PeerDirect Distributed Enterprise SDK Installation Guide

Version 6.1

Preface

This guide provides instructions on how to install the PeerDirect Distributed Enterprise SDK. It walks you step-by-step through each install phase and gives you information about what to do next.

Before you install, be sure to read the *PeerDirect Distributed Enterprise SDK Release Notes*. Release Notes provide important information about version 6.1 and describe the final software requirements, enhancements, and known limitations. Release Notes are located in the top-level directory of your installation CD-ROM.

After you install the software, you are required to perform additional steps to prepare your database for activation and replication. This information is described in the *Chapter 4, "Setting Up PeerDirect Replication"* and in the *PeerDirect Replication Engine Tutorial*.

The Tutorial does not cover deployment or advanced features, such as fragments and work sets. For more information about these topics, please see the *PeerDirect Replication Engine (PDRE) Developer's Guide and Reference.* Both the Tutorial and the Developer's Guide are available from your desktop Start menu (**Start > Program Files > PeerDirect > Documentation**).

Who's This Guide For

This guide is intended for any persons who are responsible for setting up and maintaining a PeerDirect replication network. This person may also be responsible for administering the network's software components, including PeerDirect replication servers and adapters, databases, and ODBC drivers. In this guide this role is referred to as the *PeerDirect administrator*.

A PeerDirect administrator should already be a certified database administrator for the databases they are replicating. The PeerDirect documentation is specific to PeerDirect products and offers only guidelines for integrating third-party vendor and Open Source databases as part of a PeerDirect replication network.

What's In This Guide

This guide contains the following chapters:

- Chapter 1, "Welcome to PeerDirect Distributed Enterprise SDK" — provides a general introduction to the installation process and describes options for configuring your replication network.

- Chapter 2, "Installing the PeerDirect Distributed Enterprise SDK" — describes the steps for installing the PeerDirect Distributed Enterprise SDK on the Red Hat Linux and Microsoft Windows platforms.

- Chapter 3, "Building a PeerDirect Deployment Kit" — describes steps for embedding application files and scripts in a PeerDirect Install Program for easy installation and setup.

- Chapter 4, "Setting Up PeerDirect Replication" — describes how to set up a PeerDirect Replication Network in a test or development environment using the PeerDirect SDK software.

Notation Conventions

This guide uses the following notation conventions.

- The notation **Menu > Choice** indicates that you should choose an item from a menu. For example, the notation **File > Exit** means: "Open the **File** menu and choose **Exit**."

- *Italics* indicate the title of a book or emphasizes the first usage of a term that will be referred to repeatedly in the guide.

- `Monospace text` indicates commands, functions, code examples, and names of files and directories. For example:

    ```
    C:\Program Files\PeerDirect\setup.exe
    ```

- *`Monospace italic text`* indicates that a term can be replaced by a literal value. Typically the term is enclosed in arrow brackets ($< >$) and used in example text, such as command lines or directory paths. The user is expected to replace the term with an appropriate value. For example:

    ```
    <drive>:\<install_dir>\setup.exe
    ```

    where *`<drive>`* can be replaced by the drive name "C" and *`<install_dir>`* can be replaced by the installation directory name "Program Files\PeerDirect".

How to View This Guide Online

Online versions of this guide are available in Adobe™ Acrobat™ (PDF) and HTML format on the PeerDirect Distributed Enterprise SDK CD-ROM. All PeerDirect product documentation is located in the `peerdirect\pdre\docs` directory.

Customer Support

If you encounter a technical problem and are covered by a PeerDirect Customer Support agreement, please email our support team at *support@peerdirect.com.*

The PeerDirect Customer Support team is dedicated to providing rapid, high quality response to customer problems. When contacting Customer Support, please provide the following information:

- Case number (if you are calling about a previous problem)

- Your name

- Your company name and location (city, state or province, and country)

- Contact information

- Product name and version

- Operating system

- Database type

- Detailed problem description that includes specific symptoms, observations and any troubleshooting steps you might have tried.

Please attach PDRE activity log file(s) when possible.

1

Welcome to PeerDirect Distributed Enterprise SDK

This chapter introduces you to the PeerDirect Distributed Enterprise SDK and consists of the following chapters:

- **Overview**

- **Product Licenses**

- **About the Install Program**

- **What's Next**

1.1   Overview

The PeerDirect Distributed Enterprise SDK provides a development environment for building and testing a PeerDirect Replication Network. The PeerDirect SDK software installs everything you need to install an InnerEdge or OuterEdge Server or Workstation.

The PeerDirect Replication Network is a configuration of InnerEdge and OuterEdge Servers. Typically, a replication network consists of an InnerEdge Server located at your central data center and several OuterEdge Servers set up in remote offices or at field sites. An application runs locally using data stored in local databases and therefore, is always available. In the background, the PeerDirect Replication Engine (PDRE) manages changes to your application by replicating and synchronizing data updates with other applications you've designated as active sites in the network.

The following figure shows a replication network that consists of two InnerEdge Servers (home office) connected over a TCP/IP network to several OuterEdge Servers set up in remote field or office locations.

Figure 1–1:   PeerDirect Replication Network
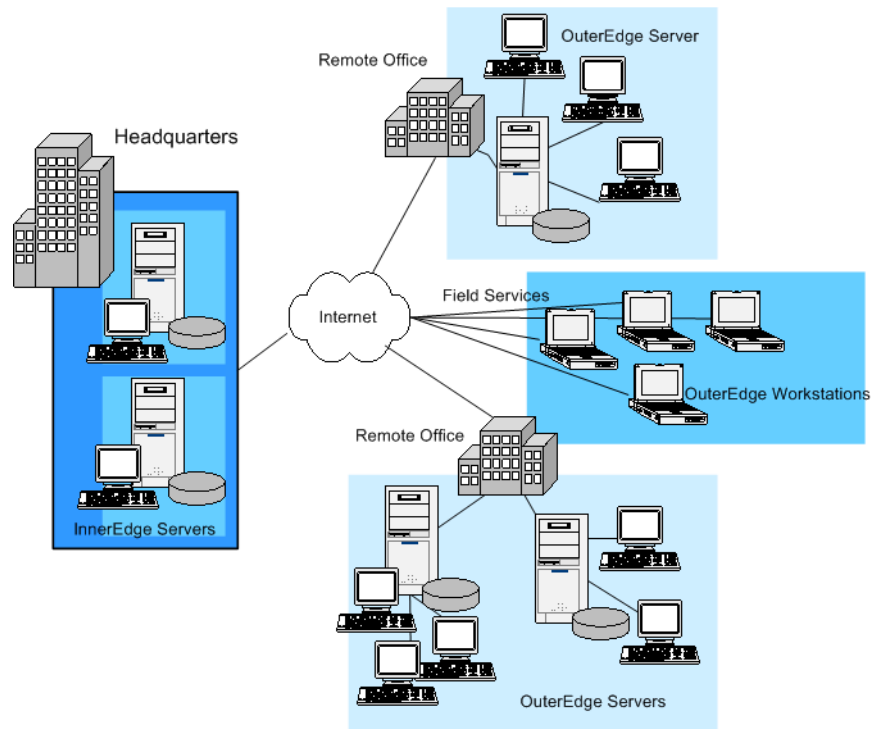
You can set up a PeerDirect Replication Network in several different ways, but for greatest benefit, we recommend you select one that matches the business requirements for distributing application data within your system. Each PeerDirect network manages the database for one or more applications (or unrelated database tables) that you wish to connect across your organization. There's no limit to the number of replication networks you can set up.

For more information about replication network layout options, please refer to the *PeerDirect Replication Engine Tutorial*. This tutorial is available on your installation CD-ROM in the `docs` directory.

For assistance in planning your PeerDirect replication network, please contact your PeerDirect account manager or send email to PeerDirect customer support at *support@peerdirect.com*.

1.1.1　　Installing a Replication Network

A PeerDirect Replication Network consists of at least two sites: one must be an InnerEdge Server, while the second may be either another InnerEdge Server or an OuterEdge Server or Workstation. Here are a few rules and recommendations to consider when setting up a PeerDirect Replication Network.

1: Always install an InnerEdge Server first, before you install the OuterEdge Servers.

The InnerEdge Server contains a highly-available complete database. To create a PeerDirect Replication Network, install the InnerEdge Server first and then install the additional InnerEdge or OuterEdge Servers for the same network.

The first InnerEdge Server performs the one-time initializations that are critical for each PeerDirect Replication Network and that enable the first InnerEdge Server to validate and accept subsequent sites into the same network.

2: Consider the availability properties of planned replication sites. Install InnerEdge Servers at high-availability sites and OuterEdge Servers at low-availability sites.

You would install an OuterEdge Server or Workstation on a remote site that you do not expect to be continually connected to the central home database. The OuterEdge Server or Workstation is typically configured for low-availability, which means that other sites on the network would attempt to connect and replicate with the high-availability InnerEdge Server.

The OuterEdge Server or Workstation is typically configured for low-availability. When you install an OuterEdge Server, the deployed site is not automatically configured. You must specify the site type as LOW during the activation of the site by using the -sitetype parameter on the dinst utility. See Chapter 4, "To prepare to activate the database on the OuterEdge Server."

In general, we recommend you install the OuterEdge Workstations on laptops or single-user systems and install OuterEdge Servers on multi-user systems.

3: Installation is only one of several steps.

After you've installed your PeerDirect software, there are several tasks you must perform in order to set up a PeerDirect Replication Network. These include

Creating Replication Rules — you open the PeerDirect Replication Designer (PRD), available as part of the PeerDirect SDK product, and create replication rules that you export to a file.

Activating Replication Sites — next you activate an InnerEdge Server, also known as the "first site". You then activate the remaining sites on either an InnerEdge Server or an OuterEdge Server or Workstation. During the activation phase, each site contacts the "first site" and starts its first replication cycle.

For detailed information about setting up replication, see chapter Chapter 4, "Setting Up PeerDirect Replication." Also refer to the *PeerDirect Replication Engine Tutorial*. This tutorial is installed in the peerdirect\pdre\docs directory.

1.1.2   Supported Databases

For information regarding each database supported by PeerDirect, please refer to the on-line reference guide available in the docs directory on your installation CD-ROM. For information about specific vendor databases, please refer to the vendor's documentation.

PeerDirect SDK version 6.1 supports the following databases:

- IBM DB2 Universal Database 6.1, 7.1, and 7.2

- IBM Informix 7.3 (Windows platforms only)

- Borland InterBase 5.6 and 6.0

- Microsoft SQL Server 7.0 SP2 and 2000

- Oracle 8.0.6, 8.1.5, 8.1.6, 8.1.7, and Oracle 9i

- Progress RDBMS 9.1D

- PostgreSQL 7.2

- Sybase Adaptive Server Anywhere 7

- Sybase Adaptive Server Enterprise 11.x using 11.1.1 EBF 7729 client

- Sybase SQLAnywhere 5.5.05

NOTE: There is no available Linux ODBC driver for Informix 7.3.

1.1.3 Supported ODBC Drivers and Replication Adapters

The following ODBC drivers and replication adapters have been certified for use with the SDK. Please contact PeerDirect at *support@peerdirect.com* if you have questions. A list of unsupported drivers is provided in the Release Notes.

Database	Supported Drivers and Adapters
IBM DB2 UDB 6.1	IBM DB2 ODBC DRIVER Version 6.01.00.00
IBM DB2 UDB 7.1	IBM DB2 ODBC DRIVER Version 7.01.00.00
IBM DB2 UDB 7.2	IBM DB2 ODBC DRIVER Version 7.02.00.00
IBM Informix 7.3.1	Peer Direct INFORMIX
Borland InterBase	InterBase InterSolv Driver (*.gdb) Version 3.11.01.00
Microsoft SQL Server 7.0 SP2	SQL Server Version 3.70.08.20
Microsoft SQL Server 2000	Peer Direct SQL Server
Oracle 8.0, 8i and 9i	Peer Direct Oracle, Peer Direct Oracle8
Progress RDBMS 9.1D	MERANT 3.60 32-BIT Progress SQL92 v9.1D, DataDirect 4.10 Progress9 **
PostgreSQL	Peer Direct PostgreSQL
Sybase Adaptive Server Anywhere 7	PeerDirect Sybase
Sybase Adaptive Server Enterprise 11.x	PeerDirect Sybase
Sybase SQLAnywhere 5.5.05	Sybase SQLAnywhere 5.0 Version 5.05.011333

** For Linux, please edit the location of the Progress ODBC driver file (pgpro915.so) if it differs from the default one. The file to edit is pdodbc located in the installation directory.

1.2 Product Licenses

There are two types of PeerDirect license files — PeerDirect Network License (PNL) and PeerDirect Developer License (PDL).

The PeerDirect Network License (PNL) allows you to activate a vendor-specific database and replicate data with other databases in a PeerDirect Replication Network. You must obtain database software separately and install it according to vendor instructions before you install your PeerDirect product.

The PeerDirect Developer License (PDL) lets you enable any database type for replication, but it does not let you deploy a replication network. The Developer License lets you define rules for a database, as for example a Progress database, but you would then need a Progress Replication Network License before you could activate the sites and deploy the replication network.

PeerDirect product licenses are distributed by PeerDirect Technical Support. If you need assistance, please contact them at *support@peerdirect.com*.

The following table lists PeerDirect products and the data management products they support:

Table 1–1:   PeerDirect SDK Products and Related Databases

PeerDirect Products	Related Database Product
PeerDirect Distributed Enterprise SDK for the InterBase Database	Borland InterBase 5.6 and 6.0
PeerDirect Distributed Enterprise SDK for the DB2 Database	IBM DB2 Universal Database 6.1, 7.1, and 7.2
PeerDirect Distributed Enterprise SDK for the Informix Database	IBM Informix Dynamic Server (IDS) 7.3 (only available on Windows platforms)
PeerDirect Distributed Enterprise SDK for the SQL Server Database	Microsoft SQL Server 7.0 SP2 and 2000
PeerDirect Distributed Enterprise SDK for the PostgreSQL Database	PostgreSQL7.2
PeerDirect Distributed Enterprise SDK for the Oracle Database	Oracle 8.0.6 Oracle 8i (8.15, 8.16, and 8.17) Oracle 9i
PeerDirect Distributed Enterprise SDK for the Progress Database	Progress RDBMS 9.1D

Table 1–1:   PeerDirect SDK Products and Related Databases

PeerDirect Products	Related Database Product
PeerDirect Distributed Enterprise SDK for the Sybase ASA Database	Sybase Adaptive Server Anywhere 7 Sybase SQLAnywhere 5.5.05 *(only available on Windows platforms)*
PeerDirect Distributed Enterprise SDK for the Sybase ASE Database	Sybase Adaptive Server Enterprise 11.x

1.3   About the Install Program

The PeerDirect Distributed Enterprise SDK install program uses the PeerDirect install program, a Web-based installation program with a built-in "create your own" custom application installer tool.

When you install the PeerDirect SDK, you can choose to 1) install all components, 2) select any subset of components, or 3) create an install kit of custom-selected components (see "Installation Options"). This last feature, called "Create Deployment Kit", gives you the ability to embed your applications within a PeerDirect install program for easy deployment to replication sites.

The PeerDirect SDK components include everything you need to set up a software development environment for developing a replication system for critical business applications. The SDK components are listed in "Installation Components" below. The PeerDirect install program installs the appropriate components into an installation directory that you specify, and creates shortcuts on your desktop for easy access.

For instructions about how to install the PeerDirect Distributed Enterprise SDK, see Chapter 2, "Installing the PeerDirect Distributed Enterprise SDK."

1.3.1   Installation Components

PeerDirect is a software system for replicating and synchronizing data stored in databases. It supports asynchronous, bidirectional database replication across TCP/IP networks, including the Internet, and replicates structured data between both homogeneous and heterogeneous database types.

NOTE: PDA is available for the Windows platform only. If you are installing on Linux, you'll need to install the PeerDirect InnerEdge Server or OuterEdge Server Client Access edition on a Windows machine and use the dinstc utility to establish the connection from the Windows machine to the PDRE running on the Linux machine.

This allows the PeerDirect Administrator console to connect to PDRE on a Linux machine and administer the specified database in the network. The dinstc utility is available for both Linux and Windows platforms.

Each SDK installs the following PeerDirect software components:

Component	Description
PeerDirect Replication Engine (PDRE)	(optional) core replication component. PDRE detects changes made to application databases since the last replication session and propagates these changes to other replication-enabled sites on a network. It performs all replication tasks including database updates, inserts, and deletions.
PeerDirect Replication Designer (PRD) *(Windows only; not installed on Linux)*	(optional) GUI interface for defining replication sites and rules; installs on Windows platforms only. Select the Client Access Edition to install this component.
PeerDirect Replication Engine Administrator (PDA), also called PDRE Admin *(Windows only; not installed on Linux)*	(optional) administers replication scheduler and subscribes work set slices; installs on Windows platforms only.
PDRE "Replicate Now" Add-on	application-embedded task dialog box that lets end users initiate data replication by clicking a single button.
Database ODBC Drivers and Replication Adapters	installs all PeerDirect ODBC drivers and replication adapters for all database types.
PeerDirect Documentation	(optional) installs these technical documents: • *PeerDirect Tutorial Guide* • *PeerDirect Developer's Guide and Reference* (not available on Linux)

1.3.2　　Installation Options

The PeerDirect SDK installation program gives you three installation options:

- **Quick Installation** — installs all components and their default settings to an installation directory that you specify. On Linux, you also specify a user name that will own the PDRE daemon.

