Lasso Professional 6
Linux User Guide

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Second Edition: February 26, 2003

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1

Chapter 1
Introduction

This chapter provides an introduction to Lasso Professional 6 on the Red Hat Linux platform, and describes how the documentation should be used.

- *The Lasso Professional 6* introduces Lasso Professional 6 on the Red Hat Linux platform.
- *Documentation* describes the recommended usage of the documentation provided with Lasso Professional 6 for Red Hat Linux.
- *Getting Started* provides an overview of the steps required to get Lasso Professional 6 up and running on Red Hat Linux.
- *Usage Rights* includes important information about usage rights for Lasso Professional 6.

Lasso Professional 6

Welcome to Lasso Professional 6, the premiere tool for serving data-driven Web sites. Lasso Professional 6 allows you to serve dynamic Web pages using a simple tag-based markup language (LDML) and integrated Lasso MySQL data source.

Lasso Professional 6 is designed to run on the most prevalent modern Web server platforms with the most popular Web serving applications. For Red Hat Linux, Lasso Professional 6 is implemented as a native application which interfaces with the Apache Web server provided with Red Hat Linux servers.

Lasso Professional 6 consists of a core Lasso Service application and several Lasso Connectors which establish links to Web servers and data sources. Lasso Professional 6 has the following components.

- **Lasso Service** – The core application or Web Data Engine.
- **Lasso MySQL** – The internal data source of Lasso Professional 6.
- **Lasso Connector for Apache** – Allows Lasso solutions to run via the built-in Apache Web server in Red Hat Linux.
- **Lasso Connector for MySQL** – Allows Lasso to access MySQL data sources other than the included Lasso MySQL data source.
- **Lasso Connector for FileMaker Pro** – Allows Lasso to access FileMaker Pro 4.x, 5.x, and 6.x data sources.
- **Lasso Connector for JDBC** – Allows Lasso to access JDBC-compliant data sources, including Microsoft SQL Server, PostgreSQL, Sybase, Oracle, and others.

For complete documentation of Lasso Professional 6 architecture and features, see *Chapter 2: Lasso Professional 6* in the Lasso Professional 6 Setup Guide.

Documentation

This section contains information about the documentation included with Lasso Professional 6 for Red Hat Linux.

Lasso Professional 6 Documentation

The documentation for Lasso Professional 6 is divided into several different references available in print and electronic formats. All electronic documentation is included in PDF format in the /usr/local/LassoProfessional6/Documentation/ folder installed with Lasso Professional 6. The following manuals and resources are available.

- **Lasso Professional 6 Linux User Guide** – This book includes all documentation for Lasso Professional 6 that is specific to Red Hat Linux. It is recommended that this guide be read first.
- **Lasso Professional 6 Setup Guide** – This book includes documentation of the architecture and features of Lasso Professional 6, the administration interface, and Lasso Security topics. It is recommended that this book be read following the guide you are reading now.
- **Lasso 6 Tutorial** – The tutorial includes detailed, step-by-step documentation of how to build a real-world Lasso solution. This book provides a good introduction to the steps involved in setting up and building a Lasso solution.

- **Lasso 6 Language Guide** – The documentation of LDML (Lasso Dynamic Markup Language), the language used to access data sources, specify programming logic, and much more.
- **LDML 6 Reference** – Provides detailed documentation of each tag in LDML 6. This is the definitive reference to the language of Lasso 6. This reference is provided as a LassoApp installed with Lasso Professional 6, and is also available as an online resource from the Blue World Web site.
- **Extending Lasso 6 Guide** – A collection of documentation and sample projects which allow you to extend the capabilities of Lasso in C, C++, Java, TCP/IP, and LDML.

Comments, suggestions, or corrections to the documentation are appreciated and may be sent to the following email address.

documentation@blueworld.com

Lasso Professional 6 Linux User Guide

This is the book you are reading. This book contains the following chapters which detail how to install and use Lasso Professional 6 on Red Hat Linux.

- *Chapter 1: Introduction* introduces Lasso Professional 6 for Red Hat Linux and the documentation, and provides instructions for getting started.
- *Chapter 2: Linux Installation* provides step-by-step instructions for installing Lasso Professional 6 on Red Hat Linux.
- *Chapter 3: Linux Issues* describes specific issues when using Lasso Professional 6 on the Red Hat Linux platform.

Documentation Issues

For a discussion of issues when using the Lasso Professional 6 documentation (other than this guide) with Red Hat Linux, see *Chapter 3: Linux Issues*. As the documentation for Lasso Professional 6 was written before the Red Hat Linux version became available, it is strongly recommended that everyone read this chapter.

Getting Started

This section provides an overview of getting started with Lasso Professional 6 for Red Hat Linux, including installation, data source configuration, administration, and running an example solution.

To get started with Lasso Professional 6:

1. Install Lasso Professional 6 for Red Hat Linux per instructions in *Chapter 2: Linux Installation* of this guide, and follow the instructions for testing the example Contacts database.
2. For setting up a data source to communicate with Lasso, refer to *Chapter 5: Data Sources* in the Lasso Professional 6 Setup Guide for data source requirements.
3. For an overview of the Lasso Administration interface, refer to *Chapter 6: Administration* in the Lasso Professional 6 Setup Guide.
4. For a complete walk-through of setting up and running a complete example database and data-driven solution with Lasso Professional 6, refer to *Chapter 2: Getting Started* in the Lasso Professional 6 Tutorial.

Usage Rights

This section describes the product usage rights for Lasso Professional 6.

New Purchase

Your license permits a single copy of Lasso Professional 6 to be installed and used on a single computer. While certain components of Lasso Professional 6 (e.g. Lasso Web server connectors) may be installed on a separate computer from the core of Lasso Professional 6 (e.g. Lasso Service), only a single instance of each component is permitted. The license does not permit development or deployment using non-purchased versions or evaluation versions.

Upgrade Purchase

It is standard industry practice and understood that by upgrading one's software one no longer uses the old version and the license to use and transfer said license ceases.

