. This view provides simple SQL access to the multidimensional data and is ideal for adhoc queries, and for use with general purpose query tools that do not manage the required joins to the dimension views.

Because a fact table contains values with different levels of aggregation, members that you select in each dimension must have the same level of aggregation if you write an SQL application to aggregate. Otherwise, your aggregations will be incorrect. One way to meet this requirement is to include a constraint on either the generation number or level number field in the dimension table.

The fact table that DB2 OLAP Server creates has one column for each non-anchor dimension, and one column for each member of the anchor dimension that stores data. The fact table that corresponds to the outline that is used in Figure 10 on page 184 has the following columns:

- Three dimension columns, one for each of three dimensions (Time, Product, and Market).
- Three anchor member columns, one for each of three members (Profit, Sales, and COGS).

The dimension columns store member IDs that refer to members of each non-anchor dimension. The member IDs can be mapped to member names using the dimension views. The anchor member columns store the actual data values. The anchor dimension members can be mapped to columns of the fact view using the dimension view for the anchor dimension.

DB2 OLAP Server uses internal names for the columns of the fact table, and internal IDs for the members. The fact view replaces the internal column names with dimension and member names, but it does not map the dimension column member IDs to member names. The star view replaces the internal column names with dimension and member names, and maps the dimension column member IDs to member names by joining the fact table to the dimension tables.

Although any dense dimension can be specified as the anchor dimension, if you are accessing the fact or star view from SQL applications and running adhoc queries, the most natural mapping is obtained if you specify the Accounts dimension as the anchor dimension.

### Fact View Name

The fact view name is obtained from the FactViewName column of the cube catalog view.

### Fact View Contents

The fact view contains a variable number of columns of two types:

#### Dimension columns

One column for each non-anchor dimension

#### Anchor member columns

One column for each anchor dimension member that stores data

Table 19 shows details about the two types of columns in the fact view.

*Table 19. Contents of the Fact View*

Name	Type	Contents
For dimension columns:	Integer	RelMemberID of the member of this dimension.

The short name for the dimension is taken from the RelDimensionName column of the cube view.

Table 19. Contents of the Fact View (continued)

Name	Type	Contents
For anchor member columns:	Double	The data value for this cell.

The short member name for the member is taken from the RelMemberName column of the dimension view of the anchor dimension.

### Querying the Fact View on UNIX and Windows NT Using SQL Statements

To access data in a fact view, your application must first determine the name of the fact view from the cube catalog view.

For example, to find the name of the fact view for the Basic database in the Sample application, you use the following SQL statement:

```
SELECT FACTVIEWNAME FROM OLAPSERV.CUBECATALOGVIEW
WHERE APPNAME='Sample' AND CUBENAME='Basic'
```

The result of the query might be:

```
OLAPSERV.SAMPBASI_FACTVIEW
```

If your application keeps track of RelMemberID values for members, you can query the fact view directly. For example, to select the data values for a product with RelMemberId 3 (100-20), in a market with RelMemberId 2 (East), at a time with RelMemberID 4 (Q3):

```
SELECT PROFIT,SALES,COGS FROM OLAPSERV.SAMPBASI_FACTVIEW
WHERE PRODUCT=3 AND MARKET=2 AND TIME=4
```

More commonly, queries on the fact view include joins with the dimension views. A query using joins that is equivalent to the previous query is:

```
SELECT PROFIT,SALES,COGS
FROM OLAPSERV.SAMPBASI_FACTVIEW,
OLAPSERV.SAMPBASID_TIME,
OLAPSERV.SAMPBASID_MARKET,
OLAPSERV.SAMPBASID_PRODUCT,
WHERE OLAPSERV.SAMPBASID_TIME.MEMBERNAME='Q3'
AND OLAPSERV.SAMPBASID_PRODUCT.MEMBERNAME='100-20'
AND OLAPSERV.SAMPBASID_MARKET.MEMBERNAME='East'
AND OLAPSERV.SAMPBASI_FACTVIEW.TIME=OLAPSERV.SAMPBASID_TIME.RELMEMBERID
AND OLAPSERV.SAMPBASI_FACTVIEW.PRODUCT=OLAPSERV.SAMPBASID_PRODUCT.RELMEMBERID
AND OLAPSERV.SAMPBASI_FACTVIEW.MARKET=OLAPSERV.SAMPBASID_MARKET.RELMEMBERID
```

### Star View Name

The star view name is obtained from the StarViewName column of the cube catalog view.

## Star View Contents

The star view contains a variable number of columns of two types:

### Dimension columns

One column for each non-anchor dimension

### Anchor member columns

One column for each anchor dimension member

Table 20 shows details about the two types of columns in the star view.

Table 20. Contents of the Star View

Name	Type	Contents
For dimension columns: The short name for the dimension is taken from the RelDimensionName column of the cube view.	VarChar(80)	Member name.
For anchor member columns: The short member name for the member is taken from the RelMemberName column of the dimension view of the anchor dimension.	Double	The data value for this cell.

## Querying the Star View on UNIX and Windows NT Using SQL Statements

To access data in the star view, your application must first determine the name of the star view from the cube catalog view.

For example, to find the name of the star view for the Basic database in the Sample application, use the following SQL statement:

```
SELECT STARVIEWNAME FROM OLAPSERV.CUBECATALOGVIEW  
WHERE APPNAME='SAMPLE' and CUBENAME='BASIC'
```

The result of this query might be:

```
OLAPSERV.SAMPBASI_STARVIEW
```

To select the data values for product 100-10, in the Central market, during the first quarter:

```
SELECT PROFIT,SALES,COGS FROM OLAPSERV.SAMPBASI_STARVIEW  
WHERE PRODUCT='100-10' AND MARKET='Central' AND TIME='Q1'
```

To select all products that lost profits in the Central market during the second quarter:



```
SELECT PRODUCT,PROFIT,SALES,COGS FROM OLAPSERV.SAMPBASI_STARVIEW
WHERE MARKET='Central' AND TIME='Q2' AND PROFIT < 0
```

Not all members of the star view are at the same hierarchical level, so construct your queries carefully when using SQL to perform aggregation operations. The selected members in a dimension must be at the same level to avoid double aggregations.

For example, the following SQL statement shows members selected at different levels in the star view. (Some sales will be counted twice because two levels of sums are aggregated.)

```
SELECT SUM(PROFIT) FROM OLAPSERV.SAMPBASI_STARVIEW
WHERE MARKET IN ('Central','Illinois') AND
PRODUCT='100' AND
TIME IN ('Q1','1996')
```

Assuming that Illinois is part of the Central market and that Q1 is part of 1996, this query results in profit figures at both the state and region level and the quarter and year level that are being summed. Because the Central market already includes Illinois data, Illinois and Q1 data are counted twice in the sum. If you want to correct the SQL to sum the sales for two states in the Central market during two different quarters, you might use the following example:

```
SELECT SUM(PROFIT) FROM OLAPSERV.SAMPBASI_STARVIEW
WHERE MARKET IN ('Indiana','Illinois') AND
PRODUCT='100' AND
TIME IN ('Q1','Q2')
```

---

## Using Other Views in SQL Applications

This section provides information about other views that you might find useful when writing SQL applications to query DB2 OLAP Server multidimensional data. The views include relational attributes, user-defined attributes, alias names, and linked reporting objects (LROs).

### Using Relational Attribute Views

When you add a relational attribute column to a dimension table, DB2 OLAP Server records its name, data type, and size in a relational attribute table for that dimension. You can access the table through a relational attribute view.

The relational attribute view name is obtained from the RATViewName column of the cube view.

Table 21 on page 196 shows details about columns in the relational attribute view.

Table 21. Contents of Relational Attribute View

Name	Type	Max Size	Contents
RATCOLUMNNAME	VarChar	20	The name of the relational attribute column, possibly surrounded by single quotations.
RATCOLUMNTYPE	Integer		A number that indicates the data type of the relational attribute columns: <ul style="list-style-type: none"> <li>• 1 = Character (CHAR)</li> <li>• 4 = Integer (INT)</li> <li>• 5 = Small integer (SMALLINT)</li> <li>• 12 = Variable character (VARCHAR)</li> </ul>
RATCOLUMNSIZE	Integer		If the RATCOLUMNTYPE is 4 or 5, RATCOLUMNSIZE is 0. If RATCOLUMNTYPE is 1 or 12, RATCOLUMNSIZE is the size specified for the column.

To access data in a relational attribute view, your application must first determine the name of the view from the cube view.

For example, to find the name of the relational attribute view for the Product dimension in the Basic database, you use the following SQL statement:

```
SELECT RATVIEWNAME FROM OLAPSERV.SAMPBASI_CUBEVIEW WHERE DIMENSIONNAME='PRODUCT'
```

This query might return:

```
OLAPSERV.SAMPBASIR_PRODUCT
```

You can use information from the relational attribute view in SQL statements. By selecting the rows from the relational attribute view, you can get a list of relational attribute columns, their types, and sizes for the corresponding dimension.

In the following example, an SQL SELECT statement retrieves the relational attribute information for the PRODUCT dimension in the BASIC database in the SAMPLE application.

```
SELECT RATCOLUMNNAME,RATCOLUMNTYPE,RATCOLUMNSIZE FROM SAMPBASIR_PRODUCT.
```

The result of this query might be:

```
RATCOLUMNNAME  RATCOLUMNTYPE  RATCOLUMNSIZE
=====
COLOR          1              10
```

In this result, a relational attribute column on the Product dimension is named Color. The column type of 1 indicates that it is a character column, and size of 10 indicates that it can hold a maximum of 10 characters per row.

## Using User-defined Attribute Views

DB2 OLAP Server maintains one user-defined attribute view for each dimension of a cube. There is one row for each member/attribute combination. Use this view to get information on a member of a dimension.

The name of the user-defined attribute view is obtained from the `UDAViewName` column of the cube view.

Table 22 shows details about columns in the user-defined attribute view.

*Table 22. Contents of User-defined Attribute View*

Name	Type	Max Size	Contents
MemberName	VarChar	80	The name of the member.
UDA	VarChar	80	The user-defined attribute text string.

To access data in a UDA view, your application must first determine the name of the UDA from the cube view.

For example, to find the name of the UDA view for the Product dimension in the Basic database, you use the following SQL statement:

```
SELECT UDAVIEWNAME FROM OLAPSERV.SAMPBASI_CUBEVIEW WHERE DIMENSIONNAME='PRODUCT'
```

This query might return:

```
OLAPSERV.SAMPBASIU_PRODUCT
```

To list the member names of all products that have an associated user-defined attribute of Promotion for the Basic database in the Sample application:

```
SELECT MEMBERNAME FROM OLAPSERV.SAMPBASIU_PRODUCT WHERE UDA = 'Promotion'
```

## Using Alias ID Views

DB2 OLAP Server maintains one alias ID view for each relational cube. It contains one row for each multidimensional alias table used within an outline. Use this view to determine what aliases are available for a cube.

The alias ID view name is obtained from the cube catalog view.

Table 23 shows details about columns in the alias ID view.

*Table 23. Contents of Alias ID View*

Name	Type	Max Size	Contents
AliasTableName	VarChar	80	The name of the multidimensional alias table. This is a collective name for a set of aliases associated with members of a cube.

Table 23. Contents of Alias ID View (continued)

Name	Type	Max Size	Contents
RelAliasTableName	VarChar	18	The DB2 OLAP Server name for this alias table. This name is used for the alias columns of the dimension view.

To access data in an alias ID view, your application must first determine the name of the alias ID view from the cube catalog view.

