



Overview Guide

## **Enterprise Connect™ Data Access**

12.6

[ Microsoft Windows and UNIX ]

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# About This Book

## Audience

This book is intended for customers who have purchased any of the following Enterprise Connect™ Data Access (ECDA) 12.6 Options:

- ECDA Option for DB2 Universal Database (UDB)
- ECDA Option for Informix
- ECDA Option for Microsoft SQL Server
- ECDA Option for ODBC
- ECDA Option for Oracle

## Product name changes

Before ECDA 12.5, its options were sold as individual DirectConnect™ products named “DirectConnect for [target].” Other than in the installer, you will see the name “DirectConnect” used in the software and in documents. Old and current option names are as follows:

**Table 1: DirectConnect and ECDA naming**

Old product name	Current option name
DirectConnect for DB2 UDB	Enterprise Connect Data Access Option for DB2 UDB
DirectConnect for Informix	Enterprise Connect Data Access Option for Informix
DirectConnect for Microsoft SQL Server	Enterprise Connect Data Access Option for Microsoft SQL Server
<ul style="list-style-type: none"><li>• DirectConnect Anywhere™</li><li>• DirectConnect for ODBC</li></ul>	Enterprise Connect Data Access Option for ODBC
DirectConnect for Oracle	Enterprise Connect Data Access Option for Oracle
DirectConnect Manager	Part of each Enterprise Connect Data Access Option, still called DirectConnect Manager

## How to use this book

The following table identifies where specific information is located in this book:

See	For
Chapter 1, “Introducing Enterprise Connect Data Access”	<ul style="list-style-type: none"> <li>• An overview of Enterprise Connect Data Access</li> <li>• Descriptions of these products:               <ul style="list-style-type: none"> <li>• DirectConnect</li> <li>• Adaptive Server<sup>®</sup> Enterprise with Component Integration Services (ASE/CIS)</li> <li>• Open Server<sup>™</sup></li> <li>• Software Developer’s Kit (SDK)</li> <li>• jConnect</li> </ul> </li> <li>• An overview of related products and options</li> </ul>
Chapter 2, “Sample solutions”	<ul style="list-style-type: none"> <li>• A description of how ECDA components work together</li> <li>• Sample solutions using ECDA components</li> </ul>

**Related documents**

See your product documentation for detailed descriptions of how to install and use Enterprise Connect Data Access components.

**Other sources of information**

Use the Sybase<sup>®</sup> Getting Started CD, the SyBooks<sup>™</sup> CD, and the Sybase Product Manuals Web site to learn more about your product:

- The Getting Started CD contains release bulletins and installation guides in PDF format, and may also contain other documents or updated information not included on the SyBooks CD. It is included with your software. To read or print documents on the Getting Started CD, you need Adobe Acrobat Reader, which you can download at no charge from the Adobe Web site using a link provided on the CD.
- The SyBooks CD contains product manuals and is included with your software. The Eclipse-based SyBooks browser allows you to access the manuals in an easy-to-use, HTML-based format.

Some documentation may be provided in PDF format, which you can access through the PDF directory on the SyBooks CD. To read or print the PDF files, you need Adobe Acrobat Reader.

Refer to the *SyBooks Installation Guide* on the Getting Started CD, or the *README.txt* file on the SyBooks CD for instructions on installing and starting SyBooks.

- The Sybase Product Manuals Web site is an online version of the SyBooks CD that you can access using a standard Web browser. In addition to product manuals, you will find links to EBFs/Maintenance, Technical Documents, Case Management, Solved Cases, newsgroups, and the Sybase Developer Network.

To access the Sybase Product Manuals Web site, go to Product Manuals at <http://www.sybase.com/support/manuals/>.

### **Sybase certifications on the Web**

Technical documentation at the Sybase Web site is updated frequently.

#### ❖ **Finding the latest information on product certifications**

- 1 Point your Web browser to Technical Documents at <http://www.sybase.com/support/techdocs/>.
- 2 Select Products from the navigation bar on the left.
- 3 Select a product name from the product list and click Go.
- 4 Select the Certification Report filter, specify a time frame, and click Go.
- 5 Click a Certification Report title to display the report.

#### ❖ **Creating a personalized view of the Sybase Web site (including support pages)**

Set up a MySybase profile. MySybase is a free service that allows you to create a personalized view of Sybase Web pages.

