Endeca® Latitude

Installation Guide

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Preface

Endeca® Latitude applications guide people to better decisions by combining the ease of search with the analytic power of business intelligence. Users get self-service access to the data they need without needing to specify in advance the queries or views they need. At the same time, the user experience is data driven, continuously revealing the salient relationships in the underlying data for them to explore.

The heart of Endeca's technology is the MDEX Engine.™ The MDEX Engine is a hybrid between an analytical database and a search engine that makes possible a new kind of Agile BI. It provides guided exploration, search, and analysis on any kind of information: structured or unstructured, inside the firm or from external sources.

Endeca Latitude includes data integration and content enrichment tools to load both structured and unstructured data. It also includes Latitude Studio, a set of tools to configure user experience features including search, analytics, and visualizations. This enables IT to partner with the business to gather requirements and rapidly iterate a solution.

About this guide

This guide contains installation instructions for setting up Endeca Latitude on Windows and Linux.

Installing Endeca Latitude consists of installing its three parts:

- MDEX Engine
- Latitude Data Integrator
- Latitude Studio

Who should use this guide

This guide is intended for system administrators installing Endeca Latitude on Windows or Linux, as well as for developers who are building applications using Endeca Latitude.

Conventions used in this guide

This guide uses the following typographical conventions:

Code examples, inline references to code elements, file names, and user input are set in `monospace` font. In the case of long lines of code, or when inline monospace text occurs at the end of a line, the following symbol is used to show that the content continues on to the next line: ¬

When copying and pasting such examples, ensure that any occurrences of the symbol and the corresponding line break are deleted and any remaining space is closed up.

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Part I

Before You Begin

Chapter 1

Endeca Latitude Installation Overview

This chapter provides a brief overview of the Endeca Latitude components and the installation process.

About this release

Read this section to understand the assumptions under which you can use this release. This section lists those aspects of the release that may change in the future. These aspects may represent limitations in the configuration process or feature availability.

Consider the following characteristics of this release:

- **Support for the MDEX Engine, Latitude Studio, and Latitude Data Integrator is limited to those versions that are included in this release of Latitude**. This release relies on the index created with the version of the MDEX Engine that supports Endeca Latitude. Similarly, this release only supports Latitude Studio and Latitude Data Integrator that are compatible with Endeca Latitude.
- **Options for loading the data sources**. In this release, you have several options for loading the data. The recommended way of loading the data is through the Latitude Data Integrator that is part of the Latitude Information Integration Suite. If your implementation already includes Informatica, the Endeca Integration for Informatica PowerCenter should be used to load data into the MDEX Engine. Other options for loading data include using the Data Ingest Web Service directly or the Java Loader utility that is available for download from the Endeca Services organization.
- **Notes about the configuration and development process**. In this release, the configuration and development process takes place in the Latitude Data Integrator and is complemented by options available to the power users in Latitude Studio.

Overview of the Latitude modules

The Endeca Latitude product consists of three major modules.

For Latitude 2.2.x, these modules are:

- Endeca MDEX Engine
- Endeca Latitude Data Integrator
- Endeca Latitude Studio

Each of these modules has its own installation package.

Note: These Latitude 2.2.x modules are compatible with one another. However, modules shipped as part of Latitude 2.2.x are not compatible with earlier versions.

About the MDEX Engine

The Endeca MDEX Engine is the indexing and query engine that provides the foundation for all Endeca solutions. A cluster is composed of a set of MDEX Engine nodes.

The MDEX Engine uses proprietary data structures and algorithms that allow it to provide real-time responses to client requests. The MDEX Engine stores the indices that were created from the Data Ingest Web Service. After the indices are stored, the MDEX Engine receives client requests via the application tier, queries the indices, and then returns the results.

The MDEX Engine is designed to be stateless. This design requires that a complete query be sent to the MDEX Engine for each request. The stateless design of the MDEX Engine facilitates the addition of MDEX Engine servers for load balancing and redundancy. Because the MDEX Engine is stateless, any replica of an MDEX Engine on one server can reply to queries independently of a replica on other MDEX Engine servers.

The Dgraph is the name of the process for the MDEX Engine. Because the Dgraph is key to every Endeca implementation, its performance is critical. A typical Endeca implementation includes one or more Dgraphs.

About the cluster of MDEX Engine nodes

A cluster is composed of a set of MDEX Engine nodes, all of which can serve query requests. Only one node is identified as the leader node; All other nodes are follower nodes. One copy of the MDEX Engine index is shared and used by all MDEX Engine nodes. The Cluster Coordinator provides communication between the nodes in the cluster. It also notifies the reader nodes about index updates and updates to the configuration.

If one of the cluster nodes fails, queries continue to be processed by other nodes in the cluster. A cluster also provides increased throughput by the MDEX Engine. By adding nodes to a cluster you can spread the query load across multiple MDEX Engine instances without the need to increase storage requirements at the same rate. Nodes can be added or removed dynamically, without having to stop the cluster.

In the development environment, you can start with a single instance of the MDEX Engine that is not part of a cluster. (Without the cluster services, having a single running MDEX Engine instance is a valid configuration for starting in the development environment.) You can then expand your single instance MDEX Engine implementation by first building a simple single-node cluster configuration and then adding more MDEX Engine nodes. When you move to a production environment, you can duplicate a multi-node cluster that you built in the development environment.

In this release, the cluster implementation requires that you download and install the Cluster Coordinator package available from the **Downloads** section of the Endeca Developer Network (EDeN). For information on configuring and running the cluster, see the chapter on clustering in the *Latitude Administrator's Guide*.

About the Latitude Data Integrator

The Latitude Data Integrator is a high-performance data integration platform that lets you extract source records from a variety of source types (from flat files to databases).

The Latitude Data Integrator then sends that data to the MDEX Engine via the Data Ingest Web Service or the Bulk Load Interface.

From a high level, the Latitude Data Integrator suite consists of:

- The LDI Designer. With its powerful graphical interface, you can build graphs that can load source data into the MDEX Engine, as well as the schema for your attributes and the index configuration documents for various MDEX Engine features.
- The Latitude connectors. Developed by Endeca, these connectors are Designer components that are easily configured to perform various data ingest operations.
- The LDI Server. The Server is used to run graphs in an enterprise-wide environment. In this environment, different users and user groups can access and run the graphs.

Note: For those customers wishing to use Informatica PowerCenter for their Endeca ETL needs, they can purchase PowerCenter directly from Endeca. Usage of Informatica in this case is restricted to the context of the Endeca Latitude 2.2.x application license, and includes the MDEX Engine Connector for Informatica PowerCenter.

About Latitude Studio

Latitude Studio enables rapid configuration of dashboard applications that offer the highly interactive Guided Navigation® user experience across a full range of structured and unstructured enterprise data.

Latitude Studio is easy to deploy and ideal for the agile development of enterprise-quality applications. Due to the component-based nature of Latitude Studio, these applications are simple to control, adapt, and extend. It provides granular layout and configuration control to enable users to manage and personalize their own experiences.

Latitude Studio consists of an enterprise-class portal framework and a library of UI components that embody best practices in Endeca applications.

About the Component SDK

The Component SDK is a packaged development environment for portlets, themes, layout templates, and other portal elements. Endeca has modified Liferay's version of its Plugins SDK to include the Endeca enhancements, such as the `EndecaPortlet` core class.

The installation and use of the Component SDK is covered in the *Latitude Developer's Guide*.

Interaction with Liferay Portal

Latitude Studio is built upon the Liferay Portal Enterprise Edition.

Liferay Portal is an open-source JSR-286 portal technology. Latitude Studio extends basic Liferay functionality to provide enhanced user management, security, cross-component interaction, and performance-optimized communication with Endeca MDEX Engines.

This version of Latitude Studio is built upon Liferay Portal 5.2 Enterprise Edition Service Pack 5.

Installation order

Following the recommended order of installation helps you minimize component dependencies.

Endeca recommends that you install the components in this order:

1. Latitude MDEX Engine (see *Installing the MDEX Engine on page 22*). After installing, to verify the installation, run the `mkmdex` command, and then start the MDEX Engine.

   Note that you can start the MDEX Engine without loading any of your source data records.
2. Latitude Data Integrator Designer (see *Installing Latitude Data Integrator on page 34*). After installing, open the LDI Designer.
3. Latitude Studio (see *Installing Latitude Studio on page 40*). After installing, to verify the installation, log in to Latitude Studio. Use the running MDEX Engine as the data source.
4. Latitude Data Integrator Server (see *Installing Latitude Data Integrator on page 34*). After installing, use a browser to access the LDI Server home page and log in.

The verification procedures for each component are described in the installation section for that component.

Chapter 2

Latitude System Requirements

This chapter describes the requirements for each component of an Endeca Latitude installation.

MDEX Engine system requirements

This version of the Endeca MDEX Engine has the following requirements:

Hardware requirements

Endeca software has the following hardware requirements. These requirements apply to all of the Latitude components.

Note: In this guide, the term "x64" refers to any processor compatible with the AMD64/EM64T architecture. You might need to upgrade your hardware, depending on the data you are processing. All run-time code must fit entirely in RAM. Likewise, hard disk capacity must be sufficient based on the size of your data set. Please contact your Endeca representative if you need more information on sizing your hardware.

Windows and Linux on x64

Minimum hardware requirements:

- x64 processor, minimum 1.8 GHz
- At least 2 GB of RAM, depending on the size of the application data set
- 80 GB hard drive, depending on the size of the application data set

Recommended hardware requirements:

- x64 3.0+ GHz processors; Endeca recommends Intel Xeon (including Nehalem) or AMD Opteron processors
- 8 GB of RAM or more, depending on the size of the application data set
- High performance network-attached storage (for example, attached via a dedicated iSCSI or fibre channel network) or high performance locally-attached RAID storage (for example, a RAID 6 or RAID 0+1 array with battery-backed write caching, operating on 72GB or 146 GB spindles at 10k or 15k RPM spindle speed)
- Gigabit Ethernet

Hardware requirements for running a cluster of MDEX Engine nodes

These requirements exist:

- Shared file system. All nodes in the cluster must have access to a shared file system on which the index is stored.
- Load balancer. In most production deployments, it is desirable to configure a load balancer between Latitude Studio and a cluster of the MDEX Engine nodes. Include host names and ports of all nodes into the load balancer configuration. This ensures that regular query-type (non-updating) requests from Latitude Studio are sent to any of the nodes in the cluster. For more information, see the cluster section of the *Latitude Administrator's Guide*.

Supported operating systems

The Endeca software supports the following 64-bit operating systems running on servers with x64 capabilities:

Platform	Description
LINUX RHEL 5	• Red Hat Enterprise Linux Server (version 5 for x64) running on x64 processors. • Red Hat Enterprise Linux Advanced Platform (version 5 for x64) running on x64 processors. For best performance on Red Hat Linux version 5 (Server and Advanced), Endeca recommends the latest version of RHEL 5.
Windows 2008	Windows Server 2008 R2 Enterprise running on x64 processors.

Notes

Windows 7 is not supported for production deployment, but operates sufficiently to enable training and small-scale development work.

Windows XP is not supported.

If you intend to install the MDEX Engine as part of a cluster of MDEX Engine nodes, all nodes must be running on the same operating system — you cannot create a cluster in which some nodes are running on Windows while other nodes are running on Linux.

Support for VMware

The MDEX Engine is supported on VMware ESX 3.5 for the following guest operating system platforms: Windows 2008 and RHEL 5 for Linux.

Use the following recommendations for the MDEX Engine server configuration for Windows and Linux:

- Configure four VCPUs on a virtual machine.
- Allocate a single MDEX Engine (Dgraph process) per virtual machine.
- Specify four threads for each MDEX Engine (Dgraph process).

The number of threads should not exceed the number of VCPUs. Endeca does not recommend running more than one MDEX Engine per virtual machine.

Linux utilities dependencies

The MDEX Engine installer requires several Linux utilities.