For example, to find the name of the UDA view for the Basic database in the Sample application, you use the following SQL statement:

```
SELECT ALIASIDVIEWNAME FROM OLAPSERV.CUBECATALOGIEW
WHERE APPNAME='Sample' AND CUBENAME='Basic'
```

The result of this query might be:

```
OLAPSERV.SAMPBASI_ALIASID
```

To list the alias tables for a cube:

```
SELECT ALIASTABLENAME FROM OLAPSERV.SAMPBASI_ALIASID
```

To determine which dimension view column to use when constructing constraints using aliases from the French Names alias table:

```
SELECT RELALIASTABLENAME FROM OLAPSERV.SAMPBASI_ALIASID
WHERE ALIASTABLENAME='French Names'
```

To list the member names and their French aliases for the members of a dimension with RelAliasTableName of FRENCHNAMES:

```
SELECT MEMBERNAME, FRENCHNAMES FROM OLAPSERV.SAMPBASID_PRODUCT
```

## Using Linked Reporting Object (LRO) Views

DB2 OLAP Server maintains one LRO view for each cube. Use this view to determine which linked reporting objects are associated with individual cells in a cube. There is one row for each linked object or cell annotation.

The name of the LRO view is obtained from the cube catalog view.

### LRO View Contents

Table 24 shows details about columns in the LRO view. The view has one additional column for each dimension, and columns that contain information about the associated object.

Table 24. Contents of Cube View

Name	Type	Max Size	Contents
------	------	----------	----------

Table 24. Contents of Cube View (continued)

Dimension columns. Short name for the dimension, taken from the RelDimensionName column of the cube table	VarChar		The name of the member of this dimension that the object is associated with.
STOREOPTION	Small Integer		The value for this column is: <ul style="list-style-type: none"> <li>• 0 if the associated object is stored on the client</li> <li>• 16 if the object is stored on the server</li> </ul>
OBJTYPE	Small Integer		The value for this column is: <ul style="list-style-type: none"> <li>• 0 if the associated object is an annotation</li> <li>• 1 if the object is application data</li> </ul>
Handle	Integer		Unique identifier for each annotation or object. When more than one object is associated with a cell, use the handle to uniquely identify one of the objects.
USERNAME	VarChar	31	The name of the user that created this object.
UPDATEDATE	Integer		The coordinated universal time (UTC) time stamp for when the object was last updated.
OBJNAME	VarChar	512	If the object type is 1 (application data), this column contains the file name of the object.
OBJDESC	VarChar	80	If the object type is 1, this column contains a description of the object.
NOTE	VarChar	600	If the object type is 0 (annotation) this column contains the text of the annotation.

### Querying the LRO View Using SQL Statements

To access data in the LRO view, your application must first determine the name of the LRO view from the cube catalog view.

For example, to find the name of the LRO view for the Basic database in the Sample application, use the following SQL statement:

```
SELECT LROVIEWNAME FROM OLAPSERV.CUBECATALOGVIEW
WHERE APPNAME='Sample' AND CUBENAME='Basic'
```

The result of this query might be:

```
OLAPSERV.SAMPBASI_LROVIEW
```

To list the descriptions of all application objects that are associated with a cube:

```
SELECT OBJDESC, USERNAME FROM OLAPSERV.SAMPBASI_LROVIEW WHERE OBJTYPE=0
```

To list all annotations made by Gary Robinson:

```
SELECT NOTE FROM OLAPSERV.SAMPBASI_LROVIEW WHERE OBJTYPE=1 AND  
    USERNAME='Gary Robinson'
```

You can query the linked reporting objects that are associated with a cell by specifying the member IDs of the cell for each dimension in the WHERE clause of the SELECT statement.

---

## Part 3. Appendixes





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## Appendix A. Relational Storage Manager Messages

This appendix contains IBM DB2 OLAP Server relational storage manager messages. An italicized word in a message indicates a variable name or number that identifies the cause of the message. Currently, Hyperion Essbase messages are not available.

The message number 1120937 is a message concerning the RDBMS and might require the assistance of the relational database administrator. RDBMS messages are written to the Essbase application log.

---

**1120110**      **The system could not open the DB2 OLAP Server configuration file.**

**Explanation:** The system will not start unless the DB2 OLAP Server configuration file is available.

**User Response:** System Administrator—Create a configuration file on the server. See the DB2 OLAP Server documentation for more information about the location and contents of this file.

---

**1120111**      **No relational database name was supplied in the DB2 OLAP Server configuration file.**

**Explanation:** The DB2 OLAP Server must be told which relational database to use to store data. Without this information, the DB2 OLAP Server is unable to start.

**User Response:** System Administrator—Check that the DB2 OLAP Server configuration file contains these lines:

```
[RSM]
RDB_NAME=database name
```

where *database name* is the name of the relational database where the DB2 OLAP Server stores its data. See “Chapter 10. Configuring DB2 OLAP Server” on page 157 for more information about the location and contents of this file.

---

**1120200**      **The cube could not be located in the cube catalog table.**

**Explanation:** The DB2 OLAP Server does not have a record of the required cube, and therefore, cannot complete the requested action.

**User Response:** Make sure the cube name you specified is correct and retry the action. If this fails, use the Application Manager to determine if the cube has been deleted or renamed. If the Application Manager lists the cube, contact IBM Software Support.

---

**1120201**      **The number of start-up connections is greater than the maximum pool size.**

**Explanation:** The DB2 OLAP Server configuration file setting for STARTCONNECTIONS is larger than the setting for MAXPOOLCONNECTIONS in that file. The DB2 OLAP Server has used the MAXPOOLCONNECTIONS setting for both.

**User Response:** System Administrator—Correct the values in the DB2 OLAP Server configuration file RSM.CFG. The value for STARTCONNECTIONS should be less than or equal to the setting for MAXPOOLCONNECTIONS. See “Chapter 10. Configuring DB2 OLAP Server” on page 157 for more information about the location and contents of this file.

---

**1120202**      **A database with the name [%s] already exists in the relational database for this application.**

**Explanation:** The system detected the existence (in the relational database) of a database with the same name as the database being created. This is due to either an installation problem or the incorrect deletion of sub-directories from the ESSBASE\APP directory in the file system. The new database was not created.

**User Response:** System administrator—Contact your IBM representative. End user—Use a different name for the database.

---

**1120300**      **Anchor dimension definition cannot be changed with data loaded. Outline changes rejected. Remove all data from the database and try again.**

**Explanation:** The outline changes have been rejected.

**User Response:** Clear all data from the cube and try again. See “Identifying an Anchor Dimension” on page 143 for more information on choosing and specifying an anchor dimension.

---

**1120301**      **No anchor dimension specified. Outline changes rejected. Specify an anchor dimension and try again.**

**Explanation:** The outline changes have been rejected.

**User Response:** Use a user-defined attribute to nominate one dimension as the anchor dimension and try again. See “Identifying an Anchor Dimension” on page 143 for more information on choosing and specifying an anchor dimension.

---

**1120302**      **More than one anchor dimension specified. Outline changes rejected.**

**Explanation:** The outline changes have been rejected.

**User Response:** Change the outline so that only one dimension is nominated as the anchor dimension. See “Identifying an Anchor Dimension” on page 143 for more information on choosing and specifying an anchor dimension.

---

**1120303**      **Anchor dimension specified is SPARSE. The anchor dimension must be DENSE.**

**Explanation:** The outline changes have been rejected.

**User Response:** Change the outline so that a dense dimension is nominated as the anchor dimension. See “Identifying an Anchor Dimension” on page 143 for more information on choosing and specifying an anchor dimension.

---

**1120304**      **Not enough columns remain in the fact table to store the added dimensions. Outline changes rejected.**

**Explanation:** The fact table column limit has been exceeded.

**User Response:** Reduce the number of dimensions in your outline.

---

**1120305**      **Not enough columns remain in the fact table to store the anchor dimension members added. Outline changes rejected.**

**Explanation:** The fact table column limit has been exceeded.

**User Response:** Reduce the number of members in the anchor dimension or choose a different anchor dimension.

---

**1120306**      **A short name for the dimension could not be created. Rename the dimension and try again.**

**Explanation:** The outline changes have been rejected.

**User Response:** Rename the dimension and retry the action. If the problem persists, contact IBM Software Support. See “Identifying an

Anchor Dimension” on page 143 for more information on choosing and specifying an anchor dimension.

---

**1120307**      **A relational name for a fact column could not be created.**

**Explanation:** Outline changes have been rejected.

**User Response:** Make dimension and member names as short and as unique as possible and then retry the action. See “Identifying an Anchor Dimension” on page 143 for more information about choosing and specifying an anchor dimension.

---

**1120308**      **DB2 OLAP Server could not select a suitable anchor dimension from those in the outline. Outline changes have been rejected.**

**Explanation:** Outline changes have been rejected.

**User Response:** If you want DB2 OLAP Server to automatically choose an anchor dimension, make sure you have at least one DENSE dimension in your outline that has a number of members less than the table column limit for your relational database minus the number of dimensions in your outline. Alternatively, you can choose an anchor dimension manually. It is recommended you choose an anchor dimension rather than letting DB2 OLAP Server choose one for you.

See “Criteria for Choosing an Anchor Dimension” on page 144 for more information on choosing the anchor dimension.

---

**1120309**      **The system-selected anchor dimension [%s] cannot be replaced by a user-specified anchor dimension with data loaded. Outline changes have been rejected.**

**Explanation:** Outline changes have been rejected.

**User Response:** Do one of the following:

- Keep the system-selected anchor dimension.
- Alter the outline to include a suitable anchor dimension.

See “Criteria for Choosing an Anchor Dimension” on page 144 for more information on choosing the anchor dimension.

---

**1120310**      **The system-selected anchor dimension [%s] has been deleted with data loaded. Outline changes have been rejected.**

**Explanation:** Outline changes have been rejected.

**User Response:** Do one of the following:

- Do not change the system-selected anchor dimension.
- Clear data from the database before saving the new outline.

See “Criteria for Choosing an Anchor Dimension” on page 144 for more information on choosing the anchor dimension.

---

**1120311**      **The system-selected anchor dimension [%s] has been made SPARSE with data loaded. Outline changes have been rejected.**

**Explanation:** Outline changes have been rejected.

**User Response:** Do one of the following:

- Do not change the system-selected anchor dimension.
- Clear data from the database before saving the new outline.

See “Criteria for Choosing an Anchor Dimension” on page 144 for more information on choosing the anchor dimension.

---

**1120312**      **The system-selected anchor dimension [%s] has been made SPARSE but no suitable replacement anchor dimension could be found. Outline changes have been rejected.**

**Explanation:** Outline changes have been rejected.

**User Response:** Do one of the following:

- Do not change the system-selected anchor dimension.
- Alter the outline to include a suitable anchor dimension.

See “Criteria for Choosing an Anchor Dimension” on page 144 for more information on choosing the anchor dimension.

---

**1120313**      **The system-selected anchor dimension [%s] has been deleted but no suitable replacement anchor dimension could be found. Outline changes have been rejected.**

**Explanation:** Outline changes have been rejected.

**User Response:** Do one of the following:

- Do not change system-selected anchor dimension.
- Alter the outline to include a suitable anchor dimension.

See “Criteria for Choosing an Anchor Dimension” on page 144 for more information on choosing the anchor dimension.

---

**1120314**      **The migration of database [%s] has begun.**

**Explanation:** The system is migrating a database created in an older release of DB2 OLAP Server so that it is compatible with the current release.

**User Response:** No action is required.

---

**1120315**      **The migration of database [%s] has ended successfully.**

**Explanation:** The system has successfully migrated a database that was created in an older release of DB2 OLAP Server so that it is compatible with the current release.

**User Response:** No action is required.

---

**1120316**      **The addition of alias table [%s] has failed because its name is the same as a current relational attribute column name on dimension [%s]. Outline changes were rejected.**

**Explanation:** The name of an alias table cannot be the same as a relational attribute column name associated with one of the dimensions.

**User Response:** Specify an alias table name that is different from any current relational attribute column names for any of the dimensions.

---

**1120323**      **Database [%s] in application [%s] was not started because the outline file does not match the outline stored in the relational database.**

**Explanation:** The database has not been started because the outline stored in the .otl file in the file system does not match the outline information stored in the relational database.

**User Response:** Make sure the .otl file for the database has not been accidentally overwritten. If it has, replace the .otl file with the original, or delete and rebuild the database.

---

**1120501**      **Some relational database commits worked and some failed. Database [%s] in application [%s] may not be valid.**

**Explanation:** DB2 OLAP Server was able to commit some changes but not other changes. The database may not be in a consistent state.