- **Custom Installation** — installs only those components you select. For certain components, you may also select server ports, server start-up preferences, and other settings.

- **Create Deployment Kit** — installs or creates an installation deployment kit based on the components you select. You can also add new components, such as application files, and specify scripts to run as part of the installation process. For more information about using the "Create Deployment Kit" option, see Chapter 3, "About the Create Deployment Kit Option."

1.4　What's Next

For information about how to install the SDK, see Chapter 2, "Installing the PeerDirect Distributed Enterprise SDK." For more information about setting up your replication network, refer to the *PeerDirect Replication Engine Tutorial Guide* and to Chapter 4, "Setting Up PeerDirect Replication" in this guide.

2

Installing the PeerDirect Distributed Enterprise SDK

This chapter describes how to install the PeerDirect Distributed Enterprise Software Development Kit (SDK). It includes the following sections:

- Planning Your Install

- Before You Install

- System Requirements

- Installing the PeerDirect Distributed Enterprise SDK

- Performing a Remote Installation of the SDK

- Updating an SDK Installation

- Uninstalling the SDK

- What's Next

2.1   Planning Your Install

Deploying a PeerDirect Replication Network requires that you perform multiple installations of InnerEdge and OuterEdge Servers that run the PeerDirect Replication Engine. This is required whether you are installing a two-server failover system, a development or test environment, or a large network of application servers.

Because a PeerDirect Replication Network is made up of individual replication nodes that have different requirements based on their position in the network (see Chapter 1, "Installing a Replication Network"), the first step to planning your installation is to identify the replication requirements for the machine you are installing. If you are uncertain about which PeerDirect replication product you need to install, please consult with your PeerDirect account manager.

The installation instructions in this guide describe how to install the PeerDirect software development kit (SDK) on a development or test server. For information about planning your replication network layout, please refer to the *PeerDirect Replication Engine Tutorial*.

2.2   Before You Install

Before you begin, PeerDirect recommends you do the following:

1. Verify that you've received the correct PeerDirect software license from PeerDirect Technical Support. The PeerDirect software development kit (SDK) license allows you to install InnerEdge and OuterEdge servers or workstations, connected to any PeerDirect-supported database, for purposes of software development and testing.

2. Review the system requirements in "System Requirements" below and verify that the machine you plan to install PeerDirect software on meets these requirements.

3. Read the Release Notes for the PeerDirect SDK for any last-minute information that may be important to you. You'll find release notes located in the top-level directory of the PeerDirect SDK installation CD-ROM.

4. Verify that your system hardware and software meet the requirements for the type of PeerDirect Replication Network you have planned. You'll find the requirements for PeerDirect replication servers and workstations in the PeerDirect Release Notes.

5. If you are planning to replicate an existing database, we strongly recommend you back up your database before you begin the SDK installation process.

6. On *Linux*, if you want more than one person to be able to run the PDRE daemon, specify a user name or account to own it and place that user in a group to which you can add other users.

7.   On *Linux*, you must install as root user. On *Windows*, you must have administrator privileges to install

You install the PeerDirect SDK from the *PeerDirect Distributed Enterprise SDK* CD-ROM (see "To start the install program" below). If you have any questions about your PeerDirect software or license, please contact Technical Support at *support@peerdirect.com*.

2.3   System Requirements

The PeerDirect Distributed Enterprise SDK version 6.1 runs on the following system platforms:

Operating Systems	Version	Requirements
Red Hat® Linux	Red Hat 7.2	*Hardware:* Pentium-based (or higher) computer running Red Hat Linux. *Memory:* Minimum of 64 MB; recommend 128 MB.** *Disk Space:* Minimum of 100 MB hard disk space.
Microsoft® Windows	• Windows 2000 • Windows NT Server (v4.0 with Service Pack 6 or higher) • Windows NT Workstation (v4.0 with Service Pack 6 or higher)	*Hardware*: Pentium-based (or higher) computer running any Windows NT-based (Win32) operating system. Memory: Minimum of 64 MB; recommend 128 MB.** *Disk Space:* Minimum of 100 MB hard disk space.

** Minimum physical memory should be at least two times the size of the largest individual record to be replicated. For example, if your database has a single record containing 50 MB of data, then a minimum of 100 MB RAM memory is required to avoid performance degradation.

2.4   Installing the PeerDirect Distributed Enterprise SDK

This section describes how to install the PeerDirect SDK version 6.1.

2.4.1   PeerDirect Installation Options

The PeerDirect installation program gives you three ways to install PeerDirect software.

Quick Installation

Select the Quick Installation method for an easy installation of all components in the installation kit. This option lets you select the installation directory and configures the installation using default settings.

On *Linux*, the Quick Installation program asks for the name of a user who will own the PDRE daemon after the installation. If you select Quick Installation, they will all run under one user.

NOTES: If you want the daemons to run under separate users, select the Custom Installation method and specify user names for each component.

Custom Installation

The Custom Installation method lets you select which software components to install. Select this option if you want to change default settings or select only a subset of components for installation. This option allows you to iteratively change the configuration of your installed components and to remove components you no longer want installed without uninstalling your entire PeerDirect installation.

Create Deployment Kit

The Create Deployment Kit option lets you select PeerDirect software and other application components to install to a kit installation area. You must first create the installation area for the kit before you create the actual deployment kit. After you create the kit, you can copy it to a CD-ROM and distribute it, or you can place it on your Web site for downloading by end users.

The Create Deployment Kit option is intended for developers who wish to build a customized PeerDirect installation for distributing applications. The installation kit can be built to include PDRE so that when it is deployed, it installs all components required to set up a PeerDirect Replication Network.

To install and create a deployment kit, please read the instructions in Chapter 3, "Building a PeerDirect Deployment Kit."

2.4.2 SDK Installation Steps

Follow these instructions if you are installing the PeerDirect SDK for the first time. If you are performing a follow-up installation or update to your current installation, see "Updating an SDK Installation" below.

To start the install program

1 ♦ Follow instructions below for your platform:

- *Linux* — Log on as a root user. Load and mount the SDK installation CD-ROM.

  NOTE: The install program should start. If the install program does not start, open the CD-ROM directory and run `./setup`.

- *Windows* — Log on to a Windows server or client machine. Insert the SDK installation CD into your CD-ROM drive.

  NOTE: The install program should start automatically. If your Windows auto-run setting is turned off, choose **Start > Run**, browse to the CD-ROM drive, select the `setup.exe` file, and click **OK**. To start the install program from a command-line prompt, change to your installation directory and type `setup.exe -browser=ie`.

2 ♦ The **Welcome to PeerDirect Software Installation** screen displays. Click **START INSTALLATION**.

3 ♦ In the **Specify the installation location** field, enter the full directory path for the installation directory. The install program will install the PeerDirect SDK software in this directory. Accept the default, type a new path, or click **Browse** to specify an existing directory on your system. The default installation directory paths are on *Linux* `/usr/local/peerdirect`, and on *Windows* `C:\Program Files\PeerDirect.`
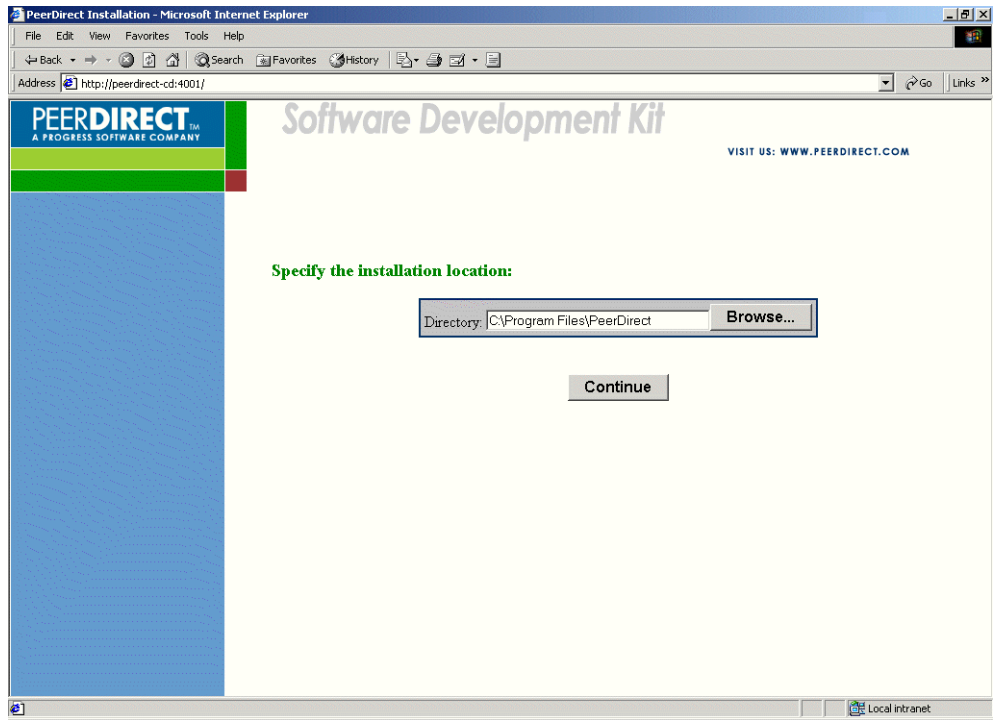
4 ♦ Click **Continue**.

5 ♦ Read the PeerDirect license agreement carefully.

- If you agree to the license, scroll to the bottom of the page and click **ACCEPT** to launch the install program. Proceed to Step 4.

- If you do not agree to the license, scroll to the bottom of the page and click **DECLINE** to exit.
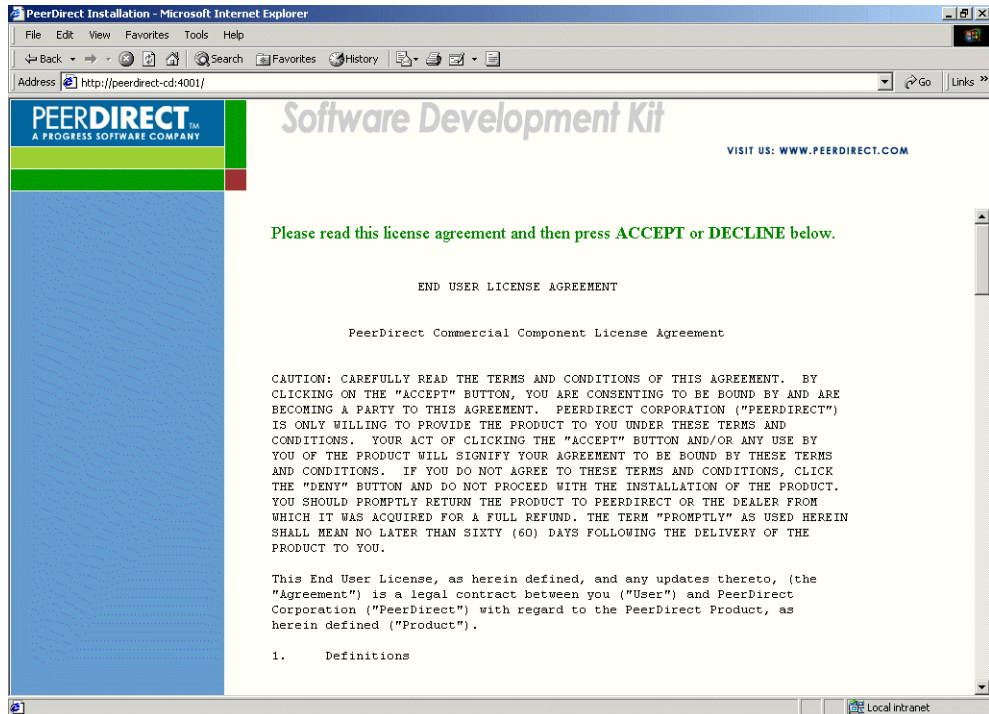
6 ♦ Select one of the following installation methods:

- **Quick Installation** — installs all PDRE components using the Runtime edition default settings.

- **Custom Installation** — lets you select which components you want to install and allows you to change component settings.

- **Create Deployment Kit** — installs and creates an installation deployment kit based on the components you select.
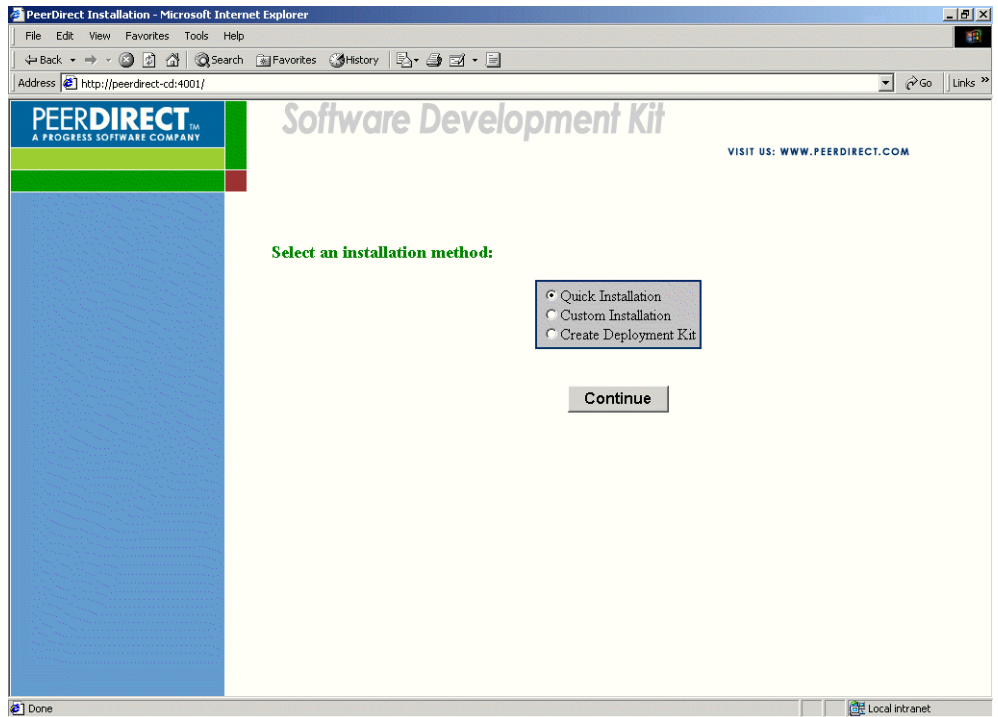
7 ♦ If you selected **Quick Installation**, click **Continue.**

8 ♦ Verify the components that will be installed. and do the following:

a) In the **Specify the PDRE Development File location** field, enter the full directory path where the PeerDirect Developer License (PDL) file is stored on your system. This file is e-mailed to you by PeerDirect Technical Support when you purchase your software.You can type the path or click **Browse** to find the file.

b) On *Linux,* in the **Specify the component account** field, enter a user name. The user name or account you specify will be able to run all daemons for installed components after the installation completes. Check **Create New User** if you want the user name or account created and added to your system.

c) Click **Install** and go to Step 13.
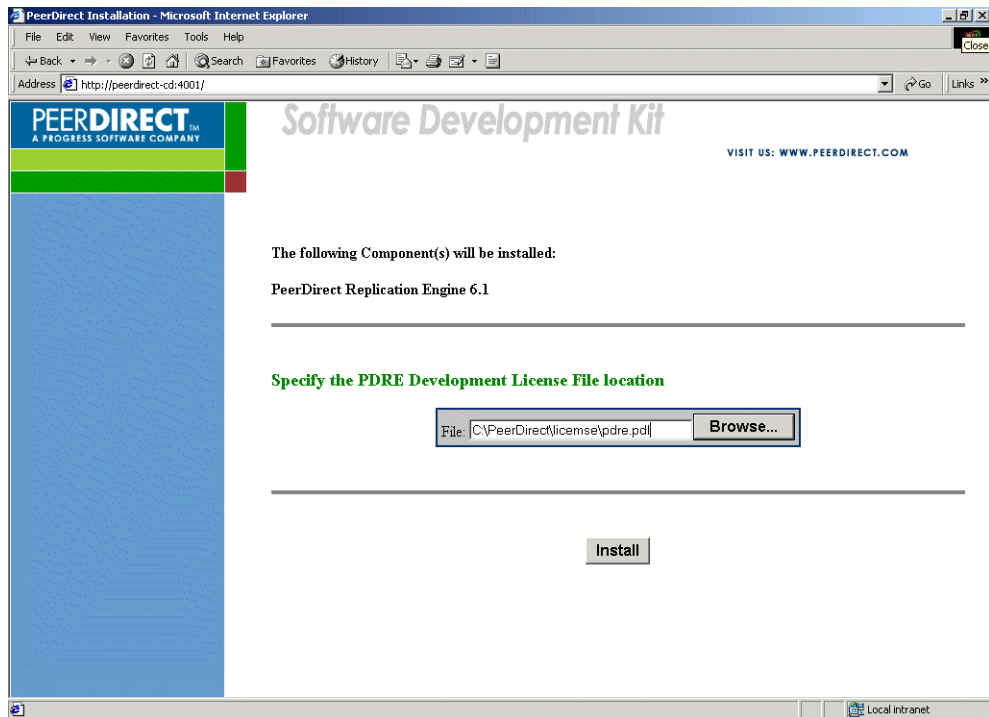
9 ♦ If you selected **Custom Installation**, click **Continue**.

