

# Novell exteNd

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INSTALLING NOVELL EXTEND



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## About This Book

### Purpose

This book describes how to install the Novell® exteNd™ suite of products.

### Audience

This book is for users and/or administrators responsible for installing and configuring the Novell exteNd product suite for both development and production environments.





# 1

## Preparing to Install exteNd 5

This chapter presents an overview of the **Novell exteNd 5** product suite installation program. The installation program is self-documenting, but there are some decisions you need to make before you run the install. This chapter helps you make them.

Topics include:

- ◆ [About the installation program](#)
- ◆ [Before you install](#)
- ◆ [Starting the install](#)
- ◆ [What gets installed](#)
- ◆ [Installing in console mode](#)
- ◆ [Deploying the Express Portal](#)
- ◆ [Uninstalling exteNd 5](#)
- ◆ [Contacting Technical Support](#)

**Latest information** For the latest information on hardware and software requirements, supported databases, and specific install issues, see the *Release Notes*.

### About the installation program

The installation program is an Install Anywhere wizard that is similar on all platforms. There are several options for installing the **Novell exteNd** suite:

Option	Description	Platform
Express	<ul style="list-style-type: none"> <li>◆ Installs all suite products and features using a default configuration</li> <li>◆ Autoconfigures MySQL</li> <li>◆ Deploys the Express Portal</li> </ul>	Windows, Linux
Server Express	<ul style="list-style-type: none"> <li>◆ Installs all server components</li> <li>◆ Autoconfigures MySQL</li> <li>◆ Deploys the Express Portal</li> </ul>	Windows, Linux
Server	<ul style="list-style-type: none"> <li>◆ Installs only the server components</li> </ul>	Windows, UNIX, Linux
Tools	<ul style="list-style-type: none"> <li>◆ Installs only the application design tools</li> </ul>	Windows, Linux
Custom	<ul style="list-style-type: none"> <li>◆ Lets you select options to install a specific configuration of products and features</li> <li>◆ Lets you install <b>exteNd</b> features to a third-party application server</li> </ul>	Windows, UNIX, Linux, NetWare®

## Before you install

This section explains what you need to know and do before installing [exteNd 5](#):

- ◆ [Preparing your computer](#)
- ◆ [Making installation decisions](#)
- ◆ [Choosing an installation option](#)
- ◆ [Choosing an installation mode](#)
- ◆ [Choosing a database for SilverMaster](#)
- ◆ [Using MySQL with exteNd 5](#)

### Preparing your computer

If you have a previously installed version of any [Novell exteNd](#) product, **uninstall** it before installing this version of the [Novell exteNd 5](#) suite.

 For details, see “[Uninstalling exteNd 5](#)” on page 14.






### Making installation decisions

These are the decisions you need to make **before** you install [Novell exteNd](#):

What to decide	Considerations	For information see
Which <b>install option</b> will you use?	<b>Applies to:</b> Windows, UNIX, Linux, and NetWare <b>Details:</b> The different install options are customized for various typical uses	<a href="#">“Choosing an installation option” on page 3</a>
Which <b>install mode</b> will you use?	<b>Applies to:</b> UNIX and Linux <b>Details:</b> You can run the installation program in either graphical mode or console mode (on Windows and NetWare, the installation program always runs in graphical mode)	<a href="#">“Choosing an installation mode” on page 4</a>
Which <b>database</b> will you use for your SilverMaster?	<b>Applies to:</b> Windows, UNIX, and Linux (on NetWare, the suite install uses the existing <a href="#">exteNd Application Server</a> and SilverMaster installed with NetWare) <b>Details:</b> The <a href="#">exteNd Application Server</a> requires a SilverMaster database to maintain its own system information; you need to specify a database of a supported type (DBMS) to use as SilverMaster	<a href="#">“Choosing a database for SilverMaster” on page 4</a>
Should you configure the <a href="#">exteNd Application Server</a> to run as a <b>service or daemon</b> ?	<b>Applies to:</b> Windows (on UNIX and Linux, this is done after installation; on NetWare, the <a href="#">exteNd Application Server</a> automatically starts by default via autoexec.ncf) <b>Details:</b> If you want the <a href="#">exteNd Application Server</a> to restart automatically whenever its host machine reboots, configure it to run as a Windows service or UNIX/Linux daemon	<a href="#">Chapter 6, “Installing the exteNd Application Server as a Service or Daemon”</a>


## Choosing an installation option

These are the installation options available with **exteNd 5**:

Install option	What it does	Platforms
Express	<p>This is the simplest way to get started using the <b>exteNd</b> suite of products. In addition to installing all of the design tools and server components (including the <b>exteNd Application Server</b>), it creates and configures a MySQL database for use as SilverMaster and deploys a portal project (Express Portal) that can be used as your starting point for development, testing, or learning.</p> <p> See <a href="#">Chapter 2, “Express and Server Express Installs”</a>.</p>	Windows, Linux
Server Express	<p>Installs the server components of <b>exteNd</b> (including the <b>exteNd Application Server</b>), but not the designers and tools used for development. The Server Express install creates and configures a MySQL database for use as SilverMaster and deploys a portal project (Express Portal) that can be used as your starting point for development, testing, or learning.</p> <p> See <a href="#">Chapter 2, “Express and Server Express Installs”</a>.</p>	Windows, Linux
Server	<p>Installs the server components of <b>exteNd</b> (including the <b>exteNd Application Server</b>), but not the designers and tools used for development. The Server install asks which type of database you will use for SilverMaster and requests specific configuration information such as port numbers and passwords. The Server install is appropriate for machines that will be hosting <b>exteNd</b> applications.</p> <p> See <a href="#">Chapter 3, “Server Install”</a>.</p>	Windows, UNIX, Linux
Tools	<p>The Tools option installs the <b>exteNd</b> design tools used for application development.</p> <p> See <a href="#">Chapter 4, “Tools Install”</a>.</p>	Windows, Linux
Custom	<p>The Custom option allows you to select which <b>exteNd</b> features are installed on your machine. You can specify your own preferences for databases, port numbers, and passwords.</p> <p>Custom is also the option to choose if you want to install <b>exteNd</b> features to a third-party J2EE application server (such as WebLogic, WebSphere, or Tomcat) instead of using the <b>exteNd Application Server</b>.</p> <p> See <a href="#">Chapter 5, “Custom Install”</a>.</p>	All platforms

## Choosing an installation mode

You can choose to run the installation program in one of the following modes (depending on your platform):

Install mode	Description
Graphical mode	<p>Graphical mode displays the installation program as a window-based wizard. It is the <b>default</b> mode when you run the installation program on any platform.</p> <p>Graphical mode is appropriate for most users.</p> <p><b>NOTE:</b> Most of the examples in this guide show the installation program running in graphical mode (except where indicated).</p>
Console mode	<p>Console mode displays the installation program as a series of text-based prompts on the console. It is an alternative way to run the installation program on the following platforms:</p> <ul style="list-style-type: none"> <li>◆ UNIX</li> <li>◆ Linux</li> </ul> <p>Console mode is appropriate for more advanced users.</p> <p> For details on using this mode, see <a href="#">“Installing in console mode” on page 9</a>.</p>

No matter which mode you use, the installation program will request the same information from you and install **exteNd 5** with the same result.

## Choosing a database for SilverMaster

The SilverMaster is a database used by the **Novell exteNd Application Server**. There is one SilverMaster for each application server or cluster. The SilverMaster keeps track of all deployment databases used by the application server and also holds the application server’s system tables—such as tables containing security group and user information. Applications can also be deployed to the SilverMaster.

### Making a DBMS choice

When choosing a DBMS to host your SilverMaster, consider the following platform issues:

Platform	DBMS considerations for SilverMaster
Windows, Linux	The Express and Server Express install options automatically install and configure <b>MySQL</b> . Alternatively, you can choose any supported DBMS for SilverMaster by using other install options.
NetWare	<b>MySQL</b> is automatically installed and configured as SilverMaster during the NetWare installation.
UNIX	You must be using a supported DBMS product and create a database to be used as SilverMaster before running the install program.

The application server can communicate with multiple database engines at once. For example, you can install your SilverMaster database on MySQL and have all of your deployment databases on another DBMS, such as Oracle.

## Preparing the database to be a SilverMaster

**NOTE:** If you are using the Express or Server Express option, the install automatically creates a MySQL database. Otherwise, you will have to create a database. If you are using the Custom option on Windows or Linux, a MySQL database can be created for you.


Preparing the database involves two operations:


- ◆ [Creating the database](#)
- ◆ [Setting up the database](#)

**Creating the database** You need to create a database to use as your SilverMaster **before** installing the application server.

**Setting up the database** The application server must be able to connect to the database you want to use as SilverMaster (as well as any other databases you want it to access). The application server acts as a **database client**—so it requires any database client software, ODBC driver, JDBC driver, and any configuration necessary for an application connecting to a particular database.

The steps for setting up a database differ for the different database types (Oracle, and so on).

 For details on setting up your database type, see the [appropriate chapter](#) in the [exteNd Application Server Database Configuration Guide](#).

 For more information about the SilverMaster database and setting it up, see the [exteNd Application Server Administrator's Guide](#) (especially the chapter on [data source configuration](#)).

## Using MySQL with exteNd 5

### Default port number

MySQL is installed at port number 63306 when configured by the [exteNd](#) suite installer. This is to avoid conflicts with any other MySQL server running on the same machine.

### MySQL on Windows

Running the Express or Server Express option installs MySQL. If you have an existing installation of MySQL running as a service on Windows, that MySQL service will be overwritten and your existing `my.ini` file (in the Windows product directory) will be renamed `my.ini.bak`.

If you want to avoid installing MySQL during the [exteNd](#) installation, use the Custom option and deselect MySQL.

### MySQL on Linux

When installing MySQL on Linux, the [exteNd](#) installation program does not set up a MySQL daemon. It's recommended that you **set up a daemon yourself** to automatically restart MySQL whenever your system reboots. Otherwise, you can start MySQL manually by executing the script `StartMySQL.sh` in the [Novell exteNd mysql](#) directory.

When you install as root user on Linux, the installation program edits the `/etc/password` and `/etc/group` files with entries required to start MySQL.

### MySQL on NetWare

MySQL and the [exteNd Application Server](#) are installed as part of the NetWare installation program. The [exteNd 5](#) suite does not reinstall either the MySQL SilverMaster or the application server during the suite install.