**User Response:** Use the validate command against the specified database to determine if it is

still valid. If it is not valid, then clear and reload the database.

---

**1120900      The relational database environment could not be initialized.**

**Explanation:** The DB2 OLAP Server cannot start up because a relational database environment handle could not be allocated.

**User Response:** Verify the relational database installation. If the problem continues, contact IBM Software Support

---

**1120901      An error was encountered when closing the relational database environment**

**Explanation:** The error was encountered when shutting down the DB2 OLAP Server. No work has been lost.

**User Response:** System Administrator—Verify the relational database installation. If the problem continues, contact IBM Software Support.

---

**1120902      Using default isolation level of cursor stability. The value specified in the configuration file is not valid.**

**Explanation:** The DB2 OLAP Server has used the default isolation level of cursor stability because the value specified in the DB2 OLAP Server configuration file is not valid.

**User Response:** System Administrator—Correct the value of the ISOLATION setting in the DB2 OLAP Server configuration file. See the DB2 OLAP Server documentation to learn more about the configuration file and the ISOLATION setting.

---

**1120903      DB2 OLAP Server could not establish a connection to the relational database %s.**

**Explanation:** DB2 OLAP Server is unable to establish a connection to the relational database.

**User Response:** Database Administrator—Verify

the relational database installation. Use the information in message 1120937 to diagnose the problem. If the problem persists, contact IBM Software Support.

---

**1120904      DB2 OLAP Server failed to establish a connection to the relational database %s.**

**Explanation:** DB2 OLAP Server is unable to establish a connection to the relational database.

**User Response:** Database Administrator—Verify the relational database installation. Use the information in message 1120937 to diagnose the problem. If the problem persists, contact IBM Software Support.

---

**1120905      The relational database returned information when a connection was terminated.**

**Explanation:** Information was returned when terminating a connection with the Relational Database. No work was lost.

**User Response:** Database Administrator—Use the information in message 1120937 to diagnose the problem. If the problem persists, contact IBM Software Support.

---

**1120906      The relational database returned information when a connection was established.**

**Explanation:** This message is for information only. A connection to the relational database has been established.

**User Response:** Database Administrator—If appropriate, use the information in message 1120937 to diagnose the problem. If the problem persists, contact your support representative.

---

**1120907      The relational database returned information when the DB2 OLAP Server disconnected.**

**Explanation:** Information was returned when disconnecting from the relational database. No work was lost.

**User Response:** Database Administrator—Use the information in message 1120937 to diagnose the problem. If the problem persists, contact IBM Software Support.

---

**1120908**      **Failure to set the isolation level prevented a connection to the relational database from being established.**

**Explanation:** The DB2 OLAP Server is unable to correctly connect to the Relational Database.

**User Response:** Database Administrator—Use the information in message 1120937 to diagnose the problem. If the problem persists, contact IBM Software Support.

---

**1120909**      **Failure to set the autocommit option prevented a connection to the relational database from being established.**

**Explanation:** The DB2 OLAP Server is unable to correctly connect to the relational database.

**User Response:** Database Administrator—Use the information in message 1120937 to diagnose the problem. If the problem persists, contact IBM Software Support.

---

**1120910**      **The relational database returned an error when the DB2 OLAP Server committed a transaction.**

**Explanation:** The DB2 OLAP Server could not commit work. Some changes may have been lost.

**User Response:** Database Administrator—Use the information in message 1120937 to diagnose the problem. If you are unable to resolve the problem, contact IBM Software Support.

---

**1120911**      **The relational database returned an error when the DB2 OLAP Server aborted a transaction.**

**Explanation:** The DB2 OLAP Server could not abort a transaction. Some changes may have been lost.

**User Response:** Database Administrator—Use

the information in message 1120937 to diagnose the problem. If you are unable to resolve the problem, contact IBM Software Support.

---

**1120912**      **An SQL statement failed to execute.**

**Explanation:** The SQL statement submitted to the relational database could not be run. Work may have been lost.

**User Response:** Database Administrator—Use the information in message 1120937 to diagnose the problem. If you are unable to resolve the problem, contact IBM Software Support.

---

**1120913**      **The relational database returned information when running an SQL statement.**

**Explanation:** Information was returned from the relational database when an SQL statement was run. This is information only. No work has been lost.

**User Response:** Database Administrator—If appropriate, use the information in message 1120937 to diagnose the problem. If the problem persists, contact IBM Software Support.

---

**1120914**      **The relational database returned an error when the DB2 OLAP Server released an execution statement.**

**Explanation:** An execution statement could not be released. No work has been lost.

**User Response:** Database Administrator—Use the information in message 1120937 to diagnose the problem. If you are unable to resolve the problem, contact IBM Software Support.

---

**1120915**      **The DB2 OLAP Server could not obtain an execution statement from the relational database.**

**Explanation:** Work could not be executed because an execution statement could not be obtained from the relational database.

**User Response:** Database Administrator—Use

the information in message 1120937 to diagnose the problem. If you are unable to resolve the problem, contact IBM Software Support.

---

**1120916      The DB2 OLAP Server encountered an error when attempting to lock a table in the relational database.**

**Explanation:** The DB2 OLAP Server is unable to lock a required table. The action being processed will fail.

**User Response:** Database Administrator—Use the information in message 1120937 to diagnose the problem. If you are unable to resolve the problem, contact IBM Software Support.

---

**1120918      The DB2 OLAP Server was unable to lock a table because it is already locked.**

**Explanation:** The DB2 OLAP Server is unable to lock a required table. The action being processed will fail.

**User Response:** System Administrator—Contact IBM Software Support.

---

**1120919      The relational database returned information when the DB2 OLAP Server locked a table.**

**Explanation:** Information was returned from the Relational Database when a table was locked. This message is for information only. No work has been lost.

**User Response:** Database Administrator—If appropriate, use the information in message 1120937 to diagnose the problem. If the problem persists, contact IBM Software Support.

---

**1120920      The DB2 OLAP Server encountered an error while preparing to read data.**

**Explanation:** The DB2 OLAP Server is unable to read the required data.

**User Response:** System Administrator—Contact IBM Software Support.

---

**1120921      The DB2 OLAP Server encountered an internal error while preparing to read data.**

**Explanation:** The DB2 OLAP Server is unable to read the required data.

**User Response:** System Administrator—Contact your support representative.

---

**1120922      The DB2 OLAP Server encountered an error while preparing to run an SQL statement to read data.**

**Explanation:** The DB2 OLAP Server is unable to read the required data.

**User Response:** Database Administrator—Use the 1120937 messages following this message to diagnose the problem. If you are unable to resolve the problem, contact IBM Software Support.

---

**1120923      The DB2 OLAP Server detected an internal error while reading data.**

**Explanation:** No rows were read. The read action may have failed.

**User Response:** System Administrator—Contact your support representative.

---

**1120924      The relational database returned information when data was read.**

**Explanation:** This message is for information only. The read request completed.

**User Response:** Database Administrator—If appropriate, use the information in message 1120937 to diagnose the problem. If the problem persists, contact your support representative.

---

**1120925      The relational database returned an error when data was read.**

**Explanation:** Data read failed. The read action will not complete.

**User Response:** Database Administrator—Use

the information in message 1120937 to diagnose the problem. If you are unable to resolve the problem, contact your support representative.

---

**1120926**      **The relational database returned information following an extended read.**

**Explanation:** This is for information only. The read request completed.

**User Response:** Database Administrator—If appropriate, use the information in message 1120937 to diagnose the problem. If the problem persists, contact your support representative.

---

**1120927**      **The relational database returned an error when processing an extended read.**

**Explanation:** Data read failed. The read action will not complete.

**User Response:** Database Administrator—Use the information in message 1120937 to diagnose the problem. If you are unable to resolve the problem, contact your support representative.

---

**1120928**      **The relational database returned an error when preparing an extended read.**

**Explanation:** Data read failed. The read action will not complete.

**User Response:** Database Administrator—Use the information in message 1120937 to diagnose the problem. If you are unable to resolve the problem, contact your support representative.

---

**1120929**      **The relational database returned information when the DB2 OLAP Server requested a named data cursor.**

**Explanation:** This is for information only. The data cursor was obtained.

**User Response:** Database Administrator—If appropriate, use the information in message 1120937 to diagnose the problem. If the problem persists, contact your support representative.

---

**1120930**      **The relational database returned an error when the DB2 OLAP Server requested a named data cursor.**

**Explanation:** The DB2 OLAP Server was unable to obtain a cursor to read data. The current action will fail.

**User Response:** Database Administrator—Use the information in message 1120937 to diagnose the problem. If you are unable to resolve the problem, contact your support representative.

---

**1120931**      **The DB2 OLAP Server encountered a column with an unsupported data type while copying a table.**

**Explanation:** The DB2 OLAP Server could not copy the table. The action will fail.

**User Response:** System Administrator—Contact your support representative.

---

**1120932**      **The DB2 OLAP Server encountered a column with an unknown data type while copying a table.**

**Explanation:** The DB2 OLAP Server could not copy the table. The action will fail.

**User Response:** System Administrator—Contact your support representative.

---

**1120937**      **Database error information: %s.**

**Explanation:** All database messages are reported using this message. Previous messages in the log indicate the state of the system.

**User Response:** System and database administrators should use these messages to diagnose problems with the relational database.



---

**1120938**      **The relational database returned an error when the DB2 OLAP Server requested a result column count.**

**Explanation:** The DB2 OLAP Server is unable to complete preparing to read data. The current action will fail.

**User Response:** Database Administrator—Use the information in message 1120937 to diagnose the problem. If you are unable to resolve the problem, contact IBM Software Support.

---

**1120939**      **The relational database returned information when the DB2 OLAP Server requested a result set description.**

**Explanation:** The DB2 OLAP Server was able to complete preparing to read data. This message is for information only.

**User Response:** Database Administrator—If appropriate, use the information in message 1120937 to diagnose the problem. If the problem persists, contact IBM Software Support.

---

**1120940**      **The relational database returned an error when the DB2 OLAP Server requested a result set description.**

**Explanation:** The DB2 OLAP Server was unable to complete preparing to read data. The current operation will fail.

**User Response:** Database Administrator—Use the information in message 1120937 to diagnose the problem. If you are unable to resolve the problem, contact IBM Software Support.

---

**1120941**      **The DB2 OLAP Server encountered an internal error while preparing an SQL string.**

**Explanation:** The length of an SQL string exceeded the amount of memory available to store the string. The SQL statement cannot be constructed or run. The current action will fail.

**User Response:** System Administrator—Contact IBM Software Support.

---

**1120942**      **The relational database returned information when the DB2 OLAP Server prepared an SQL SELECT statement.**

**Explanation:** The expression was prepared and the current action will complete. This message is for information only.

**User Response:** Database Administrator—If appropriate, use the information in message 1120937 to diagnose the problem. If the problem persists, contact IBM Software Support.

---

**1120943**      **The relational database returned information when the DB2 OLAP Server read internal ID data.**

**Explanation:** This is for information only. The read request completed.

**User Response:** Database Administrator—If appropriate, use the 1120937 messages following this message to diagnose the problem. If the problem persists, contact IBM Software Support.

---

**1120944**      **The relational database returned an error when the DB2 OLAP Server read internal ID data.**

**Explanation:** Data read failed. The read action will not complete.

**User Response:** Database Administrator—Use the information in message 1120937 to diagnose the problem. If you are unable to resolve the problem, contact your support representative.

---

**1120945**      **DB2 OLAP Server encountered an internal error when attempting to allocate a new internal ID.**

**Explanation:** DB2 OLAP Server is unable to allocate any internal IDs. The current action will fail.

**User Response:** Contact IBM Software Support.

---

**1120946**      **DB2 OLAP Server encountered an internal error when attempting to query configuration information for the relational database.**

**Explanation:** DB2 OLAP Server is unable to complete the current action.

**User Response:** Contact IBM Software Support.

---

**1120947**      **DB2 OLAP Server encountered an error because DB2 is not enabled for multiple concurrent connections.**

**Explanation:** For S/390 Only: DB2 OLAP Server encountered an error because DB2 is not enabled for multiple concurrent connections.

