



# LM-X End Users Guide

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January 2013

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# LM-X License Manager Documentation

This is the home of X-Formation's LM-X License Manager documentation. Here, you can find information that helps end-users manage LM-X License Manager servers and licensed applications.

You can also [download this documentation in PDF format](#).

## LM-X End Users Guide

The *LM-X End Users Guide* is intended for corporate use by system administrators of LM-X protected applications, as well as engineers, software developers and others who are end users of LM-X-served applications.

In addition to this document, if you are planning to use a network license, you should have obtained an LM-X license server, an LM-X license file, and an LM-X license server configuration file (optional) from your application vendor.

This guide includes information to help you administrate your LM-X protected applications, including a description of LM-X license files, how to use LM-X end user tools, and how to install/uninstall an LM-X license server.

Software application vendors should refer to the *LM-X Developers Manual* for information about using LM-X to license their products.

## Resources

As part of the LM-X License Manager user community, you have access to our Knowledgebase at <http://kb.x-formation.com> to get answers to commonly asked questions about LM-X product features, installation, usage and related topics. The Knowledgebase is updated regularly with new information to help you quickly and easily find the answers you're looking for.

For those transitioning from a FlexNet/FLEXlm license management system to LM-X, this document includes a helpful [reference of LM-X equivalencies](#) for some common FlexNet/FLEXlm actions.

## Getting started

Getting your LM-X licensed application up and running takes little to no effort. Depending on what type of licensing you have for the application, you will need the following:

Type of license	What you need
Trial	No license or setup required.
Standalone (also referred to as node-locked)	A license file installed on, and often locked to, an individual machine.
Network (also referred to as floating or shared)	A license server deployed at your site and a license file that is installed on that license server. (See <a href="#">Installing a license server on Windows</a> for details on installing network licenses.)

The [LM-X End-user Configuration Tool](#) helps you obtain the information your vendor may request from you in order to create your node-locked or floating license. For example, your application vendor may ask for your HostID. This is quickly and easily obtained by running the configuration tool and copy/pasting information from it to send to your vendor.

The LM-X End-user Configuration Tool also gives you a quick and easy way to add or remove license files from your license path, install a license server, and query a license server all from one simple dialog. These same tasks can also be run from a command line on either Windows or Unix with the [LM-X End-user utility](#).

## Optional license features

LM-X includes the following optional features that make your network license usage easier and more reliable. The features available to you depend on what your software vendor has provided. Contact your software vendor for more information about available features, or if you have a configuration file included in your software distribution (see [License Server Configuration file](#)), review this file to determine which features are included in your license.

Feature	Description
Automatic server discovery	Locates the LM-X license server automatically. All you need to do is install the license server and application, and LM-X does the rest to ensure you get up and running right away.
High-availability licensing (HAL)	<p>Lets you specify backup (redundant) license servers that will continue to enable license hosting in the event that your primary license server goes down.</p> <p>See <a href="#">How to install HAL license servers</a> for more information on HAL.</p>
License queuing	<p>Issues licenses based on a list of requests that are waiting for a license. When licenses are in high demand, requests for a license can be added to a queue, and then filled in the order of the queue as licenses become available. This is particularly useful for ensuring proper scheduling for automatic jobs and implementing fair usage of shared licenses.</p> <p>To enable license queuing, you must set the environment variable LMX_QUEUE as described in <a href="#">Environment variables</a>. Also see <a href="#">License queuing</a> for further information on license queuing.</p>
License borrowing	<p>Lets you use a license to run a network application for a limited time when you are unable to connect to the license server. For example, you can borrow a license if you are taking your machine home for the weekend or going on a business trip. Effectively, borrowing a license gives you a temporary node-locked license.</p> <p>To enable license borrowing, you must set the environment variable LMX_BORROW, as described in <a href="#">Environment variables</a>.</p>

Grace licenses	Lets you keep using a network license for a specified period of time when the license server is down, ensuring uninterrupted access to the application so you can complete your work.
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In addition to the features listed above, optional features that system administrators can use in order to control usage of application licenses include:

- Allow/deny users/groups from using the license server (including/excluding users and computers) to prevent specified users from accessing applications. This may be used as an additional security measure.
- Limit the number of licenses that can be used by individual users or groups to implement fair/desired distribution of licenses.
- Reserve a number of licenses that can be used by individual users or groups to implement fair/desired distribution of licenses.

For information about using these options, see [License Server Configuration file](#).

## How a protected application finds its license

This chapter describes the different license file types, where an application searches for its license, and how to add or remove license files from the license path environment variable. It also describes additional environment variables you can optionally set for your license.

### License files

Licenses are text files that can be accessed by a licensed application in two distinct ways:

- Locally, from a local hard drive
- Remotely, from a dedicated license server across a network

If you open a license file in a text editor, you will see a definition for the license in the following format:

```
FEATURE Feature_Name
{
VENDOR = XYZ
...
COUNT = 5
...
}
```

When the COUNT keyword exists in the license file, the license is intended for use on a license server; otherwise, the license is considered to be local and can be used directly with the protected application. The example above indicates that there are 5 network licenses for the application.

The following is an example of a local license file (the actual key has been abbreviated):

```

FEATURE f1
{
VENDOR = XFORMATION
VERSION = 1.5
END = 2008-01-01
KEY = F2DNR9K...
}

```

The following is an example of a network license file (the actual key has been abbreviated):

```

FEATURE f1
{
VENDOR = XFORMATION
VERSION = 1.5
END = 2008-01-01
KEY = F2DNR9K...
COUNT = 12
}

```

The license file path may be set in the license server configuration file. See [License Server Configuration file](#) for more information about specifying the license sever path.

The vendor may include various optional settings in a license that supply license information or control how the license may be used. The settings that can be included in a license are shown below.

```

VERSION = (Version number of the feature.)
LICENSEE = (User or company to whom the license was issued.)
START = (Date on which the feature becomes valid.)
END = (Date on which the feature expires.)
MAINTENANCE_START = (Date the license maintenance plan begins.)
MAINTENANCE_END = (Date the license maintenance plan expires.)
ISSUED = (Date the license was created.)
SN = (Custom serial number for the license.)
DATA = (Additional information regarding the license.)
COMMENT = (Additional information regarding the license.)
OPTIONS = (Additional licensing options.)
PLATFORMS = (Platform(s) to which usage is restricted.)
COUNT = (Number of network licenses that can be issued simultaneously.)
TOKEN_DEPENDENCY = (Reference to a real license upon which a token license depends.)
SOFTLIMIT = (Number of "overdraft" licenses.)
HAL_SERVERS = 3 (Enables redundant servers, or High Availability Servers.)
BORROW = (Number of hours a borrowed license may be used.)
GRACE = (Number of hours a grace license may be used.)
HOLD = (Number of minutes licenses are held before being checked in.)
USERBASED = (Number of licenses reserved for named users.)

```

HOSTBASED = (Number of licenses reserved for named hosts.)  
TIME\_ZONES = -12 to 13 (Allowed time zones, relative to GMT.)  
SHARE = HOST|USER|CUSTOM or TERMINALSERVER and/or VIRTUAL (Type of license sharing in use.)  
SYSTEMCLOCKCHECK = TRUE|FALSE (Enables/disables the system clock check.)  
HOSTID\_MATCH\_RATE = (Percentage of hostids that must match for successful hostid verification.)

VERSION = 0.0 to 9999.9999 (Version number of the feature.)  
LICENSEE = "string" (User or company to whom the license was issued.)  
START = YYYY-MM-DD (Date on which the feature becomes valid.)  
END = YYYY-MM-DD (Date on which the feature expires.)  
MAINTENANCE\_START = YYYY-MM-DD (Date the license maintenance plan begins.)  
MAINTENANCE\_END = YYYY-MM-DD (Date the license maintenance plan expires.)  
ISSUED = YYYY-MM-DD (Date on which the license was created.)  
SN = "string" (Custom serial number for the license.)  
DATA = "string" (Additional information regarding the license.)  
COMMENT = "string" (Additional information regarding the license.)  
OPTIONS = "string" (Additional licensing options for the license.)

COUNT = 1 to 2147483647 or UNLIMITED (Number of network licenses that can be issued simultaneously)

PLATFORMS = "platform strings" (Platform(s) to which usage is restricted.)

TOKEN\_DEPENDENCY = "FEATURE=FeatureName VERSION=0.0 to 9999.9999 COUNT=1 to 2147483647"

KEYTYPE = EXCLUSIVE or ADDITIVE or TOKEN (Reference to a real license upon which a token license depends.)

SOFTLIMIT = 5 (Number of "overdraft" licenses.)

HAL\_SERVERS = 3 (Enables redundant servers, or High Availability Servers.)

BORROW = 1 to 8760 (Number of hours a borrowed license may be used.)

GRACE = 1 to 168 (Number of hours a grace license may be used.)

HOLD = 1 to 1440 (Number of minutes licenses are held before being checked in.)

USERBASED = 1 to 2147483647 or ALL (Number of licenses reserved for named users.)

HOSTBASED = 1 to 2147483647 or ALL (Number of licenses reserved for named hosts.)

TIME\_ZONES = -12 to 13 (Allowed time zones, relative to GMT.)

SHARE = HOST|USER|CUSTOM or TERMINALSERVER and/or VIRTUAL (Type of license sharing in use.)

SYSTEMCLOCKCHECK = TRUE|FALSE (Enables/disables the system clock check.)

`HOSTID_MATCH_RATE = 0 to 100 (Percentage of hostids that must match for successful hostid verification.)`

## Search paths

Every LM-X protected application has a search path for licenses. The application will search for licenses in the following order.

Order	Search path
1	Preset path and/or automatic server discovery (this information is provided by your application vendor).
2	The environment variable <code>VENDOR_LICENSE_PATH</code> . The <code>VENDOR</code> name is the same as that specified in the license file.
3	The generic environment variable <code>LMX_LICENSE_PATH</code> , which is used by all applications protected by LM-X.

Using the above search paths, the application will try to find a license in the following order:

1. Borrowed license.
2. License embedded as a string in the software.
3. Node-locked (local) license.
4. Network (floating) license (this includes automatic server discovery).
5. Grace license.
6. Trial license.

Note: LM-X attempts to use local licenses before it tries to use counted network licenses to optimize license utilization.

At each step, if no license is found in the specified source, the application will continue to the next source in the path. You may specify unlimited multiple paths if desired; for example, `LMX_LICENSE_PATH=6200@server1;6200@server2;6200@server3`. The protected application stops searching as soon as it finds a valid license.

## Adding or removing license file paths

The following sections describe how to add or remove license files from the path for Windows and Unix systems and gives formats for specifying license files.

### Adding or removing license files from the path using the LM-X End-user Configuration tool

Under Windows, you can use the [LM-X End-user Configuration Tool](#), `lmxconfigtool.exe`, to add or remove license files from the `LMX_LICENSE_PATH` environment variable. The syntax of these paths is:

Platform	Syntax

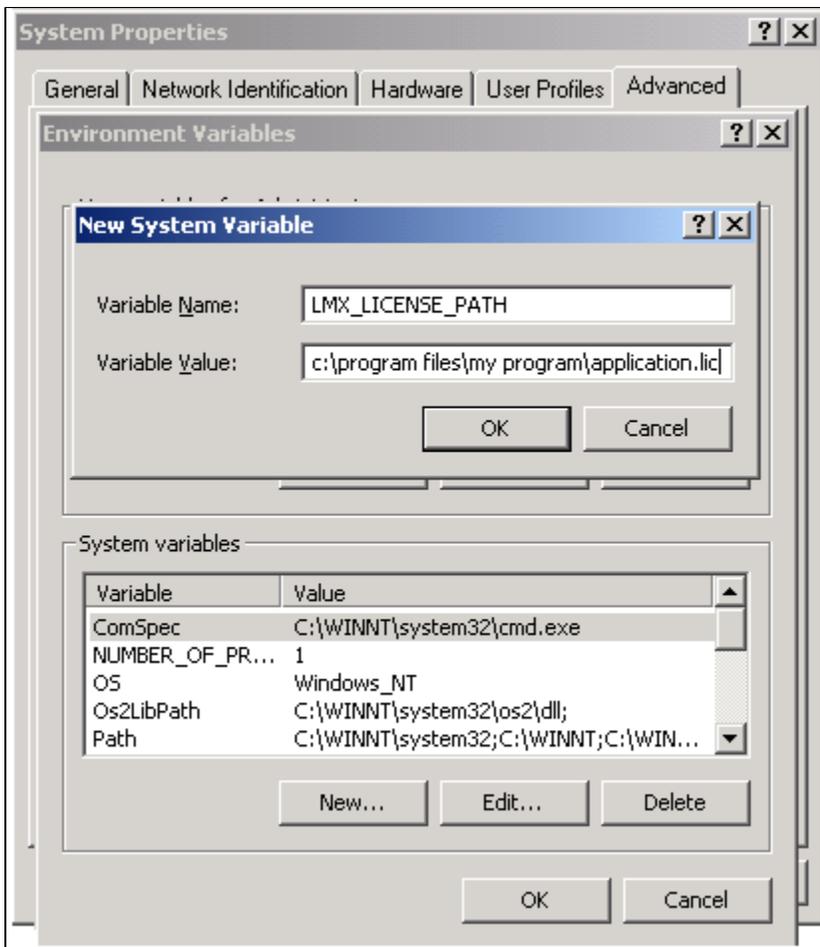
Windows	LMX_LICENSE_PATH = file1;file2;host%port;@host2:directory;...
Unix	LMX_LICENSE_PATH = file1:file2:host%port:@host2:directory;...