## Starting the install

When you're ready to install **exteNd 5**, read this section to learn about starting the **exteNd** installation program on your platform. You can get the installation program from the **exteNd** product CD or by downloading one of the following files from the **Novell** Web site:

Platform	File to download
Windows	Novell_exteNd5 <code>nn</code> _windows.zip
Solaris	Novell_exteNd5 <code>nn</code> _solaris.tar
Linux	Novell_exteNd5 <code>nn</code> _linux.tar
NetWare	Novell_exteNd5 <code>nn</code> _netware.zip

After you download one of these archives, extract its contents to your file system. Then you can start the install:

Platform	How to start the <b>exteNd</b> install
Windows	<ol style="list-style-type: none"> <li>1 Find the file <code>xtndInst.exe</code> on the <b>exteNd</b> product CD or on your file system.</li> <li>2 Run this executable file.</li> </ol>
Solaris	<ol style="list-style-type: none"> <li>1 Find the file <code>xtndInst_sol.bin</code> on the <b>exteNd</b> product CD or on your file system.</li> <li>2 Type:           <pre>sh xtndInst_sol.bin</pre> </li> </ol>
Linux	<ol style="list-style-type: none"> <li>1 Find the file <code>xtndInst_lnx.bin</code> on the <b>exteNd</b> product CD or on your file system.</li> <li>2 Type:           <pre>sh xtndInst_lnx.bin</pre> </li> </ol>
NetWare	<ol style="list-style-type: none"> <li>1 Find the file <code>install.NCF</code> (and accompanying archive <code>xtndInst.jar</code>) on the <b>exteNd</b> product CD or on your file system.</li> <li>2 Run this NCF file.           <p><b>NOTE:</b> You may need to edit <code>install.NCF</code> before running it from your file system. Make sure the java command line in <code>install.NCF</code> specifies the correct path for the <code>xtndInst.jar</code> file. For example:</p> <pre>java -cp sys:\xtndInst.jar install</pre> <p>Alternatively, you can execute this java command line directly (instead of using the <code>install.NCF</code> file).</p> </li> </ol>

## What gets installed

This section lists what gets installed or started during the installation:

- ◆ Files
- ◆ Services
- ◆ Environment variables
- ◆ Registry keys
- ◆ Startup items

If you uninstall manually, you need to make sure these are deleted or stopped.

## Files

The installation program installs into the directory of your choice. The default depends on your platform:

Platform	Default install directory
Windows	C:\Program Files\Novell\exteNd5
UNIX, Linux	/opt/novell/exteNd5
NetWare	SYS:\exteNd

If you are doing a manual uninstall, there are some things you may want to preserve:

- ◆ **Any profiles, projects, and configuration files** you have created or modified that are stored in the [Novell exteNd](#) directories
- ◆ **Any files under MySQL\data** (they will be overwritten during an Express or Server Express install)

## Services

In Windows, the installation program creates services as needed for the features you've chosen. These services may include:

Category	Service	Registry keys
Application server	Novell exteNd Application Server	My Computer\ HKEY_LOCAL_MACHINE\ SYSTEM\ControlSet001\ Services\exteNdAppServer <sup>nn</sup>
	Novell exteNd Application Server Cache Manager	My Computer\ HKEY_LOCAL_MACHINE\ SYSTEM\ControlSet001\ Services\exteNdCachemgr <sup>nn</sup>
	Novell exteNd Application Server Dispatcher	My Computer\ HKEY_LOCAL_MACHINE\ SYSTEM\ControlSet001\ Services\exteNdDispatcher <sup>nn</sup>
	Novell exteNd Application Server Load Manager	My Computer\ HKEY_LOCAL_MACHINE\ SYSTEM\ControlSet001\ Services\exteNdLoadmgr <sup>nn</sup>
exteNd Director	exteNd Director Cache Coordinator	My Computer\ HKEY_LOCAL_MACHINE\ SYSTEM\ControlSet001\ Services\CacheCoordinator
	exteNd Director DRE	My Computer\ HKEY_LOCAL_MACHINE\ SYSTEM\ControlSet001\ Services\DirectorDRE
MySQL server	mysql	My Computer\ HKEY_LOCAL_MACHINE\ SYSTEM\ControlSet001\ Services\MySQL

## Environment variables

In Windows, the following are defined as **system variables**. In UNIX/Linux, they are defined in the `.profile` file.

- ◆ NOVELL\_EXTEND\_APPSERVER\_HOME  
(SILVERSTREAM\_HOME maps to the same location; it is provided for backward compatibility)
- ◆ NOVELL\_EXTEND\_COMPOSER\_HOME
- ◆ NOVELL\_EXTEND\_DIRECTOR\_DEV\_HOME
- ◆ NOVELL\_EXTEND\_DIRECTOR\_HOME  
(SILVERSTREAM\_DIRECTOR\_HOME maps to the same location; it is provided for backward compatibility)
- ◆ NOVELL\_EXTEND\_HOME
- ◆ NOVELL\_EXTEND\_WORKBENCH\_HOME

**AGCLASSPATH** If you installed MySQL as part of the `exteNd` install, the MySQL driver is added to the AGCLASSPATH environment variable. For example:

```
C:\Program Files\Novell\exteNd5\MySQL\jdbc\mysql-connector-java-3.0.10-stable-bin.jar
```

In UNIX/Linux, AGCLASSPATH is defined in the `Novell exteNd AppServer/.agprofile` file.

**Path modifications** In Windows, path environment variables are modified as follows:

Path	Modifications
User path	C:\Program Files\Novell\exteNd5\Director\autonomy
System path	C:\Program Files\Novell\exteNd5\AppServer\bin; C:\Program Files\Novell\exteNd5\Director\autonomy

## Registry keys

In Windows, the following registry keys are defined:

Application	Registry key
exteNd Application Server	My Computer\ HKEY_LOCAL_MACHINE\SOFTWARE\Novell\exteNd\ AppServer\ <i>n.n</i>
exteNd Director™	My Computer\ HKEY_LOCAL_MACHINE\SOFTWARE\Novell\exteNd\ Director\ <i>n.n</i>
exteNd Director tools	My Computer\ HKEY_LOCAL_MACHINE\SOFTWARE\Novell\exteNd\ Workbench\ <i>n.n</i>

## Startup items


In Windows, the `exteNd` install creates the following program group on the **Start menu**:

```
Novell exteNd n.n
```



## Installing in console mode

If you've decided to run the installation program in console (text-based) mode, read this section to learn how.

 For background information about the modes available when running the installation program on your platform, see “Choosing an installation mode” on page 4.

### ➤ To run the installation program in console mode:

- 1 At the command prompt, start the installation program with the **-i console** switch. Here's the syntax for both UNIX and Linux:

```
sh installer-filename -i console
```

For example:

On this platform	You type
Solaris	sh xtndInst_sol.bin -i console
Linux	sh xtndInst_lnx.bin -i console

- 2 Follow the prompts as they display on the console.  
During the installation program, the following **commands** are available (at just about any time) to let you control its operation:

Type this command	If you want to
back	Go back to the previous prompt (to change your response or just review it)
quit	Cancel the install

## Choosing product features during a custom install

If you request a custom install while in console mode (by picking **Customize...** at the **Choose Install Set** prompt), the installation program displays the **Choose Product Features** prompt, including a list of the current feature selections:

```
Choose Product Features
-----
```

```
ENTER A COMMA SEPARATED LIST OF NUMBERS REPRESENTING THE FEATURES YOU WOULD
LIKE TO SELECT, OR DESELECT. TO VIEW A FEATURE'S DESCRIPTION, ENTER
'?'<NUMBER>'. PRESS <RETURN> WHEN YOU ARE DONE:
```

```
1- [X] exteNd Suite
2-  |-[X] Sample Database in MySQL
3-  |-[X] exteNd Messaging Platform
4-  |-[X] exteNd Application Server
5-    |-[X] Application Server
6-    |-[X] Deployment
7-    |-[X] SMC
8-    |-[X] Cluster tools
9-    |-[X] SilverJ2EEClient
10-   |-[X] UDDI services
11-  |-[X] Web Services SDK
12-  |-[X] Director
13-    |-[X] Director Designer
14-    |-[X] Director Tools
15-    |-[X] Autonomy DRE
16-  |-[X] Express Portal
```

```

17-  |-[X] Composer Server
18-  |-[X] LDAP Utility
19-  [X] Documentation
20-  [ ] Composer Server for existing exteNd Application Server
21-  [ ] Composer Server for WebLogic
22-  [ ] Composer for WebSphere
23-  [ ] Composer Server for Tomcat
24-  [X] MySQL

```

Please choose the Features to be installed by this installer.

:

This section provides some tips for completing this part of the install in console mode.

**What the symbols mean** Here's a key to the Choose Product Features list:

Symbol	Meaning
[X]	The feature is <b>selected</b> and will be installed.
[ ]	The feature is <b>deselected</b> and will <b>not</b> be installed.
[-]	The feature is <b>partially selected</b> . You see this symbol for a parent item when one or more of its children are deselected. It indicates that a <b>subset</b> of the feature will be installed.  <b>IMPORTANT:</b> If you deselect <b>all</b> of a parent item's children but leave the parent item partially selected, some files related to that parent item may get installed. If this is not what you want, be sure to <b>deselect the parent item</b> too.

**How to select and deselect** The Choose Product Features prompt works by toggling any item(s) you specify:

If you	Then
Type the number of a <b>selected</b> or <b>partially selected</b> item:  8	That item will be <b>deselected</b>
Type the number of a <b>deselected</b> item:  22	That item will be <b>selected</b>

You can toggle **multiple items** at a time by typing the appropriate item numbers in a comma-separated list. For example:

```
8,15,22
```

Toggling a **parent item** sets all of its children to the same state.

**How to review your selections** After you respond to the Choose Product Features prompt, you can review your selections by typing the **back** command. You can then make further changes or continue on to the next install prompt.

## Deploying the Express Portal

Read this section to learn when you may need to deploy the Express Portal manually after installing exteNd and how to do it:


- ◆ [About the Express Portal](#)

- ◆ When to deploy the Express Portal yourself
- ◆ Installing the deployment tools
- ◆ Setting up the Express Portal database
- ◆ Deploying the Express Portal project
- ◆ Testing the deployed Express Portal

## About the Express Portal

To help you start working with applications right away, **exteNd** provides a default project called Express Portal. It's a complete portal application based on a standard **exteNd Director** EAR project.

The source files for the Express Portal project are installed in the **Novell exteNd Projects\Express** directory. The Express Portal also requires access to a database to store and manage its application data at runtime.