The following Linux utilities must be present in the `/bin` directory:

```
basename
cat
chgrp
chown
date
dd
df
mkdir
more
rm
sed
tar
true
```

The following Linux utilities must be present in the `/usr/bin` directory:

```
awk
cksum
cut
dirname
expr
gzip
head
id
printf
tail
tr
wc
which
```

If these utilities are not in the specified locations, the installation fails with a message similar to the following:

```
 Required dependency is not executable: /bin/df. Aborting.
```

Disk space requirements

You should ensure that adequate disk space is available before installing the MDEX Engine.

On Windows, the installation process requires a minimum of 400 MB in the system partition and 200 MB in the target partition. To avoid an "out of drive space" error during the installation process, you should allow the minimum of memory required on the system and target partitions.

The Windows installation process unpacks its `.MSI` installation file, and other temporary and log files, to a location on the system drive (typically the user's %TEMP% folder). These files add another 400MB during the installation. When the process completes the installation, it deletes the temporary files and frees the 400 MB space it consumed.

On Linux, the MDEX Engine unpacks to approximately 430 MB. Because multiple versions may eventually be stored, a destination in a large disk partition is recommended.

Required Endeca components

The MDEX Engine installation does not require any other Endeca components to be previously installed. If you are planning to run a cluster of MDEX Engine nodes, then a Cluster Coordinator package must be installed after you install the MDEX Engine.

Latitude Data Integrator system requirements

The Latitude Data Integrator Designer and Server have the following installation requirements.

The system requirements for the Latitude Data Integrator products are as follows:

- The LDI Designer has the same installation requirements as the MDEX Engine. In addition, you need the Java version 6 (also called 1.6) JDK, which is included in the Latitude Data Integrator Designer installer.
- The LDI Server must be installed on a stand-alone Apache Tomcat, version 6.0.x. Note that you should not install LDI Server on the Tomcat that is hosting Latitude Studio.

Both the LDI Designer and LDI Server are compatible only with the Latitude 2.2.x version of the MDEX Engine.

Latitude Studio system requirements

This version of Endeca Latitude Studio has the following requirements:

Hardware requirements

The hardware requirements for Latitude Studio are the same as those for Endeca MDEX Engine, which are listed in the "Hardware requirements" topic under "MDEX Engine system requirements."

Supported operating systems

Latitude Studio is supported on the same Windows and Linux operating systems as the Endeca MDEX Engine, which are listed in the "Supported operating systems" topic under "MDEX Engine system requirements."

Software requirements

Latitude Studio is a Web-based application that runs in an application server. It supports the following software:

Software	Supported Versions
Application server	• Tomcat 6 • WebSphere Application Server (WAS) 7

Software	Supported Versions
Java	• Tomcat 6 is supported with Sun Java 6 • WAS 7 is supported with IBM Java 6 **Important:** For Sun Java 6, update 18 or greater is required.
Database system	• MySQL 5.1 • DB2 9.5
Browser	• Firefox 3.6 on Windows • Firefox 6.0 on Windows • Internet Explorer 8 (with compatibility mode disabled) on Windows **Tip:** Firefox is recommended. **Important:** Running Internet Explorer 8 in compatibility mode is not supported.
Browser plugin	Adobe Flash 10.0

Alternative database support

The Liferay Portal server uses a relational database to store configuration and state. By default, Liferay uses Hypersonic, but this is not recommended for production use due to performance issues. Endeca tests Latitude Studio on MySQL and DB2. However, many other databases are expected to work.

Customers should feel free to use any database, including shared systems they may already have in place. As with application servers, customers who choose to deploy on un-tested databases will always be supported on any issue that can be traced back to core Latitude Studio code and can be reproduced on a supported database.

The Latitude Studio section of this guide, combined with the *Liferay Portal Administrator's Guide*, provides detailed instructions on how to switch to another database system.

Changing the JavaScript time-out value on Internet Explorer 8

Internet Explorer 8 keeps track of the number of JavaScript lines executed. After a fixed value, the browser issues an error message, prompting the user to decide whether he or she would like to continuing running the script. Because Latitude Studio is a rich Internet application that leverages JavaScript heavily in all components, it can trigger this error during normal usage.

Microsoft describes this issue in Knowledge Base Article 175500 and specifies a fix. More detail can be found in the Knowledge Base Article (*http://support.microsoft.com/kb/175500*). The following is a condensed version of Microsoft's fix for the Internet Explorer 8 issue.

Important: If you intend to run Latitude Studio on Internet Explorer 8, Endeca strongly recommends that you apply the fix outlined in this topic.

To change the script time-out value:

1. Using a registry editor such as `Regedt32.exe`, open this key:

   ```
   HKEY_CURRENT_USER\Software\Microsoft\Internet Explorer\Styles
   ```

   Note: If the `Styles` key is not present, create a new key that is called `Styles`.

2. Create a new `DWORD` value called "MaxScriptStatements" under this key, and set the value to the desired number of script statements. You will have to try different values for your application environment, but the suggested starting point is a `DWORD` value of 0x1CFFFFF.

   Note: You can turn off this Internet Explorer 8 feature using a `DWORD` value of 0xFFFFFFFF.

Compatibility with other Latitude modules

The instructions for installing Latitude Studio assume that you already have a running MDEX Engine at which you can point Latitude Studio.

This version of Latitude Studio is compatible with the version of the MDEX Engine that is available with this Latitude release.

Chapter 3

Downloading the Latitude Software

Downloading the Latitude software

You can download Endeca Latitude modules from the Downloads section of the Endeca Developer Network (EDeN).

In this procedure, you download all Latitude modules for your platform:

- The MDEX Engine, and, optionally, the Cluster Coordinator package for running a cluster of MDEX Engine servers
- The Latitude Studio Integrator
- Latitude Studio

To download the Latitude software:

1. If you have not previously done so, establish a Support account with download access through the Support section of the Endeca Developer Network (EDeN) at *http://eden.endeca.com*. This enables the Endeca Support and Customer Care groups to track which versions of the software you are using.
2. On the EDeN homepage, click **Downloads**.
3. On the **Tools and Utilities** page, find the **Product Downloads** section, then click **View and download purchased products**.
4. On the **Product Downloads** page, click **Latitude 2**.
5. In the **Product Information** table, click the module you want to install, as described in the remaining steps.
6. Click **Installation and Quick Start** to download any of the following:
   - The Latitude 2.2.x for Windows **All-in-One Installer**.
   - The *Quick Start Guide*.
   - The **Quick Start Project**.
7. Click **Documentation** to download the full documentation set or individual documents related to installation and setup.

8. Click **MDEX Engine** to download the appropriate version of the MDEX Engine or the MDEX Engine Cluster Coordinator package for your platform:

To install:	Download:	Resulting downloaded file:
MDEX Engine on Windows	**MDEX Engine for Windows 64-bit**	Latitude_2.2.*x*_MDEX.exe
MDEX Engine on Linux	**MDEX Engine for Intel Linux 64-bit**	Latitude_2.2.*x*_MDEX.sh
MDEX Engine Cluster Coordinator on Windows	**MDEX Engine Cluster Coordinator for Windows**	Latitude_2.2.*x*_Cluster_Coordinator_Win.tgz
MDEX Engine Cluster Coordinator on Linux	**MDEX Engine Cluster Coordinator for Linux**	Latitude_2.2.*x*_Cluster_Coordinator_Linux.tgz

Note: The Cluster Coordinator package is required if you would like to run a number of MDEX Engine nodes in a clustered environment. You download and install the Cluster Coordinator package on one server you will include in a cluster as a leader node. For information on using a cluster, see the *Latitude Administrator's Guide*.

9. Click **Data Integrator** to download the appropriate set of Latitude Data Integrator files for your platform:

To install:	Download:	Resulting downloaded file:
LDI Designer for Linux	**Data Integrator Designer for Linux**	Latitude_2.2.*x*_DataIntegrator_Designer.sh
LDI Designer for Windows	**Data Integrator Designer for Windows**	Latitude_2.2.*x*_DataIntegrator_Designer.exe
LDI Server	**Data Integrator Server**	clover.war
LDI Server License	**Data Integrator Server License**	clover-license.war

10. Click **Studio** to download the appropriate set of Latitude Studio files, depending on your installation environment:

To install:	Download:	Resulting downloaded files:
Tomcat 6 bundle for Windows	• **Studio for Windows** • **Studio Components**	• Latitude_2.2.*x*_ Endeca-portal.zip • Latitude_2.2.*x*_Components.zip
Tomcat 6 bundle for Linux	• **Studio for Linux** • **Studio Components**	• Latitude_2.2.*x*_ Endeca-portal.tgz • Latitude_2.2.*x*_Components.zip
Latitude Studio for Websphere Application Server version 7	• **Studio Standalone WAR** • **Studio Standalone WAR Dependencies** • **Studio Components**	• Latitude_2.2.*x*_Endeca-portal-war.zip • Latitude_2.2.*x*_Endeca-portal- dependencies.zip • Latitude_2.2.*x*_Components.zip

Part II

Installing the MDEX Engine

Chapter 4

Installing the MDEX Engine

This section contains instructions for installing the Endeca MDEX Engine.

About User Account Control in Windows Server 2008

User Account Control in Windows Server 2008 R2 limits which tasks Standard Users can run.

User Account Control divides users into two groups - Standard Users and Administrators:

- **Standard Users** have the least amount of privileges required to perform basic tasks. They cannot install or uninstall applications to or from `%SYSTEMROOT%`, change system settings, or perform other administrative tasks.
- **Administrators** have full permissions for adding, removing, or modifying programs and user accounts.

By default, users are created as Standard Users. Although User Account Control allows Standard Users to temporarily elevate permissions in order to perform administrative tasks, doing so requires administrative credentials.

For more information regarding User Access Control and the permissions granted to each user type, see the Microsoft documentation at *http://technet.microsoft.com/en-us/library/cc731416%28WS.10%29.aspx*.

Effects on MDEX Engine Installation

The MDEX Engine installation process has changed with the introduction of User Account Control in Windows Server 2008 R2. Because of the resulting security restrictions on tasks that run at elevated privilege, running a per-machine installation of the MDEX Engine now requires administrator permissions. A user may still install a per-user installation without these permissions, but this is not supported in a production environment.

Note: UAC behavior and installation steps may differ if installing on Windows 7 for development purposes. Consult the Microsoft documentation for details.

Installing a per-user MDEX Engine installation on Windows

A per-user installation of the MDEX Engine may be used if administrator permissions are unavailable. This is primarily useful for training and for small-scale development environments.

Note: Installing a per-user installation of the MDEX Engine on Windows Server 2008 is only permitted when it has been configured as a managed application, or the `DisableMSI` registry key has been set to zero. Contact an administrator if you require a per-user installation under Windows Server 2008.

Before installing, make sure to uninstall any previous versions of the MDEX Engine using the **Uninstall a program** utility in the Control Panel.

If a per-machine installation of the MDEX Engine is already present, attempting to install a per-user installation fails and the installer instead attempts to uninstall the per-machine installation.

Important: If you are setting up your MDEX Engine for a production environment, you must use a per-machine installation.

To install the Endeca MDEX Engine as a per-user installation:

1. In your local environment, locate the Endeca MDEX Engine software that you downloaded from the Endeca Developer Network (EDeN).
2. Double-click the installer file `Latitude_2.2.`*`x`*`_MDEX.exe` to start the wizard.

   The wizard verifies the contents of the installation package and confirms that no previous version is installed.

   Note: If the installer identifies that the previous version is still installed, cancel the installation and uninstall the previous version using the **Uninstall a program** utility in the Control Panel.
3. Click **Next** to begin the installation process.
4. In the **Copyright and Legal** screen, click **Next**.
5. In the **Select Start Menu Program Folder** screen:
   (a) For the program shortcuts, either accept the default Program Folder or enter a new folder name.
   (b) Select the **Only for me (current user)** radio button.
   (c) Click **Next**.
6. In the **Destination Folder** screen, either accept the default installation folder (`%USERPROFILE%\Endeca\Latitude\2.2.`*`x`*`\MDEX`) or select another installation location. Then click **Next**.