Note that multiple paths are separated with a semicolon ( ; ) on Windows systems and a colon ( : ) on Unix systems.

### Adding license files to the path manually

If needed, you can add license files to the path manually, as described below. This method can also be used to specify other environment variables, described in [Environment variables](#).

- On Windows, you can use the system control panel.



- On Unix systems, you can add the following in /etc/profile (or see your system documentation):  
export LMX\_LICENSE\_PATH=/path/to/license.lic

### Formats for specifying license files

Possible formats for specifying license files are detailed in the following table.

Type	Description	Syntax	Example
------	-------------	--------	---------

Local license	Full path to license file	Windows: C:\path\to\license.lic  Unix: /path/to/license.lic	Windows: C:\application\licenses\my license.lic  Unix: /home/henrik/application/n l.lic
Local license	Full path to license directory – all licenses (*.lic) in specified directory will be read	Windows: C:\application\licenses{col or}  Unix: /application/licenses/	Windows: C:\application\licenses{col or}  Unix: /application/licenses/
Network license on license server	Network license stored on a specified license server (default port is 6200)	hostname%tcpport	intranet.foobar.com%5678
Network license on license server	Network license stored on a specified license server with an optional specified port (defaults to port 6200)	[tcpport]@hostname	@intranet.foobar.com
Network HAL license	Network license installed on 3 redundant servers	Windows: @hostname1;@hostname 2;@hostname3  Unix: @hostname1:@hostname 2:@hostname3	Windows: @primary_server;@secon dary_server;@third_serve r  Unix: @primary_server:@secon dary_server:@third_serve r

Note: You should always consult with your application vendor on how to set up their application.

## Environment variables

You can set the environment variables listed in the table below as needed. Note that the environment variables available to you may be limited depending on whether your vendor has allowed their use as part of your software license.

All environment variables are undefined by default, and can be defined by setting the value to a number greater than 0, for example, 1. Any additional details on variable values are given in the Value column below.

Variable name	Value	Description
---------------	-------	-------------

<p><code>VENDOR_LICENSE_PATH</code> or <code>LMX_LICENSE_PATH</code></p>	<p>The path to one or more LM-X managed licenses.</p> <p>For example: <code>LMX_LICENSE_PATH=6200@server1</code></p>	<p>This environment variable lets you set the path to the license file.</p> <p>You may specify a particular vendor using <code>VENDOR_LICENSE_PATH</code>, where <code>VENDOR</code> is the name of the application vendor, as specified in the license file. <code>LMX_LICENSE_PATH</code> is a generic environment variable used by all applications protected by LM-X.</p> <p>See <a href="#">Search paths</a> for information on how an LM-X application searches for licenses.</p> <p>You can set the license path using the <a href="#">LM-X End-user Configuration tool</a>. Adding or removing license files from the path using the LM-X End-user Configuration tool, or manually, as described in section 3.3.2, Adding license files to the path manually.</p>
<p><code>VENDOR_AUTOMATIC_SERVER_DISCOVERY</code> or <code>LMX_AUTOMATIC_SERVER_DISCOVERY</code></p>	<p>A string that can be set to enable using automatic server discovery.</p> <p>For example: <code>LMX_AUTOMATIC_SERVER_DISCOVERY=1</code></p>	<p>When this environment variable is set, automatic server discovery is enabled.</p> <p>You may specify a particular vendor using <code>VENDOR_AUTOMATIC_SERVER_DISCOVERY</code>, where <code>VENDOR</code> is the name of the application vendor, as specified in the license file. <code>LMX_AUTOMATIC_SERVER_DISCOVERY</code> is a generic environment variable used by all applications protected by LM-X.</p> <p>You can set this environment variable in the same manner as described in <a href="#">Adding license files to the path manually</a>.</p>
<p><code>VENDOR_AUTOMATIC_SERVER_DISCOVERY_SERVER</code> or <code>LMX_AUTOMATIC_SERVER_DISCOVERY_SERVER</code></p>	<p>A string that can be set to enable running an automatic server discovery server within a client.</p> <p>For example: <code>LMX_AUTOMATIC_SERVER_DISCOVERY_SERVER=1</code></p>	

When this environment variable is set in combination with `LMX_AUTOMATIC_SERVER_DISCOVERY` (described above), the client will start responding to automatic server discovery requests issued by other clients. This enables the client to relay information about another server, thereby acting as a proxy.

Only one Automatic Server Discovery server (either a license server or one client acting as a server) can be active at one time on one machine. This is handled automatically.

**Example:**

You may have a license server over the Internet and several clients on a local network. In this situation, the first client can enable the broadcast server and the other clients on the same local network will get the server address from the client machine instead of manually setting the server address. For example:

1. Client A has enabled the `LMX_AUTOMATIC_SERVER_DISCOVERY` and `LMX_AUTOMATIC_SERVER_DISCOVERY_SERVER` flags.
2. Client A checks out a license for Vendor A from Server A. Server A is located on a remote network, where automatic server discovery is not working due to firewall restrictions.
3. Client B requests automatic server discovery to check out the Vendor A software.
4. Client A gets the automatic server discovery request from Client B, and manually sets the address of the server, and then Client B gets the server information from Client A.  
You may specify a particular vendor using `VENDOR__AUTOMATIC_SERVER_DISCOVERY_SERVER`, where `VENDOR` is the name of the application vendor, as specified in the license file. `LMX_AUTOMATIC_SERVER_DISCOVERY_SERVER` is a generic environment variable used by all applications protected by LM-X.

You can set this environment variable in the same manner as described in [Adding license files to the path manually](#).

<p><i>VENDOR_BORROW</i> or <i>LMX_BORROW</i></p>	<p>The desired number of hours to allow license borrowing, from 1 - 8760. <i>or</i> &lt;0 (e.g., -1) to allow early checkin of borrowed licenses.</p> <p>Examples: To set the borrow limit to 2 days: <i>LMX_BORROW=48</i> To allow early checkin: <i>LMX_BORROW=-1</i></p>	<p>Setting this environment variable to a number greater than 0 sets the number of hours for license borrowing.</p> <p>Setting this environment variable to a number less than 0 enables early return of borrowed licenses.</p> <p>You may specify a particular vendor using <i>VENDOR_BORROW</i>, where <i>VENDOR</i> is the name of the application vendor, as specified in the license file. <i>LMX_BORROW</i> is a generic environment variable used by all applications protected by LM-X.</p> <p>You can set this environment variable in the same manner as described in <a href="#">Adding license files to the path manually</a>.</p>
<p><i>VENDOR_BORROW_FORCE_RETURN</i> or <i>LMX_BORROW_FORCE_RETURN</i></p>	<p>A string that can be set to enable forcing a borrow return. Valid values are 0 or 1.</p> <p>For example: <i>LMX_BORROW_FORCE_RETURN = 1</i></p>	<p>When this environment variable is set to 1 and <i>LMX_BORROW=-1</i> (see above), the borrowed feature will be returned on the client side, even if there is no connection with the license server.</p> <p>You may specify a particular vendor using <i>VENDOR_BORROW_FORCE_RETURN</i>, where <i>VENDOR</i> is the name of the application vendor, as specified in the license file. <i>LMX_BORROW_FORCE_RETURN</i> is a generic environment variable used by all applications protected by LM-X.</p> <p>Caution: Use this variable carefully, because it can create an inconsistency between the client and the license server.</p>

<p>LMX_RANDOMIZE_PATH</p>	<p>A string that can be set to enable using a random path. For example: LMX_RANDOMIZE_PATH=1</p>	<p>When this environment variable is set, LM-X chooses a random path from a list for each server request. If you have multiple license servers, you can set this variable to balance the load amongst the servers.</p> <p>You can set this environment variable in the same manner as described in <a href="#">Adding license files to the path manually</a>.</p>
<p>VENDOR_EXTENDEDEDLOG or LMX_EXTENDEDEDLOG</p>	<p>The path to the extended client-side log.  For example: LMX_EXTENDEDEDLOG=C:\LM-X\My_LM-X_Log_Directory\client.log</p>	<p>This environment variable lets you set the path and filename for the extended client-side log, which contains information about all client activity.</p> <p>You may specify a particular vendor using <i>VENDOR_EXTENDEDEDLOG</i>, where <i>VENDOR</i> is the name of the application vendor, as specified in the license file. <i>LMX_EXTENDEDEDLOG</i> is a generic environment variable used by all applications protected by LM-X.</p> <p><b>Important: Using extended logging delays checkouts up to 15 seconds, because it gathers more information about environment than when using normal logging.</b></p> <p>You can set this environment variable in the same manner as described in <a href="#">Adding license files to the path manually</a>.</p>

<p><code>VENDOR_CONNECTION_TIMEOU T</code> or <code>LMX_CONNECTION_TIMEOUT</code></p>	<p>The desired number of seconds, from 1 - unlimited. The default value is 30.</p> <p>For example: <code>LMX_CONNECTION_TIMEOUT=1 0</code></p>	<p>This environment variable lets you adjust the connection timeout setting. The connection timeout is set to 30 seconds by default unless you set it to a different value using this environment variable.</p> <p>Increasing the timeout value can be useful for highly loaded networks. For example, if you set <code>LMX_CONNECTION_TIMEOUT = 60</code>, the server can wait up to 60 seconds before timeout.</p> <p>You may specify a particular vendor using <code>VENDOR_CONNECTION_TIMEOUT</code>, where <code>VENDOR</code> is the name of the application vendor, as specified in the license file. <code>LMX_CONNECTION_TIMEOUT</code> is a generic environment variable used by all applications protected by LM-X.</p> <p>You can set this environment variable in the same manner as described in <a href="#">Adding license files to the path manually</a>.</p>
<p><code>VENDOR_PROJECT</code> or <code>LMX_PROJECT</code></p>	<p>A string specifying a project name.</p> <p>For example: <code>LMX_PROJECT=Doorlatch_Design</code></p>	<p>This environment variable lets you set a project name for which all or vendor-specific LM-X licensed applications are being used. The project name is reported in <code>lmxendutil -licstat</code>. (See <a href="#">LM-X End-user utility</a>.)</p> <p>This lets you track for what purpose the application was used. For example, an application may be used for three different projects being run under different departments. Tracking which of the three projects the application was used for can help with accurate cost splitting amongst the projects.</p>

<p><code>VENDOR_QUEUE</code> or <code>LMX_QUEUE</code></p>	<p>A string that can be set to enable license queuing.</p> <p>For example: <code>LMX_QUEUE=1</code></p>	<p>This environment variable enables license queuing for all checkout requests.</p> <p>You may specify a particular vendor using <code>VENDOR_QUEUE</code>, where <code>VE</code> <code>NDOR</code> is the name of the application vendor, as specified in the license file. <code>LMX_QUEUE</code> is a generic environment variable used by all applications protected by LM-X.</p> <p>You can set this environment variable in the same manner as described in <a href="#">Adding license files to the path manually</a>.</p>
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## End-user tools

This chapter describes [installing](#) and using LM-X end-user tools, which include the following.

Tool	Windows File Name	Unix File Name
<a href="#">LM-X license server</a>	Imx-serv.exe	Imx-serv
<a href="#">LM-X end-user utility</a>	Imxendutil.exe	Imxendutil
<a href="#">LM-X End-user Configuration Tool</a>	Imxconfigtool.exe	N/A (Windows only)

## Installing end-user tools and LM-X license server

*The information on this page refers to v4.4.3 and later, which introduced an installation program that installs both LM-X license server and the end-user tools. For installation instructions applicable to earlier versions, see [Removed Features](#).*

An installation program lets you quickly and easily install [end-user tools](#), including the license server. The installer will let you install the license server as a service for Windows, Linux and Mac. For other platforms, you will need to start the license server as a daemon manually.

You can download the latest installation program from [http://www.x-formation.com/lm-x\\_license\\_manager/enduser\\_downloads.html](http://www.x-formation.com/lm-x_license_manager/enduser_downloads.html). For previous versions, contact your application vendor.