10 ♦ The **Configure the following Components** screen displays.

a) Review the list of PeerDirect components available. Specify which components you want installed by checking **Install** (default) below each component name. If you do *not* want a component installed, uncheck the **Install** checkbox.

NOTE: If you have previously installed components, the install program recognizes the previous installations and gives you the option to update them**.** See "To update an SDK installation" in this chapter.
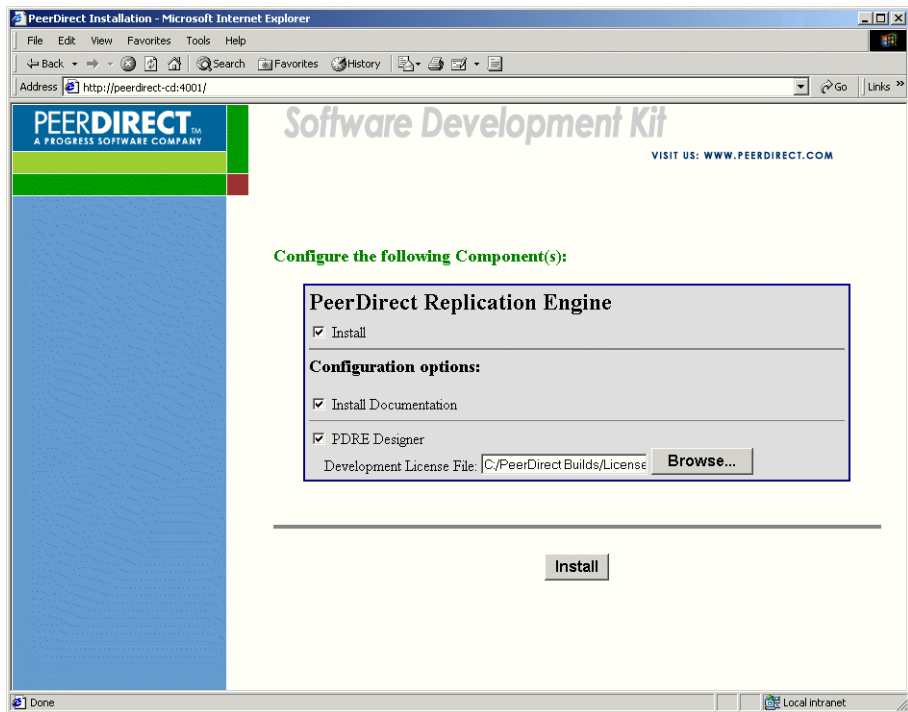
b) Check (default) **Install Documentation** to install the *PeerDirect Replication Engine Tutorial* (available on Windows and Linux) and the online *PDRE Developer's Guide and Reference* (available on Windows only) in the peerdirect\pdre\docs directory on your system. You can then access PDRE documentation from the Start menu on your desktop (**Start > Programs > PeerDirect > Documentation**).

c)   Check (default) **PDRE Designer** if you want to install this component. The PeerDirect Replication Designer (PRD) is needed to create a rules (RUL) file and to define other configuration settings in preparation for deploying a PeerDirect Replication Network.

d)   In the **Development License File** field, enter the full directory path where the Developer License (PDL) file is stored on your system. This file is e-mailed to you by PeerDirect Technical Support when you purchase your software.You can type the path or click **Browse** to find the file.

e)   On *Linux*, in the **Specify the component account** field, enter a user name. This user name will be able to tun the PeerDirect Replication Engine daemon. If the name you specify does not exist, check **Create New User** to automatically create and add it to your system.

> **NOTE:** On *Linux*, the user name is the individual who will be responsible for the PeerDirect Replication Engine (PDRE) daemon. If you want multiple persons to be able to run the PDRE component daemon, specify a user name to own it and attach the user to a group. You can then attach other users who need to run the daemon to the same group.

> **NOTE:** On *Windows*, PDRE is installed as a Windows Service by default.

11 ♦ After you select your components, click **Install**. Go to Step 13.

12 ♦ If you selected **Create Deployment Kit**, see instructions in Chapter 3, "Building a PeerDirect Deployment Kit."

13 ♦ The install program lists each component as it installs and shows you the progress of the installation.
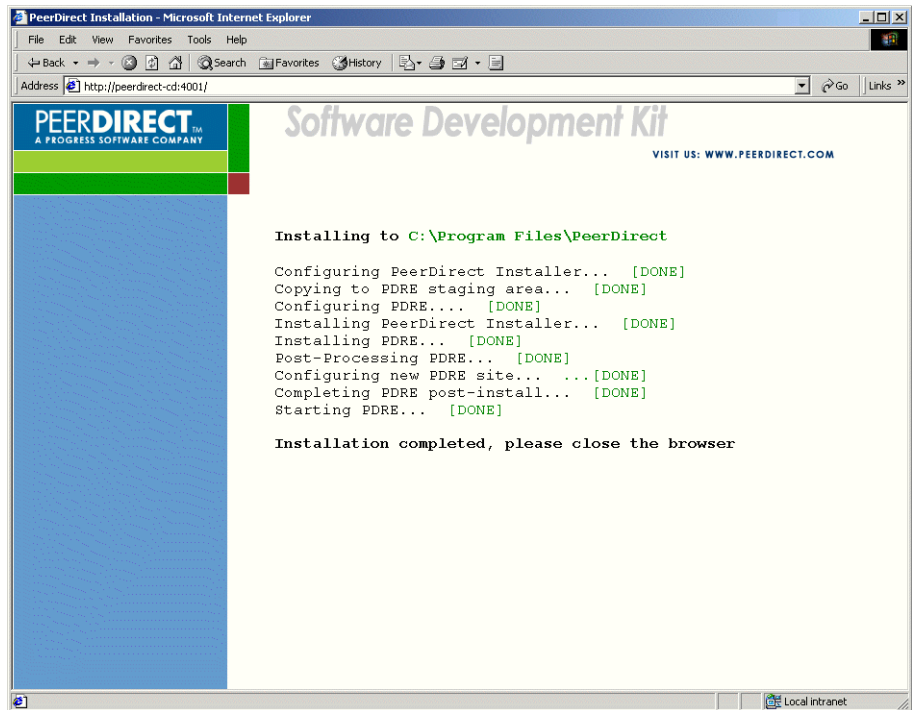
14 ♦ When the installation completes, close your browser window.

2.5   Performing a Remote Installation of the SDK

You can install the PeerDirect SDK from a remote machine by logging onto the computer where you want to install the SDK, starting the setup script, and controlling the remote installation process from a local browser. The PeerDirect install program lets you run an installation from a Web browser on any Linux, Solaris, Windows, or MacIntosh system.

To perform a remote install to a Linux system

1 ♦ Mount the PeerDirect SDK installation CD-ROM on the target server where you want to install the SDK software.

2 ♦ Open a command-line shell (for example, telnet, rlogin, ssh2, characters console) on the machine from which you want to perform the installation.

3 ♦ Log on as a root user.

4 ♦ Change to the `/mnt/cdrom` directory on the target server and launch the `./setup` script.

5 ♦ You are prompted to open a browser with the following URL:

```
http://<target_machine>:4001
```

NOTE: If port 4001 is in use on the target machine, use a different port.

6 ♦ Follow instructions for installing the PeerDirect SDK in "Installing the PeerDirect Distributed Enterprise SDK,"

7 ♦ When the install program completes, press **Ctrl/C** to exit the setup script.

2.6   Updating an SDK Installation

With the ability to embed multiple components into a PeerDirect install program, you may find the need to update your PeerDirect SDK installation. The update process is flexible and lets you choose which components you want to update, remove or ignore. To update your SDK installation, run the version 6.1 install program and specify the location of your existing SDK install directory. The SDK install program recognizes the PeerDirect components you have installed and will upgrade your server using the new components you select.

There are three options for each installable component:

- **Update** — (default) reinstalls a current version or a new version.

- **Remove** — deletes the software component from the installation area.

- **Ignore** — does not install or upgrade the software component.

NOTE: When upgrading from PeerDirect version 6.0 to 6.1, the install program removes the 6.0 installation in `C:\Program Files\PeerDirect` and installs version 6.1.

The SDK install program will update only those components where you select the "Update" radio button.

Please be sure to read the Release Notes before you perform an upgrade.

To update an SDK installation

1 ♦ Follow instructions below for your platform:

- *Linux* — Log on as a root user. Load and mount the SDK installation CD-ROM.

  NOTE: The install program should start. If the install program does not start, open the CD-ROM directory and run `./setup`.

- *Windows* — Log on to a Windows server or client machine. Insert the SDK installation CD into your CD-ROM drive.

  NOTE: The install program should start automatically. If your Windows auto-run setting is turned off, choose **Start > Run**, browse to the CD-ROM drive, select the `setup.exe` file, and click **OK**. To start the install program from a command-line prompt, change to your installation directory and type `setup.exe -browser=ie`.

2 ♦ The **Welcome to PeerDirect Software Installation** screen displays. Click **START INSTALLATION**.

3 ◆ In the **Specify the installation location** field, enter the full directory path for the installation directory. The install program looks in this directory for previously installed PeerDirect software and installs updates into the same directory. You can accept the default, type a new path, or click **Browse** to specify an existing directory on your system.
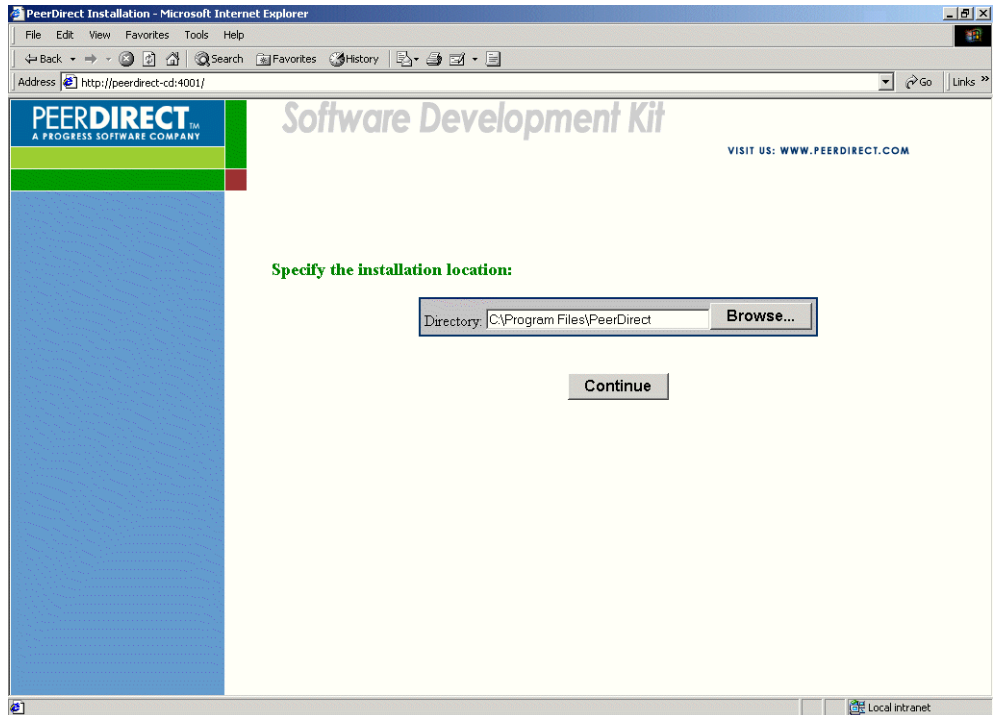
The default installation directory paths are

Platform	Run As...	Destination
Red Hat Linux	ROOT	`/usr/local/peerdirect`
Microsoft Windows	ADMIN PRIVS	C:\Program Files\PeerDirect

4 ♦ The install program recognizes the components you have installed and lets you change your installation.

    a)   Review the list of PeerDirect components that are available to update.
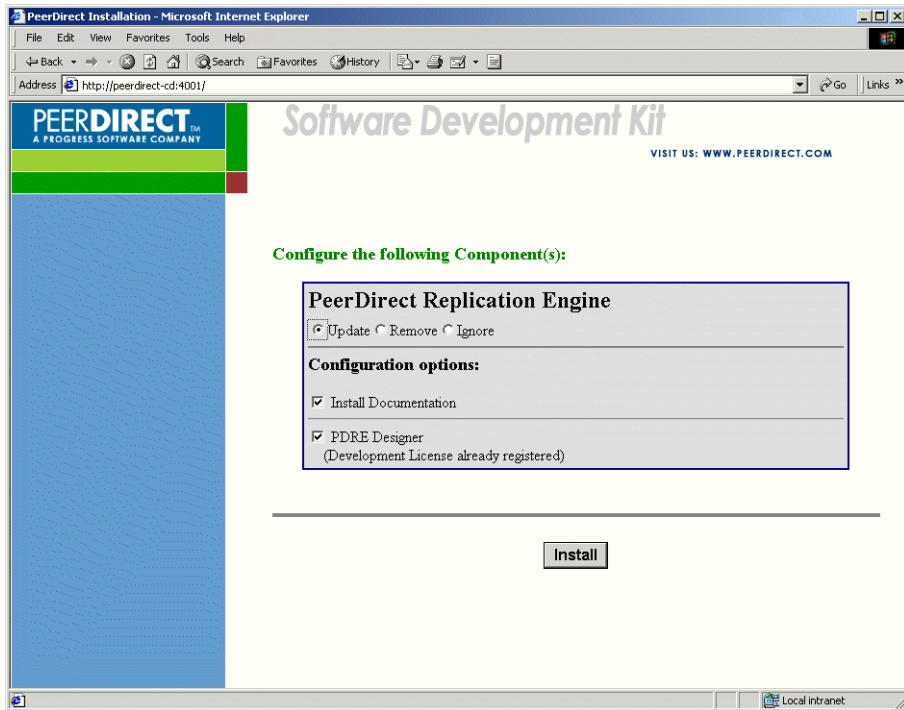
    b)   To update the PeerDirect Replication Engine (PDRE), click the **Update** radio button. If you do not want to update PDRE at this time, click **Ignore** (default).

    c)   Check which PDRE components you want installed or updated with PDRE.

    d)   Check the **Install Documentation** (default) checkbox to install or update the *PeerDirect Replication Engine Tutorial* and online *Developer's Guide and Reference* (available on Windows only) in the `peerdirect\pdre\docs` directory on your system. You can then access PeerDirect documentation from the Start menu on your desktop (**Start > Programs > PeerDirect > Documentation**).

    e)   Check **PDRE Designer** (default) to install the PeerDirect Replication Designer (PRD). This component is needed to deploy a PeerDirect Replication Network.

f) On *Linux*, in the **Specify the component account** field, enter a user name. This user name will be able to run the PeerDirect Replication Engine daemon. If the name you specify does not exist, check **Create New User** to automatically create and add it to your system.

5 ♦ Click **Install**.

6 ♦ The install program lists each component as it installs and shows you the progress of the installation.
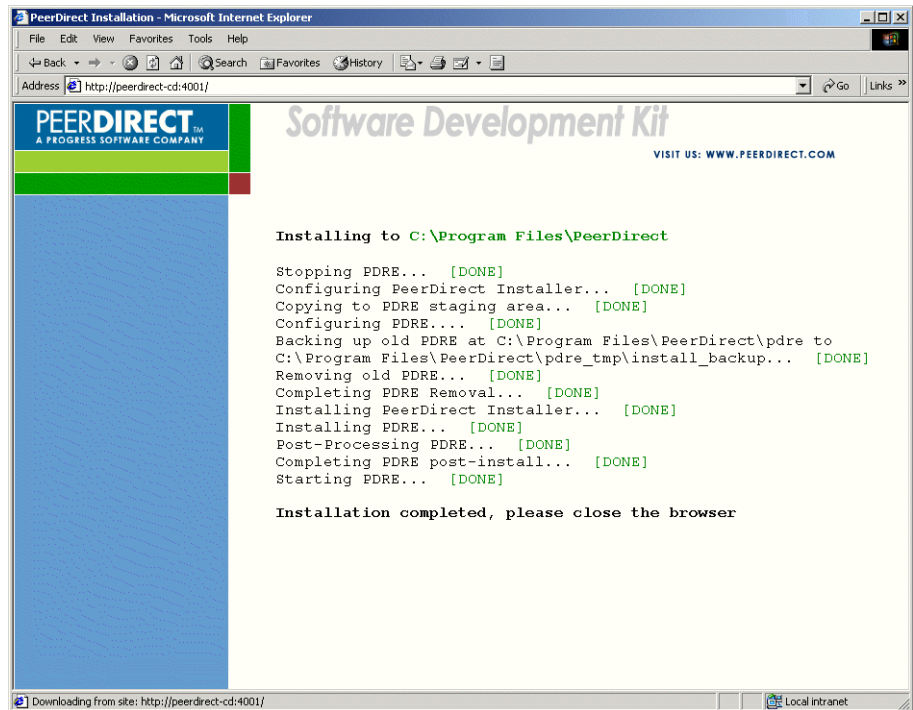
7 ♦ When the installation completes, close your browser window.

