eaDirect™ Installation and Configuration Guide

edocs®

Sun Solaris Operating Environment[TM] **Software and the IBM WebSphere**® **Application Server**

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About Online Account Management and the eaSuite™

Online Account Management solutions provide organizations and their business and consumer customers with the capability to service every aspect of their account relationship over the Internet. The account encapsulates all pertinent customer information, along with the activity and charges associated with the exchange of goods or services between a customer and an organization, and as such serves as the foundation for the relationship.

Whether an organization provides physical goods or services, the account relationship is one-time or recurring; or the customer is a large business with a global presence or is an individual consumer, the needs remain the same. Today, both organizations and their customers are demanding the ability to efficiently and conveniently manage, analyze accounts and have visibility into account initiations and modifications, detailed account history, orders, disputes and payments.

eaSuite – The Proven Platform for Online Account Management

edocs has developed the most comprehensive and sophisticated software platform and services for Online Account Management. Organizations that deploy edocs Online Account Management solutions increase productivity and improve profitability by:

- Reducing support and processing costs

- Improving operational effectiveness

- Increasing customer satisfaction

- Enhancing marketing effectiveness

The eaSuite has been deployed at organizations worldwide in some of the most complex business and rigorous technical environments, and has proven to be the industry's most scalable, standards-based platform with a total cost of ownership lower than any competing packaged or custom developed solution.

eaDirect™ is the platform product of the eaSuite that creates the core infrastructure of enterprise Online Account Management solutions. Organizations use eaDirect to access customer account data and develop ways of presenting the data for viewing, analysis and modification online. By providing business and consumer customers with online account information and self-service capabilities, eaDirect enables organizations to reduce support and processing costs, improve operational effectiveness, and increase customer satisfaction.

eaPay™ is the electronic payment solution that decreases payment processing costs, accelerates receivables, and improves operational efficiency. eaPay is a complete payment scheduling and warehousing system with real-time and batch connections to payment gateways for Automatic Clearing House (ACH) and credit card payments, and payments via various payment processing service providers.

eaService™ reduces call center management costs and increases customer satisfaction by providing critical account data access to customer service representatives (CSRs). With eaService, a contact center is able to provide better service by more efficiently resolving customer account inquiries at the point of customer contact. Through its intuitive browser interface, eaService allows CSRs to take advantage of what are generally thought of as customer-facing online capabilities of an Online Account Management system, to draw out account information.

eaMarket™ is the personalization, campaign and content management solution that enables organizations to increase revenue and improve customer satisfaction by weaving personalized marketing and customer service messages throughout the Online Account Management experience. eaMarket leverages the transactional account data that is the foundation of an Online Account Management system to present personalized relevant marketing and customer service messages to customers.

eaPost® is the account content distribution system that provides an organization's customers with the convenience of All Portals Addressable™ access to account information. eaPost handles all the complexities of securely distributing summary account information to any endpoint while also bringing customers back the organization's Website to manage and control their online experience.

About this Guide

This guide describes how to install eaDirect and configure the third-party applications that make up the eaDirect production environment. This guide also provides instructions for migrating an eaDirect database from a previous release.

This guide is intended for system administrators and other technical personnel who is responsible for installing, configuring, and maintaining eaDirect on a Sun Solaris machine.

This guide contains the following chapters:

Preparing to Install eaDirect   Describes pre-installation tasks such as installing the Windows-based eaDirect composition tools and creating owner and group accounts that are needed to install eaDirect and several third-party applications that work with eaDirect.

Setting Up a Database Server for eaDirect   Provides instructions for installing eaDirect on a database server in a distributed-computing environment, and configuring the third-party software that work with it.

Setting Up an Application Server for eaDirect   Provides instructions for installing eaDirect on an application server in a distributed-computing environment, and configuring the third-party software that work with it.

Migrating eaDirect Databases   Describes how to migrate previous versions of an eaDirect database.

This guide does not describe general Solaris 8 administration concepts and commands. For more information, refer to the appropriate Sun Solaris 8 user documentation.

Related Documentation

Online Help and a PDF version of this guide are also available.

Online	How to Access
Help	Select **Help > Help Topics** in DefTool or Composer.
A PDF of this guide	A PDF of this guide is available on the eaDirect product CD-ROM.

This guide is part of the eaDirect documentation set. For more information about implementing your eaDirect application, see one of the following guides:

Print Document	Description
eaDirect Production Guide	How to set up and run a live eaDirect application in a J2EE environment.
eaDirect User's Guide	How to design and create an eaDirect application for presenting statements online. It provides instructions on how to use the eaDirect DefTool and Composer design and development tools.

Add-on eaSuite products eaPay, eaPost, eaMarket, and eaXchange provide their own documentation.

If You Need Help

Technical support is available to customers who have valid maintenance and support contracts with edocs. Technical support engineers can help you install, configure, and maintain your edocs application.

To reach the U.S. Service Center, located in Natick, MA (Monday through Friday 8:00am to 8:00pm EST):

- Telephone: 508.652.8400

- Toll Free: 877.336.3362

- E-support: support.edocs.com (This requires a one-time online registration)

- E-mail: support@edocs.com

When you report a problem, please be prepared to provide us the following information:

- What is your name and role in your organization?

- What is your company's name?

- What is your phone number and best times to call you?

- What is your e-mail address?

- In which edocs product did a problem occur?

- What is your Operating System version?

- What were you doing when the problem occurred?

- How did the system respond to the error?

- If the system generated a screen message, please send us that screen message.

- If the system wrote information to a log file, please send us that log file.

If the system crashed or hung, please tell us.

Preparing to Install eaDirect

This chapter describes installation tasks that must be performed before you install eaDirect.

What You Need to Know When Installing eaDirect

In addition to installing the eaDirect application, you will have to install and configure several other software applications that support eaDirect. The instructions in this guide describe how to install eaDirect in a distributed computing environment that includes at least one dedicated server for application components and another dedicated server for database components.

When installing eaDirect in a distributed environment, the recommended sequence is to install and configure components on the database server first, then install and configure components on the application server. It is recommended that you install eaDirect in the same directory on the database and application servers.

Also, to ensure a reliable and stable environment for creating eaDirect applications, you must meet the software and hardware minimum requirements and confirm that eaDirect and the applications that support it are installed and configured correctly.

A successful installation of eaDirect depends on completing the following pre-installation tasks:

- Confirm that your system configuration meets the recommended hardware and software for eaDirect

- Install the Windows-based eaDirect composition tools

- Set up the eaDirect production environment

Hardware and Software Requirements

Confirm that your system meets the **minimum** recommended hardware and software requirements for installing eaDirect.

Hardware

- 512MB of RAM (1GB recommended).

- 512MB of swap space is suggested for the application server (1GB is recommended).

    You might have to increase swap space for the Oracle database on the database server. Try not to allocate too much swap space for the operating system, as it could adversely affect overall system performance.

- 60MB free disk space for the eaDirect software distribution.

- 2.2GB free disk space for the eaDirect database.

Software:

- Sun Solaris 8 on the SPARC platform with required patches and packages

- IBM WebSphere 4.0.4 (running in 32-bit mode)

- IBM WebSphere 4.0.4 eFixes (see product Release Notes for a list of required eFixes)

- JDK 1.3.1_04 that is provided with the WebSphere software distribution

- IBM MQSeries 5.2 with CSD04

- MAOC 1.0.6 and IBM MQSeries for Java 5.2 (MA88 1.1.4)

- Oracle8i 8.1.7 with required patches

- Oracle8i 8.1.7 Client software

- Oracle8i 8.1.7.1 Java Database Connectivity (JDBC) driver

- Netscape Navigator 6.2

- Internet Explorer 5.5 (SP2) or 6.0 (needed to run eaDirect's Composer tool)

- CD-ROM device that is supported by Sun Solaris 8

Installing eaDirect Components

The installation of eaDirect components is done through the InstallAnywhere installer. The tool is provided with eaDirect on its distribution CD-ROM. Below is the InstallAnywhere screen where you select the eaDirect components to install.
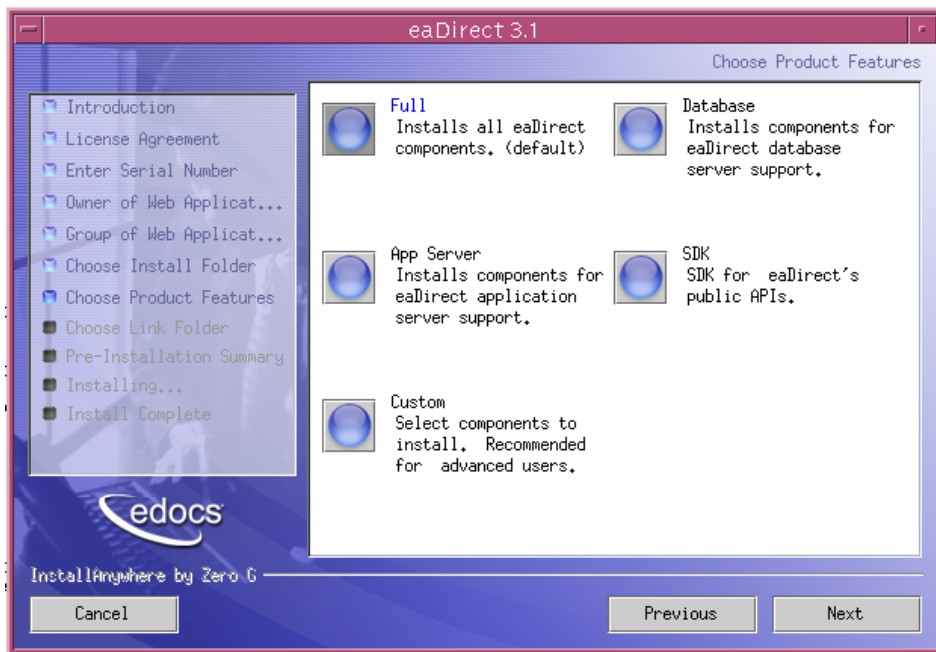
Through InstallAnywhere's easy-to-follow graphical user interface, you can choose to do a full or custom install of eaDirect components on a single server or on multiple servers in a distributed environment. The following tables describes the various eaDirect installation options:

Option	Components Installed
Full	Installs eaDirect application server components, eaDirect database server components, WebSphere J2EE files for eaDirect, eaDirect composition tools, and online product Help. **Note**: Use this installation option to install eaDirect on a single machine in a non-distributed environment. See the topic *Installing eaDirect in a Non-Distributed Environment* for more information.
Database	Installs the eaDirect database server components and online product Help.
App Server	Installs eaDirect application server components, WebSphere J2EE files for eaDirect, sample applications, and online product Help.
Custom	Gives users the option to install eaDirect application server components, eaDirect database server components, eaDirect J2EE applications, eaDirect composition tools Hierarchy samples (if licensed), and eaDirect sample applications.
SDK	Provides Javadoc, documentation and samples for the eaDirect API. This component will only appear if you have purchased a license for the SDK.

InstallAnywhere copies eaDirect files from the distribution CD-ROM to the appropriate directories, and sets up the directory hierarchy for database server and application server components. It also adds icons (including the tool to uninstall eaDirect) to the eaDirect program group that is accessible from the Windows Start menu.

For specific information about installing eaDirect components using InstallAnywhere, see the topics: *Installing the eaDirect Composition Tools*, *Installing the eaDirect Database Components* and *Installing the eaDirect Application Server Components*.

Installing the eaDirect Composition Tools

The installation of the eaDirect composition tools, which includes the DefTool and the Composer, is separate from the installation of eaDirect on a Solaris machine. To install the Windows-based composition tools, you have to run InstallAnywhere for Windows (which is provided on the eaDirect distribution CD-ROM), and choose the Tools installation option.

The eaDirect composition tools can be installed on a Windows 2000 machine. The composition tools can also be installed on a remote or dial-up server.

To install the eaDirect composition tools:

1. From the *Windows* subdirectory on the eaDirect installation CD-ROM, and double-click the command to invoke the InstallAnywhere GUI:

    `Dirins.exe`

    A start-up screen is displayed.

2. On the Introduction screen, read the eaDirect introductory information. Then click **Next**.

3. On the License Agreement screen, read and accept the terms of the agreement (use the scroll bars to move up and down on the screen) by clicking the appropriate radio button. Then click **Next**.

4. On the Enter Serial Number screen, enter your product serial number. It is stapled to the inside front cover of this guide (if your serial number has been misplaced, contact edocs Technical Support). Then click **Next**.

5. On the Choose Install Folder screen, accept the default installation folder or click **Choose** to specify another installation folder. When finished, click **Next**.

6. On the Choose Product Features screen, click **Tools**. Then click **Next**.

7. On the Choose Shortcut Folder screen, decide whether you want to create product icons and where. When finished, click **Next**.

8. On the Pre-Installation Summary screen, confirm that the information is accurate. Then click **Install**.

9. At this point, the eaDirect composition tools are copied to the designated folder. A status bar on the bottom of the screen shows the composition tools being installed. No user intervention is required.

10. The Install Complete screen reports a successful installation and the directory that contains the composition tools.

11. Click **Done** to exit the installer.

Installing eaDirect in a Non-Distributed Environment

This guide is organized to show how to install eaDirect in a distributed environment that has at least one dedicated database server and application server. However, using the InstallAnywhere 'Full' installation option, you can choose to install all the eaDirect product components on a single machine. The following procedure describes how to do this.

To install eaDirect using the InstallAnywhere 'Full' installation option:

1. From the */solaris* subdirectory on the installation CD-ROM, run the command to invoke the InstallAnywhere GUI:

   ```
   # ./Dirins.bin
   ```

   A start-up screen is displayed.

2. On the Introduction screen, read the eaDirect introductory information. When finished, click **Next**.

3. On the License Agreement screen, carefully read the terms of the agreement (use the scroll bars to move up and down on the screen) and accept the terms of the license agreement by clicking the appropriate radio button. Then click **Next**.

4. On the Enter Serial Number screen, enter your product serial number. It is stapled to the inside front cover of this guide (if your serial number has been misplaced, contact edocs Technical Support). Then click **Next**.

5. On the Owner of Web Application Server screen, enter the name of the application server owner (the recommended 'owner' is *root*). Then click **Next**.

6. On the Group of Web Application Server screen, enter the name of the group for the application server (the recommended group is *other*). Then click **Next**.

7. On the Choose Install Folder screen, accept the default installation folder (*opt/EDCSbd*), or click **Choose** to specify another installation folder. Then click **Next**.

8. On the Choose Product Features screen, click **Full**. Then click **Next**.

9. On the Pre-Installation Summary screen, confirm that the information is accurate. Then click **Install**.

    At this point, the eaDirect database and application server components are copied to the designated installation folder. A status bar on the bottom of the screen shows each component being installed. No user intervention is required.

10. The Install Complete screen reports a successful installation and the directory that contains the database and application server components.

11. Click **Done** to exit the installer.

Setting Up the eaDirect Environment

To ensure the proper operation of eaDirect, you must confirm that the third-party software applications that support eaDirect are installed on the appropriate server. When installing these applications it is very important that you follow the instructions in each product's installation documentation. This will help to ensure the integrity and reliability of the eaDirect application environment.

As part of setting up the eaDirect production environment, you also will be required to create Unix owner and group ownership for the WebSphere and Oracle distributions, and define several Oracle environment variables.

Use the following information to determine the software components that must be installed on each server in your distributed environment.

Application Server:

- IBM WebSphere 4.0.4 (running in 32-bit mode).

- IBM WebSphere 4.0.4 eFixes (see product Release Notes for the list of required eFixes).

- Sun Solaris 8 on the SPARC platform with the following packages and patches:

  SUNWesu and SUNWlibC packages

  108434-01 and 108435-01 patches

  The packages and patches can be downloaded from http://sunsolve.sun.com/). This web site also contains product information and documentation.

- JDK 1.3.0_04 that is provided with the WebSphere software distribution.

- Oracle8i 8.1.7 Client software.

- IBM MQSeries 5.2 with CSD04.

- MA0C 1.0.6 and IBM MQSeries for Java 5.2 (MA88 1.1.4).

- Netscape Communicator 6.2 or Internet Explorer 5.5 (SP2) or 6.0.

- An XServer to support charting. XWindows Virtual Frame Buffer (Xvfb) can be used if an XServer is not available.

Database Server:

- Oracle8i 8.1.6 or 8.1.7 Database Server and required patches. Also, if you're using Oracle8i 8.1.6, you must install the Oracle JDBC driver for Oracle8i 8.1.7 on the application server and add it to the Java Classpath.

Go to www.oracle.com for product information and documentation.

- Oracle 8.1.7.1 Oracle JDBC driver.

The required third-party software that supports eaDirect must be obtained separately. eaDirect does not provide them as part of its product distribution. Consult the appropriate vendor's web site for information on how these products can be obtained.

For general installation and maintenance information regarding Sun Solaris and third-party software such Oracle database and client software, see the user documentation that is shipped with each product.

Required Privileges and Accounts for Installation and Administration

The topics below describe the required accounts that are needed to install software, and manipulate files and directories in the eaDirect production environment.

Superuser (root) Account

You will need *root* privilege on each server in the eaDirect environment in order to install eaDirect components, required software packages and patches, and the third-party software applications that work with eaDirect. You will be reminded to set *root* privilege if the installation or configuration procedure requires it.

