



eaDirect™ Installation and Configuration Guide

eaDirect is a member of the eaSuite™ product line

**IBM AIX Operating Environment™ Software
and the IBM WebSphere® Application Server**

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About Customer Self-Service and eaSuite™

eaSuite

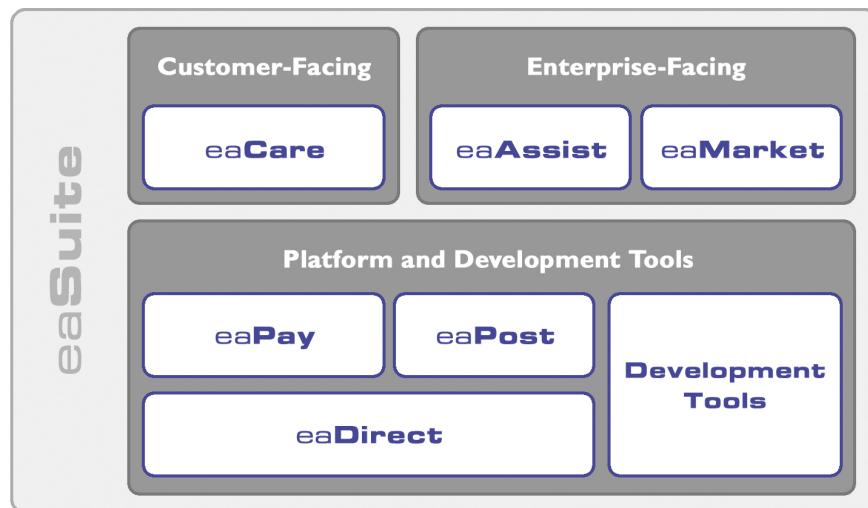
edocs has developed the industry's most comprehensive software and services for deploying Customer Self-Service solutions. eaSuite™ combines electronic presentment and payment (EPP), order management, knowledge management, personalization and application integration technologies to create an integrated, natural starting point for all customer service issues. eaSuite's unique architecture leverages and preserves existing infrastructure and data, and offers unparalleled scalability for the most demanding applications. With deployments across the healthcare, financial services, energy, retail, and communications industries, and the public sector, eaSuite powers some of the world's largest and most demanding customer self-service applications. eaSuite is a standards-based, feature rich, and highly scalable platform, that delivers the lowest total cost of ownership of any self-service solution available.

eaSuite is designed to support how organizations approach designing and deploying Customer Self-Service applications:

Customer-Facing Solutions present customers with the sophisticated functionality to meet customers' self-service needs. eaSuite offers a full set of capabilities to enable the range of business and consumer customer service activities, along with the flexibility to completely customize the solution to meet vertical industry and specific company requirements.

Enterprise-Facing Solutions empower employees within an organization and external partners to leverage the edocs platform to facilitate self-service and to support assisted service. Customer service representatives (CSRs), sales agents, account managers, marketing managers, broker-dealers and channel partners all play a role in delivering customer service, creating content, accessing information and performing activities for the benefit of customers.

Platform and Development Tools are designed to meet the rigorous infrastructure demands of the most technologically advanced organizations. These components of the eaSuite power edocs solutions with the functionality and development tools necessary to make account data available, and to create the customer- and enterprise-facing applications that enable customer self-service.



eaAssist

eaAssist™ reduces interaction costs and increases customer satisfaction by enabling enterprise agents – customer service representatives (CSRs), sales agents, broker-dealers and others – to efficiently access critical account data and service-related information to effectively service customers. Through its browser interface designed especially for the enterprise agent, eaAssist enables agents to take advantage of customer-facing online capabilities to provide better service by more efficiently resolving customer account inquiries at the point of customer contact.

eaMarket

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 Customer Self-Service experience. The transactional account data that provides the foundation for a Customer Self-Service solution – such as transaction activity, service or usage charges, current task and prior service history – bring valuable insight into customers and can help optimize personalized marketing and customer service campaigns. eaMarket leverages that data to present relevant marketing and customer service messages to customers.

eaDirect

eaDirect™ is the core infrastructure of enterprise Customer Self-Service solutions for organizations large and small with special emphasis on meeting the needs of organizations with large numbers of customers, high data volumes and extensive integration with systems and business processes across the enterprise. Organizations use eaDirect with its data access layer, composition engine, and security, enrollment and logging framework to power complex Customer Self-Service applications.

eaPay

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 Automated Clearing House (ACH) and credit card payments, and payments via various payment processing service providers.

eaPost

eaPost® is the account content distribution system that handles all the complexities of enrollment, authentication and secure distribution of summary account information to any endpoint, while also bringing customers back the organization's Website to manage and control their self-service experience.

Development Tools

eaSuite Development Tools™ are visual development applications that provide intuitive graphical user interface (GUI) environments for designing and developing Customer Self-Service solutions. The Development Tools encompass data management, workflow authoring, rules management and accounts receivable integration, as well as a full Software Developers Kit for custom application development.

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 is intended for system administrators and other technical personnel responsible for installing, configuring, and maintaining eaDirect. It contains the following chapters:

Preparing to Install eaDirect describes the hardware and software requirements for supporting products, walks you through the **InstallAnywhere** installation process, and discusses the recommended user and group accounts you need to create for your environment.

Setting Up a Database Server for eaDirect provides instructions for installing eaDirect on your database server and configuring your database server environment.

Setting Up an Application Server for eaDirect provides instructions for installing eaDirect on your application server and configuring your application server environment.

Migrating To a New Version of eaDirect describes how to migrate previous versions of an eaDirect database, check for errors, reset directory permissions, and migrate existing eaDirect applications.

Uninstalling eaDirect Components describes how to uninstall eaDirect on your database and application servers.

Appendix A: Using eaSample describes how to deploy and view the sample application and data provided with eaDirect.

Related Documentation

Online Help (for Composition Tools) and a PDF 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 Installation and Configuration Guide	How to install eaDirect and configure it in a distributed environment.
eaDirect Production Guide	How to set up and run a live eaDirect application in a J2EE environment.

Print Document	Description
eaDirect Developer's Guide	Provided with the eaDirect Software Developer's Kit (SDK), describes eaDirect application server components and related applications; defines the public interfaces for customizing and extending the functionality of an eaDirect application.

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



Before installing eaDirect, you must confirm that your system meets or exceeds recommended hardware and software requirements. During installation, you will ensure that all supporting software is correctly configured and functioning smoothly and that your environment is set up properly for eaDirect.

Follow the steps in this guide carefully and in sequence to ensure a successful installation of eaDirect.

Hardware and Software Requirements

Confirm that your system meets or exceeds the minimum recommended hardware and software requirements for installing eaDirect. Check the release notes for any updates to these requirements.

Type	Vendor	Product	Version	Notes
OS	IBM	AIX	4.3.3	Maintenance Level 10
	Microsoft	Windows	2000 or NT	supported for Windows composition tools only
HARDWARE	IBM	RS/6000 platform		
		CD-ROM	for AIX	
		disk space (database)	2.2 GB	
		disk space (software)	60 MB	
		RAM	512 MB	per CPU (1 GB recommended)

Type	Vendor	Product	Version	Notes
		Swap space	512 MB	per CPU (1 GB recommended)
JAVA/C++	IBM	C Set++ for AIX	3.6.6	3.6.6.3 for 64-bit
	IBM	VisualAge C++	4	
	Sun	IBM JDK for AIX/PPC32	v1.3.1 SR3	in WAS40 fixpak5
DATABASE SERVER	IBM	DB2	7.2	FixPak 6
APPLICATION SERVER	IBM	MQSeries	5.2	with CSD04
	IBM	WebSphere	4.0.4	eFixes
BROWSER	Microsoft	Internet Explorer	5.5 SP2 or 6	(on client machines)
	Netscape	Navigator	6.2	
XWINDOWS		Xserver OR Xvfb		to support charting and reporting

Java (JDK) Requirements

eaDirect for AIX requires the following JDK version from IBM:

IBM JDK for AIX/PPC32, Version 1.3.1 Service Release 3.

The SR3 for JDK 1.3.1 is currently available in **WAS40 fixpak5**, which can be downloaded from

<http://www-1.ibm.com/support/docview.wss?rs=180&context=SSEQTP&q=fixpak&uid=swg24003627>

WAS40 users can download and install WAS40 fixpak5 to upgrade their JDK environment to **JDK 1.3.1 SR3**.

Installing eaDirect Product Components

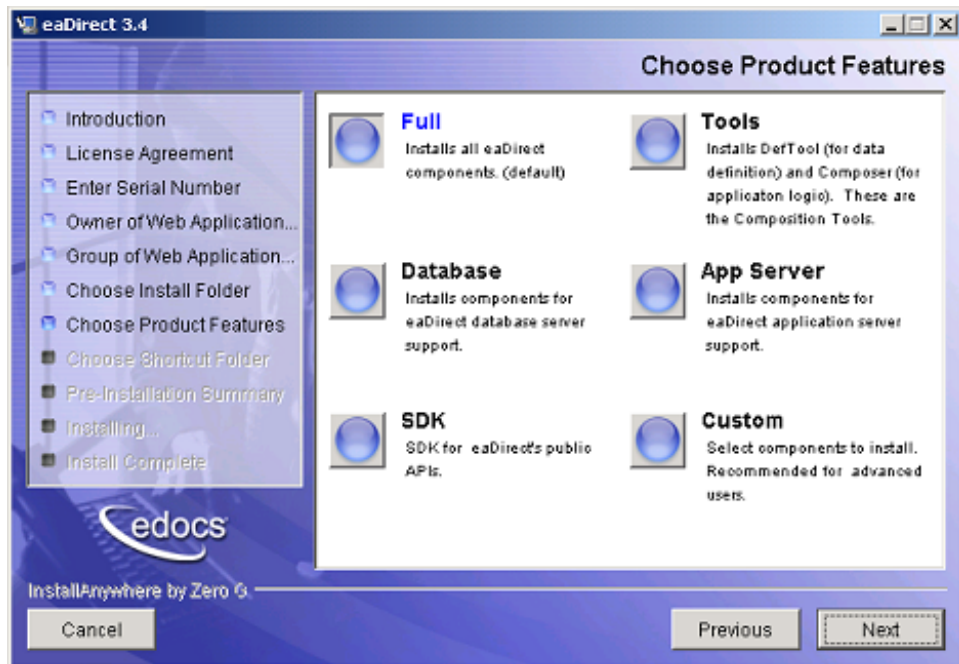
The installation of eaDirect product components is done through the InstallAnywhere installer. The tool is provided with eaDirect on its distribution CD-ROM.



Tip

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

The following screen shows where you select the eaDirect components to install. Note that the features you will see depends on which features you purchased.



With the InstallAnywhere 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 describe the various eaDirect installation options:

Installation Option	Components Installed
Full	Installs eaDirect application server components, eaDirect database server components, application server J2EE files for eaDirect, eaDirect composition tools, and online product Help. This is the default installation option for eaDirect. Note: Use this installation option to install eaDirect on a single machine. See <i>Installing eaDirect on a Single Machine</i> .
Database	Installs the eaDirect database server components and online product Help.
App Server	Installs eaDirect application server components, application server J2EE files for eaDirect, sample applications (as licensed), 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, and sample eaDirect 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.

A Windows installation (for Composition Tools) also adds icons (including the tool to uninstall eaDirect) to the eaDirect program group in the Windows Start menu.

For details 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 eaDirect in Console Mode

You can choose one of two InstallAnywhere installation modes to install eaDirect:

- GUI Mode (default)
- Console Mode

The installation procedures in this guide show eaDirect being installed using the InstallAnywhere GUI. Console Mode is an interactive character-based installation where you are prompted to respond to several installation questions.

To install eaDirect in Console Mode:

1. From the installation CD-ROM, navigate to the subdirectory for your platform (for example `\Windows`, `/Solaris`, or `/AIX`) and run the command to invoke InstallAnywhere, using the `-i console` flag. For example:

```
# ./Dirins.bin -i console
```

InstallAnywhere displays the banner:

```
Preparing CONSOLE Mode Installation...
```

2. Respond to each prompt to proceed to the next step in the installation. If you want to change something on a previous step, type **back**.

3. A successful installation displays the message:

```
Congratulations! eaDirect 3.4 has been successfully
installed to:
/usr/EDCSbd
```

Installing the eaDirect Composition Tools

The installation of the eaDirect Composition Tools (DefTool and Composer) is separate from a UNIX installation of eaDirect. To install these Windows-based composition tools, you must run InstallAnywhere for Windows (provided on the eaDirect distribution CD-ROM), and choose the **Tools** installation option.

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

To install the eaDirect composition tools (Windows):

1. From the `\Windows` subdirectory on the eaDirect installation CD-ROM, double-click the command to invoke InstallAnywhere:
`Dirins.exe`
A start-up screen appears.
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. Then 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. Then click **Next**.
8. On the Pre-Installation Summary screen, confirm that the information is accurate. Then click **Install**.

At this point, the eaDirect composition tools are copied to the designated installation folder. A status bar on the bottom of the screen shows the composition tools being installed. No user intervention is required.
9. The Install Complete screen reports a successful installation and the directory that contains the composition tools.
10. Click **Done** to exit the installer.

Installing eaDirect on a Single Machine

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 on a single machine:

1. From the installation CD-ROM, navigate to the subdirectory for your platform (for example `\Windows`, `/Solaris`, or `/AIX`) and run the command to invoke InstallAnywhere. For example (UNIX):

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

Windows users may double-click the `Dirins.exe` icon.

A start-up screen appears.
2. On the Introduction screen, read the eaDirect introductory information. Then click **Next**.
3. On the License Agreement screen, carefully read and accept the terms of the license 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 Owner of Web Application Server screen, enter the name of the application server owner (the recommended ‘owner’ is *nobody*). 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 *nobody*). Then click **Next**.

7. On the Choose Install Folder screen, accept the default installation folder (*/usr/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 server component being installed. No user intervention is required.

10. The Install Complete screen reports a successful installation and the directory that contains the eaDirect database and application server components.
11. Click **Done** to exit the installer.

Recommended User and Group Permissions

During the installation of your application server, you are prompted to specify user and group permissions for files and directories. edocs recommends that you use the application server permissions **nobody:nobody** with the eaSuite. However, if your UNIX system administrator uses custom user and group permissions at installation, you can set these permissions with the **chown**

1. To reset default user and group permissions:
Switch to root user, for example:

```
$ su root
```
2. Change directory to your application server home directory (*\$WAS_HOME*).
For example (WebLogic):

```
$ cd /usr/WebSphere/AppServer
```
3. Recursively change the user id and group id permissions of the application server installation directory and any subdirectories to the default, which is **nobody:nobody**. For example:

```
$ chown -R nobody:nobody /usr/WebSphere/AppServer
```

Where to Go From Here

If you have installed eaDirect using the ‘Full’ installation option, you can ignore the database server components installation procedure at the beginning of Chapter 2, and proceed directly to *Configuring Your Database for eaDirect*. Similarly, you can 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 third-party software that supports it. Setting up a database server to support eaDirect involves completing the following tasks:

- Confirm that the database is installed
- Install the eaDirect database server components using the InstallAnywhere tool
- Confirm that the required database environment variables are defined
- Configure the database for eaDirect
- Enable access to the 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.