- 1 Point your Web browser to Technical Documents at <http://www.sybase.com/support/techdocs/>.
- 2 Click MySybase and create a MySybase profile.

### **Sybase EBFs and software maintenance**

#### ❖ **Finding the latest information on EBFs and software maintenance**

- 1 Point your Web browser to the Sybase Support Page at <http://www.sybase.com/support>.
- 2 Select EBFs/Maintenance. If prompted, enter your MySybase user name and password.
- 3 Select a product.
- 4 Specify a time frame and click Go. A list of EBF/Maintenance releases is displayed.

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Padlock icons indicate that you do not have download authorization for certain EBF/Maintenance releases because you are not registered as a Technical Support Contact. If you have not registered, but have valid information provided by your Sybase representative or through your support contract, click Edit Roles to add the “Technical Support Contact” role to your MySybase profile.

- 5 Click the Info icon to display the EBF/Maintenance report, or click the product description to download the software.

### Icons used in this book's diagrams

Illustrations in this book use icons to represent these components of a data enterprise system:

- For Adaptive Server Enterprise and other data servers:



This icon represents either a Sybase or non-Sybase data server. If the data server in an example *must* be Adaptive Server Enterprise (ASE), the data server icon is labeled “ASE.”

- For DirectConnect:



This icon represents a DirectConnect data access server. DirectConnect servers connect LAN-based clients and heterogeneous data servers. Enterprise Connect Data Access provides DirectConnect servers for DB2 Universal Database (UDB), Informix, Microsoft SQL Server, ODBC, and Oracle.

- For Adaptive Server Enterprise with Component Integration Services (ASE/CIS):



This icon represents ASE/CIS. When combined with the appropriate DirectConnect server, ASE/CIS provides single-view read/write access to all supported database systems.



- For client applications:



This icon represents a client application. A client application is a user process or application connected to a data server. It can be a front-end application program executed by a user or a program that executes as an extension of the system.

- For Replication Server<sup>®</sup>:



This icon represents Replication Server, the Sybase program that maintains replicated data on a local area network (LAN) and processes transactions received from other Replication Servers on either a LAN or a wide area network (WAN).

- For a Replication Agent<sup>™</sup>:



This icon represents a Replication Agent, a Sybase replication system process that transfers transaction information from a database to Replication Server for distribution to other databases.

Every database from which you replicate data requires a Replication Agent specific to the database. Adaptive Server has its own RepAgent thread. The Replication Agent for any other data server is a separate process which this icon represents.

- For Enterprise Application Server (EAServer):



This icon represents EAServer, Sybase's high-performance, scalable, secure, open application server for e-portal and Internet business solutions.

- 
- For a Web server:



This icon represents a generic Web server.

- For the Web:



This icon represents the World Wide Web.

## Accessibility features

This document is available in an HTML version that is specialized for accessibility. You can navigate the HTML with an adaptive technology such as a screen reader, or view it with a screen enlarger.

The DirectConnect Manager component of Enterprise Connect Data Access 12.6 and the HTML documentation have been tested for compliance with U.S. government Section 508 Accessibility requirements. Documents that comply with Section 508 generally also meet non-U.S. accessibility guidelines, such as the World Wide Web Consortium (W3C) guidelines for Web sites.

The online help for the DirectConnect Manager component is also provided in JavaHelp, which you can navigate using a screen reader.

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**Note** You might need to configure your accessibility tool for optimal use. Some screen readers pronounce text based on its case; for example, they pronounce ALL UPPERCASE TEXT as initials, and Mixed Case Text as words. You might find it helpful to configure your tool to announce syntax conventions. Consult the documentation for your tool.

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For information about how Sybase supports accessibility, see Sybase Accessibility at <http://www.sybase.com/accessibility>. The Sybase Accessibility site includes links to information on Section 508 and W3C standards.

## If you need help

Each Sybase installation that has purchased a support contract has one or more designated people who are authorized to contact Sybase Technical Support. If you cannot resolve a problem using the manuals or online help, please have the designated person contact Sybase Technical Support or the Sybase subsidiary in your area.

# Introducing Enterprise Connect Data Access

This chapter introduces Enterprise Connect Data Access (ECDA).