If you have upgraded to Lasso Professional 6 from any previous version of Lasso, you must no longer use that version. Please see the termination provisions in the accompanying license agreement for further details. Alternatively, you could purchase a new Lasso Professional 6 license and not be bound by such upgrade restrictions.

Evaluation Versions

Evaluation versions are provided for one-time 30-day evaluation and initial product testing use. Evaluation versions are not licensed for use for extended development. The documentation provided with evaluation versions is to be used strictly within the evaluation time period.

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Chapter 2
Linux Installation

This chapter contains the installation and configuration instructions for Lasso Professional 6 on Red Hat Linux. This chapter is a step-by-step guide to installing and initializing Lasso Professional 6. It also contains information on Lasso Professional 6 components and how to they can be manually installed or modified.

- *Overview* provides an overview of the installation process for Lasso Professional 6.
- *System Requirements* lists the minimum system requirements for Lasso Professional 6.
- *Installation Instructions* includes step-by-step instructions for installing Lasso Professional 6 and establishing a basic setup.
- *Java Installation* describes installing the Java components necessary for Java-based features in Lasso Professional 6 to function properly.
- *Installation Contents* lists the files installed with Lasso Professional 6.
- *Running Lasso Professional 6* describes how to start and stop Lasso Service and Lasso MySQL, and how to check if they are running properly.
- *Extended Configuration* describes how to manually configure Apache for Lasso Professional 6, and how to set up a Lasso Professional 6 distributed architecture.
- *Uninstalling Lasso Professional 6* includes step-by-step instructions for removing Lasso Professional 6 from your system.

System Requirements

Lasso Professional 6 will run on systems which meet the minimum requirements listed below. Although Lasso Professional 6 may run on machines which do not meet these requirements, these installations will not be supported.

- 266 MHz or higher Pentium-compatible CPU.
- 128 MB of RAM. More recommended.
- Standard installation of Red Hat Linux 7.3 with network support.
- Default Red Hat Linux installation of Apache Web Server (included with server installations of Red Hat Linux).
- PDF viewer application for viewing the electronic documentation.

Certification Note: Lasso Professional 6 is certified to work with Red Hat Linux version 7.3 with default Red Hat Linux installations of Apache Web server 1.3.26. Modified versions of Apache and customized **httpd.conf** configuration files may work with Lasso Professional 6, but can not be officially supported.

Required Packages

The following packages are required in Red Hat Linux for all features in Lasso Professional 6 to function. These packages are installed with default server installations of Red Hat Linux 7.3.

Table 1: Required Packages

Package	Version
openssl-devel	0.9.6b
curl	7.9.5
libunicode	0.4
zlib	1.1.3
XFree86-libs	4.2.0

Web Browser Requirements

This section describes the basic Web browser requirements needed to successfully set up and administer Lasso Professional 6 in Red Hat Linux.

- Netscape 6.0 or higher; Mozilla 0.9.9 or higher; or Konquerer 3.0 or higher.
- Javascript enabled.

- Cookies enabled.
- Cascading Style Sheets support.
- Monitor capable of 800 x 600 resolution.

If this criteria is not met, then a browser check dialog box will be shown when trying to access Lasso Administration. You may proceed into the interface without meeting all these criteria, however some elements may not work properly. It is highly recommended that a browser that meets the listed requirements be used.

Web Browser Certification Note: Blue World Communications has tested and certified Netscape 6.2 and Mozilla 0.9.9 within KDE 3 to work with Lasso Administration in Lasso Professional 6. This certification does not warrant the exclusion of other Web browsers for use with Lasso Administration, nor does it constitute an endorsement of any particular Web browser.

Installation Instructions

This section discusses installation procedures for Lasso Professional 6, and initializing Lasso Administration for the first run. This section will introduce the following:

- *Installing Lasso Professional 6* describes how to install Lasso Professional 6 using the auto-installation program.
- *Initialization* describes the initialization of Lasso Professional 6 for running the first time.
- *Administration* describes how Lasso Administration is set up.
- *Test Configuration* describes where to go for additional installation resources and troubleshooting.

Installing Lasso Professional 6

The Lasso Professional 6 Installer for Red Hat Linux is an RPM file, which must be installed from the Red Hat Linux command line or console application. The installer will install all required files for Lasso Professional 6, and will automatically start Lasso Service, Lasso MySQL, and Apache upon completion.

To install Lasso Professional 6:

1. Copy Lasso_Pro_6-Linux-6.0.0-1.i386.rpm to the Red Hat Linux hard drive. This file is unpacked from the Lasso_Pro_6_Linux.tar.gz archive along with the Lasso_Pro_6_Linux_User_Guide.pdf, License_Agreement.txt, and Release_Notes.txt files.

2 Before using the installer, make sure that the Apache Web server is not running. This is done by entering sudo /usr/sbin/apachectl stop at the command prompt.

3 Log in as the root user of the Red Hat Linux machine. This is done by entering su in the command prompt, then entering the root password.

4 Enter the following command to install Lasso Professional 6. This will display a series of messages during the installation process.

```
rpm -i Lasso_Pro_6-Linux-6.0.0-1.i386.rpm
```

After Lasso Professional 6 is installed and Lasso Service is successfully started, a message will appear with a URL address for initializing Lasso Professional 6 in a Web browser. This is described in the next section.

Initialization

The Initialize Web page is where the administrator enters the Lasso Professional 6 serial number, and sets the global administrator username and password for the first time.

To launch the Initialize page:

1 Launch a Web browser application. See the *System Requirements* section earlier in this chapter for Web browser requirements in Red Hat Linux.

Web Browser Note: Because Lasso Administration is Web-based, initialization and administration of Lasso Professional 6 can be performed from a separate machine and operating system from the installation. See chapters 3 and 4 in the Lasso Professional 6 Setup Guide for Web browser requirements for Mac OS X and Windows 2000/XP.