User and Group Accounts for the WebSphere Distribution

During the WebSphere installation procedure, you will be prompted to specify user and group ownership for directories and files that come with the WebSphere distribution. edocs strongly recommended that you accept the default user and group account when you install the WebSphere application server . The WebSphere examples in this guide use the user and group ownership combination *root:other*.

```
drwxr-xr-x  2 root    other      512 May  9 17:49 AppProfiles
drwxr-xr-x  2 root    other      512 May  9 17:49 Data
drwxr-xr-x  2 root    other      512 May  9 17:49 Input
drwxr-xr-x  3 root    other      512 May  9 17:49 J2EEApps
drwxr-xr-x  2 root    other      512 May  9 17:49 Output
-r--r--r--  1 root    other   241991 Apr 29 17:04 ReleaseNotes.html
drwxr-xr-x  2 root    other      512 May  9 17:49 bin
drwxr-xr-x  2 root    other      512 May 10 12:45 config
drwxrwxr-x  3 root    other      512 May  9 17:50 db
drwxr-xr-x  5 root    other      512 May  9 17:49 lib
drwxr-xr-x  2 root    other      512 May  9 17:49 logs
drwxr-xr-x  6 root    other      512 May  9 17:50 samples
```

Defining Oracle Environment Variables

edocs recommends that you define several environment variables for the *oracle* account, as shown in the following table:

Variable	Description
ORACLE_BASE	Specifies the top-level directory for the Oracle product installation and administrative file structure. The OFA-recommended value is *software_mount_point/app/oracle*. For example, */u01/app/oracle*
ORACLE_HOME	Specifies the directory containing the Oracle software for a particular release. The OFA-recommended value is *<$ORACLE_BASE>/product/release*. For example, */u01/app/oracle/product/8.1.7*
LD_LIBRARY_PATH	Required for Oracle products that use shared libraries This variable must include *<$ORACLE_HOME>/lib*. For example, *LD_LIBRARY_PATH=$ORACLE_HOME/lib*

Variable	Description
ORACLE_SID	Specifies the Oracle instance name or system identifier (SID) of the Oracle database server. The SID must be unique for Oracle instances running on the same machine, and can be any combination of alphanumeric characters up to **eight** characters long. For example, `edx0`

The syntax for defining environment variables depends on which Unix shell you are using, as shown in the following examples:

Bourne or Korn shell:

```
ORACLE_BASE=/u01/app/oracle
export ORACLE_BASE
ORACLE_HOME=<$ORACLE_BASE>/product/8.1.7
export ORACLE_HOME
LD_LIBRARY_PATH=<$ORACLE_HOME>/lib
export LD_LIBRARY_PATH
ORACLE_SID=edx0
export ORACLE_SID
```

C shell:

```
setenv ORACLE_BASE=/u01/app/oracle
setenv ORACLE_HOME=<$ORACLE_BASE>/product/8.1.7
setenv LD_LIBRARY_PATH=<$ORACLE_HOME>/lib
setenv ORACLE_SID=edx0
```

Where to Go From Here

If you have installed eaDirect using the InstallAnywhere 'Full' installation option, you can ignore the database server components installation procedure at the beginning of Chapter 2, and proceed directly to the topic *Configuring the Oracle Database for eaDirect*. Similarly, you can also ignore the application server components installation procedure in Chapter 3.

Setting Up a Database Server for eaDirect **2**

Overview

This chapter provides instructions for installing eaDirect on a database server and configuring the third-party software that supports it. Setting up a database server to support eaDirect involves completing the following tasks:

- Confirm that the Oracle database is installed

- Install the eaDirect database components using the InstallAnywhere tool

- Confirm that the required Oracle environment variables are defined

- Configure the Oracle database for eaDirect

- Enable access to the Oracle database

The installation and configuration examples shown in this chapter use default eaDirect pathnames. If you choose not to accept the default pathnames, make sure your pathnames are consistent throughout the installation of eaDirect on the database and application servers.

It is recommended that you configure the database server first, then the application server.

Understanding the eaDirect Directory Structure on a Database Server

The eaDirect home directory on the database server contains all the files needed to create and configure the eaDirect production database. When you install the eaDirect database server components, you are prompted to specify a 'destination' directory. By default, this directory is *opt/EDCSbd* and it has a pre-defined hierarchical directory structure.

At the top of the directory hierarchy is *EDCSbd*. Below *EDCSbd* is the subdirectory */db*, which contains several levels of subdirectories that contain files used for database creation, configuration, and migration.

```
<EDCSbd>
      /db
```

To designate a different destination directory for the eaDirect database server components, enter the pathname to the directory when prompted during the installation procedure. It is recommended that you install eaDirect in the same directories on both the database server and the application server.

User Privileges Required for Installing the eaDirect Database Server Components

In order to install eaDirect and manipulate Oracle files and scripts (including eaDirect database server components), you will need *root* and *oracle* administrator privileges. Specifically, you will need *root* privilege to install the eaDirect database server components, and *oracle* administrator privilege to run the eaDirect database configuration script.

By default, the files copied to */db* are assigned the user and group account *oracle:dba*. It is recommended that you use the default user and group account to help ensure a successful installation. The Oracle examples in this guide also show the default user and group account *oracle:dba*.

Throughout this installation guide, you will be prompted to switch to the appropriate user privilege when necessary.

Installing the eaDirect Database Server Components

If you have not completed the prerequisite tasks for installing eaDirect as described in the section, *What You Need to Know Before Installing eaDirect*, do so now. This will help to ensure a smooth and successful installation.

The installation procedure below shows how to install the eaDirect database server components using the InstallAnywhere GUI; however, you can choose to install eaDirect in Silent or Console modes. See the topic *Installing eaDirect in Silent or Console Mode* for more information.

In order to use the InstallAnywhere GUI on a Solaris machine, you will need Xwindows software installed. You will also need to set the DISPLAY environment variable accordingly for your machine.

To install the eaDirect database server components:

1. From the */solaris* subdirectory on the installation CD-ROM, run the command to invoke the InstallAnywhere GUI:

    `# ./Dirins.bin`

    A start-up screen is displayed.

2. On the Introduction screen, read the eaDirect introductory information. Then click `Next`.

3. On the License Agreement screen, carefully read the terms of the agreement (use the scroll bars to move up and down on the screen) and accept the terms of the license agreement by clicking the appropriate radio button. Then click `Next`.

4. On the Enter Serial Number screen, enter your product serial number. It is stapled to the inside front cover of this guide (if your serial number has been misplaced, contact edocs Technical Support). Then click `Next`.

5. On the Owner of Web Application Server screen, enter the name of the application server owner (the recommended 'owner' is *root*). Then click `Next`.

6. On the Group of Web Application Server screen, enter the name of the group for the application server (the recommended group is *other*). Then click **Next**.

7. On the Choose Install Folder screen, accept the default installation folder (*opt/EDCSbd*), or click **Choose** to specify another installation folder. Then click **Next**.

8. On the Choose Product Features screen, click **Database**. Then click **Next**.

9. On the Pre-Installation Summary screen, confirm that the information is accurate. Then click **Install**.

   At this point, the eaDirect database server components are copied to the designated installation folder. A status bar on the bottom of the screen shows each database server component being installed. No user intervention is required.

10. The Install Complete screen reports a successful installation and the directory that contains the database server components.

11. Click **Done** to exit the installer.

Configuring the Oracle Database for eaDirect

Before you configure the Oracle database to support eaDirect, you must define several environment variables for the Oracle user account. You are also required to configure Oracle database access to enable eaDirect to communicate with it.

The following table lists the Oracle environment variables that must be defined for the Oracle account:

Variable	Description
ORACLE_BASE	Specifies the top-level directory for the Oracle product installation and administrative file structure. The OFA-recommended value is *software_mount_point/app/oracle*. For example, */u01/app/oracle*
ORACLE_HOME	Specifies the directory containing the Oracle software for a particular release. The OFA-recommended value is *<$ORACLE_BASE>/product/release*. For example, */u01/app/oracle/product/8.1.7*
LD_LIBRARY_PATH	Required for Oracle products that use shared libraries. This variable must include *<$ORACLE_HOME>/lib*. For example, LD_LIBRARY_PATH=$ORACLE_HOME/lib
ORACLE_SID	Specifies the Oracle instance name or system identifier (SID) of the Oracle database server. The SID must be unique for Oracle instances running on the same machine, and can be any combination of alphanumeric characters up to **eight** characters long. For example, edx0

The syntax for defining environment variables depends on which Unix shell you are using, as shown in the following examples:

Bourne or Korn shell:

```
ORACLE_BASE=/u01/app/oracle
export ORACLE_BASE
ORACLE_HOME=$ORACLE_BASE/product/8.1.7
export ORACLE_HOME
LD_LIBRARY_PATH=$ORACLE_HOME/lib
export LD_LIBRARY_PATH
ORACLE_SID=<db_instance>
export ORACLE_SID
```

C shell:

```
setenv ORACLE_BASE=/u01/app/oracle
setenv ORACLE_HOME=$ORACLE_BASE/product/8.1.7
setenv LD_LIBRARY_PATH=$ORACLE_HOME/lib
setenv ORACLE_SID=<db_instance>
```

Configuring the eaDirect Production Database

You configure the eaDirect production database by running the *edx_admin.sh* database configuration script. The database configuration procedure consists of a series of prompts, some of which require user input while others do not. If you have to abort the database setup procedure before it successfully completes, see the section, *Recovering from an Aborted Database Configuration Procedure*, for more information.

Also, before running the script to configure the eaDirect database, confirm that you have a minimum of 1.5GB free disk space in which to configure the database. Insufficient disk space can result in the database configuration procedure to fail.

Caution Make sure that you adhere to the strict character limit for the Oracle SID, which can be any combination of alphanumeric characters up to **eight** characters long.

Entering an Oracle SID with more than eight characters will cause the database configuration procedure to fail.

To configure the eaDirect production database:

1. Switch to *oracle* user and change directory to *<$EDX_HOME>/db/oracle*. For example:

   $ **cd /opt/EDCSbd/db/oracle**

2. Enter the following command at the prompt:

   $ **./edx_admin.sh**

   The eaDirect Server Administration Main Menu is displayed.

3. Select Option 1, **Sign in Menu**.

   ---

   edocs eaDirect Server Administration Main Menu Version 1.0
    ----
        [1] Sign in Menu
        [2] Capture Database File Locations
        [3] Install edocs eaDirect
        [4] Initial Data Population
        [5] Database Version Migration

        [Q] Quit

   Enter Your Selection: **1**

   A second sign-in screen is displayed. You will be prompted to enter a username, password, and Oracle SID.

   The following example shows sample values for database username, database password, and database SID; however, you can specify other values if so desired.

           SIGN IN MENU
     ----
        [1] Enter Database USERNAME ...> **edx_dba**
        [2] Enter Database PASSWORD ...> **edx**
        [3] Enter ORACLE_SID   ...> **edx0**

   Upon completion of this step, you are returned to the main administration menu.

4. Select option 2, **Capture Database File Locations**.

---

edocs eaDirect Server Administration Main Menu Version 1.0

  ----
     [1] Sign in Menu
     [2] Capture Database File Locations
     [3] Install edocs eaDirect
     [4] Initial Data Population
     [5] Database Version Migration
     [Q] Quit

 Enter Your Selection: **2**

This option specifies the absolute pathname for the various files that will comprise the eaDirect database. The location of these files depends on the type of file structure you are using. This installation process assumes the Oracle Optimal Flexible Architecture (OFA) for the database files.

During this option, you will be prompted to provide absolute pathnames for a variety of database files, including:

- Redo-Log file

- System tablespace file

- Temporary tablespace file

- Rollback tablespace file

- edocs data tablespace file

- edocs index data tablespace file

- Application data tablespace file

- Application index data tablespace file

- Detail extractor data tablespace file

- Detail extractor index tablespace file

- FS data tablespace file

- FS index tablespace file

- Order capture data tablespace file

- Order capture index tablespace file

- Database control file

For the database control file, you will be prompted to enter up to three locations. The control file is important because, among other functions, it allows access to the database. Therefore, by specifying additional locations for the control file, you are providing a means of 'backup' if a database control file is accidentally deleted or becomes corrupted.

Database files can reside wherever you want them to. If you plan to use only one disk location, specifying a pathname similar to the following for the database software and files is appropriate:

<$ORACLE_HOME>/oradata

The configuration process checks the validity of the specified locations and displays the following message if no problems are encountered:

```
Capture of Database file locations completed.
```

Upon completion of this step, press Enter to return to the edocs eaDirect Server Administration Main Menu.

5. Select Option 3, **Install edocs eaDirect**. The Install edocs eaDirect menu is displayed.

6. Select Option 1, **Initialize Oracle Database I**.

```
Install edocs eaDirect
 ------------------------------------
 [1] Initialize Oracle Database I
 [2] Shutdown Database
 [3] Startup Database
 [4] Initialize Oracle Database II
 [5] Install Application Database I
 [6] Install Application Database II
 [7] View Status Log Directory
 --------------------------------------------------
 [R] Return to previous menu

 SELECT YOUR OPTION: 1
```

The options on this menu are used to initialize the eaDirect database, which consists of:

- Creating a new database initialization file from the installation template *init.ora* file. The name of the newly created initialization file combines the 'init' prefix followed by the Oracle SID.

- Creation of the script, *create_ora_db.sh*, which contains the Oracle command that is used to create a database.

- Execution of the two files above.

During the execution of this step, you should see output similar to the following:

```
BASE=/uo1/app/oracle
INIT=initedx0.ora
Please wait, this may take a few moments
"--> Database Definition occurring..."
ORACLE instance started.

Total System Global Area    53047456 bytes
Fixed Size                     73888 bytes
Variable Size               52064256 bytes
Database Buffers              819200 bytes
Redo Buffers                   90112 bytes
Database created.
```

Upon completion of this step, press **Enter** to return to the Install edocs eaDirect menu.

7. Select Option 2, **Shutdown Database**.

```
Oracle Server Manager Release 3.1.7.0.0 – Production

Copyright (c) 1997, 1999, Oracle Corporation. All Rights
Reserved.

Oracle8i Enterprise Edition Release 8.1.7.0.0 – Production With
the Partitioning option
JServer Release 8.1.7.0.0 - Production

SVRMGR> Connected.

Database closed.
Database dismounted.
ORACLE instance shut down.
SVRMGR> Server Manager complete.
```

Upon completion of this step, press **Enter** to return to the Install edocs eaDirect menu.

8. Select Option 3, **Startup Database**.

```
Oracle Server Manager Release 3.1.7.0.0 - Production

Copyright (c) 1997, 1999, Oracle Corporation.  All Rights
Reserved.

Oracle8i Enterprise Edition Release 8.1.7.0.0 – Production With
the Partitioning option
JServer Release 8.1.7.0.0 - Production

SVRMGR> Connected.
SVRMGR> ORACLE instance started.

Total System Global Area 53047456 bytes
Fixed Size                  73888 bytes
Variable Size            52064256 bytes
Database Buffers           819200 bytes
Redo Buffers                90112 bytes
Database mounted.
Database opened.
SVRMGR> Server Manager complete.
```

Upon completion of this step, press **Enter** to return to the Install edocs eaDirect menu.

9. Select Option 4, **Initialize Oracle Database II**.

```
Install edocs eaDirect
 ------------------------------------
  [1] Initialize Oracle Database I
  [2] Shutdown Database
  [3] Startup Database
  [4] Initialize Oracle Database II
  [5] Install Application Database I
  [6] Install Application Database II
  [7] View Status Log Directory
 ---------------------------------------------------
  [R] Return to previous menu

 SELECT YOUR OPTION: 4
```

This option executes several scripts that define the data dictionary for the new database and create a stored procedure. The stored procedure is modified to contain the absolute pathnames that were defined in Option 2, `Capture Database File Locations`.

The newly created stored procedure creates the various database tablespaces and rollback segment data files that the eaDirect database requires.

This option will take approximately 20 minutes to complete. During this process informational messages are displayed, indicating that the utility scripts and the stored procedures are executing. A final message will indicate whether the processing was successful.

No user input is required for this option. Upon completion of this step, press **Enter** to return to the Install edocs eaDirect menu.

10. Select Option 5, **Install Application Database I**.

```
Install edocs eaDirect
-------------------------------------
 [1] Initialize Oracle Database I
 [2] Shutdown Database
 [3] Startup Database
 [4] Initialize Oracle Database II
 [5] Install Application Database I
 [6] Install Application Database II
 [7] View Status Log Directory
--------------------------------------------------
 [R] Return to previous menu

SELECT YOUR OPTION: 5
```

This option creates the eaDirect database tables and indexes using a SQL script named *create_tables.sql*. No user input is required for this option.

The error messages that are briefly displayed at the start of this step are an expected part of the process and can be ignored. Upon completion of this step, press **Enter** to return to the Install edocs eaDirect menu.

11. Select Option 6, **Install Application Database II**.

Install edocs eaDirect

----
   [1] Initialize Oracle Database I
   [2] Shutdown Database
   [3] Startup Database
   [4] Initialize Oracle Database II
   [5] Install Application Database I
   [6] Install Application Database II
   [7] View Status Log Directory

   [R] Return to previous menu

SELECT YOUR OPTION: **6**

This option compiles the application-defined stored procedures. These stored procedures constitute the database processing for eaDirect. During the processing, informational messages are displayed indicating the successful compilation of the individual program modules.

No user input is required for this option. Upon completion of this step, press **Enter** to go back to the Install edocs eaDirect menu.

Tip   Option 7, View Status Log Directory, allows you to view several log files that are created during the database configuration procedure. The files are copied to <*$EDX_HOME>/db/oracle*.

This option is not necessary for the database configuration procedure to complete successfully.

---

12. Select Option **R** (Return to Previous Menu). The eaDirect Server Administration Main Menu is displayed.

13. Select Option 4, **Initial Data Population**.

---
edocs eaDirect Server Administration Main Menu Version 1.0

  ----
      [1] Sign in Menu
      [2] Capture Database File Locations
      [3] Install edocs eaDirect
      [4] Initial Data Population
      [5] Database Version Migration
      [Q] Quit

Enter Your Selection: **4**

The Initial Data Population Menu is displayed.

14. Select Option 1, **Import Initial Data Set**.

Initial Data Population

---------- ----------------------
 [1] Import initial data set
 [2] Export edocs database data

 [R] Return to previous menu

Select Your Option: **1**

This option populates the newly defined database with information from a data file that is loaded into the database. As data is imported into the tables, informational messages are displayed indicating the whether the data is being imported correctly.

No user input is required for this option. Upon completion of this step, press **Enter** to return to the Initial Data Population menu.

Tip   Note that running Step 2, Export edocs database data, is not necessary at this time because the database is still empty.

---

15. Select Option **R** (Return to Previous Menu).

```
Initial Data Population
   -------------------------------------
    [1] Import initial data set
    [2] Export edocs database data
   -------------------------------------
    [R] Return to previous menu

  Select Your Option: R
```

The eaDirect Server Administration Main Menu is displayed.

16. Select Option Q (Quit) to end the eaDirect database configuration session.

```
edocs eaDirect Server Administration Main Menu Version 1.0
  --------------------------------------------------
        [1] Sign in Menu
        [2] Capture Database File Locations
        [3] Install edocs eaDirect
        [4] Initial Data Population
        [5] Database Version Migration
        [Q] Quit
  --------------------------------------------------
  Enter Your Selection: Q
```

Tip

You can ignore Option 5, Database Version Migration, at this time because you are setting up the database for the first time. You should select this option only if you want to migrate a previously installed database so that it can be used with a later version of eaDirect.