   You cannot install the MDEX Engine into a directory that contains content.

   The wizard displays both the required and available disk space for the target directory chosen. The MDEX Engine requires approximately 200 MB of disk space. The installer requires approximately 400 MB of space on the system drive for temporary files. These files are cleared after the installation process completes.

   Note: If you install to a non-default location, the installation does not create the subdirectory structure `MDEX\<`*`version`*`>` unless you specify this structure explicitly. Additionally, clicking the **Back** button in the installation wizard resets the installation path to the default directory.

7. In the **Completing the Setup Wizard** screen, click **Next**.

   The wizard begins to install the MDEX Engine files.
8. When the wizard confirms that you have successfully completed the installation, click **Finish**.
9. Open a command prompt and change to the root of your `\MDEX` installation folder.
10. Run the `mdex_setup.bat` file.

    This batch file adds the `bin` and `utilities` directories to the `PATH` environment variable.

    The script itself is optional and provided as a convenience, although it only affects the `PATH` variable for the current user in the current context.
11. After installation is complete, enable secure mode (SSL) on the MDEX Engine by following the procedure in the *Latitude Administrator's Guide*.

Installing a machine-wide MDEX Engine installation on Windows

If you are setting up your MDEX Engine for a production environment, you must use a machine-wide installation. Additionally, Endeca recommends this method of installation any time administrator permissions are available.

Before installing, make sure to uninstall any previous versions of the MDEX Engine using the **Uninstall a program** utility in the Control Panel.

To install the Endeca MDEX Engine on Windows:

1. In your local environment, locate the Endeca MDEX Engine software that you downloaded from the Endeca Developer Network (EDeN).
2. Double-click the installer file `Latitude_2.2.`*`x`*`_MDEX.exe` to start the wizard.

   The wizard verifies the contents of the installation package and confirms that no previous version is installed.

   When running an installation with administrator permissions, User Account Control will check the digital signature of the installer. Digital signatures provide system administrators with a higher level of confidence in the authenticity of the installation package.

   Note: If the installer identifies that the previous version is still installed, cancel the installation and uninstall the previous version using the **Uninstall a program** utility in the Control Panel.
3. Click **Next** to begin the installation process.
4. In the **Copyright and Legal** screen, click **Next**.
5. In the **Select Start Menu Program Folder** screen:

   (a) For the program shortcuts, either accept the default Program Folder or enter a new folder name.

   (b) Select the **Anyone who uses this computer (all users)** radio button.

   (c) Click **Next**.

6. In the **Destination Folder** screen, either accept the default installation folder (`C:\Endeca\Latitude\2.2.`*`x`*`\MDEX`) or select another installation location. Then click **Next**

   You cannot install the MDEX Engine into a directory that contains content.

   The wizard displays both the required and available disk space for the target directory chosen. The MDEX Engine requires approximately 200 MB of disk space. The installer requires approximately 400 MB of space on the system drive for temporary files. These temporary files are cleared after the installation process completes.

   Note: If you install to a non-default location, the installation does not create the subdirectory structure `MDEX\<`*`version`*`>` unless you specify this structure explicitly. Additionally, clicking the **Back** button in the installation wizard resets the installation path to the default directory.

7. In the **Completing the Setup Wizard** screen, click **Next**.

   The wizard begins to install the MDEX Engine files.

8. When the wizard confirms that you have successfully completed the installation, click **Finish**.
9. Open a command prompt and change to the root of your MDEX installation folder. `C:\Endeca\Latitude\2.2.`*`x`*`\MDEX` is the default.
10. Run the `mdex_setup.bat` file.

    This batch file adds the `bin` and `utilities` directories to the `PATH` environment variable.

    The script itself is optional and provided as a convenience, although it only affects the `PATH` variable for the current user in the current context.

11. After installation is complete, enable secure mode (SSL) on the MDEX Engine by following the procedure in the *Latitude Administrator's Guide*.

Installing the Cluster Coordinator package

To run in a cluster, the Cluster Coordinator package must be installed and the Cluster Coordinator service must be running on the one cluster node that is designated to be the leader node.

It is assumed that you have downloaded the Cluster Coordinator package and also have installed the MDEX Engine on the node.

You install the Cluster Coordinator in the `endeca/Latitude` directory. If you installed the MDEX Engine, this directory should already exist.

To install the Cluster Coordinator on the leader node:

1. Unzip the following packages to your `endeca/Latitude` directory:

Window s	`Latitude_<`*`version`*`>_Cluster_Coordinator_Win.tgz`
Linux	`Latitude_<`*`version`*`>_Cluster_Coordinator_Linux.tgz`

where `<version>` is the version of the Endeca Latitude software package.

The Cluster Coordinator package is installed in `endeca/Latitude/<version>/ClusterCoordinator` on Linux. For Windows, the path is `Endeca\Latitude\<version>\ClusterCoordinator`.

Once the Cluster Coordinator package is installed on the leader node, its service can be started.

Installing silently on Windows

Running the silent installer on Windows has different effects depending on whether or not the user has administrator permissions.

If the silent installer is run with administrator permissions, it creates a per-machine installation. Otherwise, it creates a per-user installation. Variables on the command line can be used to override this default behavior.

To install silently on Windows:

1. From a command prompt, navigate to the directory where you downloaded the installer.
2. Issue the following command:

   ```
   start /wait Latitude_2.2.x_MDEX.exe
      /s TARGETDIR=C:\Endeca\Latitude\2.2.x\MDEX
   ```

   You can replace the TARGETDIR path location in the example with the location to which you want to install. However, if you set the install location to a non-empty directory or to a drive that does not exist, the silent installation will fail with a non-zero status code.

   Additionally, an administrator can override the default behavior and create a per-user installation by setting `ALLUSERS=FALSE`.
3. Run the `mdex_setup.bat` file in the MDEX Engine root directory.

   This script adds the `utilities` directory and the MDEX Engine binaries to the `PATH` environment variable. The script itself is optional and provided as a convenience, although it only affects the `PATH` variable for the current user in the current context.
4. After installation is complete, enable secure mode (SSL) on the MDEX Engine by following the procedure in the *Latitude Administrator's Guide*.

Turning on logging for the Windows silent installer

When running the silent installer on Windows, you can turn on logging.

This can be useful, for example, if you need to debug a failed silent installation.

To turn on logging during a silent installation on Windows, add `/l=<path>`. An absolute path is required.

Installation steps for Linux

The Endeca software is distributed as a self-extracting tar file and install script. It can be installed at any location.

Note: The MDEX Engine unpacks to approximately 200 MB. Because multiple versions may eventually be stored, a destination in a large disk partition is recommended.

To install the MDEX Engine:

1. Determine where you will install the Endeca system. Verify that the target directory on which you plan to install has enough available disk space, and has write permissions (is not read-only).

   For example, in this procedure we assume that the target directory is `/localdisk` and that you have write permissions for it.

   If you do not set these permissions, the install script will not run.

2. Locate the MDEX Engine installation file. This procedure the name of the installation file is `Latitude_2.2.x_MDEX.sh`.

3. Run the Endeca installation script with the following command:

   ```
   ./Latitude_2.2.x_MDEX.sh --target /localdisk
   ```

   The Endeca copyright notice displays.

4. Scroll to the end of the copyright notice. When you reach the end of the notice, the installation begins.

   The MDEX Installer displays a message that it is about to extract files in the specified directory.

   The installer also checks that the directory has enough available disk space, and that it can write to this directory.

   If these conditions are met, the installer proceeds with the installation and completes it. If they are not met, the installer issues an error and discontinues the installation.

At the completion of the installation, the installer prompts you to run the `mdex_setup` script.

After you install the MDEX Engine, run the script (in the `endeca/Latitude/2.2.x/MDEX` directory) that is appropriate to your shell:

- For Bourne, Bash, or Korn shells, run the `mdex_setup_sh.ini` script.
- For csh or tcsh shells, run the `mdex_setup_csh.ini` script.

For example:

```
source endeca/Latitude/2.2.x/MDEX/mdex_setup_sh.ini
```

This script adds the `utilities` directory and the MDEX Engine binaries to the search path. It is provided as a convenience.

In addition, enable secure mode (SSL) on the MDEX Engine by following the procedure in the *Latitude Administrator's Guide*.

Installing silently on Linux

The silent installer is useful if you want to add the installation of the MDEX Engine to your own install script, or push out the installation on multiple machines.

The silent installer is not interactive.

To install silently on Linux:

1. From a command prompt, navigate to the directory where you downloaded the installer.

2. Issue the following command (on a single line):

   ```
   echo Y | ./Latitude_2.2.x_MDEX.sh
   ```

```
   --silent --target /usr/local
```

if you enter `N`, or any string other than `Y`, for the license agreement, the installer issues an error and exits.

Note: `--target` must be the last parameter specified.

Optionally, you can replace `/usr/local` with the location to which you want to install.

After you install the MDEX Engine, run the script (in the `endeca/Latitude/2.2.x/MDEX` directory) that is appropriate to your shell:

- For Bourne, Bash, or Korn shells, run the `mdex_setup_sh.ini` script.
- For csh or tcsh shells, run the `mdex_setup_csh.ini` script.

For example:

```
source endeca/Latitude/2.2.x/MDEX/mdex_setup_sh.ini
```

This script adds the `utilities` directory and the MDEX Engine binaries to the search path. It is provided as a convenience.

In addition, enable secure mode (SSL) on the MDEX Engine by following the procedure in the *Latitude Administrator's Guide*.

Package contents and directory structure

The MDEX Engine installation creates the following directory structure.

The default root directory for the MDEX Engine is:

- For Linux: `endeca/Latitude/2.2.x/MDEX`
- For Windows: `C:\Endeca\Latitude\2.2.x\MDEX`

The root directory contains files and software modules for all of the MDEX Engine components:

Directory	**Contents**
root directory	The release notes (`README.txt`) and the `mdex_setup` script that you run after the installation, which adds the `utilities` directory and the MDEX Engine binaries to the `PATH` environment variable.
`/bin`	Executables for various components, such as Dgraph, along with additional libraries.
`/ClusterCoordinator`	Libraries for the Cluster Coordinator. This directory is available only if you installed the Cluster Coordinator package. The Cluster Coordinator is required for running a cluster of MDEX Engine nodes.
`/conf`	Stemming, schema, and DTD files.
`/doc`	The Endeca Licensing Guide and the MDEX Engine API Reference.

Directory	Contents
`/lib`	Object file libraries.
`/utilities`	Executable files for various utilities, such as GZIP, touch, and grep (Windows only).
`/lib64`	64-bit libraries (Linux only).
`/xquery`	XQuery Web services.

Chapter 5

After You Install

After you install the MDEX Engine, use the following procedures to verify your installation.

Testing your installation with the mkmdex and dgraph commands

To verify the installation, you can create an instance of the MDEX Engine by running the **mkmdex** and **dgraph** commands.

Before running the **mkmdex** command, you must ensure that you added the MDEX binaries and utilities to your path. An error results when you attempt to run **mkmdex** outside of its home directory and have not set the variables. You can either set the path variables manually or set them by running the **mdex_setup.bat** file. For example, if you installed the MDEX Engine in the default location on a Windows machine, at the command prompt, enter:

```
C:\Endeca\Latitude\2.2.x\MDEX\mdex_setup.bat
```

Note that if you use mdex_setup.bat, the batch file only sets the variables for the user in the current context.

The **mkmdex** command creates the index database used by the MDEX Engine. The **dgraph** command starts the MDEX Engine.

Note: The instructions in this topic are based on Windows. If you installed on Linux, the steps will be similar, though you will need to substitute executables and paths.

To test that the installation succeeded and create a running instance of the MDEX Engine, perform the following steps:

1. Open a Command Prompt window.
2. At the prompt, enter **mkmdex** followed by a prefix name for the MDEX Engine index. (Be sure to specify an absolute path if the index is to be created in a directory other than the current one).

   The command creates an initial index that the MDEX Engine will use to store its data.