You've successfully updated your PeerDirect software.

2.7   Uninstalling the SDK

To uninstall the Distributed Enterprise SDK

On *Windows*, choose **Start > PeerDirect > Uninstall** from the Start menu on your desktop.

On *Linux,* log in as root and use the script `<install_dir>`/uninstall

where `<install_dir>` is the directory path for your PeerDirect installed components.

2.8   What's Next

You've successfully installed the SDK and are now ready to begin development work. You'll find useful information for developers in the *PeerDirect Developer's Guide and Reference* (available on the Windows platform). We also recommend that you read the *PeerDirect Replication Engine Tutorial Guide*. Both documents are located in the docs directory of the PeerDirect installation CD-ROMs and are available by choosing **Start > Programs > PeerDirect > Documentation** from your desktop Start menu.

3

Building a PeerDirect Deployment Kit

This chapter describes how to build a deployment kit that embeds your business applications and scripts into a PeerDirect InnerEdge or OuterEdge Server install program. This chapter includes the following sections:

- About the PeerDirect Application Install Builder Tool

- About the Create Deployment Kit Option

- Setting Up Components to Add to a Deployment Kit

- Setting Up Scripts for a Components File

- Creating a PeerDirect Deployment Kit

- Modifying a Deployment Kit

3.1   About the PeerDirect Application Install Builder Tool

The PeerDirect Install Builder Tool allows developers to customize the installation of applications and other software on PeerDirect InnerEdge and OuterEdge Servers. In a typical PeerDirect Replication Network, InnerEdge Servers are connected to multiple remote sites that are running OuterEdge Servers. Each OuterEdge Server must be compatible with the InnerEdge Server it replicates with and must be configured appropriately to replicate with the other sites in its network. PeerDirect provides an easy deployment kit to help you prepare each site for replication.

By using the PeerDirect Install Builder Tool, you can develop one install program that contains all the correct software components for easy deployment to replication sites. The installation is user-friendly and easy for application end users to run.

Building a deployment kit lets you control which software components are installed. You can embed new releases of application files, patches, and configuration set-up scripts. The final kit you build can be downloaded from your Web site or delivered to each site on a CD-ROM. Each kit contains the PeerDirect software required to set up replication.

You do not need special software to run the PeerDirect Install Builder Tool. It's built right into your PeerDirect Distributed Enterprise SDK install program. You perform the same steps as if you were getting ready to install — you select the components you want to install, and create an initial kit staging area by clicking **Install**. When you're ready to create the final kit, you click **Create Kit**. This option creates the install kit in a directory you select. Later you can return to the kit and make changes if you choose. When you're ready to deploy, the final kit can be copied to a CD-ROM or placed on your Web-site for downloading. A kit contains only the components installed into the kit staging area. Therefore, if you change the component configuration of your kit, you must click **Install** again and then create the kit again by clicking **Create Kit**. For detailed instructions, see "To create a deployment kit."

The PeerDirect Install Builder Tool is available on both the Red Hat Linux and Microsoft Windows platforms.

NOTE: If you plan to build a deployment kit, PeerDirect recommends that you install onto a machine where there is no other instance of PDRE running and choose the **Create Deployment Kit** option (you cannot create kits from a Quick or Custom installation).

3.2   About the Create Deployment Kit Option

To create a deployment kit, start the PeerDirect SDK install program and select the **Create Deployment Kit** option. Make sure that you create your deployment kit on a machine where you've not previously installed PeerDirect software.

The **Create Deployment Kit** option lets you select the components you want in the kit and also lets you add new components, such as application files and set-up scripts, to the final install kit.

Figure 1-1 shows the Create Deployment Kit stages. The SDK install program asks you to select components to install into a kit staging area on your local system.

Figure 3–1:   Workflow for Creating a Deployment Kit
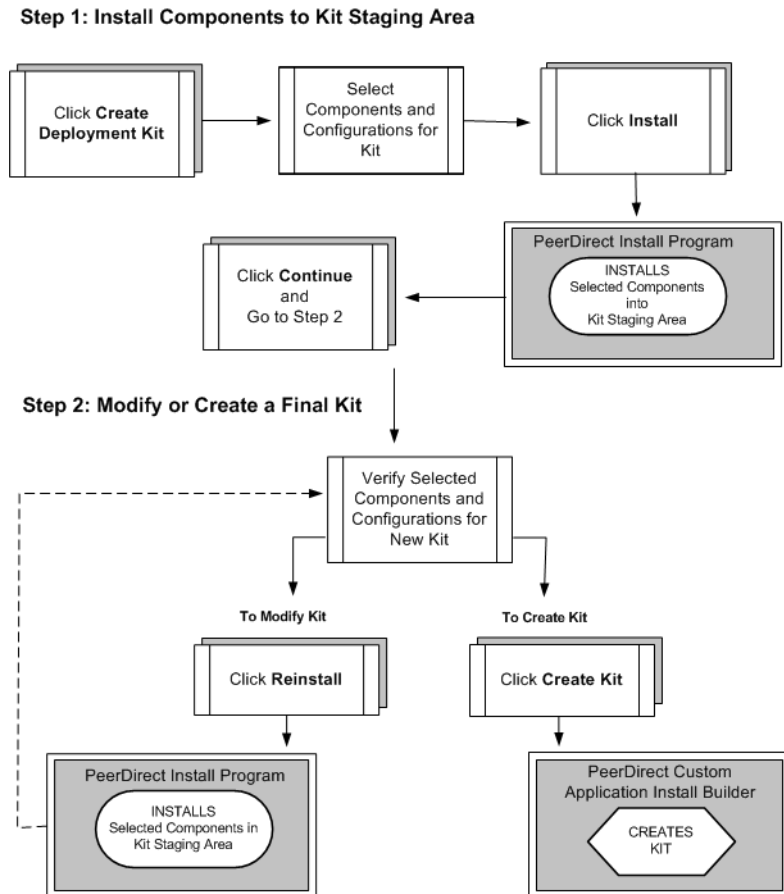
The PeerDirect Create Deployment Kit option follows this workflow to build a deployment kit:

1. **Create a Kit Staging Area** — select and install an initial set of kit components into a kit staging area. See Figure 3–1 - Step 1.

2. **Verify Kit Components** — the SDK install program shows you the components you currently have installed in the kit staging area and gives you options to reconfigure the kit if you need to (see Figure 3–1 - Step 2). You can also add new components.

3. **Modify Kit and Reinstall** — if you've changed your kit configuration, you must click **Reinstall**. This action installs a new configuration into the kit staging area. Then verify your components and make sure you now have the deployment configuration you want for your PeerDirect Replication Network sites. You may iterate kit changes as many times as you like. Each time you change your kit components, make sure you click the **Reinstall** button so that your changes are placed into the kit staging area.

4. **Create Final Kit** — after you verify that the components you selected are correct, click **Create Kit**. The program creates the kit in a directory that you specify.

When you're ready, you can copy the kit directory to a CD-ROM for distribution to remote sites or zip it for downloading on your Web site. On *Linux*, you can tar the kit directory or create an ISO file for general deployment.

In the following sections of this chapter, you'll find step-by-step instructions for creating and modifying a PeerDirect deployment kit.

3.3　Setting Up Components to Add to a Deployment Kit

Each component you add to a PeerDirect Deployment Kit must be organized in a separate directory and must contain the following folders, files and scripts:

– *linux* (folder) — place all install objects for the Linux platform in this folder.

– *MSWin32* (folder) — place all install objects for the Microsoft Windows NT-based platforms in this folder.

NOTE:　Use the templates provided by PeerDirect to create your folders and files. You can include both the linux and the MSWin32 folders in a component directory if you are deploying on both platforms. If you are deploying on only one platform, include only the appropriate folder for that platform.

– *Component* (file) — contains basic information about the component and includes script names and locations, and configuration parameters.

– *Configuration* (file) — records the current values for component options. These values override any default values that are set by parameters in the Component file.

– *Order* (file) — (optional) specifies the order in which components will be displayed in an install program window. If the Order file is empty or not present, the ordering of components is alphabetical.

– Perl scripts — one or more scripts used to control component operations. Each script is passed a dictionary of option name value pairs defined for the component and returns either a pass or failure code. Because the scripts are referred to by filename using the SCRIPT command in the Component file, scripts must reside in the same directory as the Component file.

– all pristine sources — after you add new components and scripts, and click **Install**, the installer tool adds PeerDirect files and executable files to the kit.

For example, in the PeerDirect\samples directory, you'll find the apache component folder. The apache folder contains the following folders and files:

Folders	*Files*
MSWin32	Configuration
linux	Order
	apache.pl

If you want to change a component after you've added it to a kit staging area, do one of the following:

- Give the newer version of the component a new name and add it to the kit; next remove the older version from the kit.

- Re-add the component using the same name.

- Update the component by writing a script to create the updates and run this script at installation time.

To set up a component to add to a Deployment Kit

1 ♦ Create a directory to contain the components you want copied to the kit staging area. You can create this directory anywhere on your system. For example, you could create a "MyKit" directory in the PeerDirect installation directory: `C:\Program Files\PeerDirect\MyKit`.

2 ♦ In this new directory, create one or both of the following folders:

    a) If you are deploying the kit to Win32 systems, create a new folder and name it "MSWin32".

    b) If you are deploying the kit to Linux systems, create a new folder and name it "linux".

Everything you place in these folders will get copied to the installation area; for example, executable files and configuration scripts can be placed in these folders.

3 ♦ Place installation objects for each platform into the corresponding platform folders you created in Step 2.

4 ♦ Create a "Component" file. See "Setting Up Scripts for a Components File" below.

5 ♦ Create a "Configuration" file. See "Examples of Files in a Component Directory" below.

6 ♦ Create the PL (Perl) file that will be used in the script commands in the "Component" file. See "Examples of Files in a Component Directory" below.

7 ♦ Optionally, create an "Order" file to specify the order you want components displayed on the installer screen. See "Examples of Files in a Component Directory" below.

3.4 Setting Up Scripts for a Components File

You might want to write scripts for your component. To tell the install program which scripts to run and where they are located, you place basic information (such as script names and locations, and configurable parameters) into the Component file (see above) using script commands and `param` statements.

The following table lists available script commands and describes what they do. Certain script commands have a required order. Please refer to the script command examples in "Component File" below for examples and the correct ordering of commands.

Table 3–1: **Script Commands**

script commands	Description
final	gives a component an opportunity to do whatever it needs to after all the components have been installed and started. An example is loading a database with starter data.
checkOK	checks the values specified by the user in component GUI fields and ensures they are valid.Returns appropriate results and/or error messages. Preceded by the configgui script.
configgui	responsible for the graphic user interface for each component that displays in the installer.
doconfig	if checkOK returns no errors, stores the values submitted by the user in preparation for installation. Preceded by the checkOK script.
install	moves the component executable file and files from the install staging area to the specified installation location.
postinstall	responsible for actions after an install such as setting the environment, setting the registry, and installing menu and desktop shortcuts.
postuninstall	responsible for actions after an uninstall such as restoring the environment, cleaning the registry, and cleaning the menu and desktop shortcuts.
permit	checks required resources, such as ports, to ensure they are available.
preinstall	responsible for actions that happen before the install, for example, fetch, patch and build steps. • Fetch - consists of moving PeerDirect pristine sources from their pre-install location to the Component directory. • Patch - modifies the sources locally by applying the configuration values. • Build - preforms any final build procedures required.

Table 3–1:   Script Commands

script commands	Description
preserve	responsible for preserving data during an update operation. Data is typically stored locally, then restored by the restore script.
preuninstall	performs operations before an uninstall.
restore	allows the component to perform any data conversion tasks that require the new version of the component. Data is typically obtained locally as created by the preserve script. Preceded by the preserve script.
start	starts the component.
stop	stops the component.
uninstall	performs uninstall tasks such as moving and deleting files. The uninstall script

3.4.1   Examples of Files in a Component Directory

The following are examples of a Component, Configuration and Order files that you would include in your Component directory.

Configuration File

The example below shows the current values for the title and version of the component, which subdirectory it is installed into, and allocated disk space size. These values override any default values that might be set by parameters in the Component file.

Example:

```
title Apache
version 1.36
installSubDir apaches
files 800
space 3072
```

Component File

The Component File contains information about the component and includes script names and their locations, and configuration parameters. Command statements in a component file use the following syntax:

Type	Syntax Description

script	The syntax for `script` commands is
	
	`script <command> <perl_filename>`
	`<comp_title>::<command_name>`
	
	where *\<command\>* is one of the script commands listed in Table 3–1, *\<perl_filename\>* is the name of the PL file that runs the script command, *\<comp_title\>* is the name of the component, and *\<command_name\>* is the script command name, such as `install` and `stop`.
	
	The script commands in the following example are shown in their required order.

param	The syntax for `param` statements is `param <name> <type> [<values>] [<default>]` where *\<name\>* is the name of the parameter you want to set, *\<type\>* is the data type of the accepted value, *\<values\>* is one or more values set by the parameter, and *\<default\>* is the default value set for the parameter.

Example:

```
script preserve apache.pl Apache::preserve
script stop apache.pl Apache::stop
script permit apache.pl Apache::permit
script preinstall apache.pl Apache::preinst
script uninstall apache.pl Apache::uninst
script install apache.pl Apache::install
script postinstall apache.pl Apache::postinst
script profile apache.pl Apache::write_profile
script start apache.pl Apache::start
script restore apache.pl Apache::restore
script configgui apache.pl Apache::configgui
```

```
script doconfig apache.pl Apache::doconfig
script checkOK apache.pl Apache::checkOK


param port int 0 - 80
param user string
param createok int 0 1 0
```

Order File

The Order file specifies the order in which components will be displayed in an install program window. If the Order file is empty or does not exist, components display in alphabetical order.

Example:

apache

pdre

3.5   Creating a PeerDirect Deployment Kit

Follow these instructions if you are creating a deployment kit for the first time or creating a kit staging area in preparation for creating a kit. Also see "About the Create Deployment Kit Option."

To modify an existing deployment kit, see "Modifying a Deployment Kit" below.

To create a deployment kit

1 ♦ Follow instructions specific to your platform below:

- *Linux* — Log on as ROOT (superuser). Load and mount the PeerDirect Distributed Enterprise SDK installation CD-ROM.

  The install program should start. If the install program does not start, open the CD-ROM directory and run ./setup.

- *Windows* — Log on to a Windows server or client machine. You must have administrative privileges to run the install program. Insert the PeerDirect SDK installation CD into your CD-ROM drive

  The install program should start automatically. If your Windows auto-run setting is turned off, choose **Start > Run**, browse to the CD-ROM drive, select the

setup.exe file, and click **OK**. To start the install program from a command-line prompt, change to your installation directory and type setup.exe -browser=ie.