Required User Privileges

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.

Installing with a Custom Database User

The user `db2inst1` is required to install eaDirect database components. To install with another user, follow the procedure below.

To install with another database user:

1. Before installing eaDirect, use SMIT to create a group `db2iadm` containing a user `db2inst1`. This will allow SMIT to install eaDirect to your AIX system, although you will not perform the actual installation with this user.
2. Navigate to your edocs home directory (by default `/usr/EDCSbd`).
3. Recursively change the user and group permissions of the `/db` directory and all subdirectories to the database instance owner.
4. Switch user to your custom user and run `edx_admin.sh` to create the eaDirect database with your new owner.

Defining Environment Variables

edocs recommends that you define several environment variables for the `db2inst1` user account, as shown in the following table:

Variable	Description
<i>HOME</i>	Specifies the db2inst1 home directory. For example, <code>/export/home/db2inst1</code>
<i>PATH</i>	Required to located DB2 executables For example, <code>PATH=\$PATH:\$HOME/bin</code>
<i>LIBPATH</i>	Specifies the JDBC drivers directory For example, <code>LIBPATH=\$LIBPATH:\$HOME/sql/lib/java12</code>

The syntax used to define environment variables depends on which UNIX shell you are using, as shown in the following examples.

To define environment variables in the Bourne or Korn shell:

```
PATH=$PATH:$HOME/bin
export PATH
```

To define environment variables in the C shell:

```
setenv PATH=$PATH:$HOME/bin
```

Installing eaDirect Database Server Components

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

Tip

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

By default, eaDirect is installed in */usr/EDCSbd*. You can change the default installation directory when prompted during installation.

edocs recommends that you install eaDirect in the same top-level directory on both the database server and the application server.

To install the eaDirect database server components:

1. Log in as *root* user.
2. From the */aix* subdirectory on the eaDirect installation CD-ROM, run the command to invoke the InstallAnywhere GUI:

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

A start-up screen appears.

3. On the Introduction screen, read the eaDirect introductory information. Then click **Next**.
4. On the License Agreement screen, carefully read and accept the terms of the license agreement (use the scroll bars to move up and down on the screen) by clicking the appropriate radio button. Then click **Next**.
5. 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**.
6. On the Owner of Web Application Server screen, enter the name of the application server owner (the recommended 'owner' is *nobody*). Then click **Next**.
7. On the Group of Web Application Server screen, enter the name of the group for the application server (the recommended group is *nobody*). Then click **Next**.
8. On the Choose Install Folder screen, accept the default installation folder or click **Choose** to specify another installation folder. Then click **Next**.
9. On the Choose Product Features screen, click **Database**. Then click **Next**.
10. 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.
11. The Install Complete screen reports a successful installation and the directory that contains the database server components.
12. Click **Done**.

Creating and Configuring Your eaDirect Database

Before you configure your database to support eaDirect, you must define several environment variables for your database user account. After running the configuration script, you will also need to configure database access to eaDirect.

Creating and Configuring the eaDirect Database with `edx_admin.sh`

You create and configure the eaDirect production database by running the `edx_admin.sh` database configuration script. This script issues a series of prompts; some require user input, while others execute automatically.

Before running `edx_admin.sh`, confirm that you have a minimum of 2.2 GB free disk space. Insufficient disk space can cause database configuration to fail.

You should also verify database ownership before running `edx_admin.sh`.

If you have to abort the database setup procedure before it successfully completes, see *Recovering from an Aborted Database Configuration Procedure*.

Verifying Database Ownership

Before running `edx_admin.sh`, you should verify that the owner information (**userid/groupid**) of the `$EDX_HOME/db` directory is set to the DB2 instance owner defined during installation, such as `db2inst1`. If a different instance user will be used, you will need to change the ownership of that directory.

To change directory owner information:

1. Navigate to the `$EDX_HOME/db` directory and enter the `chown` command for your database instance, for example:

```
chown -fR db2inst1:db2iadml /usr/EDCSbd/db
```

2. Verify the profile information of the DB2 instance owner. For example, first switch to user `db2inst1` as follows:

```
# su - db2inst1
```

3. View the *.profile* for *db2inst1* using a text editor such as **vi**. For example:

```
vi .profile
```

4. Verify that the following lines are part of *.profile* and if not then add them:

```
#Setup DB2 environment for instance (root) user.
if [-f /home/<db2_instance_owner>/sqllib/db2profile ] ;
then
. /home/<db2_instance_owner>/sqllib/db2profile
fi
#Force DB2 to use JDBC 2.0.
if [-f /home/<db2_instance_owner>/sqllib/java12/usejdbc2
] ; then
. /home/<db2_instance_owner>/sqllib/java12/usejdbc2
fi
```

5. Save the changes and exit your editor. You can now run the script.



Tip

You will also need the owner information for the *.profile* file used by the application server owner.

To create and configure the eaDirect database:

1. Switch user to *db2inst1* and change the working directory to *\$EDX_HOME/db/db2*. For example:

```
# su - db2inst1
# cd /usr/EDCSbd/db/db2
```

2. Enter the following command at the prompt:

```
#!/edx_admin.sh
```

The eaDirect Server Administration for DB2 Main Menu appears. Select Option 1, **Sign in Menu**.

```
edocs eaDirect Server Administration for DB2 Main Menu
-----
[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
```

3. A second sign-in screen appears. You will be prompted to enter a username, password, and DB2 Database name.

The following example shows sample values for database username, database password, and database alias. These values can be whatever you want them to be. For example:

```
SIGN IN MENU
-----
[1] Enter Database USERNAME ...>db2inst1
[2] Enter Database PASSWORD ...>db2inst1
[3] Enter DB2 DATABASE Name ...>edx0
```

4. Upon completion of this step, you are returned to the main administration menu.
5. Select option 2, **Capture Database File Locations**.

```
edocs eaDirect Server Administration for DB2 Main Menu
-----
[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.

During this session, you will be prompted to provide absolute pathnames for where you want to store the following types of files:

- Temporary tablespace
- edocs data tablespace
- edocs index data tablespace
- PWC Application data tablespace
- PWC Application index data tablespace
- CDA Application data tablespace
- CDA Application index data tablespace
- Application data tablespace
- Application index data tablespace

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:

`$DB2_HOME/edx_db2data`

However, if you plan to disperse the software over several disks (to possibly improve performance) specifying pathnames such as the following might be more suitable:

Database Files	Suggested Mount Point
edocs data tablespace	<i>/u01/ edx_db2data</i>
edocs index data tablespace	<i>/u02/ edx_db2data</i>
Application data tablespace	<i>/u03/ edx_db2data</i>
Application index data tablespace	<i>/u04/ edx_db2data</i>
Detail extractor data tablespace	<i>/u05/ edx_db2data</i>
Detail extractor index data tablespace	<i>/u06/ edx_db2data</i>
FS data tablespace	<i>/u07/ edx_db2data</i>

Database Files	Suggested Mount Point
FS index data tablespace	/u08/edx_db2data
Order capture data tablespace	/u09/edx_db2data
Order capture index tablespace	/u10/edx_db2data
Temporary tablespace	/u11/edx_db2data

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

Press ENTER to return to menu.

6. Upon completion of this step, you are returned to the Main Administration Menu.
7. From the main menu, select Option 3, **Install edocs eaDirect**. This option begins the installation of the physical database. A new menu appears.
8. Select Option 1, **Initialize DB2 instance parameters**.

```

Install edocs eaDirect
-----
[1] Initialize DB2 instance parameters
[2] Shutdown Database
[3] Startup Database
[4] Initialize edocs eaDirect database
[5] Create Application Database tables
[6] Compile Application Database procedures
[7] View Status Log Directory
-----
[R] Return to previous menu

SELECT YOUR OPTION: 1
    
```

The options on this menu begin the initialization of the eaDirect database.

No user input is required for this option. During the execution of this step, you should see output similar to the following:

```

Setting DB2 registry variables...
Done
Press ENTER to return to menu
    
```

Upon completion of this step, you will be returned to the Install edocs eaDirect menu.

9. From the Install edocs eaDirect menu, select Option 2, **Shutdown Database**, followed by Option 3, **Startup Database**.

These options let you perform a quick test on the database you just defined. The **Shutdown Database** and **Startup Database** options must be executed successively.

```
SQL1064N DB2STOP processing was successful
Press ENTER to return to menu
SQL1063N DB2START processing was successful
Press ENTER to return to menu
```

Upon completion of this step, you will be returned to the Install edocs eaDirect menu.

10. From the Install edocs eaDirect menu, select Option 4, **Initialize edocs eaDirect Database**.

```
Install edocs eaDirect
-----
[1] Initialize DB2 instance parameters
[2] Shutdown Database
[3] Startup Database
[4] Initialize edocs eaDirect database
[5] Create Application Database tables
[6] Compile Application Database procedures
[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 appear 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, you are returned to the Install edocs eaDirect menu.

11. From the edocs eaDirect menu, select Option 5, **Create Application Database tables.**

```
Install edocs eaDirect
-----
[1] Initialize DB2 instance parameters
[2] Shutdown Database
[3] Startup Database
[4] Initialize edocs eaDirect database
[5] Create Application Database tables
[6] Compile Application Database procedures
[7] View Status Log Directory
-----
[R] Return to previous menu

SELECT YOUR OPTION: 5
```

This option creates the eaDirect database tables. No user input is required for this option.

The error messages that are displayed during this step are an expected part of the process and can be ignored. Upon completion of this step, you will be returned to the Install edocs eaDirect menu.

12. From the Install edocs eaDirect menu, select Option 6, **Compile Application Database procedures.**

```
Install edocs eaDirect
-----
[1] Initialize DB2 instance parameters
[2] Shutdown Database
[3] Startup Database
[4] Initialize edocs eaDirect database
[5] Create Application Database tables
[6] Compile Application Database procedures
[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, you will be returned 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/db2`.

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

13. Select **Return to Previous Menu**. The eaDirect Server Administration for DB2 Main Menu appears.

14. 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 appears.

15. 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, you will be returned to the Initial Data Population menu.

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

16. Select **Return to Previous Menu**. You will be returned to the eaDirect Server Administration for DB2 Main Menu.

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

SELECT YOUR OPTION: R
```

17. Select **Quit** to end the eaDirect database configuration session.

```
edocs eaDirect Server Administration for DB2 Main Menu
-----
[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
```

Recovering from a Failed Database Configuration

At some point during the database configuration procedure, you might encounter a situation that requires you to abort the procedure. Note that aborting the procedure will result in the loss of any configuration information that you had previously entered.

Before you can run the database configuration script again, you **must** first do a manual cleanup of the partially configured database.

To recover from a failed database configuration:

1. Shut down any database that has been created. A confirmation message appears if the database shutdown procedure is successful.
2. Remove any directories and files whose name matches the Database Name and Alias that were specified during the database configuration procedure.

Creating Database Tables for Order Capture

In order to use the Order Capture feature in eaSample, you must manually execute a script **on your database machine** that creates the appropriate database tables for the sample application. The command syntax is:

```
create_demo_oc_table.sh database_name database_username  
database_password
```

This procedure must be done **before** you deploy the sample application. For more information about order capture, see *eaSDK: Order Capture and Management*.

To create database tables for Order Capture:

1. Switch user to your database owner, for example *db2inst1*.
2. Change directory to **\$EDX_HOME/db/db2**

```
# su - db2inst1  
$ cd /usr/EDCSbd/db/db2
```

3. Run the `Create_demo_oc_table.sh` file providing the database username, database SID, and database password. For example:

```
# create_demo_oc_table.sh edx0 edx_dba edx
```

This script connects to the database, drops any existing order capture schema objects, and creates a new order capture schema for your database.

4. When the script has completed, you are returned to the command prompt. No additional user input is required.

Connecting to the eaDirect Database

The next step in setting up the database server for eaDirect is to establish connectivity to the database. This step catalogs a node and a database as the database owner, for example, `db2inst1`, to include information about your eaDirect database. This needs to be performed if the database is on a **remote** machine.



If the eaDirect database is installed on the same machine as the eaDirect application, you must manually edit the database directory to include a loopback configuration for the eaDirect database. Consult your database administrator and DB2 documentation for details.

To connect to the eaDirect production database:

1. Switch user to DB2 on the application server, for example:

```
# su - db2inst1
```

2. If the database is on a remote machine, catalog the node and the database on the Application server machine using the following syntax:

```
$ db2 "catalog tcpip node <node_name> remote
<server_name> server <server_listen_port>"
```

```
$ db2 "catalog database <remote_database_name> as
<database_alias> at node <node_name>"
```

For example:

```
$ db2 "catalog tcpip node edx_node remote
corolla.edocs.com server 50000"
```

```
$ db2 "catalog database edx0 as edx0 at node edx_node"
```

Tip

You do not need to stop and start the database for this procedure to take effect, as it is done on the client side.

3. Check to make sure that the node and database have been created correctly.

```
$ db2 "list node directory"
One Node entry should be:
Node name = EDX_NODE
Comment =
Protocol = TCPIP
Hostname = corolla
Service name = 50000

$ db2 "list database directory"
One Database entry should be:
Database alias = EDX0
Database name = EDX0
Node name = EDX_NODE
Database release level = 9.00
Comment =
Directory entry type = Remote
Catalog node number = 0
```

4. Connect to the database with the correct database name, for example:

```
$ db2 "connect to edx0 user db2inst1 using db2inst1"

Database Connection Information
Database server = DB2/6000 7.2.4
SQL authorization ID = DB2INST1
Local database alias = EDX0
```


Setting Up an Application Server for eaDirect

3

Overview

This chapter provides instructions for installing eaDirect on an application server and configuring supporting software. Configuring an application server for eaDirect involves the following tasks:

- Confirm that third-party software is correctly installed and configured
- Install the eaDirect application components using InstallAnywhere
- Define your eaDirect environment
- Configure Java resources for eaDirect
- Enable connectivity to the database

The installation and configuration examples shown in this chapter use default pathnames for eaDirect, for example */usr/EDCSbd*.

To designate a different destination directory for the eaDirect application server components, enter the pathname to the directory when prompted during installation.

edocs recommends that you install eaDirect in the same top-level directory on both the database server and the application server.



Tip

If you have not already installed the database server components and configured the database server for eaDirect, do so now.

Required User Privileges

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

WebSphere installation will prompt you to specify user and group account (ownership) for WebSphere directories and files. The default WebSphere user and group account is *root:system*.

edocs recommends that you use the more secure user and group account *nobody:nobody* when you install WebSphere. The examples in this guide use the user and group account *nobody:nobody*.

Defining Your eaDirect Environment

Confirm that all third-party software applications that support eaDirect are installed on the appropriate server. Follow the installation instructions in each product's documentation to ensure the integrity and reliability of the eaDirect environment.

Before installing eaDirect, you must confirm that your system meets or exceeds recommended hardware and software requirements. During installation, you will ensure that all supporting software is correctly configured and functioning smoothly and that your environment is set up properly for eaDirect.

Follow the steps in this guide carefully and in sequence to ensure a successful installation of eaDirect.

Use the Hardware and Software Requirements on page 15 to determine the software components that must be installed on each server in your distributed environment.

You will also need to create accounts, owner and group privileges, and environment variables for the application server and database server distributions.