The topics covered in this chapter are:

Topic	Page
What is Enterprise Connect Data Access?	1
What does ECDA include?	4
Related products and options	9

## What is Enterprise Connect Data Access?

Enterprise Connect Data Access is an integrated set of software applications and connectivity tools that you use to access data within a heterogeneous database environment. ECDA gives you the ability to access a variety of LAN-based, non-Sybase data sources, as well as mainframe data sources. It consists of components that provide transparent data access within an enterprise, including access to servers housed on z/OS, AS400, UNIX, Linux, and Microsoft Windows platforms.

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**Note** Mainframe Connect Integrated Product Suite (IPS), a suite of products you can purchase separately, allows you to access and integrate mainframe data and applications. See “Mainframe Connect IPS” on page 10 for more information.

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Using ECDA, you can maintain a corporate view of distributed operations, even when distributed business units run on a variety of hardware and database management system (DBMS) platforms. Because ECDA is database-independent middleware, it allows LAN-based clients to see a consistent picture of enterprise data, no matter what the data source.

## Sybase Central plug-ins

ECDA components allow applications to interact with non-Sybase DBMSs, such as DB2 UDB, Informix, Microsoft SQL Server, and Oracle, as well as Sybase DBMSs, including Adaptive Server Enterprise (ASE), Adaptive Server Anywhere, and Sybase IQ.

Sybase Central™ is a graphical tool that provides a common interface for managing Sybase products. Each server product is managed by a service provider “plug-in” that operates in parallel with other service providers in the Sybase Central framework.

Sybase Central displays a visual representation of servers and provides a point-and-click interface for choosing options.

ECDA provides the following Sybase Central plug-ins:

- Adaptive Server Enterprise plug-in, which allows you to manage and monitor Adaptive Server installations. This plug-in also allows you to set up proxy tables with ASE/CIS for access to remote, non-Sybase data sources.
- DirectConnect plug-in (DirectConnect Manager), which allows you to manage DirectConnect servers locally or remotely throughout your business environment.

## Enterprise Connect Data Access capabilities

ECDA offers the following capabilities:

- Transparent access
- Interoperability
- Data management

The following subsections describe these capabilities in more detail.

### Transparent access

ECDA provides transparent access to a variety of data sources, because you can:

- Create developer, application, and user interfaces that let developers, applications, and users work with familiar tools—no matter how your business enterprise changes or what new technologies are added

- Access information on remote, heterogeneous data servers as if it were from a single source
- Connect to DB2 UDB, Informix, Microsoft SQL Server, Oracle, and Sybase IQ using the appropriate DirectConnect software, either directly or in conjunction with ASE/CIS, Replication Server, or EAServer
- Connect to several ODBC-compliant databases using DirectConnect for ODBC and an appropriate ODBC driver, either directly or in conjunction with ASE/CIS

## **Interoperability**

ECDA supports a variety of client interfaces. You can connect to ECDA with:

- Client applications written either in Java using jConnect for JDBC, or in C/C++ using Open Client libraries
- Open Server applications
- JDBC and ODBC applications

ECDA interoperates with other Sybase products and product suites. With ECDA, you can:

- Replicate data bidirectionally between heterogeneous or non-Sybase data servers in conjunction with Replication Server and Replication Server Heterogeneous Replication Options
- Access and change data through the Web in conjunction with EAServer

## **Data management**

Because ECDA helps you manage your enterprise data, you can:

- Share data efficiently throughout your organization by moving it in bulk form between data sources using the DirectConnect transfer feature or the Adaptive Server select into statement
- Manage DirectConnect services and Sybase components using the Sybase Central graphical user interface (GUI)

## What does ECDA include?

ECDA includes:

- DirectConnect, which works standalone or behind Adaptive Server and Replication Server to provide dynamic access to DB2 UDB, Informix, Microsoft SQL Server, and Oracle databases, as well as to several other ODBC-compliant databases

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**Note** Replication Server is not included with EDCA.

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- Adaptive Server Enterprise (ASE), with restricted license for Component Integration Services (CIS) for a single view of distributed and heterogeneous data sources
- Open Server, with which you can create a custom server application
- Software Developer's Kit (SDK), with which you can create custom client applications and use drivers to connect your existing applications to ECDA
- jConnect for JDBC™ driver from Sybase, which provides native access to all Sybase database products and servers based on Open Server

The following sections describe each of these components.