2 If on the same machine as the Lasso Professional 6 installation, go to the following URL.

```
http://127.0.0.1/Lasso/
```

If on a different machine from the Lasso Professional 6 installation, go to the following URL. Replace www.example.com with the domain name or IP address of the server running Lasso Professional 6.

```
http://www.example.com/Lasso/
```

Troubleshooting: In the event the Lasso Initialization page does not load, make sure that Lasso Service and Lasso MySQL have started properly as described in the *Running Lasso Professional 6* section of this chapter. Otherwise, make sure that Apache is running, and that the installer was able to successfully edit the Apache configuration file (httpd.conf) as

described in the *Extended Configuration > Lasso Connector for Apache* section of this chapter.

Initializing Lasso Professional 6

The Welcome to Lasso Professional 6 panel displays a message listing the steps required to initialize Lasso. This involves entering a serial number, and setting the administrator username and password.

Figure 1: Initialize Page

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For evaluation versions of Lasso Professional 6, an evaluation serial number is required to complete initialization. To request an evaluation serial number, select the Request Evaluation Serial Number button. This will take you to the Blue World Web site, where an evaluation serial number can be obtained.

Once a serial number is obtained, Lasso Professional 6 can be initialized by following the procedure below.

To initialize Lasso Professional 6:

1 Enter the Lasso Professional 6 serial number in the Serial Number field. This must be entered exactly as it appears in your Blue World invoice using the following format:

LP6-LIN-123456789

Serial numbers are case-sensitive. Make sure that all capitalization is correct and that all letters and numbers are entered, including the LP6 prefix.

2 Enter an administrator username in the Administrator Username field. This username will be used by the Lasso Professional 6 global administrator to log in to the administration interface, as discussed in *Chapter 6: Administration* of the Lasso Professional 6 Setup Guide.

   Note: The administrator username and password in Lasso Administration are independent of Red Hat Linux administrator usernames and passwords, and do not have to match.

3 Enter an administrator password in the Administrator Password field. This password will be used by the Lasso Professional 6 global administrator with the administrator username to log in to the administration interface.

4 Re-enter an administrator password in the Confirm Password field.

5 Select Submit Information.

Note: Only a person with the administrator username and password will be able to log in to Lasso Administration, and has full privileges to make changes therein. Make sure this information is kept secure.

Not entering one or any of the required fields before selecting the Submit button will return an error. After the initialization information has been successfully submitted, an Initialization Complete panel is displayed stating that Lasso Professional 6 has been successfully initialized.

Figure 2: Initialization Complete Panel

Selecting the Open Lasso Administration button will open Lasso Administration, where all options in Lasso Professional 6 can be set up and configured.

Administration

At this point, Lasso Professional 6 has been initialized and is ready to use. Lasso Professional 6 provides a convenient, Web-based interface for configuring Lasso global settings, instantly managing and editing databases,

configuring Lasso Security, monitoring events, and much more. It is within this interface that all Lasso settings and databases are set up and configured.

Figure 3: Lasso Professional 6 Administration

For a full description of Lasso Administration and how to use it, see *Chapter 6: Administration* in the Lasso Professional 6 Setup Guide.

Test Configuration

At this point, it will be desirable to set up and test existing data sources in Lasso Professional 6. The Contacts database in Lasso MySQL is supplied specifically for this purpose. Follow the procedures below to set up and test the Contacts database.

Testing the Contacts Database

The Contacts database can be tested using the Browse section of Lasso Administration, which allows one to browse through the records of the Contacts database. The Browse section is described in *Chapter 9: Browse* in the Lasso Professional 6 Setup Guide. Follow the procedure below for testing the Contacts database.

Figure 4: Databases Page

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To test the Contacts database:

1 In Lasso Administration, go to the *Browse > Databases > Select* page.

2 In the Database Select panel, select Lasso Connector for Lasso MySQL from the Connector pull-down menu. This will display Lasso MySQL in the host pull-down menu, which is the only selectable host.

3 Select Contacts from the Database pull-down menu.

4 Select people from the Table pull-down menu.

5 Select ID from the Key Field pull-down menu.

6 To display all records in the people table, select the Find All Records button. This displays all records in the people table in the List page sorted by ID.

7 To add a record, select the Add tab.

8 In the Add Record panel, enter an appropriate value for each field.

9 Select Add Record.

10 After the record has been added, try to search for it by selecting the Search tab.

11 In the Search Database panel, enter the same value in the company field that you entered in step 7.

12 Select Search. If the newly added record appears in the resulting screen, then Lasso Professional 6 has been set up correctly.

As soon as this is accomplished, one is ready to start deploying and developing Lasso solutions. The following describes where to go for more infor-

mation on building MySQL databases, setting up and testing external data sources, and starting development.

- Setting up existing FileMaker Pro, MySQL, and JDBC data sources for use with Lasso Professional 6 is described in *Chapter 5: Data Sources* and *Chapter 7: Setup > Data Sources* in the Lasso Professional 6 Setup Guide. These data sources can also be tested in the Browse section of Lasso Administration.
- The Build section of Lasso Administration allows custom MySQL databases to be built and enabled for use with Lasso Professional 6, and is described in *Chapter 8: Build* in the Lasso Professional 6 Setup Guide.
- For a walk-through on how to build a custom Lasso solution for FileMaker Pro or MySQL data sources, see the Lasso 6 Tutorial.

Security Note: Lasso Professional 6 uses ports 14550 and 14551 for Lasso Service and Lasso MySQL, respectively. These applications cannot be accessed by anonymous users, however, to protect these applications it is recommended that system administrators block these ports from incoming requests from IP addresses other than the IP address of the Web server using Lasso Professional 6.

Java Installation

This section discusses installing Sun's Java Runtime Environment (JRE) 1.4.1 for Red Hat Linux. JRE 1.4.1 is required to successfully use the Java-based features available in Lasso Professional 6. These include LJAPI modules, JDBC data source connectivity, and LDML tags which are dependent upon Java. For details on which LDML tags are dependent upon Java, see the LDML 6 Reference. It is unnecessary to install Java if these features will not be used.