**User Response:** Refer to the DB2 OLAP Server documentation and the DB2 documentation to see how DB2 should be enabled for multiple concurrent connections.

---

**1121000**      **DB2 OLAP Server failed to open the storage manager. Report this error to your system administrator.**

**Explanation:** The DB2 OLAP Server will not start.

**User Response:** System Administrator—Check the application log file for DB2 error information. If you are unable to resolve the problem, contact IBM Software Support.

---

**1121001**      **DB2 OLAP Server failed to close storage manager. Report this error to your system administrator.**

**Explanation:** An error occurred with the relational database.

**User Response:** System Administrator—Check the application log file for DB2 error information. If you are unable to resolve the problem, contact IBM Software Support.

---

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**1121002**      **DB2 OLAP Server failed to open the application. Report this error to your system administrator.**

**Explanation:** An error occurred with the relational database.

**User Response:** System Administrator—Check the application log file for DB2 error information. If you are unable to resolve the problem, contact IBM Software Support.

---

**1121003**      **DB2 OLAP Server failed to close an application. Report this error to your system administrator.**

**Explanation:** An error occurred with the relational database.

**User Response:** System Administrator—Check the application log file for DB2 error information. If you are unable to resolve the problem, contact IBM Software Support.

---

**1121004**      **DB2 OLAP Server failed to open a database. Report this error to your system administrator.**

**Explanation:** An error occurred with the relational database.

**User Response:** System Administrator—Check the application log file for DB2 error information. If you are unable to resolve the problem, contact IBM Software Support.

---

**1121005**      **DB2 OLAP Server failed to close a database. Report this error to your system administrator.**

**Explanation:** An error occurred with the relational database.

**User Response:** System Administrator—Check the application log file for DB2 error information. If you are unable to resolve the problem, contact IBM Software Support.

---

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**1121006**      **DB2 OLAP Server failed to open a thread. Report this error to your system administrator.**

**Explanation:** An error occurred with the relational database.

**User Response:** System Administrator—Check the application log file for DB2 error information. If you are unable to resolve the problem, contact IBM Software Support.

---

**1121007**      **DB2 OLAP Server failed to close a thread. Report this error to your system administrator.**

**Explanation:** An error occurred with the relational database.

**User Response:** System Administrator—Check the application log file for DB2 error information. If you are unable to resolve the problem, contact IBM Software Support.

---

**1121008**      **DB2 OLAP Server failed to open a transaction. Report this error to your system administrator.**

**Explanation:** An error occurred with the relational database.

**User Response:** System Administrator—Check the application log file for DB2 error information. If you are unable to resolve the problem, contact IBM Software Support.

---

**1121009**      **DB2 OLAP Server failed to close a transaction. Report this error to your system administrator.**

**Explanation:** An error occurred with the relational database.

**User Response:** System Administrator—Use the information in previous messages to diagnose and correct the problem. If you are unable to resolve the problem, contact IBM Software Support.

---

**1121010**      **DB2 OLAP Server failed to commit a transaction. Report this error to your system administrator.**

**Explanation:** An error occurred with the relational database.

**User Response:** System Administrator—Check the application log file for DB2 error information. If you are unable to resolve the problem, contact IBM Software Support.

---

**1121011**      **DB2 OLAP Server failed to abort a transaction. Report this error to your system administrator.**

**Explanation:** An error occurred with the relational database.

**User Response:** System Administrator—Check the application log file for DB2 error information. If you are unable to resolve the problem, contact IBM Software Support.

---

**1121012**      **DB2 OLAP Server failed to fix a block. Report this error to your system administrator.**

**Explanation:** An error occurred with the relational database.

**User Response:** System Administrator—Check the application log file for DB2 error information. If you are unable to resolve the problem, contact IBM Software Support.

---

**1121013**      **DB2 OLAP Server failed to fix the next block. Report this error to your system administrator.**

**Explanation:** An error occurred with the relational database.

**User Response:** System Administrator—Check the application log file for DB2 error information. If you are unable to resolve the problem, contact IBM Software Support.

---

**1121014**      **DB2 OLAP Server failed to read a block. Report this error to your system administrator.**

**Explanation:** An error occurred with the relational database.

**User Response:** System Administrator—Check the application log file for DB2 error information. If you are unable to resolve the problem, contact IBM Software Support.

---

**1121015**      **DB2 OLAP Server failed to unfix a block. Report this error to your system administrator.**

**Explanation:** An error occurred with the relational database.

**User Response:** System Administrator—Check the application log file for DB2 error information. If you are unable to resolve the problem, contact IBM Software Support.

---

**1121016**      **DB2 OLAP Server failed to set the database to a read-only state. Report this error to your system administrator.**

**Explanation:** An error occurred with the relational database.

**User Response:** System Administrator—Check the application log file for DB2 error information. If you are unable to resolve the problem, contact IBM Software Support.

---

**1121017**      **DB2 OLAP Server failed to set the database to a read-write state. Report this error to your system administrator.**

**Explanation:** An error occurred with the relational database.

**User Response:** System Administrator—Check the application log file for DB2 error information. If you are unable to resolve the problem, contact IBM Software Support.

---

**1121018**      **DB2 OLAP Server failed to clear the data from database. Report this error to your system administrator.**

**Explanation:** An error occurred with the relational database.

**User Response:** System Administrator—Check the application log file for DB2 error information. If you are unable to resolve the problem, contact IBM Software Support.

---

**1121019**      **DB2 OLAP Server failed to retrieve database information. Report this error to your system administrator.**

**Explanation:** An error occurred with the relational database.

**User Response:** System Administrator—Check the application log file for DB2 error information. If you are unable to resolve the problem, contact IBM Software Support.

---

**1121020**      **DB2 OLAP Server failed to retrieve database information. Report this error to your system administrator.**

**Explanation:** An error occurred with the relational database.

**User Response:** System Administrator—Check the application log file for DB2 error information. If you are unable to resolve the problem, contact IBM Software Support.

---

**1121021**      **DB2 OLAP Server failed to free database information. Report this error to your system administrator.**

**Explanation:** An error occurred with the relational database.

**User Response:** System Administrator—Check the application log file for DB2 error information. If you are unable to resolve the problem, contact IBM Software Support.

---

**1121022**      **DB2 OLAP Server failed to restructure a database. Report this error to your system administrator.**

**Explanation:** An error occurred with the relational database.

**User Response:** System Administrator—Check the application log file for DB2 error information. If you are unable to resolve the problem, contact IBM Software Support.

---

**1121023**      **DB2 OLAP Server failed to create a new database. Report this error to your system administrator.**

**Explanation:** An error occurred with the relational database.

**User Response:** System Administrator—Check the application log file for DB2 error information. If you are unable to resolve the problem, contact IBM Software Support.

---

**1121024**      **DB2 OLAP Server failed to delete a database. Report this error to your system administrator.**

**Explanation:** An error occurred with the relational database.

**User Response:** System Administrator—Check the application log file for DB2 error information. If you are unable to resolve the problem, contact IBM Software Support.

---

**1121025**      **DB2 OLAP Server failed to rename a database. Report this error to your system administrator.**

**Explanation:** An error occurred with the relational database.

**User Response:** System Administrator—Check the application log file for DB2 error information. If you are unable to resolve the problem, contact IBM Software Support.

---

**1121026**      **DB2 OLAP Server failed to copy a database. Report this error to your system administrator.**

**Explanation:** An error occurred with the relational database.

**User Response:** System Administrator—Check the application log file for DB2 error information. If you are unable to resolve the problem, contact IBM Software Support.

---

**1121027**      **DB2 OLAP Server failed to archive a database. Report this error to your system administrator.**

**Explanation:** An error occurred with the relational database.

**User Response:** System Administrator—Check the application log file for DB2 error information. If you are unable to resolve the problem, contact IBM Software Support.

---

**1121028**      **DB2 OLAP Server failed to validate a database. Report this error to your system administrator.**

**Explanation:** An error occurred with the relational database.

**User Response:** System Administrator—Check the application log file for DB2 error information. If you are unable to resolve the problem, contact IBM Software Support.

---

**1121029**      **DB2 OLAP Server failed to create a new application. Report this error to your system administrator.**

**Explanation:** An error occurred with the relational database.

**User Response:** System Administrator—Check the application log file for DB2 error information. If you are unable to resolve the problem, contact IBM Software Support.

---

**1121030**      **DB2 OLAP Server failed to delete an application. Report this error to your system administrator.**

**Explanation:** An error occurred with the relational database.

**User Response:** System Administrator—Check the application log file for DB2 error information. If you are unable to resolve the problem, contact IBM Software Support.

---

**1121031**      **DB2 OLAP Server failed to rename an application. Report this error to your system administrator.**

**Explanation:** An error occurred with the relational database.

**User Response:** System Administrator—Check the application log file for DB2 error information. If you are unable to resolve the problem, contact IBM Software Support.

---

**1121032**      **DB2 OLAP Server failed to copy an application. Report this error to your system administrator.**

**Explanation:** An error occurred with the relational database.

**User Response:** System Administrator—Check the application log file for DB2 error information. If you are unable to resolve the problem, contact IBM Software Support.

---

**1121033**      **DB2 OLAP Server failed to link an object. Report this error to your system administrator.**

**Explanation:** An error occurred with the relational database.

**User Response:** System Administrator—Check the application log file for DB2 error information. If you are unable to resolve the problem, contact IBM Software Support.

---

**1121034**      **DB2 OLAP Server failed to delete a linked object. Report this error to your system administrator.**

**Explanation:** An error occurred with the relational database.

**User Response:** System Administrator—Check the application log file for DB2 error information. If you are unable to resolve the problem, contact IBM Software Support.

---

**1121035**      **DB2 OLAP Server failed to update a linked object. Report this error to your system administrator.**

**Explanation:** An error occurred with the relational database.

**User Response:** System Administrator—Check the application log file for DB2 error information. If you are unable to resolve the problem, contact IBM Software Support.

---

**1121036**      **DB2 OLAP Server failed to get a linked object. Report this error to your system administrator.**

**Explanation:** An error occurred with the relational database.

**User Response:** System Administrator—Check the application log file for DB2 error information. If you are unable to resolve the problem, contact IBM Software Support.

---

**1121037**      **DB2 OLAP Server failed to get the catalog of linked objects.**

**Explanation:** An error occurred with the relational database.

**User Response:** System Administrator—Check the application log file for DB2 error information. If you are unable to resolve the problem, contact IBM Software Support.

---

**1121038 DB2 OLAP Server failed to list the linked objects.**

**Explanation:** An error occurred with the relational database.

**User Response:** System Administrator—Check the application log file for DB2 error information. If you are unable to resolve the problem, contact IBM Software Support.

---

**1121039 DB2 OLAP Server failed to purge the linked objects.**

**Explanation:** An error occurred with the relational database.

**User Response:** System Administrator—Check the application log file for DB2 error information. If you are unable to resolve the problem, contact IBM Software Support.

---

**1121041 DB2 OLAP Server failed to create a list of LRO flags. Report this error to your system administrator.**

**Explanation:** An error occurred with the relational database.

**User Response:** System Administrator—Check the application log file for DB2 error information. If you are unable to resolve the problem, contact IBM Software Support.

---

**1121042 DB2 OLAP Server failed to free LRO memory. Report this error to your system administrator.**

**Explanation:** An error occurred with the relational database.

**User Response:** System Administrator—Check the application log file for DB2 error information. If you are unable to resolve the problem, contact IBM Software Support.

---

**1121200 The LRO object was not updated because the provided status did not match the status in the LRO table.**

**Explanation:** An error occurred with the relational database. Report this error to your system administrator.

**User Response:** System Administrator—Check the application log file for DB2 error information. If you are unable to resolve the problem, contact IBM Software Support.

---

**1121201 The LRO object was not updated because the provided object type did not match the object type in the LRO table.**

**Explanation:** An error occurred with the relational database. Report this error to your system administrator.

**User Response:** System Administrator—Check the application log file for DB2 error information. If you are unable to resolve the problem, contact IBM Software Support.