 For further details on this project and to learn how the application works, see the chapter **About the Express Portal** in the **exteNd Director Portal Guide**.

## When to deploy the Express Portal yourself

The **exteNd** installation program automatically deploys the Express Portal if you request an Express or Server Express install (which are available when the target platform is Windows or Linux). In all other cases, you must deploy the Express Portal yourself after installation if you want to have it running on your application server.

If your target platform is **UNIX or NetWare**, note that Server and Custom are the only install options available, neither of which performs the Express Portal deployment. So for these server platforms, you must always deploy the Express Portal yourself if you want to use it.

## Installing the deployment tools

To deploy the Express Portal yourself, you'll want the **exteNd** designers, which include built-in tools for application generation and deployment. You can install the **exteNd** designers on either a **Windows or Linux** machine; select one of the following install options:

- ◆ Express
- ◆ Tools
- ◆ Custom

You can then use that Windows or Linux machine to deploy to your application server, which may be running on Windows, UNIX, Linux, or NetWare.

## Setting up the Express Portal database

Before deploying, you also need to set up the database required by the Express Portal. It will be used to store the Express Portal database schema and data.

### ➤ To set up the Express Portal database:

- 1 Create a **new** database or find an **existing** one to use; it must be a database type supported by **exteNd** applications (for a list, see the **Release Notes**).

**IMPORTANT:** To avoid conflicts, don't reuse the existing database of another deployed Express Portal.

- 2 Create a JDBC **connection pool** on your application server for access to that database. Name the connection pool **ExpressPortal**.

To create a connection pool on the [Novell exteNd Application Server](#), use the SMC (Server Management Console). For details, see the chapter on [data source configuration](#) in the [exteNd Application Server Administrator's Guide](#).

### If you're deploying to NetWare

If you are preparing to deploy the Express Portal to the [Novell exteNd Application Server](#) on NetWare, there are some details you need to know about for proper setup of the Express Portal database.

**Database type** MySQL 4.0 (which is shipped with NetWare 6.5 Support Pack 2) is not supported for the Express Portal database. But you can use MySQL 4.1 (which is installed with the [exteNd 5](#) suite on Windows and Linux) or any other database listed in the [Release Notes](#). To use MySQL 4.1:

- 1 Do an **Express install** of [exteNd](#) on a Windows or Linux machine.
- 2 Use **MySQL-Front** to create a new MySQL database on that machine. Give this database a unique name, such as **ExpressPortalNW**.

**Connection pool** If you do create a MySQL database for the Express Portal, follow these steps to set up the JDBC connection pool for it on the NetWare server:

- 1 Open the Server Management Console in the NetWare GUI by selecting **Novell>exteNd Application Server>SMC**.
- 2 Go to **Pools** and click the **Add** button.
- 3 Specify **MySQL** as your Database Platform and accept the pre-configured settings. Then click **Next**.
- 4 Specify the following, then click **Next**.
  - ◆ The Pool Name **ExpressPortal**
  - ◆ The **User Name** and **Password** for your MySQL database
- 5 Edit the default **JDBC URL** as follows, then click **Next**.
  - ◆ Replace **%HOST%** with the full **IP address and port number** of your MySQL database server (note that the default MySQL port configured by the [exteNd](#) suite install is 63306)
  - ◆ Replace **%DBNAME%** with the **database name** (such as **ExpressPortalNW**)

The resulting JDBC URL should look something like this:

```
jdbc:mysql://11.222.333.44:63306/ExpressPortalNW
```
- 6 When the Properties panels display, simply click **Next** and then **Finish**.

## Deploying the Express Portal project

The Express Portal is an [exteNd Director](#) EAR project, so you'll use the [exteNd Director](#) tools to deploy it to your application server.

### ➤ To deploy the Express Portal project:

- 1 Go to the **Windows or Linux machine** where you installed the [exteNd](#) designers.
- 2 Start the [exteNd Director development environment](#) by doing one of the following:

Platform	What to do
Windows	<ol style="list-style-type: none"> <li>1 Go to the list of all programs on the Windows <b>Start</b> menu.</li> <li>2 Select <b>Novell exteNd <i>n.n</i>&gt;Director&gt;Director Designer</b>.</li> </ol>

Platform	What to do
Windows, Linux	<ol style="list-style-type: none"> <li>1 Go to the <a href="#">Novell exteNd tools/bin</a> directory.</li> <li>2 Run the executable file named <code>xd</code>.</li> </ol>

- 3 If the Express Portal project (**Express.spf**) doesn't open by default, open it yourself by selecting **File>Open Project**.  
You'll find Express.spf in the [Novell exteNd Projects/Express](#) directory on your local Windows or Linux machine.
- 4 Select **Project>Director>Configuration**, then go to the **Framework** tab.
- 5 Edit the setting **Server Accessible Temp Directory** to specify a temporary directory on your application server machine (needed to store some files for [exteNd Director](#)). Then click **OK**.

If your application server platform is	The temp directory setting is typically
Windows	C:\Program Files\Novell\exteNd5\temp
UNIX, Linux	/opt/novell/exteNd5/temp
NetWare	SYS:\exteNd\temp

Note that the path you specify is relative to your application server machine.

- 6 Select **Project>Deployment Settings**, then go to the **Server Profiles** tab and click the **New** button.  
When the New Server Profile dialog displays, fill it in to create a server profile that specifies your target application server. For example, these settings are for an [exteNd](#) application server running on a NetWare machine:

Click **OK** to return to the Deployment Settings dialog.

- 7 Specify the **User name** and **Password** for the administrator of your application server.
- 8 Go to the **Deployment Info** tab to specify any additional information required by the type of application server you are deploying to.  
For an [exteNd](#) application server, click the **browse (...)** button to select the **Novell Deployment Plan** to use: **Express\_DeplPlan.xml** (in the [Novell exteNd Projects/Express](#) directory).
- 9 Click **OK** to complete the Deployment Settings dialog.
- 10 Select **Project>Deploy Archive** to begin deploying the Express Portal project to your specified application server.  
Watch the **Output Pane** for notification when the deployment has completed.

 For more information, see the chapter on [deploying exteNd Director applications](#) in [Developing exteNd Director Applications](#).

## Testing the deployed Express Portal

Once deployment is done, use a **Web browser** to see the Express Portal running on your application server. Go to this URL:

```
http://serverhost:port/ExpressPortal
```

For an **exteNd** application server, the port number is typically one of the following, depending on the platform:

Application server platform	Typical port number
Windows	80
UNIX, Linux	8080
NetWare	83

## Uninstalling exteNd 5

If you need to remove an existing **exteNd 5** installation, you can run the **exteNd 5 uninstall program** that's provided on your machine. To start the uninstall program, use one of the following approaches (depending on your platform).

**IMPORTANT:** Before you uninstall (by using the uninstall program or manually), make sure you **shut down** all **exteNd 5** programs, services, and daemons.

Platform	How to run the uninstall program
Windows	<ol style="list-style-type: none"> <li>1 Go to the list of all programs on the Windows <b>Start</b> menu.</li> <li>2 Select <b>Novell exteNd <i>n.n</i>&gt;Uninstall Novell exteNd Suite 5</b>.</li> </ol> <ol style="list-style-type: none"> <li>1 Go to the Windows <b>Control Panel</b> and select <b>Add or Remove Programs</b>.</li> <li>2 Select <b>Novell exteNd Suite 5</b>, then click the <b>Change/Remove</b> button.</li> </ol>
Windows, UNIX, Linux	<ol style="list-style-type: none"> <li>1 Go to the <b>Novell exteNd UninstallerData/exteNdSuite</b> directory.</li> <li>2 Run the executable file named <b>Uninstall_ExteNd5_Suite</b>.</li> </ol>
Windows, UNIX, Linux, NetWare	At the command prompt, type: <pre>java -cp exteNd_dir/UninstallerData/exteNdSuite/uninstaller.jar uninstall</pre>

The uninstall program will run in the same mode you used when installing **exteNd 5**, either graphical mode or console mode.

The uninstall program won't remove files that were created or changed after **exteNd 5** was installed. You can examine the remaining files to decide if there are any (as described in "**Files**" on page 7) that you want to keep. You can remove the other files and folders yourself.

**Uninstalling manually** As an alternative to using the uninstall program, you can manually remove the files and other artifacts of your existing **exteNd 5** installation.



See the section on "**What gets installed**" on page 6 for a list of files and other artifacts to remove.

**After uninstalling** No matter how you uninstall **exteNd 5**, make sure you **reboot** your machine when the uninstall is done.

## Contacting Technical Support

To learn about the online product support available to you, visit the **Novell exteNd Web site** (<http://extend.novell.com/>).

If you contact the **Novell exteNd** support staff for assistance, you will be asked to provide the following:

- ◆ **Information about your environment**
- ◆ **Information about your problem**

### Information about your environment

Category	Details
Product versions	Available from the <b>About...</b> help menu
Product type	The suite edition you are using
Operating system	The platform for your server
Database platform for SilverMaster	The DBMS you are using for your SilverMaster
Other databases	The DBMSs you are using for application deployment and application data, including versions
Database drivers	The types and versions of the database drivers you are using
Browser	The name and version number of the Web browser you are using
Java Virtual Machine version (JVM)	Displayed when you start the <b>exteNd Application Server</b>
Proxy servers and firewalls	Whether you are using a proxy server or firewall in your system configuration

### Information about your problem

- ◆ Does the problem occur in the **development environment** or at **runtime**?
- ◆ What was the **specific action** that caused the error?
- ◆ What **error message** did you see?
- ◆ Can the problem be **recreated** consistently?
- ◆ What are the **exact steps** to recreate the error? Please be prepared to provide an **example**





# 2 Express and Server Express Installs

This chapter presents an overview of the Express and Server Express installation options. These options allow you to quickly install the entire suite or the server features of the suite with minimal input required. Topics include:

- ◆ [About the Express install option](#)
- ◆ [About the Server Express install option](#)
- ◆ [Running the installer](#)

## About the Express install option

The **Express** install is the simplest way for you to get started using the **exteNd** suite of products. In addition to installing all of the design tools and server components (including the **exteNd Application Server**), it creates and configures a MySQL database for use as SilverMaster and deploys a portal project (Express Portal) that can be used as your starting point for development, testing, or learning. Express is available on Windows and Linux.