2 ♦ The **Welcome to PeerDirect Software Installation 6.1** screen displays. Click **START INSTALLATION**.
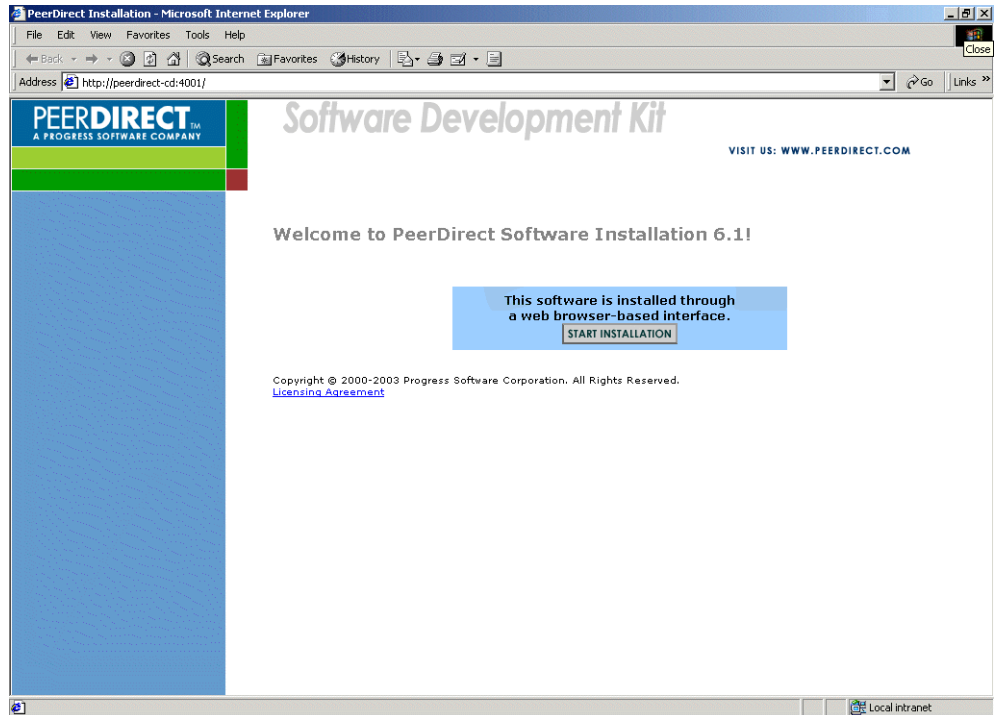
3 ♦ In the **Specify the installation location** field, enter the full directory path for the installation directory. You can accept the default, type a new path, or click **Browse** to find an existing directory on your system. The install program will install the PeerDirect SDK in this directory. The default installation directory paths are

Platform	Run As...	Destination
Red Hat Linux	ROOT	/usr/local/peerdirect
Microsoft Windows	ADMIN PRIVS	C:\Program Files\PeerDirect

NOTE: For ease of creation and iterative development of a deployment kit, PeerDirect recommends that you install into a directory that is dedicated to the task of creating a kit.
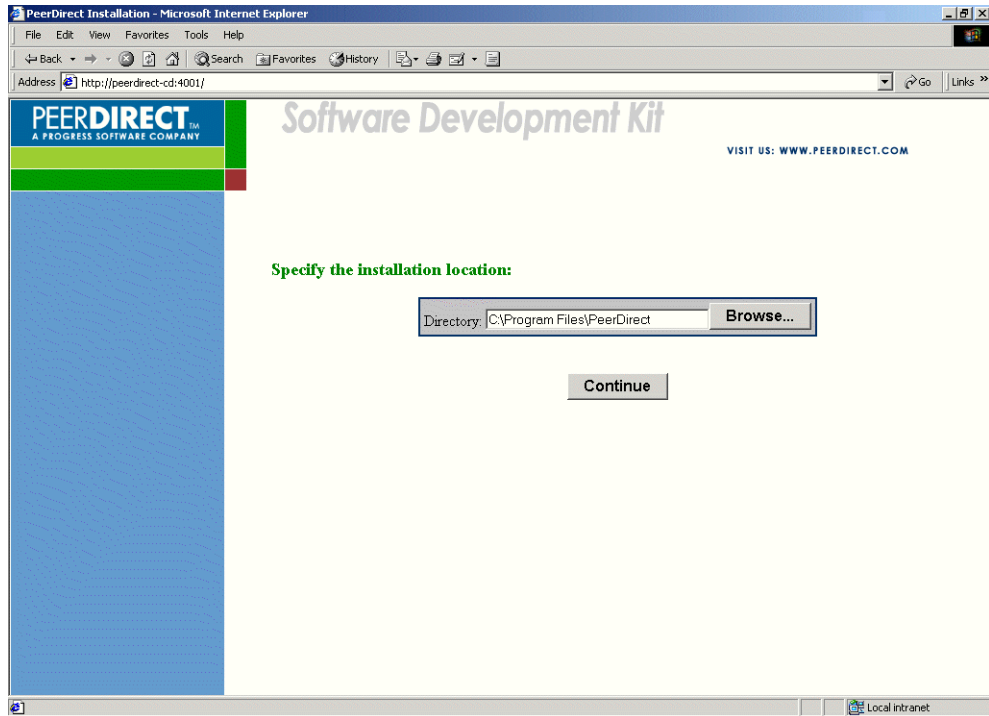
4 ♦ Click **Continue**.

5 ♦ If this is the first time you are running the install program, read the PeerDirect license agreement carefully. This screen does not display when you rerun the install program to update installation components.

- If you agree to the license, scroll to the bottom of the page and click **ACCEPT** to launch the install program. Proceed to Step 5.

- If you do not agree to the license, scroll to the bottom of the page and click **DECLINE** to exit.
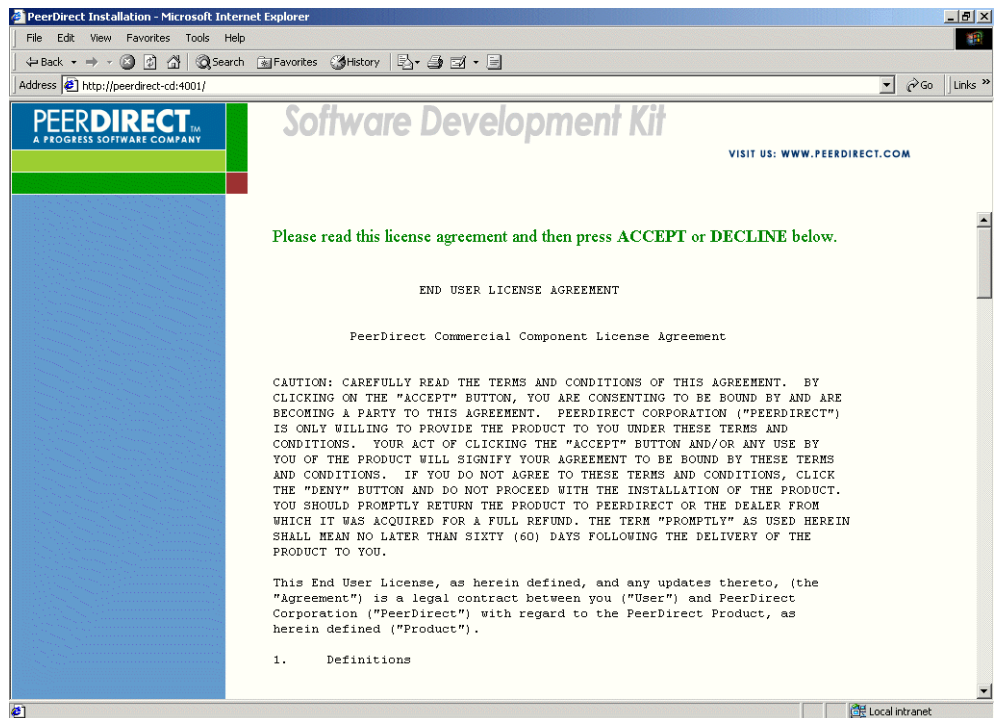
6 ♦ Select **Create Deployment Kit** and click **Continue.**
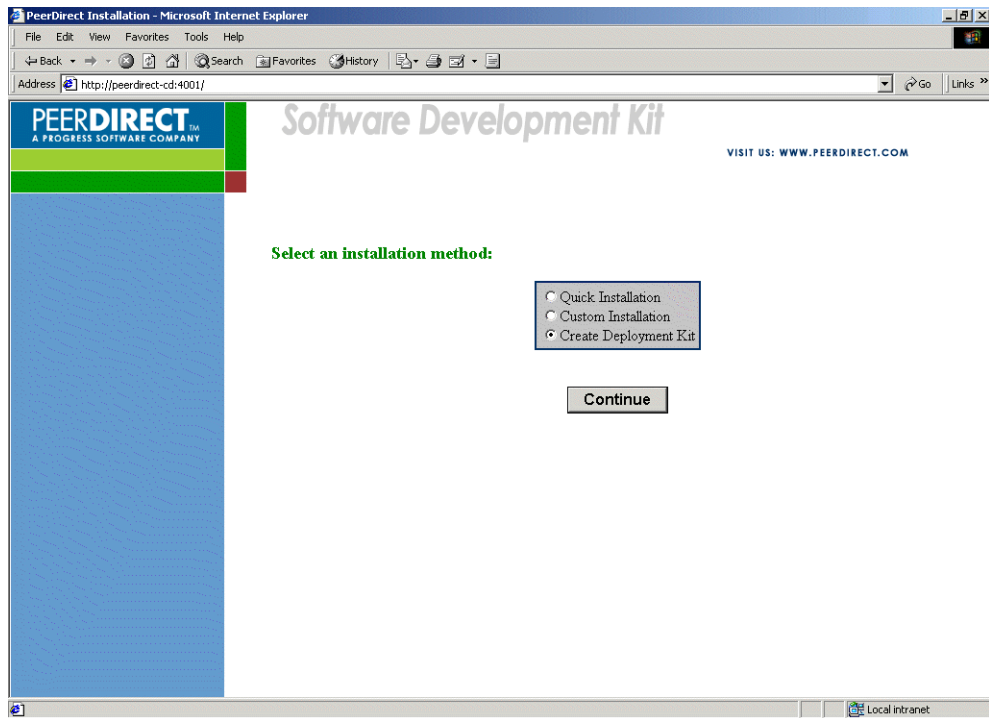
7 ♦ In the **Configure the following Components** screen, do the following:

a)   Review the list of PeerDirect components that you can select to install.
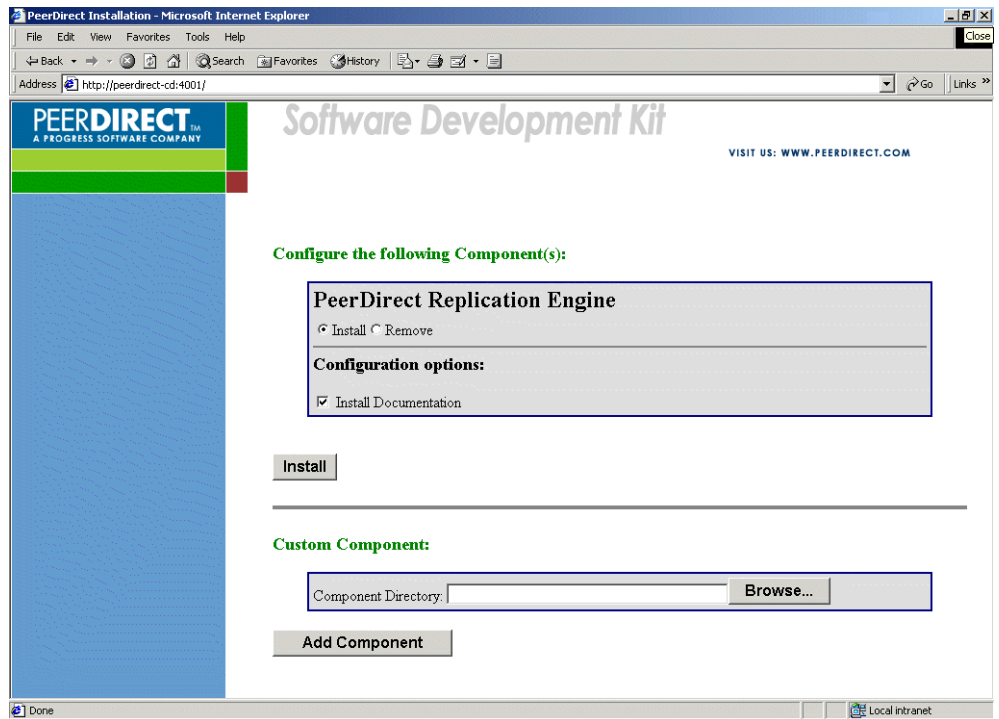
b)   To install the PeerDirect Replication Engine (PDRE), check **Install** (default). If you do not want to install PDRE at this time, check **Remove**.

c)   Check **Install Documentation** to install the PDRE documentation into the kit staging area.

d)   On *Linux*, in the **Specify the component account** field, type a user name. This user name will be able to run the PeerDirect Replication Engine daemon. You may enter a user or account name. Check **Create New User** if you want the install program to create the user name or account you specify.

NOTE: On *Linux*, you are asked to specify a user name. The user name is an individual or an account that is able to run the PeerDirect Replication Engine (PDRE) daemon. If you want multiple persons to be able to execute the PDRE component daemon,

specify a user name to own it and attach that user to a group. You can then attach other users who need to administer the daemon to the same group.

8 ♦ (Optional) To add a new component:

a) (In the **Components Directory** field, enter the full directory path to the directory that contains the component files and folders you want to add or click **Browse Components** to find the directory on your system.

b) Click **Add Component** to have the specified component copied to the kit staging area (see "Setting Up Components to Add to a Deployment Kit" and "Setting Up Scripts for a Components File."
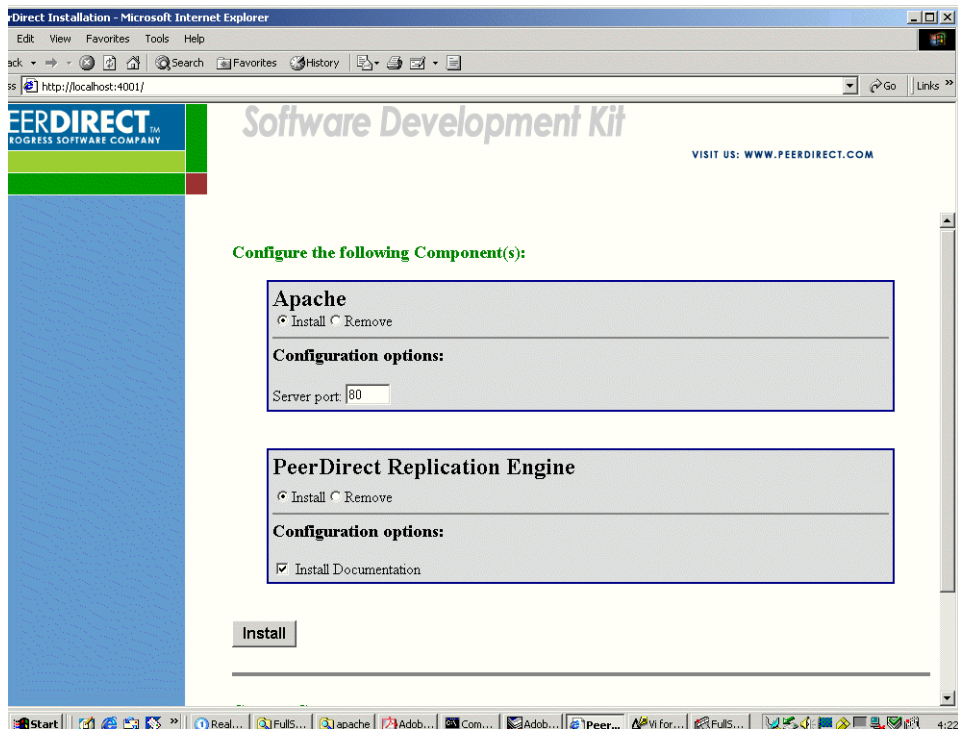
c) The screen refreshes and shows the added component.

d) Repeat Step a to add multiple new components.

9 ♦ When you're ready to install the components to the kit staging area, click **Install**.

10 ♦ The install program lists each component as it installs and shows you the progress of the installation. When the installation completes, click **Continue**.
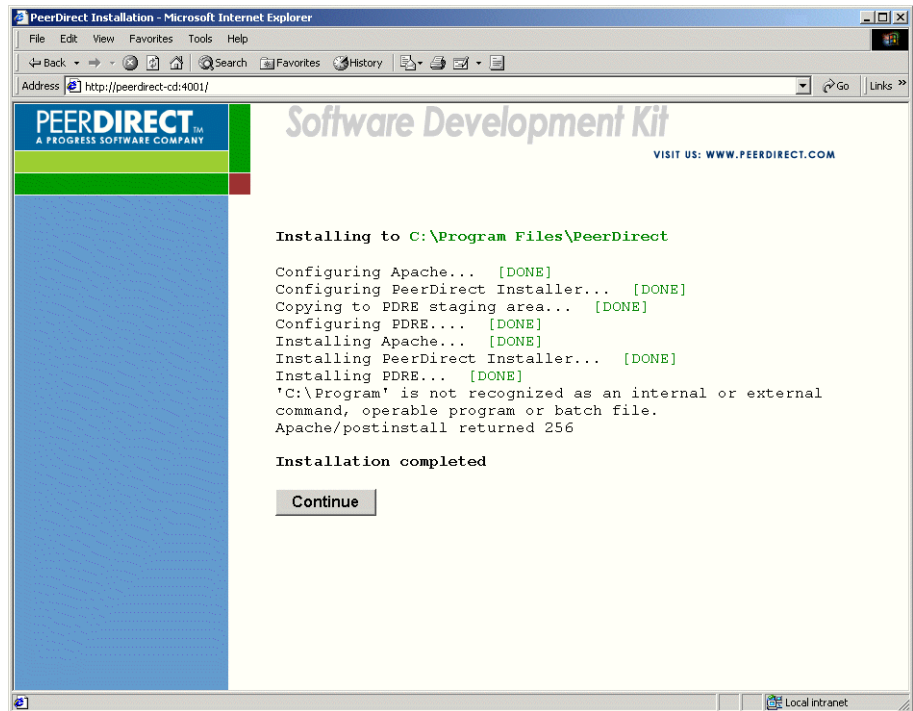
11 ♦ In the next form, do the following:

a) Review the list of PeerDirect components that you selected. The kit will be a copy of the installation in the kit staging area. Therefore, if you make a change to the components, you must perform a new "Install" before you can create a kit.
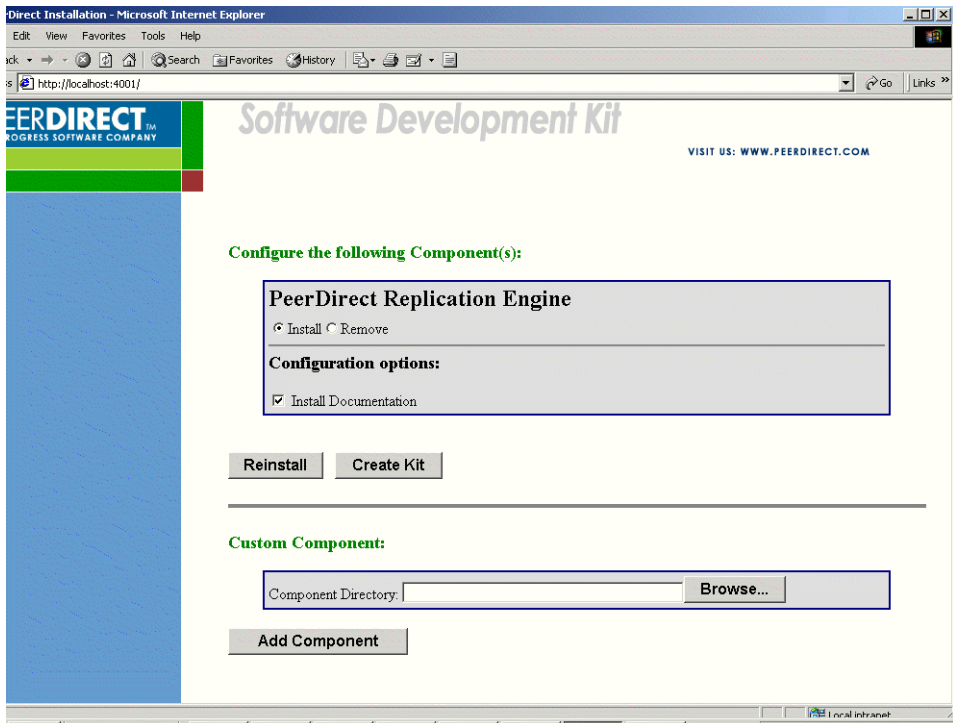
b) Specify how you want each component managed by selecting one of the following:

- **Install** — installs the component as part of the kit.