When you run the installation program, a wizard guides you through each installation step. The installation program optionally lets you install LM-X License Server as a service and helps you locate and copy the liblmxvendor library, which is required for starting LM-X License Server. This library and any updates to it are supplied by your application vendor.

## LM-X End-user utility

*The information on this page refers to LM-X v4.4.3 or newer, which added the -vendor option. If you are using a previous version of LM-X, please see the documentation relevant to your version: [v4.4 documentation](#); [documentation for versions prior to v4.4](#).*

The LM-X End-user utility lets you get the HostID values for the computer system. For machine-locked licenses, application vendors will use HostID values to create licenses specifically for your system. The LM-X End-user utility also lets you:

- See who is currently using specific licenses on the license server, and see the borrow, grace and trial licenses currently checked out
- Remotely access the license server
- Remove users from the license server
- Read and verify a usage database and print the usage information to the screen

The LM-X End-user utility may be run by any user; you do not need administrator privileges to run the utility. The `lmxendutil` command usage is as follows. Optional parameters are enclosed in square brackets ( [ ] ). Variables are shown in italic text.

<b>Command</b>	<b>Syntax</b>	<b>Description</b>
-hostid	<code>lmxendutil -hostid</code>	Displays HostID values of your computer system.

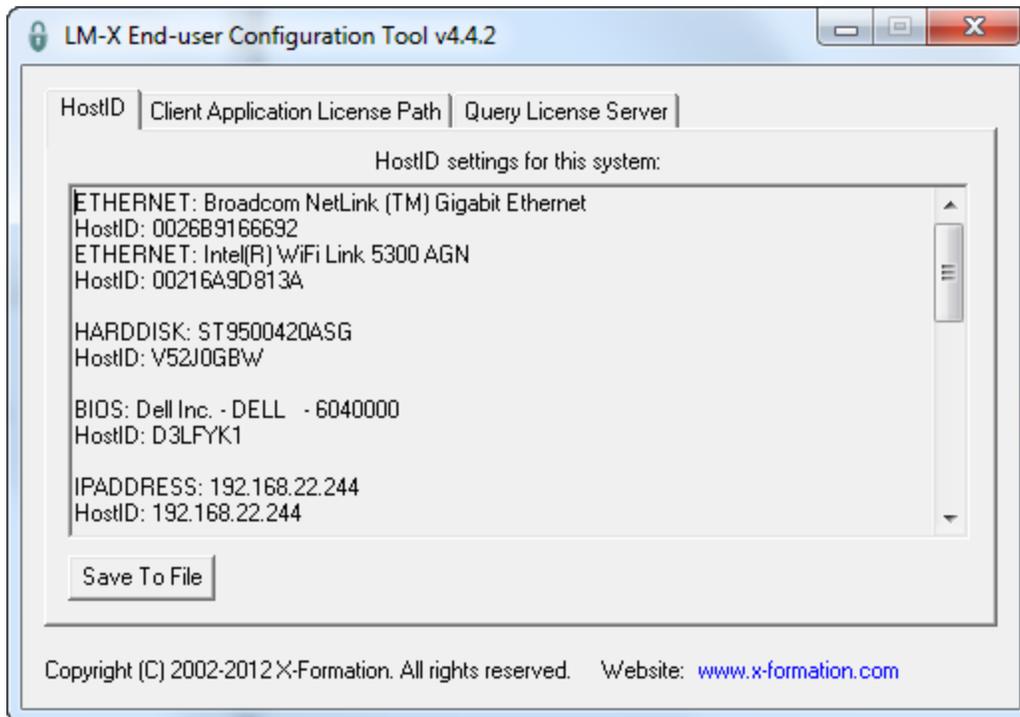
-licstat	Imxendutil -licstat [-vendor <i>vendor_name</i> -host <i>host</i> -port <i>port</i> -network -borrow -grace -trial -denials]	<p>Displays statistics and lists which users are currently using which licenses on a specific license server.</p> <p>When -vendor is used, the statistics will be limited to the specified vendor. If -vendor is not used, information such as grace, borrow and trial checkouts may not be returned, because the vendor is unknown.</p> <p>Information for the borrow, grace and trial licenses currently checked out is also returned unless one or more options are specified; for example, specifying -borrow will result in only borrow information being returned. If the -denials option is specified, this command additionally prints detailed information about denials for current and disconnected users for the past 24 hours, including username, hostname, IP address, login times, and denial times.</p> <p>See below for descriptions of optional parameters -host and -port.</p>
-licstatxml	Imxendutil -licstatxml [-vendor <i>vendor_name</i> -host <i>host</i> -port <i>port</i> -network -borrow -grace -trial -denials]	Displays the same information as for -licstat, but in XML format.
-restartserver	Imxendutil -restartserver [-host <i>host</i> -port <i>port</i> -password <i>password</i> ]	<p>Remotely restarts the license server.</p> <p>See below for descriptions of optional parameters -host, -port and -password.</p>
-shutdownserver	Imxendutil -shutdownserver [-host <i>host</i> -port <i>port</i> -password <i>password</i> ]	<p>Remotely shuts down the license server.</p> <p>See below for descriptions of optional parameters -host, -port and -password.</p>

-removeuser	lmxendutil -removeuser -clientusername <i>username</i> -clienthostname <i>host</i> [-host <i>host</i> -port <i>port</i> -password <i>password</i> ]	Removes a user from the license server. Parameter descriptions are as follows:  -clientusername <i>username</i> Removes a user with the specified username.  -clienthostname <i>host</i> Removes a user at the specified hostname.  See below for descriptions of optional parameters -host, -port and -password.
-host	-host <i>host</i>	Optional parameter that connects to the specified license server host. If you do not enter this optional parameter, the local host is used.
-port	-port <i>port</i>	Optional parameter that connects to license server on port ' <i>myport</i> '. If you do not enter this optional parameter, the default port is used.
-password	-password <i>password</i>	Optional parameter that uses the specified password. If you do not use this optional parameter explicitly, you will be prompted for the password (in this case, the password you enter is not displayed on the screen as you type).
-readusagedb	lmxendutil -readusagedb <i>usage.db</i>	Reads the specified usage database and performs a verification, then prints the usage information to the screen. (See <a href="#">Pay Per Use.</a> )

## LM-X End-user Configuration Tool

The End-user Configuration Tool is a Windows-only tool that lets you:

- See the HostID values of your computer system (in the HostID tab as shown in the example below)
- Edit the license path environment variable (see [Adding or removing license files from the path using the LM-X End-user Configuration tool](#) for more information)
- Query a license server



Note: After making changes to the license path, reboot to ensure that the changes take effect.

## LM-X license server

The LM-X license server is a machine used to host network (floating, or shared) software licenses. Unlike node-locked licenses that are installed locally on individual users' machines, network licenses are able to be shared among many users. The LM-X license server fulfills requests to run the network application if the requested license(s) are available. When the network license is released (for example, a user closes the application), the license is reclaimed by the license server and made available for other checkout requests.

When you start the LM-X license server, it reads the associated configuration file (if one exists) to determine user settings such as the log file output path, whether certain users should be denied checkout of licenses, etc. (See [License Server Configuration file](#).) The following sections describe how to manage the LM-X license server.

## Protocols

The license server runs over TCP protocol. LM-X supports IPv4/6 dual stack, which means that it is able to communicate in both IPv4 and IPv6 without having separate versions of the applications.

The license server also uses UDP protocol to allow applications to perform automatic server discovery on the network. Note: Automatic server discovery works only on local networks and will not work on WAN or VPN connections. Automatic server discovery is not guaranteed to work on all networks, particularly enterprise networks on which local firewalls or routers cut off UDP broadcast traffic.

When connecting client applications to IPv6 enabled servers, you must enclose the IP addresses in brackets [ ].

For example, to set environment variables for an IPv6 license server, you would enter:

```
LMX_LICENSE_PATH = @[1:2:3:4:5:6:7:8] or LMX_LICENSE_PATH = @[::1]
```

(For information about license file paths, see [Adding or removing license file paths](#).)

## License Server Configuration file

*The information on this page refers to LM-X v4.4 or newer, which added the USAGE\_WRITE\_INTERVAL setting. This setting is not available in previous versions of LM-X.*

The vendor may supply a license server configuration file, named lmx-serv.cfg by default. This configuration file is an ASCII text file, which can be opened and modified using any text editor. You may replace the existing information in the configuration file as needed.

The configuration file includes instructions for using each setting in the file, which may include the following, depending on the options provided by your vendor. Some of the configuration settings can also be specified using the web-based UI, as described in [Administration](#).

Syntax	Description	Examples
TCP_LISTEN_PORT = <i>port number</i>	<p>The TCP port number the license server will listen on.</p> <ul style="list-style-type: none"> <li>• TCP port is used for data traffic protocol. The default TCP port is 6200.</li> <li>• UDP port is used for automatic server discovery protocol. The UDP port is fixed to 6200 and cannot be changed. See <a href="http://www.iana.org/assignments/port-numbers">http://www.iana.org/assignments/port-numbers</a> for more information.</li> </ul>	TCP_LISTEN_PORT = 6200
TCP_BIND_ADDRESS = <i>IP_address_1 IP_address_2</i>	<p>Limit which networks the license server allows for client connections.</p> <p>When this setting is specified, the license server will only accept clients that connect from a network that uses the specified IP addresses. You can specify only one address for each IP version (one for IPV4 and one for IPV6).</p> <p>This setting is useful when the license server is connected to more than one network (has more than one IP address) and you want to limit allowed connections based on which network the client is on.</p> <p>When this setting is unspecified, the license server accepts clients from all available networks.</p>	TCP_BIND_ADDRESS = 192.168.21.321 8000:8000:8000:8000:abcd:1234:12df:fd54

<p>HAL_SERVERserver_number = [port]@hostname or HAL_SERVERserver_number = [port]@IP_address</p> <p>Note: Port is optional.</p>	<p>High Availability Licensing (HAL) servers, which enable redundant servers, so if one server goes down, two others will still work. HAL consists of 3 specified servers, at least 2 of which must be up and running at all times.</p> <p>Each HAL_SERVER line indicates a license server that has HAL enabled by its license(s). Each HAL server has a specific role, and should be specified in terms of how many resources each server has:</p> <ul style="list-style-type: none"> <li>• HAL_SERVER1 is your master server, which allows both CHECKOUT and BORROW. HAL_SERVER1 should be your most powerful server.</li> <li>• HAL_SERVER2 is your first slave server, which allows CHECKOUT but denies BORROW in the event that your master server goes down. HAL_SERVER2 should be your second most powerful server.</li> <li>• HAL_SERVER3 is part of your configuration to ensure that everything works as expected, and does not allow any CHECKOUT or BORROW requests. HAL_SERVER3 should be your least powerful server.</li> </ul> <p><b>Important:</b> The HAL_SERVER list must be identical on all your servers for HAL to function properly</p>	<p>HAL_SERVER1 = 6200@server1 HAL_SERVER2 = 6200@server2 HAL_SERVER3 = 6200@server3</p>
<p>LOG_FILE = path</p>	<p>The log file path. Specifying the full path is preferred.</p> <p>If you do not specify this setting, the default is used: On Windows the default is lmx-serv-vendor.log, under the license server directory. On Unix, the default location for the log file is in the directory from which the license server was started</p>	<p>LOG_FILE = c:\program files\lmx-server.log LOG_FILE = /home/user1/lmx-serv.log</p>

<p>LOG_FORMAT= NORMAL or EXTENDED</p>	<p>The format for the log file.</p> <p>The default setting for the log file format is NORMAL.</p> <p>Specifying EXTENDED causes additional information to be included in the log file, such as license server HostIDs, whether the license server is a virtual machine, etc. Setting the log file format to EXTENDED is particularly useful for debugging purposes.</p>	<p>LOG_FORMAT= NORMAL LOG_FORMAT=EXTENDED</p>
<p>LOG_EXCLUDE = <i>message1, message2</i>, etc.</p>	<p>Exclude messages from the log. The following messages can be excluded: CHECKOUT, CHECKIN, STATUS, BORROW, BORROW_RETURN, REMOVE_USER, REMOTE_RESTART or REMOTE_SHUTDOWN.</p>	<p>LOG_EXCLUDE = CHECKOUT, CHECKIN, STATUS</p>
<p>LOGFILE_ROTATE_INTERVAL = <i>rotation_interval</i></p>	<p>The interval for log file rotation.</p> <p>The value may be set to "day" (every day at midnight), "week" (every Monday at midnight), or "month" (the first day of every month at midnight).</p> <p>After rotation, the old log file will be named <i>filename.log.rotation_date</i> in the format <i>yyyy-mm-dd</i>.</p> <p>A message indicating the location of the rotated log file is added to the end of the old log file and the beginning of the new log file, as follows:</p> <p>"Log file was rotated and saved to <i>filename</i>."</p>	<p>LOGFILE_ROTATE_INTERVAL = <i>day</i></p>