   For example, if you enter:

   ```
   mkmdex C:\apps\testapp
   ```

The **`mkmdex`** command appends `_indexes` to the `testapp` directory name (i.e., `testapp_indexes`) and adds subdirectories.

3. To start the MDEX Engine, enter the **`dgraph`** command and specify the directory name that you provided above.

   For example, enter:

   ```
   dgraph C:\apps\testapp
   ```

   The command loads XQuery and Web services into the MDEX Engine, and starts the MDEX Engine on the default HTTP port of 5555 and the default bulk load port of 5556.

   The MDEX Engine will be fully running when you see this output in the Command Prompt window:

   ```
   Starting HTTP server on port: 5555
   [Mon Sep 26 09:15:58 2011] Dynamic graph server "dgraph" version "7.3.0.569637",
   pid=4408 listening for HTTP connections on port 5555, and bulk ingest connections
   on port 5556 at Mon Sep 26 09:15:58 2011
   ```

Note: To point your Latitude Studio application to the MDEX Engine as a data source, see the Latitude Studio installation section of this guide. Ensure that you make note of the Dgraph's port and hostname, and specify them in the Latitude Studio's data source files.

mkmdex command

The **`mkmdex`** command creates an initial index that the MDEX Engine uses to store its data.

The **`mkmdex`** command takes the following parameters:

```
mkmdex [--port port] [--verbose] [--help] [-t secs] [db_prefix]
```

db_prefix specifies the prefix to be used for the MDEX Engine database directory. If the database is to be created in a directory other than the current one, be sure to specify the absolute path to the directory.

The flags provide the following functionality:

Flags	Description
`--port` *port*	Specifies the port to use during the provisioning of the MDEX Engine. If you do not use this flag, the default port of 5551 is used. Note that in addition to this port, a bulk load port is opened on port+1 (5552 is the default bulk load port.)
`-t` *secs*	Specifies the maximum time (in seconds) to wait for the MDEX Engine to be fully started. The MDEX Engine must be started as part of the provisioning operation. The default startup time is 60 seconds. Note that unlike the other flags, the `-t` flag has only one dash.
`--verbose`	Enables verbose mode.
`--help`	Prints usage information and exits.

For example, use this command to create a database (using the prefix `mdexdb`) in the current directory:

```
mkmdex -t 90 mdexdb
```

The command will create a database directory named `mdexdb_indexes` and will provision the MDEX Engine using the default 5551 port. The command will wait up to 90 seconds for the MDEX Engine to start up.

Checking that the Dgraph process is running

Use the `ping` URL command to verify that the Dgraph process is running on a given host name and port number.

To check that the Dgraph process is running, open a browser window and enter the following URL in the Address bar:

```
http://hostname:port/admin?op=ping
```

For example, enter:

```
http://localhost:5555/admin?op=ping
```

The browser window displays a lightweight HTML page that lists the MDEX Engine's host name and port, followed by a timestamp, as in this example:

```
dgraph Web07-WIN:5555 responding at Mon Sep 26 09:27:43 2011
```

If the MDEX Engine is not running, then your browser will display an error message saying that it cannot establish a connection.

Loading the correct resolver library

If, when running the Dgraph on a Linux machine, you get the error `Couldn't resolve host host`, your system might be loading the wrong resolver library at run time.

This can happen if `ld.so.cache` contains an entry for a different version than the one you need first.

To load the correct resolver library:

4. Set `LD_LIBRARY_PATH` as follows so that it will be searched before `ld.so.cache`.

- For csh and similar shells:

  ```
  setenv LD_LIBRARY_PATH /lib:${LD_LIBRARY_PATH}
  ```

- For bash:

  ```
  export LD_LIBRARY_PATH=/lib:${LD_LIBRARY_PATH}
  ```

Part III

Installing Latitude Data Integrator

This chapter describes how to install the Latitude Data Integrator on Linux and Windows platforms.

LDI installation packages

LDI Designer installation on Windows

LDI Designer installation on Linux

LDI Server installation

Chapter 6

Installing Latitude Data Integrator

This chapter describes how to install the Latitude Data Integrator on Linux and Windows platforms.

LDI installation packages

There are Latitude Data Integrator Designer installation packages for Linux and Windows clients, and one for the Server.

Linux client installation package

The Linux client installation package is named **Data Integrator Designer for Linux**.

The package consists of a shell script file named `Latitude_2.2.x_DataIntegrator_Designer.sh`. This file contains a complete version of the LDI Designer utility, including the Latitude connectors.

Windows client installation package

The Windows client installation package is named **Data Integrator Designer for Windows**. The installer contains a complete version of the LDI Designer utility, including the Latitude connectors.

The package consists of a Windows executable file named `Latitude_2.2.x_DataIntegrator_Designer.exe`. This file contains a complete version of the LDI Designer utility, including the Latitude connectors.

LDI Server installation package

The LDI Server installation package is named **Data Integrator Server**. The package contains a Zip file named `Latitude_2.2.x_DataIntegrator_Server.zip`. This file contains two components:

- The `clover.war` file contains the server version of the Latitude Data Integrator, including the Latitude connectors.
- The `clover-license.war` file contains the license for the LDI Server.

The contents of the package can be installed on either a Linux or Windows machine.

LDI Designer installation on Windows

This topic describes how to install Latitude Data Integrator Designer on a Windows client machine.

The LDI Designer is installed as a machine-wide installation. This type of installation is used because it is intended for a production environment.

This procedure assumes that you have downloaded the Latitude Data Integrator Designer installer for Windows.

To install Latitude Data Integrator Designer on a Windows client:

1. Double-click the installer file to start the wizard.

   The wizard verifies the contents of the installation package.
2. Click **Next** to begin the installation process.
3. In the **Copyright and Legal** screen, click **Next**.
4. In the **Destination Folder** screen, either accept the default installation folder or select another installation location. Then click **Next**.

   You cannot install the LDI Designer into a folder that contains content.
5. In the **Completing the Setup Wizard** screen, click **Next**.

   The wizard begins to install the LDI Designer files.
6. When the wizard confirms that you have successfully completed the installation, click **Finish**.

After installation, double-click the LDI Designer shortcut icon to start the program.

LDI Designer installation on Linux

This topic describes how to install Latitude Data Integrator Designer on a Linux client machine.

This procedure assumes that you have downloaded the `Latitude_2.2.x_DataIntegrator_Designer.sh` installation file.

To install Latitude Data Integrator Designer on a Linux client:

1. Determine where you will install the LDI Designer. Verify that the target directory on which you plan to install has write permissions (is not read-only).

   For example, in this procedure we assume that the target directory is `/localdisk` and that you have write permissions for it. If you do not set these permissions, the install script will not run.
2. Run the LDI Designer installation script with the following command:

   ```
   ./Latitude_2.2.x_DataIntegrator_Designer.sh --target /localdisk
   ```
3. The Endeca copyright notice displays first. Scroll to the end of the copyright notice. When you reach the end of the notice, the installation begins.

   The installer displays a message that it is about to extract files in the specified directory. The installer also checks that the directory has enough available disk space, and that it can write to this directory. If these conditions are met, the installer proceeds with the installation and completes it. If they are not met, the installer issues an error and discontinues the installation.

The installation is finished when you see this confirmation message:

```
Installation complete!
```

As a result of the installation, the LDI Designer is installed in:

```
endeca/Latitude/2.2.x/DataIntegrator
```

To start up the LDI Designer, run the `ldi-designer` executable file in the `DataIntegrator` directory.

LDI Server installation

This topic provides information on installing the Latitude Data Integrator Server.

The LDI Server must be installed on a stand-alone Apache Tomcat, version 6.0.x.

Note: Do not install LDI Server on a Tomcat server that is being used to host other applications. For example, do not install LDI Server on the Tomcat that is hosting Latitude Studio.

To install the Latitude Data Integrator Server:

1. Make sure that the install machine has the Java SDK version 1.6.x or higher installed.

   Also ensure that the `JAVA_HOME` and `JRE_HOME` environment variables are set. If `JRE_HOME` is not set, it defaults to the `JAVA_HOME` setting.

2. The LDI Server requires a stand-alone Apache Tomcat version 6.0.x to run. If you have not already done so, you can install Apache Tomcat 6.0.x as follows:

   (a) Download the binary distribution from: *http://tomcat.apache.org/download-60.cgi*

   (b) Unpack the ZIP file to a directory of your choosing.

   (c) By default, Tomcat starts up on HTTP connector 8080. If another application on the install machine is already using port 8080 (for example, if you have another instance of Tomcat on the machine), then change the default startup port by modifying the `conf/server.xml` file.

   (d) Run Tomcat with the `startup.sh` (for Linux) or `startup.bat` (for Windows) program file in the Tomcat `bin` directory.

   (e) Use a browser to check whether Tomcat is running on URL **http://localhost:8080**. The default Tomcat home page should appear if Tomcat is running properly.

   If you need more detailed installation instructions, go to: *http://tomcat.apache.org/tomcat-6.0-doc/setup.html*

   For instructions on installing Tomcat as a Windows service, see go to: *http://tomcat.apache.org/tomcat-6.0-doc/windows-service-howto.html*

3. Shut down Tomcat to continue with the rest of the installation procedure.

4. Copy the `clover-license.war` and `clover.war` files to the Tomcat `webapps` directory.

5. Create a `setenv` file and configure the Tomcat memory settings appropriate for your needs.

   See the "Creating a setenv file" section (in the next topic) for details on creating this file.

6. Restart Tomcat.

7. Using a browser, verify that the LDI Server license was successfully deployed by using the **http://localhost:8080/clover-license** URL command. The browser should show this light-weight page:

   ```
   This webapp runs on context /clover-license, which is correct.
   ```

8. Using a browser, bring up the LDI Server home page by using the **http://localhost:8080/clover** URL command.
9. Log into the LDI Server: by clicking **Log in to Server Administration** and
   (a) Click **Log in to Server Administration**.
   (b) At the Access Server Gui page, use **clover** as both the username and password and click the **login** button.

After the LDI Server is running, you can access the *Reference Manual* from either the LDI Server home page or via this URL:

```
http://localhost:8080/clover/docs/index.html
```

The *Reference Manual* provides comprehensive documentation on the operations available in the LDI Server.

Tomcat configuration recommendations

This topic provides some configuration tips for getting started with your Tomcat application server.

Keep in mind that complete documentation on configuring and using the Tomcat server is available at this URL for the server:

```
http://localhost:8080/docs/
```

This topic provides some configuration tips that are specific to the LDI Server application.

Creating a setenv file

It is recommended that you create a file named `setenv.bat` (Windows) or `setenv.sh` (Linux) and place it in the Tomcat `bin` directory. With this file (which is run by the `catalina.bat` and `catalina.sh` scripts), you can change the following Tomcat environment settings with the `JAVA_OPTS` variable:

- You can set the minimum and maximum memory heap size with the JVM `-Xms` and `-Xmx` parameters. The best limits depend on many conditions, such as transformations which LDI should execute. For these types of transformations, a maximum of 1 GB is recommended. For example, to set the minimum heap size to 128 MB and the maximum heap size to 1024 MB, use:

  ```
  JAVA_OPTS="-Xms128m -Xmx1024m"
  ```

- You should set the maximum limit of the PermGen (Permanent Generation) memory space to a size larger than the default. The default of 64 MB is not enough for enterprise applications. A suitable memory limit depends on various criteria, but 256 MB would make a good choice in most cases. If the PermGen space maximum is too low, `OutOfMemoryError: PermGen space` errors may occur. You can set the PermGen maximum limit with the following JVM parameter:

  ```
  -XX:MaxPermSize=256m
  ```

- For performance reasons, it is recommended that the application is run in Server mode. Apache Tomcat does not run in Server mode by default. You can set the Server mode by using the JVM `-server` parameter. You can set the JVM parameter in the `JAVA_OPTS` variable in the environment variable in the setenv file.