---

**1121202 The update or get LRO operation failed because the LRO object was not found in the LRO table.**

**Explanation:** An error occurred with the relational database. Report this error to your system administrator.

**User Response:** System Administrator—Check the application log file for DB2 error information. If you are unable to resolve the problem, contact IBM Software Support.

---

**1121302 The removal of the relational attribute column [%s] failed because relational attributes exist in the column. The column must be empty before being removed. Outline changes were rejected.**

**Explanation:** The removal of a relational attribute column failed because there are still relational attributes in the column.

**User Response:** Delete all the relational attributes from the relational attribute column before removing the column.

---

**1121303**      **No relational attribute column name was found after the RELCOL keyword for the dimension [%s]. Outline changes were rejected.**

**Explanation:** The addition of a relational attribute column failed because no column name was found following the RELCOL keyword.

**User Response:** Specify a RELCOL UDA that conforms to the rules for adding a relational attribute column. For example: RELCOL columnname datatype

---

**1121304**      **No data type was found after the RELCOL keyword and relational attribute column name [%s] for dimension [%s]. Outline changes were rejected.**

**Explanation:** The addition of a relational attribute column failed because no data type was found following the column name after the RELCOL keyword.

**User Response:** Specify a RELCOL UDA that conforms to the rules for adding a relational attribute column. For example: RELCOL columnname datatype

---

**1121305**      **The relational attribute column name [%s] specified after the RELCOL keyword for dimension [%s] is too long. Outline changes were rejected.**

**Explanation:** The addition of a relational attribute column failed because the column name was too long.

**User Response:** Specify a RELCOL UDA that contains a column name that is not greater than the maximum length for your database.

---

**1121306**      **No recognized data type was found after the RELCOL keyword and relational attribute column name [%s] for dimension [%s]. Outline changes were rejected.**

**Explanation:** The addition of a relational attribute column failed because the data type specified was not recognized.

**User Response:** Specify a RELCOL UDA which contains a supported data type.

---

**1121307**      **No size was found following a character data type after the RELCOL keyword and relational attribute column name [%s] for dimension [%s]. Outline changes were rejected.**

**Explanation:** The addition of a relational attribute column failed because no size was specified with the character data type.

**User Response:** Specify a RELCOL UDA that conforms to the syntax for a character data type column. For example: RELCOL columnname CHAR(10)

---

**1121308**      **No matching single quote was found at the end of a column name after the RELCOL keyword for dimension [%s]. Outline changes were rejected.**

**Explanation:** The addition of a relational attribute column failed because no matching single quote was found at the end of the column name.

**User Response:** Specify a RELCOL UDA that conforms to the syntax for adding a column with the columns name surrounding by single quotes. For example: RELCOL 'nnn' integer



---

**1121309**      **The column name [%s] after the RELCOL keyword for dimension [%s] does not conform to the naming convention for columns in the relational database. Outline changes were rejected.**

**Explanation:** The addition of a relational attribute column failed because the column name contains characters not allowed in a column name by the relational database.

**User Response:** Specify a RELCOL UDA with a column name that conforms to the naming convention for columns in the relational database, or surround the column name with single quotes.

---

**1121310**      **The column name [%s] after the RELCOL keyword for dimension [%s] is the same as the name of a current relational attribute column or an attribute column being deleted. Outline changes were rejected.**

**Explanation:** The addition of a relational attribute column failed because the column name is the same as either a current relational attribute column or a column that is being deleted.

**User Response:** Take one of the following actions:

- Specify a RELCOL UDA with a column name that is different from any current relational attribute columns for the dimension.
- Delete the current column, save the outline, and add the new relational attribute column.

---

**1121311**      **The column name [%s] after the RELCOL keyword for dimension [%s] is the same as the name of a current alias table. Outline changes were rejected.**

**Explanation:** The addition of a relational attribute column failed because the column name is the same as a current alias table name.

**User Response:** Specify a RELCOL UDA with a

column name that is different from any current alias table name.

---

**1121312**      **No relational attribute column name was found after the RELVAL keyword for member [%s] in dimension [%s]. Outline changes were rejected.**

**Explanation:** The addition of a relational attribute value failed because no column name was found following the RELVAL keyword.

**User Response:** Specify a RELVAL UDA that conforms to the rules for adding a relational attribute value. For example: RELVAL columnname datavalue

---

**1121313**      **No data value was found after the relational attribute column name and RELVAL keyword for member [%s] in dimension [%s]. Outline changes were rejected.**

**Explanation:** The addition of a relational attribute value failed because no value was found following the column name after the RELVAL keyword.

**User Response:** Specify a RELVAL UDA that conforms to the rules for adding a relational attribute value. For example: RELVAL columnname datavalue

---

**1121314**      **The relational attribute column name specified after the RELVAL keyword for member [%s] in dimension [%s] is too long. Outline changes were rejected.**

**Explanation:** The addition of a relational attribute value failed because the column name was too long.

**User Response:** Specify a RELVAL UDA that contains a column name that is not greater than the maximum length for your database.

---

**1121315**      **The column name specified after the RELVAL keyword for member [%s] is not recognized as an existing relational attribute column for dimension [%s]. Outline changes were rejected.**

**Explanation:** The addition of a relational attribute value failed because the column name was not recognized.

**User Response:** Specify a RELVAL UDA that contains a column name that was previously specified in a RELCOL UDA.

---

**1121316**      **No quotes were found surrounding the character data after the RELVAL keyword and relational attribute column name for member [%s] in dimension [%s]. Outline changes were rejected.**

**Explanation:** The addition of a relational attribute character value failed because it was not surrounded by single quotes.

**User Response:** Specify a RELVAL UDA that conforms to the syntax for a character data type column. For example: RELVAL columnname 'A string'

---

**1121317**      **No matching single quote was found at the end of a column name after the RELVAL keyword for member [%s] in dimension [%s]. Outline changes were rejected.**

**Explanation:** The addition of a relational attribute value failed because no matching single quote was found at the end of the column name.

**User Response:** Specify a RELVAL UDA that conforms to the syntax for adding a value with the column name surrounding by single quotes. For example: RELVAL columnname 'A string'

---

**1121318**      **Character data following the RELVAL keyword is larger than the size specified for the relational attribute column for member [%s] in dimension [%s]. Outline changes were rejected.**

**Explanation:** The addition of a relational attribute value failed because the character data supplied is larger than the column size specified.

**User Response:** Specify a RELVAL UDA which has character data less than or equal to the size specified for the column.

---

## Appendix B. Using the DB2 Library

The DB2 Universal Database library consists of online help, books (PDF and HTML), and sample programs in HTML format. This section describes the information that is provided, and how you can access it.

To access product information online, you can use the Information Center. For more information, see “Accessing Information with the Information Center” on page 235. You can view task information, DB2 books, troubleshooting information, sample programs, and DB2 information on the Web.

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### DB2 PDF Files and Printed Books

#### DB2 Information

The following table divides the DB2 books into four categories:

##### **DB2 Guide and Reference Information**

These books contain the common DB2 information for all platforms.

##### **DB2 Installation and Configuration Information**

These books are for DB2 on a specific platform. For example, there are separate *Quick Beginnings* books for DB2 on OS/2, Windows, and UNIX-based platforms.

##### **Cross-platform sample programs in HTML**

These samples are the HTML version of the sample programs that are installed with the Application Development Client. The samples are for informational purposes and do not replace the actual programs.

##### **Release notes**

These files contain late-breaking information that could not be included in the DB2 books.

The installation manuals, release notes, and tutorials are viewable in HTML directly from the product CD-ROM. Most books are available in HTML on the product CD-ROM for viewing and in Adobe Acrobat (PDF) format on the DB2 publications CD-ROM for viewing and printing. You can also order a printed copy from IBM; see “Ordering the Printed Books” on page 231. The following table lists books that can be ordered.

On OS/2 and Windows platforms, you can install the HTML files under the `sql1lib\doc\html` directory. DB2 information is translated into different

languages; however, all the information is not translated into every language. Whenever information is not available in a specific language, the English information is provided

On UNIX platforms, you can install multiple language versions of the HTML files under the `doc/%L/html` directories, where `%L` represents the locale. For more information, refer to the appropriate *Quick Beginnings* book.

You can obtain DB2 books and access information in a variety of ways:

- “Viewing Information Online” on page 234
- “Searching Information Online” on page 238
- “Ordering the Printed Books” on page 231
- “Printing the PDF Books” on page 230

Table 25. DB2 Information

Name	Description	Form Number PDF File Name	HTML Directory
<b>DB2 Guide and Reference Information</b>			
<i>Administration Guide</i>	<i>Administration Guide: Planning</i> provides an overview of database concepts, information about design issues (such as logical and physical database design), and a discussion of high availability.	SC09-2946 db2d1x70	db2d0
	<i>Administration Guide: Implementation</i> provides information on implementation issues such as implementing your design, accessing databases, auditing, backup and recovery.	SC09-2944 db2d2x70	
	<i>Administration Guide: Performance</i> provides information on database environment and application performance evaluation and tuning.	SC09-2945 db2d3x70	
	You can order the three volumes of the <i>Administration Guide</i> in the English language in North America using the form number SBOF-8934.		
<i>Administrative API Reference</i>	Describes the DB2 application programming interfaces (APIs) and data structures that you can use to manage your databases. This book also explains how to call APIs from your applications.	SC09-2947 db2b0x70	db2b0

Table 25. DB2 Information (continued)

Name	Description	Form Number PDF File Name	HTML Directory
<i>Application Building Guide</i>	Provides environment setup information and step-by-step instructions about how to compile, link, and run DB2 applications on Windows, OS/2, and UNIX-based platforms.	SC09-2948 db2axx70	db2ax
<i>APPC, CPI-C, and SNA Sense Codes</i>	Provides general information about APPC, CPI-C, and SNA sense codes that you may encounter when using DB2 Universal Database products.	No form number db2apx70	db2ap
	Available in HTML format only.		
<i>Application Development Guide</i>	Explains how to develop applications that access DB2 databases using embedded SQL or Java (JDBC and SQLJ). Discussion topics include writing stored procedures, writing user-defined functions, creating user-defined types, using triggers, and developing applications in partitioned environments or with federated systems.	SC09-2949 db2a0x70	db2a0
<i>CLI Guide and Reference</i>	Explains how to develop applications that access DB2 databases using the DB2 Call Level Interface, a callable SQL interface that is compatible with the Microsoft ODBC specification.	SC09-2950 db2l0x70	db2l0
<i>Command Reference</i>	Explains how to use the Command Line Processor and describes the DB2 commands that you can use to manage your database.	SC09-2951 db2n0x70	db2n0
<i>Connectivity Supplement</i>	Provides setup and reference information on how to use DB2 for AS/400, DB2 for OS/390, DB2 for MVS, or DB2 for VM as DRDA application requesters with DB2 Universal Database servers. This book also details how to use DRDA application servers with DB2 Connect application requesters.	No form number db2h1x70	db2h1
	Available in HTML and PDF only.		