Capturing Environment Data with *edx_config*

eaDirect provides several configuration files that you use to define your environment. The 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.

When you run *edx_config*, it prompts you to enter values pertaining to the Java and DB2 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.

This procedure is only required on the application server.



Tip

Make sure that the database values entered below are the same as the database values you specified when you set up the eaDirect database, as described in the topic *Configuring the DB2 Database for eaDirect*.

Before you run the script, you should verify that the ownership of the *\$EDX_HOME* directory is set to the user and group of the WebSphere Application Server. If not, you can change it as follows:

```
chown -fR nobody:nobody /usr/EDCSbd
```

To capture information about your eaDirect environment:

1. Switch user to the WebSphere owner (*nobody*, in our examples), and navigate to *\$EDX_HOME/bin*. For example:

```
# su - nobody
$ cd /usr/EDCSbd/bin
```

2. Run *edx_config*.

```
$ ./edx_config
```

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

```
Enter DB2 Instance Name : [db2inst1] [q] db2inst1
Enter DB2 Instance Home : [/export/home/db2inst1] [q]
/export/home/db2inst1
Enter DB2 username : [db2inst1] [q] db2inst1
Enter DB2 Password : [db2inst1] [q] db2inst1
Enter DB2 Database : [edx0] [q] edx0
Enter WebSphere Application Server root directory :
[/usr/WebSphere/AppServer] [q] /usr/WebSphere/AppServer
Enter MQSeries java client directory : [/usr/mqm/java]
[q] /usr/mqm/java
Enter Java root directory :
[/usr/WebSphere/AppServer/java] [q]
/usr/WebSphere/AppServer/java
```



Be sure the time zone (TZ) for your server is set to your system time zone. eaDirect jobs can fail if Java system time does not match actual system time.

Passing Environment Data to Your Application Server

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 startup script, **startupServer.sh**.

To pass your eaDirect environment to WebSphere:

1. Switch user to the WebSphere owner (*nobody*, in our examples), if necessary.
2. Change directory to *\$WAS_HOME/bin* (for example, */usr/WebSphere/AppServer/bin*) and stop the administration server, **startupServer.sh**. You can use the **kill** command or type **Ctrl+C** to stop the administration 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:

```
WAS_HOME=/usr/WebSphere/AppServer/
export WAS_HOME
```

```
EDX_HOME=/usr/EDCSbd/
export EDX_HOME
```

4. In the same file, initialize the variable `$EDX_HOME` for `edx.config` just before the command to start the JVM. The dot and space preceding the pathname are a required part of the syntax. For example:

```
export LD_LIBRARY_PATH LIBPATH EXTSHM
. $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 \
com.ibm.ws.bootstrap.WSLauncher \
com.ibm.ejs.sm.util.process.Nanny
$WAS_HOME/bin/admin.config
```



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 `else` line of this `if ["${DB_TYPE}" != "DB2"]` clause.

5. Save and close the file.
6. Change directory to `$WAS_HOME/bin` and open `launchClient.sh`.
7. Add the environmental variable “`$EDX_OPTS`” just below the line ‘`$JAVA_HOME/bin/java`’. For example:

```
$JAVA_HOME/bin/java \  
  $WAS_JAVAOPTS \  
  $CLIENTSAS \  
  $EDX_OPTS \  
  -Dserver.root=$WAS_HOME \  
  -Dws.ext.dirs=$WAS_EXT_DIRS \  
  -Dcom.ibm.CORBA.BootstrapHost=$COMPUTERNAME \  
  -Djava.naming.factory.initial=$NAMING_FACTORY \  
  -classpath  
  $WAS_CLASSPATHcom.ibm.ws.bootstrap.WSLauncher \  
  
com.ibm.websphere.client.applicationclient.launchClient  
"$@"
```

8. Save and close the file.
9. Open the *admin.config* file.
10. Add the following line:

```
com.ibm.ejs.sm.adminServer.bootstrapPort=<port>
```

The <port> value is usually 1025 or higher.

11. Save and close the file.

Starting and Stopping Your Application Server

WebSphere

WebSphere provides the *startupServer.sh* command for starting the administration server from a command line window. This command is located in *\$WAS_HOME/bin*.

The *startupServer.sh* command works fine for starting the administration server in a non-production environment where there are no running jobs. However, the disadvantage to using this command is that it will cause WebSphere to stop immediately if a **Ctrl+C** (which is often used to force a hard shutdown of the server) is entered in the directory where the administration server was started, or if the command line window is closed.

Therefore, it is recommended that you use command syntax similar to the following when starting the administration server in an active eaDirect production environment:

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

This command will not stop WebSphere if you enter **Ctrl+C**, or if you close the command line window where you started the administration server. Using the recommended command syntax to start up the administration 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.

Installing eaDirect Application Server Components

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



Tip

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 for your machine.

By default, eaDirect is installed in `/usr/EDCSbd`. You can change the default installation directory when prompted during installation.

edocs recommends that you install eaDirect in the same top-level directory on both the database server and the application server.

To install the application server components:

1. Log in as *root* user.
2. Set the `WAS_HOME` environment variable to the WebSphere home directory. For example:

```
export WAS_HOME=/usr/WebSphere/AppServer
```

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

```
# ./Dirins.bin
```
4. On the Introduction screen, read the eaDirect introductory information. Then click **Next**.
5. 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**.
6. 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**.
7. On the Owner of Web Application Server screen, enter the name of the application server owner (the recommended 'owner' is *nobody*). Then click **Next**.
8. On the Group of Web Application Server screen, enter the name of the group for the application server (the recommended group is *nobody*). Then click **Next**.
9. On the Choose Install Folder screen, accept the default installation folder (*/usr/EDCSbd*), or click **Choose** to specify another installation folder. Then click **Next**.
10. On the Choose Product Features screen, click **App Server**. Then click **Next**.
11. On the Pre-Installation Summary screen, confirm that the information is accurate. Then click **Install**.
12. 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.

13. The Install Complete screen reports a successful installation and the directory that contains the application server components.
14. Click **Done**.

Understanding the Structure of the eaDirect Application Directory

The eaDirect home directory is a repository for all files that are required by the eaDirect application. It also has a pre-defined hierarchical structure.

By default, eaDirect is installed into a directory hierarchy that contains a top level or "home" directory, */usr/EDCSbd*, below which all other eaDirect directories are created. The directories in */usr/EDCSbd* are grouped by functionality and contain the libraries, executables, log files, and sample training files that eaDirect uses. For example:

```
<EDCSbd>
/AppProfiles
/Data
/Input
/J2EEApps
/Output
/Uninstall
/bin
/config
/documentation
/jre
/lib
/logs
/samples
```

Files are organized within functional groups according to a Data Definition Name (DDN), which is also synonymous with the name of an eaDirect application.

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

Directory	Contents
AppProfiles	Contains the Versioned Sets (configuration and HTML template files created in the design environment) that are published to the production environment.
bin	Contains scripts that define the eaDirect environment (for example, edx_config) and scripts that start eaDirect processes (for example, ws_scheduler).
config	Contains configuration files that define the eaDirect production environment.
Data	Contains the input data files that are copied to this directory after the Scanner finds them in the Input directory for an application. The other production tasks use these files to process the input data from a service provider.
Input	Contains the input data files needed by the Scanner production task.
J2EEApps	Contains the eaDirect J2EE EAR file <i>ear-eadirect.ear</i> . This file also contains the WAR files for the eaPay, eaPost, and eaXchange add-on modules.
lib	Contains several java archive (<i>.jar</i>) files and AIX directories.
logs	Contains application log files generated in the eaDirect production environment.
Output	Contains output files from Batch XML and HTML jobs running in the eaDirect Command Center.
samples	Contains data files for two sample applications, <i>NatlWireless</i> and <i>Training</i> , that can be used for setup and testing. Also includes <i>hierarchySample</i> (if licensed) and <i>umfSample</i> (if licensed).

Directory	Contents
Uninstall	Contains the eaDirect uninstall script and other files pertaining to uninstalling eaDirect.
documentation	Documentation for the eaSuite products that are installed.
jre	Java runtime used by eaDirect.

Installing to a Custom Directory

To install to a directory other than `/usr/EDCSbd`:

1. Install eaDirect with SMIT to `/usr/EDCSbd` (the default install)
2. Copy all files and directories from `/usr/EDCSbd` to the new location, for example `/usr/mydir`. Keep the subdirectory tree intact, for example `/usr/mydir/bin` in place of `/usr/EDCSbd/bin`.
3. Navigate to your new home directory and run `$EDX_HOME/config/edx_config`.
4. Edit `$WAS_HOME/bin/startupServer.sh` to reflect your new `$EDX_HOME` directory.



eaDirect uninstallation scripts are not customizable. To uninstall eaDirect components, you must move all files and directories back to `/usr/EDCSbd`.

Configuring Java Resources for eaDirect

After you have successfully configured the DB2 database for eaDirect, you must now create and configure JDBC 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:

- Create a new application server for eaDirect
- Configure the 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

Starting the WebSphere Administrative Console

You configure Java resources through the WebSphere Administrative Console.

To invoke the WebSphere Administrative Console:

1. Change directory to *\$WAS_HOME/bin*, change the user to the WebSphere owner, and run the administration server start-up script, *startupServer.sh*, providing the host and port. For example:

```
# su - nobody
# cd /usr/WebSphere/AppServer/bin
# ./startupServer.sh montero 1025 &
```

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

```
# cd /usr/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:

```
# cd /usr/WebSphere/AppServer/bin
# ./adminclient.sh montero 1025 &
```

This starts the admin client on port 1025.

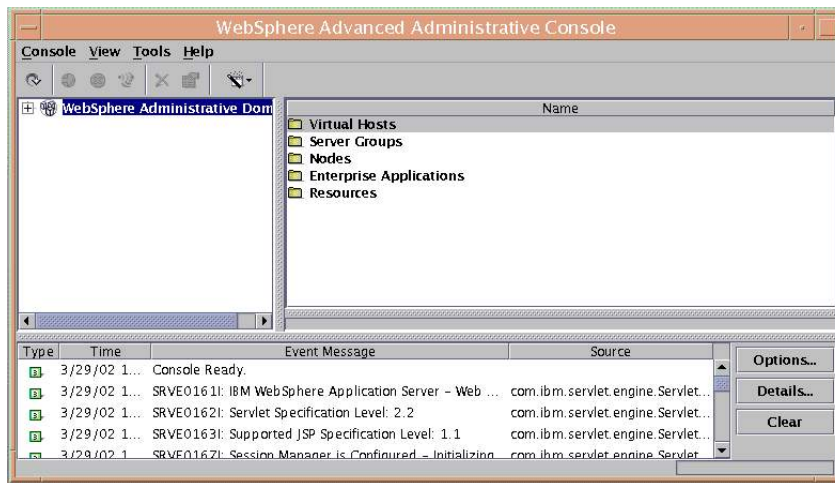


Tip

The Administrative Console appears in an X-window, so you will have to have X-window 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:

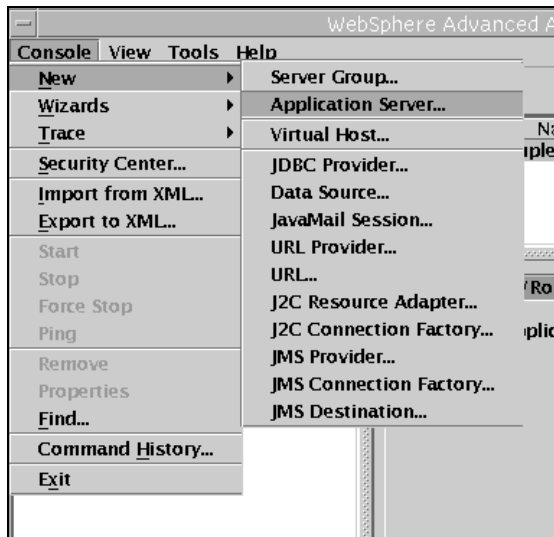
```
set DISPLAY=montero:0.0
export DISPLAY
```

4. The WebSphere Administrative Console appears.

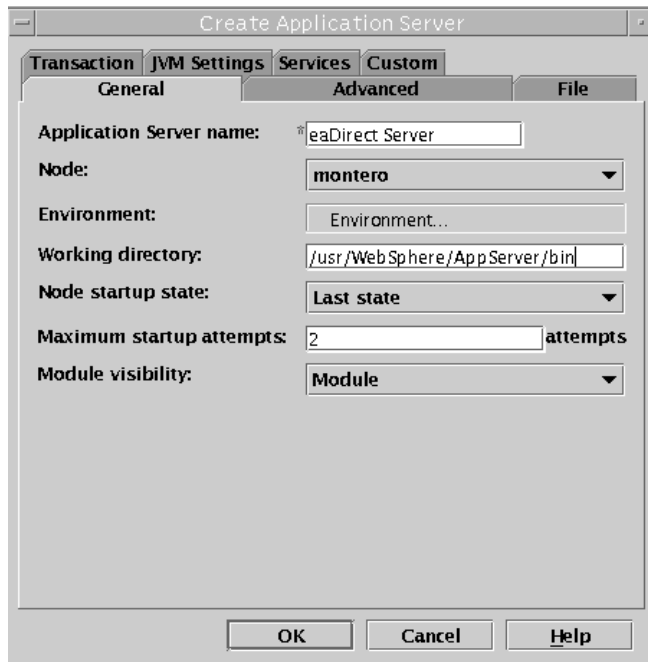


Creating a New Application Server

1. Expand the WebSphere Administrative Domain view.
2. On the toolbar, select **Console**, then **New**, then **Application Server**.

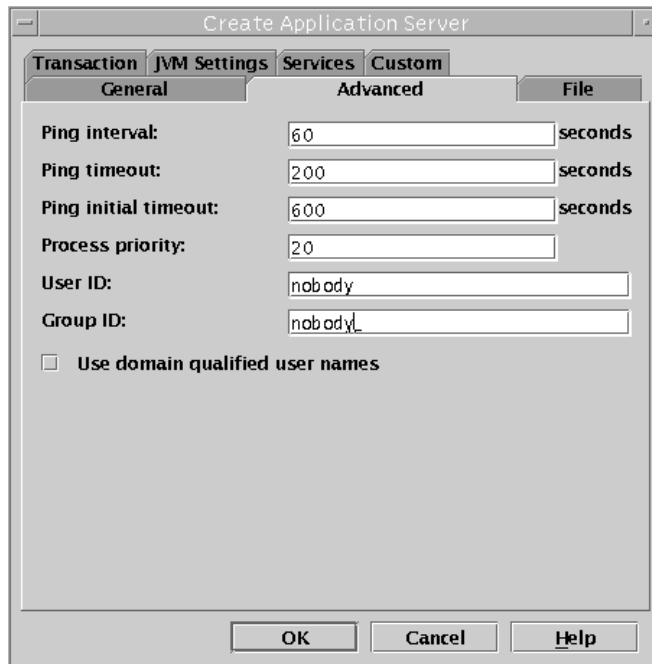


3. On the General tab, enter a name for the new application server instance. For example, eaDirect Server.
4. Enter a working directory for the application server instance. For example, *\$WAS_HOME/bin*.

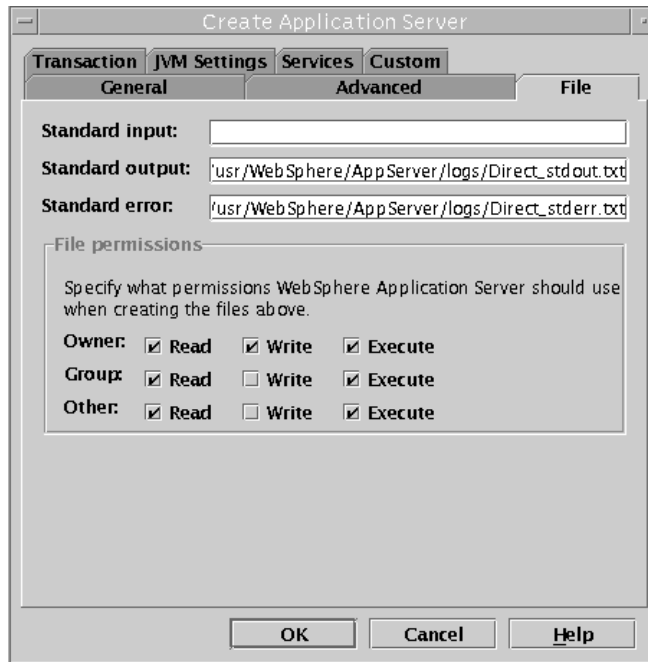


5. On the **Advanced** tab, in the application server setup, enter the WebSphere Application Server userid and group values.

Setting Up an Application Server for eaDirect



6. Click the **File** tab and enter filenames for standard output and standard error logs.



7. Click **OK** to close the Create Application Server dialog.
8. Click **OK** to close the Information dialog reporting that the action completed successfully.

Configuring JDBC Connection Pools

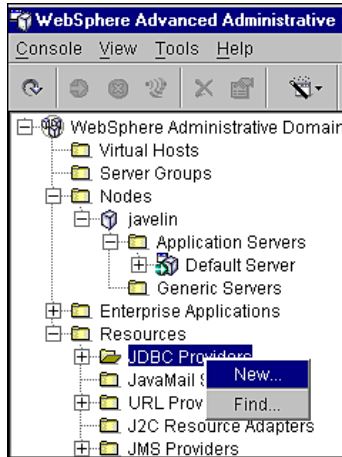
A connection pool contains named groups of JDBC connections that are created when the connection pool is registered, usually when starting up the WebSphere Server. The WebSphere Server opens JDBC connections to the database during the startup process and adds the connections to the pool.

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

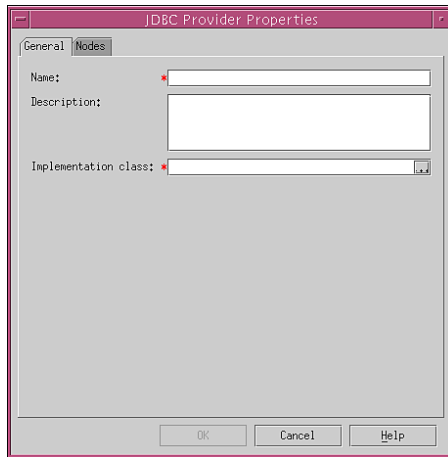
You will create three JDBC Connection Pools. The next section describes how to create the first JDBC Connection Pool. After that procedure, the values for the remaining two connection pools are listed. Create those connection pools following the procedure shown for the first connection pool.

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.

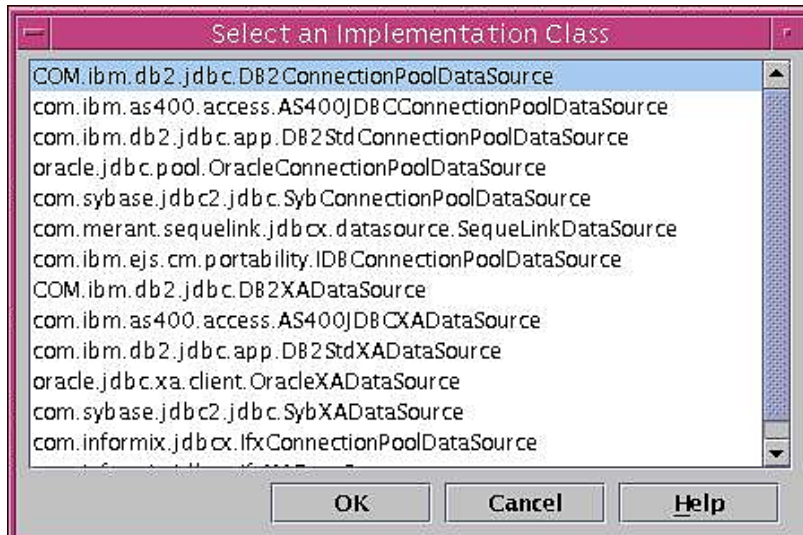


The JDBC Provider Properties dialog appears.

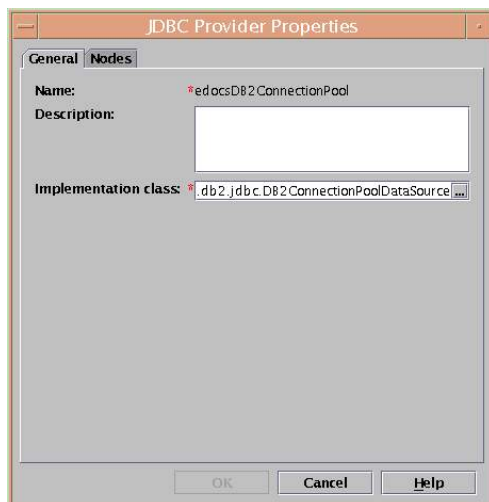


2. On the General tab, enter **edxUserConnectionPool** in the Name field.
3. Click the (...) button next to the Implementation Class field. The Select an Implementation Class dialog appears.

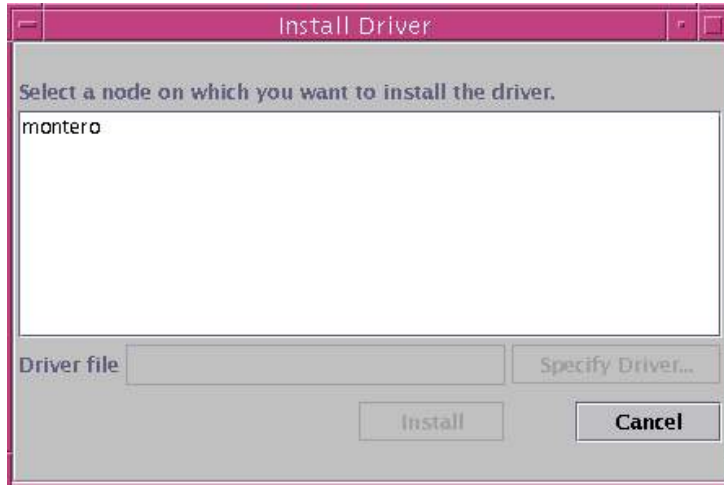
- From the list of implementation classes, select **COM.ibm.db2.jdbc.DB2ConnectionPoolDataSource**.



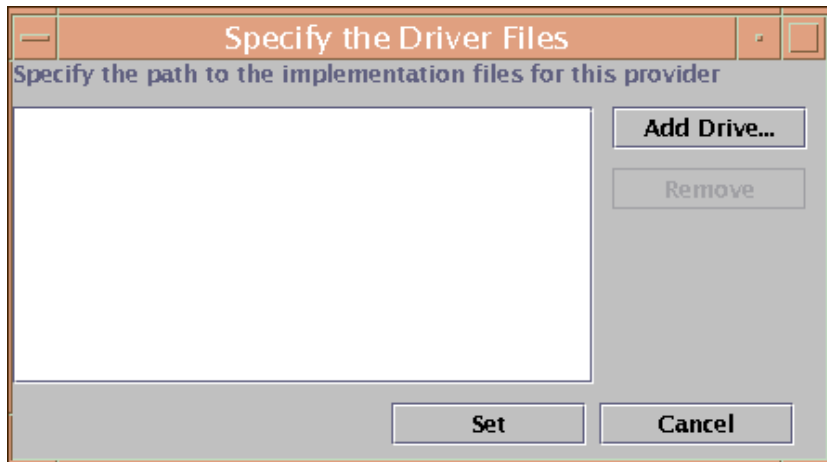
- Click **OK**. The name of the implementation class is added to the Implementation class field in the JDBC Provider Properties dialog.



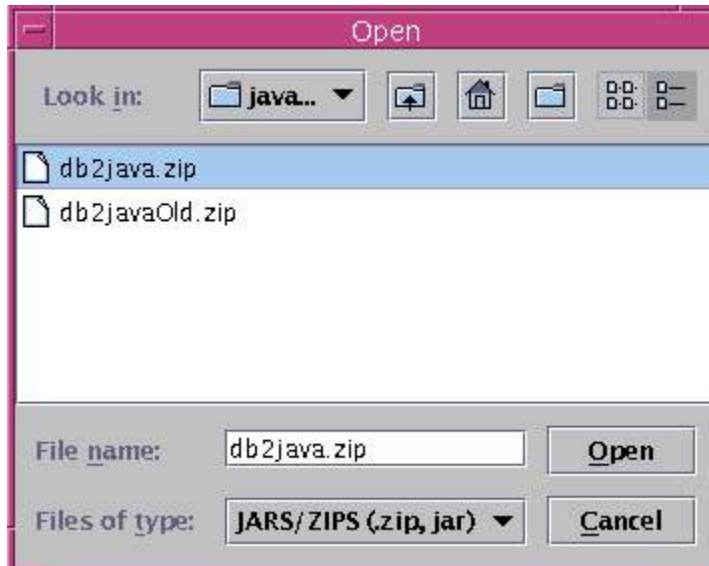
6. Click the Nodes tab, and click **Install New**. The Install Driver dialog appears.
7. Select the node on which you want to install the JDBC driver. This is your application server machine name, for example **montero**.



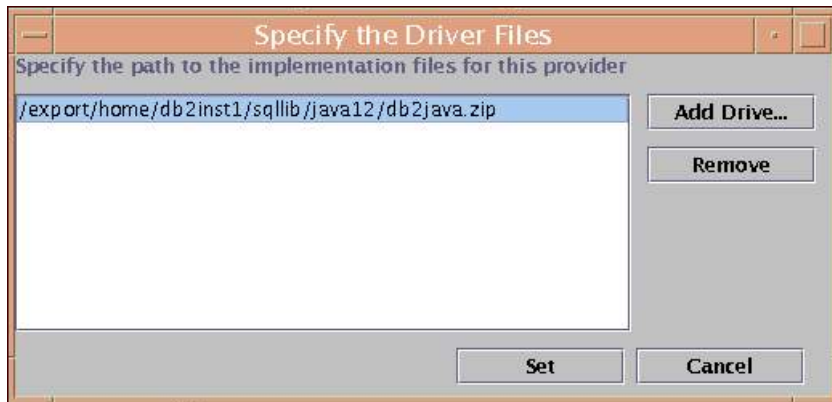
8. Click **Specify Driver**. The Specify the Driver Files dialog appears.



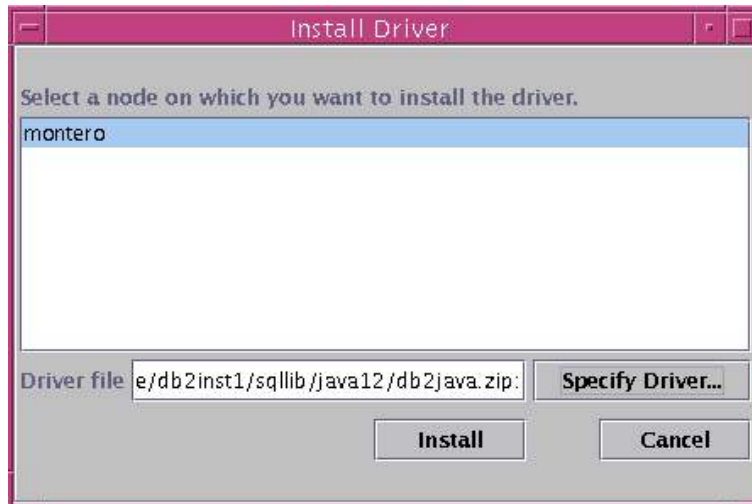
9. Click **Add Driver** and in the Open dialog, navigate to *\$DB2_HOME/sqlib/java12* (where *\$DB2_HOME* is the home directory of db2inst1. For example, */export/home/db2inst1*).
10. Select **db2java.zip**. The file is added to the File name field.



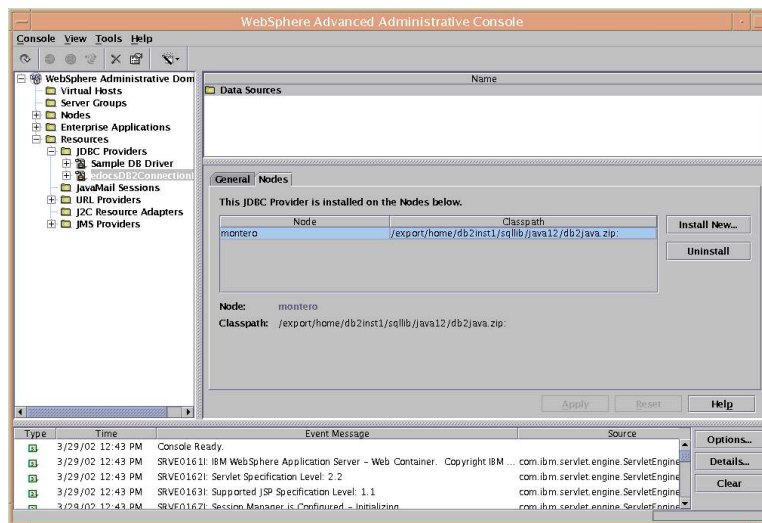
11. Click **Open**. The Specify the Driver Files dialog appears, showing the absolute pathname to the JDBC driver you just selected.



12. Click **Set**. The Install Driver dialog appears, showing the pathname to the selected JDBC driver in the Driver file field.



13. Click **Install**. The node and Classpath of the JDBC driver is added to the JDBC Provider folder for edocsDB2ConnectionPool.



14. Click **OK** to close the JDBC Driver dialog. If Apply is available, it will gray out after a few seconds.

edxLoggerConnectionPool Configuration

Using the previous procedures, add the following connection pool:

Attribute Name	Attribute Values
Name	<code>edxLoggerConnectionPool</code>
Implementation Class	<code>COM.ibm.db2.jdbc.DB2ConnectionPoolDataSource</code>
Node	your application server name
Driver	<code>db2java.zip</code>



Tip

Remember to move the Targets-Server from Available to Chosen for each pool as you configure it.

edxAdminConnectionPool Configuration

Using the previous procedures, add the following connection pool:

Attribute Name	Attribute Values
Name	<code>edxAdminConnectionPool</code>
Implementation Class	<code>COM.ibm.db2.jdbc.DB2ConnectionPoolDataSource</code>
Node	Your application server name
Driver	<code>db2java.zip</code>

Configuring Data Sources

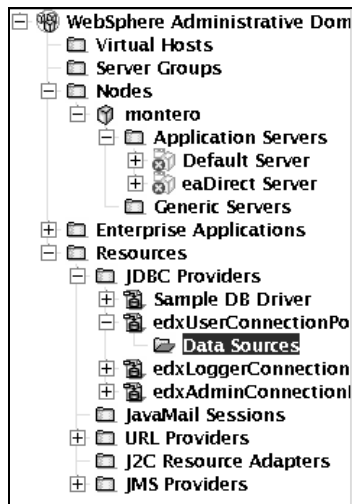
To configure a data source for the JDBC connection pool:

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:

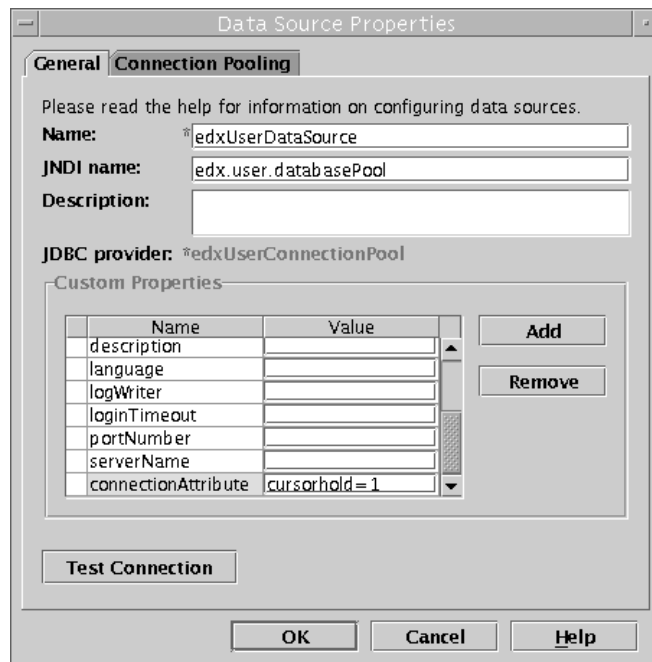
1. Expand the Resources folder in your domain to show the JDBC Providers folder.
2. Expand the JDBC Providers folder and expand **edxUserConnectionPool**.



3. Right-click on **Data Sources**, and then select **New** from the menu. The Data Source Properties dialog appears.
4. Click the **General** tab and enter the following values:

Field	Value
Name	edxUserDataSource (case-sensitive)
JNDI Name	edx.user.databasePool (case-sensitive)

Field	Value
Database Name	edx0 (or the name of the DB2 database you specified during the database configuration procedure)
User ID	db2inst1 (or the name of the DB2 database user you specified during the database configuration procedure)
Password	db2inst1 (or the name of the DB2 database password you specified during the database configuration procedure)

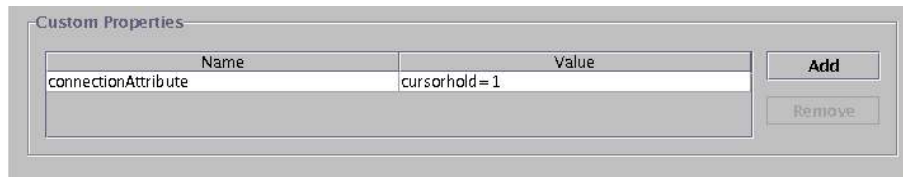


You can click **Test Connection** to verify you entered the user and password correctly.

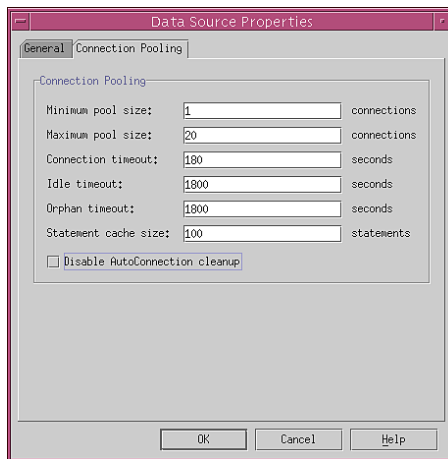
5. Click **Add** under Custom Properties and enter the following values:

Setting Up an Application Server for eaDirect

Field	Value
Name	<code>connectionAttribute</code>
Value	<code>cursorhold=1</code>



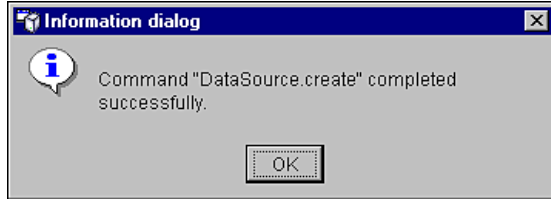
6. Click the **Connection Pooling** tab. In the Maximum pool size field, set the maximum pool size to **50**.



Tip

Maximum connection pool size increased in 3.4 and later versions to support concurrency for multiple jobs.

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.
10. Configure **edxLoggerDataSource** using the procedures shown for **edxUserDataSource**, and the following values:

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

11. Configure **edxAdminDataSource** using the procedures shown for **edxUserDataSource**, and the following values:

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



Remember to move the Targets-Server from Available to Chosen for each data source as you configure it.

12. Exit the administrative client.

Configuring JVM Settings

To configure JVM settings for your application server:

1. Open a terminal window.

2. Change user to the WebSphere owner (*nobody*, in our examples), and navigate to *\$WAS_HOME/bin*.
3. Run the configuration script *XMLConfig.sh* using the following syntax, replacing the defaults with your values as needed:

```
# ./XMLConfig.sh -import
/usr/EDCSbd/config/ws_config.xml -adminNodeName montero
-nameServiceHost montero -nameServicePort 1025 -
substitute "NodeName=montero;ServerName=eaDirect
Server;EDX_HOME=/usr/EDCSbd;JMS_HOME=/usr/mqm/java"
```

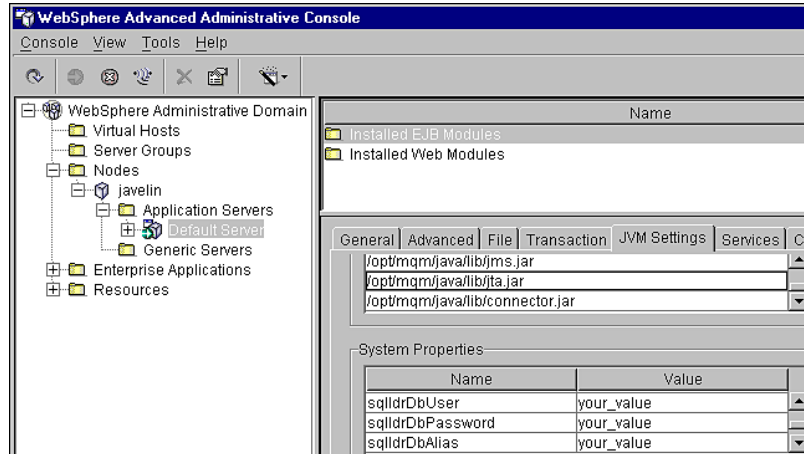
Tip

If you use environment variables, make sure *\$EDX_HOME* points to the correct installation directory (*/usr/EDCSbd/* in the example above).

4. Press **Return**. The configuration script runs automatically. No user input is required.
5. Upon completion, you are returned to the command prompt.

To configure JVM settings for custom users or properties:

1. SQL Loader system properties are defined in the file *\$EDX_HOME/config/edx_sqlldr.config*. If you customize these system properties, you will have to manually specify the parameters for the JVM of the eaDirect application server using the System Properties table of the WebSphere Administrative Console.



- When you run `edx_config`, the script asks you to enter your DB user name, password and alias. If you are using values other than the defaults, you must also set these values through JVM settings in the System Properties table. Use the values in the following table to define your username, password, and alias.

Name	Value
sqlldrDbUser	com.edocs.tasks.loader.user
sqlldrDbPassword	com.edocs.tasks.loader.password
sqlldrDbAlias	com.edocs.tasks.loader.alias

- Click **Apply** for the changes to 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.com/software/ts/mqseries>.

To set up MQSeries (overview):

1. 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
2. Configure JMSAdmin, which passes Java parameters to MQSeries.
3. Create a queue manager for eaDirect.
4. Verify that the MQSeries Publish/Subscribe broker is installed and running.
5. 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` (not the executable `JMSAdmin`). For example:

```
cd /usr/mqm/java/bin
vi -R JMSAdmin.config
```

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

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

- From the list of JNDI service providers, comment out the following setting:

```
INITIAL_CONTEXT_FACTORY=com.ibm.ejs.ns.jndi.CNInitialContextFactory
```

- From the list of URLs for JNDI service providers, uncomment the following setting and edit it for your application server and port:

```
PROVIDER_URL=iiop://localhost:1025
```

**Tip**

Port 1025 is the default port for the administration server. You can specify another port number if necessary, but it must match the port for the admin server.

- Make sure that no other settings are uncommented for a JNDI service provider and URL.
- Save and close the file.

To configure JMSAdmin:

- Change Directory to `$JMS_HOME/java/bin` and open `JMSAdmin.config`. For example:

```
cd /usr/mqm/java/bin
vi -R JMSAdmin.config
```

- Add the following lines to the end of the file:

```
WAS_HOME=/usr/WebSphere/AppServer
MQ_JAVA_INSTALL_PATH=/usr/mqm/java
PATH=$PATH:/usr/WebSphere/AppServer/java/jre/lib/ext
export MQ_JAVA_INSTALL_PATH PATH WAS_HOME
java -DMQJMS_LOG_DIR=$MQ_JAVA_INSTALL_PATH/log
-DMQJMS_TRACE_DIR=$MQ_JAVA_INSTALL_PATH/trace
-DMQJMS_INSTALL_PATH=$MQ_JAVA_INSTALL_PATH
-Djava.ext.dirs=$MQ_JAVA_INSTALL_PATH/lib:$WAS_HOME/java/
jre/lib/ext:$WAS_HOME/lib
com.ibm.mq.jms.admin.JMSAdmin $*
```

If the paths to `WAS_HOME` and `MQ_JAVA` are not correct for your installation, then update them.

To create a MQSeries Queue Manager:

1. Change your user to the MQSeries owner, for example *nobody*.
2. Navigate to *\$JMS_HOME/java/bin* where *\$JMS_HOME* is the directory in which you installed MQSeries. By default, MQSeries is installed in */usr/mqm*.
3. Create a queue manager called *edxQueueManager* by running the following command:

```
# crtmqm -u SYSTEM.DEAD.LETTER.QUEUE edxQueueManager
```
4. Start the queue manager using the following command:

```
# strmqm edxQueueManager
```
5. Verify that *edxQueueManager* is running by using the following command:

```
# dspmq
```
6. If *edxQueueManager* is listed with a status of 'Ended', start it using the *strmqm* command.



You can stop the *edxQueueManager* using the *endmqm* command.

To verify that the MQSeries Publish/Subscribe broker is installed and running

1. Make sure that you have the pathname *\$JMS_HOME/bin* in your PATH.
2. As the MQSeries owner (in our examples, *nobody*), run the following command:

```
# dspmqbrk -m edxQueueManager
```
3. 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* is included in the system's PATH setting.

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

```
# strmqbrk -m edxQueueManager
```

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

```
# dspmqbrk -m edxQueueManager
```

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

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

7. Change directory to `$JMS_HOME/java/bin`, and create the MQ JMS System queues by running the following command:

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

This command creates objects and returns:

```
No commands have a syntax error.  
All valid MQSC commands were processed.
```

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=/usr/EDCSbd  
export EDX_HOME
```

4. Then run the following command using the `.` (dot) 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 deploy on WebSphere. This is done through the Application Assembly Tool.

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

To start the Application Assembly Tool from the command line:

- Change directory to `$WAS_HOME/bin`, and invoke the WebSphere Application Assembly Tool by running the script `assembly.sh`. For example:

```
# su - nobody
# cd /usr/WebSphere/AppServer/bin
# ./assembly.sh &
```

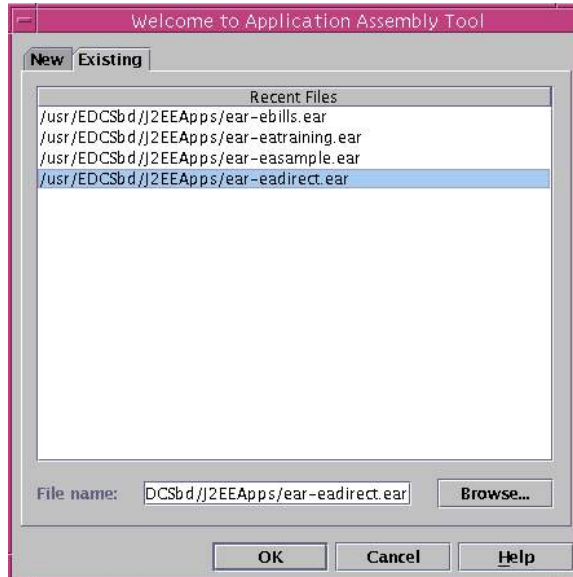


The Application Assembly Tool appears in an X-window, so you will have to have X-window software installed and you might have to set your display (in your `.profile` file) to the local machine if you are trying to invoke the Application Assembly tool remotely. For example:

```
set DISPLAY=montero:0.0
export DISPLAY
```

To generate deployment code for eaDirect J2EE applications:

1. When the Application Assembly Tool appears, click the **Existing** tab.

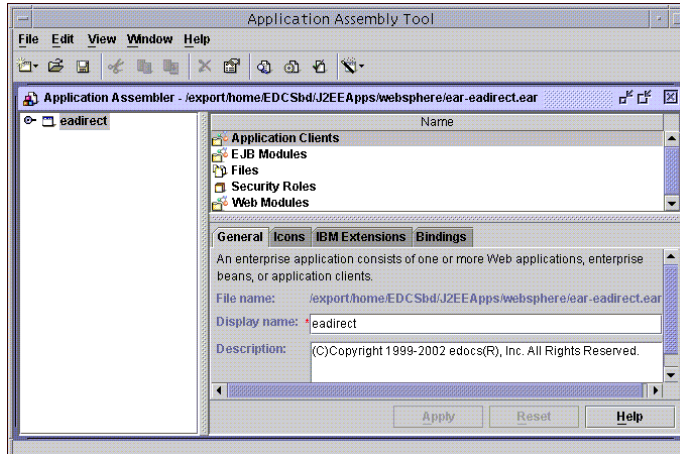


2. Click **Browse** at the bottom of the dialog, and navigate to the directory that contains the eaDirect J2EE applications. For example:

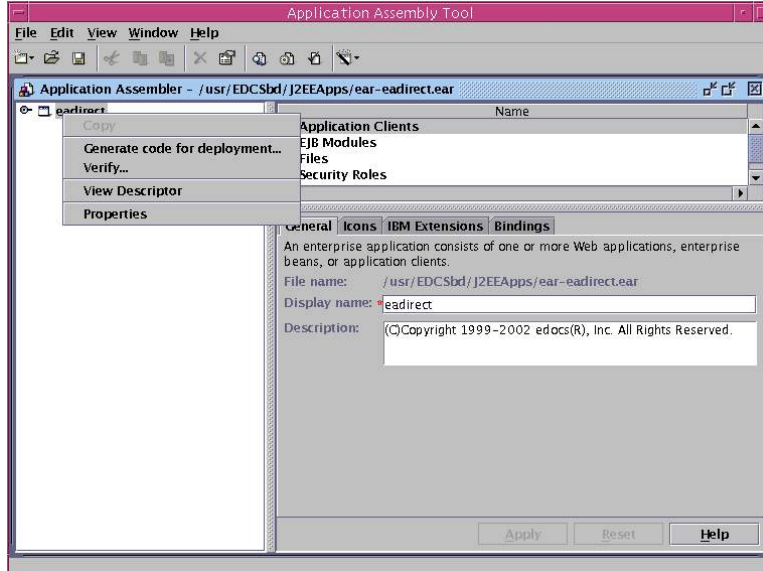


3. Select **ear-eadirect.ear** from the list of J2EE applications and click **Select**.

4. Click **OK**. The eaDirect application opens in the Application Assembly Tool.



5. In the left pane, right click on **eaDirect**, and select **Generate code for deployment** from the menu.



The **Generate Code for deployment** dialog appears.