Ignoring this option will not negatively impact the database configuration procedure in any way. Chapter 5, *Migrating eaDirect Databases*, describes how to migrate a database from one version of eaDirect to another.

Setting Up Database Tables for Order Capture in eaSample

In order to use the Order Capture feature in the eaSample application that is provided with the eaDirect distribution, you must manually execute a script that connects to the Oracle database and creates the appropriate database tables. This procedure must be done before you deploy the sample application to WebSphere, otherwise you will see errors during WebSphere Server start up. See *Appendix A: Using eaSample* for more information.

Recovering from an Aborted Database Configuration Session

You should only do the steps below if you encountered errors during any part of the database configuration procedure. Before configuring the database again using the *edx_admin.sh* configuration script, you must first do a manual cleanup of the partially configured database on your machine.

To recover from an aborted database configuration session:

1. Confirm that the appropriate Oracle SID has been set. As oracle user, you can use the Unix echo command to find out the identity of the current Oracle SID. For example:

    ```
    $ echo $ORACLE_SID
      edx0
    ```

    If the Oracle SID is incorrect, set it as follows:

    ```
    $ ORACLE_SID=edx0  (where 'edx0' represents your Oracle SID)
    $ export ORACLE_SID
    ```

2. Switch to *oracle* user, and shut down the Oracle database and Oracle listener using the following *sqlplus* commands:

    ```
    $ sqlplus internal

    SQL*Plus: Release 8.1.7.0.0 - Production on Wed Feb 13 14:22:43
    2002

    (c) Copyright 2000 Oracle Corporation. All rights reserved.

    Connected to:
    Oracle8i Enterprise Edition Release 8.1.7.0.0 – Production
    With the Partitioning option
    JServer Release 8.1.7.0.0 - Production

    SQL> shutdown immediate

    Database closed.
    Database dismounted.
    ORACLE instance shut down.

    SQL> exit

    Disconnected from Oracle8i Enterprise Edition Release 8.1.7.0.0
    – Production With the Partitioning option

    JServer Release 8.1.7.0.0 - Production
    ```

3. Locate all files associated with the Oracle SID you defined. For example:

    $ **find . -name '*edx*' –print**

    The search results should look something like this:

```
./product/8.1.7/dbs/initedx0.ora
./product/oradata/edx0
./product/oradata/edx0/redo/logedx0.log
./product/oradata/edx0/redo/logedx1.log
./product/oradata/edx0/data/sysedx0.dbf
./product/oradata/edx0/data/rbs1edx0.dbf
./product/oradata/edx0/data/usr1edx0.dbf
./product/oradata/edx0/data/tmp1edx0.dbf
./product/oradata/edx0/data/indx1edx0.dbf
./product/oradata/edx0/data/edx_data.dbf
./product/oradata/edx0/data/edx_data_idx.dbf
./product/oradata/edx0/data/edx_app_data.dbf
./product/oradata/edx0/data/edx_app_data_idx.dbf
./admin/edx0
./admin/edx0/bdump/alert_edx0.log
./admin/edx0/pfile/initedx0.ora
```

4. Change directory to the locations of the files containing the Oracle SID you defined, and manually remove them with the command:

    $ **rm –rf '*edx*'**

Enabling Connectivity to the eaDirect Production Database

The next step in setting up the database server is to edit two Oracle configuration files to ensure proper access to the eaDirect production database. They are:

*   *listener.ora*

*   *tnsnames.ora*

Both Oracle configuration files are described in the following table:

Configuration File	Description
listener.ora	The configuration file for the Oracle listener. It resides on the database server and includes service names and address of all listeners on a computer, the SIDs of the databases for which they listen, and various control parameters that the listener uses. This file is installed with the Oracle installation. The default directory for this file is *<$ORACLE_HOME>/network/admin*.
tnsnames.ora	This file includes a list of service names of network databases that are mapped to connect descriptors. It is used by clients and distributed database servers to identify potential server destinations. The default directory for this file is *<$ORACLE_HOME>/network/admin*.

To enable connectivity to the eaDirect production database:

1. Switch user to o*racle* and change directory to *<$ORACLE_HOME>/network/admin*. For example:

    $ **cd /export/home/oracle/product/8.1.7/network/admin**

2. Open *listener.ora* and edit the file so that correctly identifies your Oracle SID (as specified during the database configuration procedure) and your Oracle 'home' pathname. For example:

```
(SID_DESC =
  (SID_NAME = edx0)
  (ORACLE_HOME = /export/home/oracle/product/8.1.7)
 )
```

3. Save and close *listener.ora*.

4. In the same directory, open *tnsnames.ora* and edit it so that eaDirect is able to communicate with the Oracle database. A sample section from *tnsnames.ora* is shown below for an installed Oracle database that uses the service name edx.db (your service name might be different), and is installed on a database server named javelin.

```
edx.db =
  (DESCRIPTION =
    (ADDRESS_LIST =
      (ADDRESS = (PROTOCOL = TCP)(HOST = javelin)(PORT = 1521))

    )
    (CONNECT_DATA =
      (SID = edx0)
    )
  )
```

5. Save and close *tnsnames.ora*.

6. Stop the Oracle listener.

```
$ lsnrctl stop

LSNRCTL for Solaris: Version 8.1.7.0.0 - Production on 16-JAN-
2002 17:37:32

(c) Copyright 1998 Oracle Corporation. All rights reserved.

Connecting to
(DESCRIPTION=(ADDRESS=(PROTOCOL=IPC)(KEY=EXTPROC)))

The command completed successfully
```

7. Restart the Oracle listener.

```
$ lsnrctl start

LSNRCTL for Solaris: Version 8.1.7.0.0 - Production on 16-JAN-
2002 17:37:46

(c) Copyright 1998 Oracle Corporation. All rights reserved.

Starting /export/home/oracle/product/8.1.7/bin/tnslsnr: please
wait...
.
.
.
Services Summary...
 PLSExtProc has 1 service handler(s)
 edx0       has 1 service handler(s)
 was        has 1 service handler(s)

The command completed successfully
```

8. After the Oracle listener has been restarted, you should see a service handler for the eaDirect instance. In the following example, the service handler is labeled edx0, but it should match the name you entered for the Oracle SID during the database configuration procedure. See the topic, *Configuring the Oracle Database for eaDirect*, for more information.

Tip After the application server components have been installed, you will be able to confirm connectivity to the Oracle database, as described in the topic *Confirming Connectivity to the eaDirect Production Database* in Chapter 3.

Setting Up an Application Server for eaDirect

3

Overview

This chapter provides instructions for installing eaDirect on an application server and configuring the third-party software that support it. Setting up an application server to support eaDirect involves completing the following tasks:

- Confirm that WebSphere 4.0.3 is installed

- Confirm that IBM's Java Development Kit 1.3.1_04 is installed

- Confirm that the Oracle 8.1.7 Client software is installed

- Install the eaDirect application components using the InstallAnywhere tool

- Configure WebSphere's Java resources for eaDirect

- Enable connectivity to the Oracle database

The installation and configuration examples shown in this chapter use default pathnames for eaDirect, such as */opt/EDCSbd*. If you choose not to accept the default pathnames, make sure your pathnames are consistent throughout the installation of eaDirect on both servers.

Tip	If you have not already installed the database server components and configured the database server for eaDirect, do so now. When installing eaDirect, it is recommended that you install eaDirect in the same directory on the database and application servers.

User Privilege Required for Installing the eaDirect Application Server Components

In order to install the eaDirect application server components, you will need *root* administrator privilege. Throughout this installation guide, you will be reminded to switch to *root* privilege if the installation or configuration procedure requires it.

Starting WebSphere in an Active eaDirect Production Environment

WebSphere provides the *startupServer.sh* command for starting the application server from a command line. This command is located in *<$WAS_HOME>/bin* (where *$WAS_HOME* is the WebSphere installation directory).

To start the WebSphere administration server, enter the command:

```
# ./startupServer.sh &
```

The *startupServer.sh* command works fine for starting the administration server in a non-production environment where there are no running jobs. However, in an active eaDirect production environment where jobs are constantly running, it is recommended that you use command syntax similar to the one below when starting the administration server.

```
# nohup ./startupServer.sh &
```

This command will not stop WebSphere if you close the command line window in which you started the application server. Using the recommended command syntax to start up the application server helps to ensure a more stable and trouble-free production environment.

Tip	An alternative to using a single startup command is to create a script that includes the recommended command to start WebSphere in an active production environment, and the commands used to start the Scheduler and Logger processes (see the topic, *Starting the eaDirect Scheduler and Logger*).

Understanding the eaDirect Directory Structure on an Application Server

The eaDirect home directory on the application server contains all the files needed to support the eaDirect application. When you install the eaDirect application server components, you are prompted to specify a 'destination' directory. By default, this directory is *opt/EDCSbd* and it has a pre-defined hierarchical directory structure.

At the top of the structure is *EDCSbd*. Below *EDCSbd* are several subdirectories that are grouped by functionality and contain the J2EE applications, libraries, executables, log files, configuration files, and sample applications that eaDirect uses.

It is recommended that you install eaDirect in the same directory on the application and database servers. The following screen shows a sample directory hierarchy that is created on an application server in a distributed environment. Note that during the eaDirect installation several files (such as the product Release Notes and the eaDirect installation log file) are copied to */EDCSbd*. These files are not shown in the sample screen below.

```
<EDCSbd>
    /AppProfiles
    /bin
    /config
    /Data
    /Input
    /J2EEApps
    /jre
    /lib
    /logs
    /Output
    /samples (created only if the eaDirect J2EE sample
            applications are installed)
    /Uninstall
```

Tip When installing eaDirect on a single machine with the InstallAnywhere 'Full' option, the database subdirectories (as mentioned in the topic *Understanding the Directory Structure on a Database Server* in Chapter 2) are included in the eaDirect directory hierarchy shown above.

The contents of */EDCSbd* on the application server are described in the following table:

Directory	Contents
AppProfiles	Contains Version Sets (configuration and HTML template files created in the design environment) that are published to the production environment.
bin	Contains scripts used to start the eaDirect Scheduler (*ws_scheduler*) and Logger (*ws_logger*) processes and scripts used to configure JMS objects.
config	Contains configuration files that are used to define the eaDirect environment.

Directory	Contents
Data	Contains the input data files that are copied to this directory after the Scanner finds them in the Input directory for an application and moves them here (other production tasks use these files to process the input data from a service provider). Also contains intermediate representation (*.ir*) and log files for an application.
Input	Contains the input data files from a service provider that are needed by the Scanner production task.
J2EEApps	Contains the eaDirect J2EE EAR file *ear-eadirect.ear*. This file also contains the WAR files for the eaPay, eaPost, and eaXchange add-on modules.
jre	Contains library and binary files that are used by the Java Runtime Environment.
lib	Contains JAR files that are used by the WebSphere application server.
logs	Contains application log files generated by activity in the production environment.
Output	Contains output files from Batch XML and HTML jobs running in the eaDirect Command Center.
samples	Contains the *ear-easample.ear* and *ear-eatraining.ear* sample applications in subdirectories labeled */eaSample* and */eaTraining*. Also contains sample data files that can be used with the *ear-easample.ear* and the *ear-eatraining.ear* sample applications. Also includes *hierarchySample* (if licensed) and *umfSample* (if licensed).
Uninstall	Contains the eaDirect uninstall script and other files pertaining to uninstalling eaDirect.

Installing the eaDirect Application Server Components

If you have not completed the prerequisite tasks for installing eaDirect as described in the section, *What You Need to Know Before Installing eaDirect*, do so now. This will help to ensure a smooth and successful installation.

The installation procedure below shows how to install the eaDirect application server components using the InstallAnywhere GUI; however, you can choose to install eaDirect in Silent or Console modes. See the topic *InstallAnywhere Installation Modes* for more information.

In order to use the InstallAnywhere GUI on a Solaris machine, you will need Xwindows software installed. You will also need to set the DISPLAY environment variable accordingly for your machine.

To install the eaDirect application server components:

1. From the */solaris* subdirectory on the installation CD-ROM, run the command to invoke the InstallAnywhere GUI:

   ```
   # ./Dirins.bin
   ```

   A start-up screen is displayed.

Tip   Be sure to set your display before starting the installer. For example, using the sh shell:

```
export DISPLAY=<hostname>:0.0
```

substituting your host name for `<hostname>`.

---

2. On the Introduction screen, read the eaDirect introductory information. Then click **Next**.

3. On the License Agreement screen, carefully read the terms of the agreement (use the scroll bars to move up and down on the screen) and accept the terms of the license agreement by clicking the appropriate radio button. Then click **Next**.

4. On the Enter Serial Number screen, enter your product serial number. It is stapled to the inside front cover of this guide (if your serial number has been misplaced, contact edocs Technical Support). Then click **Next**.

5. On the Owner of Web Application Server screen, enter the name of the application server owner (the recommended 'owner' is *root*). Then click **Next**.

6. On the Group of Web Application Server screen, enter the name of the group for the application server (the recommended group is *other*). Then click **Next**.

7. On the Choose Install Folder screen, accept the default installation folder (*opt/EDCSbd*), or click **Choose** to specify another installation folder. Then click **Next**.

8. On the Choose Product Features screen, click **App Server**. Then click **Next**.

9. On the Pre-Installation Summary screen, confirm that the information is accurate. Then click **Install**.

   At this point, the eaDirect application server components are copied to the designated installation folder. A status bar on the bottom of the screen shows each component being installed. No user intervention is required.

10. The Install Complete screen reports a successful installation and the directory that contains the application server components.

11. Click **Done** to exit the installer.

Defining the eaDirect Environment for WebSphere Server

Defining the eaDirect environment for WebSphere involves performing the following tasks:

- Capture information about your eaDirect environment

- Pass your eaDirect environment to WebSphere at server startup

eaDirect provides two configuration files that you use to define your eaDirect environment, and pass it to WebSphere at server startup. The configuration files, *edx_config* and *edx.config*, are included among the application components that you installed earlier, and are copied to *<$EDX_HOME>/bin and <$EDX_HOME>/config* respectively.

The following topics describe how to define your eaDirect environment and pass it to WebSphere at server startup.

Capturing Information about Your eaDirect Environment

The method used to capture your eaDirect environment is to run the configuration script *edx_config*. When run, it prompts you to enter values for the current Java and Oracle database installation. These values take the form of absolute directory pathnames or user identification information. You should run this script anytime you need to modify your eaDirect environment.

Note that you only need run *edx_config* on the application server (or where your eaDirect application server components are installed).

To capture information about your eaDirect environment:

1. Switch user to *root*, and navigate to *<$EDX_HOME>/bin*. For example:

   # **cd /opt/EDCSbd/bin**

2. Run the *edx_config* configuration script.

   # **./edx_config**

3. Provide values for the following parameters. You can accept default values, if appropriate.

```
Enter Oracle home directory:[/export/home/oracle/product/8.1.7] [q]
/export/home/oracle/product/8.1.7
Oracle DB username:[edx_dba] [q]/edx_dba
Oracle password:[edx] [q]edx
Oracle DB alias (tnsname):[edx.db] [q]edx.db
Enter the application server to use, weblogic (wl) or websphere (ws) : [q]ws
Enter WebSphere Application Server root directory:[/opt/WebSphere/AppServer]
[q]/opt/WebSphere/AppServer
Enter MQSeries java client directory:[/opt/mqm/java] [q]/opt/mqm/java
Enter Java root directory:[/opt/WebSphere/AppServer/java] [q]
/opt/WebSphere/AppServer/java
```

4. Make sure that the database values are the same values that you specified during the database configuration procedure, as described in the topic *Configuring the Oracle Database for eaDirect*.

The values that are specified during this session are copied to the configuration file *edx_env* in *<$EDX_HOME>/config*.

Caution	As part of capturing information about your eaDirect environment, you should manually edit *edx_env* to include the time zone (TZ) environment variable, reflecting the correct time zone. Failure to do this could result in scheduled jobs failing because the Java system time might not be the same as the actual system time.

Passing the eaDirect Environment to WebSphere at Server Startup

You pass your eaDirect environment to WebSphere by 'sourcing' (that is, having WebSphere call and dynamically process a file) the configuration file, *edx.config*, in the WebSphere Administration Server start up script, *startupServer.sh*.

To pass your eaDirect environment to WebSphere:

1. Switch to *root* user.

2. Change directory to *<$WAS_HOME>/bin* (for example, */opt/WebSphere/AppServer/bin*) and stop the application server (the server you started with the *startupServer.sh* command*)*. You can use the **kill** command to stop the application server.

3. Open *startupServer.sh* and declare and initialize the variable *<$EDX_HOME>* near the beginning of the file with other variable declarations. For example:

```
# !/bin/ksh

binDir=`dirname $0`
. $binDir/setupCmdLine.sh

WAS_HOME=/opt/WebSphere/AppServer/
export WAS_HOME
EDX_HOME=/export/home/EDCSbd/
export EDX_HOME
```

4. In the same file, source *edx.config* just before the command to start the JVM (the dot and space preceding the pathname are a required part of the syntax):

```
. $EDX_HOME/config/edx.config
${JAVA_EXE?}\
-classpath $WAS_HOME/lib/bootstrap.jar:$CLASSPATH\
-Dws.ext.dirs=$WAS_EXT_DIRS\
-Djavax.rmi.CORBA.UtilClass=com.ibm.CORBA.iiop.Util\
-Dcom.ibm.CORBA.iiop.noLocalCopies=true\
-DDER_DRIVER_PATH=$DER_DRIVER_PATH\
-Dserver.root=$WAS_HOME\
-Xbootclasspath/a:$JAVA_HOME/jre/lib/ext/ibmorb.jar\
com.ibm.ws.bootstrap.WSLauncher\
com.ibm.ejs.sm.util.process.Nanny $WAS_HOME/bin/admin.config
```

Note: The block of code in the sample above is similar to another block of code that appears in *startupServer.sh*. Make sure that you modify the appropriate block of code, which begins below the line: **if ["${DB_TYPE}" != "DB2"]**.