- **Remove** — removes the component from the kit. This option removes the component from the kit staging area. Because the kit is created using components in the kit staging area, the component is not included in the final deployment kit.

12 ♦ When you're ready, do one of the following:

- To reinstall selected components into the kit staging area (required if you change your kit configuration), click **Reinstall**. Go to Step 10.

- • To create a deployment kit, click **Create Kit**. Go to Step 13.

13 ♦ In the **Select the Kit location** field, enter the full directory path for where you want the kit created.

14 ♦ In the **Select the Kit Installation location** field, enter the full directory path where you want the kit installed by end users. This ensures that the kit software installs in the same directory on each computer.

15 ♦ Click **Create Kit**.
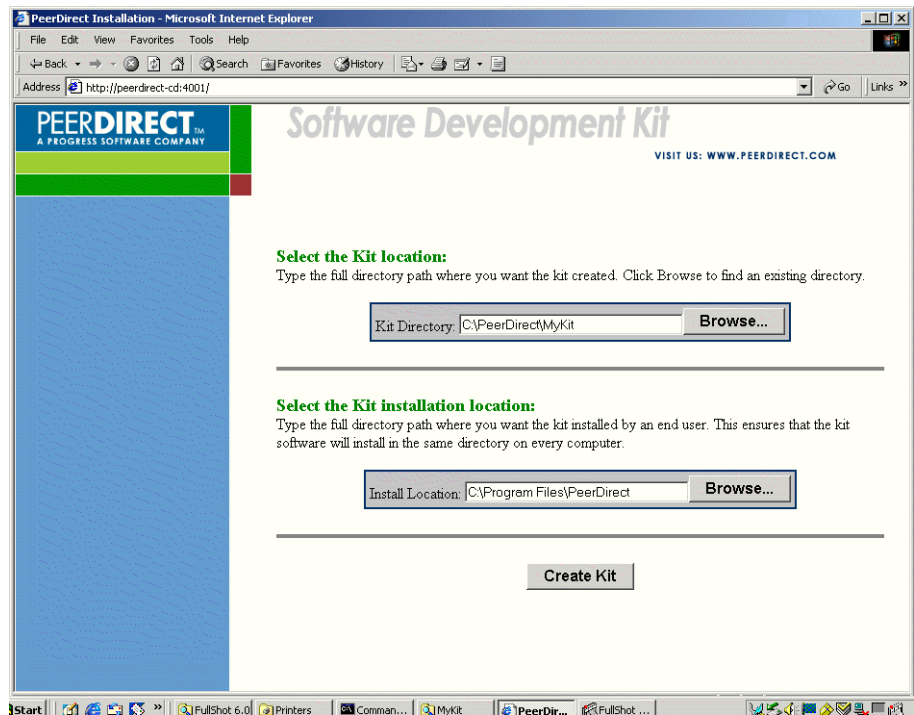
16 ♦ The install program lists each component as it creates the kit.
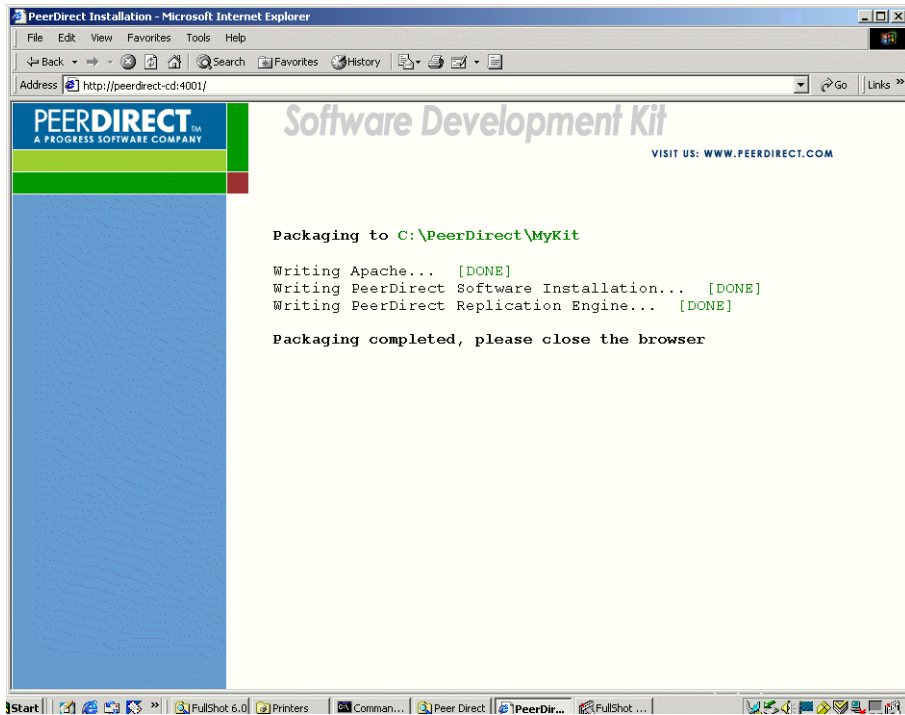
17 ♦ Please close the browser window when the program completes.

3.6   Modifying a Deployment Kit

PeerDirect gives you the ability to build a deployment kit that you can use to distribute your application software along with the PeerDirect software that will replicate it. You can iterate development of a kit by opening a previous kit you created. The PeerDirect Application Install Builder tool will tell you which components are already included in the kit. You can then add or remove components to create a new kit.

NOTE: When building a kit, the Application Install Builder tool does not retain any custom configurations you may have set up for components. Each kit is built using unmodified component sources to ensure the quality of the final kit. For this reason, you must always re-install any changed component configuration to the kit staging area before you build a final kit. See "About the Create Deployment Kit Option."

NOTE: Because the Application Install Builder Tool does not retain any custom configurations you set, anything you need to preserve should be in a script.

To modify a deployment kit

1 ♦   Follow instructions specific to your platform below:

- *Linux* — Log on as a root (superuser). Start the PeerDirect SDK install program. You can load and mount the PeerDirect SDK installation CD-ROM or if already installed, run the ./setup file from your installation directory.

  If the install program does not start, open the CD-ROM directory and run ./setup.

- *Windows* — Log on to a Windows server or client machine. Start the PeerDirect SDK installation program. You can insert the PeerDirect SDK installation CD into your CD-ROM drive or if already installed, run the setup.exe file in your installation directory.

  The install program should start automatically. If your Windows auto-run setting is turned off, choose **Start > Run**, browse to the CD-ROM drive, select the setup.exe file, and click **OK**.

2 ♦   Click **Start Installation**.

3 ♦   Select **Create Deployment Kit** and click **Continue**.

4 ♦ Specify the same installation directory path you used for the previous deployment kit you installed. Click **Continue**.
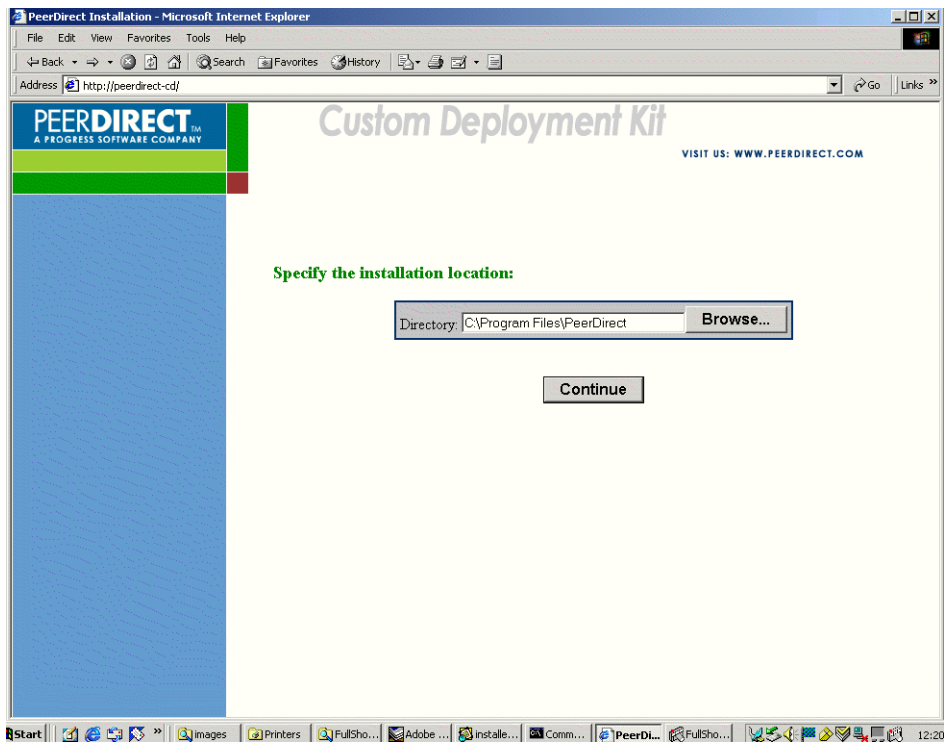
5 ◆ The next screen shows you the kit components in your kit staging area.
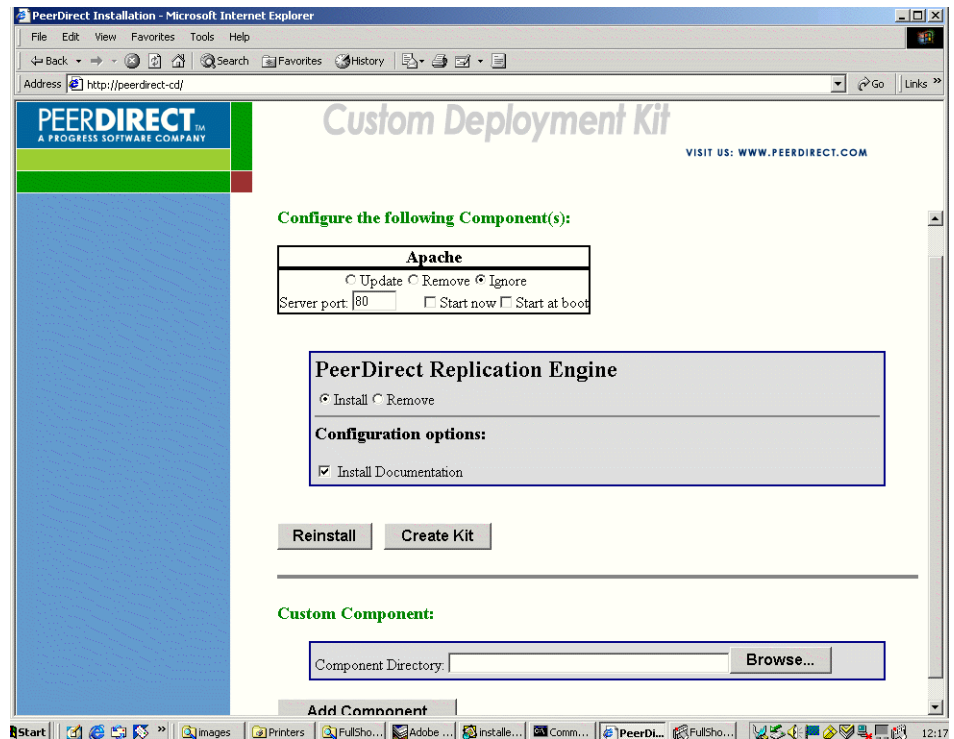
6 ◆ To make changes to the kit, begin with Step 11 in "Creating a PeerDirect Deployment Kit" above and follow the instructions for modifying your kit configuration and creating a new kit.

3.6.1 Example of a Deployment Kit

The deployment kit you create installs the components you've included in the kit (listed at the top of the install screen) and gives the end user a single "Start Installation" button that installs everything.
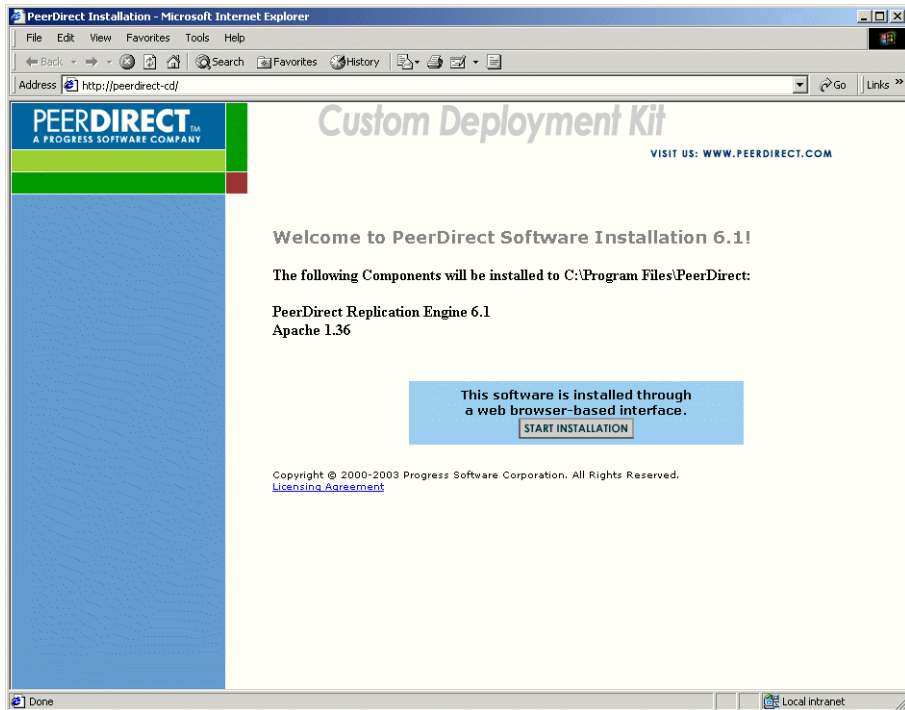
After the end user starts the installation, a screen displays messages that give the user status.
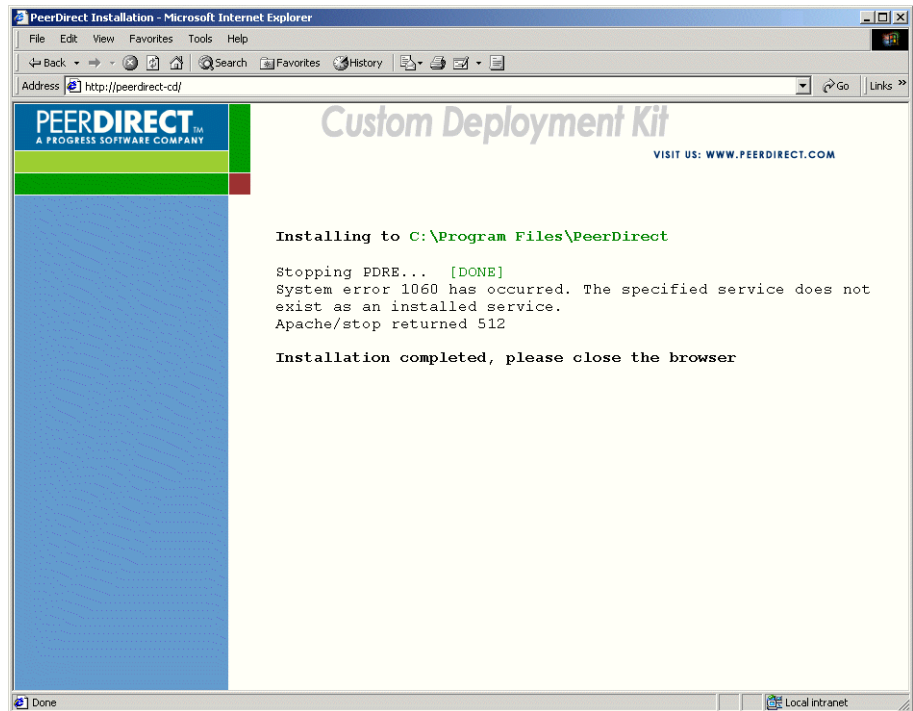
When the installation completes, the end user closes the browser.