6. In the **Dependent classpath** field, enter the java classpath for the edocs system, client, and common JAR files separated by colons, for example:

```
/usr/EDCSbd/lib/edx_system.jar:/usr/EDCSbd/lib/edx_client.jar:/usr/EDCSbd/lib/edx_common.jar
```

**Tip**

Be sure to include the leading slashes so that these classpaths are taken from the root.

7. Select **DB2 Universal Database for Windows, Version 7.2** from the Database type drop-down menu.

8. Click **Generate Now**. During generation of the deployment code, status information is shown in the window at the bottom of the dialog.
9. 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.
10. Click **Close** to exit from the Generate code for deployment dialog.
11. Repeat Steps 2 to 9 to generate deployment code for each sample application you want to assemble, for example **eaSample** or **eaTraining**.
12. Click **Exit** in the File menu to close the Application Assembly Tool.



Tip

When generating deployment code for the eaTraining sample application, you might see warnings involving deprecated methods. These warnings do not indicate that the process has failed. As long as there are '0 errors' reported after each EJB in the sample application has been processed, the deployment code has been generated successfully.

Deploying J2EE Web Applications for eaDirect

When you install eaDirect, you will find Enterprise Application Archives (EAR files) for sample web applications in the `/EDCSbd/samples/j2eeapps` directory of your eaDirect installation. You deploy these applications using your application server's administrative console.

In general, deploying a web application involves three distinct phases:

1. Component creation, typically done by application developers
2. Application assembly, typically done by application developers (although they may not have participated in the 'component creation' phase)
3. Application deployment, typically done by both application developers and system administrators

During development and testing, it is common for web developers to deploy their own applications. However, when the application has been assembled and is ready for production, a system administrator most likely will deploy it.

Web Applications Included with eaDirect

J2EE Application	Description
<i>ear-eadirect.ear</i>	Core functionality of eaDirect, including the Command Center and the eaDirect engine. Also contains placeholder files for other components of the eaSuite. By default, installed to: <i>\$EDX_HOME/J2EEApps/weblogic</i>
<i>ear-easample.ear</i>	Demonstrates the core features of eaDirect, including non-hierarchical enrollment model using edocs Common Directory Access (CDA); content access to statement summary and detail data; line item dispute and annotation; order capture and management. Note: In order to use the eaSample application, you must first run the file <i>create_demo_oc_table.sh</i> , which creates the database tables for Order Capture. See <i>Appendix A: Using eaSample</i> for more information.
<i>ear-eatraining.ear</i>	Demonstrates more advanced features of eaDirect, including hierarchical user enrollment using edocs Common Directory Access (CDA).
<i>ear-hierarchySample.ear</i>	Contains the Hierarchy Console, an intuitive user interface for enterprise profile management. Administrators can use the Hierarchy Console to organize and edit accounts and subaccounts into account groups that can control access privileges, statement viewing, editing user profiles, and other online account management. Requires a separate license.
<i>ear-reportSample.ear</i>	Supports customized reports on account data for phone call usage. <i>WebLogic only.</i>
<i>ear-umfsample.ear</i>	Implements a non-directory enrollment model that customizes the edocs user management framework as an interface to enrollment information already stored in a separate repository. Requires a separate license.

To deploy a web application to your application server:

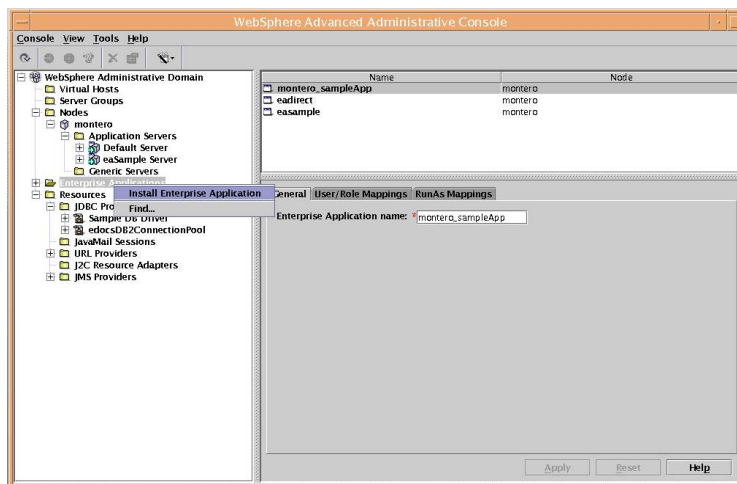
1. Change directory to *\$WAS_HOME/bin*, and invoke the WebSphere Administrative Console by running the script *adminclient.sh*. For example:

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```
# cd /usr/WebSphere/AppServer/bin
# ./adminclient.sh montero 1025 &
```

where **montero** is the application server name. This starts the administrative client on port 1025.

2. Expand the WebSphere Administrative Domain view.
3. Right-click the **Enterprise Applications** folder and select **Install Enterprise Applications** from the menu.

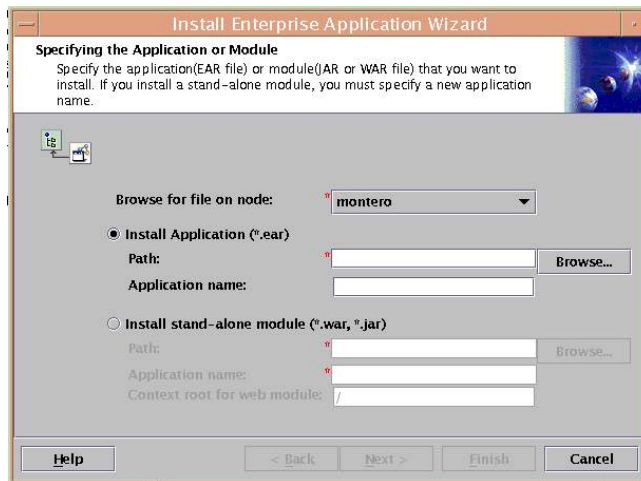


The Install Enterprise Application Wizard dialog appears.

4. Confirm that the correct node has been chosen in the Browse for file on node field.



5. Click **Install Application**, and click **Browse**.



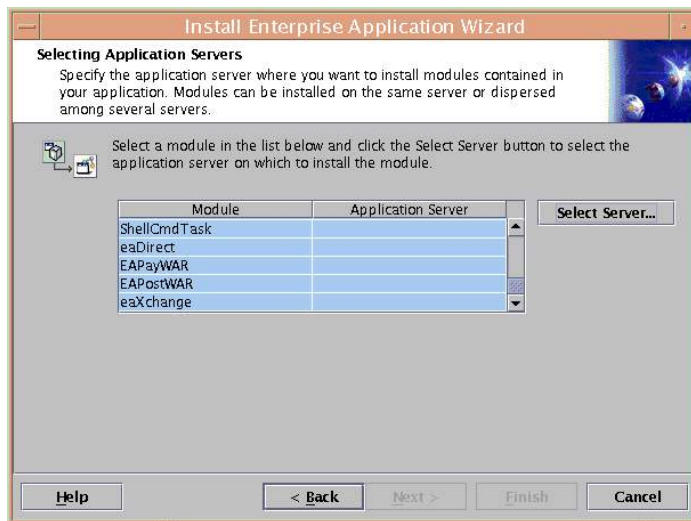
The **Open** dialog appears.

6. Deploy the EAR files one at a time that were assembled in the Application Assembly Tool by navigating to `$EDX_HOME/J2EEApps`, and selecting an assembled file. The example shows `Deployed_ear-eadirect.ear` selected for deployment.

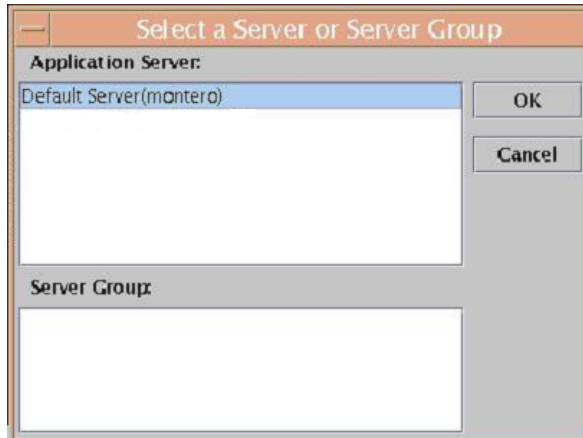
Setting Up an Application Server for eaDirect



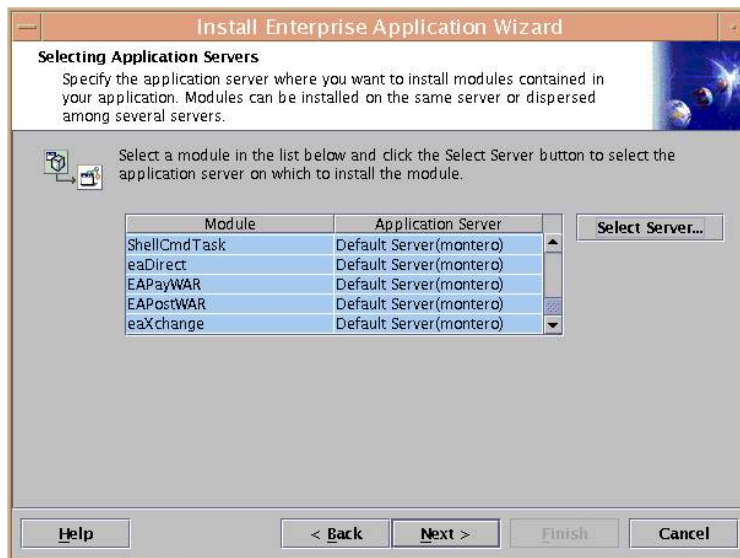
7. Click **Open**. The Install Enterprise Application Wizard dialog appears.
8. In the Install Enterprise Application Wizard dialog, click **Next** (about 7 to 9 times) until you come to the Selecting Application Servers screen. Highlight all the modules for selection by clicking the first and last module in the list, while holding down the **Shift** key.



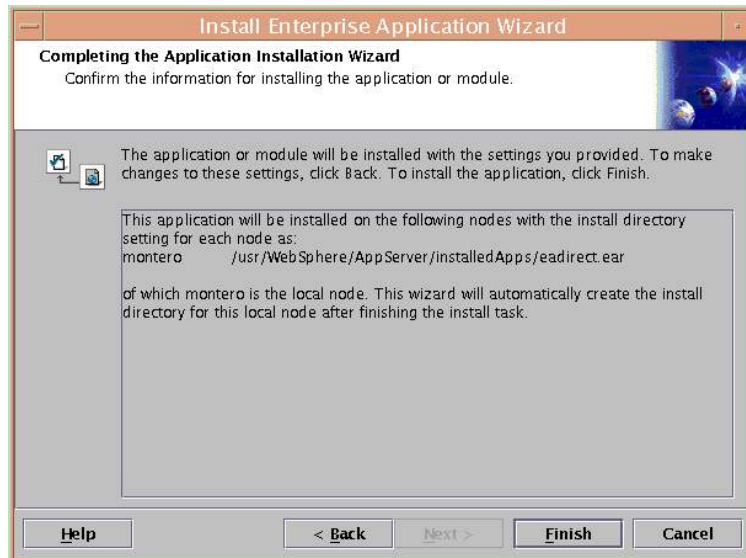
9. Click **Select Server**. The Select a Server or Server Group dialog appears.
10. Select the Default Server.



11. Click **OK** to close the **Select a Server or Server Group** dialog. The Install Enterprise Application Wizard dialog lists the modules and the server on which they will be installed.



12. Click **Next**. The installation of the modules takes place on the application server.



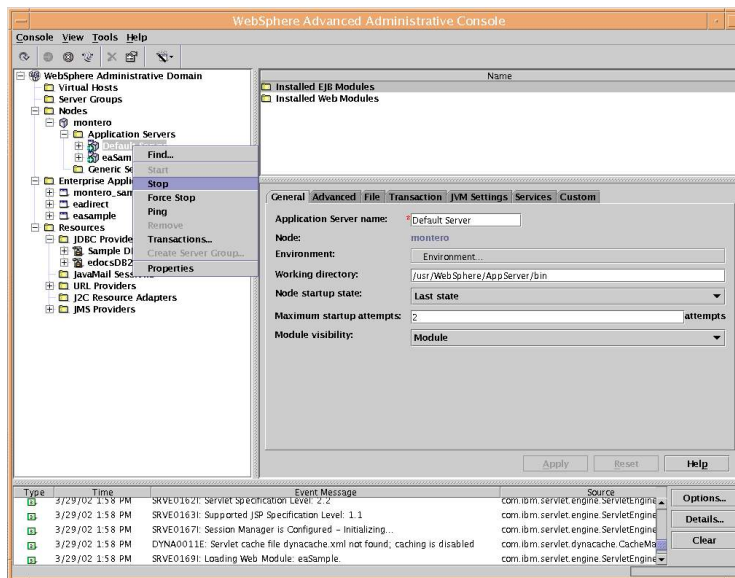
13. Click **Finish**.
14. When asked if you want to regenerate code, click **No**.



15. Click **OK** to close the Information dialog reporting that the installation was successful.



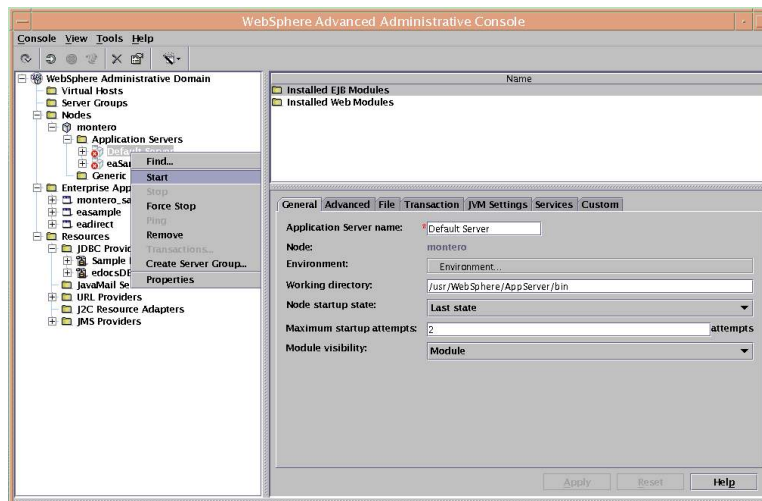
16. Stop the application server(s) that have the newly installed eaDirect J2EE applications by right-clicking the application server name in the left pane, and clicking **Stop** in the menu.



17. An Information dialog appears when the application server has stopped successfully.
18. Click **OK** to close the dialog.

If the administration console was running on this node, then the console will close when the application stops. If that happens, restart the administration console to continue eaDirect installation.

19. Start the application server(s) that have the newly installed eaDirect J2EE applications by right clicking the application server name, and clicking **Start** in the menu.



20. An Information dialog appears when the application server has stopped successfully.
21. Click **OK** to close the dialog.

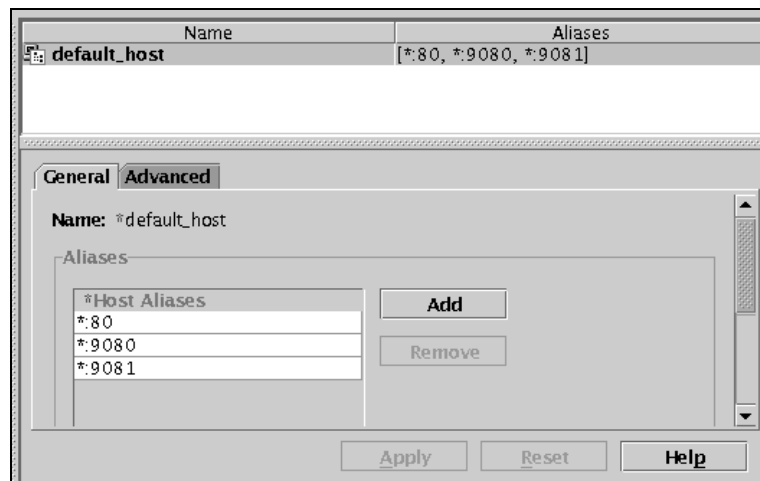
To regenerate Web Server Plug-in:

1. Expand the WebSphere Administrative Domain view.
2. Expand the Nodes folder and the application server's node name.
3. Right-click on the node name and click **Regen WebServer plugin**.
4. The Event Message window in the administration console will appear when the web server plug-in regeneration is complete.

Configuring a Virtual Host Alias for a New Application Server

To configure a virtual host alias for a new application server:

1. Expand the WebSphere Administrative Domain view.
2. Click the **Virtual Hosts** folder.
3. On the General tab, click **Add** to open a new line.
4. Enter the HTTP transport on which the new application server is listening.



The sample screen shows a virtual host alias being created for the HTTP transport, ***:*:9081**, which was specified for the new application server named eaDirect Server (note that transport port 9080 is for the default application server). Make sure you include the asterisk and colon when you enter the transport number.

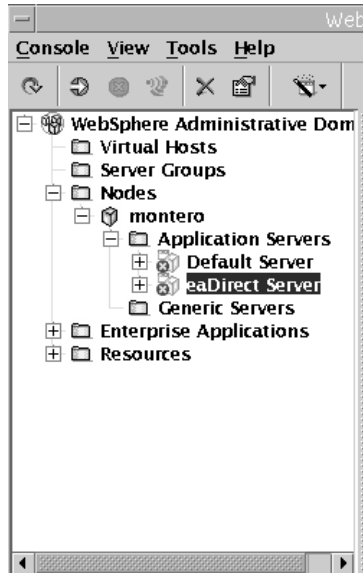
5. Click **Apply** for the changes to take effect.

Restarting the Applications and Servers

Stop and restart the applications and application servers, so that the previous changes will take affect.

To Stop or Start the eaDirect Server:

1. Select the eaDirect Server, on the tree under Nodes, then Application Servers.



2. Click the start or stop buttons located on the administrative toolbar.



3. Or, right click on the Application Server, and select Stop or Start.

Starting the eaDirect Scheduler

After all the eaDirect EAR files have been deployed to the application server, you must start the eaDirect Scheduler in order to schedule and run jobs in the eaDirect Command Center. If you attempt to run a new job with the Scheduler not running, the job will not run and you will see 'Not yet started' as its status.

To start the Scheduler:

1. Switch user to the application server owner, for example *nobody*.
2. Change directory to *\$EDX_HOME/bin*.
3. Run the Scheduler command for your application server, host, and port.
For example:

```
# ./ws_scheduler -start -url iiop://montero:1025
```

Tip

This example uses the default port for the administration server. You can specify another port number if necessary, but it must match the port for the admin server.

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

Logging into the Command Center

You can test the installation of eaDirect on your application server by logging in to the eaDirect 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 to invoke the Command Center, for example:

```
http://montero:9081/eaDirect
```

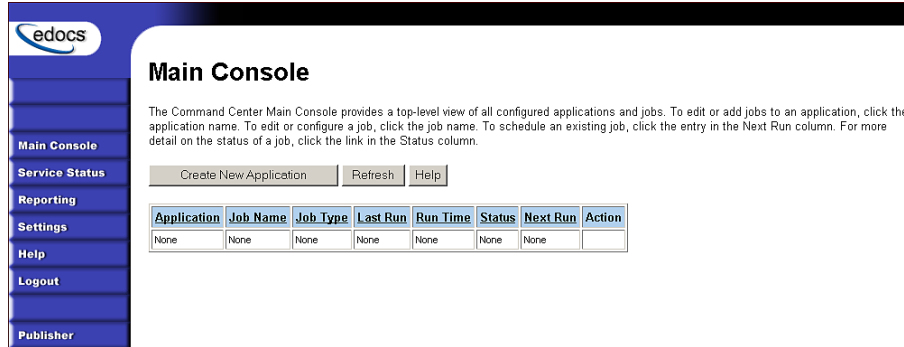
3. A successful connection to the Command Center displays the Login Administrator page.



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 until you have created an application and scheduled a job. For detailed information about creating eaDirect applications and jobs, see the *eaDirect Production Guide*.



In order to run jobs in the Command Center, the eaDirect Scheduler **must** be running.



Troubleshooting Tips

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.

Service Status

There is a database configuration problem.

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 the database configuration procedure in Chapter 3.
- Review your JDBC connections, as described earlier in this chapter.
- Confirm that the database server is running.

Then try logging in to the Command Center again.

Migrating to a New Version of eaDirect

4

Migrating eaDirect Databases

To migrate an existing eaDirect database to a newer version, you will use the database setup shell script *edx_admin.sh*. This script's main menu has a Database Version Migration option that allows you to select from available migration paths for your version and platform.

Preparing to Migrate an eaDirect Database

Before you run the database admin script *edx_admin.sh*, you should:

- Make a full backup of your current database.
- Start the database instance that accesses the database you are upgrading.
- Confirm that all login sessions using the eaDirect database user have logged out of the instance.
- Check the status of all user objects. If any of them indicate an INVALID status, contact the database administrator to correct this problem before migrating.
- Have the password for user SYS available. You will need it during the database migration process.

Migrating a Database



Caution

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

To migrate an eaDirect database to a newer version:

1. Switch to the database user, and change directory to the database directory of your eaDirect installation.
2. Run *edx_admin.sh*. The edocs eaDirect Server Administration Main Menu appears.
3. Select option 5, **Database Version Migration**. The Database Version Migration menu appears.
4. Select a database migration option. Typically, option 1 will migrate your database to the latest version.
5. You will be prompted to enter the admin ID for the database (default is **edx0**), and your eaDirect username and password (default is **edx_dba/edx**).
6. Indicate whether you have already done a full backup of your database (Y/N).
If you have not backed up your database, you are asked whether you want to continue the migration process (Y/N).
7. 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.
8. If **'yes'**, you are returned to the edocs eaDirect Server Administration Main Menu, where you can select **Q** (Quit) to end the database migration session.
9. If you choose to continue with the database migration, the admin script runs the migration script *db_version_migrate.sh* and asks you to enter your host, port, and Java home directory.

10. If this information is correct, the database migration will start. You will see the message:

```
This migration requires the creation of 6 new
tablespaces!>
Please enter valid paths and ensure at least 1Gig disk
space ...>
```

Database files can reside wherever you want them to. If you plan to use a single database server, you can specify a pathname to your database home directory, for example:

```
$DB2_HOME/edx_db2data
```

In a distributed environment (which can improve performance), you may want to define pathnames to different mount points as shown in this example:

Database Files	Suggested Mount Point
Detail extractor index data tablespace	/u06/edx_db2data
FS data tablespace	/u07/edx_db2data
FS index data tablespace	/u08/edx_db2data
Order capture data tablespace	/u09/edx_db2data
Order capture index tablespace	/u10/edx_db2data

11. At the end of the database migration process, you are prompted to check the session log file for errors.
12. Select Option **R** (Return to previous menu). The Database Version Migration screen appears.
13. Select Option **R** (Return to previous menu). The edocs eaDirect Server Administration Main Menu appears.
- Select Option **Q** (Quit).

Checking for Errors and Resetting Permissions

After you migrate a database from a previous release of eaDirect, you should:

- 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:

- *billdir_initial_db_data.log*
- *create_buffers.log*
- *create_tbspaces.log*
- *scan.log*
- *compile_sproc.log*
- *create_tables.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 is no 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.

Resetting Permissions After a Database Migration

After migrating your database, confirm that the owner and group of all the eaDirect directories **except** the */db* directory and its subdirectories is set to the application server owner, for example **nobody/nobody**.

The */db* directory and its subdirectories should have their owner and group set to the database owner, for example **dbinst1:db2iadm1**.

Migrating eaDirect Applications

When upgrading to a new version of eaDirect, you must migrate your J2EE and Web applications to accommodate the new version. The sample applications provided with each version of eaDirect provide examples of how to use the current features of eaDirect.

- See the *Release Notes* for your version for important information about specific migration requirements and settings.
- See *What's New in eaDirect* for information about new features, and information about how to add support for those features to your application.
- See *eaSDK: Customizing and Deploying Applications* for information about the components that make up the J2EE and Web applications, and the procedures for recreating EAR and WAR files.
- Merge your custom code into the sample application, and rename it. For more information, see *eaSDK: Customizing and Deploying Applications*.
- Redeploy your custom application.

Migrating To a Custom Data Source

You must specify a datasource EJB for each eaDirect application (DDN) you create in the Command Center. When creating an eaDirect application in the Command Center, a datasource refers to an EJB in your application (EAR file) that specifies summary information and location of your document data.

During database migration, the `edx_admin.sh` script maps DDNs to the default datasource `edx/ejb/EdocsDataSource`, packaged in `ear-eadirect.ear`. For more information about datasource mapping, see *What's New in eaDirect*.

To change the `DataSource` value to point to a custom `DataSource`, or to another `DataSource` in a different deployed application, you can edit and run the SQL script `update_data_source.sql` on the database server. This script is located in the `/migration` subdirectory of the database directory in your eaDirect installation.



Tip

You do not need to run this script if you are using the default datasource.

You will need to edit `update_data_source.sql` to replace the placeholder values for datasource name and document definition name (DDN) with your own values. Since each DDN may now have its own datasource, you can copy and paste the update sequence for each DDN. Save and close `update_data_source.sql` and run this SQL script to update your DDNs.



Caution

Consult the Release Notes for your version and platform to locate the correct version of `update_data_source.sql`.

Uninstalling eaDirect

5

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

Uninstalling the eaDirect Components

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

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 database.
2. Switch user to *root* and navigate to `$EDX_HOME/Uninstall`.
3. Run the eaDirect uninstall command:

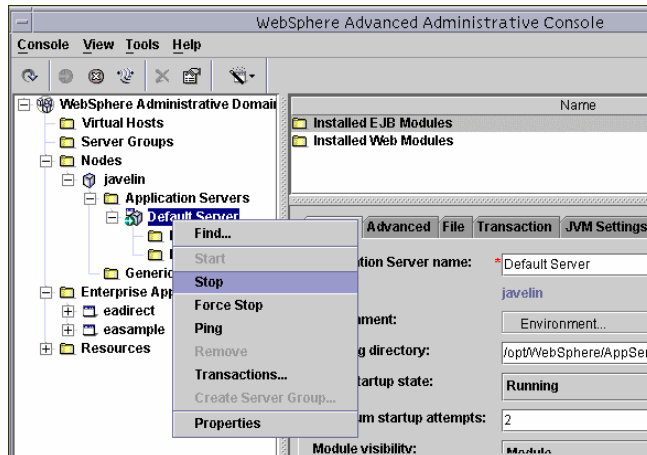
```
# ./Uninstall_eaDirect
```
4. Manually remove any files that were not removed by the InstallAnywhere tool.

To uninstall the eaDirect application server components:

1. As WebSphere owner (*nobody*, in our examples) user, navigate to $\$WAS_HOME/bin$ and invoke the WebSphere Administrative Console. For example:

```
# ./adminclient.sh montero 1025 &
```

2. When the WebSphere console appears, 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.

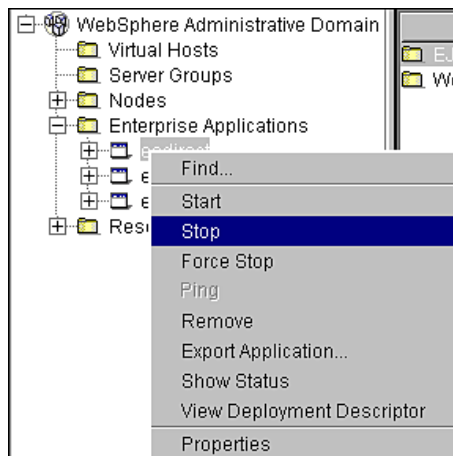
Undeploying eaDirect J2EE Applications

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

To undeploy eaDirect J2EE applications on WebSphere:

1. As the WebSphere owner (*nobody*, in our examples) 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 montero 1025 &
```
2. When the WebSphere Administrative Console appears, 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.



Uninstalling eaDirect

An information dialog appears:



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.

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, as 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 eaDirect. 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

The following steps describe how to use **eaSample** to view the sample eaDirect application called **NatlWireless**. NatlWireless is a set of example design and data files that demonstrate the features of an eaDirect presentment application.

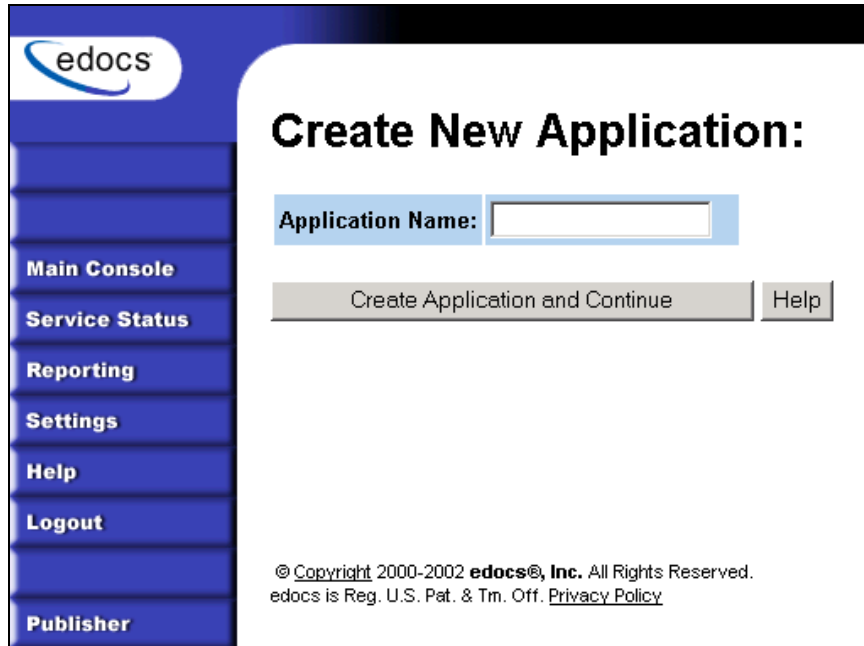
You must set up NatlWireless in the eaDirect Command Center (production environment), then enroll and log in to eaSample to view sample bills.