### DirectConnect

DirectConnect is the ECDA component that provides basic connectivity to non-Sybase data sources. In particular, it provides access management, transaction management, and remote systems management through DirectConnect Manager.

DirectConnect data access servers provide connectivity between clients located throughout the enterprise and enterprise data servers. You can use a DirectConnect server on its own to connect directly to a single, non-Sybase data server. Or, you can combine DirectConnect servers with Adaptive Server or Replication Server, the Sybase products that provide a Transact-SQL™ interface so you can access, move, and replicate data in a heterogeneous environment.

DirectConnect consists of a server and one or more access service libraries, which have specific sets of configuration properties. The server provides the framework in which the service libraries operate. Each access service library accesses data from a particular target database, such as DB2 UDB, Informix, Microsoft SQL Server, and Oracle.

**DirectConnect servers**

ECDA includes these DirectConnect servers:

- DirectConnect for DB2 UDB, which provides connectivity to DB2 UDB running on z/OS, AS400, NT, and UNIX platforms
- DirectConnect for Informix, which provides connectivity to Informix database servers
- DirectConnect for Microsoft SQL Server, which provides connectivity to Microsoft SQL Server databases
- DirectConnect for ODBC, which provides connectivity to ODBC-accessible database servers
- DirectConnect for Oracle, which provides connectivity to Oracle database servers

**DirectConnect Manager**

DirectConnect Manager is a GUI systems management tool for administering DirectConnect. It runs on Windows and UNIX platforms, within the Sybase systems management framework, Sybase Central. DirectConnect Manager displays a consolidated view of all DirectConnect servers across your enterprise.

Using DirectConnect Manager, you can:

- Manage DirectConnect servers on multiple platforms.
- Change configuration properties of DirectConnect servers, service libraries, and services.
- Create and copy services by copying an existing service and giving it a unique name.
- Create new servers.
- Start and stop existing servers.
- Start, stop, and delete services. (From a remote site, DirectConnect Manager is the only way you can start a service.)
- Test the availability of a data source by creating a connection to it.
- Retrieve a DirectConnect server log file or a subset of the log, and view log file messages with a text editor.

DirectConnect ODBC driver

- Update DirectConnect server connection information.
- View the status of a service and data source on the desktop.

The DirectConnect ODBC driver lets your ODBC client application work with DirectConnect.

## Adaptive Server Enterprise with Component Integration Services (ASE/CIS)

Adaptive Server is provided with ECDA for the Component Integration Services functionality (ASE/CIS). With ASE/CIS your client applications can view and change data on multiple, heterogeneous data servers as if it were single-source data. ASE/CIS performs datatype transformations and enables heterogeneous joins.

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**Note** When included in ECDA, the ASE/CIS license does not include support for local data storage within Adaptive Server. If you have purchased a full Adaptive Server license with the CIS option, you are licensed for local data storage within Adaptive Server.

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ASE/CIS allows users to access both Sybase and non-Sybase databases on different servers. These external data sources include host data files and tables, views, and remote procedure calls (RPCs) in database systems such as Adaptive Server, Oracle, and DB2 UDB.

Using ASE/CIS, you can:

- Access tables and views that reside on remote servers as if they were local objects.
- Perform joins between tables in multiple remote, heterogeneous servers. For example, it is possible to join tables between an Oracle DBMS and DB2 UDB, and between tables in multiple DB2 UDB database servers.
- Create stored procedures that work with distributed heterogeneous data.
- Transfer the contents of one table into a new table on any supported remote server using a `select into` statement.
- Provide applications, such as PowerBuilder®, Microsoft Access, and DataEase, with transparent access to heterogeneous data.
- Maintain referential integrity across heterogeneous data sources.



- Access native remote server capabilities using the Component Integration Services passthrough mode.
- Map RPCs into proxy table structures and perform operations on them as though they were local tables.

ASE ODBC and OLE DB drivers

The ASE ODBC and OLE DB drivers let your ODBC and OLE DB client applications work with ASE/CIS.

## Open Server

Open Server provides the libraries, tools, and interfaces you need to create a custom server application. Open Server consists of a programming interfaces component and a network services component. See the Open Server documentation for more information about the components of Open Server.