The following is an example of a `setenv.bat` file:

```
set "JAVA_OPTS=%JAVA_OPTS% -Xms128m -Xmx1024m -XX:MaxPermSize=256m -server"
```

About database connections

The default installation (without changes to the configuration) uses the embedded Apache Derby DB, and therefore does not need an extra database server. In addition, the installation (as regards to the DB) does not need any subsequent configuration.

LDI Server configures itself during the first startup. Database tables and some necessary records are automatically created on the first startup with an empty database. In the **Sandboxes** tab of the LDI Server Administration GUI, you can check that there is one default sandbox created with one test graph.

Only one LDI Server instance can work with the embedded DB. If you need more instances, you should configure an external DB.

You will have to determine if the embedded Apache Derby DB is sufficient for your application when you are ready for production deployment. If the Apache Derby DB is not sufficient, you can configure an external DB connection such as Microsoft SQL or Oracle. For details on configuring external DBs, see Chapter 16 ("Configuration) in the *Reference Manual* for the LDI Server.

Part IV

Installing Latitude Studio

Chapter 7

Installing Latitude Studio

After downloading the Latitude Studio software, you install it on your development server.

About the installation process

You can install Latitude Studio on one of three available platforms.

The options are:

- Latitude Studio with the Windows Tomcat bundle. This is based on Tomcat 6 and Java 1.6.
- Latitude Studio with the Linux Tomcat bundle. This is based on Tomcat 6 and Java 1.6.
- Latitude Studio as a standalone application on Websphere Application Server 7.

Note: The following steps deploy the portal using the default embedded Hypersonic database, which is not intended for production use.

In production, you must deploy using an alternate database. More information about this process can be found in the section "Using a different database" in the "Other Installation Tasks" chapter.

Briefly, to deploy an alternate database, you can modify the `portal-ext.properties` file to specify the appropriate JDBC connection information for the desired database.

Alternatively, you can follow the instructions in the *Liferay Portal Administrator's Guide* to set up a JDBC provider and data source in your application server, and then configure `portal-ext.properties` to look up the data source by JNDI name.

Important: To start up, Latitude Studio requires the Endeca Theme. Even if you do not intend to use the Endeca Theme in production, you should not uninstall the Endeca Theme (`endeca-theme-<version>.war`) from the `endeca-portal\deploy` directory.

Regardless of which platform installation you use, you should secure mode (SSL) on the MDEX Engine and on Studio. For details on enabling secure mode on Studio, see the *Latitude Studio User's Guide*.

Installing the Windows Tomcat bundle

This topic provides the steps for installing the Latitude Studio Windows Tomcat bundle on your development server. In this version, Tomcat 6 and the JVM 1.6 are embedded.

Note: The data sources in your Latitude Studio application must always include a default data source. This data source is automatically assigned to all data-source-backed components when they are initially added to a page. Latitude Studio comes with a `default.json` file. For details on configuring this data source to point to your server, see "Updating default.json and default-schema.json to point to your server".

To install the Latitude Studio Tomcat bundle:

1. Unzip `Latitude_2.2.x_Endeca-portal.zip` to the directory of your choice.

   Latitude Studio creates a directory called `endeca-portal`. For example, if you unzip into `C:`, Latitude Studio installs into `C:\endeca-portal`.

2. Extract the `.war` files from `Latitude_2.2.x_Components.zip` and place them into the `endeca-portal\deploy` directory. The `.war` files go in the root of `endeca-portal\deploy`. There should be no subdirectories.

   Note: This directory already contains themes, hooks, and layouts required by the portal. It is safe to overwrite these files with the versions in `Latitude_2.2.x_Components.zip`.

3. If the environment variables `CATALINA_HOME` or `JAVA_HOME` are already set, update them to point to your newly installed Tomcat directory and a valid 1.6 JRE.

   For example, set `CATALINA_HOME` to `C:\<path_to_endeca-portal>\tomcat-6.0.29`, and set `JAVA_HOME` to `C:\<path_to_endeca-portal>\tomcat-6.0.29\jre1.6.0_21\win`.

   If you do not have these environment variables set, you can leave them un-set.

4. To start the portal's Tomcat instance, run `endeca-portal\tomcat-6.0.29\bin\startup.bat`.

   Note: Server startup can take several minutes. You can follow the log messages to ascertain when the process is complete. Do not shut down the Tomcat window while Latitude Studio is running.

5. To test that the application is running, go to the portal (`http://localhost:8080/`) in your browser. Log in using the following default credentials:

Login:	`test@endeca.com`
Password:	`test`

6. Optionally, you can set up *log4j* logging. `log4j` provides configurable, Java-based logging in an open-source utility.

   Note: For more information about Latitude Studio logging, see the *Latitude Studio User's Guide*.

Before you can begin building an application, you need to add your data sources, including a default data source.

Getting Started with Latitude Studio

Other Latitude Studio Installation Tasks

Changing the context root for the Windows Tomcat bundle

Optionally, after installing the Windows Tomcat bundle, you can change the context root.

When you first install the bundle, it uses the default context root of "/", and you got access to Latitude Studio by going to `http://localhost:8080/`. If you change the context root to "sales", then the URL would be `http://localhost:8080/sales`.

To change the context root:

1. Rename `endeca-portal\tomcat-6.0.29\conf\Catalina\localhost\ROOT.xml` file to `<`*`context root`*`>.xml`.

   For example, if your context root is `sales`, the file name should be `sales.xml`.

   For multi-level context paths, separate the name with #. For example, for a context path of `/sales/east`, the file name should be `sales#east.xml`.

2. Modify the XML file created in the previous step as needed:
   - For a root context: `<Context path="" />`
   - For a context of `/sales`: `<Context path="/sales"/>`
   - For a context of `/sales/east`: `<Context path="/sales/east"/>`

3. Rename the `endeca-portal\tomcat-6.0.29\webapps\ROOT` directory to `endeca-portal\tomcat-6.0.29\webapps\<`*`context root`*`>`.

   For multi-level context paths, use a multi-level path like the following: `endeca-portal\tomcat-6.0.29\webapps\sales#east`.

4. Edit the `endeca-portal\portal-ext.properties` file. Find the `portal.ctx` property at the beginning of `portal-ext.properties`. Change the value of this setting to be the same context root value you used above. However, do not include a trailing slash in the `portal.ctx` value.

   For example, use this value:

   ```
   portal.ctx=/mycompany/portal
   ```

   Do not use this value:

   ```
   portal.ctx=/mycompany/portal/
   ```

Running Latitude Studio as a Windows service

If you have installed the Windows Tomcat bundle, then you can run Latitude Studio as a Windows service.

About running Latitude Studio as a Windows service

Running Latitude Studio as a Windows service requires the Tomcat service installer files.

The Latitude Studio bundle does not include the Tomcat service installer files. You will need to obtain those files from the Tomcat download, which is available from the Apache web site.

After you obtain the files, you then configure and install the service.

You also should install the Tomcat service monitor. The monitor is used to configure and monitor the Windows service, and is useful for troubleshooting. The service monitor executable also is available from the Tomcat download.

Obtaining the service installer files

The service installer and monitor files are part of the Tomcat download.

You must use the files for Tomcat version 6.0.29.

To obtain the files and add them to Latitude Studio:

1. From the Apache Tomcat website (*http://tomcat.apache.org*), download the Tomcat file `apache-tomcat-6.0.29-windows-x86.zip` .
   A sample URL for the archive directory is: *http://archive.apache.org/dist/tomcat/tomcat-6/v6.0.29/bin/*

   If you are not using the bundled JVM, and your JVM is 64-bit, then you must download `apache-tomcat-6.0.29-windows-x64.zip`. This is the 64-bit version of the Tomcat download.
2. Extract the file to a temporary directory.
3. In the `bin` subdirectory of the temporary download directory, locate the following files:
   - `service.bat`
   - `tomcat6.exe`
   - `tomcat6w.exe`. This is the Tomcat service monitor.
4. Copy these files to the `bin` directory of Latitude Studio:

   ```
   endeca-portal\tomcat-6.0.29\bin
   ```

Configuring the service

In the `service.bat` file, you need to configure the service name, description, and memory allocation. The Tomcat monitor file name also must be updated to reflect the change to the service name.

After you copy the Tomcat service installation files, before you can start the service, you need to update `service.bat` to:

- Edit the service name and descriptions to reflect your Latitude Studio installation
- Add additional JVM startup arguments
- Increase the memory allocation. Latitude Studio requires more memory than is set in the default values.

If you change the service name, then you also must change the name of the Tomcat monitor executable.

To update the configuration:

1. Open the file `service.bat`.
2. In the file, find the following lines:

   ```
   set SERVICE_NAME=Tomcat6
   set PR_DISPLAYNAME=Apache Tomcat 6
   ```

3. Change the name and display name to reflect your Latitude Studio installation. For example:

   ```
   set SERVICE_NAME=LS22
   set PR_DISPLAYNAME=Latitude Studio 2.2
   ```

4. Next, find the following line:

   ```
   set PR_DESCRIPTION=Apache Tomcat 6.0.29 Server -
   http://tomcat.apache.org/
   ```

5. Change the service description to reflect your Latitude Studio installation. For example:

   ```
   set PR_DESCRIPTION=Endeca Latitude Studio server, version 2.2
   ```

6. Next, find the following line:

   ```
   "%EXECUTABLE%" //US//%SERVICE_NAME% ++JvmOptions "-Djava.io.tmpdir=%CATALINA_BASE%\temp
   ;-Djava.util.logging.manager=org.apache.juli.ClassLoaderLogManager
   ;-Djava.util.logging.config.file
   =%CATALINA_BASE%\conf\logging.properties" --JvmMs 128 --JvmMx 256
   ```

7. Replace the last part of the line:

   ```
   -Djava.util.logging.config.file
   =%CATALINA_BASE%\conf\logging.properties" --JvmMs 128 --JvmMx 256
   ```

   with:

   ```
   -Djava.util.logging.config.file=%CATALINA_BASE%\conf\logging.properties;-XX:MaxPermSize
   =256m" --JvmMs 256 --JvmMx 1024
   ```

   Make sure that there are no manual line breaks or extra spaces.

8. Immediately below that line, add the following line:

   ```
   "%EXECUTABLE%" //US//%SERVICE_NAME% ++JvmOptions "-Dfile.encoding=UTF8
   ;-Djava.net.preferIPv4Stack=true;-Duser.timezone=GMT;-XX:MaxPermSize=256m"
   ```

   Make sure there are no manual line breaks or extra spaces.

9. Save and close the file.
10. Create a copy of the Tomcat monitor file (`tomcat6w.exe`). Rename the copy to be <*value of SERVICE_NAME*>`w.exe`.

    For example, if you set `SERVICE_NAME=LS22` in `service.bat`, then you must rename the copy of the `tomcat6w.exe` to `LS22w.exe`.

Installing and starting the service

To install the service, you run the `service.bat` file. You also must update the Tomcat monitor to point to the JVM.

Before you install the service, make sure that you have updated the configuration.

Also, if you are not using the bundled JVM, then make sure that the `JAVA_HOME` environment variable is set to the location of your JDK. By default, `service.bat` looks for `%JAVA_HOME%\jre\server\jvm.dll`.

To install and start the Latitude Studio service:

1. From the command line, navigate to the Latitude Studio Tomcat `bin` directory.

   ```
   endeca_portal\tomcat-6.0.29\bin\
   ```

2. Run the following command:

   ```
   service.bat install
   ```

3. Configure the Tomcat monitor to point to the JVM:
   (a) Double-click the monitor executable.
   (b) On the properties dialog, click the **Java** tab.
   (c) Uncheck **Use default**.
   (d) In the **Java Virtual Machine** field, set the full path to `jvm.dll`.

   For the bundled JVM, the file is `endeca-portal\tomcat-6.0.29\jre1.6.0_21\win\bin\server\jvm.dll`.

   If you are not using the bundled JVM, then set the path to your JVM.

   (e) Click **OK.**
4. When you install the service, it is set up to be started manually. To configure the service to start automatically:
   (a) Display the **Services** list (**Control Panel>Administrative Tools>Services**).
   (b) In the list, double-click the Latitude Studio service.