To install JRE 1.4:

1. Download Sun's JRE installer for Linux at the following URL:

   http://java.sun.com/j2se/1.4.1/download.html

2. Follow the instructions at the following URL to install JRE 1.4.1:

   http://java.sun.com/j2se/1.4.1/jre/install.html

The Java-based features of Lasso Professional 6 can be enabled and tested within Lasso Administration. See *Chapter 3: Linux Issues* for more information.

JRE Versions

If a different version of the Java Runtime Environment is installed other than 1.4.1, it is possible to port this version to Lasso by creating a j2re1.4.1 symlink to the current version.

To port a different JRE version to Lasso Professional 6:

Execute the command below in the console. Replace j2re<version> with the JRE version folder currently installed.

```
ln -s /usr/java/j2re<version> /usr/java/j2re1.4.1
```

Certification Note: While versions of Java other than JRE 1.4.1 may work with Lasso Professional 6, they are not officially supported.

Installation Contents

This section contains a list of all files and folders that are installed during Lasso Professional 6 installation.

Lasso User Note: The Lasso Professional 6 installer creates a lasso (lowercase) user and group account in Red Hat Linux that is used to read, write, and execute files related to Lasso Professional 6. This user is installed automatically, and no configuration for this user is required. Do not attempt to configure or change the settings for this user as it will affect the functionality of Lasso Professional 6.

Application Files

Lasso Professional 6 installs the following files and folders in the /usr/local/LassoProfessional6 folder on the Red Hat Linux hard drive.

- **Admin folder** – Contains files and folders used for administering Lasso Professional 6.

  Backup folder – Is the destination folder for all Lasso MySQL table backups using the *Monitor > Lasso MySQL > Maintenance* section of Lasso Administration. For more information, see *Chapter 10: Monitor* in the Lasso Professional 6 Setup Guide.

  Browse folder – Is the destination folder for all text data imported and exported using the *Browse > Database > Import* and *Browse > Database > Export* sections of Lasso Administration. For more information, see *Chapter 9: Browse* in the Lasso Professional 6 Setup Guide.

BuildLassoApps folder – Is a folder used to build LassoApps. For more information, see *Chapter 8: Build* in the Lasso Professional 6 Setup Guide.

Setup folder – Is the destination folder for all files exported using Lasso_3_Exporter and the *Setup > Global Settings > Import/Export* section of Lasso Administration. For more information, see *Chapter 7: Setup*.

LassoService.sh – This is the "watchdog" script for Lasso Professional 6. This file continuously queries Lasso Service to make sure that it is running when it is supposed to be, and automatically restarts Lasso Service if it inadvertently quits. When it does this, a log entry is added to the standard system log file (traditionally /var/log/system.log) in Red Hat Linux. If the number of restarts exceeds 20 per hour, the script stops attempting to start Lasso Service until the problem is fixed manually and the machine is rebooted.

- **Documentation folder** – Contains all Lasso Professional 6 documentation in PDF format, which can be viewed with Adobe Acrobat Reader. The following files and folders are contained in this folder. It is highly recommended that the documentation be read in this order.

  1-ReadMeFirst folder – Contains Release_Notes.txt, License_Agreement.txt, and Lasso_Pro_6_Linux_User_Guide.pdf. Read this documentation in this folder first before proceeding to configure Lasso Professional 6.

  2-SetupGuide folder – Contains Lasso_Pro_6_Setup_Guide.pdf.

  3-Tutorial folder – Contains Lasso_6_Tutorial.pdf and the LassoISP_Solution, Databases, and LassoApp folders.

  4-LanguageGuide folder – Contains Lasso_6_Language_Guide.pdf, examples.

  5-ExtendingLasso folder – Contains Extending_Lasso_6_Guide.pdf and the LassoApps, LCP, LCAPI, and LJAPI folders.

  6-LassoMySQL folder – Contains documentation for Lasso MySQL.

- **Extensions folder** – Contains additional Lasso 6 connectors and LassoApps not installed by default. This includes:

  DatabaseBrowser.LassoApp – Is the Lasso Database Browser, which is discussed in *Chapter 9: Browse* in the Lasso Professional 6 Setup Guide.

- **JDBCDrivers folder** – Drivers for JDBC data sources are placed here (empty by default). For instructions on how to use this folder while configuring JDBC data sources, see *Chapter 5: Data Sources* in the Lasso Professional 6 Setup Guide.

- **LassoModules folder** – Contains all default Lasso modules included with Lasso Professional 6 as listed below. All data source connectors (including third-party connectors) and tag modules should go here.

  EmailCAPIDataSource.so – Implements legacy email tag support.

FMPConnector.so – Data source connector module for FileMaker Pro data sources.

MySQLConnector.so – Data source connector module for external MySQL data sources.

JDBCConnector.jar – Data source connector module for JDBC data sources.

LJAPI.jar – Implements core support for all LJAPI modules (formerly blueworld.lasso.zip in previous versions of Lasso).

libLJAPI5.so – Implements support for LJAPI modules prior to LJAPI 6.

libLJAPI6.so – Implements support for LJAPI 6 modules.

NSLookup.class – Java class file for [NSLookup] tag.

iText.jar – Required library for the [PDF_...] tags.

PDF.jar – Implements support for the [PDF_...] tags.

PDFTag.class – Java class file for the [PDF_...] tags.

Xalan.jar – Required library for the [XML_...] tags.

XercesImpl.jar– Required library for the [XML_...] tags.

XML-APIs.jar – Implements support for the [XML_...] tags.

XMLTransformTag.class – Java class file for the [XML_...] tags.

Note: There is no separate module for the Lasso Connector for Lasso MySQL. This is built into the core Lasso Service code.