With Open Server, you can:

- Create an application for any type of server.
- Create applications that perform calculations, provide access to real-time data, or interface with e-mail applications.
- Communicate directly with Sybase and non-Sybase protocols.

Replication Server and the DirectConnect gateways are Open Server applications.

## SDK

SDK is a set of libraries and utilities for developing client applications. It includes the following components:

Open Client

Open Client provides the interfaces that client applications, third-party products, and other Sybase products need to communicate with Adaptive Server and Open Server applications. Open Client provides runtime libraries and additional tools you need to develop custom client applications. Open Client network services support specific protocols such as TCP/IP and DECnet.

Open Client includes the following programming interfaces and network services:

- A set of libraries used to develop and deploy C-language applications that access Adaptive Server data

	<ul style="list-style-type: none"><li>• Drivers for integrating Client-Library and Open Server applications with directory and security services</li><li>• Sample programs for Client-Library and DB-Library™</li></ul>
Open Client Embedded SQL™/C	With this precompiler you can embed Transact-SQL statements into C-language applications.
Open Client Embedded SQL/COBOL	With this precompiler you can embed Transact-SQL statements into COBOL-language applications.
Language modules	<p>You can provide system messages and datetime formats to help you localize your applications. The default installation includes:</p> <ul style="list-style-type: none"><li>• U.S. English language module</li><li>• Unicode UTF-8 encoding (utf8)</li><li>• IBM code page 850 (cp850)</li><li>• IBM code page 437 (cp437)</li><li>• ISO 8859-1 (iso_1)</li><li>• Hewlett-Packard Roman 8 (roman8) character sets</li></ul> <p>You can purchase additional language modules through Sybase.</p>

## jConnect

jConnect is the high-performance JDBC driver from Sybase that provides native access to all Sybase database products, including Adaptive Server, Replication Server, and servers based on Open Server. Through ASE/CIS or through DirectConnect, jConnect can access more than 25 enterprise and legacy database servers. jConnect uses Java Runtime Environment (JRE) 1.4 for its runtime environment.

jConnect is both:

- A net-protocol/all-Java driver within a gateway-enabled (three-tier) environment
- A native-protocol/all-Java driver within a gateway-less (two-tier) environment

The protocol that jConnect uses is Tabular Data Stream™ (TDS), the native protocol for Adaptive Server and Open Server applications. jConnect works with the following components:

- ASE/CIS
- Enterprise Application Server (EAServer)
- DirectConnect
- Adaptive Server Anywhere
- Adaptive Server IQ
- Replication Server

In addition, jConnect for JDBC can access AS/400, Oracle, and other data sources using DirectConnect.

## Related products and options

There are several related Sybase products and options you can purchase separately that extend the capabilities of your system:

- Sybase Replication Server
- Sybase Replication Server Options
- Mainframe Connect IPS
- Replication Agent for DB2 UDB for OS/390

## Sybase Replication Server

Replication Server is an Open Server application that maintains replicated data in multiple databases while ensuring the integrity and consistency of the data. It provides client applications with local data access, thereby reducing the load on the network and centralized computer systems.

Replication Server supports heterogeneous data servers. You can build a replication system from existing databases and applications and, as your enterprise grows and changes, you can add data servers and Replication Servers to accommodate your evolving business needs.

See the Sybase Replication Server documentation for more information about Replication Server.

## Sybase Replication Server Options

If you already own Sybase Replication Server, you can purchase one or more Sybase Replication Server Options. These options are sets of products packaged together to give you unidirectional or bidirectional replication between Adaptive Server and non-Adaptive Server databases.

Four options are available on Microsoft Windows or UNIX platforms:

- Replication Server Option for Oracle, which provides replication to and from Oracle databases
- Replication Server Option for Microsoft SQL Server, which provides replication to and from Microsoft SQL Server databases
- Replication Server Option for IBM DB2 UDB, which provides replication to and from IBM DB2 UDB
- Replication Server Option for Informix, which provides replication to and from Informix databases

See the Sybase Replication Server Options *Overview Guide* for more information about the options available for purchase with Sybase Replication Server.