<p><code>MIN_USER_REMOVE_TIME = <i>time</i></code> <i>in seconds</i></p>	<p>Minimum time, in seconds, that must elapse from the connection before a user can be removed using <code>lmxendutil</code>.</p> <p>The specified time must be equal to or greater than the number of seconds specified by your application vendor. Default minimum time is 120 seconds. If the time is set to -1, user removals will not be allowed.</p>	<p><code>MIN_USER_REMOVE_TIME = 120</code></p>
<p><code>LICENSE_FILE = <i>path</i></code></p>	<p>The license file path.</p> <p>On Windows: If no file is set, the license server will look for <code>vendor.lic</code> in the same directory as the license server.</p> <p>On Unix: If no file is set, the license server will look for <code>/usr/x-formation/vendor.lic</code>.</p> <p>In both cases, the filenames must be lowercase. You can specify one or multiple paths as needed.</p>	<p><code>LICENSE_FILE = d:\server\network.lic</code>  <code>LICENSE_FILE = c:\extra_file.lic</code>  <code>LICENSE_FILE = /home/user1/floating_license.lic</code>  <code>LICENSE_FILE = /home/user1/floating_license2.lic</code></p>
<p><code>USAGE_DATABASE = <i>database path</i></code></p>	<p>Pay-per-use usage database (used for billing purposes). See <a href="#">Pay Per Use</a> for detailed information, including database format and an example of data printout.</p>	<p><code>USAGE_DATABASE = d:\server\usage.db</code>  <code>USAGE_DATABASE = /home/user1/usage.db</code></p>
<p><code>USAGE_LEVEL= <i>detail level</i></code></p>	<p>Specify pay-per-use detail level.</p> <ul style="list-style-type: none"> <li>• STANDARD includes basic usage information.</li> <li>• DETAILED includes user information in addition to the basic usage information.</li> </ul>	<p><code>USAGE_LEVEL = STANDARD</code></p>
<p><code>USAGE_WRITE_INTERVAL= <i>number of actions</i></code></p>	<p>Specify the number of pay-per-use <a href="#">actions</a> (checkouts, checkins, etc.) after which pay-per-use records will be written to the pay-per-use database file. The default setting is 1000.</p>	<p><code>USAGE_WRITE_INTERVAL = 1000</code></p>

<p>REMOTE_ACCESS_PASSWORD = <i>password</i></p>	<p>Remote administration password (used when remotely stopping and restarting the license server and removing users from it).</p> <p>The password is case-sensitive.</p>	<p>REMOTE_ACCESS_PASSWORD = MyPassword123</p>
<p>FAST_QUEUE = <i>feature1, feature2,</i> etc. or FAST_QUEUE = ALL</p>	<p>Fast queuing allows requests that can be fulfilled immediately to be fulfilled.</p> <p>For example, if a client is waiting for two licenses, and only one license is immediately available, another client that needs only one license can bypass the queue and take the single license without waiting.</p> <p>Default behavior of license queuing is to put the client at the end of the queue regardless whether the license request could be satisfied.</p>	<p>FAST_QUEUE = f2, d5, app2</p>

<p><i>ALLOW_IPADDR_ALL = one or more IP addresses</i></p> <p><i>ALLOW_IPADDR_feature name = one or more IP addresses (must be either specific A.B.C.D or with wildcards; e.g., A.B.*)</i></p> <p><i>DENY_IPADDR_ALL = one or more IP addresses</i></p> <p><i>DENY_IPADDR_feature name = one or more IP addresses (must be either specific A.B.C.D or with wildcards; e.g., A.B.*)</i></p> <p><i>ALLOW_HOST_ALL = one or more hosts</i></p> <p><i>ALLOW_HOST_feature name = one or more hosts</i></p> <p><i>DENY_HOST_ALL = one or more hosts</i></p> <p><i>DENY_HOST_feature name = one or more hosts</i></p> <p><i>ALLOW_USER_ALL = one or more users</i></p> <p><i>ALLOW_USER_feature name = one or more users</i></p> <p><i>DENY_USER_ALL = one or more users</i></p> <p><i>DENY_USER_feature name = one or more users</i></p> <p>Note: For host, you can use a hostname or use "localhost" to specify the current machine. For IP address, you can specify a complete address (A.B.C.D) or use wildcards; e.g., A.B.*).</p>	<p>Allow/deny specific clients from using the license server.</p> <p>The allow/deny rules work as follows:</p> <ul style="list-style-type: none"> <li>• Rules are attempted to be matched in the order they are written.</li> <li>• If no rule matches the specific client, then that client is allowed.</li> </ul>	<p>The following example will allow clients on only 2 subnets, user Administrator and root from any host and deny everyone else. This applies to all features.</p> <pre>ALLOW_IPADDR_ALL = 192.168.1.* 192.168.2.* ALLOW_USER_ALL = Administrator root DENY_IPADDR_ALL = ...</pre> <p>The following example will deny clients on localhost, deny the machines with hostname 'untrusted' and 'crackerjack', allow clients on the internal network, and deny everyone else. This applies to the feature f2.</p> <pre>DENY_HOST_f2 = localhost untrusted crackerjack ALLOW_IPADDR_f2 = 192.168.. DENY_IPADDR_f2 = ...</pre>
---	---	--

<p>ALLOW_BORROW_IPADDR_ALL = <i>one or more hosts</i></p> <p>ALLOW_BORROW_IPADDR_<i>feature name</i> = <i>one or more hosts</i></p> <p>DENY_BORROW_IPADDR_ALL = <i>one or more hosts</i></p> <p>DENY_BORROW_IPADDR_<i>feature name</i> = <i>one or more hosts</i></p> <p>ALLOW_BORROW_HOST_ALL = <i>one or more hosts</i></p> <p>ALLOW_BORROW_HOST_<i>feature name</i> = <i>one or more hosts</i></p> <p>DENY_BORROW_HOST_ALL = <i>one or more hosts</i></p> <p>DENY_BORROW_HOST_<i>feature name</i> = <i>one or more hosts</i></p> <p>ALLOW_BORROW_USER_ALL = <i>one or more users</i></p> <p>ALLOW_BORROW_USER_<i>feature name</i> = <i>one or more users</i></p> <p>DENY_BORROW_USER_ALL = <i>one or more users</i></p> <p>DENY_BORROW_USER_<i>feature name</i> = <i>one or more users</i></p> <p>Note: For host, you can use a hostname or use "localhost" to specify the current machine. For IP address, you can specify a complete address (A.B.C.D) or use wildcards; e.g., A.B.C.*).</p>	<p>Allow/deny specific clients from borrowing licenses.</p>	<p>The following example will allow the specific users, and deny host and IP addresses on the list from borrowing any feature. Everyone else will be allowed.</p> <p>ALLOW_BORROW_USER_ALL = daisy harry tom  DENY_BORROW_HOST_ALL = server1 machine5  DENY_BORROW_IPADDR_ALL = 192.168.3.* 192.168.4.*</p> <p>The following example will allow the specific users and deny everyone else from borrowing f2.</p> <p>ALLOW_BORROW_USER_f2 = lazyjack rabbit joeuser  DENY_BORROW_IPADDR_f2 = *..*</p>
---	---	--

<p>LIMIT_USER_feature name_limit count = one or more users  LIMIT_HOST_feature name_limit count = one or more hosts  LIMIT_IPADDR_feature name_limit count = one or more hosts</p> <p>Note: For host, you can use a hostname or use "localhost" to specify the current machine. For IP address, you can specify a complete address (A.B.C.D) or use wildcards; e.g., A.B.C.*).</p>	<p>Limit the number of licenses that can be used by individual users or groups to implement fair/desired distribution of licenses.</p> <p>Limiting of users is done by a first match rule, so if a user belongs to more than one group specified in restrictions, the first restriction will apply to that user.</p>	<p>LIMIT_USER_f2_5 = harry joe sam  LIMIT_IPADDR_f3_3 = 192.168.2.* 192.168.4.*</p>
<p>RESERVE_USER_feature name__reserve count = one or more users  RESERVE_HOST_feature name__reserve count = one or more hosts  RESERVE_IPADDR_feature name_reserve count = one or more hosts</p> <p>Note: For host, you can use a hostname or use "localhost" to specify the current machine. For IP address, you can specify a complete address (A.B.C.D) or use wildcards; e.g., A.B.C.*).</p>	<p>Reserve a number of licenses that can be used by individual users or groups to implement fair/desired distribution of licenses.</p> <p>Reservation of users is done by a first match rule, so if a user belongs to more than one group specified in the rules, the first rule will apply to that user.</p>	<p>RESERVE_USER_f2_5 = harry joe sam  RESERVE_IPADDR_f3_3 = 192.168.2.* 192.168.4.*</p>
<p>BORROW_LIMIT_COUNT_ALL = limit count  BORROW_LIMIT_COUNT_feature name = limit count</p>	<p>Limit the number of licenses that can be borrowed to prevent all licenses from being borrowed at the same time.</p>	<p>BORROW_LIMIT_COUNT_f2 = 1  BORROW_LIMIT_COUNT_ABCDEF = 5</p>
<p>BORROW_LIMIT_HOURS_ALL = limit hours  BORROW_LIMIT_HOURS_feature name = limit hours</p>	<p>Limit the number of hours licenses can be borrowed to prevent licenses from being borrowed for too long.</p>	<p>BORROW_LIMIT_HOURS_f2 = 1  BORROW_LIMIT_HOURS_ABCDEF = 5</p>

<pre>FEATURE <i>featurename</i> { <i>feature settings</i> }</pre>	<p>Specify licenses directly within the configuration file to eliminate the need to have both a license file and configuration file for the license server. You can specify any features from one or more license files.</p> <p>The content must be specified within the <code>_START_LICENSE_</code> and <code>_END_LICENSE_</code> clauses.</p>	<pre>_START_LICENSE_ FEATURE F1 { VENDOR = XYZ } _END_LICENSE_</pre>
---	---	--

## License server log file

The license server can produce a log file that details activity such as client connections or disconnections, license checkout/checkin, and other server activity. For Unix operating systems, the log file may also contain [exit signals](#).

In the configuration file, you can control the following settings for the license server log:

- Turn logging on or off.
- Specify normal or extended logging. When using extended logging note that:
  - Extended logging results in greater detail in the log file.
  - Extended logs can be [imported into License Statistics](#) to obtain denied request statistics.)
- Specify the interval for log file rotation. Generally, data written to the log file is useful only for a limited time, so log rotation is recommended for removing old log data and reducing the storage requirements of the log file.
- Specify the desired output location for the log.

See [License Server Configuration file](#) for more details about the above log settings. You can also control these log settings using the web-based UI, as described in [Enabling and configuring license server logging](#).

Over time, the log file can grow to a substantial size depending on licensing activity, so it is best to write the log to a local file system rather than across a network.

If the log file is deleted, the license server will create a new log file on the next write.

## Running the license server from a command line

***The information on this page refers to v4.4.3 and later, which introduced an installation program that installs both LM-X license server and the end-user tools and removed some commands from Imx-serv. For applicable to earlier versions, see [documentation for previous versions](#).***

The Imx-serv command will let you run the license server as a service in Windows or as a daemon in the background on Unix. However, it is recommended that you [use the provided installer](#) to install and start the license server instead of using Imx-serv.

The Imx-serv command usage is as follows.

### For Windows:

Command	Options
Imx-serv	[-config <i>configfile</i> -licpath <i>licensefile</i> -logfile <i>logfile</i> -port <i>portnumber</i> ]

**For Unix:**

Command	Options
lmx-serv	[-background -config <i>configfile</i> -licpath <i>licensefile</i> -logfile <i>logfile</i> -port <i>portnumber</i> ]

*Where:*

Command			Description
Long version	Short version	Applies to	
-background	-b	Unix	Run the license server as a daemon in the background.
-config	-c	All	Specify an optional path to an lmx-serv.cfg configuration file. Typing the full path is required. If the server is run without the -c parameter, it will use default settings.
-licpath	-l	All	<p>Specify an optional license file path that will be read in addition to those specified within the lmx-serv.cfg configuration file.</p> <p>Alternatively, you may specify a directory in which the license server will look for all .lic files. You can specify multiple paths, separated by a semicolon ( ; ) for Windows or a colon ( : ) for Unix; for example, "-l C:\dir1;c:\dir2."</p> <p>If no default license is defined in the configuration file and the -l parameter is not specified (or no license can be found in given location), the server will look for all .lic files in its directory.</p>

-logfile	-lf	All	Specify an optional logfile path, which will override any logfile settings in the lmx-serv.cfg configuration file.
-port	-p	All	Specify an optional port number, which will override the port number set in the configuration file.
-help	-h	All	Print out usage information for these commands.