## About the Server Express install option

The **Server Express** option installs the server components of **exteNd** (including the **exteNd Application Server**), but not the designers and tools used for development. The Server Express install automatically creates and configures a MySQL database for use as SilverMaster and deploys the Express Portal. This install option is appropriate for machines that will be hosting **exteNd** applications. Server Express is available on Windows and Linux.

## Running the installer

Although there are different things happening behind the scenes, the install wizard asks for the same input during the Express and Server Express installations.

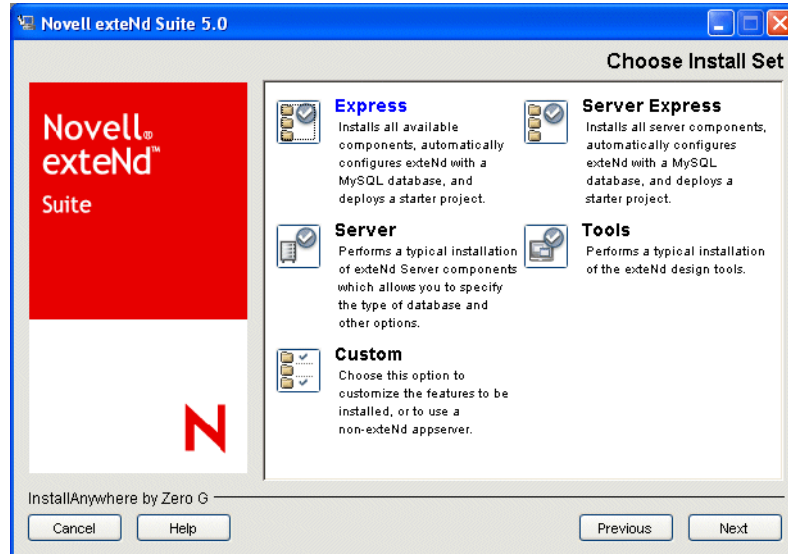
**IMPORTANT:** Novell recommends uninstalling any previous version of **exteNd** before reinstalling. If you choose to install over an existing **exteNd** installation and use the Express or Server Express install, the installer will **overwrite the existing SilverMaster and ExpressPortal** databases. Any changes made to those databases will be lost.


➤ **To install **exteNd** using the Express or Server Express option:**

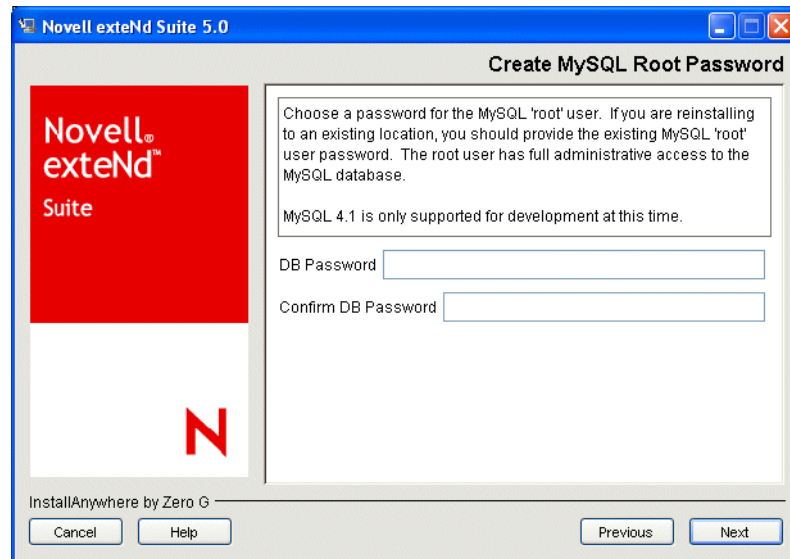
- 1 Exit all other programs (if running on Windows), then launch the **exteNd** installation program as described in “[Starting the install](#)” on page 14.

The product **splash screen** displays, including a dropdown for selecting the language in which you want to see the install prompts.


- 2 Select one of the available **language** choices and click **OK**.
- 3 When the **Introduction** panel displays, read it then click **Next**.  
The License Agreement panel displays.
- 4 To continue with the install, you must **accept the license agreement** (by selecting the corresponding radio button). Then click **Next**.
- 5 When the **Installation Key** panel displays, type your key (note that it's case-sensitive) then click **Next**.  
**NOTE:** Your installation key determines which product features are available to be installed.  
The Choose Install Set panel displays.
- 6 Select **Express** or **Server Express** (as appropriate), then click **Next**.



- 7 When the **Choose Install Location** panel displays, accept the default or specify a different directory where you want **exteNd** to be installed. Then click **Next**.  
**NOTE:** If the specified directory doesn't exist, you'll be prompted to confirm that you want it created. Click **OK**.
- 8 If the Configure MySQL Server panel displays, accept the default (63306) for **MySQL Port** or specify a different port number on which MySQL is to listen. Then click **Next**.  
 For more information, see [“Using MySQL with exteNd 5” on page 13](#).  
The MySQL Root Password panel displays.
- 9 Type the **database password** to be used for the MySQL root user, then click **Next**.  
**IMPORTANT:** When reinstalling to an existing location, specify the existing MySQL root password.

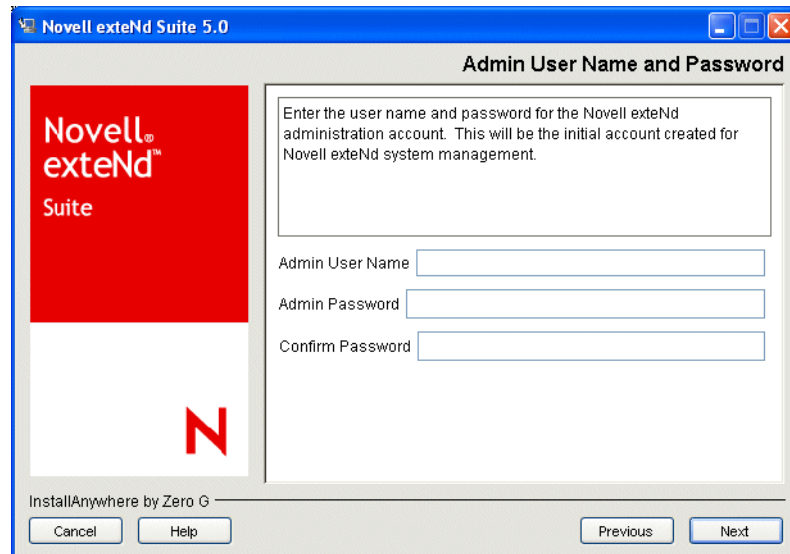


- 10 When the **HTTP Port Number** panel displays, accept the default (80 on Windows, 8080 on Linux) or specify a different port number on which the **exteNd Application Server** is to listen. Then click **Next**.


 For more about port usage, see the chapter on **running the server** in the **exteNd Application Server Administrator's Guide**.

The Admin User Name and Password panel displays.

- 11 Type the **user name** and **password** to be used for the initial **exteNd** administration account.



When creating this account, the installation program will assign **Locksmith** privileges to it. Your **exteNd** administrator will log in to this account when managing the application server and other aspects of the **exteNd** system.

 For more information, see the chapter on **setting up users and groups** in the **exteNd Application Server Administrator's Guide**.

Click **Next** to advance to the **Pre-Installation Summary** panel.

- 12 If the summary matches the result you want, click **Install** to proceed with the installation.



# 3

## Server Install

This chapter presents an overview of the Server installation option. Topics include:

- ◆ [About the Server install option](#)
- ◆ [Running the installer](#)

### About the Server install option

The **Server** option installs the server components of **exteNd** (including the **exteNd Application Server**), but not the designers and tools used for development. The Server install asks which type of database you will use for SilverMaster and requests specific configuration information such as port numbers and passwords. The Server install is appropriate for machines that will be hosting **exteNd** applications. Server is available on Windows, UNIX, and Linux.

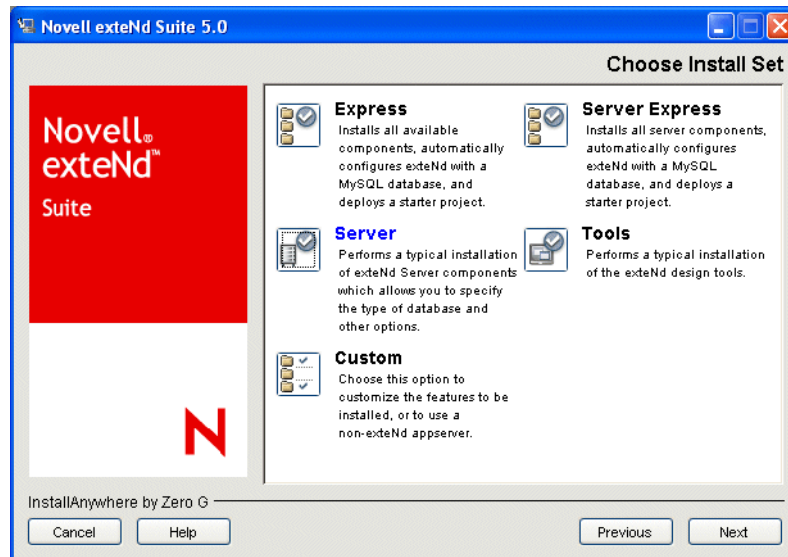
**NOTE:** On **NetWare**, don't choose the Server option listed by the **exteNd** installation program (because it lacks some of the **exteNd** components you need). Choose the **Custom** option instead (see [Chapter 5](#), "Custom Install").

### Running the installer

When you run the Server install, the questions presented vary depending on selections you make along the way, as well as which install key you are using.

➤ **To install **exteNd** using the **Server** option:**

- 1 Exit all other programs (if running on Windows), then launch the **exteNd** installation program as described in "[Starting the install](#)" on page 14.  
The product **splash screen** displays, including a dropdown for selecting the language in which you want to see the install prompts.
- 2 Select one of the available **language** choices and click **OK**.
- 3 When the **Introduction** panel displays, read it then click **Next**.  
The License Agreement panel displays.
- 4 To continue with the install, you must **accept the license agreement** (by selecting the corresponding radio button). Then click **Next**.
- 5 When the **Installation Key** panel displays, type your key (note that it's case-sensitive) then click **Next**.  
**NOTE:** Your installation key determines which product features are available to be installed.  
The Choose Install Set panel displays.
- 6 Select **Server**, then click **Next**.