## Mainframe Connect IPS

Mainframe Connect IPS provides a product suite that provides access to *and integration of* mainframe data and applications. Mainframe Connect IPS allows you to write applications that access mainframe data and allow the mainframe to act as a client to other Sybase servers. For more information about linking LAN-based and mainframe data using Mainframe Connect IPS, see the Mainframe Connect IPS *Overview Guide*.

## Replication Agent for UDB

Replication Agent for UDB lets you replicate transactions from a DB2 UDB primary database on UNIX, Windows NT, and Windows 2000 platforms. For more information about replicating data from DB2 UDB, see the Replication Agent for UDB DB2 documentation set.

## Sample solutions

This chapter describes sample solutions to business problems using Enterprise Connect Data Access (ECDA) components.

The topics covered in this chapter are:

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Although there are many ways your site can use ECDA to access data, the scenarios in this section provide some high-level examples of the solutions that ECDA provides.

### Transparent access to local heterogeneous data stores

#### Profile

An insurance company has an application that processes claims and requires data from two sources: an DB2 UDB for AS/400 database and an Oracle database. The company uses DirectConnect for DB2 UDB to retrieve data from the DB2 UDB for AS/400 database and DirectConnect for Oracle to retrieve data from the Oracle database. This eases administration and eliminates the need for changes to the claims application.

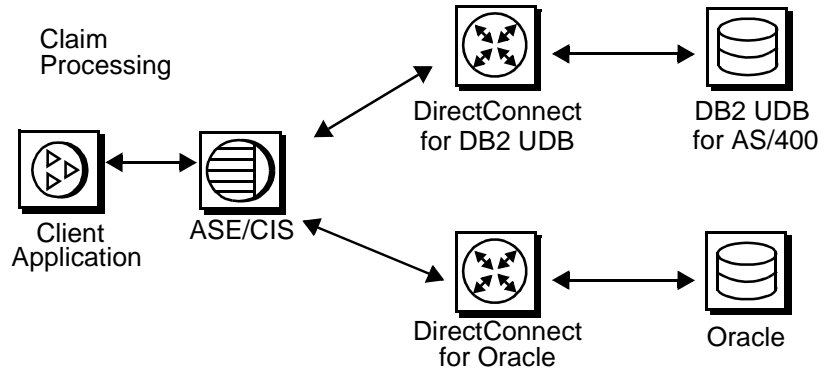
#### Sybase components

To retrieve the data without the application (or the user) being aware of the specific data location, the insurance company uses the following components in ECDA:

- ASE/CIS
- DirectConnect for DB2 UDB
- DirectConnect for Oracle

Figure 2-1 illustrates this sample scenario.

**Figure 2-1: Transparent access to local heterogeneous data stores**



See “What does ECDA include?” on page 4 for descriptions of specific components.

## Access to distributed data sources

### Profile

A securities company requires an immediate customer profile when the broker receives a call from the customer. The broker client application immediately brings up the customer profile based on the telephone number of the caller. This data is stored in the Informix database at the local work group’s office in Memphis and is updated through DirectConnect for Informix. Real-time feeds from outside the system are stored in DB2 UDB on a z/OS host located in New York and are accessed by DirectConnect for DB2 UDB. Client inquiries regarding other investments and current prices need to be queried off the z/OS host and displayed within the broker client application.

### Sybase components

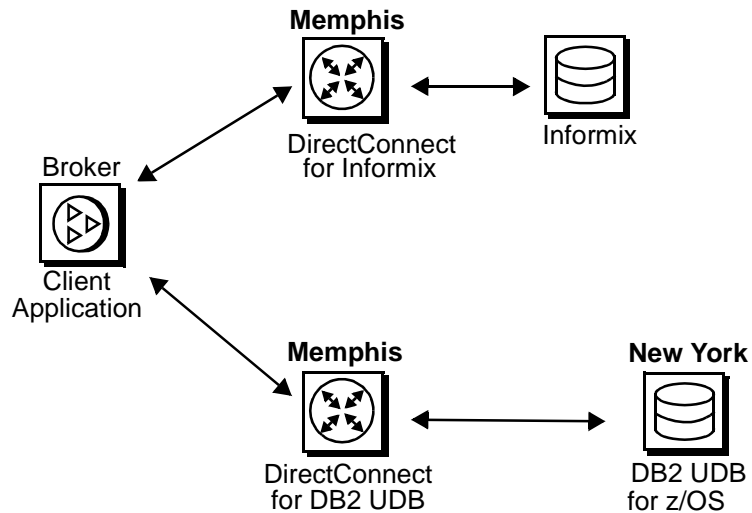
To set up transparent access to heterogeneous data stores, the securities company uses the following components in ECDA:

- Sybase DirectConnect for Informix
- Sybase DirectConnect for DB2 UDB

This combination of components gives the securities company access to heterogeneous data stores.