We recommend enclosing all switches (e.g., configuration file path) within double quotes (" ") to avoid problems with white spaces.

The following example shows running the license server on Windows from a command line.

```

c:\Program Files (x86)\LM-X>lmx-serv-xformation.exe -l network.lic -c lmx-serv.cfg
[2012-12-13 09:15:03] LM-X License Server v4.3.6 build DEVELOPMENT on Justyna-PC (Win32_x86)
[2012-12-13 09:15:03] Copyright (C) 2002-2012 X-Formation. All rights reserved.
[2012-12-13 09:15:03] Website: http://www.lm-x.com http://www.x-formation.com
[2012-12-13 09:15:03] License server has pid 2312.
[2012-12-13 09:15:03] Serving licenses for vendor XFORMATION.
[2012-12-13 09:15:03] License server using TCP IPv4 port 6200.
[2012-12-13 09:15:03] License server using TCP IPv6 port 6200.
[2012-12-13 09:15:03] License server using UDP IPv4 port 6200.
[2012-12-13 09:15:03] WARNING: Windows firewall blocks TCP port 6200.
[2012-12-13 09:15:03] WARNING: Communication to license server might not work properly.
[2012-12-13 09:15:03] WARNING: Windows firewall blocks UDP port 6200.
[2012-12-13 09:15:03] WARNING: Automatic server discovery might not work properly.
[2012-12-13 09:15:03] Reading licenses...
[2012-12-13 09:15:03] License file(s):
[2012-12-13 09:15:03] c:\Program Files (x86)\LM-X\network.lic
[2012-12-13 09:15:03] Log file path: Not set
[2012-12-13 09:15:03] Log to stdout: Yes
[2012-12-13 09:15:03] Log format: Normal
[2012-12-13 09:15:03] Configuration file path: c:\Program Files (x86)\LM-X\lmx-serv.cfg
[2012-12-13 09:15:03] Serving following features:
[2012-12-13 09:15:03] LicensedExampleClass (v1.0) (1 license(s)) license type: exclusive
[2012-12-13 09:15:03] borrow (v1.0) (1 license(s)) license type: exclusive
[2012-12-13 09:15:03] f1 (v1.5) (5 license(s)) license type: exclusive
[2012-12-13 09:15:03] f2 (v1.0) (5 license(s)) shared on: HOST USER VIRTUAL license type: additive
[2012-12-13 09:15:03] f2 (v1.0) (10 license(s)) license type: additive
[2012-12-13 09:15:03]
[2012-12-13 09:15:04] Minimum user remove time set to 120 seconds.
[2012-12-13 09:15:04] To administrate the license server go to page http://Justyna-PC:6200
[2012-12-13 09:15:04] Ready to serve...

```

## Unix exit signals

When running LM-X on a Unix operating system, you may see an "exit signal" message in the license server log file. Exit signals are not LM-X errors, but rather events sent from the operating system to instruct an application to shut down in various ways. For example, the following excerpt from a Linux license server log file contains exit signal 15, which is the signal SIGTERM (termination).

```
[2012-02-08 15:48:15] WARNING: Unable to establish connection with  
HAL peer 6200@193.28.180.39. Please make sure the host is up!  
[2012-02-08 15:52:35] Shutting down due to exit signal 15
```

You can find information about exit signals at [http://www.comptechdoc.org/os/linux/programming/linux\\_pgsignals.html](http://www.comptechdoc.org/os/linux/programming/linux_pgsignals.html).

## Web-based UI

LM-X License Manager includes a web-based UI that helps you to monitor and manage your LM-X license server. The LM-X web-based UI runs on most popular browsers. For complete system requirements for the web-based UI, please see [System requirements for web-based UIs](#).

Using the web-based UI, you can:

- View information and statistics about the LM-X license server.
- Restart or shut down the license server.
- View the LM-X server's HostIDs (unique machine values that can be used to lock a license file to a host), such as Ethernet, Hostname, IP Address, etc.
- View license usage statistics for the current license server, as well as for borrow, grace and trial licenses.
- View and edit the configuration file. (A password is required to access the configuration file.)
- View and search for entries in the log file.

## Accessing the web-based UI

To access the web-based UI, open a browser and enter your LM-X license server's IP address as the URL. The web-based UI with data specific to that license server will open.

You can access the host of the LM-X license server on the same port as the license server, which defaults to 6200. For example, <http://lmx-server-host:6200>.

## Viewing server information and statistics

*The information on this page refers to LM-X version 4.1, which added new graphs to the Dashboard. If you are running LM-X version 4.0, please refer to [version 4.0 documentation](#) for information relevant to that version.*

The LM-X License Server Dashboard shows information about your LM-X license server, including:

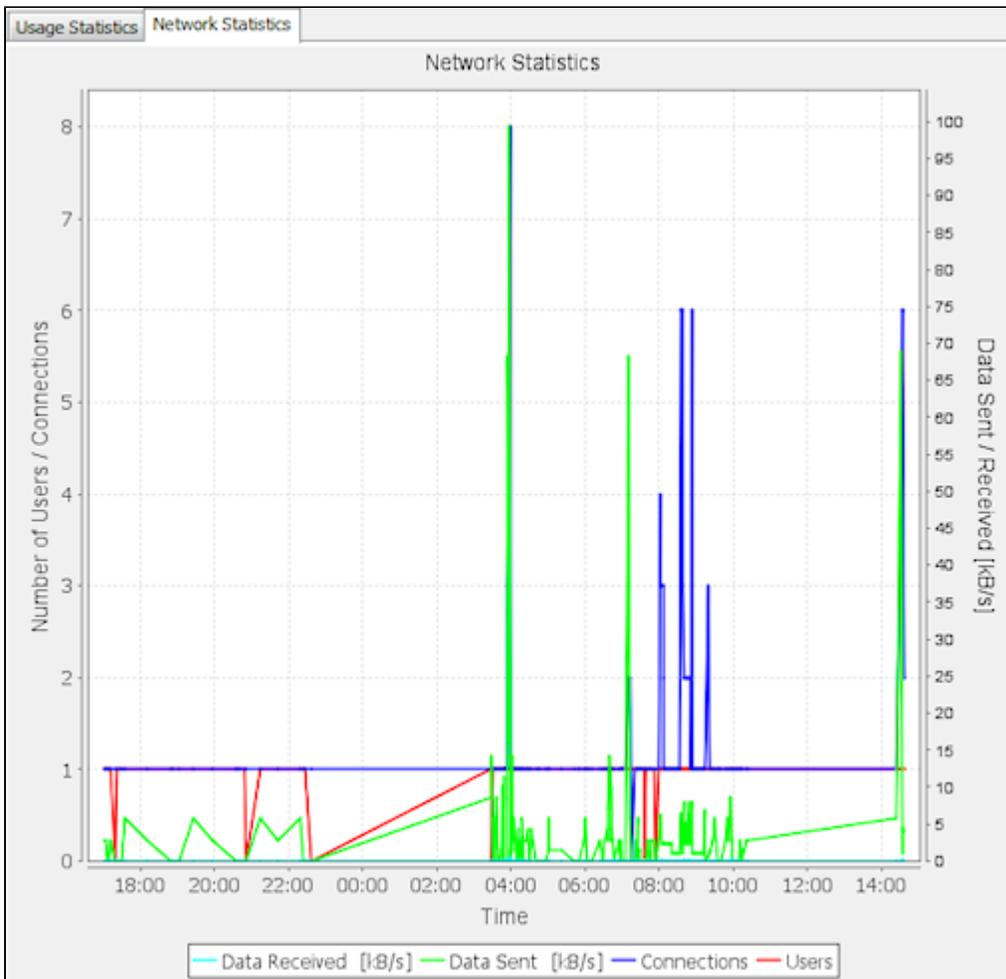
- General information, such as the hostname and port for the server, the LM-X version it is running, whether HAL and extended logging are enabled, etc.
- The IP addresses for the server.
- General statistics, including the number of users currently logged into the server and the number of features that are on the server.

In addition, the following graphs illustrate the license server data:

- The Usage Statistics graph shows usage and denials history for the past month for a selected feature on the server.
- The Network Statistics graph shows general statistics such as the server's number of users, connections, and data received/sent.

Using the right click menu in the graphs, you can:

- Modify chart properties, including settings for Title (renaming the chart and changing the appearance of the title text); Plot (renaming and changing the appearance of the axes and the lines in the plot, and setting the orientation of the plot); and Other (rendering options).
- Save the graph (currently limited to .PNG format).
- Print the graph.
- Zoom in/out on both axes or one axis (Domain, the horizontal line; or Range, the vertical line). For example, if you select Zoom Out > Domain Axis, the timeline on the graph will be less detailed and show a greater length of time. Zooming in shows greater detail over a shorter period of time.
- Zoom automatically to the extent of one or both axes of the graph. For example, the Network Statistics graph shown below has been zoomed automatically to both axes, so it shows all existing data (the data has been gathered for 20 hours and the upper limit of data sent/received is 100 kilobytes per second).



In addition to these shortcut menu zoom options, you can also click and drag to zoom to particular details in the graph.

### Restarting or shutting down the server

The LM-X License Manager Dashboard's License Server Administration area, located at the bottom of the Dashboard page, includes the ability to restart or shut down the license server. Restarting the license server normally takes a few seconds, but may take longer depending on the speed of the license server machine, number of licenses, and other factors.

### Viewing HostIDs

*The information on this page refers to LM-X version 4.1, which now allows saving HostID information to a text file. If you are running LM-X version 4.0, please refer to [version 4.0 documentation](#) for information relevant to that version.*

The HostIDs tab in the web-based UI lists all the HostIDs for the license server. The information for each HostID includes the Type (for example, ETHERNET, HOSTNAME, IPADDRESS, etc.), Description, and Value. The Description and Value are often identical, but some HostID types will have different entries. For example, an Ethernet HostID will have the Ethernet manufacturer under Description, and the actual Ethernet ID under Value.

You can use the Save button to save HostID information about the current machine the license server is running on to a text file. Saving this information to file gives you an easy way to supply your HostID information to your software vendor when requested.

### Viewing license usage statistics

*The information on this page refers to LM-X version 4.1, which added new information to the user statistics report. If you are running LM-X version 4.0, please refer to [version 4.0 documentation](#) for information relevant to that version.*

The License Usage tab in the web-based UI includes license usage statistics for features and users on the license server. Select Users or Features from the View options at the top right of the License Usage page to choose which statistics to see.

When you select Feature from the View options, the License Usage page includes the following information for each feature being served by the LM-X license server:

- Feature name
- Software version number
- Software vendor name
- Key type (e.g., Exclusive, Additive, Token, etc.)
- Share code (e.g., Host, User, Virtual, etc.)
- License start and expire dates
- License type (e.g., Network)
- Total number of licenses for that feature on the license server
- Number of licenses in use
- Number of borrowed licenses

When you select User from the View options, the License Usage page lists the following statistics for each user on the LM-X license server:

- User name
- User's machine hostname
- The IP address for the user's machine
- The features the user checked out
- The number of licenses the user has used
- The user's login and checkout time
- The state of the license (Borrowed, Checked Out, etc.)
- Borrow expiration

In addition to showing statistics for each user, you can use the Action column options to release all the licenses that are currently in use by a particular user.

The user statistics report may contain identical usernames and hosts under the following circumstances:

- If the user checked out multiple different features, each feature is displayed in a separate row.
- If multiple clients are started (for example, multiple instances of one application), you will see each client separately. (If you remove one client, the remaining clients will still remain valid.)

## Viewing the log file

The Log File tab in the web-based UI lets you see the LM-X license server log file. You can filter results to show all entries, or limit the log to warnings or errors. You can search for specific entries in the log file using the Search box and the Next and Previous buttons.

## Administration

The following sections describe the administrative functions of the LM-X web-based UI, which are located as sub-tabs under the Administration tab. Many settings in the Administration sub-tabs give you a user interface for modifying the contents of the configuration file; for example, setting values for HAL servers, the Pay Per Use database, logging, etc.

To ensure that the administrative functions are accessed only by authorized administrators, you must enter a valid password to open the Administration tab. The password is stored in the configuration file and can be seen when setting up the license server.

### *Managing licenses*

To manage licenses, go to the License Management sub-tab under the Administration tab. From this page, you can activate (download) a license from License Activation Center (LAC). In addition, you can upload license files; for example, a file that your vendor has sent to you via email or a license that you have previously activated and want to upload to the server.

- To activate a license, enter the activation key, and then click Add Activation Key. The activation key is added and automatically activated.
- To reactivate a license, click the Reactivate icon in the Action column for the license you want to reactivate.
- To upload existing license files from LAC, click Upload License File, and then save the file to the desired location using the Upload File dialog that appears.