Table 25. DB2 Information (continued)

Name	Description	Form Number PDF File Name	HTML Directory
<i>Data Movement Utilities Guide and Reference</i>	Explains how to use DB2 utilities, such as import, export, load, AutoLoader, and DPROP, that facilitate the movement of data.	SC09-2955 db2dmx70	db2dm
<i>Data Warehouse Center Administration Guide</i>	Provides information on how to build and maintain a data warehouse using the Data Warehouse Center.	SC26-9993 db2ddx70	db2dd
<i>Data Warehouse Center Application Integration Guide</i>	Provides information to help programmers integrate applications with the Data Warehouse Center and with the Information Catalog Manager.	SC26-9994 db2adx70	db2ad
<i>DB2 Connect User's Guide</i>	Provides concepts, programming, and general usage information for the DB2 Connect products.	SC09-2954 db2c0x70	db2c0
<i>DB2 Query Patroller Administration Guide</i>	Provides an operational overview of the DB2 Query Patroller system, specific operational and administrative information, and task information for the administrative graphical user interface utilities.	SC09-2958 db2dwx70	db2dw
<i>DB2 Query Patroller User's Guide</i>	Describes how to use the tools and functions of the DB2 Query Patroller.	SC09-2960 db2wwx70	db2ww
<i>Glossary</i>	Provides definitions for terms used in DB2 and its components.  Available in HTML format and in the <i>SQL Reference</i> .	No form number db2t0x70	db2t0
<i>Image, Audio, and Video Extenders Administration and Programming</i>	Provides general information about DB2 extenders, and information on the administration and configuration of the image, audio, and video (IAV) extenders and on programming using the IAV extenders. It includes reference information, diagnostic information (with messages), and samples.	SC26-9929 dmbu7x70	dmbu7
<i>Information Catalog Manager Administration Guide</i>	Provides guidance on managing information catalogs.	SC26-9995 db2dix70	db2di

Table 25. DB2 Information (continued)

Name	Description	Form Number PDF File Name	HTML Directory
<i>Information Catalog Manager Programming Guide and Reference</i>	Provides definitions for the architected interfaces for the Information Catalog Manager.	SC26-9997 db2bix70	db2bi
<i>Information Catalog Manager User's Guide</i>	Provides information on using the Information Catalog Manager user interface.	SC26-9996 db2aix70	db2ai
<i>Installation and Configuration Supplement</i>	Guides you through the planning, installation, and setup of platform-specific DB2 clients. This supplement also contains information on binding, setting up client and server communications, DB2 GUI tools, DRDA AS, distributed installation, the configuration of distributed requests, and accessing heterogeneous data sources.	GC09-2957 db2iyx70	db2iy
<i>Message Reference</i>	Lists messages and codes issued by DB2, the Information Catalog Manager, and the Data Warehouse Center, and describes the actions you should take.  You can order both volumes of the Message Reference in the English language in North America with the form number SBOF-8932.	Volume 1 GC09-2978 db2m1x70 Volume 2 GC09-2979 db2m2x70	db2m0
<i>OLAP Integration Server Administration Guide</i>	Explains how to use the Administration Manager component of the OLAP Integration Server.	SC27-0787 db2dpx70	n/a
<i>OLAP Integration Server Metaoutline User's Guide</i>	Explains how to create and populate OLAP metaoutlines using the standard OLAP Metaoutline interface (not by using the Metaoutline Assistant).	SC27-0784 db2upx70	n/a
<i>OLAP Integration Server Model User's Guide</i>	Explains how to create OLAP models using the standard OLAP Model Interface (not by using the Model Assistant).	SC27-0783 db2lpx70	n/a
<i>OLAP Setup and User's Guide</i>	Provides configuration and setup information for the OLAP Starter Kit.	SC27-0702 db2ipx70	db2ip
<i>OLAP Spreadsheet Add-in User's Guide for Excel</i>	Describes how to use the Excel spreadsheet program to analyze OLAP data.	SC27-0786 db2epx70	db2ep

Table 25. DB2 Information (continued)

Name	Description	Form Number PDF File Name	HTML Directory
<i>OLAP Spreadsheet Add-in User's Guide for Lotus 1-2-3</i>	Describes how to use the Lotus 1-2-3 spreadsheet program to analyze OLAP data.	SC27-0785 db2tpx70	db2tp
<i>Replication Guide and Reference</i>	Provides planning, configuration, administration, and usage information for the IBM Replication tools supplied with DB2.	SC26-9920 db2e0x70	db2e0
<i>Spatial Extender User's Guide and Reference</i>	Provides information about installing, configuring, administering, programming, and troubleshooting the Spatial Extender. Also provides significant descriptions of spatial data concepts and provides reference information (messages and SQL) specific to the Spatial Extender.	SC27-0701 db2sbx70	db2sb
<i>SQL Getting Started</i>	Introduces SQL concepts and provides examples for many constructs and tasks.	SC09-2973 db2y0x70	db2y0
<i>SQL Reference, Volume 1 and Volume 2</i>	Describes SQL syntax, semantics, and the rules of the language. This book also includes information about release-to-release incompatibilities, product limits, and catalog views.  You can order both volumes of the <i>SQL Reference</i> in the English language in North America with the form number SBOF-8933.	Volume 1 SC09-2974 db2s1x70  Volume 2 SC09-2975 db2s2x70	db2s0
<i>System Monitor Guide and Reference</i>	Describes how to collect different kinds of information about databases and the database manager. This book explains how to use the information to understand database activity, improve performance, and determine the cause of problems.	SC09-2956 db2f0x70	db2f0
<i>Text Extender Administration and Programming</i>	Provides general information about DB2 extenders and information on the administration and configuring of the text extender and on programming using the text extenders. It includes reference information, diagnostic information (with messages) and samples.	SC26-9930 desu9x70	desu9



Table 25. DB2 Information (continued)

Name	Description	Form Number PDF File Name	HTML Directory
<i>Troubleshooting Guide</i>	Helps you determine the source of errors, recover from problems, and use diagnostic tools in consultation with DB2 Customer Service.	GC09-2850 db2p0x70	db2p0
<i>What's New</i>	Describes the new features, functions, and enhancements in DB2 Universal Database, Version 7.	SC09-2976 db2q0x70	db2q0
<b>DB2 Installation and Configuration Information</b>			
<i>DB2 Connect Enterprise Edition for OS/2 and Windows Quick Beginnings</i>	Provides planning, migration, installation, and configuration information for DB2 Connect Enterprise Edition on the OS/2 and Windows 32-bit operating systems. This book also contains installation and setup information for many supported clients.	GC09-2953 db2c6x70	db2c6
<i>DB2 Connect Enterprise Edition for UNIX Quick Beginnings</i>	Provides planning, migration, installation, configuration, and task information for DB2 Connect Enterprise Edition on UNIX-based platforms. This book also contains installation and setup information for many supported clients.	GC09-2952 db2cyx70	db2cy
<i>DB2 Connect Personal Edition Quick Beginnings</i>	Provides planning, migration, installation, configuration, and task information for DB2 Connect Personal Edition on the OS/2 and Windows 32-bit operating systems. This book also contains installation and setup information for all supported clients.	GC09-2967 db2c1x70	db2c1
<i>DB2 Connect Personal Edition Quick Beginnings for Linux</i>	Provides planning, installation, migration, and configuration information for DB2 Connect Personal Edition on all supported Linux distributions.	GC09-2962 db2c4x70	db2c4
<i>DB2 Data Links Manager Quick Beginnings</i>	Provides planning, installation, configuration, and task information for DB2 Data Links Manager for AIX and Windows 32-bit operating systems.	GC09-2966 db2z6x70	db2z6

Table 25. DB2 Information (continued)

Name	Description	Form Number PDF File Name	HTML Directory
<i>DB2 Enterprise - Extended Edition for UNIX Quick Beginnings</i>	Provides planning, installation, and configuration information for DB2 Enterprise - Extended Edition on UNIX-based platforms. This book also contains installation and setup information for many supported clients.	GC09-2964 db2v3x70	db2v3
<i>DB2 Enterprise - Extended Edition for Windows Quick Beginnings</i>	Provides planning, installation, and configuration information for DB2 Enterprise - Extended Edition for Windows 32-bit operating systems. This book also contains installation and setup information for many supported clients.	GC09-2963 db2v6x70	db2v6
<i>DB2 for OS/2 Quick Beginnings</i>	Provides planning, installation, migration, and configuration information for DB2 Universal Database on the OS/2 operating system. This book also contains installation and setup information for many supported clients.	GC09-2968 db2i2x70	db2i2
<i>DB2 for UNIX Quick Beginnings</i>	Provides planning, installation, migration, and configuration information for DB2 Universal Database on UNIX-based platforms. This book also contains installation and setup information for many supported clients.	GC09-2970 db2ixx70	db2ix
<i>DB2 for Windows Quick Beginnings</i>	Provides planning, installation, migration, and configuration information for DB2 Universal Database on Windows 32-bit operating systems. This book also contains installation and setup information for many supported clients.	GC09-2971 db2i6x70	db2i6
<i>DB2 Personal Edition Quick Beginnings</i>	Provides planning, installation, migration, and configuration information for DB2 Universal Database Personal Edition on the OS/2 and Windows 32-bit operating systems.	GC09-2969 db2i1x70	db2i1
<i>DB2 Personal Edition Quick Beginnings for Linux</i>	Provides planning, installation, migration, and configuration information for DB2 Universal Database Personal Edition on all supported Linux distributions.	GC09-2972 db2i4x70	db2i4

Table 25. DB2 Information (continued)

Name	Description	Form Number PDF File Name	HTML Directory
<i>DB2 Query Patroller Installation Guide</i>	Provides installation information about DB2 Query Patroller.	GC09-2959 db2iwx70	db2iw
<i>DB2 Warehouse Manager Installation Guide</i>	Provides installation information for warehouse agents, warehouse transformers, and the Information Catalog Manager.	GC26-9998 db2idx70	db2id
<b>Cross-Platform Sample Programs in HTML</b>			
Sample programs in HTML	Provides the sample programs in HTML format for the programming languages on all platforms supported by DB2. The sample programs are provided for informational purposes only. Not all samples are available in all programming languages. The HTML samples are only available when the DB2 Application Development Client is installed.  For more information on the programs, refer to the <i>Application Building Guide</i> .	No form number	db2hs
<b>Release Notes</b>			
<i>DB2 Connect Release Notes</i>	Provides late-breaking information that could not be included in the DB2 Connect books.	See note #2.	db2cr
<i>DB2 Installation Notes</i>	Provides late-breaking installation-specific information that could not be included in the DB2 books.	Available on product CD-ROM only.	
<i>DB2 Release Notes</i>	Provides late-breaking information about all DB2 products and features that could not be included in the DB2 books.	See note #2.	db2ir

**Notes:**

1. The character *x* in the sixth position of the file name indicates the language version of a book. For example, the file name *db2d0e70* identifies the English version of the *Administration Guide* and the file name *db2d0f70* identifies the French version of the same book. The following letters are used in the sixth position of the file name to indicate the language version:

Language	Identifier
Brazilian Portuguese	b

Bulgarian	u
Czech	x
Danish	d
Dutch	q
English	e
Finnish	y
French	f
German	g
Greek	a
Hungarian	h
Italian	i
Japanese	j
Korean	k
Norwegian	n
Polish	p
Portuguese	v
Russian	r
Simp. Chinese	c
Slovenian	l
Spanish	z
Swedish	s
Trad. Chinese	t
Turkish	m

2. Late breaking information that could not be included in the DB2 books is available in the Release Notes in HTML format and as an ASCII file. The HTML version is available from the Information Center and on the product CD-ROMs. To view the ASCII file:
  - On UNIX-based platforms, see the `Release.Notes` file. This file is located in the `DB2DIR/Readme/%L` directory, where `%L` represents the locale name and `DB2DIR` represents:
    - `/usr/lpp/db2_07_01` on AIX
    - `/opt/IBMDB2/V7.1` on HP-UX, PTX, Solaris, and Silicon Graphics IRIX
    - `/usr/IBMDB2/V7.1` on Linux.
  - On other platforms, see the `RELEASE.TXT` file. This file is located in the directory where the product is installed. On OS/2 platforms, you can also double-click the **IBM DB2** folder and then double-click the **Release Notes** icon.

## Printing the PDF Books

If you prefer to have printed copies of the books, you can print the PDF files found on the DB2 publications CD-ROM. Using the Adobe Acrobat Reader, you can print either the entire book or a specific range of pages. For the file name of each book in the library, see Table 25 on page 222.

You can obtain the latest version of the Adobe Acrobat Reader from the Adobe Web site at <http://www.adobe.com>.

The PDF files are included on the DB2 publications CD-ROM with a file extension of PDF. To access the PDF files:

1. Insert the DB2 publications CD-ROM. On UNIX-based platforms, mount the DB2 publications CD-ROM. Refer to your *Quick Beginnings* book for the mounting procedures.
2. Start the Acrobat Reader.
3. Open the desired PDF file from one of the following locations:
  - On OS/2 and Windows platforms:  
*x:\doc\language* directory, where *x* represents the CD-ROM drive and *language* represent the two-character country code that represents your language (for example, EN for English).
  - On UNIX-based platforms:  
*/cdrom/doc/%L* directory on the CD-ROM, where */cdrom* represents the mount point of the CD-ROM and *%L* represents the name of the desired locale.