- **LassoMySQL folder** – Contains a standard installation of Lasso MySQL. Lasso MySQL is the internal MySQL database provided with Lasso Professional 6. Lasso MySQL is required to store Lasso Professional 6 settings and preferences, and can also be used to store data in place of, or in concert with, external databases. For more information, see *Chapter 12: Lasso MySQL* in the Lasso Professional 6 Setup Guide.
- **LassoService** – Lasso Service is the core executable of Lasso Professional 6. It is implemented as a service application which can be started and stopped independently from the Web server. Lasso Service is the Lasso Web Data Engine.
- **LassoStartup folder** – Contains the Startup.LassoApp file, which is used by Lasso Service during startup. All Lasso format files and LassoApps which need to be launched during startup should be placed here. For information on how to use the LassoStartup folder, see *Chapter 3: Format Files* of the Lasso 6 Language Guide. For additional discussion of the LassoStartup folder, see the Extending Lasso 6 Guide.
- **Tools folder** – Contains Red Hat Linux terminal command files for performing various tasks with Lasso Professional 6. These command

files allow users to perform tasks using the terminal by simply double-clicking on the command files.

consoleLassoService.sh – Starts Lasso Service as an application in the terminal. Useful for viewing the startup log and troubleshooting. For instructions on how to use this file, see the *Running Lasso Professional 6* section of this chapter.

LassoMySQLclient – Lasso MySQL command line utility. Allows direct communication with Lasso MySQL databases via SQL statements.

startLassoMySQL.sh – Starts Lasso MySQL via the terminal. For instructions on how to use this file, see the *Running Lasso Professional 6* section of this chapter.

startLassoService.sh – Starts Lasso Service via the terminal. For instructions on how to use this file, see the *Running Lasso Professional 6* section of this chapter.

stopLassoMySQL.sh – Stops Lasso MySQL via the terminal. For instructions on how to use this file, see the *Running Lasso Professional 6* section of this chapter.

stopLassoService.sh – Stops Lasso Service via the terminal. For instructions on how to use this file, see the *Running Lasso Professional 6* section of this chapter.

Startup Files

The /usr/sbin/ folder contains files that are used to auto-start Lasso Service at boot time.

- **lassoctl** – Auto-starts Lasso Service at boot time. A symbolic link to this file is also placed in /etc/rc.d/init.d/.
- **lassomysqlctl** – Auto-starts Lasso MySQL at boot time. A symbolic link to this file is also placed in /etc/rc.d/init.d/.

Web Server Files

Lasso Professional 6 installs the following files in the Web server root folder of the Red Hat Linux hard drive. For Apache Web Server, this is the /var/www/html/ folder.

Lasso folder

The Lasso folder contains the following:

- **default.html, default.htm, index.html, index.htm** – Contains the splash screen for Lasso Professional 6.

- **Admin.LassoApp** – The Lasso Administration LassoApp. For more information, see *Chapter 6: Administration* in the Lasso Professional 6 Setup Guide.
- **GroupAdmin.LassoApp** – The Group Administration LassoApp. For more information, see *Chapter 7: Setup* in the Lasso Professional 6 Setup Guide.
- **LDMLReference.LassoApp** – The LDML 6 Reference LassoApp. For more information, see *Chapter 5: LDML Reference* in the Lasso 6 Language Guide.
- **RPC.LassoApp** – The XML-RPC LassoApp. For more information, see *Chapter 29: XML* in the Lasso 6 Language Guide.
- **error.lasso** – The default Lasso error page.
- **images folder** – Contains images files for the HTML pages in the Lasso folder.
- **initialize.lasso** – The initialization page for Lasso Professional 6.
- **install.html** – The installation splash screen for Lasso Professional 6.
- **logout.lasso** – The default Lasso logout page.

Linux Files

Lasso Professional 6 installs the following files in various locations in Red Hat Linux.

- **httpd.conf** – Lasso Professional 6 modifies the Apache configuration file (httpd.conf) located in the /etc/httpd/conf folder.
- **lassoapache.conf** – The Web server configuration file for Lasso Connector for Apache, located in the /etc/lasso folder.
- **LassoConnectorforApache.so** – This file is the Lasso Web server connector for Apache, located in /user/lib/apache folder.
- **LassoMySQL.sock** – This file is placed in the /tmp folder while Lasso MySQL is running.
- **LassoService.pid** – This file is placed in the /tmp folder while Lasso Service is running.

Running Lasso Professional 6

This section describes how to start and stop Lasso Service and Lasso MySQL, which are the two main components of Lasso Professional 6.

- *Lasso MySQL* describes manually starting and stopping Lasso MySQL, which is the internal MySQL database provided with Lasso Professional 6.
- *Lasso Service* describes manually starting and stopping Lasso Service, which is the core executable of Lasso Professional 6.

Lasso MySQL

Lasso MySQL is the internal MySQL database provided with Lasso Professional 6, and is required to store Lasso 6 settings and preferences, and can also be used to store data in place of, or in concert with external databases. Lasso MySQL is started and stopped using the terminal command files provided in the /usr/local/LassoProfessional6/Tools folder.

Warning: Lasso MySQL is highly integrated within the architecture of Lasso Professional 6, and should never be removed, disabled, or overwritten. For more information on Lasso MySQL, see ***Chapter 12: Lasso MySQL*** in the Lasso Professional 6 Setup Guide

To start Lasso MySQL:

1. Log in as the root user of the Red Hat Linux machine. This is done by entering su in the command prompt, then entering the root password.
2. At the command prompt, enter the following to go to the Tools folder.

   ```
   cd /usr/local/LassoProfessional6/Tools
   ```

3. Enter the following command to start Lasso MySQL.

   ```
   ./startLassoMySQL.sh
   ```

4. A Lasso MySQL has been successfully started message will appear in the console window when Lasso MySQL has started.

To stop Lasso MySQL:

1. Log in as the root user of the Red Hat Linux machine. This is done by entering su in the command prompt, then entering the root password.
2. At the command prompt, enter the following to go to the Tools folder.