For general information about LAC, see [Introduction to License Activation Center](#). For information about activating licenses in LAC, see [License Activation Center End User Guide](#).

### *Enabling and configuring HAL*

To enable and configure High Availability Licensing (HAL), go to the High Availability Licensing sub-tab under the Administration tab.

- To enable HAL, check the Enable checkbox.
- You can configure the HAL servers by entering the server information under the Configure area.
- To save your changes, click Save. You must restart the server for your changes to take effect.
- You can cancel any changes not yet saved by clicking the Cancel button.

For more information about HAL, see [High Availability Licensing](#).

### *Enabling and configuring Pay Per Use*

To enable and configure Pay Per Use, go to the Pay Per Use sub-tab under the Administration tab.

- To enable Pay Per Use, check the Enable checkbox.
- You can enter the desired Pay Per Use database name and format (Normal or Extended) under the

Configuration area.

- To download the Pay Per Use database file (for example, to deliver it to your vendor), click Download and select the desired location and file name for the file using the Save dialog that appears.
- To save your changes, click Save. You must restart the server for your changes to take effect.
- You can cancel any changes not yet saved by clicking the Cancel button.

For more information about how to use and configure Pay Per Use, see [Pay Per Use](#).

### ***Enabling and configuring license server logging***

To enable and configure license server logging, go to the Logging sub-tab under the Administration tab.

- To enable Logging, check the Enable checkbox.
- Under the Configuration area, you can specify the name for the log file, the format of the file (Normal or Extended), the rotation interval (None, Daily, Weekly or Monthly) to use for removing older data, and any LM-X messages to exclude from logging. When using extended logging note that:
  - Extended logging results in greater detail in the log file.
  - Extended logs can be [imported into License Statistics](#) to obtain denied request statistics.)
- To save your changes, click Save. You must restart the server for your changes to take effect.
- You can cancel any changes not yet saved by clicking the Cancel button.

For more information about license server logging, see [License server log file](#) and [License Server Configuration file](#).

### ***Editing the configuration file***

The Configuration File sub-tab under the Administration tab lets you review and change the LM-X [license server configuration file](#).

- After making changes to the configuration file, click Save. You must restart the server for your changes to take effect.
- You can cancel any changes not yet saved by clicking the Cancel button.

### ***Miscellaneous settings***

The Misc sub-tab under the Administration tab lets you configure settings for TCP, remote access and user removal. From this page, you can:

- Specify the TCP port number in the TCP Listen Port field. (For more information about the TCP Listen Port, see [License Server Configuration file](#).)
- Enter a password for remote access to the license server in the Remote Access Password field. You must verify the password by entering it again in the Confirm Password field.
- Enable user removal by checking the Enable User Removal Checkbox.
- Set the minimum time for user removal. The value for user removal must be no less than 120 (seconds). (For more information about user removal, see [License Server Configuration file](#).)

## **Optional features**

The following sections describe LM-X license server features that you and/or your vendor may optionally enable, including [Pay Per Use](#), [license borrowing](#), [automatic server discovery](#), and [license queuing](#).

### **High Availability Licensing**

High Availability Licensing (HAL) allows you to specify backup (redundant) license servers that will continue to enable license hosting in the event that the primary license server goes down. To use HAL, your license must be

HAL-enabled by your vendor.

HAL requires a stable network connection to prevent hiccups in traffic between the servers, which can potentially cause license checkout problems. Too many network problems will make the system unstable and users will not get reliable access to the software. For this reason, enabling HAL over WAN is recommended only if the connection is fast and stable.

Note that a license server can serve either a HAL-enabled license or normal network license, not both.

Installing HAL license servers is very similar to installing a normal network license, but instead of installing the license on only one server, you install it on three servers. You must also edit the HAL server settings in your `lmx-serv.cfg` file in addition to the settings required for a normal network license.

## How to install HAL license servers

The following steps describe how to easily install HAL (High Availability License) license servers on Windows using the LM-X End-user Configuration Tool. You will be using the same procedure described in [Installing a license server on Windows](#), but will do the procedure for three servers instead of one.

1. For *each of the three servers* that will be used in your HAL configuration, follow steps 1 through 7 in [Installing a license server on Windows](#).
2. Edit the configuration file as described in step 8 in [Installing a license server on Windows](#). In addition to the required edits to the configuration file, edit the HAL server settings. (HAL can also be enabled and the servers configured by using the web-based UI, as described in [Enabling and configuring HAL](#).)

HAL requires a set of 3 license servers. Each HAL license server has a fixed role, as described in the following table:

HAL license server number	Role
1	This HAL license server can allow clients to both checkout and borrow licenses, exactly like a normal license server.
2	In the event that HAL license server #1 is down, this server can allow clients to checkout licenses, but will deny borrow requests.
3	This HAL license server will deny any requests, but is required as a part of the configuration to ensure high availability.

You must specify the three servers in the license server configuration file for *each of the three servers* that will be used in your HAL configuration. To ensure the configuration files are identical, you may wish to edit one configuration file and copy the file to the other two servers. (The servers may have different settings throughout the configuration file as needed, but the HAL settings must be identical.)

3. Open the log file to verify the HAL license servers are started and working normally, indicated by the line

"Ready to serve..." as shown in the following example. (This example is the log file for a master server; that is, the server specified as HAL\_SERVER1 in the configuration file.)

```
[2009-01-21 16:13:04] License server using TCP IPv4 port 6200.
[2009-01-21 16:13:04] License server using UDP IPv4 port 6200.
[2009-01-21 16:13:04] Logfile path: lmx-server.log
[2009-01-21 16:13:04] License file(s):
[2009-01-21 16:13:04] C:\LM-X\xformation.lic
[2009-01-21 16:13:04] Serving following features:
[2009-01-21 16:13:04] f1 (v1.5) (5 licenses) license type: exclusive
[2009-01-21 16:13:04]
[2009-01-21 16:13:04] Minimum user remove time set to 120 seconds.
[2009-01-21 16:13:04] Ready to serve...
[2009-01-21 16:13:04] HAL: This license server is configured as a HAL
MASTER.
[2009-01-21 16:13:04] HAL: Peer server: my_#2_server:6200
[2009-01-21 16:13:04] HAL: Peer server: my_#3_server:6200
[2009-01-21 16:13:04] HAL: CHECKOUT requests on this server are NOT
ALLOWED!
[2009-01-21 16:13:04] HAL: BORROW requests on this server are NOT ALLOWED!
[2009-01-21 16:13:04] HAL: Connection with HAL peer my_#2_server:6200 is
up!
[2009-01-21 16:13:04] HAL: Connection with HAL peer my_#3_server:6200 is
up!
[2009-01-21 16:13:19] HAL: CHECKOUT requests on this server are ALLOWED!
[2009-01-21 16:13:19] HAL: BORROW requests on this server are ALLOWED!
```

Note that the log file for the servers specified as HAL\_SERVER1 and HAL\_SERVER2 in the configuration file (the servers that allow requests) may initially indicate that the server is not allowing requests. However, within 30 seconds, when the connection between the servers is detected, the log file will report that requests are allowed.

As for normal license servers, the log file will indicate the cause of any problems running the HAL servers. Note: you must disable or configure your firewall on each HAL server for HAL to function properly.

## Pay Per Use

The Pay Per Use feature captures license usage in a pay-per-use database which can then be sent to the vendor upon request. The database is authenticated, and its contents can be validated by the vendor.

For example, if you have an unrestricted use license that is paid for based on monthly usage, your vendor can request that you write the usage information to a pay-per-use database each month, and send the database file to them for billing purposes.

Usage databases use SQLite, a free open source database. You can find out more about SQLite at <http://www.sqlite.org>.

## Enabling and using usage databases

*The information on this page refers to LM-X v4.4 or newer, which added the USAGE\_WRITE\_INTERVAL setting. This setting is not available in previous versions of LM-X.*

The vendor enables Pay Per Use by editing the USAGE\_DATABASE entry (disabled by default) in the license server configuration file. The configuration file contains a description and examples for using the USAGE\_DATABASE setting. (For information on configuring Pay Per Use, see [License Server Configuration file](#) and [Enabling and configuring license server logging.](#))

You can edit the USAGE\_LEVEL setting in the configuration file to specify whether to generate a STANDARD report that does not include user information, or a DETAILED report that includes the username, hostname and IP address for each checkout and checkin request. The USAGE\_LEVEL setting is set to STANDARD in the configuration file by default. In addition, you can set the USAGE\_WRITE\_INTERVAL option in the configuration to specify the number of pay-per-use [actions](#) (checkouts, checkins, etc.) that should occur before pay-per-use records will be written to the usage database file. Note that records will immediately be written to the database file when the server is shut down.

The usage database can be verified and printed to screen using the lmxendutil -readusagedb command. (See [LM-X End-user utility](#) for information about using this command.) This command reads the database, performs a verification, and prints the usage table content to the screen. You can review the content to ensure its validity by verifying the ID ranges; however, never attempt to manipulate the database.

### Database structure

The usage database contains several tables; however, the only table that may be accessed is named usage. The other tables are for authentication purposes only.

The contents of the usage table are described below.

Table name	Columns	Description
usage	(id integer primary key, time integer, action text, comment text, auth text)	This table contains usage information. Each row in the table contains a timestamp, an action that occurred, comments on additional information if applicable, and authentication information.

The time format used in the time integer column is "time\_t," which you can find out more about by going to: [http://en.wikipedia.org/wiki/Time\\_t](http://en.wikipedia.org/wiki/Time_t).

The action text column will contain one of the following:

Action	Description
STARTUP	Indicates the license server started up. The comment text column is empty.
SHUTDOWN	Indicates the license server was shut down. The comment text column is empty.

CHECKOUT	<p>Indicates a checkout was performed. The comment text column contains additional information related to the checkout, including the feature name, a unique id of the specific feature (in case there are multiple licenses on the server of the same feature name), and a count. For example, (FEATURE: UNLIMITED UNIQUEID: 5E7100EE3F98F68F559AB09D57AA8BA154F77907A 48D2487 COUNT: 1 SOFTLIMIT_EXCEEDED: FALSE).</p> <p>SOFTLIMIT_EXCEEDED indicates whether the number of licenses specified for softlimit licensing has been exceeded.</p>
CHECKIN	<p>Indicates a checkin was performed. The comment text column contains additional information related to the checkin, in the same manner as for CHECKOUT.</p>
USAGE	<p>Specifies the current usage of a particular feature. This is the sum of all checkouts, checkins, and borrows that have occurred. The comment text column contains additional information related to the usage, in the same manner as for CHECKOUT. For example, (FEATURE: UNLIMITED UNIQUEID: 1ECA6DB5DDEAA15E565AE7C78AFBB6F67DC9F35 593CCBFB0 COUNT: 2 SOFTLIMIT_EXCEEDED: FALSE USERNAME: Administrator HOSTNAME: amilo IPADDRESS: ::1)</p> <p>The above example shows the syntax for USAGE_LEVEL set to DETAILED, which includes USERNAME, HOSTNAME, and IPADDRESS (see <a href="#">Enabling and using usage databases</a>).</p>

### Usage table example

The following is a partial example of a usage table printout.

```

Timestamp: 2009-01-30 07:37:06 Action: CHECKOUT Comment: FEATURE:
TEST_MULTIUSER
UNIQUEID: C48E3CC9D201846D8FC3F2C0B22289323D64E026750ECBFE COUNT: 3
Timestamp: 2009-01-30 07:37:06 Action: USAGE Comment: FEATURE:
TEST_MULTIUSER
UNIQUEID: C48E3CC9D201846D8FC3F2C0B22289323D64E026750ECBFE COUNT: 402
Timestamp: 2009-01-30 07:37:06 Action: CHECKOUT Comment: FEATURE:
TEST_MULTIUSER
UNIQUEID: C48E3CC9D201846D8FC3F2C0B22289323D64E026750ECBFE COUNT: 3
Timestamp: 2009-01-30 07:37:06 Action: USAGE Comment: FEATURE:
TEST_MULTIUSER
UNIQUEID: C48E3CC9D201846D8FC3F2C0B22289323D64E026750ECBFE COUNT: 405
Timestamp: 2009-01-30 07:37:06 Action: CHECKIN Comment: FEATURE:
TEST_MULTIUSER
UNIQUEID: C48E3CC9D201846D8FC3F2C0B22289323D64E026750ECBFE COUNT: 32
Timestamp: 2009-01-30 07:37:06 Action: USAGE Comment: FEATURE:
TEST_MULTIUSER
UNIQUEID: C48E3CC9D201846D8FC3F2C0B22289323D64E026750ECBFE COUNT: 373
.
.
.
Timestamp: 2009-01-30 07:37:08 Action: CHECKIN Comment: FEATURE:
TEST_MULTIUSER
UNIQUEID: C48E3CC9D201846D8FC3F2C0B22289323D64E026750ECBFE COUNT: 61
Timestamp: 2009-01-30 07:37:08 Action: USAGE Comment: FEATURE:
TEST_MULTIUSER
UNIQUEID: C48E3CC9D201846D8FC3F2C0B22289323D64E026750ECBFE COUNT: 0
Timestamp: 2009-01-30 07:37:08 Action: CHECKOUT Comment: FEATURE:
TEST_MULTIUSER
UNIQUEID: C48E3CC9D201846D8FC3F2C0B22289323D64E026750ECBFE COUNT: 500
Timestamp: 2009-01-30 07:37:08 Action: USAGE Comment: FEATURE:
TEST_MULTIUSER
UNIQUEID: C48E3CC9D201846D8FC3F2C0B22289323D64E026750ECBFE COUNT: 500
Timestamp: 2009-01-30 07:37:08 Action: CHECKIN Comment: FEATURE:
TEST_MULTIUSER
UNIQUEID: C48E3CC9D201846D8FC3F2C0B22289323D64E026750ECBFE COUNT: 500
Timestamp: 2009-01-30 07:37:08 Action: USAGE Comment: FEATURE:
TEST_MULTIUSER
UNIQUEID: C48E3CC9D201846D8FC3F2C0B22289323D64E026750ECBFE COUNT: 0
Timestamp: 2009-01-30 07:37:08 Action: SHUTDOWN Comment:

```

## Borrowing a license

LM-X License Manager supports license borrowing, which lets you use a network license without being connected to the license server. Borrowing is commonly used in cases such as taking a laptop computer home for the weekend or for traveling off-site, giving you access to the software when a connection to the network is not possible.