3.7   What's Next

The next chapter describes how to set up replication for InnerEdge and OuterEdge Servers and Workstations. Please read this chapter and also the *PeerDirect Replication Engine Tutorial* (**Start > Program > PeerDirect > Documentation**).

4

Setting Up PeerDirect Replication

This chapter describes how to set up PeerDirect replication using your PeerDirect SDK software. It will take you through each phase of the PeerDirect Replication Engine set up and includes these sections:

- **Overview**

- **Database Considerations**

- **Setting Up Databases for Replication**

- **About Preparing Databases for Activation**

- **Initiating a Replication Session**

- **Administering a Replication Network**

- **What's Next**

4.1   Overview

All successful replication networks begin with a deployment strategy and plan. Begin by considering the different layout options that PeerDirect offers and choose the one that offers you the benefits and features you need. You'll find basic network layout designs described in Chapter 1 and in the *PeerDirect Replication Engine Tutorial* guide.

The initial setup of a replication network requires that you install the PeerDirect Replication Designer (PRD) available in the Windows PeerDirect SDK product. You need the PeerDirect Replication Designer (PRD) to define the replication rules for the database. These rules allow the PeerDirect Replication Engine (PDRE) to know what and how the data is to be synchronized between two or more sites within a PeerDirect Replication Network.

You next export the replication rules you define to a file and apply it against an InnerEdge Server or OuterEdge Server | Workstation database using the dimprule utility. This step enables the database for replication and prepares it for activation into a PeerDirect Replication Network. To activate the database, you use the dinst utility. The dimprule and dinst utilities are present in both the Windows and Linux versions of PDRE 6.1.

This chapter provides detailed instruction steps for both the InnerEdge and OuterEdge Servers. See "Setting Up Replication on an InnerEdge Server" and "Setting Up Replication on an OuterEdge Server or Workstation" below.

4.1.1   Setting Up Replication on an InnerEdge Server

You must define replication rules *before* you can complete setup of the first InnerEdge Server site. To set up replication on the first Inner Edge Server, complete these steps:

1 ♦ Install the PeerDirect Distributed Enterprise SDK software and use the PeerDirect Replication Designer to create replication rules. See the *PeerDirect Distributed Enterprise SDK Installation Guide* and the *Developer's Guide and Reference* for information about how to create rules.

2 ♦ Install an InnerEdge Server running PDRE on a primary datacenter server that hosts the database with which you plan to replicate OuterEdge Servers. Refer to the *PeerDirect InnerEdge Server Installation Guide* for installation instructions.

3 ♦ Set up database logins and permissions so that PDRE can access the required data for replication. See "Setting Up Database Logins and Permissions."

4 ♦ Using the dimprule utility, prepare to activate the database. See "To prepare to activate an InnerEdge Server using the dimprule utility."

5 ♦ Using the dinst utility, activate the InnerEdge Server site. See "To activate the database at the InnerEdge Server site."

NOTE: You must activate the site on the InnerEdge Server first and then activate the site on the OuterEdge Server.

4.1.2   Setting Up Replication on an OuterEdge Server or Workstation

You should already have installed one InnerEdge Server on a primary server that hosts the database you plan to use to replicate data. If you chose Method A (see the "Overview"), you should also have completed the preparation of your first InnerEdge Server database and activated the site.

If you chose Method B, after you install both the InnerEdge and OuterEdge Servers, the next step is to complete setup of the InnerEdge Server (see previous section) and then setup the OuterEdge Server.

To set up replication on an OuterEdge Server or Workstation, complete these steps:

1 ♦ Install an OuterEdge Server or Workstation that runs PDRE. Refer to the *PeerDirect OuterEdge Server Installation Guide* for installation instructions.

2 ♦ Set up database logins and permissions so that PDRE can access the required data for replication. See "Setting Up Database Logins and Permissions."

3 ♦ Prepare the OuterEdge Server | Workstation database. See "To prepare to activate the database on the OuterEdge Server."

4 ♦ Activate the OuterEdge Server | Workstation site. As part of this process, the first replication session will be initiated automatically. See "To prepare to activate the database on the OuterEdge Server."

After the first replication, you can use the PeerDirect Administrator (PDA) console to set up the PeerDirect Replication Engine to automatically replicate data on schedule.

4.1.3 Setup Task Sequence

Setting up a PeerDirect Replication Network requires that you perform a sequence of tasks. There are two ways to perform this sequence. You can choose to set up your replication sites one by one, beginning with your first InnerEdge Server (see Table 4–1) or you can perform all your installation tasks first and then prepare and activate each site separately (see Table 4–2). You should choose the method that you think works best for your particular deployment purposes. The following tables describe the two methods. For detail instructions, please refer to the referenced resources.

Table 4–1:   Method A- Sequence of Replication Network Setup Tasks

Step	Task	Description
1	**Plan Replication Network**	Plan and design your distributed application system and replication network as an up front activity. Review your database configuration and schema design to make sure it meets the PeerDirect requirements for replication of data.
		You'll find some typical replication network layouts described in Chapter 1, "Welcome to PeerDirect Distributed Enterprise SDK" and in the *PeerDirect Replication Engine Tutorial*.
2	**Install the Distributed Enterprise SDK (Windows version)**	When you install the SDK, you must also install the PeerDirect Replication Designer (PRD) to create the database rules for your PeerDirect Replication Network.
		The PRD is only available as part of the PeerDirect Distributed Enterprise SDK software product.
		This guide describes how to install the PeerDirect SDK.
3	**Define Replication Rules**	Use the PeerDirect Replication Designer (PRD) to define the database replication rules for your PeerDirect Replication Network. See the *PeerDirect Replication Engine Tutorial* and *Developer's Reference Guides*.

Step	Task	Description
4	**Export Replication Rules**	After you've created replication rules and are satisfied, select **Tools > Prepare to Activate** and then **File > Export Rules**. This exports the rules to a rules file that you use to set up your replication databases at each site. See "To export rules."
5	**Install the InnerEdge Server as the first site**	Install the InnerEdge Server on a central data server that is highly available to the other sites in your PeerDirect Replication Network. See the *PeerDirect InnerEdge Server Installation Guide*.
6	**Prepare the InnerEdge Server database**	Prepare the first site database using the dimprule utility. Be sure to use the -FIRSTSITE parameter. See "Preparing to Activate Your Replication Sites."
7	**Activate the InnerEdge Server site**	Activate the InnerEdge Server site using the dinst utility. Be sure to use the -FIRSTSITE parameter. See "Activating the InnerEdge Server Database."
8	**Install an InnerEdge Server or OuterEdge Server | Workstation as a second site**	After you install and activate your first site, install your second replication site. Later, you'll repeat this step for the other sites in your replication network. See the *PeerDirect InnerEdge Server* or *OuterEdge Server and Workstation Installation Guides*.
9	**Prepare the InnerEdge Server or OuterEdge Server | Workstation database as a second site**	Prepare the second site's database by using the dimprule utility. Later, you'll repeat this step for all remaining sites you've installed as part of your replication network. See "To prepare to activate the database on the OuterEdge Server."

Step	Task	Description
10	**Activate the InnerEdge Server or OuterEdge Server | Workstation site as a second site**	Activate the second site using the dinst utility. As part of this process, the initial replication session is started with the first site. Later, you'll repeat this step for all remaining sites. See "To prepare to activate the database on the OuterEdge Server."
11	**Repeat Step 7 - 9** to install, prepare and activate the remaining sites in your replication network.	Repeat steps 7 - 9 until all replication sites in your PeerDirect Replication Network are installed, prepared and activated.

Table 4–2: Method B - Sequence of Replication Network Setup Tasks

Step	Task	Description
1	**Plan Replication Network**	Plan and design your distributed application system and replication network as an up front activity. Review your database configuration and schema design to make sure it meets the PeerDirect requirements for replication of data. You'll find typical replication network layouts described in Chapter 1, "Welcome to PeerDirect Distributed Enterprise SDK" and in the *PeerDirect Replication Engine Tutorial*.
2	**Install the Distributed Enterprise SDK (Windows version)**	You must install the PeerDirect Replication Designer (PRD) to create the database rules for your PeerDirect Replication Network. The PRD is only available as part of the PeerDirect Distributed Enterprise SDK software product. This guide describes how to install the PeerDirect SDK.

Step	Task	Description
3	**Define Replication Rules**	Use the PeerDirect Replication Designer (PRD) to define the database replication rules for your PeerDirect Replication Network. This is where the work you did in Step 1 pays off. See the *PeerDirect Replication Engine Tutorial* and *Developer's Reference Guides*.
4	**Export Replication Rules to a File**	After you've created replication rules and are satisfied, select **Tools > Prepare to Activate** and then **File > Export Rules**. This exports the rules to a rules file that you use to set up your replication databases at each site. See "To export rules."
5	**Install the InnerEdge Server as the first site**	Install the InnerEdge Server on a central data server that is highly available to the other sites in your PeerDirect Replication Network. See the *PeerDirect InnerEdge Server Installation Guide* for more information.
8	**Install an InnerEdge Server or OuterEdge Server | Workstation on the second and remaining sites in the network**	After you install and activate your first site, install your second replication site. Repeat this step for the other sites in your replication network. See the *PeerDirect InnerEdge* Server or *PeerDirect OuterEdge Server and Workstation Installation Guides* for more information.
6	**Prepare the InnerEdge Server database as the first site**	Prepare the first site database the dimprule utility. Be sure to use the -FIRSTSITE parameter. See "Preparing to Activate Your Replication Sites" in this chapter for more information.

Step	Task	Description
7	**Activate the InnerEdge Server site as the first site**	Activate the InnerEdge Server site using the dinst utility. Be sure to use the `-FIRSTSITE` parameter. See "To activate the database at the InnerEdge Server site" in this chapter for more information.
9	**Prepare the InnerEdge Server or OuterEdge Server | Workstation database on the second site and remaining sites in the network**	Prepare the second site's database by using the dimprule utility. Repeat this step for all remaining sites you've installed as part of your replication network. See "To prepare to activate the database on the OuterEdge Server" for more information.
10	**Activate the InnerEdge Server or OuterEdge Server | Workstation site on the second site and remaining sites in the network**	Activate the second site using the dinst utility. As part of this process, the initial replication session is started with the first site. Repeat this step for all remaining sites. See "To prepare to activate the database on the OuterEdge Server" for further instruction.

Each InnerEdge Server and OuterEdge Server | Workstation runs a PeerDirect Replication Engine (PDRE) component that replicates data among the databases in your PeerDirect Replication Network. You can select to install PDRE on your server or workstation when you run the PeerDirect install program (on *Windows*, select the Runtime edition).

For instructions about how to install an OuterEdge Server, see the *PeerDirect OuterEdge Server Installation Guide* available on the OuterEdge installation CD-ROM. For instructions about installing an InnerEdge Server, please refer to the *PeerDirect InnerEdge Server Installation Guide* included on your InnerEdge Server installation CD-ROM. All documentation is located in the docs directory at the top-level or root of each installation CD-ROM.

4.1.4 Recommendations

You'll find instructions in this chapter for setting up replication on both the PeerDirect InnerEdge and OuterEdge Servers. As you work, it is important that you follow the instructions from first to last step in the sequence in which they are presented. Do not skip any steps.

We strongly recommend that you read the *PeerDirect Replication Engine Tutorial Guide* located in the `docs` directory of the PeerDirect InnerEdge Server installation CD-ROM. This guide provides detailed and complete information about setting up and configuring the PeerDirect Replication Engine (PDRE). If you are reading the *PeerDirect Replication Engine Tutorial*, the instructions in this chapter for the InnerEdge Server match the Tutorial instructions for the first replication site; instructions for the OuterEdge Server match the Tutorial instructions for the second site.

4.2 Database Considerations

When replicating databases with the PeerDirect Replication Engine, please follow these recommendations:

Homogeneous and Heterogeneous Replication Networks

When you configure a database to work with PDRE, you have the ability to replicate data between databases of the same vendor type (homogeneous), or to replicate with databases that are different (heterogeneous), such as a Microsoft SQL Server and an Oracle database. For a list of PeerDirect-supported databases, see Table 1–1.

When you replicate between different vendor-specific databases, you must ensure that the data types being used are compatible. Replication will not happen unless the documented "basic data type" match for a given field across the two different database platforms. The length and precision of each column must also be identical across the two database environments.

For detailed information about replicating with databases of different types, please refer to the *PeerDirect Replication Engine Tutorial Guide*. See also Chapter 1, "Supported Databases"

Foreign Keys

Foreign keys are important if you wish to impact the order in which keys are replicated. If you plan to use work sets, you *must* use foreign keys.

It is important that PDRE know the foreign keys for each table involved in replication. Database table relationships are defined from the bottom up, that is from the first child to the parent to which it is related by a foreign key. PDRE uses this information to determine the order in which tables are replicated, as parent tables are always replicated before child tables. Foreign key relationships are also used in defining work sets and transaction sets, and to ensure that deletions are cascaded to dependent tables.

For instructions about how to define foreign keys, see "Specifying Foreign Keys."

Cascading Table Deletions

If your database includes local (non-replicated) tables that are related to replicated tables, cascading deletions will not extend to these local tables. This means that you must either use triggers to ensure that deletions are cascaded to local tables and/or you must enable cascading deletions in your database software or in your business application.

Note that if you implement referential integrity constraints between these local and replicated tables without ensuring that deletions are properly cascaded to the local table(s), PDRE deletions will cause these constraints to "break".

Consistent Naming

Please ensure that all tables you plan to replicate have the same names across replicated databases. This is not a problem if you enable a first database and then copy it to other locations that you plan to replicate with.

Columns in replicated tables must also have identical names, and when replicating between two different vendor databases, must have compatible data types.

There are no requirements for tables or columns that you do not plan to replicate.

Unsupported Data Types

Tables you plan to replicate should not include unsupported data types or associated settings or properties. This includes the use of auto increment fields such as Microsoft IDENTITY fields. By default, PDRE replicates all columns in a table but you can modify this behavior using a feature called *fragments*.

For a list of supported data types and database-specific types, please refer to the *PeerDirect Developer's Guide and Reference*. For information about how to replicate a table that uses IDENTITY fields, please see the appendix: "Replicating a Table Containing IDENTITY Fields" in the *Developer's Guide*.

Unique Primary Keys

All tables you plan to replicate must have a unique primary key. With the exception of Microsoft SQL Server, it is not necessary to have primary key constraints physically defined in the database.

To enhance performance, PeerDirect recommends that you set a unique index on each table's primary key. Primary keys may be *simple* — comprised of a single column — or *composite* — comprised of two or more columns. However, no component of a primary key may contain a NULL value.

Database Versions

PDRE supports specific versions of most database platforms. Please be sure to consult Table 1–1 or the Release Notes (relnotes.txt) for the exact versions of your database software that can be used with PDRE. If you have an earlier or a later version of the database software than the one specified, you may encounter problems if you attempt to use it with PDRE. Please contact PeerDirect Technical Support at support@peerdirect.com if you have questions.

Clock Synchronization

The date and time must be set correctly on all machines in a replication network, including all database servers, PDRE servers, application servers (machine running database clients), and remotely connected machines. PeerDirect recommends that you install and use one of the following programs to synchronize the clocks on your machines:

- Tardis (http://www.kaska.demon.co.uk)

- Dimension 4 (http://www.thinkman.com/dimension4/)

4.3   Setting Up Databases for Replication

To set up a PeerDirect Replication Network, you must perform a series of tasks. The sequence of these tasks is outlined in the Overview of this chapter. The sections below describe each task in detail.

4.3.1   Setting Up Database Logins and Permissions

Both PeerDirect Replication Designer (PRD) and PeerDirect Replication Engine (PDRE) require access permissions that allow them to manipulate tables in the database.

Each installed...	Requires...
PeerDirect Replication Designer (PRD)	access to all application tables to be replicated.
	permissions to create and update new tables in the database.
PeerDirect Replication Engine (PDRE)	insert/update/delete/select access to all replicated tables, all PeerDirect system tables, and all PeerDirect control tables in the database.
	exclusive use of a specific login ID if you plan to implement triggers to maintain control fields.

If your database requires users to log in, you will need to provide login IDs that have appropriate permissions to access and update your database for PRD and PDRE to use.

To create a Login ID with adequate permissions in your database

Before you begin to use PRD or PDRE, we recommend you do the following:

1 ♦ Create a database user called "PDUSER".

2 ♦ Give PDUSER insert/update/delete/select access to all replicated tables, all PeerDirect system tables, and all PeerDirect control tables in the database

3 ♦ Also give PDUSER all permissions equivalent to those of the database owner.

4 ♦ Set up PRD and PDRE to use the PDUSER login ID.