   The properties dialog for the service is displayed.

   (c) From the **Startup type** drop-down list, select **Automatic**.
   (d) Click **OK**.
5. From the **Services** list, to start the service for the first time, right click the service, then click **Start**.

Troubleshooting the service installation

If the service installs properly, but fails to start, you can use the steps provided here to troubleshoot.

For additional details on using the Tomcat service and service monitor, see *http://tomcat.apache.org/tomcat-6.0-doc/windows-service-howto.html*.

As you are troubleshooting, check the log files (`endeca-portal\tomcat-6.0.29\logs\jakarta_service*.log`) for the relevant messages.

If the service will not start:

1. Make sure that you have used the correct version of the Tomcat download:
   - Tomcat version 6.0.29
   - For a 32-bit JVM (including the bundled JVM), `apache-tomcat-6.0.29-windows-x86.zip`
   - For a 64-bit JVM, `apache-tomcat-6.0.29-windows-x64.zip`

2. If you are not using the bundled JVM, make sure that the `JAVA_HOME` environment variable is set to the location of your JDK.

   By default, `service.bat` looks for `%JAVA_HOME%\jre\server\jvm.dll`.

   To change `JAVA_HOME` after the service is installed:

   (a) Uninstall the service. To uninstall the service, run the following command: `service.bat remove`

   (b) Update `JAVA_HOME`.

   (c) Reinstall and restart the service.

3. Make sure the Tomcat service monitor is configured to point to the location of your JVM.

   (a) Double-click the monitor executable.

   (b) On the properties dialog, click the **Java** tab.

   (c) Uncheck **Use default**.

   (d) In the **Java Virtual Machine** field, specify the path to `jvm.dll`.

   For the bundled JVM, the file is `endeca-portal\tomcat-6.0.29\jre1.6.0_21\win\bin\server\jvm.dll`.

   If you are not using the bundled JVM, then set the path to your JVM.

   (e) Click **OK.**

4. Use the Tomcat service monitor to set the startup and shutdown modes to Java.

   (a) Double-click the monitor executable.

   (b) On the properties dialog, click the **Startup** tab.

   (c) From the **Mode** drop-down list, select **Java**.

   (d) Click the **Shutdown** tab.

   (e) From the **Mode** drop-down list, select **Java**.

   (f) Click **OK**.

Installing the Linux Tomcat bundle

In the Latitude Studio Linux Tomcat bundle version of Latitude Studio, Tomcat 6 is embedded.

Note: Among the data sources in your Latitude Studio application, you must always include a default data source. This data source is automatically assigned to all data-source-backed components when they are initially added to a page. Latitude Studio comes with a `default.json` file.

For details on configuring this data source to point to your server, see "Updating default.json and default-schema.json to point to your server".

To install the Latitude Studio Tomcat bundle:

1. Extract `Latitude_2.2.x_Endeca-portal.tgz` to the directory of your choice.

2. Extract the `.war` files from `Latitude_2.2.x_Components.zip` and place them into the `endeca-portal/deploy` directory. The `.war` files go in the root of `endeca-portal/deploy`. There should be no subdirectories.

   Note: This directory already contains themes, hooks, and layouts required by the portal. It is safe to overwrite these files with the versions in `Latitude_2.2.x_Components.zip`.

3. If the environment variable `CATALINA_HOME` is already set, update it to point to your newly installed Tomcat directory.
4. Make sure that the `JAVA_HOME` environment variable is set to point to a valid 1.6 JRE.
5. To start the portal's Tomcat instance, run `endeca-portal/tomcat-6.0.29/bin/startup.sh`.

   Note: Server startup can take several minutes. You can follow the log messages to ascertain when the process is complete.

6. To test that the application is running, go to the portal (`http://localhost:8080/`) in your browser. Log in using the following default credentials:

Login:	`test@endeca.com`
Password:	`test`

7. Optionally, you can set up *log4j* logging. `log4j` provides configurable, Java-based logging in an open-source utility.

   Note: For more information about Latitude Studio logging, see the *Latitude Studio User's Guide*.

Getting Started with Latitude Studio

Other Latitude Studio Installation Tasks

Changing the context root in the Linux Tomcat bundle

Optionally, you can change the context root used by your Latitude Studio application.

When you first install the bundle, it uses the default context root of "/", and you got access to Latitude Studio by going to `http://localhost:8080/`. If you change the context root to "sales", then the URL would be `http://localhost:8080/sales`.

To change the context root:

1. Rename `endeca-portal/tomcat-6.0.29/conf/Catalina/localhost/ROOT.xml` file to `<context root>.xml`.

   For example, if your context root is `sales`, the file name should be `sales.xml`.

   For multi-level context paths, separate the name with #. For example, for a context path of `/sales/east`, the file name should be `sales#east.xml`.

2. Modify the XML file created in the previous step as needed:
   - For a root context: `<Context path="" />`

- For a context of `/sales`: `<Context path="/sales"/>`
- For a context of `/sales/east`: `<Context path="/sales/east"/>`

3. Rename the `endeca-portal/tomcat-6.0.29/webapps/ROOT` directory to `endeca-portal/tomcat-6.0.29/webapps/<context root>`.

   For multi-level context paths, use a multi-level path like the following: `endeca-portal/tomcat-6.0.29/webapps/sales#east`.

4. Edit the `endeca-portal/portal-ext.properties` file.

   Find the `portal.ctx` property at the beginning of `portal-ext.properties`.

   Change the value of this setting to be the same context root value you used above. However, do not include a trailing slash in the `portal.ctx` value.

   For example, use this value:

   ```
   portal.ctx=/sales/east
   ```

   Do not use this value:

   ```
   portal.ctx=/sales/east/
   ```

Installing Latitude Studio on the WebSphere Application Server version 7

You can deploy Latitude Studio as a standalone application on WebSphere Application Server (WAS) version 7.0.

Before following the steps here, consult the *Liferay Portal Administrator's Guide*, which contains portal deployment instructions and examples for WebSphere Application Server 7.0.

Note: The examples in this section are based on a Linux server WAS deployment. If you are installing on Windows, the steps will be similar, though you will need to substitute Windows executables and paths. In certain examples, backslashes are used to escape the dollar sign ($) character on Linux, because the shell would otherwise attempt a variable substitution for this character. These backslashes should not be required on a Windows system.

Note: Among the data sources in your Latitude Studio application, you must always include a default data source. This data source is automatically assigned to all data-source-backed components when they are initially added to a page. For details, see the topic "Updating default.json to point to your server" in the next chapter.

High-level overview of WebSphere Application Server 7 deployment

Here is an overview of the steps for deploying Latitude Studio on WAS 7. This overview is followed by the details for each step.

To deploy Latitude Studio on WAS:

1. Deploy dependency `.jar` files.

   The exact list of required files and destination directories is provided below.

2. Start (or restart) the WAS server.
3. Install the Latitude Studio `.war` file as an enterprise application.
4. Edit and deploy `portal-ext.properties`.
5. Create the `endeca-data-sources/*.json` data source configuration files.
   For more information, see the *Latitude Studio User's Guide*.
6. Install the Endeca theme, portlet components, and other framework `.war` files.
7. Install the Liferay license.

   The instructions for obtaining and installing the license are provided later in this section.
8. Start the Latitude Studio enterprise application.
9. Optionally, repeat step 6 for any additional plugins you want to add.

Deploying Latitude Studio dependency libraries on WAS 7

Latitude Studio requires the deployment of several Java libraries.

These libraries are deployed to a global class loader, making them available to multiple applications.

To deploy the Latitude Studio dependency libraries:

1. Unzip the `.jar` files found in `Latitude_2.2.x_endeca-portal-dependencies.zip`.
2. Upload the following `.jar` files from the `.zip` file to the WAS server's external library directory.

   (For example, if WAS is installed in `/usr/local/WAS/AppServer`, you would deploy the selected `.jar` files into `/usr/local/WAS/AppServer/lib/ext/`.)

   ```
   annotations.jar
   commons-lang.jar
   cxf-2.2.8.jar
   cxf-orawsdl-adapter.jar
   endeca-images.jar
   endeca_navigation.jar
   endeca-portal.jar
   ext-service.jar
   hsql.jar
   jabsorb.jar
   jackson-core-lgpl-1.7.2.jar
   jackson-mapper-lgpl-1.7.2.jar
   log4j.jar
   mdex-bindings.jar
   oracle.http_client_11.1.1.jar
   orawsdl.jar
   portal-kernel.jar
   portal-service.jar
   portlet.jar
   slf4j-api.jar
   slf4j-log4j12.jar
   XmlSchema-1.4.3.jar
   ```
3. Restart the WAS server so that it can pick up the newly available `.jar` files.

Extracting the standalone portal WAR on WAS 7

Before you can install the standalone portal WAR, you must extract it from its download package.

To extract the standalone portal WAR on WAS 7:

1. Unzip `Latitude_2.2.`*`x`*`_endeca-portal-war.zip` into a temporary directory.

   This zip file contains the `endeca-portal-<`*`version`*`>.war` file and the `copyright.txt` file.
2. Read the `copyright.txt` file, then save it to the location of your choice.
3. Note the location of the `endeca-portal-<`*`version`*`>.war` file, as you will need to navigate to it in the next step.

Deploying the standalone portal WAR on WAS 7

After downloading and extracting the necessary files, you can deploy Latitude Studio as an enterprise application in WebSphere Application Server, and then install portlets, themes, and other plugins as modules in that enterprise application.

The following steps document the installation procedure by using the IBM Integrated Solutions Console for a WebSphere Application Server installed and maintained without the use of the Deployment Manager, and consisting of one cell with one node and one server.

The instructions may need to be adjusted for clustered environments, environments maintained with the Deployment Manager, or for environments where administration is performed by using tools like `wsadmin`, rather than the Integrated Solutions Console.

The following steps assume that no other applications are deployed in the same application server. If there are other applications, ensure that no applications are bound to context root `/` (or that any such applications are stopped during the Latitude Studio deployment).

After following these steps, you will be able to adjust the context root for the Latitude Studio application, to ensure it does not conflict with other applications.

To deploy the Latitude Studio standalone portal WAR on WAS 7:

1. Start the WAS server.
2. Log in to the WAS Integrated Solutions Console, using the appropriate administrator credentials.
3. In the WAS Integrated Solutions Console, select **Applications>New Application>New Enterprise Application**.
4. Click to browse to and select the Endeca Latitude Studio WAR you downloaded earlier (`endeca-portal-<`*`version`*`>.war`), and then click **Next**.
5. Select **Choose to generate default bindings and mappings**. Check the following options:
   - **Generate default bindings**
   - **Override existing bindings**
6. Still in the **Choose to generate default bindings and mappings** section, check **Use default virtual host name for Web and SIP modules**, and then enter `default_host` in the text field.

   Click **Next.**

7. By default, the application name is **endeca-portal-<*version*>_war**. Set the application name to a more relevant name (for example, `LatitudeStudio`). All other installation options can remain unchanged. Click **Next**.

   Note: Do not use spaces in the application name. For example, use **LatitudeStudio** instead of **Latitude Studio**.

8. In **Map modules to servers**, accept the default settings, and then click **Next**.
9. In **Map context roots for Web modules**, set the context root to the desired path for your Latitude Studio installation, and then click **Next**.

   Note: Make a note of your context root, as you will need to reference it several times during the deployment process.

10. In **Install New Application**, confirm that your settings are correct, and then click **Finish**.
11. Wait for installation. If the installation is successful, click **Save directly to master configuration**.

Creating the Liferay Home directory on WAS 7

The remaining instructions in this section refer to a directory called Liferay Home. The Liferay Home directory is created relative to the user's home directory.

Manually create a Liferay Home directory (`/home/endeca/liferay/`), along with the following subdirectories:

- `/home/endeca/liferay/data`
- `/home/endeca/liferay/data/endeca-data-sources`
- `/home/endeca/liferay/websphere-deploy`

Editing the portal-ext.properties file for WAS 7 deployment

Before deploying your `portal-ext.properties` file, you must edit it.