5. Save and close *startupServer.sh*.

Confirming Connectivity to the eaDirect Production Database

In order for an Oracle SQL*Plus session to connect to the eaDirect production database on the database server, the file *tnsnames.ora* must be configured properly. This file includes a list of service names of network databases that are mapped to connect descriptors, and is used by clients and distributed database servers to identify potential server destinations.

For eaDirect, this means confirming that the host name, database service name, and the SID are correct for your database.

To confirm connectivity to the eaDirect production database:

1. Switch user to *oracle*.

2. Change directory to *<$ORACLE_HOME>/network/admin*.

3. Confirm that *tnsnames.ora* is configured correctly to communicate with the Oracle database on the database server. A sample section from *tnsnames.ora* is shown below for an installed Oracle database that uses the service name edx.db (your service name might be different), and is installed on a database server named javelin.

```
edx.db =
  (DESCRIPTION =
    (ADDRESS_LIST =
      (ADDRESS = (PROTOCOL = TCP)(HOST = javelin)(PORT = 1521))
    )
    (CONNECT_DATA =
      (SID = edx0)
    )
  )
```

4. If you edit the file to enter or correct database configuration settings, make sure you save it.

The file *tnsnames.ora* is created during the Oracle installation and, by default, is copied to *<$ORACLE_HOME>/network/admin*.

Confirming Connectivity to the Database Server

Now that you have set up both servers to support eaDirect, you can confirm connectivity to the database server by running the following *sqlplus* commands (note that WebSphere must be aware of your environment in order for this connectivity test to work properly):

Switch user to *oracle*, and use the following syntax:

```
$  sqlplus database_username/database_password@database.alias
```

For example:

```
$ sqlplus edx_dba/edx@edx.db

SQL*Plus: Release 8.1.7.0.0 - Production on Mon Jan 21 10:25:25
2002

(c) Copyright 2000 Oracle Corporation. All rights reserved.
```

```
Connected to: Oracle8i Enterprise Edition Release 8.1.7.0.0 –
Production With the Partitioning option

JServer Release 8.1.7.0.0 - Production

SQL> show parameters db_name

NAME        TYPE     VALUE
---------   -------  -----------
db_name     string   edx0

SQL> exit

Disconnected from Oracle8i Enterprise Edition Release 8.1.7.0.0 –
Production With the Partitioning option

JServer Release 8.1.7.0.0 - Production
```

Deploying and Installing eaDirect Applications to WebSphere

In general, deploying an application involves three distinct phases:

- Component creation, typically done by application developers

- Application assembly, typically done by application developers (although they may not have participated in the 'component creation' phase)

- Application deployment, typically done by both application developers and system administrators

It's not unusual for application programmers during development and testing to deploy their own applications. However, after the application has been assembled and is ready for production, a system administrator most likely will deploy it.

You deploy eaDirect J2EE applications using the WebSphere Administrative Console. The process consists of:

- Configuring Java database connectivity for eaDirect on WebSphere

- Generating deployment code for eaDirect J2EE applications

- Installing the deployed applications on WebSphere

Three J2EE applications are provided in the eaDirect software distribution:

J2EE Application	Description
ear-eadirect.ear	The eaDirect online account management and billing application. This EAR file is required for deployment.
	By default, installed to: *<$EDX_HOME>/J2EEApps/websphere*
ear-easample.ear	Sample online account management and billing application. This EAR file is not required for deployment, but can be used as a template and for current demo pages using Common Directory Access (CDA).
	By default, installed to: *<$EDX_HOME>/samples/eaSample/J2EEApps/websphere*
ear-eatraining.ear	Sample hierarchical online account management and billing application. This EAR file is not required for deployment, but can be used for testing and training purposes.
	By default, installed to: *<$EDX_HOME>/samples/eaTraining/J2EEApps/websphere*

Configuring Java Resources for eaDirect on WebSphere

After you have successfully configured the Oracle database for eaDirect, you must now configure Java resources on WebSphere. These resources enable the manipulation of existing data from relational databases and other data sources, and enables application components to asynchronously send and receive messages.

Specifically, you will be doing the following:

- Configure JDBC connection pools and a JDBC driver

- Configure data sources for the JDBC connection pools

- Configure Java Virtual Machine (JVM) settings for a new application server

- Configure Java Messaging Services (JMS) using IBM MQSeries

You access and configure Java resources through the WebSphere Administrative Console.

To invoke the WebSphere Administrative Console:

1. Change directory to *<$WAS_HOME>/bin* and run the administration server start-up script, *startupServer.sh*. For example:

   # **nohup ./startupServer.sh &**

2. To ensure that that administration server has started correctly, change directory to *<$WAS_HOME>/logs* and use the Solaris **tail** command to view the contents of the *tracefile* file. For example:

   # **cd /opt/WebSphere/AppServer/logs**
   # **tail –f tracefile**

   A successful startup of the administration server will report in the tracefile: "adminServer open for e-business". For example:

```
# tail -f tracefile
[02.01.09 12:07:46:408 EST] 69c82e AdminServer I ADMS0008I: Initializing
WebSphere Administration server
[02.01.09 12:07:52:754 EST] 69c82e ResourceBinde I SVR0049I: Binding
SM_DATASOURCE as jdbc/SM_Datasource
[02.01.09 12:07:56:213 EST] 69c82e EJBEngine I WSVR0037I: Starting EJB jar :
Name Service
[02.01.09 12:07:59:884 EST] 69c82e EJBEngine I WSVR0037I: Starting EJB jar :
Repository
[02.01.09 12:08:19:160 EST] 69c82e EJBEngine I WSVR0037I: Starting EJB jar :
Tasks
[02.01.09 12:08:24:048 EST] 69c82e Server A WSVR0023I: Server __adminServer
open for e-business
```

3. Change directory to *<$WAS_HOME>/bin*, and invoke the WebSphere Administrative Console by running the script *adminclient.sh*. For example:

   # **./adminclient.sh &**

Tip	Be sure to set your display before starting the administrative console. For example, using the sh shell:
	export DISPLAY=<hostname>:0.0
	substituting your host name for <hostname>.

4. The WebSphere Advanced Administrative Console is displayed.
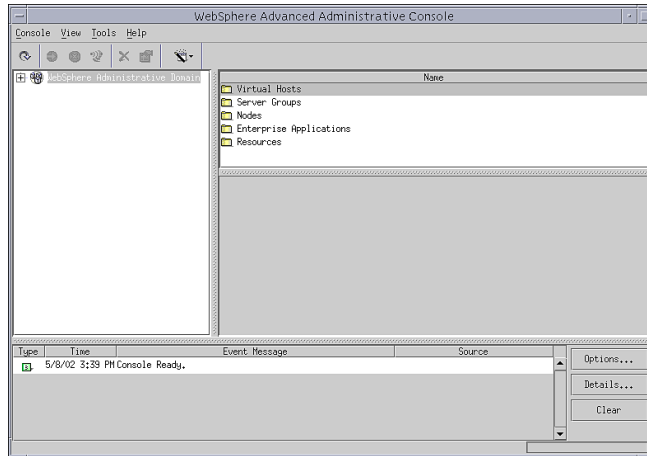
Configuring JDBC Connection Pools

A connection pool contains named groups of JDBC connections that are created when the connection pool is registered, usually when starting up the WebSphere Server. The WebSphere Server opens JDBC connections to the database during the startup process and adds the connections to the pool.

Your application borrows a connection from the pool, uses it, and then returns it to the pool by closing it.

You will create three JDBC Connection Pools. The next section describes how to create the first JDBC Connection Pool. After that procedure, the values for the remaining two connection pools are listed. Create those connection pools following the procedure shown for the first connection pool.

To configure the first JDBC connection pool and JDBC driver:

1. Expand the Resources folder in your domain, right-click on **JDBC Providers**, and then select **New** from the menu.
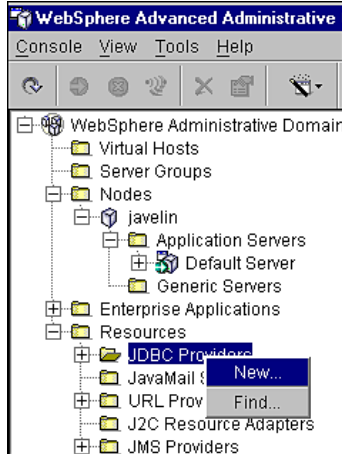
The JDBC Provider Properties dialog is displayed.
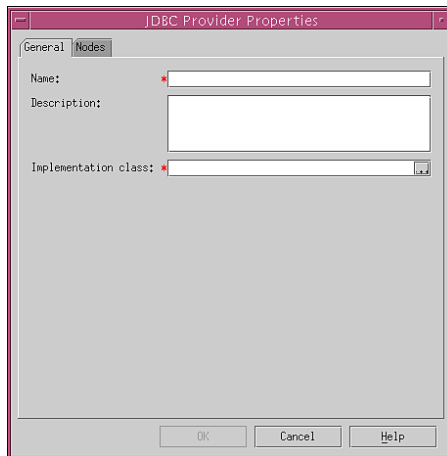
2.   On the General tab, enter **edxUserConnectionPool** in the Name field.

3.   Click the (...) button next to the Implementation Class field. The Select an Implementation Class dialog is displayed.

4. From the list of implementation classes, select
    oracle.jdbc.pool.OracleConnectionPoolDataSource.
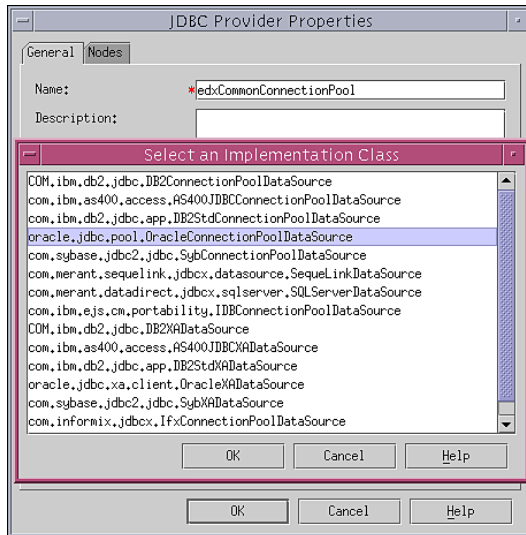
5. Click **OK**. The name of the implementation class is added to the
    Implementation class field in the JDBC Provider Properties dialog.
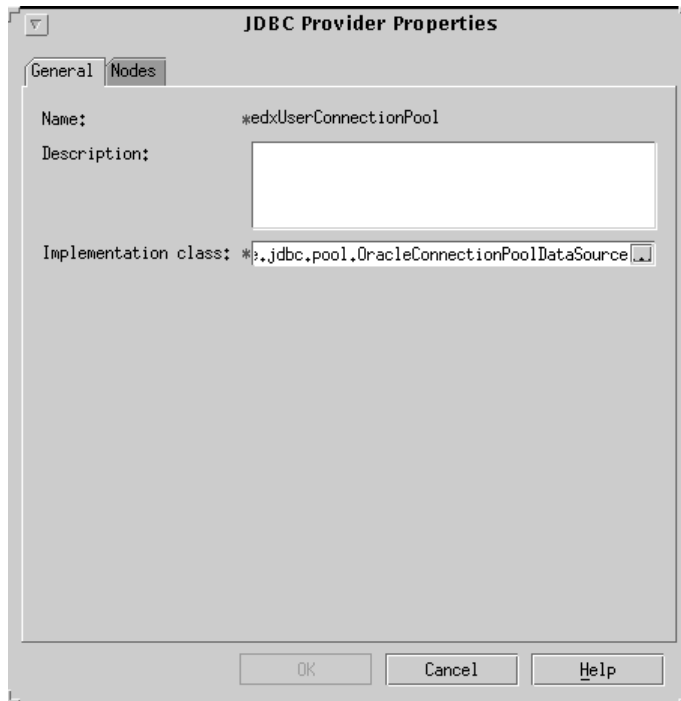
6. Click the **Nodes** tab, and click **Install New**. The Install Driver dialog is displayed.

7. Select the node (that is, the name of the machine that your application server is on. For example, javelin) on which you want to install the JDBC driver.
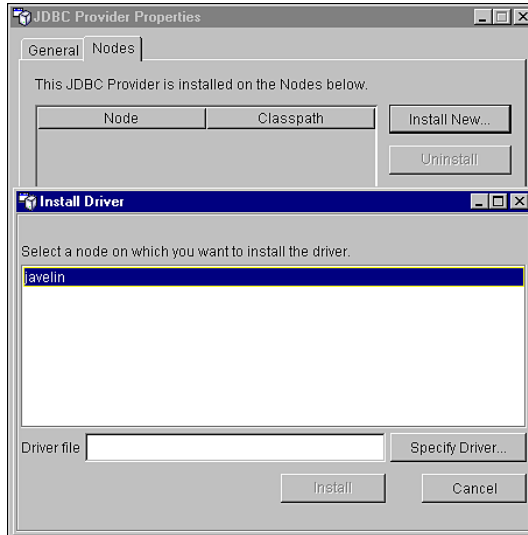
8. Click **Specify Driver**. The Specify the Driver Files dialog is displayed.
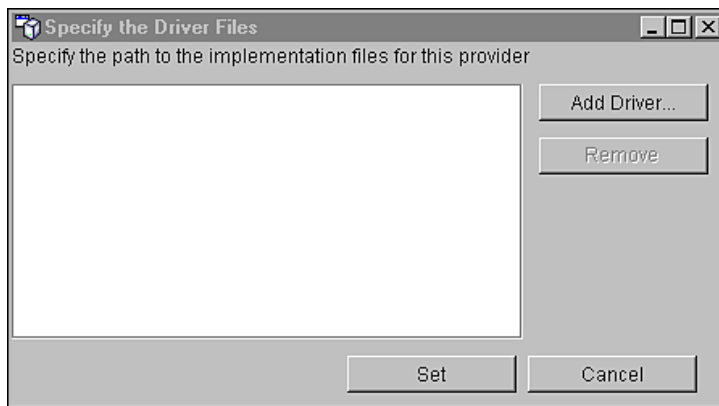
9. Click **Add Driver** and in the Open dialog, navigate to
<$ORACLE_HOME>/jdbc/lib.

10. Select *classes12.zip*. The file is added to the File name field.
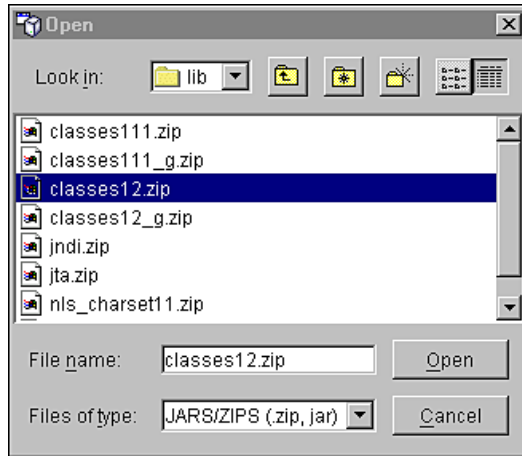
11. Click **Open**. The Specify the Driver Files dialog is displayed, showing the absolute pathname to the JDBC driver you just selected.
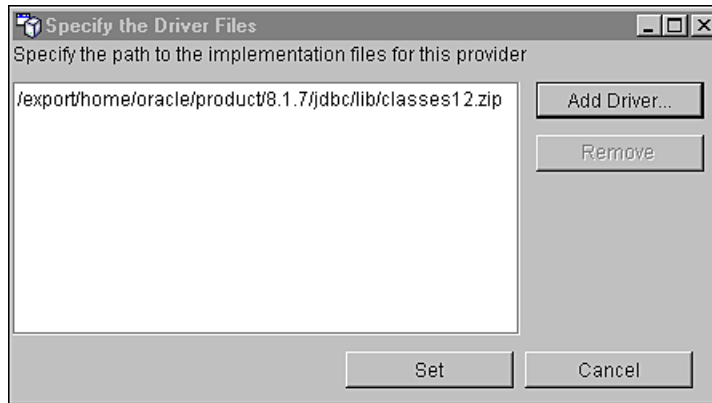
12. Click **Set**. The Install Driver dialog is displayed, showing the pathname to the selected JDBC driver in the Driver file field.
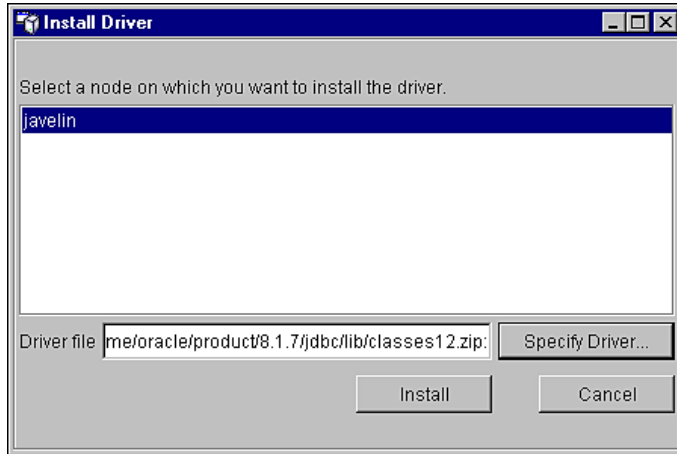
13. Click **Install**. The node and Classpath of the JDBC driver are added to the JDBC Provider Properties dialog.
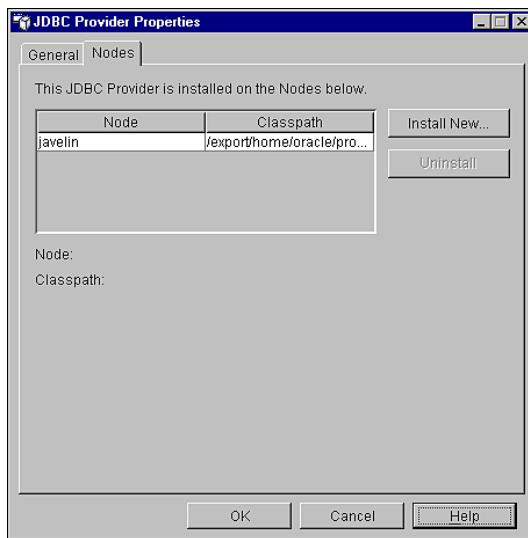
14. Click **OK**. You should see:
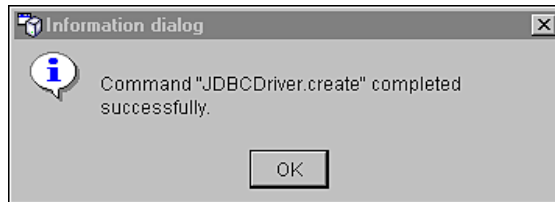
15. Click **OK** to close the Information dialog.