   ```
   cd /usr/local/LassoProfessional6/Tools
   ```

3. Enter the following command to stop Lasso Service.

   ```
   ./stopLassoService.sh
   ```

4. A Lasso MySQL has been successfully stopped message will appear in the console window when Lasso MySQL has stopped.

To see if Lasso MySQL is running:

At the command prompt, enter the following command. This will display all LassoMySQL processes currently running.

```
ps -ax | grep LassoMySQL
```

Note: More than one LassoMySQL process will be shown due to the fact that Lasso MySQL is multi-threaded. Once Lasso MySQL is stopped using the stopLassoMySQL.sh file, all LassoMySQL threads are killed.

Lasso Service

Lasso Service is the core executable of Lasso Professional 6. It is implemented as a service application which can be started and stopped independently from the Apache Web server. Lasso Service is started and stopped using the terminal command files provided in the /usr/local/LassoProfessional6/Tools folder.

Note: Lasso MySQL must be started before Lasso Service. Follow the procedure in the previous section to start Lasso MySQL.

To start Lasso Service:

1. Log in as the root user of the Red Hat Linux machine. This is done by entering su in the command prompt, then entering the root password.
2. At the command prompt, enter the following to go to the Tools folder.

   ```
   cd /usr/local/LassoProfessional6/Tools
   ```

3. Enter the following command to start Lasso Service.

   ```
   ./startLassoService.sh
   ```

4. A Lasso Service has been successfully started message will appear in the console window when Lasso Service has started.

Lasso Service can also be run in verbose mode from within the console. This allows Lasso Professional 6 status messages to be viewed, including all actions that are currently being performed and all actions that have been performed since start up. This is useful for monitoring and troubleshooting purposes. Lasso Service should be started this way whenever any problem is encountered in Lasso Professional 6.

To start Lasso Service in console mode:

1. Log in as the root user of the Red Hat Linux machine. This is done by entering su in the command prompt, then entering the root password.
2. At the command prompt, enter the following to go to the Tools folder.

   ```
   cd /usr/local/LassoProfessional6/Tools
   ```

3 Enter the following command to start Lasso Service in console mode.

```
./consoleLassoService.sh
```

4 Lasso Service messages will now appear in the console. Lasso Service now "owns" the console, and quitting the console will effectively quit Lasso Service.

To stop Lasso Service:

1 Log in as the root user of the Red Hat Linux machine. This is done by entering su in the command prompt, then entering the root password.

2 At the command prompt, enter the following to go to the Tools folder.

```
cd /usr/local/LassoProfessional6/Tools
```

3 Enter the following command to stop Lasso Service.

```
./stopLassoService.sh
```

4 A Lasso Service has been successfully stopped message will appear in the console window when Lasso Service has stopped.

To see if Lasso Service is running:

At the command prompt, enter the following command. This will display all LassoService processes currently running.

```
ps -ax | grep LassoService
```

Note: More than one LassoService process will be shown due to the fact that Lasso Service is multi-threaded. Once Lasso Service is stopped using the stopLassoService.sh file, all LassoService threads are killed.

Extended Configuration

This section discusses the changes the Lasso Professional 6 installer makes to the Apache configuration file, and how to configure Lasso Professional 6 for a distributed architecture with Apache. This section describes the following:

- *Lasso Connector for Apache* describes configuring the module that installs into Apache and provides connectivity to Lasso Service.
- *Remote Apache Configuration* describes manually configuring Lasso Service to run on a separate machine from Apache Web server (distributed architecture).

Warning: Do not follow the instructions in this section as part of a default installation or configuration process. The installer will configure a basic instal-

lation of Lasso Professional 6 properly without any additional modification. This section is intended as a reference for experienced Apache administrators.

Lasso Connector for Apache

Lasso Connector for Apache is the default Web server connector included with Lasso Professional 6 for Red Hat Linux. This section describes what settings Lasso Professional 6 adds to the Apache configuration file (httpd.conf), and how to view or manually change these settings changes.

Apache Configuration

The Lasso Professional 6 installer will automatically perform all necessary changes to the httpd.conf file, located in the hidden /etc/httpd/conf folder on the Red Hat Linux hard drive. After the altering the httpd.conf file, the installer makes a backup of the original file named httpd.conf.bak. The following procedure describes viewing the changes the Lasso Professional 6 installer makes to the Apache configuration file.

To view changes made to the Apache configuration file:

1. Log in as the root user of the Red Hat Linux machine. This is done by entering su in the command prompt, then entering the root password.
2. At the command prompt, enter the following to open the httpd.conf file in the Pico text editor:

   ```
   sudo pico /etc/httpd/conf/httpd.conf
   ```

3. Within the file, locate a string named #LoadModule ssl_module. The following lines should be added after it:

   ```
   #Begin: Added by Lasso 6 Installer
   LoadModule lasso_module /usr/libexec/httpd/LassoConnectorforApache.so
   AddModule LassoConnectorforApache.c
   AddHandler lasso-handler lasso
   AddHandler lasso-handler lassoapp
   #End: Added by Lasso 6 Installer
   ```

   The #Begin and #End lines make it easier for subsequent installers to find Lasso directives and remove or modify them. The AddHandler lines tell Apache to process files with the extensions .lasso and .lassoapp with Lasso Service.

   File Extensions Note: Apache can be set up to process alternate file extensions with Lasso Service by adding additional lines using the following format: AddHandler lasso-handler extension. Replace extension with the file extension you wish to be processed by Lasso Service (e.g. htm, html, etc.).

4 Save the httpd.conf file.

5 Restart Apache Web Server for any changes to take place. This is done by entering the following at the command prompt:

```
sudo /usr/sbin/apachectl restart
```

Remote Apache Configuration

This section describes setting up Lasso Professional 6 in a distributed architecture where Lasso Service runs on a separate Red Hat Linux machine from the Red Hat Linux Apache Web server. To do this, follow the procedure below.

To setup Lasso Connector for Apache on a remote server:

1 On the machine running Lasso Service, stop Lasso Service using the stopLassoService.sh file.

2 On the machine running Lasso Service, stop Apache if it is running. Since the Lasso Connector for Apache is being moved to a remote machine, all Lasso format files and LassoApps (including Lasso Administration) should no longer be served from this machine.