Endeca's default version of `portal-ext.properties` is included in the package `Latitude_2.2.`*`x`*`_endeca-portal-dependencies.zip`.

1. Open the `portal-ext.properties` file
2. Add the following lines to the end of the file:

   ```
   # Specify a directory where Liferay will "deploy" processed plugins.
   # From this directory, WAS users will deploy WARs as modules in the
   # Latitude Studio enterprise application.
   #
   auto.deploy.dest.dir=${liferay.home}/websphere-deploy
   #
   # Set this to true to enable JMX integration in
   # com.liferay.portal.cache.EhcachePortalCacheManager.
   #
   ehcache.portal.cache.manager.jmx.enabled=false
   ```

Note: The destination directory (specified by the `auto.deploy.dest.dir` setting) must exist before the plugin is hot-deployed. In the above example, you must manually create the `websphere-deploy` directory if it does not exist.

3. Find the `portal.ctx` property at the beginning of `portal-ext.properties`.

   Change the value of this setting to be the same context root value you used when deploying the standalone portal WAR. However, do not include a trailing slash in the `portal.ctx` value.

   For example, use this value:

   ```
   portal.ctx=/mycompany/portal
   ```

   Do not use this value:

   ```
   portal.ctx=/mycompany/portal/
   ```

4. Save the file.

Configuring portal-ext.properties for WAS 7 deployment

After you edit your `portal-ext.properties` file, you must deploy it in WAS.

To deploy the file, you can either:

- Update the application to include the `portal-ext.properties` file.
- Upload the `portal-ext.properties` file to the Liferay Home directory on the server.

Updating the application to include the portal-ext.properties file on WAS 7

After you create the `portal-ext.properties` file, you can use the IBM Integrated Solutions Console to include `portal-ext.properties` in the `endeca-portal.war` module.

These steps may be performed with the `wsadmin` tool instead of the Integrated Solutions Console, and may need to be adjusted for alternate WAS configurations.

Note: In order to make changes to the `portal-ext.properties` file, users will need to repeat these steps to update the application with updated versions of the `portal-ext.properties` file. In some environments, it may be more appropriate to deploy the `portal-ext.properties` file to the Liferay Home directory, where it can be updated without updating the deployed application. That option is described in another topic.

To deploy a `portal-ext.properties` file in the Integrated Solutions Console:

1. Go to **Applications>Application Types>WebSphere Enterprise Applications**.
2. Select the enterprise application created when you deployed the portal WAR, then click **Update**.
3. Select **Replace or add a single file**.
4. Specify the path to deploy the file into the `WEB-INF/classes` directory of the portal Web application.

   For example: `endeca-portal-<`*`version`*`>.war/WEB-INF/classes/portal-ext.properties`
5. Browse to where you created the file on your computer.
6. When the file has successfully updated, click **Save directly to master configuration**.

Uploading portal-ext.properties to Liferay Home on the server on WAS 7

After you create the `portal-ext.properties` file, you can manually upload it to WAS.

To manually upload the `portal-ext.properties` file:

1. Upload the `portal-ext.properties` file to the Liferay Home directory. For example: `/home/endeca/liferay/portal-ext.properties`.
2. When the Latitude Studio application is started, Liferay reads these properties.

Example settings for portal-ext.properties on WAS 7

Endeca's default version of `portal-ext.properties` is included in the package `Latitude_2.2.x_Endeca-portal-dependencies.zip`.

This file serves as a useful starting point for configuration of the portal properties, and should be deployed to the application server according to the steps described in a previous topic.

Note: Most of the settings in the default `portal-ext.properties` file are not specific to deployment on WAS 7. However, the following additional settings (which you must add to the file as described in the topic "Configuring portal-ext.properties for WAS 7 deployment") are important for portlet deployment on WAS:

```
auto.deploy.dest.dir=/home/endeca/liferay/websphere-deploy
ehcache.portal.cache.manager.jmx.enabled=false
```

Deploying Endeca data source configuration on WAS 7

To configure one or more MDEX Engines as data sources for Latitude Studio, you must deploy a JSON configuration file for each MDEX Engine.

These files should be deployed relative to the Liferay Home directory.

Sample data source configuration files are provided as `.json.sample` files in the `Latitude_2.2.x_endeca-portal-dependencies.zip` file you downloaded.

To deploy the Endeca data source configuration, upload the files to the `data/endeca-data-sources/` subdirectory.

For example, `/home/endeca/liferay/data/endeca-data-sources/default.json`.

Starting the application on WAS 7

Once the Latitude Studio application has been deployed, and the `portal-ext.properties` file has been configured and deployed, the application needs to be started.

The following steps describe this process in the IBM Integrated Solutions Console.

To start the application:

1. Go to **Applications>Application Types >WebSphere Enterprise Applications**.
2. Select the enterprise application created when you deployed the portal WAR.
3. If the application is not already running, click **Start** to start it.
4. View your deployed application at the root context of the server.

5. Restart WAS 7.

Deploying components and other plugins in WAS 7

This section describes how to deploy components, themes, hooks, and other plugins in WAS 7.

These plugins are located in the `Latitude_2.2.x_Components.zip` package.

About Liferay component pre-processing in WAS 7

WAS does not support the hot deployment of components. However, Liferay's deployment code must update plugins by adding necessary libraries and configuration files.

For example, Liferay's portlet deployment code adds the following important piece of configuration to a portlet component's `web.xml` file:

```
<context-param>
  <param-name>com.ibm.websphere.portletcontainer.PortletDeploymentEnabled</param-name>
  <param-value>false</param-value>
</context-param>
```

This context parameter is important for WAS deployment, as it ensures that WAS's portal server does not attempt to load the new portlet, and instead allows Latitude Studio to load the newly deployed portlet.

For this reason, Liferay must be allowed to pre-process components before they are deployed to WAS. You upload your `.war` files to Liferay's `deploy` directory so that Liferay's deployer can find and process them.

Deploying components in WAS 7

Liferay must pre-process Latitude Studio components before they can be deployed in WAS 7.

Important: To start up, Latitude Studio requires the Endeca Theme. Even if you do not intend to use the Endeca Theme in production, you should deploy the Endeca Theme (`endeca-theme-<version>.war`).

To deploy Latitude Studio components in WAS 7:

1. Copy all component `.war` files to `${liferay.home}/deploy`.
2. Wait while Liferay pre-processes the .war files and places them in the `${liferay.home}/websphere-deploy` directory.
3. Deploy the `.war` files generated in step 2 as modules in the Latitude Studio enterprise application. To do this, you can either use:
   - The WebSphere Integrated Solutions Console.
   - The command line, using `wsadmin`.

Deploying generated .war files on WAS 7 with the Integrated Solutions Console

You can use the IBM Integrated Solutions Console to deploy the `.war` files it finds in the `websphere-deploy` directory.

Note: These steps may need to be adjusted for alternate WAS configurations.

To deploy a generated .war file with the Integrated Solutions Console:

1. Go to **Applications>Application Types>WebSphere Enterprise Applications**.
2. Select the enterprise application created when you deployed the portal .war file, then click **Update**.
3. Select **Replace or add a single module**.
4. Specify the path to deploy the file as the display name of the new module.

   For example, if you are adding endeca-navigation-portlet.war, specify the path as endeca-navigation-portlet.
5. Browse the remote file system to the newly created .war file in the Liferay deploy output directory.

   Continuing the example above, this might be /home/endeca/liferay/websphere-deploy/endeca-navigation-portlet.war.
6. After finding the file, click **Ok**.
7. Select the detailed install path. Keep the defaults on all screens except the context root.

   Set the context root to match the display name of the new plugin (in this example, /endeca-navigation-portlet/).
8. Once it has successfully updated, click **Save directly to master configuration**.

Using wsadmin to deploy the generated .war file on WAS 7

You can also use the wsadmin tool to deploy the generated .war file from the command line.

Note: These steps may need to be adjusted for alternate WAS configurations.

In the wsadmin tool, enter a command similar to the example below, where the command is executed from the Liferay deploy output directory (that is, the directory containing the endeca-navigation-portlet.war file):

```
[WAS]/AppServer/bin/wsadmin.sh -c "\$AdminApp update LatitudeStudio
modulefile {-operation addupdate -contents endeca-navigation-port¬
let.war -contextroot /endeca-navigation-portlet/ -contenturi endeca-navi¬
gation-portlet -usedefaultbindings}" -c "\$AdminConfig save"
```

In this example:

- The enterprise application is named LatitudeStudio.
- The file name for the module being added is endeca-navigation-portlet.war.
- The module display name is endeca-navigation-portlet
- The command is executed in /home/endeca/liferay/websphere-deploy/ .

Installing the Latitude Studio license

Before you can start Latitude Studio, you must install the license, which is provided in the component .zip file.

To install the license:

1. Extract the Latitude Studio license (`latitude_studio_license.xml`) from the component .zip file (`Latitude_2.2.`*`x`*`_Components.zip`).
2. Save the file to the `${liferay.home}/deploy` directory of your Latitude Studio installation.

When you start Latitude Studio, the license is installed.

Troubleshooting WAS 7 deployment

When deploying Latitude Studio on WAS 7, keep the following issue in mind.

Updating the Latitude Studio .war file

If you need to update the Latitude Studio `.war` file (not any individual plugin, but the portal `.war` itself), you must restart the WAS server. If you only restart the module, the restart might not be successful.

Chapter 8

Getting Started with Latitude Studio

After installing Latitude Studio, use the following steps to launch and configure Latitude Studio and begin to work with it.

For more comprehensive information about Liferay components and concepts, see the *Liferay Portal Administrator's Guide*.

Starting Latitude Studio

After you complete the Latitude Studio installation, you can start and log in to the application.

Before logging in to Latitude Studio:

- Make sure you have a data source in place.
- Edit the host and port settings in `default.json` to match your data source.

To start Latitude Studio:

1. Start your application server.
2. In your Web browser, go to the portal.
3. Log in using the default login and password:

Login:	`test@endeca.com`
Password:	`test`

Updating default.json and default-schema.json to point to your server

When you first install Latitude Studio, all components that require a backing data source are bound to a data source called `default.json`.

The `endeca-portal\data\endeca-data-sources` directory contains the `default.json` file.

Before you can start working with components in Latitude Studio, you must either:

- Update this file to point to the correct server and port.
- From the **Framework Settings** component, select a different data source to use as the default.

The `endeca-portal\data\endeca-data-sources` directory also contains a `default-schema.json` file. It points to the same server and port as the default version of `default.json`, but is set up to only display configuration records.

You should also update `default-schema.json` to point to the correct server and port.

To update the `default.json` and `default-schema.json` files:

1. In the `endeca-portal\data\endeca-data-sources` directory, open `default.json` in a text editor.
2. In the file, edit the server and port lines to reflect your server. For example:

   ```
   {
      "server":"localhost",
      "port":"5555"
   }
   ```

3. Save the file.
4. Open default-schema.json in a text editor.
5. In the file, edit the server and port lines to reflect your server.

   Make sure you do not edit or remove the `mdexRecords` parameter.

After you have updated the `default.json` and `default-schema.json` files, you can log in to Latitude Studio and begin adding components to your application.

For details on viewing configuration settings for data sources, see the *Latitude Studio User's Guide*.

Changing Control Panel settings

After logging in to Latitude Studio, you may also want to use the **Control Panel** to configure Latitude Studio settings.

Accessing the Control Panel

The **Control Panel** provides access to a wide range of edit controls, including managing accounts, adding new users, and monitoring performance. There are also Latitude-specific components for managing data sources, configuring Latitude Studio settings, and monitoring Latitude Studio performance.

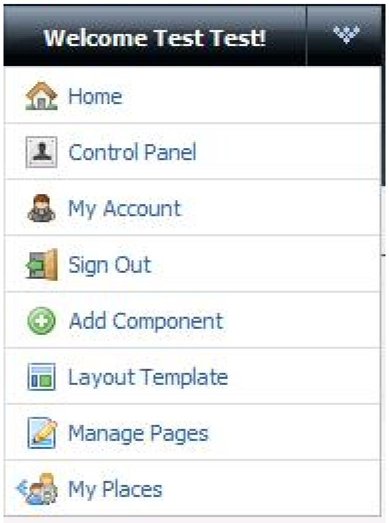
For full documentation on **Control Panel** capabilities, see the *Liferay Portal Administrator's Guide*.