16. Click **Apply** for the changes to take effect.

17. Expand the Resources folder and the JDBC Providers folder to confirm that the new JDBC connection pool, edxUserConnectionPool, has been added.
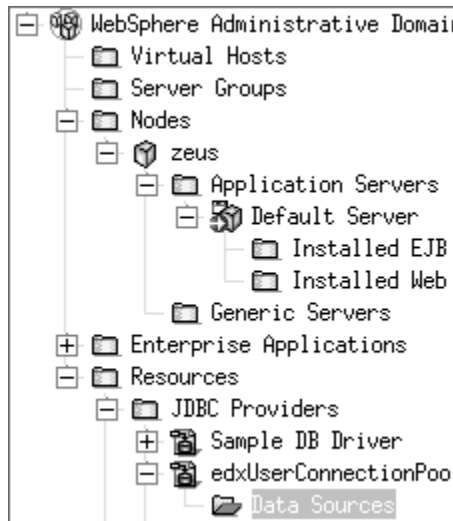
edxLoggerConnectionPool Configuration

Using the procedures shown for edxUserConnectionPool, add the following connection pool:

Attribute Name	Attribute Values
Name	`edxLoggerConnectionPool`
Implementation Class	`oracle.jdbc.pool.OracleConnectionPoolDataSource`
Node	`javelin`
Driver	`classes12.zip`

edxAdminConnectionPool Configuration

Using the procedures shown for edxUserConnectionPool, add the following connection pool:

Attribute Name	Attribute Values
Name	`edxAdminConnectionPool`
Implementation Class	`oracle.jdbc.pool.OracleConnectionPoolDataSource`
Node	`javelin`
Driver	`classes12.zip`

Configuring Data Sources

A transaction data source enables JDBC clients to obtain a connection to a Database management System (DBMS). Each data source points to the value specified for the Name attribute when a JDBC connection pool was configured.

You will configure three transaction data sources. After that procedure, the values for the remaining two transaction data sources are listed. Create those data sources following the procedure shown for the first data sources.

To configure a data source for edxUserConnectionPool

1. Expand the Resources folder in your domain to show the JDBC Providers folder.

2. Expand the JDBC Providers folder and expand **edxUserConnectionPool**.

3. Right-click on **Data Sources**, and then select **New** from the menu.
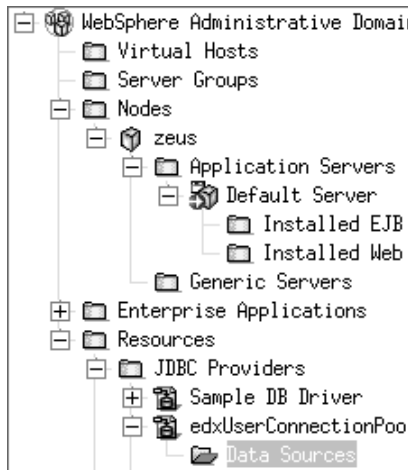
The Data Source Properties dialog is displayed.

4. On the General tab, enter the following values for the Name and JNDI Name parameters (entering a description is optional):

Field	Value
Name	**edxUserDataSource** (note that this name can be whatever you want it to be)
JNDI Name	**edx.user.databasePool** (note that this name is required. Also, be mindful of case sensitivity when entering this value.)

5. Scroll down to Custom Properties, and enter the following database properties by clicking **Add** to open a new line:

Parameter	Value

URL (all uppercase)	`jdbc:oracle:thin:@<servername>:1521:<ORACLE_SID>`
	
	For example:
	`jdbc:oracle:thin:@javelin:1521:edx0`

user	`edx_dba` (or the name of the Oracle database user you specified during the database configuration procedure)

Parameter	Value
password	**edx** (or the name of the Oracle database password you specified during the database configuration procedure. Make sure you confirm your password.)
databaseName	**edx0** (or the name of the Oracle SID you specified during the database configuration procedure)
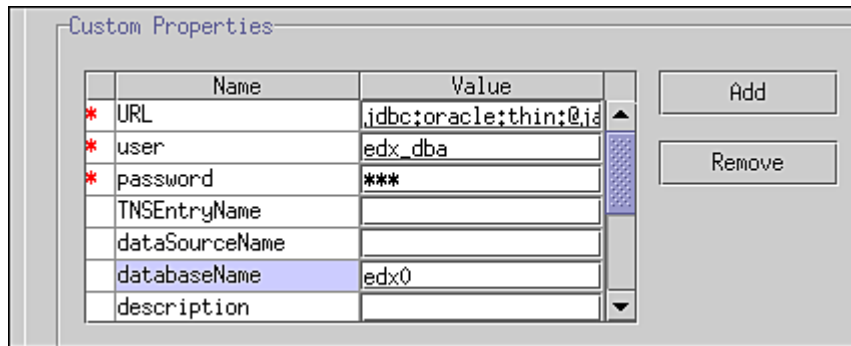
6. Click the **Connection Pooling** tab. In the Maximum pool size field, set the maximum pool size to 20.
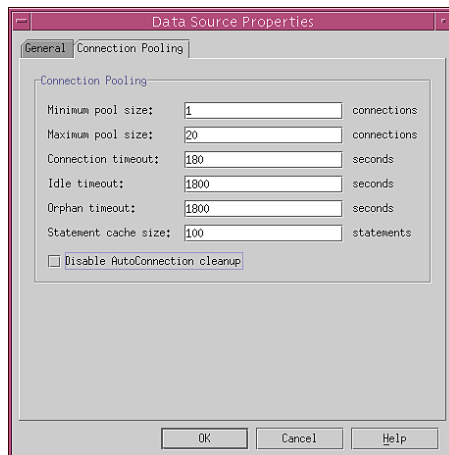
7. Make sure that the Disable AutoConnection cleanup parameter is enabled (box unchecked).

8. Click **OK** to close the Data Source Properties dialog. You should see:
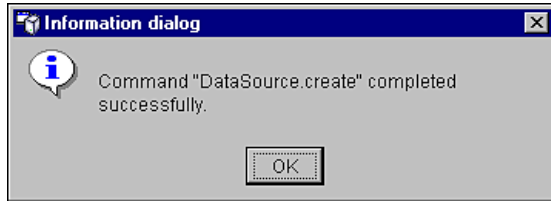
9. Click **OK** to close the Information dialog.

edxLoggerDataSource Configuration

Using the procedures shown for edxUserDataSource, add the following connection pool:

Attribute Name	Attribute Value
Name	`edxLoggerDataSource`
JNDI Name	`edx.logger.databasePool`
Pool Name	`edxLoggerConnectionPool`

edxAdminDataSource Configuration

Using the procedures shown for edxUserDataSource, add the following connection pool:

Attribute Name	Attribute Value
Name	`edxAdminDataSource`
JNDI Name	`edx.databasePool`
Pool Name	`edxAdminConnectionPool`

Configuring JVM Settings

To configure JVM settings for your application server:

1. Open a command line window.

2. Change user to *root*, and navigate to *<$WAS_HOME>/bin*.

3. Run the configuration script *XMLConfig.sh* using the following syntax:

```
# ./XMLConfig.sh –import <$EDX_HOME>/config/ws_config.xml –adminNodeName
your_machine_name -substitute "NodeName=your_machine_name;ServerName=Default
Server;EDX_HOME=absolute_path_to_eaDirect_home;JMS_HOME=absoulte_path_to_JMS_ho
me"
```

For example:

```
# ./XMLConfig.sh –import /opt/EDCSbd/config/ws_config.xml –adminNodeName
javelin -substitute "NodeName=javelin;ServerName=Default
Server;EDX_HOME=/opt/EDCSbd;JMS_HOME=/opt/mqm/java"
```

> **Tip**   If you are using environment variables, make sure
> *<$EDX_HOME>* is pointing to the correct installation directory.

4. Press **Return**. The configuration script runs automatically. No user input is required.

5. Upon completion, you are returned to the command prompt.

6. If you are using SQL Loader system properties other than those defined in the file *<$EDX_HOME>/config/edx_sqlldr.config*, you will have to manually specify the parameters for the JVM of the application server on which eaDirect is installed using the WebSphere Administrative Console (System Properties table). For example:
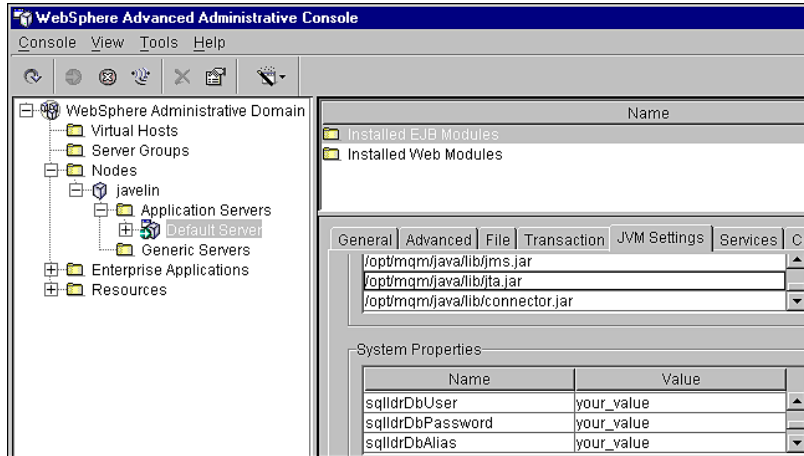
7. Click **Apply** for the changes take effect.

Configuring MQSeries Support for Java Messaging Service

This topic describes how to configure MQSeries Support for Java Messaging Service for eaDirect. Before running the procedures in this topic, you should have already installed the following MQSeries components on a machine where the WebSphere application server is running:

- MQSeries 5.2 with CSD_4. For information about installing MQSeries 5.2, see *book/pdf/en_US/amqdac03* on the MQSeries 5.2 installation CD-ROM.

- MA0C (MQSeries Publish and Subscribe package version 1.0.6). For more information, see http://www-3.ibm.com/software/ts/mqseries/txppacs/ma0c.html.

- MQSeries for Java 5.2 (MA88 1.1.4). For more information, http://www-3.ibm.com/software/ts/mqseries/txppacs/ma0c.html.

JMS configuration for eaDirect is done using a configuration script and not through the WebSphere Administrative Console. This is because JMS resources are external to the WebSphere application server (see the WebSphere Info Center for more information).

For more information about MQSeries 5.2, see the IBM MQSeries documentation that is provided on the distribution CD-ROM with the software, or go to http://www-3.ibm/software/ts/mqseries.

After installing MQSeries, you will have to:

- Configure *JMSAdmin.config*, which is the default configuration file for the MQSeries Classes for Java Message Service Administration Tool. The JMSAdmin tool is used to administer JMS objects such as connection factories, queues, and topics, and binds them to a JNDI name space

- Create a queue manager for eaDirect

- Verify that the MQSeries Publish/Subscribe broker is installed and running properly

- Configure the JMS connection factory and destinations for eaDirect

These procedures are described in the following subtopics.

To configure *JMSAdmin.config*:

1. Change Directory to *<$JMS_HOME>/java/bin* and open *JMSAdmin.config*.

2. From the list of JNDI service providers, uncomment the following setting:

`INITIAL_CONTEXT_FACTORY=com.ibm.websphere.naming.WsnInitialContextFactory`

3. From the list of URLs for JNDI service providers, uncomment the following setting:

`PROVIDER_URL=iiop://localhost:900` (note that you can use your own port number instead of the default port 900)

4. Make sure that no other settings are uncommented for a JNDI service provider and URL.

5. Save and close the file.

To create a MQSeries Queue Manager:

1. As *root* user, navigate to *<$JMS_HOME>/java/bin* (where *$JMS_HOME* is the directory in which you installed MQSeries. By default, MQSeries is installed in */opt/mqm*.

2. Create a queue manager called edxQueueManager by running the following command:

    ```
    # crtmqm -u SYSTEM.DEAD.LETTER.QUEUE edxQueueManager
    ```

3. Start the queue manager using the following command:

    ```
    # strmqm edxQueueManager
    ```

    You can verify that edxQueueManager is running by using the following command:

    ```
    # dspmq
    ```

Tip   If edxQueueManager is listed with a status of 'Ended', start it using the *strmqm* command.

To verify that the MQSeries Publish/Subscribe broker is installed and running (make sure that you have the pathname *<$JMS_HOME>/bin* in your PATH before running the commands in this procedure)**:**

1. As *root* user, run the following command:

    ```
    # dspmqbrk -m edxQueueManager
    ```

2. If you receive an error message that the operating system cannot run the *dspmqbrk* command, confirm that the MQSeries Publish/Subscribe broker is installed properly, and that *<$JMS_HOME>/bin* in included in the system's PATH setting.

3. If the operating system reports that the broker is unavailable (or inactive), start it using the following command:

    ```
    # strmqbrk -m edxQueueManager
    ```

4. Run the following command to verify that the broker has been installed and is running:

    ```
    # dspmqbrk -m edxQueueManager
    ```

5. If the broker is running, you should see a message similar to the following:

```
MQSeries message broker for queue manager
edxQueueManager running
```

6. Change directory to *<$JMS_HOME>/java/bin*, and create the MQ JMS System queues by running the following command:

```
# runmqsc edxQueueManager < MQJMS_PSQ.mqsc
```

To configure a topic connection factory and topic objects for eaDirect:

1. Confirm that the WebSphere administration server is running.

2. Change directory to *<$JMS_HOME>/java/bin*.

3. Supply a value for *EDX_HOME* and export it, for example:

```
# EDX_HOME=/opt/EDCSbd; export EDX_HOME
```

4. Then run the following command:

```
# $EDX_HOME/bin/edx_mqm_config
```

Tip If your MQSeries server is on a remote machine, see the IBM MQSeries documentation for the appropriate configuration.

Generating Deployment Code for eaDirect J2EE Applications

The next step in setting up the application server is to generate the deployment code for the eaDirect J2EE applications that you will later install (see the topic, *Installing Deployed J2EE Applications*) on WebSphere. This is done though the Application Assembly Tool.

The following instructions describe how to invoke the Application Assembly Tool from a command line window. However, you can also start it from the WebSphere Administrative Console.

To generate deployment code for eaDirect J2EE applications:

1. From the WebSphere Administrative Console, open the Tools menu and
   select **Application Assembly Tool**.
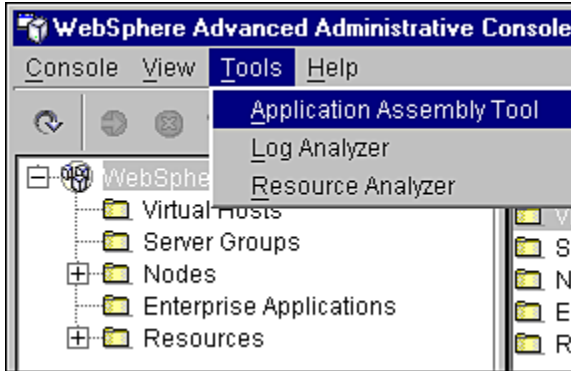
The Application Assembly Tool is displayed.
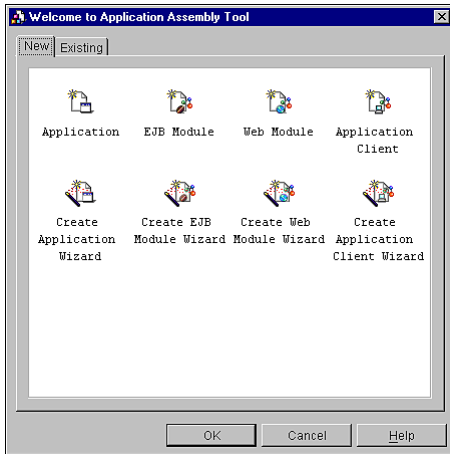
Tip	You can also invoke the Application Assembly Tool from a command line by change directory to *<$WAS_HOME>/bin*, and running the script *assembly.sh*. For example:

```
# ./assembly.sh &
```

The Application Assembly Tool is displayed in an Xwindow, so you will have to have Xwindow software installed and you might have to set your display (in your *.profile* file) to the local machine if you are trying to invoke the Application Assembly tool remotely. For example:

```
set DISPLAY=<your_machine_name>:0.0
export DISPLAY
```

2. Click the **Existing** tab, and click **Browse** at the bottom of the dialog to navigate to the directory that contains the eaDirect J2EE application that you want to deploy.
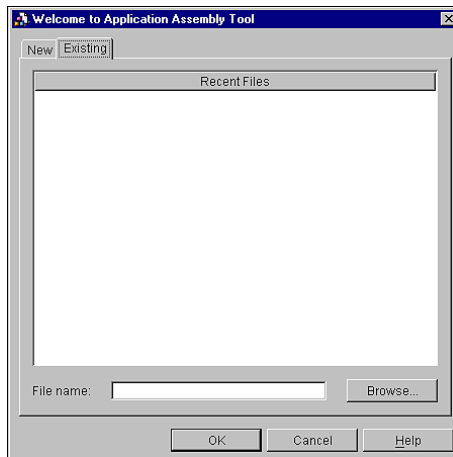
3. Select the J2EE application, in this case *ear-eadirect.ear*, and then click **Select**. (Note that by default *ear-eadirect.ear* is located in the directory *<$EDX_HOME>/J2EEApps/websphere*.)