Figure 2-2 illustrates this sample scenario.

Figure 2-2: Access to distributed data sources



See “What does ECDA include?” on page 4 for descriptions of specific components.

## Accessing and changing data through an enterprise portal

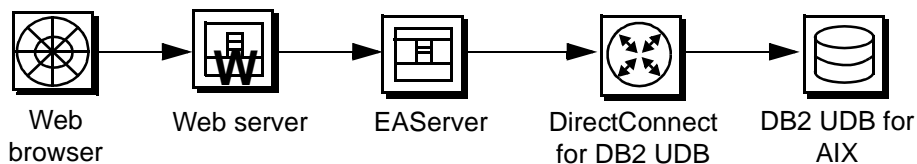
### Profile

A Web-based business—with 20 locations where product orders can be accessed and updated—needs to access orders and customer information stored in DB2 UDB on AIX. The business relies heavily on stored procedures and cannot use dynamic SQL to access AIX data.

### Sybase components

Figure 2-3 illustrates this sample scenario.

**Figure 2-3: Accessing and changing data through the Web**



To access and change data through the Web, the business uses the following components of ECDA: DirectConnect for DB2 UDB. The company also uses a separately purchased EAServer.

## Integrating systems of two companies

### Profile

A Paris retail company has just acquired another company in New York. It needs to integrate its Oracle data with the DB2 UDB for UNIX data of the acquired company as quickly as possible to share information such as customer profiles and orders. To capture data changes and replicate them to other systems where they can be incorporated without having to re-code existing applications, the company uses components in ECDA plus components in Sybase Replication Server Options and Sybase Replication Server, purchased separately.

### Sybase components

To set up bidirectional, enterprise-wide replication, the retail company uses the following components of ECDA:

- Sybase DirectConnect for DB2 UDB
- Sybase DirectConnect for Oracle

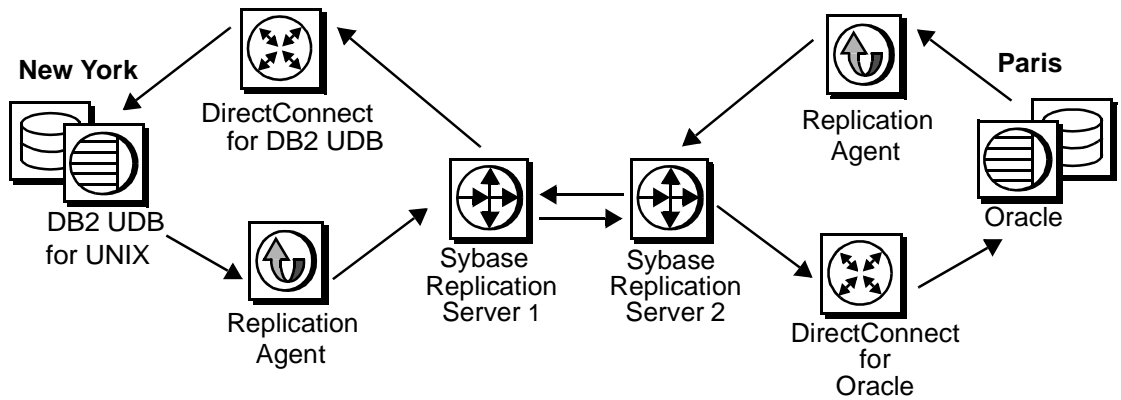
See “What does ECDA include?” on page 4 for descriptions of specific ECDA components.

The company uses the following components of Sybase Replication Server Options and Sybase Replication Server:

- Sybase Replication Agent
- Replication Server

Figure 2-4 illustrates the sample scenario which integrates Oracle data with DB2 UDB for UNIX data.



**Figure 2-4: Bidirectional, enterprise-wide replication**

See “Related products and options” on page 9 for more information about Sybase Replication Server Options and Sybase Replication Server.