For information on the Latitude-specific **Control Panel** components, see the *Latitude Studio User's Guide*.

To access the **Control Panel**:

1. Click the Dock in the upper-right corner of the page.

   The Dock is labeled "Welcome <*user name*>!"

2. From the drop-down menu, select **Control Panel**.

About the Framework Settings component

The **Framework Settings** component on the **Control Panel** provides access to state, security, and other settings.

For details about **Framework Settings**, see the *Latitude Studio User's Guide*.

Importing sample Latitude Studio pages

Latitude Studio provides a set of sample pages you can use as a starting point for working with components and viewing data and configuration settings.

One page, called **Data Explorer**, contains components bound to the `default` data source. This page allows you to explore the data in the default data source.

The other page, **Schema Explorer**, contains similar components. The components on the **Schema Explorer** page are bound to the `default-schema` data source, which only displays configuration records. This page allows you to explore the configuration settings for the default data source.

The sample pages are in a LAR file called `SchemaAndDataExplorers.lar`. The file is in the `endeca-portal` directory.

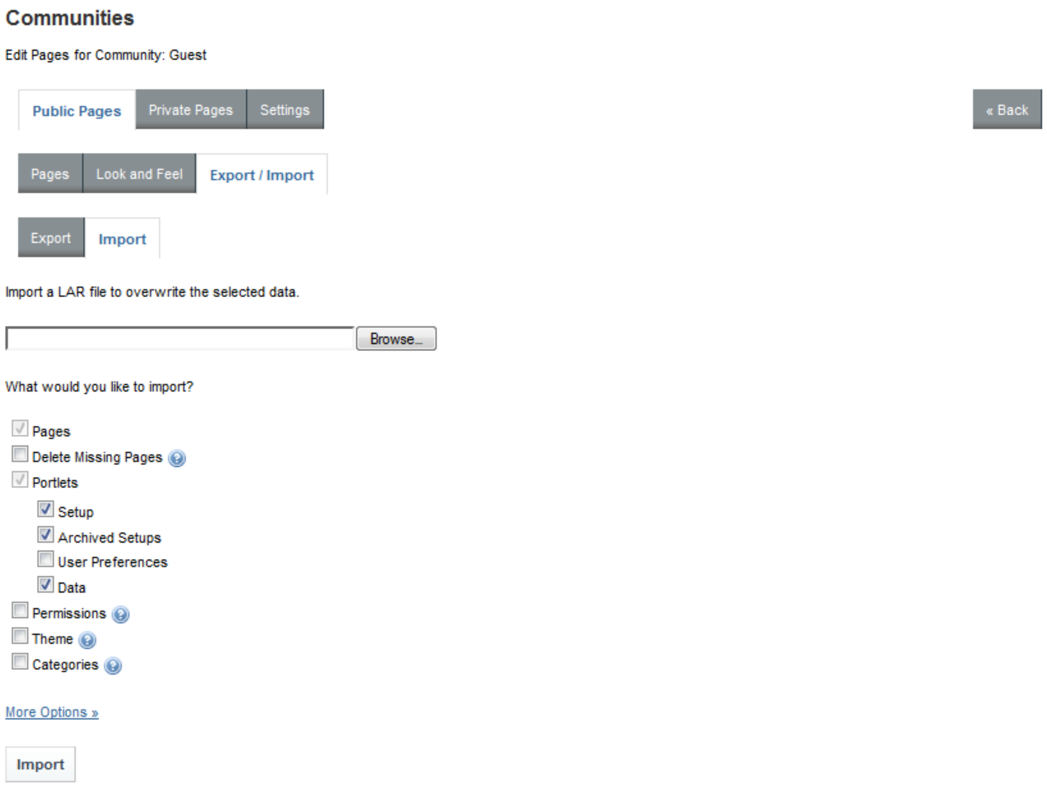
To import the sample pages into Latitude Studio:

1. To display the **Manage Pages** options from the **Communities** component:
   (a) From the Dock menu, select **Control Panel**.
   (b) On the **Control Panel**, click **Communities**.

   (c) On the **Communities** page, for the community you want to import the pages into, click the **Actions** button, then click **Manage Pages**.

   If you have not set up any other communities, then the only community is the **Guest** community.

2. On the **Communities** page for the selected community, click the **Export/Import** tab.
3. Click the **Import** tab. The **Import** tab contains the options for importing pages from a LAR file.



Communities

Edit Pages for Community: Guest

Import a LAR file to overwrite the selected data.

What would you like to import?

☑ Pages
☐ Delete Missing Pages
☑ Portlets
  ☑ Setup
  ☑ Archived Setups
  ☐ User Preferences
  ☑ Data
☐ Permissions
☐ Theme
☐ Categories

4. To search for and select the `SchemaAndDataExplorers.lar` file, click the **Browse** button.
5. Click the **Import** button.

   The **Data Explorer** and **Schema Explorer** pages are added to the application.

Adding components to a Latitude Studio page

Latitude Studio provides several standard components that you use to add Latitude functionality to your application.

For information about building applications with Latitude Studio, see the *Latitude Studio User's Guide*.

To add a Latitude component to your Latitude Studio application:

1. Click the Dock in the upper-right corner of the page.
2. In the drop-down menu, select **Add Component**.

   The **Add Component** dialog box opens.

3. In the **Add Component** dialog box, expand the **Latitude** category.

   A list of the available Latitude components is displayed.

4. To add a component to the main page layout, either:
   - Click the **Add** link for the component.
   - Drag the component from the **Add Component** dialog to the page.

Exploring the Latitude Sample Application in Latitude Studio

For instructions on how to download, run, and explore the Latitude Quick Start project and the Latitude Sample application, see the *Latitude Quick Start Guide*. By following the procedure outlined in that guide, you will be able to add the Latitude Sample Application files to your Latitude installation and explore the Sample Application in Latitude Studio.

Chapter 9

Other Latitude Studio Installation Tasks

For a production instance, you must use a database other than the default Hypersonic database.

Using a different database to store application data

For production instances, you need to switch from the default Hypersonic (HSQL) database.

About using a different database

The Liferay portal server uses a relational database to store configuration and state, such as portlet preferences, user permissions, system settings, and more.

By default, Liferay uses Hypersonic (HSQL), which is an embedded database running inside the Java virtual machine. HSQL is useful for standing up a Liferay instance very quickly, but must NOT be used in production due to performance issues and its inability to support clustered Liferay instances.

For instructions on switching to another supported database system, see the *Liferay Portal Administrator's Guide*. Keep the following details in mind:

- Latitude Studio ships with a `portal-ext.properties` file (in the portal distribution's root directory). You can modify this file instead of creating a new one.
- Endeca has tested Latitude Studio on MySQL and DB2. Other databases are expected to work but have not been explicitly tested.

Overview of the process for switching to a different database

This topic provides a high-level overview of the steps involved in switching from the default Hypersonic database to the production RDBMS of your choice.

Note: Because the details vary from database to database, this topic only provides a high-level overview of this process. For detailed information, see the *Liferay Portal Administrator's Guide*.

To switch to a different database:

1. Install and verify that your database is working.
2. Create a new empty database or schema for the Liferay portal.
3. Create a database user for the Liferay portal.

4. Grant that user access to the appropriate database/schema, with privileges to create tables, alter schemas, and so on in that database. Ensure that the user has remote access from the Liferay application servers.
5. Stop Liferay if it is running.
6. Edit the `portal-ext.properties` file. In the JDBC section, comment out the settings for Hypersonic, and uncomment the settings for your database.
7. Edit the settings for your database of choice, adding the appropriate username and password and editing the JDBC connection string as necessary.
8. Start Latitude Studio. Monitor its logs to ensure for any error messages while connecting to the database and creating tables.
9. After tables have been created and you have validated Liferay is running, you may remove the liferay user's alter table privileges.

   Note that you may have to add these back later if you upgrade Liferay or install components that require schema changes.

Part V

Uninstallation Tasks

Chapter 10

Uninstalling the Latitude Modules

This chapter describes how to uninstall the various modules of an Endeca Latitude installation.

Uninstalling the MDEX Engine

This section contains the procedures for uninstalling the MDEX Engine package.

Steps to uninstall the MDEX Engine on Windows

Follow these steps to uninstall the MDEX Engine from your Windows machine.

Before you begin the uninstall process, back up files that you want to retain from the MDEX Engine root directory.

You also must:

- Stop all Endeca processes, including the Dgraph.
- Close any open PDF files.

To uninstall the MDEX Engine from your Windows machine:

1. From the Windows Control Panel, select **Programs>Programs and Features>Uninstall a program**.
2. Select **Endeca Latitude 2.2.*x* MDEX Engine 7.2.0 x64 Edition** from the list of installed software.
3. Click the **Uninstall** option.

   The setup wizard is launched.
4. In the wizard, make sure that the **Uninstall** radio button is selected and then click **Next**.
5. In the following dialog, click **Next** to begin the uninstall procedure.
6. Click **Finish** to exit the wizard.

Steps to uninstall the MDEX Engine on Linux

Follow these steps to uninstall the MDEX Engine from your Linux machine.

Before you begin the uninstall process, back up files that you want to retain from the MDEX Engine directory.

Make sure that you stop all Endeca processes, including the Dgraph, before uninstalling the Endeca software.

To uninstall the MDEX Engine from your Linux machine:

1. Change to the parent directory of the Latitude install directory.
2. Issue an `rm` command as in this example:

   ```
   rm -rf endeca/Latitude/2.2.x/MDEX
   ```

This command removes the Endeca MDEX Engine.

Uninstalling the Latitude Data Integrator

This section contains the procedures for uninstalling the Latitude Data Integrator Designer package.

Uninstalling LDI Designer on Windows

Follow these steps to uninstall the LDI Designer from your Windows client machine.

Although the uninstall procedure does not delete the LDI workspace folder, it is a good practice to back up your LDI projects before uninstalling.

To uninstall the Latitude Data Integrator Designer from your Windows machine:

1. From the Windows Control Panel, select **Programs>Uninstall a program**.
2. Select **Endeca Latitude Data Integrator Designer** from the list of installed software.
3. Click the **Uninstall** option.
4. In the Uninstall wizard, select the **Uninstall** option and click **Next**.
5. In the Completing the Setup Wizard dialog, click **Next**.
6. When the uninstallation procedure is completed, click **Finish**.
7. The uninstallation procedure leaves some folders (such as `configuration` and `p2`) in the install folder. You must manually delete these folders if you intend to later reinstall into this location.

As mentioned above, the LDI workspace folder is not deleted after this procedure. You can delete it or not, as you wish. If you do keep it, it can be used by a later reinstallation of LDI Designer.

Uninstalling LDI Designer on Linux

Follow these steps to uninstall the LDI Designer from your Linux client machine.

Although the uninstall procedure does not delete the LDI workspace folder, it is a good practice to back up your LDI projects before uninstalling.

To uninstall the Latitude Data Integrator Designer from your Linux machine:

1. Change to the parent directory of the LDI install directory.
2. Issue an `rm` command as in this example:

   ```
   rm -rf cloveretl-designer
   ```

3. Delete your LDI workspace folder.

As mentioned above, the LDI workspace folder is not deleted after Step 2. However, if you re-install the LDI Designer, it is recommended that you back up the LDI projects (in the workspace folder) and then delete the workspace folder. After re-installation, you can import the LDI projects from their saved location.

Uninstalling LDI Server

Follow these steps to uninstall the LDI Server.

To uninstall the LDI Server from your Windows or Linux machine:

1. Shut down Tomcat.
2. Delete the Tomcat install directory.

Uninstalling Latitude Studio

To uninstall Latitude Studio, remove the packages and directories that you installed.

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