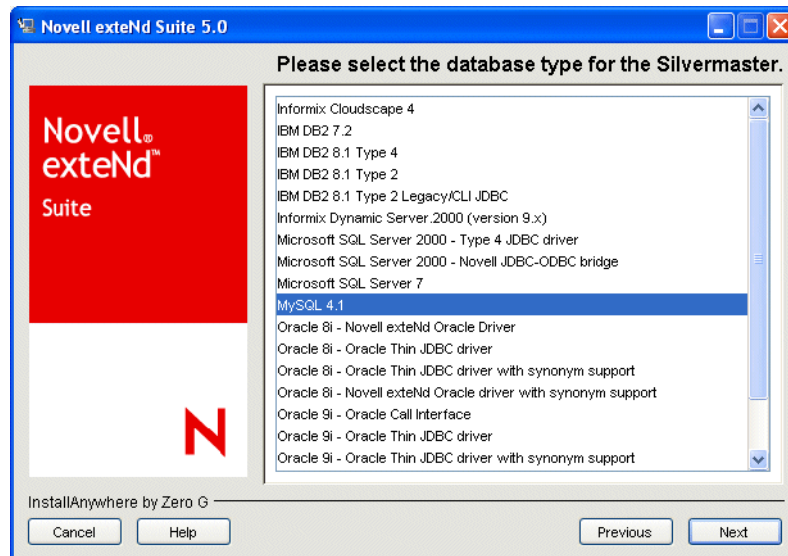


- 7 When the **Choose Install Location** panel displays, accept the default or specify a different directory where you want **exteNd** to be installed. Then click **Next**.

**NOTE:** If the specified directory doesn't exist, you'll be prompted to confirm that you want it created. Click **OK**.

The installation program prompts for the type of database you are providing to be used as **SilverMaster** (which is required by the **exteNd Application Server**).

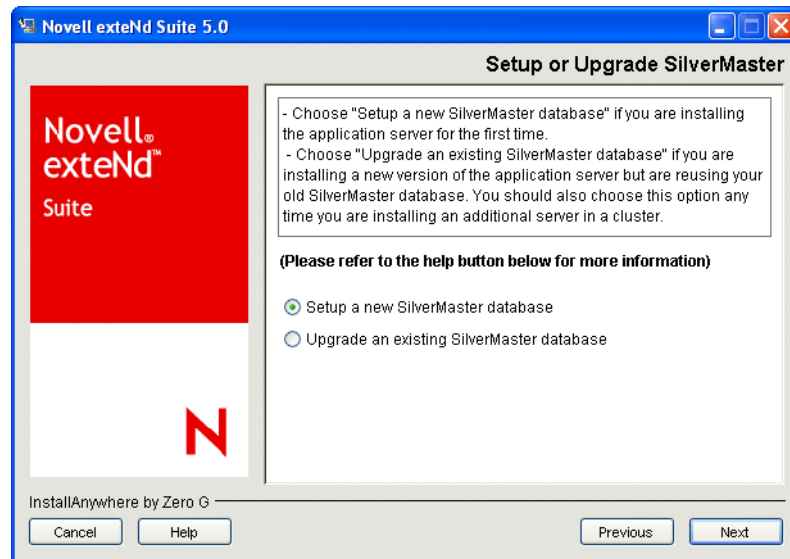
- 8 Select your **database type** from the list of supported DBMSs, then click **Next**.




- 9 If the **Set Driver AGCLASSPATH** panel displays, specify the full path of the JDBC driver (JAR file) that you want **exteNd** to use when connecting to the **SilverMaster** database. Then click **Next**.

The **Setup or Upgrade SilverMaster** panel displays.

- 10 Select one of the following radio buttons, then click **Next**.



Select this	If you
Setup a new SilverMaster database	Have a database that has never before been used as a SilverMaster.
Upgrade an existing SilverMaster database	Have an existing SilverMaster database that you would like to upgrade to the current version of <b>exteNd</b> . This choice will retain all database tables, security settings, and user information.

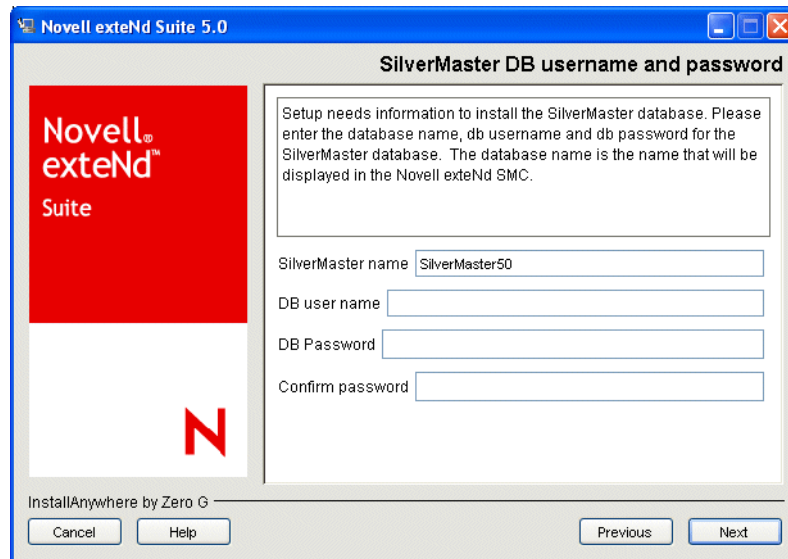
 For more information about the SilverMaster database and setting it up, see the [exteNd Application Server Administrator's Guide](#) (especially the chapter on **data source configuration**).

- 11 When the installation program prompts for **JDBC driver settings**, specify the JDBC URL (and any attributes) needed for your driver to connect to the SilverMaster database. Then click **Next**.


 For more information on these settings, see your JDBC driver documentation and the **chapter for your DBMS** in the [exteNd Application Server Database Configuration Guide](#).

The **SilverMaster DB Username and Password** panel displays.


- 12 Specify the following, then click **Next**.



- ◆ The **DB name** of the SilverMaster database (the default is SilverMaster50)
  - ◆ The **user name** and **password** that **exteNd** will use when connecting to the SilverMaster database
- 13 When the **HTTP Port Number** panel displays, accept the default (80 on Windows, 8080 on UNIX/Linux) or specify a different port number on which the **exteNd Application Server** is to listen. Then click **Next**.
 

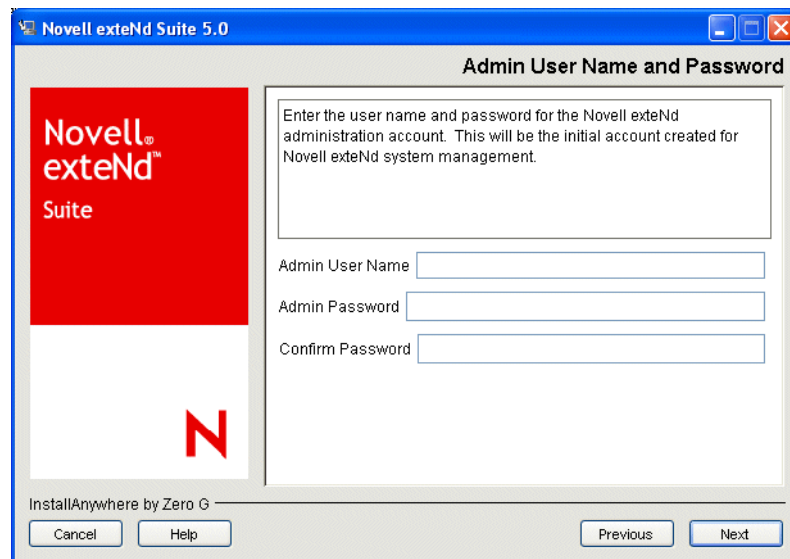
 For more about port usage, see the chapter on **running the server** in the **exteNd Application Server Administrator's Guide**.
  - 14 The installation program asks if you want to **restrict access** to the **exteNd Application Server**. Select the appropriate radio button, then click **Next**.
 

When access is restricted (the default), unauthorized users will not be able to perform administration operations or browse directory listings; this is especially important for production servers. If you are setting up a server for development or testing, you may not always need (or want) to restrict access.


 For more information, see the chapter on **using security** in the **exteNd Application Server Administrator's Guide**.

The Admin User Name and Password panel displays.
  - 15 Type the **user name** and **password** to be used for the initial **exteNd administration account**. Then click **Next**.





When creating this account, the installation program will assign **Locksmith** privileges to it. Your **exteNd** administrator will log in to this account when managing the application server and other aspects of the **exteNd** system.

 For more information, see the chapter on **setting up users and groups** in the **exteNd Application Server Administrator's Guide**.

- 16 If you are installing on Windows, the installation program asks if you want to run the **exteNd Application Server** as a **service**. Select the appropriate radio button, then click **Next**.

 For details on running as a service, see **Chapter 6, "Installing the exteNd Application Server as a Service or Daemon"**.

The Director Cache Coordinator Port panel displays.

- 17 Accept the default (54490) for **Cache Coordinator RMI Port**, or specify a different port number. This port is used by **exteNd Director** to communicate with different instances of an **exteNd Director** application in a clustered server environment.

Click **Next** to advance to the **Pre-Installation Summary** panel.

- 18 If the summary matches the result you want, click **Install** to proceed with the installation.



# 4 Tools Install

This chapter presents an overview of the Tools installation option. Topics include:

- ◆ [About the Tools install option](#)
- ◆ [Running the installer](#)

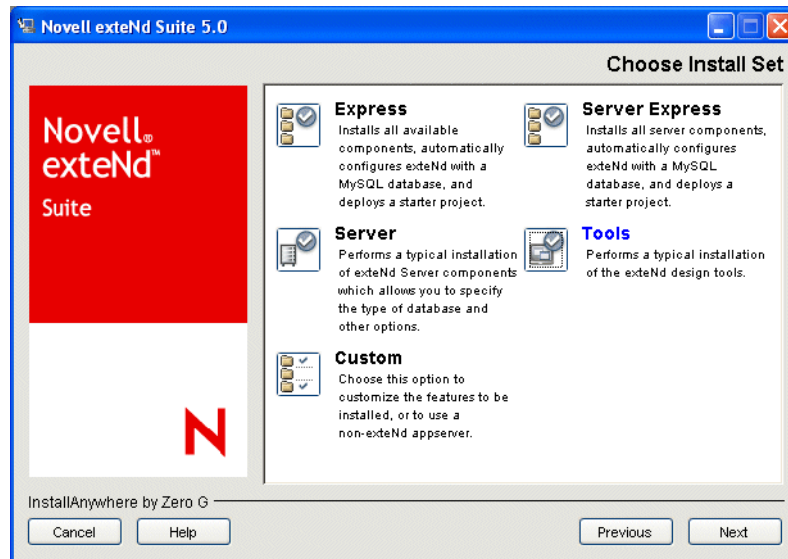
## About the Tools install option

The **Tools** option installs the **exteNd** design tools used for application development. Tools is available on Windows and Linux.