You can also copy the PDF files from the CD-ROM to a local or network drive and read them from there.

## Ordering the Printed Books

You can order the printed DB2 books either individually or as a set (in North America only) by using a sold bill of forms (SBOF) number. To order books, contact your IBM authorized dealer or marketing representative, or phone 1-800-879-2755 in the United States or 1-800-IBM-4YOU in Canada. You can also order the books from the Publications Web page at <http://www.elink.ibm.com/pbl/pbl>.

Two sets of books are available. SBOF-8935 provides reference and usage information for the DB2 Warehouse Manager. SBOF-8931 provides reference and usage information for all other DB2 Universal Database products and features. The contents of each SBOF are listed in the following table:

Table 26. Ordering the printed books

SBOF Number	Books Included
SBOF-8931	<ul style="list-style-type: none"> <li>• Administration Guide: Planning</li> <li>• Administration Guide: Implementation</li> <li>• Administration Guide: Performance</li> <li>• Administrative API Reference</li> <li>• Application Building Guide</li> <li>• Application Development Guide</li> <li>• CLI Guide and Reference</li> <li>• Command Reference</li> <li>• Data Movement Utilities Guide and Reference</li> <li>• Data Warehouse Center Administration Guide</li> <li>• Data Warehouse Center Application Integration Guide</li> <li>• DB2 Connect User's Guide</li> <li>• Installation and Configuration Supplement</li> <li>• Image, Audio, and Video Extenders Administration and Programming</li> <li>• Message Reference, Volumes 1 and 2</li> <li>• OLAP Integration Server Administration Guide</li> <li>• OLAP Integration Server Metaoutline User's Guide</li> <li>• OLAP Integration Server Model User's Guide</li> <li>• OLAP Integration Server User's Guide</li> <li>• OLAP Setup and User's Guide</li> <li>• OLAP Spreadsheet Add-in User's Guide for Excel</li> <li>• OLAP Spreadsheet Add-in User's Guide for Lotus 1-2-3</li> <li>• Replication Guide and Reference</li> <li>• Spatial Extender Administration and Programming Guide</li> <li>• SQL Getting Started</li> <li>• SQL Reference, Volumes 1 and 2</li> <li>• System Monitor Guide and Reference</li> <li>• Text Extender Administration and Programming</li> <li>• Troubleshooting Guide</li> <li>• What's New</li> </ul>
SBOF-8935	<ul style="list-style-type: none"> <li>• Information Catalog Manager Administration Guide</li> <li>• Information Catalog Manager User's Guide</li> <li>• Information Catalog Manager Programming Guide and Reference</li> <li>• Query Patroller Administration Guide</li> <li>• Query Patroller User's Guide</li> </ul>

## DB2 Online Documentation

### Accessing Online Help

Online help is available with all DB2 components. The following table describes the various types of help.

Type of Help	Contents	How to Access...
<i>Command Help</i>	Explains the syntax of commands in the command line processor.	<p>From the command line processor in interactive mode, enter:</p> <p style="padding-left: 40px;"><i>? command</i></p> <p>where <i>command</i> represents a keyword or the entire command.</p> <p>For example, <i>? catalog</i> displays help for all the CATALOG commands, while <i>? catalog database</i> displays help for the CATALOG DATABASE command.</p>
<i>Client Configuration Assistant Help</i>	Explains the tasks you can perform in a window or notebook. The help includes overview and prerequisite information you need to know, and it describes how to use the window or notebook controls.	From a window or notebook, click the <b>Help</b> push button or press the <b>F1</b> key.
<i>Command Center Help</i>		
<i>Control Center Help</i>		
<i>Data Warehouse Center Help</i>		
<i>Event Analyzer Help</i>		
<i>Information Catalog Manager Help</i>		
<i>Satellite Administration Center Help</i>		
<i>Script Center Help</i>	<p>From the command line processor in interactive mode, enter:</p> <p style="padding-left: 40px;"><i>? XXXnnnnn</i></p> <p>where <i>XXXnnnnn</i> represents a valid message identifier.</p> <p>For example, <i>? SQL30081</i> displays help about the SQL30081 message.</p> <p>To view message help one screen at a time, enter:</p> <p style="padding-left: 40px;"><i>? XXXnnnnn   more</i></p> <p>To save message help in a file, enter:</p> <p style="padding-left: 40px;"><i>? XXXnnnnn &gt; filename.ext</i></p> <p>where <i>filename.ext</i> represents the file where you want to save the message help.</p>	

Type of Help	Contents	How to Access...
<i>SQL Help</i>	Explains the syntax of SQL statements.	<p>From the command line processor in interactive mode, enter:</p> <pre>help <i>statement</i></pre> <p>where <i>statement</i> represents an SQL statement.</p> <p>For example, help SELECT displays help about the SELECT statement.</p> <p><b>Note:</b> SQL help is not available on UNIX-based platforms.</p>
<i>SQLSTATE Help</i>	Explains SQL states and class codes.	<p>From the command line processor in interactive mode, enter:</p> <pre>? <i>sqlstate</i> or ? <i>class code</i></pre> <p>where <i>sqlstate</i> represents a valid five-digit SQL state and <i>class code</i> represents the first two digits of the SQL state.</p> <p>For example, ? 08003 displays help for the 08003 SQL state, while ? 08 displays help for the 08 class code.</p>

## Viewing Information Online

The books included with this product are in Hypertext Markup Language (HTML) softcopy format. Softcopy format enables you to search or browse the information and provides hypertext links to related information. It also makes it easier to share the library across your site.

You can view the online books or sample programs with any browser that conforms to HTML Version 3.2 specifications.

To view online books or sample programs:

- If you are running DB2 administration tools, use the Information Center.
- From a browser, click **File** —> **Open Page**. The page you open contains descriptions of and links to DB2 information:
  - On UNIX-based platforms, open the following page:

```
INSTHOME/sql1lib/doc/%L/html/index.htm
```

where %L represents the locale name.

- On other platforms, open the following page:

```
sql1lib\doc\html\index.htm
```

The path is located on the drive where DB2 is installed.



If you have not installed the Information Center, you can open the page by double-clicking the **DB2 Information** icon. Depending on the system you are using, the icon is in the main product folder or the Windows Start menu.

### **Installing the Netscape Browser**

If you do not already have a Web browser installed, you can install Netscape from the Netscape CD-ROM found in the product boxes. For detailed instructions on how to install it, perform the following:

1. Insert the Netscape CD-ROM.
2. On UNIX-based platforms only, mount the CD-ROM. Refer to your *Quick Beginnings* book for the mounting procedures.
3. For installation instructions, refer to the `CDNAVnn.txt` file, where *nn* represents your two character language identifier. The file is located at the root directory of the CD-ROM.

### **Accessing Information with the Information Center**

The Information Center provides quick access to DB2 product information. The Information Center is available on all platforms on which the DB2 administration tools are available.

You can open the Information Center by double-clicking the Information Center icon. Depending on the system you are using, the icon is in the Information folder in the main product folder or the Windows **Start** menu.

You can also access the Information Center by using the toolbar and the **Help** menu on the DB2 Windows platform.

The Information Center provides six types of information. Click the appropriate tab to look at the topics provided for that type.

<b>Tasks</b>	Key tasks you can perform using DB2.
<b>Reference</b>	DB2 reference information, such as keywords, commands, and APIs.
<b>Books</b>	DB2 books.
<b>Troubleshooting</b>	Categories of error messages and their recovery actions.
<b>Sample Programs</b>	Sample programs that come with the DB2 Application Development Client. If you did not install the DB2 Application Development Client, this tab is not displayed.
<b>Web</b>	DB2 information on the World Wide Web. To access this information, you must have a connection to the Web from your system.

When you select an item in one of the lists, the Information Center launches a viewer to display the information. The viewer might be the system help viewer, an editor, or a Web browser, depending on the kind of information you select.

The Information Center provides a find feature, so you can look for a specific topic without browsing the lists.

For a full text search, follow the hypertext link in the Information Center to the **Search DB2 Online Information** search form.

The HTML search server is usually started automatically. If a search in the HTML information does not work, you may have to start the search server using one of the following methods:

#### **On Windows**

Click **Start** and select **Programs** → **IBM DB2** → **Information** → **Start HTML Search Server**.

#### **On OS/2**

Double-click the **DB2 for OS/2** folder, and then double-click the **Start HTML Search Server** icon.

Refer to the release notes if you experience any other problems when searching the HTML information.

**Note:** The Search function is not available in the Linux, PTX, and Silicon Graphics IRIX environments.

### **Using DB2 Wizards**

Wizards help you complete specific administration tasks by taking you through each task one step at a time. Wizards are available through the Control Center and the Client Configuration Assistant. The following table lists the wizards and describes their purpose.

**Note:** The Create Database, Create Index, Configure Multisite Update, and Performance Configuration wizards are available for the partitioned database environment.

<b>Wizard</b>	<b>Helps You to...</b>	<b>How to Access...</b>
<i>Add Database</i>	Catalog a database on a client workstation.	From the Client Configuration Assistant, click <b>Add</b> .
<i>Back up Database</i>	Determine, create, and schedule a backup plan.	From the Control Center, right-click the database you want to back up and select <b>Backup</b> → <b>Database Using Wizard</b> .

<b>Wizard</b>	<b>Helps You to...</b>	<b>How to Access...</b>
<i>Configure Multisite Update</i>	Configure a multisite update, a distributed transaction, or a two-phase commit.	From the Control Center, right-click the <b>Databases</b> folder and select <b>Multisite Update</b> .
<i>Create Database</i>	Create a database, and perform some basic configuration tasks.	From the Control Center, right-click the <b>Databases</b> folder and select <b>Create</b> —> <b>Database Using Wizard</b> .
<i>Create Table</i>	Select basic data types, and create a primary key for the table.	From the Control Center, right-click the <b>Tables</b> icon and select <b>Create</b> —> <b>Table Using Wizard</b> .
<i>Create Table Space</i>	Create a new table space.	From the Control Center, right-click the <b>Table Spaces</b> icon and select <b>Create</b> —> <b>Table Space Using Wizard</b> .
<i>Create Index</i>	Advise which indexes to create and drop for all your queries.	From the Control Center, right-click the <b>Index</b> icon and select <b>Create</b> —> <b>Index Using Wizard</b> .
<i>Performance Configuration</i>	Tune the performance of a database by updating configuration parameters to match your business requirements.	From the Control Center, right-click the database you want to tune and select <b>Configure Performance Using Wizard</b> .  For the partitioned database environment, from the Database Partitions view, right-click the first database partition you want to tune and select <b>Configure Performance Using Wizard</b> .
<i>Restore Database</i>	Recover a database after a failure. It helps you understand which backup to use, and which logs to replay.	From the Control Center, right-click the database you want to restore and select <b>Restore</b> —> <b>Database Using Wizard</b> .

## Setting Up a Document Server

By default, the DB2 information is installed on your local system. This means that each person who needs access to the DB2 information must install the same files. To have the DB2 information stored in a single location, perform the following steps:

1. Copy all files and subdirectories from `\sql1lib\doc\html` on your local system to a Web server. Each book has its own subdirectory that contains all the necessary HTML and GIF files that make up the book. Ensure that the directory structure remains the same.

2. Configure the Web server to look for the files in the new location. For information, refer to the NetQuestion Appendix in the *Installation and Configuration Supplement*.
3. If you are using the Java version of the Information Center, you can specify a base URL for all HTML files. You should use the URL for the list of books.
4. When you are able to view the book files, you can bookmark commonly viewed topics. You will probably want to bookmark the following pages:
  - List of books
  - Tables of contents of frequently used books
  - Frequently referenced articles, such as the ALTER TABLE topic
  - The Search form

For information about how you can serve the DB2 Universal Database online documentation files from a central machine, refer to the NetQuestion Appendix in the *Installation and Configuration Supplement*.