Your software vendor must allow license borrowing for it to be available for your use. In some cases, the vendor may supply an interface for borrowing or returning licenses. Otherwise, you can borrow and do an early return of licenses by setting an LM-X environment variable specifically for this purpose.

Use the following steps to borrow a license using an LM-X environment variable. (Instructions given for accessing environment variable settings are for Windows 7. Please see your OS documentation or your system administrator for instructions on editing environment variables for your specific OS.)

1. Open the Windows Control Panel and select System and Security.
2. Select System from the System and Security options.
3. Select Advanced system settings from the list of options in the left column of the System window.
4. From the System Properties dialog that appears, select Environment Variables...
5. Under System variables, select New...
6. For the Variable name, enter LMX\_BORROW or vendor\_BORROW (where vendor is the name of the software vendor for the software to be borrowed). Set the value to the number of hours for which you want to borrow the license. This number cannot be greater than the number of hours the software vendor allows.
7. Click OK to add the variable.
8. Click OK from the Environment Variables dialog to save your changes, and then click OK from the System Properties dialog.

If you're running the application, be sure to restart it after setting the environment variable change to ensure that the settings are picked up. The license will be borrowed the next time you checkout the license and will be available for the specified duration, after which the application will no longer be available without connecting to the license server.

9. If you want to do an early return of the license at any time before its expiration, repeat the steps above to access the environment variables, then select LMX\_BORROW from the list of environment variables, and click Edit.
10. Change the value to -1 (or any negative value). This will return the license so it's once again available for other users to check out.

Note: You can query the server to see whether a license is borrowed at any time using the [LM-X End-user Configuration Tool](#) or [LM-X End-user utility, lmxendutil](#).

In very rare cases, the client may not receive a borrowed license due to network problems that occur at the exact time a license is being borrowed. Because borrowing is not transaction based, the server may see the borrow as successful and will not allow the client to attempt another borrow. Instead, a second borrow request will fail with the message "Feature already borrowed on server." The client must then wait until the borrow time expires to successfully borrow a license if this network problem occurs.

## Automatic server discovery

LM-X License Manager's automatic server discovery allows a client application to find license servers on the network automatically. This feature eliminates the need for end users to enter server information and makes it easy for system administrators to move from one license server to another without notifying users. Automatic server discovery is performed only when the license server is unavailable or the feature couldn't be found on the known license servers. Otherwise, a local cache is used, making this feature unobtrusive and lightweight.

Note that automatic server discovery works only on local networks and will not work on WAN or VPN connections.

If your software vendor allows automatic server discovery to be used for its licenses, you can enable it by setting an LM-X environment variable specifically for this purpose, as described below. (Instructions given for accessing environment variable settings are for Windows 7. Please see your OS documentation or your system administrator for instructions on editing environment variables for your specific OS.)

1. Open the Windows Control Panel and select System and Security.
2. Select System from the System and Security options.

3. Select Advanced system settings from the list of options in the left column of the System window.
4. From the System Properties dialog that appears, select Environment Variables...
5. Under System variables, select New...
6. For the Variable name, enter LMX\_AUTOMATIC\_SERVER\_DISCOVERY or vendor\_AUTOMATIC\_SERVER\_DISCOVERY (where vendor is the name of the software vendor for which to use automatic server discovery) and set the value to 1 (or any positive number) to enable it.
7. Click OK to add the variable.
8. Click OK from the Environment Variables dialog to save your changes, and then click OK from the System Properties dialog to close it.

## License queuing

License queuing, which must be enabled by your vendor, helps you implement fair usage when licenses may not be immediately available. This feature is particularly useful for jobs scheduled for automatic execution.

Without queuing enabled, checkout requests are immediately denied if the required license(s) are unavailable. If queuing is enabled, its behavior is determined by the vendor; for example, applications may be placed on hold until the necessary license(s) become available. Contact your vendor for information about how license queuing has been implemented for your licenses. All license requests are appended to the end of the queue by default, regardless whether the request can be fulfilled immediately.

To enable license queuing, set the LM-X environment variable LMX\_QUEUE, as described below (see also [Environment variables](#)). (Instructions given for accessing environment variable settings are for Windows 7. Please see your OS documentation or your system administrator for instructions on editing environment variables for your specific OS.)

1. Open the Windows Control Panel and select **System and Security**.
2. Select **System** from the System and Security options.
3. Select **Advanced system settings** from the list of options in the left column of the System window.
4. From the System Properties dialog that appears, select **Environment Variables...**
5. Under System variables, select **New...**
6. For the Variable name, enter LMX\_QUEUE or vendor\_QUEUE (where vendor is the name of the software vendor for which to use license queuing) and set the value to 1 (or any positive number) to enable it.
7. Click **OK** to add the variable.
8. Click **OK** from the Environment Variables dialog to save your changes, and then click **OK** from the System Properties dialog to close it.

Alternatively, you can enable fast queuing, which allows requests to be fulfilled immediately when possible. Fast queuing can allow smaller license requests to be processed more promptly and help ensure higher license utilization. However, because it might enable users to bypass the queue, it does not necessarily implement fairness.

For example, if a client is waiting for two licenses, and only one license is immediately available, another client that needs only one license can bypass the queue and take the single license without waiting.

To enable fast queuing, edit the FAST\_QUEUE option in your license server configuration file. You can enable fast queuing for specified features or for all features; for example:

```
FAST_QUEUE = f1, f3  
or  
FAST_QUEUE = ALL
```

## Logs

LM-X includes the following logs.

Log	Description
License server log	<p>This log lists server actions that are helpful for debugging. You can configure this log for normal or extended detail, as well as set rotation intervals, name and path, in the configuration file as described in <a href="#">License Server Configuration file</a>.</p> <p>Example of normal license server log:</p> <pre data-bbox="865 510 1438 1959"> [2010-10-07 10:53:46] LM-X License Server v3.6 build 7504 on Konradm-PC (Win32_x86) [2010-10-07 10:53:46] Copyright (C) 2002-2010 X-Formation. All rights reserved. [2010-10-07 10:53:46] Website: http://www.lm-x.com http://www.x-formation.com [2010-10-07 10:53:46] License server has pid 4676. [2010-10-07 10:53:46] Serving licenses for vendor XFORMATION. [2010-10-07 10:53:46] [2010-10-07 10:53:46] License server using TCP IPv4 port 6200. [2010-10-07 10:53:46] License server using TCP IPv6 port 6200. [2010-10-07 10:53:46] License server using UDP IPv4 port 6200. [2010-10-07 10:53:47] Reading licenses... [2010-10-07 10:53:47] License file(s): [2010-10-07 10:53:47] C:\x-formation\lm-x\win32_x86_ vc2008\..\..\..\..\out/ win32_x86/win32_x86/..\example s/network/network.lic [2010-10-07 10:53:48] Log file path: C:\x-formation\lm-x\win32_x86_ vc2008\ licserver-accept-examples.log [2010-10-07 10:53:48] Log to </pre>

```
stdout: Yes
[2010-10-07 10:53:48] Log
format: Normal
[2010-10-07 10:53:48]
Configuration file path:
C:\x-formation\lm-x\win32_x86_
vc2008\
../../lmx-serv-examples.cfg
[2010-10-07 10:53:48] Serving
following features:[2010-10-07
10:53:48] f1 (v1.5)
(5 license(s)) license type:
exclusive
[2010-10-07 10:53:48] f2
(v1.0) (5 license(s)) shared
on: HOST USER license type:
additive
[2010-10-07 10:53:48] f2
(v1.0) (10 license(s)) license
type: additive
[2010-10-07 10:53:48] borrow
(v1.0) (1 license(s)) license
type: exclusive
[2010-10-07 10:53:48]
LicensedExampleClass (v1.0) (1
```

```
license(s)) license type:  
exclusive
```

## Extended client log

This log lists client actions, entirely for diagnostic purposes. This log is disabled by default. You can enable it using the LMX\_EXTENDEDDLOG environment variable as described in [Environment variables](#).

This log will be generated or appended to every time a checkout request occurs.

## Example:

```
[2010-10-14 11:49:35] LM-X
Extended Client Log
[2010-10-14 11:49:36]
[2010-10-14 11:49:36] Machine
settings:
[2010-10-14 11:49:36]
Username: pkukielka
[2010-10-14 11:49:36]
Hostname: SUPPORT2-PC
[2010-10-14 11:49:36] Vendor
name: XFORMATION
[2010-10-14 11:49:36] Working
directory: c:\x-formation
[2010-10-14 11:49:36]
Platform: Win32_x86
[2010-10-14 11:49:36] Version:
6.1
[2010-10-14 11:49:36] Virtual
machine: No
[2010-10-14 11:49:36] Terminal
server session: No
[2010-10-14 11:49:36]
[2010-10-14 11:49:36]
Environment variables:
[2010-10-14 11:49:36]
LMX_AUTOMATIC_SERVER_DISCOVERY
= <not set>
[2010-10-14 11:49:36]
LMX_QUEUE = <not set>
[2010-10-14 11:49:36]
LMX_PROJECT = <not set>
[2010-10-14 11:49:36]
LMX_BORROW = 1
[2010-10-14 11:49:36]
LMX_LICENSE_PATH = <not set>
[2010-10-14 11:49:36]
LMX_CONNECTION_TIMEOUT = 30
```

## lmxendutil -licstat output

This report contains license usage statistics, lists which users are currently using which licenses on a specific license server, and gives information on the borrow, grace and trial licenses currently checked out. See [LM-X End-user utility](#) for information on generating this report.

Example:

```
LM-X End-user Utility v3.5
Copyright (C) 2002-2010
X-Formation. All rights
reserved.
Searching all license paths
and performing automatic
server discovery...
+++++
+++++
LM-X License Server on
6400@192.168.22.103:
Server version: v3.6 Uptime: 0
hour(s) 0 min(s) 4 sec(s)
-----
-----
Feature: two_licserver
Version: 1.0 Vendor:
XFORMATION
Start date: NONE Expire date:
NONE
Key type: EXCLUSIVE License
sharing: VIRTUAL
10 of 10 license(s) used:
10 license(s) used by
hg@vista-x64 [::1]
Login time: 2010-10-14 15:37
Checkout time: 2010-10-14
15:37
+++++
+++++
LM-X License Server on
6200@192.168.22.103:
Server version: v3.6 Uptime: 0
hour(s) 0 min(s) 23 sec(s)
-----
-----
Feature: f3 Version: 1.5
Vendor: XFORMATION
Start date: NONE Expire date:
NONE
Key type: EXCLUSIVE
0 of 5 license(s) used
```

```
-----  
-----  
Feature: f2 Version: 1.0  
Vendor: XFORMATION  
Start date: NONE Expire date:  
NONE  
Key type: EXCLUSIVE License  
sharing: VIRTUAL  
0 of 5 license(s) used  
-----
```

```
-----  
-----  
Feature: grace Version: 1.0  
Vendor: XFORMATION  
Start date: NONE Expire date:  
NONE  
Key type: EXCLUSIVE License
```

```
sharing: VIRTUAL
0 of 5 license(s) used
```

Imxendutil -licstatxml output

This report contains license usage statistics and lists currently used licenses on a specific license server as XML. See [LM-X End-user utility](#) for information on generating this report.