## Running the installer

➤ **To install exteNd using the Tools option:**

- 1 Exit all other programs (if running on Windows), then launch the **exteNd** installation program as described in [“Starting the install” on page 14](#).  
The product **splash screen** displays, including a dropdown for selecting the language in which you want to see the install prompts.
- 2 Select one of the available **language** choices and click **OK**.
- 3 When the **Introduction** panel displays, read it then click **Next**.  
The License Agreement panel displays.
- 4 To continue with the install, you must **accept the license agreement** (by selecting the corresponding radio button). Then click **Next**.
- 5 When the **Installation Key** panel displays, type your key (note that it’s case-sensitive) then click **Next**.  
**NOTE:** Your installation key determines which product features are available to be installed.  
The Choose Install Set panel displays.
- 6 Select **Tools**, then click **Next**.



- 7 When the **Choose Install Location** panel displays, accept the default or specify a different directory where you want **exteNd** to be installed. Then click **Next**.  
**NOTE:** If the specified directory doesn't exist, you'll be prompted to confirm that you want it created. Click **OK**.  
The **Pre-Installation Summary** panel displays.
- 8 If the summary matches the result you want, click **Install** to proceed with the installation.

# 5 Custom Install

This chapter presents an overview of the Custom installation option. Topics include:

- ◆ [About the Custom install option](#)
- ◆ [Running the installer](#)
- ◆ [Installing Composer Server for an existing application server](#)

## About the Custom install option

The **Custom** option allows you to select which **exteNd** features are installed on your machine. You can specify your own preferences for databases, port numbers, and passwords.

Custom is also the option to choose if you want to install **exteNd** features to a third-party J2EE application server (such as WebLogic, WebSphere, or Tomcat) instead of using the **exteNd Application Server**.

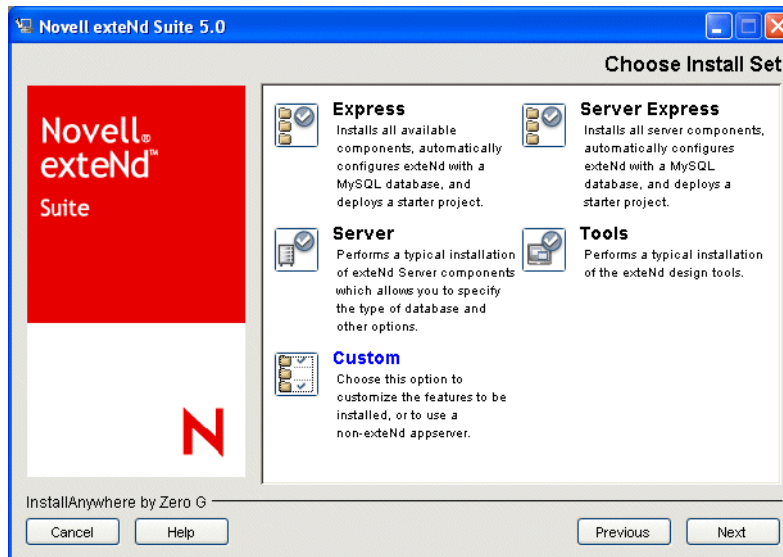
Custom is available on all platforms.

## Running the installer

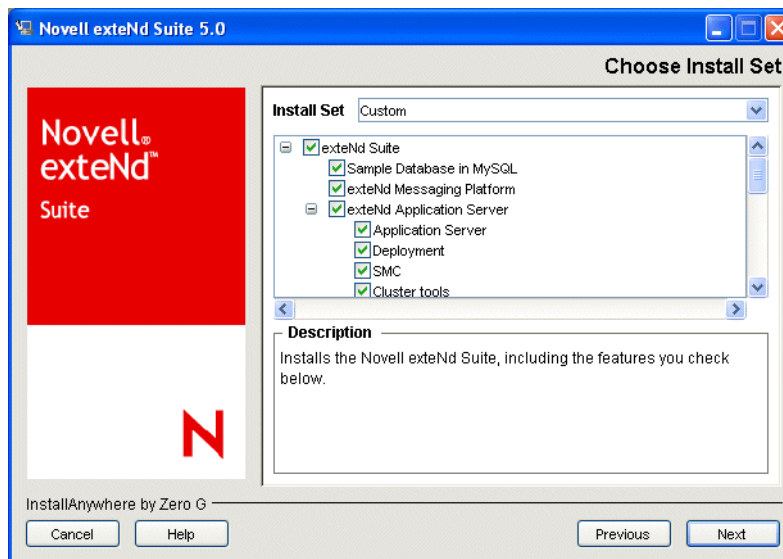
When you run the Custom install, the questions presented vary depending on selections you make along the way, as well as which install key you are using.

➤ **To install exteNd using the Custom option:**

- 1 Exit all other programs (if running on Windows), then launch the **exteNd** installation program as described in [“Starting the install” on page 14](#).  
The product **splash screen** displays, including a dropdown for selecting the language in which you want to see the install prompts.
- 2 Select one of the available **language** choices and click **OK**.
- 3 When the **Introduction** panel displays, read it then click **Next**.  
The License Agreement panel displays.
- 4 To continue with the install, you must **accept the license agreement** (by selecting the corresponding radio button). Then click **Next**.
- 5 When the **Installation Key** panel displays, type your key (note that it’s case-sensitive) then click **Next**.  
**NOTE:** Your installation key determines which product features are available to be installed.  
The Choose Install Set panel displays.
- 6 Select **Custom**, then click **Next**.



The installation program lists the **product features** available to you, including checkboxes for selecting or deselecting particular items.



- 7 **Select or deselect features** as needed, so that only the ones you want to install are checked. As you work with this list, note that:
  - ◆ You can click any item name to display its **description**.
  - ◆ The - symbol in a checkbox indicates a parent item that's **partially selected** (because one or more of its children are deselected). A subset of that feature will be installed.

**IMPORTANT:** If you deselect all of a parent item's children but leave the parent item partially selected, some files related to that parent item may get installed. If this is not what you want, be sure to **deselect the parent item** too.

When you're done making feature selections, click **Next**.

- 8 When the **Choose Install Location** panel displays, accept the default or specify a different directory where you want **exteNd** to be installed. Then click **Next**.
 

**NOTE:** If the specified directory doesn't exist, you'll be prompted to confirm that you want it created. Click **OK**.
- 9 If you chose to install **MySQL**:

- 9a When the Configure MySQL Server panel displays, accept the default (63306) for the **MySQL Port** or specify a different port number on which MySQL is to listen. On Linux, you can also accept the default **socket** (/tmp/mysql.exteNd.sock) or specify another. Then click **Next**.

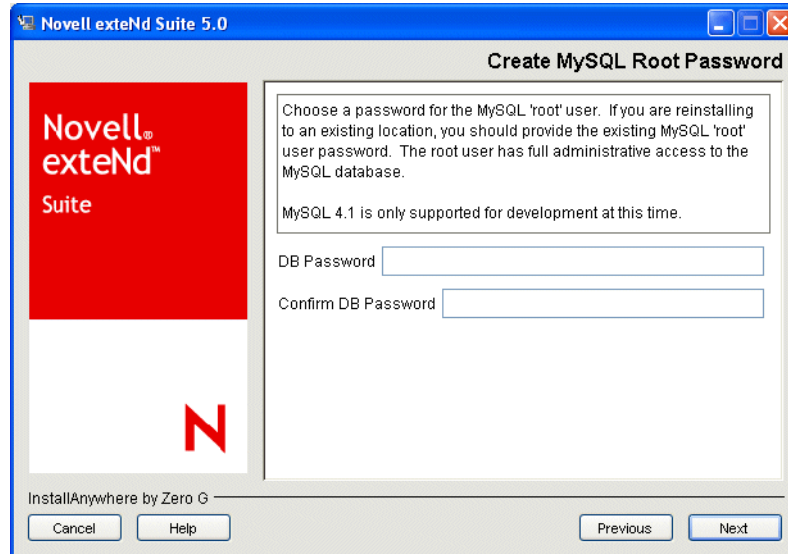


For more information, see “Using MySQL with exteNd 5” on page 13.

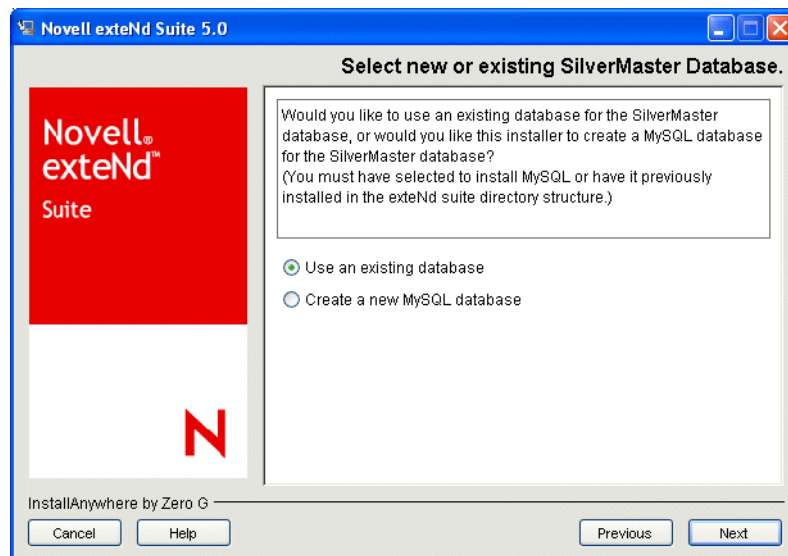
The MySQL Root Password panel displays.

- 9b Type the **database password** to be used for the MySQL root user, then click **Next**.