### Searching Information Online

To find information in the HTML files, use one of the following methods:

- Click **Search** in the top frame. Use the search form to find a specific topic. This function is not available in the Linux, PTX, or Silicon Graphics IRIX environments.
- Click **Index** in the top frame. Use the index to find a specific topic in the book.
- Display the table of contents or index of the help or the HTML book, and then use the find function of the Web browser to find a specific topic in the book.
- Use the bookmark function of the Web browser to quickly return to a specific topic.
- Use the search function of the Information Center to find specific topics. See “Accessing Information with the Information Center” on page 235 for details.

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## Glossary

This glossary defines terms that are used in this book and throughout the IBM DB2 OLAP Server library.

**accounts dimension.** A dimension type that makes accounting intelligence available. You can tag one dimension as an accounts dimension, but an accounts dimension is not required.

**administrator.** A person who is responsible for installing and maintaining DB2 OLAP Server and for setting up user accounts and security.

**agent.** A process that starts and stops applications and databases, manages connections from users, and handles user-access security.

**alias ID table.** A table created by DB2 OLAP Server in your relational database that contains a mapping of multidimensional alias table names to ID numbers allocated by DB2 OLAP Server.

**alias ID view.** A view created by DB2 OLAP Server in your relational database that contains one row for each multidimensional alias table used with a relational cube. There is one alias ID view for each relational cube.

**alias name.** An alternate name for a dimension or member.

**anchor dimension.** A dense dimension that is specified as the dimension that DB2 OLAP Server uses to help define the structure of the fact table it creates in the relational cube for a multidimensional database.

**API.** Application programming interface. The DB2 OLAP Server API is a library of functions that you can use in a custom C or Visual Basic program to access DB2 OLAP Server.

**Application Manager.** A tool that you can use to create and maintain OLAP applications.

**application section.** A section in the Relational Storage Manager configuration file that contains values for parameters that override the values for the same parameters in the RSM section of the configuration file.

**block.** A string of data elements recorded or transmitted as a unit.

**cache.** A component of memory. Each multidimensional database contains a data cache and an index cache.

**calculation.** An equation within a database outline, a calculation script, or a report script that calculates a value for a particular member or point in a report.

**calculation script.** A text file that contains instructions to perform calculations within a multidimensional database. Also called a calc script.

**Commit Block parameter.** A parameter on the Transaction page of the Database Settings notebook in the Application Manager that you use to set the number of blocks that can be changed before DB2 OLAP Server commits the blocks.

**cube catalog table.** A table that DB2 OLAP Server creates in your relational database that contains a list of all the multidimensional databases that are stored in your relational database. The cube catalog table also shows the application with which each cube is associated. Each time that you create a multidimensional database, DB2 OLAP Server creates a new row in this table.

**cube catalog view.** A view that DB2 OLAP Server creates in your relational database that allows an SQL user to access a list of OLAP applications and relational cubes.

**cube table.** A table that DB2 OLAP Server creates in your relational database that contains a list of dimensions in a relational cube and information about each dimension.

**cube view.** A view that DB2 OLAP Server creates in your relational database that allows an SQL user to access the names of all dimensions in a relational cube and associated information for each dimension. There is one cube view for each relational cube in your relational database.

**data load.** The process of populating a multidimensional database with data. Loading data establishes actual values for the values of the cells defined in the database outline for the database.

**data load rules.** A set of operations that DB2 OLAP Server performs on data as it is loaded from an external source file.

**database administrator.** A person responsible for administering a relational database.

**database log file.** A set of primary and secondary log files consisting of log records that record all changes to a database. The database log file is used to roll back changes for units of work that are not committed and to recover a database to a consistent state.

**database managed space (DMS).** Space in a table that is managed by the database.

**database name.** The name of the relational database where you want DB2 OLAP Server to store your multidimensional data.

**database outline.** The structure that defines all elements of a database within DB2 OLAP Server. It contains definitions of dimensions and members, dense or sparse dimension tags and attributes, the anchor dimension attribute, calculations, shared members, and alternations to the basic roll-up structure of the database.

**database password.** The password for the user ID that you want DB2 OLAP Server to use to log on to your relational database.

**database section.** A section in the Relational Storage Manager configuration file that contains values for parameters that override the values for the same parameters for the current application.

**database settings.** Settings that you can modify to improve performance and space utilization for your relational database. You can change database settings by using utilities or commands supplied with your relational database management system.

**database user ID.** The user ID that you want DB2 OLAP Server to use to log on to your relational database. The default is the supervisor ID that you specify when you start DB2 OLAP Server for the first time.

**dense dimension.** A dimension with a high probability for occupying one or more data points in every combination of dimensions that occurs.

**dimension.** A data category, such as time, accounts, products, or markets. In a multidimensional database outline, the dimensions represent the highest consolidation level.

**dimension table.** A table that DB2 OLAP Server creates in your relational database that contains detailed information about the members in a dimension. There is one dimension table for each dimension in an outline.

**dimension view.** A view that DB2 OLAP Server creates in your relational database that allows an SQL user to access information about members contained in a dimension.

**ESSCMD.** A command-line interface used to perform server operations interactively or through a batch file.

**fact table.** A table, or in many cases a set of four tables, that DB2 OLAP Server creates in your relational database that contains all data values for a relational cube.

**fact view.** A view that DB2 OLAP Server creates in your relational database that allows an SQL

user to join fact data to dimensions to access the actual data values in a relational cube.

**generation name.** A unique name that describes a generation in a database outline.

**generation table.** A table that DB2 OLAP Server creates in your relational database that contains generation numbers and names for each named generation specified when you created the outline. There is one generation table for each dimension in an outline.

**isolation level.** A parameter that determines how data is locked or isolated from other transactions and processes while the data is being accessed. You can set the isolation level in the Relational Storage Manager configuration file (RSM.CFG).

**key table.** A table that DB2 OLAP Server creates in your relational database that is equivalent to the multidimensional database index. DB2 OLAP Server creates the key table after the first successful restructure.

**level name.** A unique name that describes a level in a database outline.

**level table.** A table that DB2 OLAP Server creates in your relational database that contains level numbers and names for each named level specified when you created an outline. There is one level table for each dimension in an outline.

**member.** A discrete component within a dimension. For example, January 1997 or 1Qtr97 are typical members of a Time dimension.

**metaoutline.** A template containing the structure and rules for creating a database outline from an OLAP model. Using the metaoutline, you can create a database outline and load data into it. The DB2 OLAP Integration Server desktop includes a tool called OLAP Metaoutline that you can use to create one or more metaoutlines from an OLAP model.

**model.** A logical model (star schema) that you create from tables and columns in a relational database. You can use the OLAP model to create a metaoutline that generates the structure of a

multidimensional database. The DB2 OLAP Integration Server desktop includes a tool called OLAP Metaoutline that you can use to design and create an OLAP model based on a relational data source.

**multidimensional data.** The data in a multidimensional database. Data can include basic data values (loaded from an external source) that represent combinations of the lowest level of members in the dimensions of the database; data values that are calculated from the base data values; and rolled up data values that are created by combining values for members in dimension hierarchies.

**multidimensional database.** An OLAP database that you create using the Application Manager or ESSCMD commands (in DB2 OLAP Server) or with the DB2 OLAP Integration Server desktop, which is in the Starter Kit. An OLAP database includes a database outline, data, associated optional calculation scripts, optional report scripts, and data load rules. DB2 OLAP Server stores the actual data and a shadow of the database outline in tables in a relational database.

**named pipes.** An API used for special node-to-node applications and particularly for access to communications and database servers.

**OLAP application.** An application that you create using the Application Manager or the ESSCMD commands (in DB2 OLAP Server) or with the DB2 OLAP Integration Server desktop, which is in the Starter Kit. An OLAP application can contain one or more multidimensional databases and any associated calculation scripts, report scripts, and data load rules.

**OLAP metaoutline.** See *metaoutline*.

**OLAP model.** See *model*.

**online analytical processing (OLAP).** A multidimensional, multi-user, client server computing environment for users who need to analyze consolidated enterprise data in real time.

OLAP systems feature zooming, data pivoting, complex calculations, trend analyses, and modeling.

**outline.** See *database outline*.

**RDBMS.** Relational database management system. A database that can be perceived as a set of tables and manipulated in accordance with the relational model of data.

**relational attribute.** A characteristic of a dimension table, represented by a column. You can run SQL statements against the data in relational attribute columns.

**relational cube.** A set of data and metadata stored in a relational database that together define a multidimensional database. A relational cube is similar to a multidimensional database, but refers to the portion of a multidimensional database that is stored in a relational database.

**relational database.** A database that is organized and accessed according to relationships between data items. A relational database contains a collection of relational tables, views, and indexes.

**relational database parameters.** Parameters that you can set in the Relational Storage Manager configuration file.

**relational storage manager.** A DB2 OLAP Server component that gives the OLAP engine access to DB2 and other relational databases.

**Relational Storage Manager configuration file (RSM.CFG).** A DB2 OLAP Server file that contains relational database parameters that you can change.

**relational table.** A table that DB2 OLAP Server creates in your relational database. DB2 OLAP Server creates several relational tables for each OLAP application and database you create.

**relational view.** A view that DB2 OLAP Server creates in your relational database. DB2 OLAP Server creates several relational views for each OLAP application and database you create.

**report script.** An ASCII file that contains Report Writer commands that generate one or more production reports. Report scripts can be run in batch mode, using the ESSCMD command-line interface, or through the Application Manager. The script is a text file that contains data retrieval, formatting, and output instructions.

**restructure.** An operation to regenerate or rebuild the tables and views that DB2 OLAP Server created in your relational database.

**RSM.CFG file.** See *Relational Storage Manager configuration file*.

**shadow.** Information stored in relational tables that shadows the information stored in a multidimensional database outline.

**shared member.** A member that explicitly shares storage space with another member of the same name. This member has an attribute that designates it as shared. Shared members prevent making extra calculations on a member that appears in more than one location in a database outline.

**sibling.** A child member at the same branch level.

**sparse dimension.** A dimension with a low percentage of available data positions filled. For example, a product that is not sold in all of a company's available markets would be a good sparse candidate.

**Spreadsheet Add-in.** Software that merges with Microsoft Excel and Lotus 1-2-3 to enable analysis of multidimensional databases. The software library appears as a menu Add-In to the spreadsheet and provides such features as connect, zoom-in, and calculate.

**SQL application.** An application that uses SQL statements. You can use SQL applications to access data in a relational cube.

**SQL.** Structured Query Language. A standardized language for defining and manipulating data in a relational database.

**star schema.** The type of relational database schema used by DB2 OLAP Server. When you use the Application Manager to create a multidimensional database, DB2 OLAP Server creates a main fact table and a set of dimension tables. The fact table holds the actual data values for the database, and the dimension tables hold data about members and their relationships.

**star view.** A relation view that DB2 OLAP Server creates in your relational database that allows an SQL user to access data from the star schema in a single view with the JOIN already done.

**table space.** An abstraction of a collection of containers into which database objects are stored. A table space provides a level of indirection between a database and the tables stored within the database. A table space:

- Has space on media storage devices assigned to it.
- Has tables created within it. These tables will consume space in the containers that belong to the table space. The data, index, long field, and LOB portions of a table can be stored in the same table space, or can be individually broken out into separate table spaces.

**time dimension.** A dimension type that defines how often you collect and update data. You can tag only one dimension as Time, although you do not need to have a Time dimension.

**user-defined attribute (UDA).** A string saved with the member of a dimension that describes some aspect of the member. A user-defined attribute called RELANCHOR is used on the top level member of a dimension to indicate that the dimension should be used as the anchor dimension.

**user-defined attribute table.** A relational table that DB2 OLAP Server creates in your relational database that contains a member ID and user-defined attribute name for each named member specified when you create an outline. There is one user-defined attribute table for each dimension in an outline.

**user-defined attribute view.** A relational view that DB2 OLAP Server creates in your relational database that allows an SQL user to access all user-defined attributes for a dimension.



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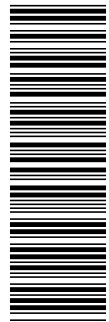


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