3 On the machine running Lasso Service, move the Lasso folder from the Web server root folder (e.g. /usr/www/html) to the Web server root folder on the remote server.

4 On the machine running Lasso Service, locate the LassoConnectorforApache.so file and move it into the /usr/lib/apache folder on the remote server.

5 On the machine running Lasso Service, locate the lassoapache.conf file and move it into the /etc/lasso folder on the remote server.

6 On the remote Web server, log in as the root user of the Red Hat Linux machine. This is done by entering su in the command prompt, then entering the root password.

7 At the command prompt, enter the following to open the httpd.conf file in the Pico text editor:

```
sudo pico /etc/httpd/conf/httpd.conf
```

8 Add the required lines to the Apache configuration file (httpd.conf) for Lasso Professional 6 as specified in the previous *Lasso Connector for Apache* section.

9 Save and close the httpd.conf file.

10 At the command prompt, enter the following to open the lassoapache.conf file in the Pico text editor:

```
sudo pico /etc/lasso/lassoapache.conf
```

11 Next to Server, replace 127.0.0.1 with the correct host name or IP address of the machine running Lasso Service.

12 Save and close the lassoapache.conf file.

13 On the remote server, restart Apache Web Server. This is done by entering the following command in the terminal:

```
sudo /usr/sbin/apachectl restart
```

14 On the machine running Lasso Service, start Lasso Service. This can be done using the startLassoService.sh file described in the *Running Lasso Professional 6* section of this chapter.

Note: In Lasso Professional 6, only one Web server may connect to the machine running Lasso Service at a time.

Uninstalling Lasso Professional 6

Lasso Professional 6 can be uninstalled using the procedure below. This will automatically remove all core program and system files, and is the only recommended way to uninstall Lasso Professional 6.

Warning: The RPM will remove all files installed by the RPM, including the lasso_internal database which stores all Lasso Administration settings. For preservation of settings, it is recommended that a Lasso Administration export be performed before uninstalling. See *Chapter 7: Setup* in the Lasso Professional 6 Setup Guide for more information.

To uninstall Lasso Professional 6:

1 Stop Lasso Service using the stopLassoService.sh file, as described in the *Running Lasso Professional 6* section of this chapter.

2 Stop Lasso MySQL using the stopLassoMySQL.sh file, as described in the *Running Lasso Professional 6* section of this chapter.

3 Log in as the root user of the Red Hat Linux machine. This is done by entering su in the command prompt, then entering the root password.

4 Enter the following command to uninstall Lasso Professional 6.

```
rpm -e Lasso_Pro_6-Linux-6.0.0-1
```

Files and Folders Not Removed

The RPM will not remove any non-default files created after the time of install. These files include new Lasso MySQL databases, Lasso log files,

Lasso setups, and custom format files and LassoApps. These files remain in the following locations:

- **Applications folder** – The /usr/local/LassoProfessional6 folder is left on the Red Hat Linux hard drive, which contains the following folders:

  Admin – Contains exported Lasso setup information, MySQL backup tables, exported text data, and LassoApp build files from Lasso Administration.

  JDBCDrivers – Contains any JDBC drivers installed to Lasso Professional 6 by the administrator.

  LassoModules – Contains data sources connectors, Java libraries, and any customized Lasso modules.

  LassoMySQL – Contains any new Lasso MySQL databases created since the original installation.
- **Web Server Root folder** – The /var/www/html/ folder retains all format files created or modified since the time of installation. Customized format files, Web pages, and scripts will not be deleted during uninstallation.
- **Linux folders** – The /etc/lasso folder remains on the Red Hat Linux hard drive.

These files and folders may be backed up for preservation, or may be deleted to completely remove Lasso Professional 6 and all settings from the system.

Reinstallation Note: Any non-default files remaining on the system from a previous installation of Lasso Professional 6 will not be overwritten by installing a newer installation. Therefore, any exported Lasso Administration settings and Lasso MySQL databases from a previous installation may be imported and used in a newer installation of Lasso Professional 6 without having to move files.

3

Chapter 3
Linux Issues

This chapter describes issues specific to running Lasso Professional 6 on Red Hat Linux versus other operating systems. Issues are described in the categories listed below.

- *Documentation* describes guidelines to follow when using the Lasso Professional 6 documentation with Red Hat Linux.
- *Lasso Administration* describes issues specific to Lasso Administration in Lasso Professional 6 for Red Hat Linux.
- *Lasso MySQL* describes issues specific to Lasso MySQL in Lasso Professional 6 for Red Hat Linux.
- *LDML Coding* describes issues specific to writing LDML code in Lasso Professional 6 for Red Hat Linux.
- *Extending Lasso* describes issues specific to using LCAPI and LJAPI with Lasso Professional 6 for Red Hat Linux.

Documentation

This section describes issues in the current Lasso Professional 6 documentation when used with the Red Hat Linux version. The sub-sections below describe guidelines that should be followed when consulting the Lasso Professional 6 documentation (other than this guide) for Lasso Professional 6 on Red Hat Linux.

Letter Case

File and folder names in the Red Hat Linux version of Lasso Professional 6 may differ from those in the documentation in terms of letter case. The

Red Hat Linux operating system is strictly case-sensitive, and certain file and folder names may not work when requested due to improper case. Use the following guidelines when using file and folder names in the documentation in Red Hat Linux.

- The LassoProfessional6 folder begins with uppercase characters, and should be typed as LassoProfessional6. All files and folders within the LassoProfessional6 folder also begin with uppercase characters.
- The Lasso folder in the Web server root folder begins with an upper-case character.
- All MySQL database and table names should be typed with the same letter case as their files exist on disk.
- The lasso user created in Red Hat Linux is lowercase, and should be typed as lasso when executing commands at the command prompt.

File Paths

File paths presented in the documentation for Mac OS X should be used for the Linux version as they both use forward slashes (/). All Mac OS X file paths within the LassoProfessional6 folder will be identical to the Linux version.