4. Click **OK**. The eaDirect application opens in the Application Assembly Tool.
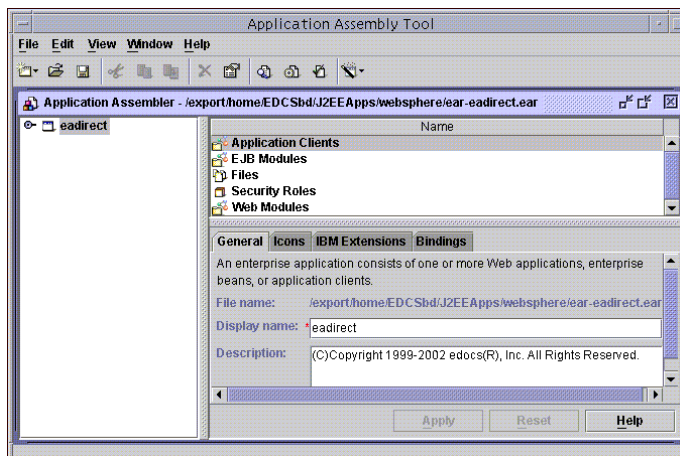
5. Right-click on the file name and select `Generate code for deployment` on the menu.
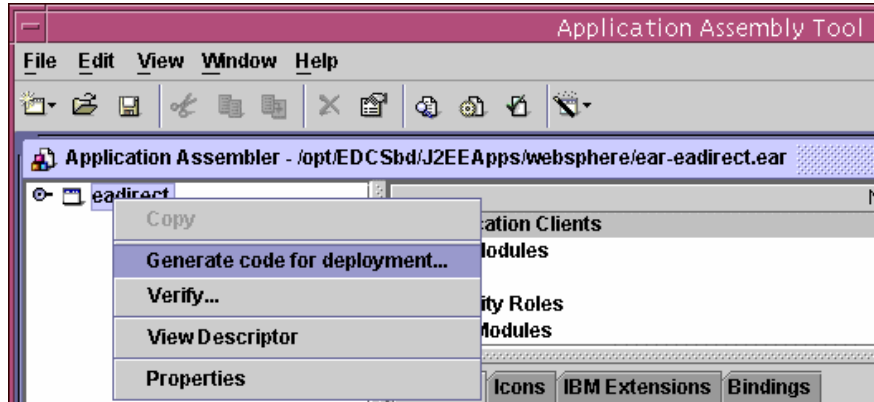
The Generate Code for deployment dialog is displayed.

6. In the Dependent classpath field, enter the java Classpath
    <$EDX_HOME>/lib/edx_system.jar, *<$EDX_HOME>/lib/edx_client.jar*
    and *<$EDX_HOME>/lib/edx_common.jar*, then select **Oracle version 8**
    from the Database type drop-down menu.
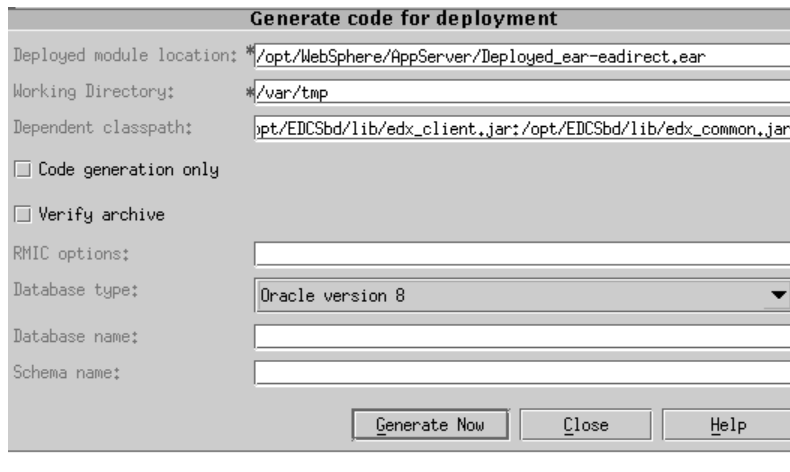
7. Click **Generate Now**. During generation of the deployment code, status
    information is shown in the window at the bottom of the dialog.

8. Wait for the progress bar at the bottom of the Application Assembly Tool to complete. Some applications might take several minutes to deploy, depending on the speed of your machine.

9. Click **Close** to exit from the Generate code for deployment dialog.

To generate deployment code for the eaDirect sample applications:

1. Select **Open** from the File menu in the Application Assembly Tool. The Open dialog is displayed.

2. To generate deployment code for eaSample, navigate to *<$EDX_HOME>/opt/EDCSbd/samples/eaSample/J2EEApps/websphere* and select *ear-easample.ear*. The name of the EAR file is displayed in the File name field of the Open dialog.
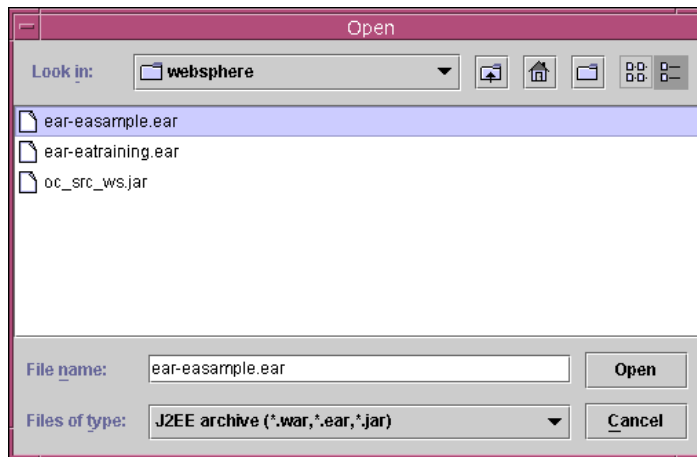
> **Caution** If you choose to deploy eaSample at this time, you must first run *create_demo_oc_table.sh*, which creates the database tables needed for the Order Capture feature. Failure to do so will result in errors when you start WebSphere Server. See *Appendix A: Using eaSample* for more information.

Similarly, to generate deployment code for eaTraining, navigate to *<$EDX_HOME>/opt/EDCSbd/samples/eaTraining/J2EEApps/websphere* and select *ear-eatraining.ear*. The name of the EAR file is displayed in the File name field of the Open dialog (not shown).

3. Click **Open**. The sample application is displayed in the Application Assembly Tool.
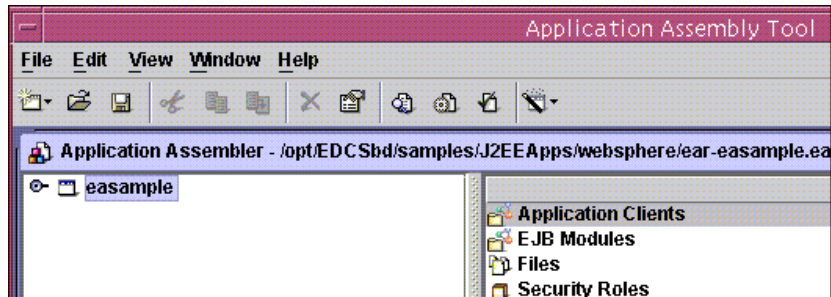
4. Repeat Steps 5 to 9 in the eaDirect 'generate deployment code' process to generate deployment code for each sample application you want to assemble.

    Note: When generating deployment code for the eaTraining sample application, you might see a number of 'warnings' and 'problems' involving depreciated methods; however, these warnings and errors should not be seen as an indication that the process has failed. As long as there are '0 errors' reported after each EJB has been processed in the sample application, the deployment code has been generated successfully.)

5. Click **Exit** in the File menu to close the Application Assembly Tool.

Installing Deployed eaDirect J2EE Applications

To install deployed eaDirect J2EE applications:

1. Expand the WebSphere Administrative Domain view.

2. Right-click the **Enterprise Applications** folder, and then select **Install Enterprise Applications** on the menu.
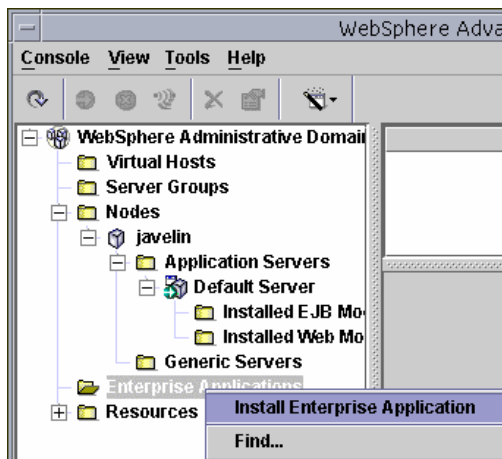
The Install Enterprise Application Wizard dialog is displayed.

3. Click the **Install Application** radio button, and confirm that the correct node has been chosen in the Browse for file on node field. For example:
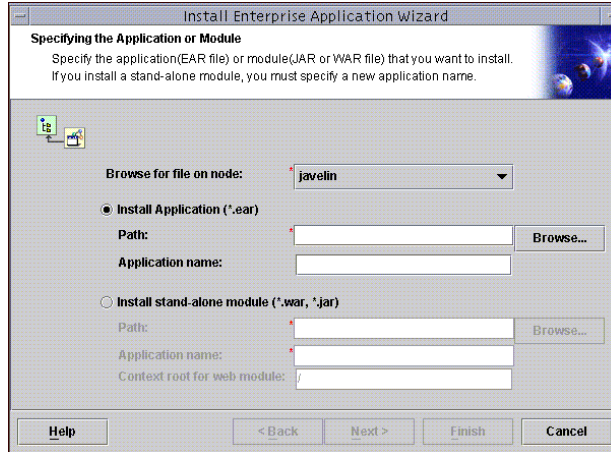
4. Click **Browse**. The Open dialog is displayed.

5. Navigate to *<$EDX_HOME>/J2EEApps/websphere*, and select
    Deployed_ear-eadirect.ear. The name of the file is displayed in the
    File name field.
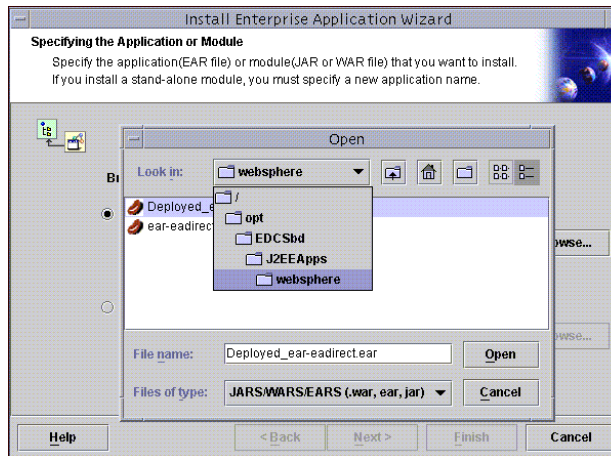
6. Click **Open**. The Install Enterprise Application Wizard dialog is displayed
    with the name of the deployed EAR file in the InstallApplication (*.ear) Path
    field.
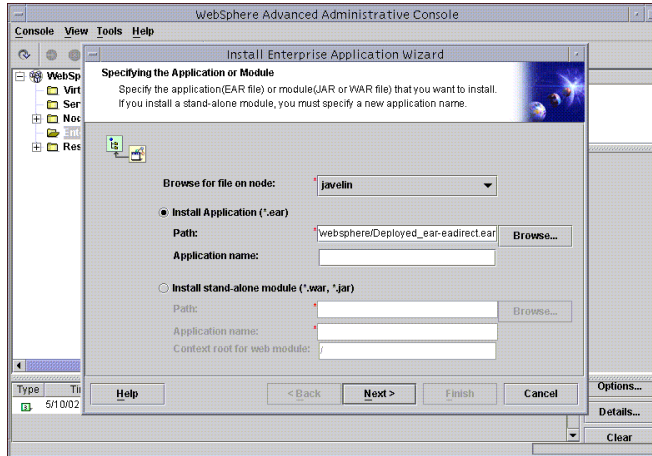
7. Click **Next** about nine times until you come to the Selecting Application
   Servers screen. Highlight all the modules for selection by clicking the first
   and last module in the list, while holding down the Shift key.
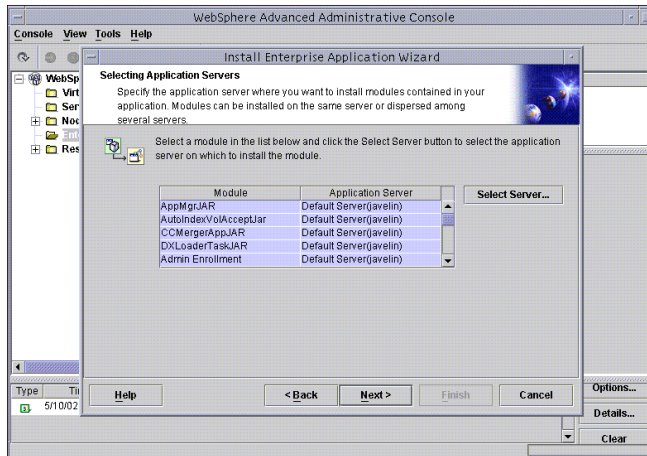
8. Click **Select Server**. The Select a Server or Server Group dialog is
   displayed.

9. Select the Default Server. In the sample screen below, the default server is
   named javelin.
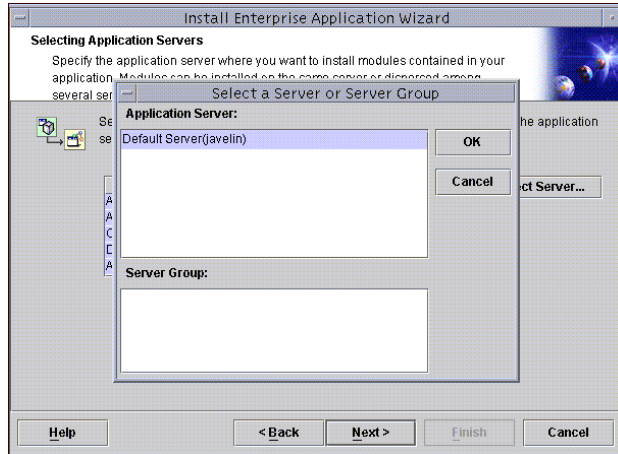
10. Click **OK** to close the Select a Server of Server Group dialog. The Install Enterprise Application Wizard dialog lists the modules and the server on which they will be installed.
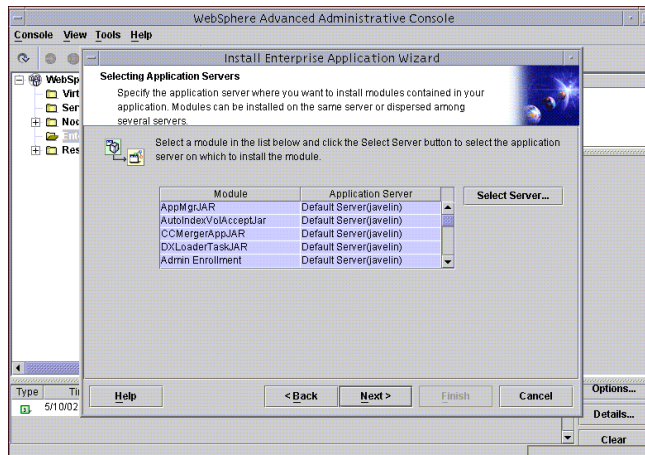
11. Click **Next**.
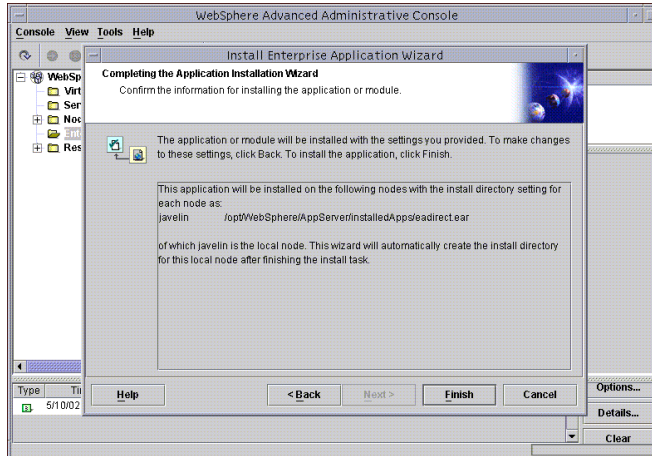
12. Click **Finish**.

13. When asked if you want to regenerate code, click **No**. The installation of eaDirect takes place on the application server.
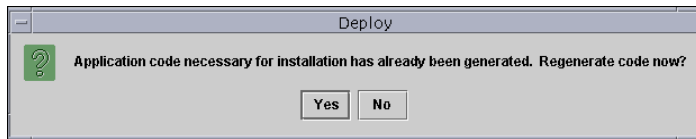
14. Click **OK** to close the Information dialog reporting that the installation was successful.
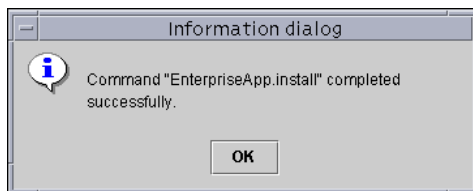
15. For additional eaDirect J2EE applications that you want to install, repeat Steps 2 to 12. Remember that you can only install applications to WebSphere after they have been deployed with the Application Assembly Tool.

16. Stop the server on which you installed the eaDirect J2EE application. Select (expand) **Nodes** and <*your_node*> and **Application Servers**, and then right-click the server name in the left pane. Select **Stop** on the menu.
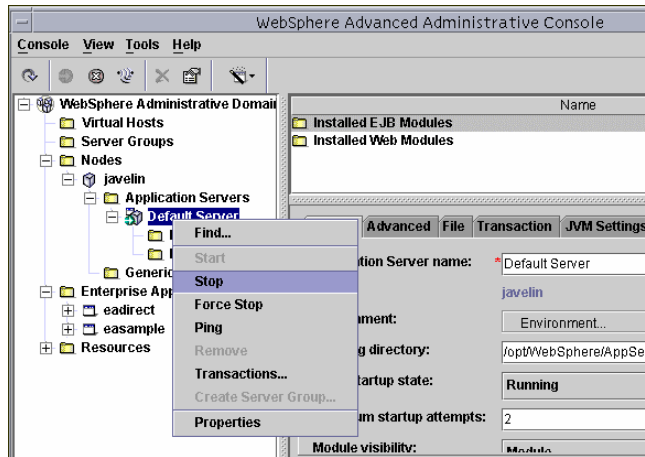

17. An Information dialog notifies you that the application server has stopped successfully.

18. Click **OK** to close the Information dialog.

19. Restart the application server by right-clicking on the its name, and selecting **Start** on the menu.
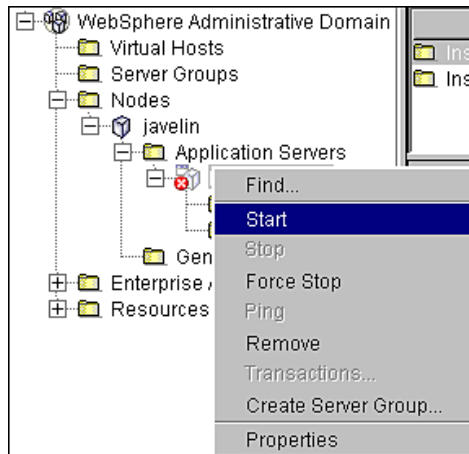
20. An Information dialog notifies you that the application server has started successfully.