Alternatively, you can have PDRE use the login ID of the user who owns the database tables you want to replicate. Whatever you use, make sure it is a user ID that is only used by PDRE.

NOTE: Do not use an alias or the Microsoft/Sybase "sa" or Oracle "system" user. Do not alias the PDUSER login to any other user.

4.3.2   Selecting Databases to Replicate

You use the PeerDirect Replication Designer (PRD) to select and configure the databases you want to replicate with as part of a replication network.

NOTE: For Microsoft SQL Server, be sure to define primary keys in the database before you run PRD, otherwise you will encounter replication errors.

When you start PRD for the first time, PRD asks you detailed questions about the database, connection and replication information, including tables to replicate, and primary and foreign keys.

To select a database to replicate

1 ♦ Start the PeerDirect Replication Designer (PRD).

NOTE: Starting PRD also starts the PeerDirect Replication Engine.

2 ♦ The **Database Information** screen displays. Complete the following fields:

a)   **Database Type** — select the type of database you wish to replicate.

Table 4–3:   Database Type Formats

Database Type	Format
Borland InterBase	`Full path to the .GBD file or` `<server_name>:<db_name>`
IBM DB2 UDB	`<db_name>`
IBM Informix	`<db_name>:<host>:<server>:<service_name>:<protocol>`
Microsoft SQL Server 6.5, 7.0, 2000	`<server_name>:<db_name>[:<extras>]`
Oracle 8	`<server_name>`
Oracle 8.1.6 and above	`<host>:<SID>:<port>`
Progress RDBMS 9.1D	`<host>:<port>:<db_name>`
PostgreSQL	`<server_name>:<port>:<db_name>`
Sybase Adaptive Server Anywhere Sybase SQL Anywhere 5	`Full path to .DB file or` `<server_name>[:<db_name>]` `where <server_name> is the` `LOCAL for the local database.`
Sybase Adaptive Server Enterprise 11.x	`<server_name>:<db_name>`

    b)   **Database Locator** — enter the location of the database you wish to replicate. Depending on the database type you select, you'll see one of these formats:

    c)   **Database Connection Information** — (optional) if you need a user/login ID and password to access your database through ODBC, enter the following information

NOTE: The user name PDUSER must have already been granted the necessary permissions to the database.

3 ♦   **UserName** — enter the user name or login ID required to access the database.

    a)   **Password** — enter the password required to access the database.

    b)   **Optional Parameters** — enter any additional connection parameters. For example, if your database uses a system database to validate users, you must enter its name here. The syntax is `systemdb=myfile.mdw`.

4 ♦ Click **Next**.

5 ♦ The **Database Information** screen displays. Complete these fields.

    a)   **Project** — enter the name of your project.

    b)   **Network** — enter the name of the replication network. The network will be comprised of the databases you identify for replication.

NOTE: Only databases that are part of the same project and network may replicate together. Databases in two different networks will not interact.

6 ♦ **Release** — enter the name of this release. Each project/network may have multiple releases as new replication features are added or database schema changes are implemented.

7 ♦ Click **Next**.

4.3.3   Selecting Tables for Replication

You use the main PRD window to specify which tables to replicate (tables are initially marked as "Not Replicated") and to configure the advanced features of PDRE.

To select tables for replication

1 ♦ In the main PRD window, select the tables in your database that you want to replicate.

2 ♦ Choose **Actions > Replicate Table**.

3 ♦ Click the *Replicated* tab at the bottom of the left panel. The tables you marked for replication are shown in the replicated list.

4.3.4   Specifying Foreign Keys

If you have foreign key constraints defined in your database, PRD will automatically detect them (except for Oracle). These foreign keys display when you select the **Foreign Keys** tab. You may add more foreign key relationships if you wish.

It is important that PDRE know what the foreign keys are for each table it replicates. Foreign keys determine the order in which PDRE replicates tables, replicating parent tables before child tables. Foreign keys are also required if you define work sets ad transaction sets. See "Foreign Keys" in "Database Considerations."

To specify foreign key relationships

1 ♦ In the main PRD window, click the **Foreign Key** tab.

2 ♦ In the **Create new relationship from <TableName> to parent table** field, from the drop-down menu select a parent table for this child table. The primary key field(s) for the parent table and candidate foreign key field(s) display.

3 ♦ Select the appropriate foreign key field(s) that correspond to the primary key field(s).

4 ♦ Click **Add Relationship**. The relationship is added to the list of **Existing Relationships**.

Repeat these steps for each foreign key in your database.

To modify a foreign key relationship

1 ♦ Select a relationship from the **Existing Relationships** list.

2 ♦ Select the primary key and foreign key fields from the drop-down menu.

3 ♦ Click **Apply Changes**.

To delete a relationship, select the relationship from the **Existing Relationships** list, and click **Delete Relationship**.

4.3.5   Verifying and Saving Replication Rules

The next step is to verify and save your database's replication rules. Verifying the database performs checks for cyclic dependencies, such as circular foreign key references, and whether each replicated table has a primary key specified.

To verify and save database replication rules

1 ♦ In the main PRD window, choose **Tools > Verify Rules**.

2 ♦ If PRD found errors in your database, they are displayed. Correct them and re-run the verify tool.

3 ♦ Repeat step 2 until all error messages are resolved.

4 ♦ Choose **File > Save**.

NOTE: PRD lets you save your changes even if there are errors, but you cannot continue with the next steps unless you correct all errors. To view the error messages, select **View > Verification Messages**.

4.4   About Preparing Databases for Activation

You must prepare each database in your replication network for activation using the dimprule utility. If the first site was prepared for activation by PRD (see "Preparing to Activate With PRD"), you do not need to run the dimprule utility.

The dimprule utility

- writes information to PeerDirect system tables.

- creates a control table for each table you are replicating.

- preprocesses any pre-existing user data — also referred to as *starter data*— found in replicated tables by creating control table records for each user table record. (This step is performed at the first InnerEdge Server site but only if you check the **Mark starter data for replication** checkbox, so make sure you check the checkbox.)

NOTE: It is very important that you mark starter data for replication only at your *first site*, which should be an InnerEdge Server site.

PeerDirect recommends that you run PRD in your SDK development environment to create replication rules, and then import these rules to the first site of your production environment (which should be an InnerEdge Server) using the dimprule utility (see "Preparing to Activate Your Replication Sites"). Be sure to specify the dimprule -FIRSTSITE parameter at the first InnerEdge Server site.

If you use PRD to activate your first site, you must be sure to check the **Mark starter data for replication** checkbox for InnerEdge Servers. All data in the OuterEdge database(s) will be initialized during a special *starter data reconciliation phase* that occurs during the initial replication with the InnerEdge Server database.

4.4.1　　Preparing to Activate Your Replication Sites

Begin by preparing your first InnerEdge Server for activation. PeerDirect recommends that you create your Rule file using PRD in your SDK development environment and then run the dimprule utility to prepare your first InnerEdge Server site.

To prepare to activate an InnerEdge Server using the dimprule utility

Create your rule (.rul) file in PRD before you run `dimprule` on the first InnerEdge Server site.

1 ♦ Open a command-line prompt window.

2 ♦ Type the following command:

```
DIMPRULE -FIRSTSITE -DA=<db_type> -DB=<db_locator> -ODBCN=<username>
-ODBCP=<password> <rule_file_name.rul> [-logwide] [-v]
```

> Example for PostgreSQL database:
>
> ```
> dimprule -FIRSTSITE -DA=postgresql
> -DB=outeredge1:5432:db1
> ```

where

<db_type> is the type of database to be activated and *<db_locator>* is the location of the database. See Table 4–3.

<username> is the user name you used in the PeerDirect Replication Designer (PRD). PDRE will use this name to connect to the SQL database. PeerDirect strongly recommends that you use "PDUSER". See "Setting Up Database Logins and Permissions.".

<password> is the password that corresponds to the user name above. The parameter is optional and defaults to "password". Be sure to enclose the password in double-quotes if it contains spaces.

<rule_file_name.rul> is the name of the file you created when you set up the first InnerEdge server. You can get the name of this file from that site.

-logwide and -v (verbose) are optional parameters that enable detailed logging activity.

-FIRSTSITE designates this site to be the first site in the replication network and is used at only one site per replication network.

NOTE:　The -ODBCN and -ODNCP parameters represent the user ID and password that PDRE will use to log in to and access the database. You must therefore have granted sufficient permissions to this user ID to allow it to read and update all replicated tables in the database. See "Setting Up Database Logins and Permissions.".

4.4.2 Preparing to Activate With PRD

This preparation lets you export a Rule (RUL) file which the PeerDirect administrator can then use to set up and activate other servers. It is important that you create the Rule file for the first site you install and then apply the same Rule file to all other databases you plan to replicate with. Be sure to write down the name of the Rule file you create for future PDRE installations.

To prepare to activate your InnerEdge Server database

1 ♦ Choose **Tools > Prepare to Activate...**.

2 ♦ If you know the network address of the InnerEdge Server site in your replication network, enter it. If you are using single engine replication, you can enter "localhost".

3 ♦ If you have initial data in the database (starter data), leave the **Mark starter data for replication** checkbox checked.

4 ♦ Click **OK**.

5 ♦ A dialog appears telling you that the database has been prepared for activation.

6 ♦ Click **OK**.

To export rules

After you have successfully completed the Prepare to Activate... operation, you must export the replication rules to a file. The default file extension is `.rul`.

1 ♦ Choose **File > Export Rules** and save the replication rules to a file, such as xPD060102.RUL. You must use this rule file to set up other replication sites.

2 ♦ Exit the PeerDirect Replication Designer.

4.4.3 Activating the InnerEdge Server Database

After you've prepared the InnerEdge Server, you must prepare the OuterEdge Server and associate it with the PeerDirect Replication Engine on the InnerEdge Server. This will activate your database, making it available for replication and creating the default PeerDirect Administrator account for the site.

To activate the database at the InnerEdge Server site

1 ♦ Open a command-line prompt window.

2 ♦ Type the following command

```
DINST -DATABASETYPE=<db_type> -DBLOCATOR=<db_locator>
-ODBCN=<username> -ODBCP=<password> -FIRSTSITE
-PNLICENSE=<license.pnl>
```

where

<db_type> is the type of database to be activated and <db_locator> is the location of the database. See Table 4–3.

<username> is the user name you used in the PeerDirect Replication Designer (PRD). PeerDirect strongly recommends that you use "PDUSER" as the user name. See "Setting Up Database Logins and Permissions.".

<password> is the password that corresponds to the user name above. The parameter is optional and defaults to "". the empty string. Be sure to enclose the password in double-quotes if it contains spaces.

-FIRSTSITE designates this site to be the first site in the replication network and is used at only one site per replication network.

-PNLICENSE is the replication network file and specifies the network license to use with your replication network. This license is sent to you by PeerDirect Technical Support when you purchase your software. If you need assistance, please contact them at *support@peerdirect.com*.

<license.pnl> is the full path and file name of the license. If you do not supply this information, a dialog appears asking you to supply the license file location.

NOTE: The -ODBCN and -ODNCP parameters represent the user ID and password that PDRE will use to log in to and access the database. You must therefore have granted sufficient permissions to this user ID to allow it to read and update all replicated tables in the database. See "Setting Up Database Logins and Permissions.".

> **NOTE:** For a compete list of DINST arguments and other PDRE utility commands, use the "-?" argument; for example, "DINST -?".

3 ♦ A dialog appears informing you that the activation of the database was successful.

4 ♦ Click **OK**.

5 ♦ In a command-line shell or window, initiate the triggers by typing

DTRIGGER *<odbc_datatsource>* -ODBCN=*<username>* -ODBCP=*<password>*

where

<odbc_datasource> is the name of the data source.

<username> is the user name that PDRE uses to connect to the database.

<password> is the password that corresponds to the user name above.

4.4.4 Preparing and Activating the OuterEdge Server Sites

This task must be performed from the command-line console of the machine that is running PDRE for the OuterEdge Server. Depending on your configurations, this may not be the same machine on which the OuterEdge database resides.

Once activation of the OuterEdge database is completed, the first replication between the InnerEdge and OuterEdge Server sites occurs.

If you are activating the second database at another workstation, you will encounter errors if PDRE is not already running at the first site. The first replication at a new site normally takes longer than subsequent replications, because PDRE guarantees that all data in common at both sites are exactly synchronized. Subsequent replications normally send only what changed.

To prepare to activate the database on the OuterEdge Server

1 ♦ Open a command prompt window.

2 ♦ You must run `dimprule` to activate the rule file you created when you set up the first InnerEdge Server. To do this, type the following command:

```
DIMPRULE -DA=<db_type> -DB=<db_locator> -ODBCN=<username>
-ODBCP=<password> <rule_file_name.rul> [-logwide] [-v]
```

Example for PostgreSQL database:

```
dimprule -DA=postgresql -DB=outeredge1:5432:db1
```

where

<db_type> is the type of database to be activated and *<db_locator>* is the location of the database. See Table 4–3.

<username> is the user name you used in the PeerDirect Replication Designer (PRD). PDRE will use this name to connect to the SQL database. PeerDirect strongly recommends that you use "PDUSER". See "Setting Up Database Logins and Permissions.".

<password> is the password that corresponds to the user name above. The parameter is optional and defaults to "password". Be sure to enclose the password in double-quotes if it contains spaces.

<rule_file_name.rul> is the name of the file you created when you set up the first InnerEdge server. You can get the name of this file from that site.

-logwide and -v (verbose) are optional parameters that enable detailed logging activity.

To activate an OuterEdge Server site

Use the dinst utility to activate the OuterEdge Server site.

1 ♦ Type the following DINST command:

```
DINST -DATABASETYPE=<db_type> -DBLOCATOR=<db_locator>
-ODBCN=<username> -ODBCP=<password> -SITETYPE=<site_type> -PA
=<first_PDRE_site>
```

> where
>
> `-SITETYPE` specifies one of the following values. For an OuterEdge Server, select either LOW or HIGH. Select COMPLETE only if you are configuring your OuterEdge Server to be a failover server.
>
> a) LOW — (default) site is available only for replication from time to time.
>
> b) HIGH — site is available for replication at all times.
>
> c) COMPLETE — site is available for replication at all times and the database stores ALL of the data in the replication network, that is all work set slices are auto-subscribed to.
>
> `-PA` specifies the first PDRE site you installed, which should also be the first InnerEdge Server site installed.

NOTE: The `-ODBCN` and `-ODNCP` parameters represent the user ID and password that PDRE will use to log in to and access the database. You must therefore have granted sufficient permissions to this user ID to allow it to read and update all replicated tables in the database. See "Setting Up Database Logins and Permissions."

> For a compete list of DINST arguments and other PDRE utility commands, use the "-?" argument; for example, "DINST -?".

2 ♦ A dialog appears informing you that the activation of the database was successful.

3 ♦ Click **OK**. The first replication between the InnerEdge Server and OuterEdge site occurs.

NOTE: If you are activating the OuterEdge Server database at another workstation, you will encounter errors if PDRE is not already running on the InnerEdge Server. The first replication at a new site normally takes longer than subsequent replications, because PDRE guarantees that all data in common at both sites are exactly synchronized. Subsequent replications normally send only what changed.

4 ♦ In a command-line shell or window, initiate triggers by typing

```
DTRIGGER <odbc_datatsource> -ODBCN=<username>
-ODBCP=<password>
```

where

<odbc_datasource> is the name of the data source.

<username> is the user name that PDRE uses to connect to the database.

`<password>` is the password that corresponds to the user name above.

NOTE: This step is not necessary for a Progress replication network.

4.5   Initiating a Replication Session

PDRE initiates replication data bidirectionally from either the InnerEdge Server or the OuterEdge Server. If your PeerDirect-prepared databases have activated successfully, follow these directions to initiate further replication sessions.

1 ♦ Open the PDRE user interface.

2 ♦ Choose **Action > Initiate Replication**.

3 ♦ The **Initiate Replication** dialog displays. Select the database you want to initiate, typically the second database site.

4 ♦ Click **Replicate Now.**

If one of the replication sites has a site type of LOW, PDRE may tell you that it is unable to find a suitable replication partner site. This happens if you select a HIGH site and click Replicate Now, because LOW sites are never chosen by default as partner sites. If you want to initiate replication from a HIGH site to a LOW site, you must use the Advanced button and explicitly select the two sites you want to replicate between. The easiest way to avoid this message is to always select the LOW site and initiate the replication from the LOW site to the HIGH site.

4.6   Administering a Replication Network

To administer a replication network, the Windows PeerDirect Administrator is required. This application is used to schedule or subscribe to work set slices (see the *PeerDirect Replication Engine Tutorial* for information about how to create and use work slices).

If your replication network is running on Linux, you must install the Windows PeerDirect InnerEdge or OuterEdge Server. When you install, choose the Custom Installation option and the Client Access Edition. When you've completed the installation, then you can activate a client database site by using the `dinstc` utility. This will allow the PeerDirect Administrator to connect to a PeerDirect Replication Engine on Linux and remotely administer the specified database in the network.

4.7   What's Next

You've successfully set up PDRE and can perform your first replication. Refer to the PeerDirect Replication Engine (PDRE) documentation for information about replicating data (located in the `docs` directory of the PeerDirect InnerEdge Server installation CD-ROM.