The fully-qualified path to the LassoProfessional6 folder in Red Hat Linux is as follows, and should be used whenever a fully-qualified path from the hard drive root is referenced.

/usr/local/LassoProfessional6/

The fully-qualified path to the Lasso folder in the Web server root folder in Red Hat Linux is as follows, and should be used whenever a fully-qualified path from the hard drive root is referenced.

/var/www/html/

Installation Contents

All installation instructions as well as the correct names and paths to the files installed are described in *Chapter 2: Linux Installation* of this guide.

Lasso Administration

This section describes differences in Lasso Administration in Red Hat Linux installations of Lasso Professional 6 from other operating systems (e.g. Mac OS X and Windows 2000/XP).

Upgrade Page

The *Setup > Global Settings > Upgrade* page is not functional for the Red Hat Linux version as there was no previous version of Lasso Web Data Engine 3.x for Red Hat Linux. Subsequently, there is no LassoProfessional6/Admin/Upgrade folder or Lasso3Exporter application installed in the Red Hat Linux version of Lasso Professional 6.

Java Page

Once JRE 1.4.1 is installed on the Red Hat Linux machine, the *Setup > Global Settings > Java* page does not require class path and library path information to be entered. The operation of Java in Red Hat Linux with Lasso Professional 6 is similar to Mac OS X in this regard.

Lasso MySQL

This section describes differences in Lasso MySQL on Red Hat Linux from other operating systems (e.g. Mac OS X and Windows 2000/XP). For documentation of Lasso MySQL, see *Chapter 12: Lasso MySQL* in the Lasso Professional 6 Setup Guide.

Lasso MySQL Libraries

An additional lib folder is installed in the LassoProfessional6/LassoMySQL folder so that Lasso MySQL library files may be installed independently of any shared external MySQL libraries currently installed on the Red Hat Linux machine. This allows Lasso MySQL to be installed and exist independently of any other version of MySQL on the same machine.

LDML Coding

This section describes issues when writing LDML code in Lasso Professional 6 for Red Hat Linux.

Case Sensitivity

The Red Hat Linux operating system is strictly case-sensitive, and certain file and folder names may not work when requested in LDML code due to improper case. Use the following guidelines when typing names in Red Hat Linux.

- All file and folder names referenced in LDML code (such as in an [Include] tag) must be coded in the same case as they exist on disk.
- All database and table names must be coded in the same case as they exist on disk for Linux installations of MySQL and Lasso MySQL.

File Creation and Permissions

Refer to the following guidelines when using LDML file creation tags in Red Hat Linux. File creation tags include the [File_...], [Log_...], [HTTP_...], [FTP_...], and [PDF_...] LDML tag sets. For more information on these, see the Lasso 6 Language Guide.

- When creating new files using LDML tags, the lasso user in Red Hat Linux must have sufficient Linux file permissions to manipulate the folder that is being written to. To grant the lasso user ownership of a folder in Red Hat Linux, enter the following command in the command prompt.

  ```
  chown lasso foldername
  ```

- When manipulating existing files using LDML tags, the lasso user in Red Hat Linux must have sufficient Linux file permissions to manipulate the file that is being used. To grant the lasso user ownership of a file in Red Hat Linux, enter the following command in the command prompt.

  ```
  chown lasso filename
  ```

- When creating new files using LDML, files will be created on the Red Hat Linux hard drive that have the Red Hat Linux file permissions of the lasso group and user.

Line Ending Characters

Line ending characters in Red Hat Linux are the same as those in Mac OS X (\n), and should be used whenever a line-ending character is needed. Line ending characters are often used to specify a carriage return in a text string.

Extending Lasso

This section describes issues specific to using LCAPI (Lasso C++ API), LJAPI (Lasso Java API), and LCP (Lasso Connector Protocol) with Lasso Professional 6 for Red Hat Linux, as covered in the Extending Lasso 6 Guide.

LCAPI

When developing in LCAPI with Lasso Professional 6 for Red Hat Linux, refer to the following guidelines.

- Refer to the Mac OS X procedures in the *Getting Started* and *Debugging* sections of *Chapter 6: Lasso C/C++ API 6* in the Extending Lasso 6 Guide (as opposed to the Windows procedures) when using Red Hat Linux. These procedures involve using the GNU C++ compiler.
- Change any fully-qualified Mac OS X file paths to Red Hat Linux paths as described in the *Documentation* section of *Chapter 3: Linux Issues*, which is the chapter you are reading now.
- All .command files for starting and stopping Lasso Service are now .sh files.

LJAPI

When developing in LJAPI with Lasso Professional 6 for Red Hat Linux, refer to the following guidelines.

- Refer to the Mac OS X procedures in the *Getting Started* and *Debugging* sections of *Chapter 8: Lasso Java API 6* in the Extending Lasso 6 Guide (as opposed to the Windows procedures) when using Red Hat Linux. These procedures involve using the <javac> compiler.
- Change any fully-qualified Mac OS X file paths to Red Hat Linux paths as described in the *Documentation* section of *Chapter 3: Linux Issues*, which is the chapter you are reading now.
- All .command files for starting and stopping Lasso Service are now .sh files.

LCP

When developing in LCP with Lasso Professional 6 for Red Hat Linux, refer to the following guidelines.

- Refer to the Mac OS X procedures in the *Getting Started* and *Debugging* sections of *Chapter 7: Lasso Connector Protocol* in the Extending Lasso 6 Guide (as opposed to the Windows procedures) when using Red Hat Linux. These procedures involve using the GNU C++ compiler.
- Change any fully-qualified Mac OS X file paths to Red Hat Linux paths as described in the *Documentation* section of *Chapter 3: Linux Issues*, which is the chapter you are reading now.
- Lasso Connector for Apache (Red Hat Linux version) is the only Lasso connector source code included with Lasso Professional 6 for Red Hat Linux.

- The referenced OSXApache folder that contains the source for Lasso Connector for Apache has been renamed as the Apache folder in the Red Hat Linux version.

A

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