**IMPORTANT:** When reinstalling to an existing location, specify the existing MySQL root password.



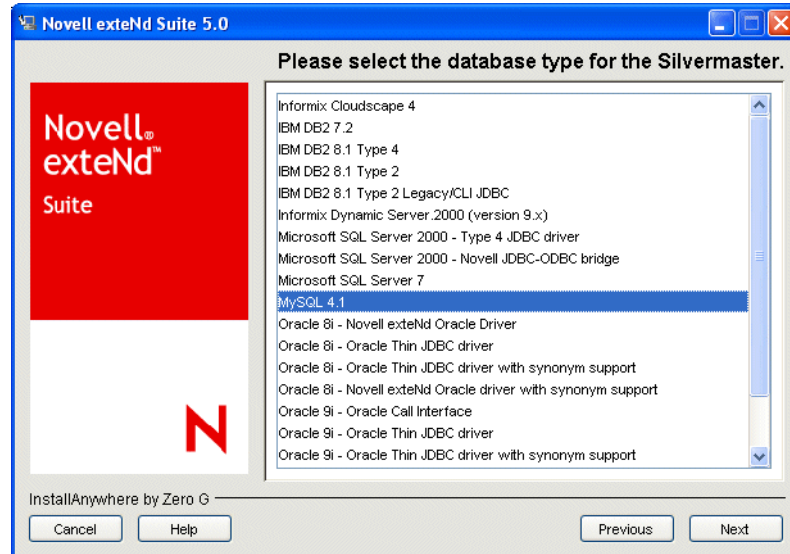
- 10 If you chose to install the **exteNd Application Server**, continue with [Step 11](#).  
If you chose **not** to install that feature, skip to [Step 17](#).
- 11 This part of the install deals with configuring the **SilverMaster database** used by the **exteNd Application Server**:
- If you have **MySQL** (from this **exteNd** install or a prior one), the installation program offers to create a **new MySQL database** to use as SilverMaster. The other choice is to provide an **existing database** (of any supported DBMS) yourself. Select the appropriate radio button, then click **Next**.



- ◆ If you don't have MySQL, you won't get this choice. You must provide an existing database.

Providing an existing database for SilverMaster involves answering these additional install questions:

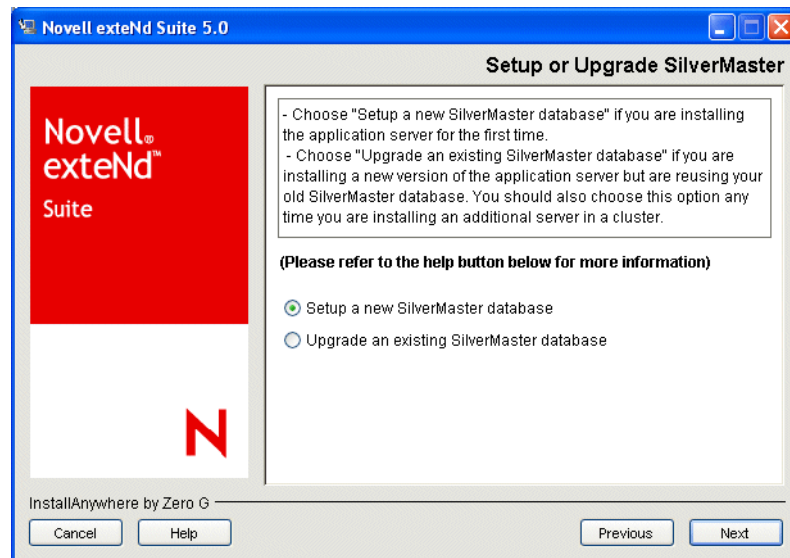
- 11a** When prompted, select your **database type** from the list of supported DBMSs then click **Next**.



- 11b** If the **Set Driver AGCLASSPATH** panel displays, specify the full path of the JDBC driver (JAR file) that you want **exteNd** to use when connecting to the SilverMaster database. Then click **Next**.

The **Setup or Upgrade SilverMaster** panel displays.


- 11c** Select one of the following radio buttons, then click **Next**.



Select this	If you
Setup a new SilverMaster database	Have a database that has never before been used as a SilverMaster.



Select this	If you
Upgrade an existing SilverMaster database	Have an existing SilverMaster database that you would like to upgrade to the current version of exteNd. This choice will retain all database tables, security settings, and user information.

 For more information about the SilverMaster database and setting it up, see the [exteNd Application Server Administrator's Guide](#) (especially the chapter on [data source configuration](#)).

- 11d** When the installation program prompts for **JDBC driver settings**, specify the JDBC URL (and any attributes) needed for your driver to connect to the SilverMaster database. Then click **Next**.

 For more information on these settings, see your JDBC driver documentation and the [chapter for your DBMS](#) in the [exteNd Application Server Database Configuration Guide](#).

The **SilverMaster DB Username and Password** panel displays.


- 11e** Specify the following, then click **Next**.



The **DB name** of the SilverMaster database (the default is SilverMaster50)


The **user name** and **password** that exteNd will use when connecting to the SilverMaster database

- 12** When the **HTTP Port Number** panel displays, accept the default (80 on Windows, 8080 on UNIX/Linux) or specify a different port number on which the [exteNd Application Server](#) is to listen. Then click **Next**.

 For more about port usage, see the chapter on [running the server](#) in the [exteNd Application Server Administrator's Guide](#).

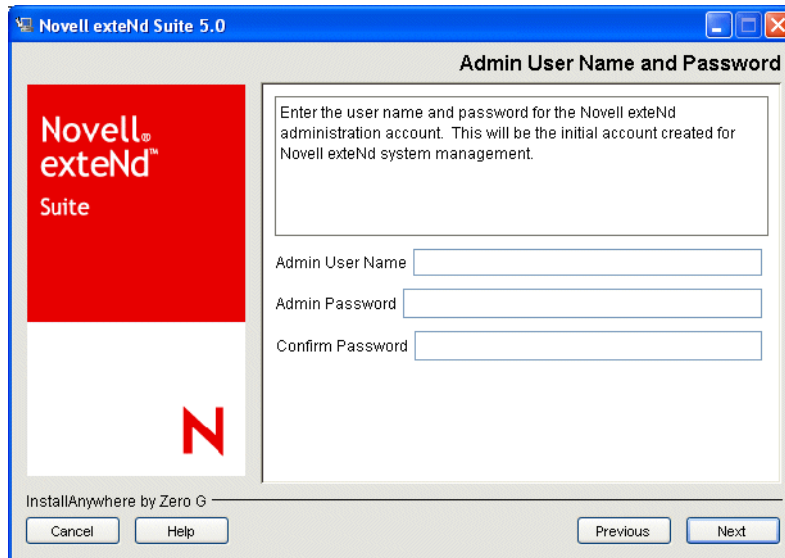
- 13** When the **Name Service Port Number** panel displays, accept the default (54890) or specify a different port number. Then click **Next**.
- 14** The installation program asks if you want to **restrict access** to the [exteNd Application Server](#). Select the appropriate radio button, then click **Next**.

When access is restricted (the default), unauthorized users will not be able to perform administration operations or browse directory listings; this is especially important for production servers. If you are setting up a server for development or testing, you may not always need (or want) to restrict access.


 For more information, see the chapter on [using security](#) in the [exteNd Application Server Administrator's Guide](#).

The Admin User Name and Password panel displays.

- 15 Type the **user name** and **password** to be used for the initial **exteNd administration** account. Then click **Next**.



When creating this account, the installation program will assign **Locksmith** privileges to it. Your **exteNd** administrator will log in to this account when managing the application server and other aspects of the **exteNd** system.

 For more information, see the chapter on [setting up users and groups](#) in the [exteNd Application Server Administrator's Guide](#).

- 16 If you are installing on Windows, the installation program asks if you want to run the **exteNd Application Server** as a **service**. Select the appropriate radio button, then click **Next**.

 For details on running as a service, see [Chapter 6, "Installing the exteNd Application Server as a Service or Daemon"](#).

- 17 If you chose to install **exteNd Director**, the Director Cache Coordinator Port panel displays.

Accept the default (54490) for **Cache Coordinator RMI Port**, or specify a different port number. This port is used by **exteNd Director** to communicate with different instances of an **exteNd Director** application in a clustered server environment.

Click **Next** to advance to the **Pre-Installation Summary** panel.

- 18 If the summary matches the result you want, click **Install** to proceed with the installation.

## Installing Composer Server for an existing application server

During a Custom installation, you can choose to install the **exteNd Composer server components** to an existing application server (one that's already installed and capable of running). Your options include:


- ◆ Composer Server for **existing exteNd Application Server**
- ◆ Composer Server for **WebLogic**
- ◆ Composer Server for **WebSphere**
- ◆ Composer Server for **Tomcat**

If you select one of these options, the installation program will prompt you to provide some information about that application server. This information may include (depending on the application server type):

- ◆ The **root location** (directory) where the application server is installed
- ◆ Which **version** of the application server you have (if multiple versions are supported)
- ◆ The **user name** and **password** of an administrator to log in to the application server

You'll also be prompted when you need to **have your application server running** in preparation for the Composer Server install. During the install, your application server will be **shut down and restarted** as needed to configure the **exteNd Composer** server components.

In some cases, you may need to intervene in this process by **manually starting or stopping** the application server, or by **confirming** that the application server has started or stopped. The installation program will notify you about what to do and when.

 For additional notes on installing Composer Server in your environment, see the **exteNd Composer Release Notes**.



# 6

## Installing the exteNd Application Server as a Service or Daemon

This chapter describes how you can configure the **exteNd Application Server** to restart automatically when necessary:

- ◆ [About services and daemons](#)
- ◆ [Running as a Windows service](#)
- ◆ [Running as UNIX/Linux daemons](#)
- ◆ [Running on NetWare](#)

### About services and daemons

With high-availability servers in a multiuser environment, it often makes sense to run them as Windows **services** or UNIX/Linux **daemons**. Running the **exteNd Application Server** and the database server as a service or daemon on the same machine ensures that both services restart automatically when the machine reboots. This helps you:

- ◆ **Avoid security risks** caused by keeping the server program logged in on the computer running the server
- ◆ **Automatically start the server** whenever Windows or UNIX/Linux is started
- ◆ **Start the server remotely** with the Windows Service Manager or with a UNIX/Linux shell
- ◆ **Run the server with administrative account privileges** while you run other programs using your local accounts
- ◆ **Avoid tying the server to a specific user ID**

By default, the application server does not run as a service or daemon.

### What can run as a service or daemon

The following **Novell exteNd Application Server** programs can run as services or daemons:

Program	Description	Runs as
Application Server	Serves applications	Runs as a desktop program by default
Load Manager	Manages the activity of the servers in a cluster	Usually run as a desktop program
Dispatcher	Redirects requests to application servers	
Cache Manager	Keeps server caches for clusters in sync	

## Running as a Windows service

When you run high-availability servers in a multiuser environment, it can make sense to run them as Windows services. Running the Novell exteNd Application Server and the database server as services on the same machine ensures that both restart automatically whenever the machine reboots. If the application server connects to databases on other machines, you should also make sure they restart automatically on reboot.