21. Click **OK** to close the Information dialog.

22. Start the eaDirect J2EE application by expanding the Enterprise Applications folder, right clicking on the application name (for example, *eadirect*), and then selecting **Start** from the menu.
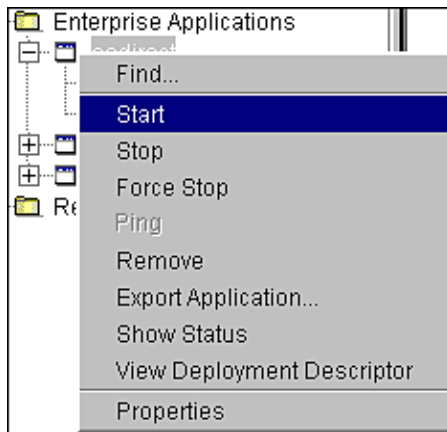
23. An Information dialog notifies you that the application has started successfully.
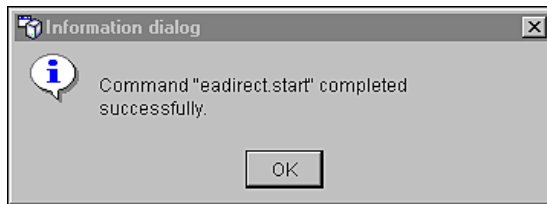
24. Click **OK** to close the Information dialog.

Logging into the Command Center

You can test the installation of eaDirect on your application server by logging in to eaDirect's web-based Command Center. The Command Center

To log in to the Command Center:

1. Confirm that the application and database servers are running.

2. Open a web browser and enter the URL syntax to invoke the Command Center:

    `http://<server_name>:9080/eaDirect`

    For example:

    `http://javelin:9080/eaDirect`

3. A successful connection displays the Command Center Login Administrator page.

4. Log into the Command Center using the default administrator ID and password:

   Administrator ID: **admin**
   Password: **edocs**

5. A successful login displays an empty Main Console page. In order to run jobs (after you have created them), make sure that the Scheduler and Logger is optional are running. See the topic *Starting the eaDirect Scheduler and Logger* for more information.
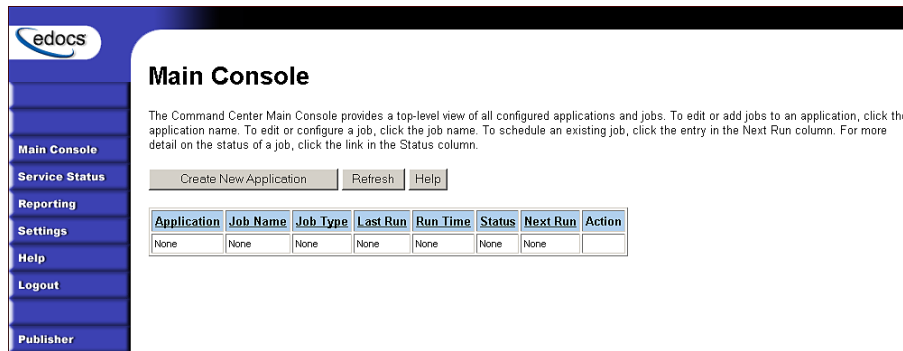
6. If you are unable to log into the Command Center, click **Service Status** on the menu to see what the problem is. For example, a database configuration problem might prevent a user from logging in to the Command Center.
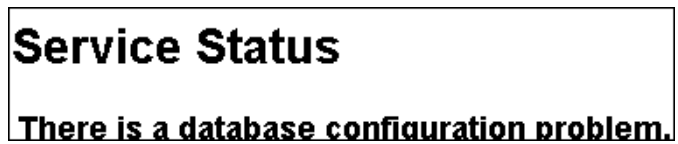
7. Troubleshoot the problem by carefully reviewing what you have done up to this point. You should:

   • Make sure you have configured the database correctly, as described in Chapter 3.

- Check the settings in the file *tnsnames.ora*, as described earlier in this chapter.

- Review your Java connections, as described earlier in this chapter.

- Try logging in to the Command Center again.

Starting the eaDirect Scheduler and Logger

The Scheduler process is needed to run and schedule jobs in the eaDirect Command Center. The Logger is an optional process that allows you to record production activity in the Command Center.

To start the Scheduler:

1. Switch user to *root*.

2. Change directory to <*$EDX_HOME>/bin* and run the command that starts the Scheduler process. The Scheduler command syntax is:

   ```
   # ./ws_scheduler –start –url iiop://hostname:port
   ```

   For example:

   ```
   # ./ws_scheduler –start –url iiop://javelin:900
   ```

Tip	Port 900 is the default port for the administration server. You can specify another port number if necessary.

3. You can stop the Scheduler by replacing the *-start* parameter with the *-stop* parameter.

To start the Logger:

1. Switch user to *root*.

2. Change directory to <*$EDX_HOME>/bin* and run the command that starts the Logger process. The Logger command syntax is:

   ```
   # ./ws_logger –start –url iiop://hostname:port
   ```

For example:

```
# ./ws_logger -start -url iiop://javelin:900
```

Tip	Port 900 is the default port for the administration server. You can specify another port number if necessary.

Migrating eaDirect Databases

Migrating eaDirect Databases

As part of the eaDirect database setup process, you can choose to migrate an earlier version of an eaDirect database. This functionality is accessed through a menu option on the edocs eaDirect Server Administration Main Menu, and allows you to migrate the following databases:

- Version 3.0 to Version 3.1

- Version 2.1/2.2 to Version 3.0

- Version 2.0.2 to Version 2.1

- Version 2.0.1 to Version 2.0.2

- Version 1.9.0.5/1.9.0.6/1.9.0.7 to Version 2.0.2

- Version 1.9.0.4 to Version 2.0.2

- Version 1.9.0.3 to Version 2.0.2

- Version 1.7.2.1 to Version 2.0.2

Preparing to Migrate an eaDirect Database

Perform the following tasks before running *edx_admin.sh* (database setup script) to access the database version migration option:

- Make a full backup of your current database.

- Confirm that the Oracle instance accessing the database to be upgraded is running.

- Check the status of all user objects. If any of them indicate an INVALID status, contact the database administrator to correct this problem before continuing with the database migration process.

- Confirm that all login sessions using eaDirect Oracle user have logged out of the instance.

- Confirm that you have the password for user SYS available. You will need it during the database migration process.

Migrating a Database

When migrating your database, make sure that you have sufficient disk space available. edocs recommends that you have at least 1.5 GB of available disk space for the database migration.

1. Switch to *oracle* user, and change directory to *<$EDX_HOME>/db/oracle*.

   ```
   $ su - oracle
   $ cd /opt/EDCSbd/db/oracle
   ```

2. Run *edx_admin.sh*. The edocs eaDirect Server Administration Main Menu is displayed.

3. Select option 5, **Database Version Migration**.

---

edocs eaDirect Server Administration Main Menu Version 1.0

  ----

     [1] Sign in Menu
     [2] Capture Database File Locations
     [3] Install edocs eaDirect
     [4] Initial Data Population
     [5] Database Version Migration
     [Q] Quit

 Enter Your Selection: **5**

---

4. From the Database Version Migration menu, indicate the version of the
   eaDirect database you want to upgrade. The example screens that follow
   show an eaDirect 2.1 database being migrated to eaDirect 3.0

 Database Version Migration

  ----

[1] Version 3.0 to Version 3.1
[2] Version 2.1/2.2 to Version 3.0
[3] Version 2.0.2 to Version 2.1
[4] Version 2.0.1 to Version 2.0.2
[5] Version 1.9.0.5/1.9.0.6/1.9.0.7 to Version 2.0.
[6] Version 1.9.0.4 to Version 2.0.
[7] Version 1.9.0.3 to Version 2.0.2
[8] Version 1.7.2.1 to Version 2.0.2

[R] Return to previous menu

SELECT YOUR OPTION: **1**

You will be prompted to enter the Oracle SID for the database, and your
eaDirect username and password.

```
Please enter Oracle SID -> edx0
Enter Database Username -> edx_dba
Enter Database Password -> edx
```

---

5. Indicate whether you have already done a full backup of your database.

   ```
   We strongly advise taking full backup of your
   existing database before applying the migration

   Do you have a backup (Y/N): Y
   ```

   If you have not backed up your database, you are asked whether you want to continue the migration process.

   ```
   Still continue with the migration (Y/N): N
   ```

6. Enter your choice to abort the migration process or continue. If '**no'**, you are returned to the Database Version Migration menu where you can select the option to return to the previous menu.

   If 'yes', you are returned to the edocs eaDirect Server Administration Main Menu, where you can select 'Q' to end the database migration session.

   If you choose to continue with the database migration, the migration script *db_version_migrate.sh* is run.

   ```
   Database migration from 3.0 to 3.1
   ***********************************************
   Thu Oct 10 10:05:15 EDT 2002
   ***********************************************
   Migration process started
   ***********************************************

   Please enter the password for SYS user -->
   ```

7. Enter the password for the Oracle SYS user:

```
Please enter password for Oracle SYS user -> change_on_install
```

   This question is not asked when migrating from3.0 to 3.1.

Caution   A minimum of 2.2GB of disk space is required for eaDirect 3.1.
Make sure you have enough space before migrating.

---

9. A successful database migration will display the message:

   ```
   Migration successful
   ```

10. Before ending the database migration process, you are prompted to check the session log file that is created automatically for errors.

```
***********************************************
Please check the log file for any errors...
Log filename:  /opt/EDCSbd/db/oracle/migrate0411100446.log
***********************************************
Ending migration process
```

11. From the Database Version Migration menu, select **Return to previous menu**.

```
Database Version Migration
--------------------------
 [1] Version 2.1/2.2 to Version 3.0
 [2] Version 2.0.2 to Version 2.1
 [3] Version 2.0.1 to Version 2.0.2
 [4] Version 1.9.0.5/1.9.0.6/1.9.0.7 to Version 2.0.2
 [5] Version 1.9.0.4 to Version 2.0.2
 [6] Version 1.9.0.3 to Version 2.0.2
 [7] Version 1.7.2.1 to Version 2.0.2
 --------------------------------------------------
 [R] Return to previous menu

SELECT YOUR OPTION: R
```

12. From the edocs eaDirect Server Administration Main Menu, select **Quit**.

```
edocs eaDirect Server Administration Main Menu Version 1.0
  --------------------------------------------------
      [1] Sign in Menu
      [2] Capture Database File Locations
      [3] Install edocs eaDirect
      [4] Initial Data Population
      [5] Database Version Migration
      [Q] Quit
  --------------------------------------------------
  Enter Your Selection: Q
```

Post Database Migration Tasks

Perform the following tasks after migrating a database from a previous release of eaDirect:

- Check *.log* files for errors

- Reset permissions for edocs directories and files

Checking *.log* files for errors

Upon completion of the database migration process, you should check the following *.log* files for errors:

- *rollback_segment_add.log*

- *ddlupdate.log*

- *package_upgrade.log*

- *docids_function_add.log*

- *upgrade_constrained_data.log*

- *migrate<xxxxxxxxxx>.log*

In the context of migrating an eaDirect database, a 'normal' error is one that does not cause the upgrade process to fail, such as trying to drop an object that does not exist. Conversely, an 'abnormal' error is one that can cause the database migration process to fail, which can have a cascading effect throughout the process. That is, a single 'abnormal' error can lead to many other 'abnormal' errors as the database migration process proceeds.

Although there isn't an easy way to differentiate between 'normal' and 'abnormal' errors, there is a way to check whether the database upgrade was successful. Typically, if the process does not flag invalid objects or there are no violations of referential constraints, then the operation was successful.

To determine the number of invalid objects:

1. Switch to *oracle* user.

2. Invoke SQL and run the following queries:

```
SQL> select count (*) from user_objects
     where status <> 'VALID';
```

You can obtain the number of records that violated any referential constraints by running the following query:

```
SQL> select count (*) from exceptions;
```

This query does not apply to migrating 1.7.2.1 databases to Version 2.0.2. A returned value of 0 indicates that the database upgrade completed successfully.

Resetting Permissions for edocs Directories and Files

After migrating your database, confirm that all the eaDirect directories, with the exception of the */db* directory and its subdirectories, reflect the same directory and file ownership as that of the WebSphere owner. The following example shows the contents of *<$EDX_HOME>* on a single server:

```
drwxr-xr-x 2 root    other    512 May  9 17:49 AppProfiles
drwxr-xr-x 2 root    other    512 May  9 17:49 Data
drwxr-xr-x 2 root    other    512 May  9 17:49 Input
drwxr-xr-x 3 root    other    512 May  9 17:49 J2EEApps
drwxr-xr-x 2 root    other    512 May  9 17:49 Output
-r--r--r-- 1 root    other 241991 Apr 29 17:04 ReleaseNotes.html
drwxr-xr-x 2 root    other    512 May  9 17:49 bin
drwxr-xr-x 2 root    other    512 May 10 12:45 config
drwxrwxr-x 3 oracle dba      512 May  9 17:50 db
drwxr-xr-x 5 root    other    512 May  9 17:49 lib
drwxr-xr-x 2 root    other    512 May  9 17:49 logs
drwxr-xr-x 6 root    other    512 May  9 17:50 samples
```

For database files and directories under *<$EDX_HOME>*, eaDirect uses the default owner and group permissions *oracle:dba*.

This chapter describes several tasks that can be performed anytime after eaDirect has been installed.

Uninstalling eaDirect Components

When uninstalling eaDirect, it is recommended that you repeat the sequence used to install the application. That is, remove eaDirect from the database server first, then the application server.

To uninstall the eaDirect database server components:

1. Shut down any database that has been created. See the topic *Recovering from an Aborted Database Configuration Session* for instructions on how to gracefully shut down the Oracle database.

2. Switch user to *root* and navigate to *<$EDX_HOME>/Uninstall*.

3. Run the eaDirect uninstall command:

   ```
   # ./Uninstall_eaDirect
   ```

4. Manually remove any files that were not removed by the InstallAnywhere tool.

To uninstall the eaDirect application components:

1. As *root* user, navigate to *<$WAS_HOME>/bin* and invoke the WebSphere Administrative Console. For example:

   ```
   # ./adminclient.sh &
   ```

2. When the WebSphere console is displayed, expand the Domain.

3. Expand the Enterprise Applications folder, and then right-click on the application server you want to stop.

4. Select **Stop** on the menu.
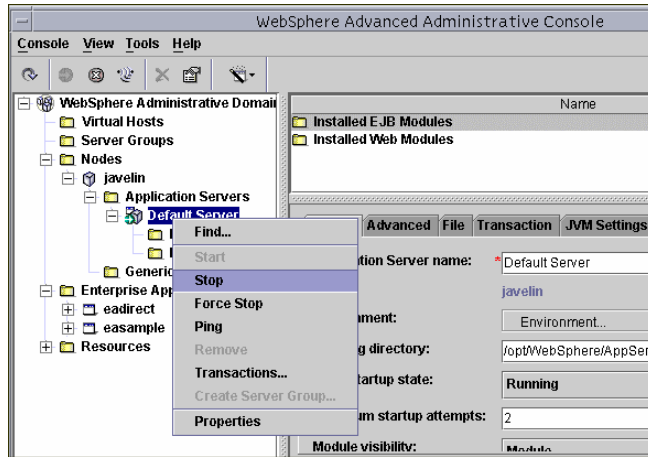
5. Click **OK** to close the Information dialog notifying you that the action completed successfully.

6. As *root* user, navigate to *<$EDX_HOME>/Uninstall* and run the eaDirect uninstall tool.

    ```
    # ./Uninstall_eaDirect
    ```

7. When the uninstall is done, manually remove any files that were not deleted.

Uninstalling eaDirect J2EE Applications on WebSphere

Follow the steps below to uninstall J2EE applications running on your WebSphere application server.

To uninstall eaDirect J2EE applications on WebSphere:

1. As *root* user, start the WebSphere Administrative Console if it isn't running. This can be done by navigating to *<$WAS_HOME>/bin* and run the command:

   ```
   # ./adminclient.sh &
   ```

2. When the WebSphere Administrative Console is displayed, expand your Domain to show the Enterprise Applications folder.

3. Expand the Enterprise Applications folder and click on the J2EE application that you want to uninstall

4. Right-click `stop` from the menu.

Post-InstallationTasks
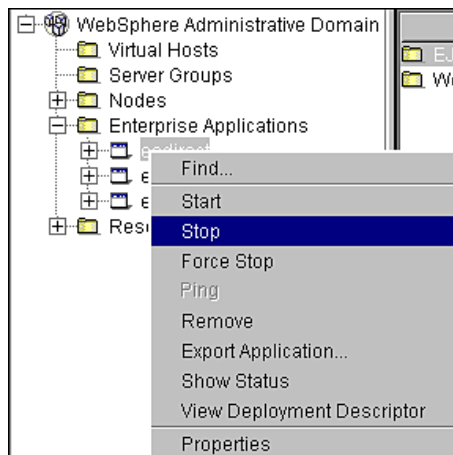
An information dialog is displayed:

5. Open a command line window and navigate to
   <$WAS_HOME>/installedApps.

6. Manually remove the EAR file from the directory.

7. Navigate to *<$EDX_HOME>J2EEApps/websphere.*

8. Manually remove the deployed EAR file from the directory.

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Appendix A: Using eaSample

About eaSample

eaSample is a sample J2EE application that eaDirect provides as part of its software distribution. You can use it as a framework for developing a custom EJB application; it contains all the Java Server Pages (JSPs), HTML, image files, scripts, and templates you need to get started. eaSample deploys as *ear-easample.ear* .

You can use eaSample to view the sample NatlWireless, Training, and NW_LDDetail applications provided with your system. You can use the data and design files in these sample applications to become familiar with eaDirect by creating sample billing applications and jobs, publishing data and design files in the form of *version sets*, and scheduling the jobs to run in the Command Center, the administrative 'hub' for the eaDirect production environment.

eaSample demonstrates the following types of data presentment:

- Dynamic HTML views

- Detail data extraction (DetailExtractor job)

- Annotations

- Disputes

- Order capture

Caution	Before deploying eaSample, you must first run *create_demo_oc_table.sh*, which creates the database tables needed for the Order Capture feature. Failure to do so will result in errors when you start WebSphere Server. See the topic *Setting Up Database Tables for Order Capture in eaSample* for more information.