Setting Up NatlWireless

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 stylesheet 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 eaDirect application for NatlWireless:

1. Start your application server and the Scheduler, if not already running.
2. Open a web browser and enter the URL to the eaDirect Command Center, for example:
`http://montero:9080/eaDirect`
3. Create a new application for NatlWireless. Click **Create New Application** at the Main Console. The Create New Application screen appears.

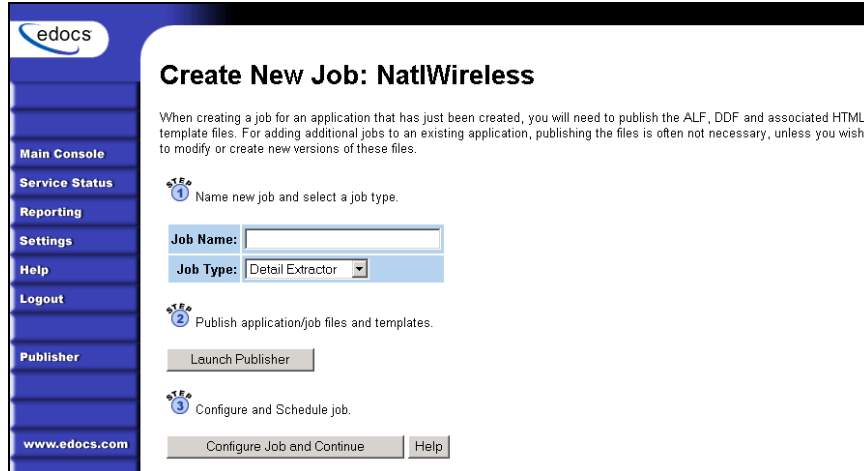


The screenshot shows a web interface for creating a new application. On the left is a blue navigation sidebar with the 'edocs' logo at the top and menu items: Main Console, Service Status, Reporting, Settings, Help, Logout, and Publisher. The main content area has a white background with the title 'Create New Application:'. Below the title is a text input field labeled 'Application Name:'. Underneath the input field are two buttons: 'Create Application and Continue' and 'Help'. At the bottom of the main area, there is a copyright notice: '© Copyright 2000-2002 edocs®, Inc. All Rights Reserved. edocs is Reg. U.S. Pat. & Tm. Off. [Privacy Policy](#)'.

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

To create and configure an Indexer job:

1. The Create New Job screen appears 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:

The screenshot shows the edocs application interface. On the left is a blue sidebar with navigation buttons: Browse, Create, Fetch, Delete, Help, and the website URL www.edocs.com. The main content area is titled 'Select a Version Set Type' and is divided into two sections: 'Dynamic Web Views' and 'Batch Jobs'. Each section contains a table with 'Job Type' and 'Number of Auxiliary Files' columns.

Job Type	Number of Auxiliary Files
HTML	0 1 2 3 more
CSV	0
XML	0
CHART	0
XSLT	0
XMLQuery	0

Job Type	Number of Auxiliary Files
Detail Extractor	0
Email Notification	0 1 2 3 more
HTML Output	0 1 2 3 more
Indexer	0
XML Output	0

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

The screenshot shows a web interface for 'edocs'. On the left is a vertical navigation menu with buttons for 'Browse', 'Create', 'Fetch', 'Delete', and 'Help'. The main content area is titled 'Create a version set for Indexer'. It contains a form with the following fields and controls:

- Application:** A dropdown menu with 'NatlWireless' selected.
- View Name:** A text input field containing 'Indexer'.
- DDF File:** A text input field followed by a 'Browse...' button.
- Below the DDF File field are three buttons: 'Submit', 'Clear', and 'Help'.

At the bottom of the form area, there is a copyright notice: '© Copyright 2000-2002 edocs®, Inc. All Rights Reserved. edocs is Reg. U.S. Pat. & Tm. Off. [Privacy Policy](#)'.

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.
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:

The screenshot shows the 'edocs' application interface. On the left is a vertical navigation menu with options: Main Console, Service Status, Reporting, Settings, Help, Logout, Publisher, and www.edocs.com. The main content area is titled 'Application: natlwireless Job: Indexer'. Below the title is a paragraph of instructions: 'From this screen, all parameters of the selected job can be modified. To edit parameters, change the entries in the desired fields and click the Submit Changes and Schedule button. To Reset the fields or for Help click the appropriate button at the top of the screen.' Below this are four buttons: 'Submit Changes and Schedule', 'Refresh', 'Reset', and 'Help'. The configuration is divided into four task sections:

- Task 1: Scanner**
 - Input File Path: c:\edocs\EDCSbd\input\natlwireless\
 - Input File Name: *.*
 - Output File Path: c:\edocs\EDCSbd\Data\natlwireless\
- Task 2: Indexer**
 - DDF Path: c:\edocs\EDCSbd\AppProfiles\natlwireless\DOC_CONFIG\Indexer\20021112163407\NatlWireless.ddf
 - Doc Date: ----Today's Date----
 - Index Field List: A list of fields (AmountDue, CallForward*, CallID*, CallWait*, CentState*) with arrows and a selection box containing 'StatementDate'.
- Task 3: IXLoader**
 - Skip Rows: 0
 - Split Size: 0
 - Optional Field Count: 0
 - Load Method: Direct
- Task 4: AutoIndexVolAccept**
 - Action on Index Volume: Auto Accept

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:

The screenshot shows the 'edocs' interface. On the left is a blue sidebar with navigation buttons: Browse, Create, Fetch, Delete, Help, and the website URL www.edocs.com. The main content area is titled 'Select a Version Set Type' and contains two sections:

Dynamic Web Views

Job Type	Number of Auxiliary Files
HTML	0 1 2 3 more
CSV	0
XML	0
CHART	0
XSLT	0
XMLQuery	0

Batch Jobs

Job Type	Number of Auxiliary Files
Detail Extractor	0
Email Notification	0 1 2 3 more
HTML Output	0 1 2 3 more
Indexer	0
XML Output	0

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

The screenshot shows the edocs web application interface. On the left is a blue navigation sidebar with buttons for Browse, Create, Fetch, Delete, and Help. The main content area is titled "Create a version set for HTML" and contains the following form fields and buttons:

- Application:** A drop-down menu with "Please select" as the current selection.
- View Type:** A text field containing "HTML".
- View Name:** An empty text input field.
- DDF File:** A text input field with a "Browse..." button to its right.
- ALF File :** A text input field with a "Browse..." button to its right.
- HTML Template:** A text input field with a "Browse..." button to its right.
- At the bottom of the form are three buttons: "Submit", "Clear", and "Help".

At the bottom of the page, there is a copyright notice: "© Copyright 2000-2002 edocs®, Inc. All Rights Reserved. edocs is Reg. U.S. Pat. & Tm. Off. Privacy Policy". The URL "www.edocs.com" is visible in the bottom left corner of the sidebar.

10. Select **NatlWireless** from the drop-down list of application names. Enter **HtmlDetail** for the view name. Browse to *\$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:

The screenshot shows the edocs web interface. On the left is a blue navigation sidebar with buttons for Browse, Create, Fetch, Delete, and Help, and the URL www.edocs.com at the bottom. The main content area is white and displays submission information under the heading 'Submission'. The details include: Application: NatlWireless, View Type: HTML, View Name: HTMLDetail, and Timestamp: Mon Apr 22 16:56:53 EDT 2002. Below this, it states 'This version set contains the following files:' and lists three files with their full paths: NatlWireless.alf, NatlWireless.ddf, and NatlWireless.htm. At the bottom of the main area is a copyright notice: © Copyright 2000-2002 edocs®, Inc. All Rights Reserved. edocs is Reg. U.S. Pat. & Tm. Off. Privacy Policy.

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 and configure a 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 JSPs 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 stylesheet. The default location for this file is *\$EDX_HOME/samples/NatlWireless/DetailExtractor*.
10. Click **Submit** and close the Publisher.
11. On the Create New Job screen in the Command Center, click **Configure Job and Continue**. eaDirect displays the Detail Extractor job configuration screen.

Application: natlwireless Job: DetailExtractor

From this screen, all parameters of the selected job can be modified. To edit parameters, change the entries in the desired fields and click the Submit Changes and Schedule button. To Reset the fields or for Help click the appropriate button at the top of the screen.

Submit Changes and Schedule Refresh Reset Help

Task 1: IVNScanner

Index Volume Status: Accepted

Scan Starting From (Number of Days): 7

Task 2: StatementsToIR

View Name: dtlextr

Enroll Model:

Output File Path: /opt/EDCSbd/Data/natlwireless/

Task 3: DXLoader

Load Method: Direct

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. (The DetailQuery view name is hard coded 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 (both 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	<i>dispute_sql.xml</i>
AnnotationQuery	<i>annot_sql.xml</i>

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

21. On the Main Console, 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**.

Viewing NatlWireless Statements in eaSample

When the Indexer job completes successfully (status changes to "Done"), you are ready to view your online statements in eaSample.

To use eaSample to view NatlWireless statements:

1. Open a Web browser and access eaSample, substituting your own server name (host) and port number:

`http://montero:9080/eaSample/User?app=UserMain&jsp=/user/jsp/HistoryList.jsp&ddn=NatlWireless`

The eaSample User Login page appears.

edocs® ONLINE ACCOUNT MANAGEMENT & BILLING

Enroll Now

User Login... Enter your username, password and click "Submit." If you do not have a username or password, [Enroll Now](#) to sign up for your electronic bill.

Username:

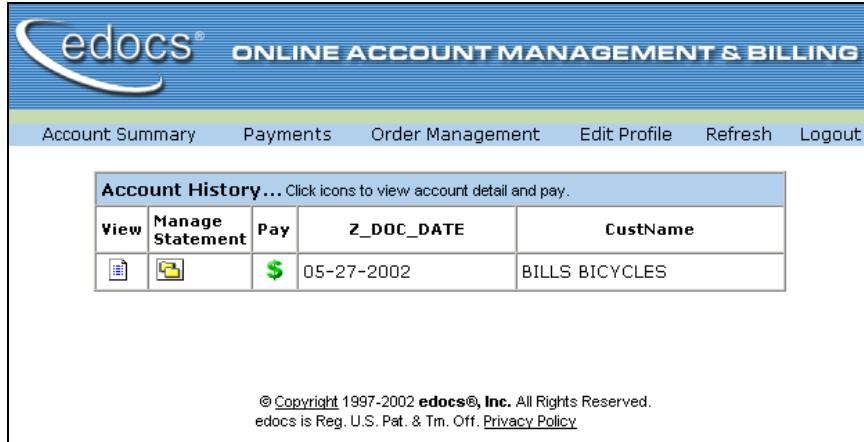
Password:


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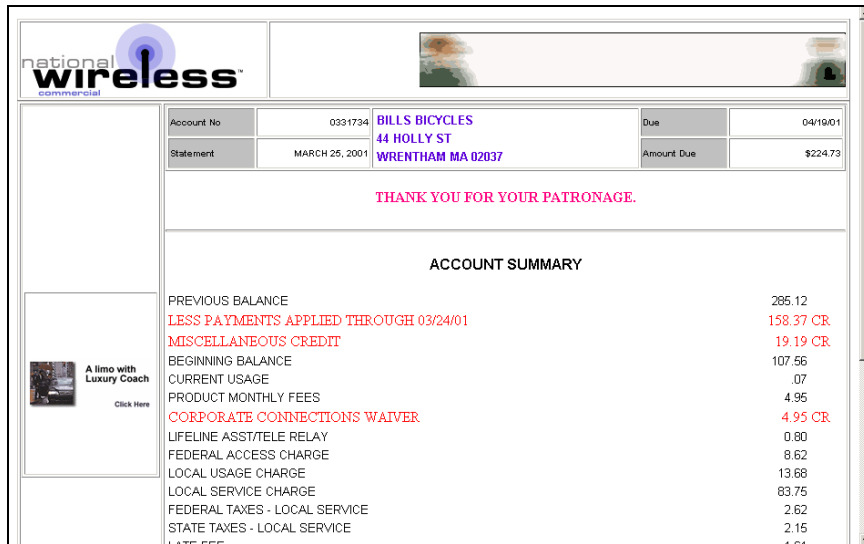
2. Click the **Enroll Now** link. The sample enrollment page appears.


The screenshot shows the edocs ONLINE ACCOUNT MANAGEMENT & BILLING interface. At the top, the edocs logo is on the left and the text "ONLINE ACCOUNT MANAGEMENT & BILLING" is on the right. Below this is a blue header bar. The main content area contains a form titled "Please enter the following to enroll:". The form has five rows, each with a label and a text input field: "Username:", "Password:", "Re-Type password:", "Email Address:", and "Account Number:". Below the form are two buttons: "Submit" and "Reset". At the bottom of the form area, there is a copyright notice: "© Copyright 1997-2002 edocs®, Inc. All Rights Reserved. edocs is Reg. U.S. Pat. & Tm. Off. Privacy Policy".

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:** 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.

edocs® ONLINE ACCOUNT MANAGEMENT & BILLING			
Account Summary Payments Order Management Edit Profile Refresh Logout			
Comments	Summary Info Description	Summary Info Amount	Dispute
	PREVIOUS BALANCE	285.12	
	LESS PAYMENTS APPLIED THROUGH 03/24/01	158.37	
	MISCELLANEOUS CREDIT	19.19	
	BEGINNING BALANCE	107.56	
	CURRENT USAGE	.07	
	PRODUCT MONTHLY FEES	4.95	
	CORPORATE CONNECTIONS WAIVER	4.95	
	LIFELINE ASST/TELE RELAY	0.80	
	FEDERAL ACCESS CHARGE	8.62	
	LOCAL USAGE CHARGE	13.68	
	LOCAL SERVICE CHARGE	83.75	
	FEDERAL TAXES - LOCAL SERVICE	2.62	
	STATE TAXES - LOCAL SERVICE	2.15	
	LATE FEE	1.61	

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

Add note:

Description: CURRENT USAGE

Category: Business

Comment:

- 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:	<input type="text"/>
Comments:	<input type="text"/>
<input type="button" value="Submit"/> <input type="button" value="Reset"/>	

Where to Go From Here

For more information about creating design files for publishing data with eaDirect, see the *eaDirect User's Guide*.

For more information about creating and configuring applications and jobs in the Command Center, see the *eaDirect Production Guide*.

For more information about developing a custom web application to work with eaDirect, see the *eaDirect Software Developers Kit (SDK)*.

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