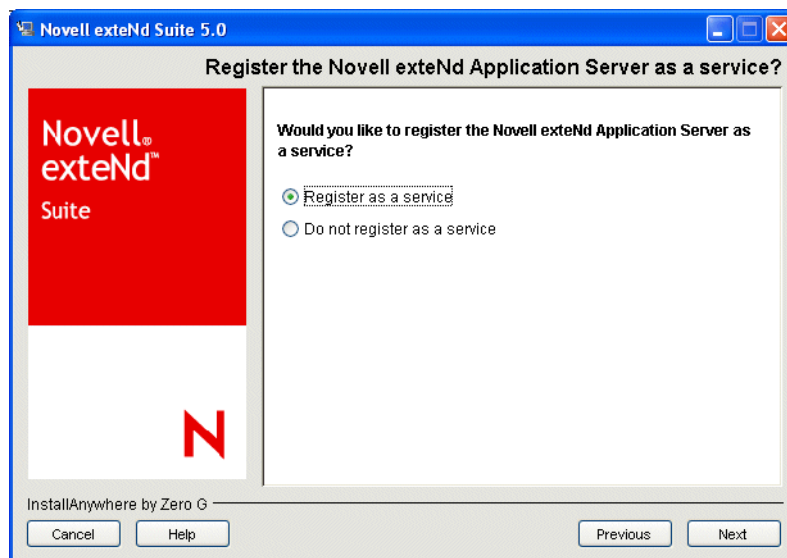
### Creating a Windows service

There are two ways to create the Windows services for the exteNd Application Server and cluster servers:

- ◆ During installation
- ◆ After installation

#### During installation

The exteNd installer includes a choice (available with the Server and Custom install options only) to automatically create Windows services for the application server and cluster servers.



#### After installation

The Windows services may also be created after installation by using the utility **SilverServiceUtil.exe**. This is a command-line DOS utility and should be run from a DOS window. The following commands will create the Windows services for the exteNd servers (where *nn* and *n.n* refer to the version number of the application server):

```
SilverServiceUtil.exe -create -service exteNdAppServernn -display \
"Novell exteNd Application Server n.n" -program \
%NOVELL_EXTEND_APPSERVER_HOME%\bin\SilverServer.exe

SilverServiceUtil.exe -create -service exteNdCacheMgrnn -display \
"Novell exteNd Cache Manager Server n.n" -program \
%NOVELL_EXTEND_APPSERVER_HOME%\bin\SilverServer.exe

SilverServiceUtil.exe -create -service exteNdLoagMgrnn \
-display "Novell exteNd Load Manager Server n.n" \
-program %NOVELL_EXTEND_APPSERVER_HOME%\bin\SilverServer.exe
```

```
SilverServiceUtil.exe -create -service exteNdDispatchernn \
-display "Novell exteNd Dispatcher n.n" \
-program %NOVELL_EXTEND_APPSERVER_HOME%\bin\SilverServer.exe
```

## Starting a Windows service

The services need to be started after they are created.

### ➤ To start a Windows service:

- 1 Select **Administrative Tools** in the Windows Control Panel.
- 2 Open **Services** and find the **Novell exteNd Application Server *n.n*** service.
- 3 Right-click the service and select **Start**.

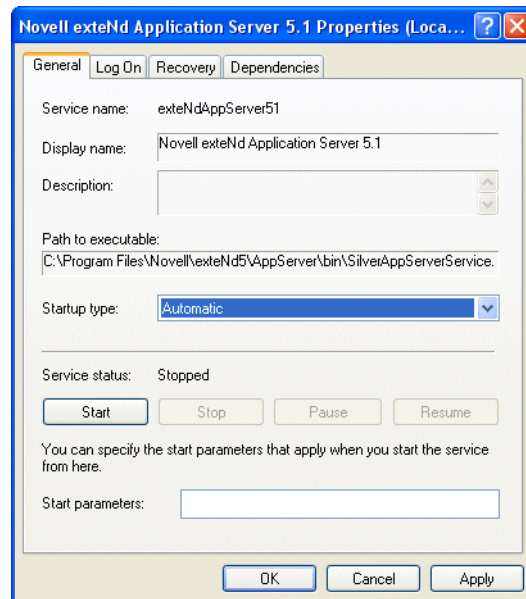
**NOTE:** This procedure may vary a bit on the various Windows platforms.

The **exteNd** server does not normally open a DOS console window when it is started as a service. The console output is redirected to a text file stored in the %NOVELL\_EXTEND\_APPSERVER\_HOME%\temp directory.

## Starting automatically after reboot

The services are configured as manual start. To have them restart automatically:

- 1 Select **Administrative Tools** in the Windows Control Panel.
- 2 Open **Services** and find the **Novell exteNd Application Server *n.n*** service.
- 3 Right-click the service and select **Properties**. Change the Startup type to **Automatic**.



## Passing command-line arguments

You can specify command-line arguments that will get passed to the **exteNd** servers when they are started as Windows services. To do this you edit the Windows registry entry for the service, using the Windows registry editor.

➤ **To specify command-line arguments:**

- 1 From the **Start** menu select **Run**.
- 2 Enter **regedit** and click **OK**. This starts the registry editor.
- 3 In the left panel, expand **HKEY\_LOCAL\_MACHINE, SYSTEM, CurrentControlSet, Services**.
- 4 Click the service you want to add command-line parameters for. The registry settings for the service displays in the right panel.
- 5 Right-click **StartupOptions**, then select **Modify**.
- 6 Enter the startup command-line options and click **OK** to save them.
- 7 Exit the Windows registry editor.

The command-line arguments will be passed into the **exteNd** server process the next time it is started as a service.

## Service dependencies

If the **exteNd Application Server** depends on a database server (or other server) that runs on the same machine, the database service must be started before the application server service.

You should add a service dependency to the application server service to guarantee that the database server will be started before the application server.

You do this with the **SilverServiceUtil.exe** command-line tool.

## Running as UNIX/Linux daemons

All UNIX and Linux distributions of the **exteNd Application Server** include the **extendctl** script, which can be used to start and stop **exteNd** server processes in the background.

The installation program also installs **sample startup scripts** that your system can run to automatically start the application server or cluster components as daemons at boot time.

Server path	Cluster path
<i>\$installationdirectory</i> /etc/silverserver	<i>\$installationdirectory</i> /etc/silvercluster

A system administrator with root privileges must copy the sample server and cluster scripts from the install directory into your operating system's **boot directory**.

## Manual start of exteNd server daemon process

The **extendctl** script can be used to start, stop, and restart server processes.

```
$NOVELL_EXTEND_APPSERVER_HOME/etc/extendctl
```

For usage information, use **extendctl -h**. Here are some examples.

```
extendctl start -A      (starts the appserver in the background)
extendctl stop -A      (stops the background appserver process)
extendctl restart -A   (restarts the background appserver process)
extendctl status -A    (tests whether the appserver is running)
extendctl tail -A      (starts a "tail -f" on the appserver console output)
```

The flag **-A** refers to the application server. Other options are available for use with cluster servers.



## Server console output

When the `extendctl` script starts an `exteNd` server in the background, the server's console output is redirected to a file with the following naming convention:

```
$NOVELL_EXTEND_APPSERVER_HOME/temp/SilverServer.XXXXX.out
```

XXXXXX begins at 00001 and is incremented by 1 each time a server is restarted.

You can optionally specify an alternate output directory. But you cannot change the naming convention for console output files.

The default behavior of the `extendctl` script is to delete all but the last few output files created by each server. The number of output files saved can be changed. And you can always start the output file index over again at 00001 by deleting the index file:

```
$NOVELL_EXTEND_APPSERVER_HOME/temp/.outfile.index
```

**NOTE:** Don't do this unless all `exteNd` server processes are stopped.

## Passing command-line arguments to `exteNd` background processes

To pass one or more command-line arguments to the application server (or a cluster server), use the `-p` option with the `extendctl` script. For example:

```
extendctl start -A -p "+cp:p /tmp/foo.jar -nomonitor"
```

This causes the arguments `"cp:p /tmp/foo.jar -nomonitor"` to be passed to the application server when it is started in the background. The argument to the `-p` switch must be enclosed in double quotes.

## Starting `exteNd` servers automatically after a reboot

The directory `$NOVELL_EXTEND_APPSERVER_HOME/etc` contains sample scripts that may be copied into the appropriate areas in `/etc/init.d` or `/etc/rc.d`. These scripts are named:

```
silverserver (to start/stop an AppServer process)
silvercluster (to start/stop the cluster control servers)
```

The variable `EXTEND_HOME` must be changed in these scripts to reflect the `exteNd` installation directory. These scripts support the `start`, `stop`, `restart`, and `status` commands.

The way to set up the application server or cluster servers to restart after a reboot varies from system to system. See your OS documentation or your UNIX/Linux system administrator for more information. Remember that the application server process must be started after any of its dependent daemon processes (that is, databases) are started. If the `exteNd` cluster servers are being used, they must be started before the server is started.

## Starting `exteNd` servers as a user other than root

An `exteNd Application Server` started by the system after a reboot will be running as the root user.

- **To specify a different user:**
  - 1 Make sure the server is running.
  - 2 Start the SMC and connect to the server (see the overview chapter in the *exteNd Application Server Administrator's Guide* for details).
  - 3 Select **View>Configuration** to display the configuration panels.
  - 4 Select the **General** panel.
  - 5 Edit the user name in the **Username for server (UNIX only)** text box.

**TIP:** The specified user ID must have the proper permissions to files in the **exteNd** installation directory.

- 6 Restart the server for the changes to take effect.

Now the server will change its effective user ID whenever it starts up.

**IMPORTANT:** The server must be restarted as root. Otherwise, the server will fail to start—either because it can't change the user ID or because it can't read from or write to a file. These problems can usually be avoided if you ensure that the user ID being set for the server is the user that owns the **exteNd** install directory contents.

## Running on NetWare

In NetWare, the **autoexec.ncf** file is used to automatically restart the **exteNd Application Server** when the NetWare server restarts. When you install the application server, the commands for this are added by default to **autoexec.ncf**.

If you don't want the application server to restart automatically, you can edit **autoexec.ncf** to remove those commands.

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