Setting Up Database Tables for Order Capture in eaSample

In order to use the Order Capture feature in the eaSample application that is provided with the eaDirect distribution, you must manually execute a script that connects to the Oracle database and creates the appropriate database tables. This procedure must be done before you deploy the sample application to WebSphere.

To create database tables for Order Capture in eaSample:

1. Change user to *oracle* and navigate to *<$EDX_HOME>/samples/eaSample/db/oracle*.

2. Confirm that the appropriate Oracle SID has been set. As oracle user, you can use the Unix echo command to find out the identity of the current Oracle SID. For example:

    ```
    $ echo $ORACLE_SID
      edx0
    ```

    If the Oracle SID is incorrect, set it as follows:

    ```
    $ ORACLE_SID=edx0  (where 'edx0' represents your Oracle SID)
    $ export ORACLE_SID
    ```

3. Run the script *create_demo_oc_table.sh* and provide your database SID, database username, and database password when prompted. For example:

    ```
    $ ./create_demo_oc_table.sh edx0 edx_dba edx
    ```

4. The script runs automatically from this point on. No user intervention is necessary.

5. Upon completion, you are returned to the command prompt.

Viewing Sample Customer Information in NatlWireless using eaSample

The following steps describe how to use eaSample to view the sample eaDirect application called NatlWireless. NatlWireless is a set of eaDirect design and data files which eaDirect provides with its software to demonstrate the various features of an eaDirect presentment application.

You must set up NatlWireless in the eaDirect Command Center (production environment), then enroll and log into eaSample to view sample bills.

Setting up NatlWireless in the production environment includes the following general steps, described in detail below:

1. Create a new application for NatlWireless in the eaDirect Command Center.

2. Create a new Indexer job, publishing the application DDF for the job to use, configure the four tasks that run sequentially as part of the Indexer job, and run the job. Then publish the NatlWireless application (dynamic HTML view) files designed to display the statement summary.

3. Create and configure a DetailExtractor job, publishing the DDF, database table XML file, and statement XSLT style sheet view files designed for the DetailExtractor job, and run the job. Then publish the three dynamic XML Query files (views) designed to display the extracted NatlWireless data and demonstrate the disputes and annotations features.

To create a new application for NatlWireless in the eaDirect Command Center:

1. Start WebSphere Server and the Scheduler, if not already running.

2. Open a web browser and enter the URL to the eaDirect Command Center, using the syntax:

    ```
    http://host:port/eaDirect
    ```

    For example:

    http://javelin:7001/eaDirect

3. Create a new application for NatlWireless. Click `Create New Application` at the Main Console. eaDirect displays the Create New Application screen:

4. Enter `NatlWireless` as the application name. Click `Create Application and Continue`. eaDirect displays the Create New Job screen.

To create a new Indexer job, publish the associated NatlWireless files, and run the Indexer job:

1. The Create New Job screen is displayed automatically after you create a new application:
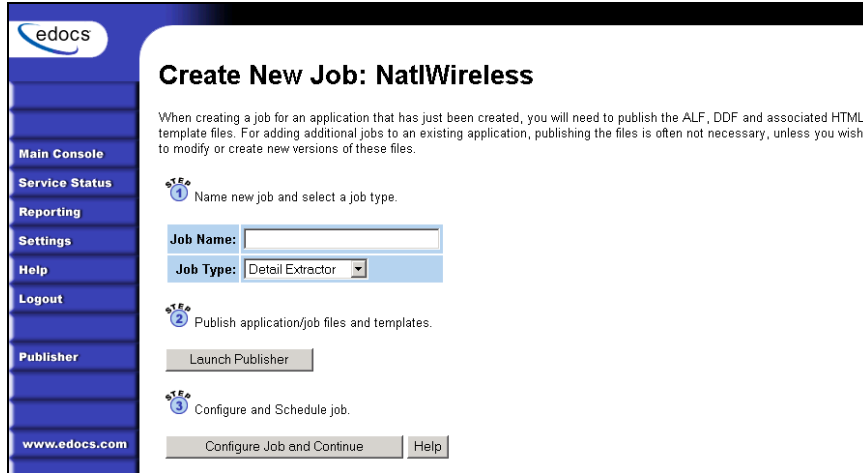
2. Enter **Indexer** for the Indexer job name, select the **Indexer** job type from
    the drop-down menu. Click **Launch Publisher** to publish the design files
    for NatlWireless. Click **Create**. The Publisher displays the Select a Version
    Set Type screen:

3. Under Batch Jobs, next to Indexer, click 0 (Number of Auxiliary files). The Publisher displays the Create a Version Set For Indexer screen:

4. Select **NatlWireless** from the list of application names, and browse to the *<$EDX_HOME>/samples/NatlWireless* directory and select **NatlWireless.DDF** file for the Indexer job.

> **Tip** If you are using a Windows machine for browser access, you will have to FTP the data files to the local Windows machine in order to access them.

5. Click **Submit**. The Publisher displays the Submission screen with details about the DDF file. Close the Publisher window.

6. At the Create New Job screen in Command Center, click **Configure Job and Continue**. eaDirect displays the job configuration screen. For each task, specify the configuration parameters listed below:

Task 1: Scanner Task Configuration	
Input File Path	Use the default (`EDX_HOME/Input/NatlWireless`).
Input File Name	Specify `NatlWireless.txt`.
Output File Path	Use the default (`EDX_HOME/Data/NatlWireless`).
Task 2: Indexer Task Configuration	
DDF Path	(Not editable.)
Doc Date	(Not editable.)
Index Field List	Select the `CustName` field for indexing. To select a field, highlight the field name and click the right arrow button. Use the scroll bar to view more fields. To unselect a field, highlight the field name and click the left arrow button.

Task 3: IXLoader Task Configuration	
Skip Rows	Use the default (`0`).
Split Size	Use the default (`0`).
Optional Field Count	Use the default (`0`)
Load Method	Use the default (**Direct Load**)
Task 4: AutoIndexVolAccept Task Configuration	
Action on Index Volume	Use the default (**AutoAccept**).

7. When finished entering the configuration parameters, click **Submit Changes and Schedule**. eaDirect asks "OK to submit this configuration?" Click **OK**. eaDirect submits the job configuration parameters and displays the Schedule screen.

8. In the left pane, click **Main Console**. On the Main Console's left pane, click **Publisher**, and then click **Create**. The Publisher displays the Select a Version Set Type screen:

9. Next to HTML under Dynamic Web Views, click **0**. The Publisher displays the Create a Version Set for HTML screen:

10. Select **NatlWireless** from the drop-down list of application names. Enter **HtmlDetail** for the view name. Browse *<$EDX_HOME>/samples/NatlWireless* and select the **NatlWireless.DDF**, **NatlWireless.ALF**, and **NatlWireless.HTM** design files. Then click **Submit**. The Publisher displays the Submission screen showing the files you published:
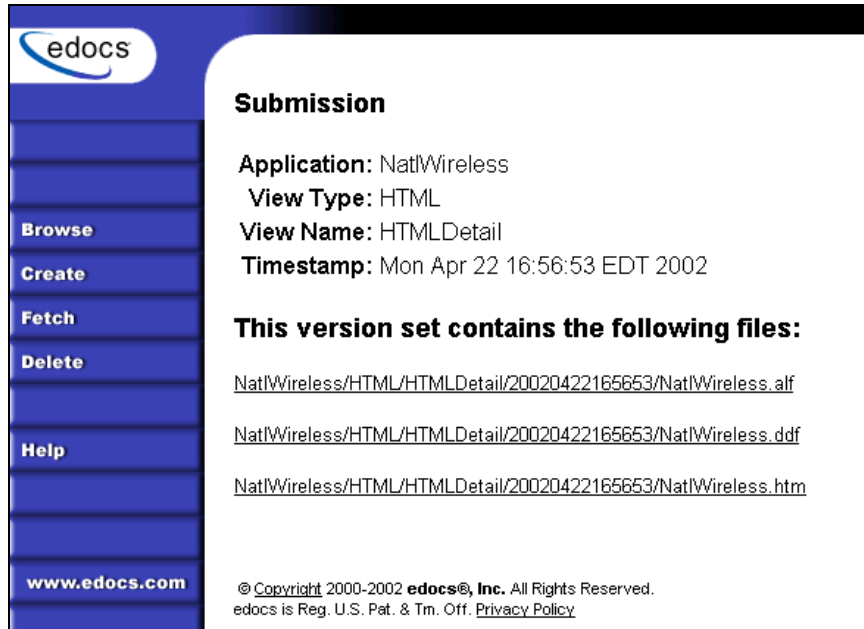
11. Close the Publisher.

12. Move the NatlWireless data file (*NatlWireless.txt)*, which is located in *<$EDX_HOME>/samples/NatlWireless/datafile*, to *<$EDX_HOME>/Input/NatlWireless*. This is the same data file that you specified when you configured the job.

13. On the Main Console, click the **Run Now** button next to the NatlWireless Indexer job. Monitor the job's progress by clicking **Refresh** on the Main Console window. The Indexer job completes successfully when the job status on the Main Console changes to "Done."

To create a new DetailExtractor job, publish the associated NatlWireless files, and run the DetailExtractor job:

1. On the Main Console, click the application name, **NatlWireless**, listed under Applications in the table.

2. Click **Add New Job**. eaDirect displays the Create New Job screen.

3. Enter a job name (the job name can be whatever you want it to be), and then select job type **Detail Extractor**.

4. Click **Launch Publisher**. eaDirect displays the Publisher screen. Click **Create**. The Publisher displays the Select a Version Set Type screen.

5. Under Batch Jobs, next to Detail Extractor, click **0** (Number of Auxiliary files). The Publisher displays the Create a Version Set For Detail Extractor screen.

6. Select the **NatlWireless** application from the drop-down list. Enter the view name **dtlextr** (this name is hard coded in several JSP's for detail, disputes, and annotations).

7. Browse to select **NatlWireless.DDF**. (The default location for this file is *<$EDX_HOME>/samples/NatlWireless/NatlWireless.DDF*.)

8. Browse to select **summary_info.XML**, the database table XML view file created for this job. (The default location for this file is *<$EDX_HOME>/samples/NatlWireless/DetailExtractor*.)

9. Browse to select **summary_info.XSL**, the statement XSLT style sheet. (The default location for this file is *<$EDX_HOME>/samples/NatlWireless/DetailExtractor*.)

10. Click **Submit**, and then close the Publisher.

11. At the Create New Job screen in the Command Center, click **Configure Job and Continue**. eaDirect displays the Detail Extractor job configuration screen.

12. Specify the configuration parameters (listed below) for each of the three tasks that run as part of the Detail Extractor job:

Task 1: IVNScanner Task Configuration	
Field	**What to enter/select**
Index Volume Status	Choose the default, `Accepted`.
Scan Starting From (Number of Days)	Use the default (`7`).
Task 2: StatementsToIR Task Configuration	
Field	**What to enter/select**
View Name	`dtlextr`
Enroll Model	Leave blank.
Output File Path	Use the default (your data output directory, which you specified in the Scanner task for the Indexer job).

Task 3: DXLoader Configuration	
Field	**What to enter/select**
Load Method	Use the default (`Direct`).

13. Click `Submit Changes and Schedule`. eaDirect asks "OK to submit this configuration?". Click `OK`. eaDirect submits the job configuration parameters and displays the Schedule screen.

14. On the Schedule screen, click `Run Now`.

15. On the left pane, click `Main Console`.

16. Publish the XMLQuery dynamic web views that use the data extracted by the DetailExtractor; click `Publisher`.

17. Click `Create`. The Publisher displays the Select a Version Set Type screen. Under Dynamic Web Views, click the `0` next to the XML Query job type. The Publisher displays the Create a Version Set for XML Query screen.

18. Select the `NatlWireless` application. Enter `DetailQuery` as the view name, and browse *<$EDX_HOME>/samples/NatlWireless/XMLQuery* to select the `detail_sql.xml` XML query file. (This view name is customized in your JSP HTML pages as the specific name the Web browser looks for in the code.) Click `Submit`. The Publisher displays the Submission screen:

19. Click `Create` and repeat the previous two steps twice to publish two additional XML Query views (these view names are hard coded in your JSP HTML pages as the specific names the Web browser looks for in the code):

View Name	File
DisputeQuery	*dispute_sql.xml*
AnnotationQuery	*annot_sql.xml*

20. Close the Publisher. You can proceed to use eaSample to display the data.

21. On the Main Console, click the **Run Now** button next to the NatlWireless DetailExtractor job. Monitor the job's progress by clicking **Refresh** on the Main Console window. The DetailExtractor job completes successfully when the job status on the Main Console changes to "Done."

To use eaSample to view NatlWireless statements:

1. When the Indexer job completes successfully (status changes to "Done"), open a Web browser and access eaSample using the following URL syntax, substituting your own server name (host) and port number:

   ```
   http://<host>[:port]/eaSample/User?app=UserMain&jsp=
   /user/jsp/HistoryList.jsp&ddn=NatlWireless
   ```

   For example:

   **http://javelin:7001/eaSample/User?app=UserMain&jsp=
   /user/jsp/HistoryList.jsp&ddn=NatlWireless**

   The eaSample User Login page appears.

2. Click the **Enroll Now** link. eaDirect displays the sample enrollment page:

3. You can enter any user name and any password. However, you must enter a valid email address and a valid NatlWireless customer account number, such as one of the following: 0331734, 4191463, or 8611250. (Use **Reset** to clear the text fields, if necessary.) Click **Submit** to save the subscription information. eaDirect displays a message to let you know you have subscribed successfully. Click **OK** to display the User Login page.

4. Enter the username (Subscriber ID) and password (the same combination you entered during enrollment).

5. Click **Submit**. The sample statement summary page for the account appears. (Note that you must have eaPay, the eaDirect payment module, installed to view the payment screens and functionality.)
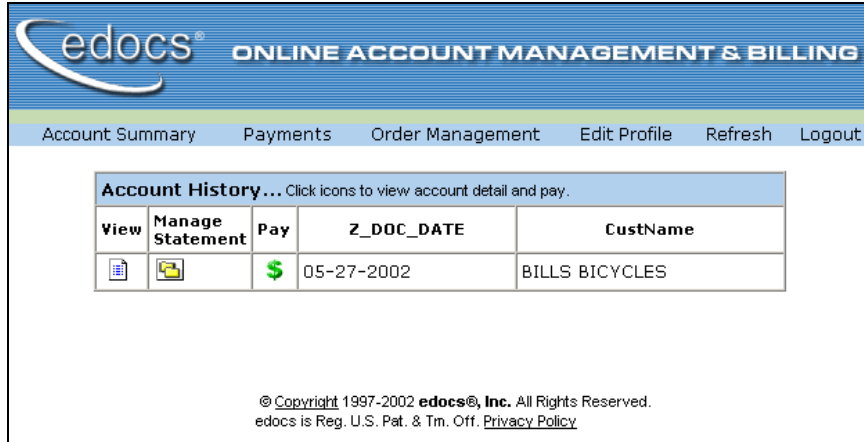
6. To view the statement summary, click the View icon .
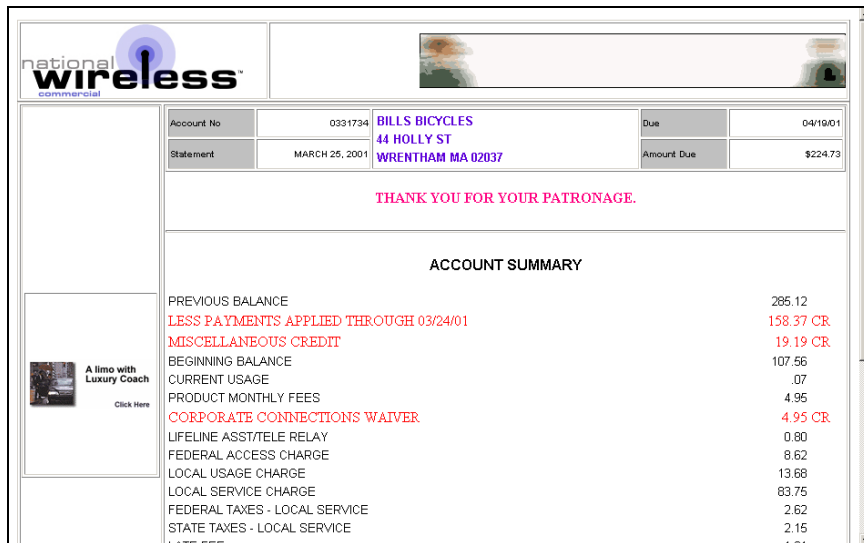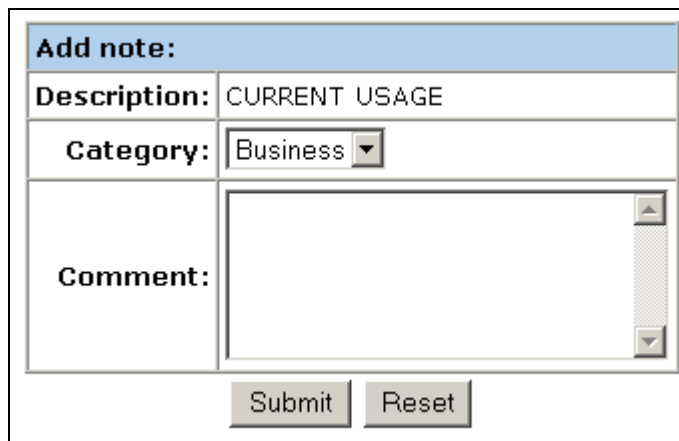
7. To view the Manage Statement page, click from the History page.

*   Click next to an item to display the Add Note page where you can add comments (annotations) regarding that item:

- Click ● to display the Dispute Your Statement page where you can dispute the item:

Dispute your statement:	
Disputed Item:	Summary Info Amount
Current Amount:	4.95
Adjusted Amount:	
Comments:	

Submit   Reset

For more information:

The *eaDirect Production Guide* describes Command Center activities such as creating applications, configuring jobs, and publishing accompanying eaDirect application, HTML, and other design files for batch and dynamic presentation.

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