Example:

```
<?xml version="1.0"
encoding="UTF-8"?>
<LM-X STAT_VERSION="3.6">
<LICENSE_PATH TYPE="NETWORK"
HOST="6200@rafal-PC"
SERVER_VERSION="3.6" UPTIME="0
\\hour(s) 0 min(s) 30 sec(s)"
STATUS="SUCCESS">
<FEATURE NAME="f1"
VERSION="1.5"
VENDOR="XFORMATION"
END="2018-01-01"
\\USED_LICENSES="0"
TOTAL_LICENSES="5"
SHARE="VIRTUAL"/>
<FEATURE NAME="f2"
VERSION="1.0"
VENDOR="XFORMATION"
END="2018-01-01"
\\USED_LICENSES="0"
TOTAL_LICENSES="5" SHARE="HOST
,USER ,VIRTUAL"/>
<FEATURE NAME="f2"
VERSION="1.0"
VENDOR="XFORMATION"
END="2018-01-01"
\\USED_LICENSES="0"
TOTAL_LICENSES="10"
SHARE="VIRTUAL"/>
<FEATURE NAME="borrow"
VERSION="1.0"
VENDOR="XFORMATION"
USED_LICENSES="0"
\\TOTAL_LICENSES="1"
SHARE="VIRTUAL"/>
<FEATURE
NAME="LicensedExampleClass"
VERSION="1.0"
VENDOR="XFORMATION"
```

```
\\USED_LICENSES="0"  
TOTAL_LICENSES="1"  
SHARE="VIRTUAL"/>  
<FEATURE NAME="prod_a"  
VERSION="1.0"  
VENDOR="XFORMATION"  
USED_LICENSES="0"  
\\TOTAL_LICENSES="5"  
SHARE="VIRTUAL"/>  
<FEATURE NAME="prod_b"  
VERSION="1.0"  
VENDOR="XFORMATION"  
USED_LICENSES="0"
```

	<pre>\\TOTAL_LICENSES="5" SHARE="VIRTUAL" /&gt;</pre>
Pay-per-use database file	<p>This database file lists pay-per-use information that can be sent to your vendor for billing purposes. See <a href="#">Pay Per Use</a> for more information.</p> <p>Example:</p> <pre>Timestamp: 2009-01-30 07:37:06 Action: CHECKOUT Comment: FEATURE: TEST_MULTIUSER UNIQUEID: C48E3CC9D201846D8FC3F2C0B22289 323D64E026750ECBFE COUNT: 3 Timestamp: 2009-01-30 07:37:06 Action: USAGE Comment: FEATURE: TEST_MULTIUSER UNIQUEID: C48E3CC9D201846D8FC3F2C0B22289 323D64E026750ECBFE COUNT: 402 Timestamp: 2009-01-30 07:37:06 Action: CHECKOUT Comment: FEATURE: TEST_MULTIUSER UNIQUEID: C48E3CC9D201846D8FC3F2C0B22289 323D64E026750ECBFE COUNT: 3 Timestamp: 2009-01-30 07:37:06 Action: USAGE Comment: FEATURE: TEST_MULTIUSER UNIQUEID: C48E3CC9D201846D8FC3F2C0B22289 323D64E026750ECBFE COUNT: 405 Timestamp: 2009-01-30 07:37:06 Action: CHECKIN Comment: FEATURE: TEST_MULTIUSER UNIQUEID: C48E3CC9D201846D8FC3F2C0B22289 323D64E026750ECBFE COUNT: 32 Timestamp: 2009-01-30 07:37:06 Action: USAGE Comment: FEATURE: TEST_MULTIUSER UNIQUEID: C48E3CC9D201846D8FC3F2C0B22289 323D64E026750ECBFE COUNT: 373</pre>

## Error messages

*The information on this page refers to LM-X version 4.4.3, which added new error codes. If you are running a previous version of LM-X please refer to the documentation relevant to your version: [version 4.0 documentation](#); [version 4.1 documentation](#).*

The following table lists the possible error messages that can be reported upon any failure of LM-X API functions:

Return Code Number	Return Code	Description
0	LMX_SUCCESS	Operation successful.
1	LMX_UNKNOWN_ERROR	Unknown error occurred.
2	LMX_INVALID_PARAMETER	Invalid input parameter.
3	LMX_NO_NETWORK	Unable to initialize network subsystem.
4	LMX_BAD_LICFILE	License file is using unknown/invalid syntax.
5	LMX_NO_MEMORY	No more available memory.
6	LMX_FILE_READ_ERROR	Unable to read file.
7	LMX_BAD_DATE	Invalid date.
8	LMX_BAD_KEY	Invalid license key.
9	LMX_FEATURE_NOT_FOUND	Feature not found.
10	LMX_BAD_HOSTID	HostID does not match license.
11	LMX_TOO_EARLY_DATE	Software activation date is not yet reached.
12	LMX_TOO_LATE_DATE	Software expired.
13	LMX_BAD_VERSION	Software version does not match license.
14	LMX_NETWORK_ERROR	Unexpected network-related error occurred.
15	LMX_NO_NETWORK_HOST	Unable to connect to license server.
16	LMX_NETWORK_DENY	Rejected actively from license server.

17	LMX_NOT_ENOUGH_LICENSES	Request for more licenses than available on license server.
18	LMX_BAD_SYSTEMCLOCK	System clock has been set back.
19	LMX_TS_DENY	Feature not allowed to run on terminal server clients.
20	LMX_VIRTUAL_DENY	Feature not allowed to run on a virtual machine.
21	LMX_BORROW_TOO_LONG	The specified borrow period is too long.
22	LMX_FILE_SAVE_ERROR	Unable to save file.
23	LMX_ALREADY_BORROWED	Feature already borrowed.
24	LMX_BORROW_RETURN_ERROR	Unable to return borrowed feature.
25	LMX_SERVER_BORROW_ERROR	Deprecated. License server returned borrow error.
26	LMX_BORROW_NOT_ENABLED	Borrow functionality not enabled on client side.
27	LMX_NOT_BORROWED	The feature that was attempted to be returned was not borrowed.
28	LMX_DONGLE_ERROR	Dongle is not attached or does not function correctly.
29	LMX_SOFTLIMIT	Request exceeds the number of softlimit licenses available.
30	LMX_BAD_PLATFORM	Platform not permitted by license.
31	LMX_RESET_SYSTEMCLOCK_EXCEEDED	Deprecated. Number of allowed reset system clock attempts exceeded.
32	LMX_TOKEN_LOOP	Infinite token loop detected.
33	LMX_BLACKLIST	Feature is blacklisted.
34	LMX_VENDOR_DENY	Feature checkout rejected by vendor-defined rules.

35	LMX_NOT_NETWORK_FEATURE	Unable to use local license as a network license.
36	LMX_BAD_TIMEZONE	Checkout is not permitted in the client time zone.
37	LMX_SERVER_NOT_IN_USE	License server is not currently in use.
38	LMX_LICSERVICE_ERROR	Deprecated. Problem with License Distribution Service.
40	LMX_NOT_IMPLEMENTED	Functionality not implemented.
41	LMX_BORROW_LIMIT_EXCEEDED	License server limitation on number of borrowed features exceeded.
42	LMX_SERVER_FUNC_ERROR	License server function error occurred.
43	LMX_HEARTBEAT_LOST_LICENSE	License is lost due to heartbeat failure.
44	LMX_SINGLE_LOCK	Unable to obtain single-usage lock.
45	LMX_AUTH_ERROR	Cannot authenticate user on license server.
46	LMX_NETWORK_SEND_ERROR	Error sending message over network.
47	LMX_NETWORK_RECEIVE_ERROR	Error receiving message over network.
48	LMX_QUEUE	Feature has been queued.
49	LMX_BAD_SECURITY_CONFIG	LM-X security configuration file mismatch.
50	LMX_FEATURE_HAL_MISMATCH	Feature has different HAL settings than other features on the same license server.
51	LMX_NOT_LOCAL_FEATURE	Unable to use network license as a local license.
52	LMX_FEATURE_NOT_REPLACEABLE	Unable to replace missing feature.

53	LMX_HOSTID_NOT_AVAILABLE	HostID is not available on the current machine.
54	LMX_FEATURE_ALREADY_RESERVED	Feature is already reserved.
55	LMX_FEATURE_ALREADY_CHECKED_OUT	Feature is already checked out.
56	LMX_RESERVATION_NOT_FOUND	Reservation not found.
57	LMX_API_NOT_REENTRANT	Calling an API function from a callback function is not allowed.
58	LMX_LICENSE_UPLOAD_ERROR	Problem with license file upload.
59	LMX_INTERNAL_LICENSE_NOT_EMBEDDED	Internal LM-X license file is not embedded.

## Frequently Asked Questions

To find answers to frequently asked questions about LM-X, visit our Knowledgebase at <http://kb.x-formation.com>. The Knowledgebase is updated regularly with new information to help you quickly and easily find the answers you're looking for.

## LM-X Reference for FlexNet Users

This section provides a reference for users who are familiar with FlexNet/FLEXlm. You can use this reference to determine how FlexNet/FLEXlm-specific actions correspond with LM-X actions. This reference assumes you have experience using FlexNet/FLEXlm.

### Comparison of license files

LM-X licenses are text files, just like FlexNet/FLEXlm licenses. A typical LM-X license looks like the following example.

```
FEATURE my_app
\{
VENDOR = XFORMATION
VERSION = 1.0
END = 2010-03-27
LICENSEE = "COMPANY_ABC"
KEY = RNCLMCH56104622J8JAA5U0EROSHD9RA22E5HOFEQSKVSTA5RO \
VGK7M5884EEI9V1PRB97BBAIH5AN4PU73LGUQSDM
\}
```

LM-X has the same concept of features and vendors that FlexNet/FLEXlm does. However, the LM-X format is easier to understand, because everything is marked by specific keywords.

For more information about LM-X license files, see [License files](#).

### Comparison of license paths

You use license paths to describe where licenses are found. In FlexNet/FLEXlm, the environment variable `LM_LICENSE_FILE` or `VENDOR_LICENSE_FILE` defines where the application should look for a license. With LM-X, you use the variable `LMX_LICENSE_PATH` or `VENDOR_LICENSE_PATH`.

The following tables show examples of specifying the path to a local license.

FlexNet/FLEXlm	LM-X
Windows: <code>LM_LICENSE_FILE=C:\application\license.dat</code>  Unix: <code>LM_LICENSE_FILE=/usr/application/license.dat</code>	Windows: <code>LMX_LICENSE_PATH=C:\application\myapplication.lic</code>  Unix: <code>LMX_LICENSE_PATH=/usr/application/myapplication.lic</code>

Examples of specifying the path to a network license:

FlexNet/FLEXlm	LM-X
Windows: <code>LM_LICENSE_FILE=port@host</code>  Unix: <code>LM_LICENSE_FILE=port@host</code>	Windows: <code>LMX_LICENSE_PATH=port@host</code>  Unix: <code>LMX_LICENSE_PATH=port@host</code>

## Comparison of license server setup

When setting up a network license, you must set up a license server. The table below specifies the files required for a network license setup and how they relate to FlexNet/FLEXlm files.

FlexNet/FLEXlm	LM-X
License server  Windows: <code>lmgrd.exe</code> Unix: <code>lmgrd</code>	License server  Windows: <code>lmx-serv-vendor.exe</code> Unix: <code>lmx-serv-vendor</code>
Vendor daemon  Windows: <code>vendord.exe</code> Unix: <code>vendord</code>	Vendor daemon  Windows: <code>lmx-serv-vendor.exe</code> Unix: <code>lmx-serv-vendor</code>
License file  <code>license.dat</code>	License file  <code>networkapp.lic</code>
Option file  <code>vendord.opt</code>	Configuration file  <code>lmx-serv.cfg</code>

Note that lmgrd and the vendor daemon are collected into one license server in LM-X.

Instead of specifying port numbers, SERVER lines and optional information in the license file and option file, you specify this information in the [license server configuration file](#), lmx-serv.cfg. Some settings, such as license file and log file paths and port number, may also be specified at the command line, as described in [Running the license server from a command line](#).

When you want to set up your network license server, make sure that you have the lmx-serv-vendor executable, lmx-serv.cfg, and your network license.

## The LM-X license server

Under Windows, you can run the license server in the console or as a service that runs in the background. Under Unix, you can run the license server in the foreground or background.

The license server works in the same way as FlexNet/FLEXlm. It serves licenses by listening on a specific TCP port and allowing you to check out licenses for network use or for borrowing, if enabled by your application vendor. Additionally, the server uses UDP for automatic server discovery. This enables applications to find the server without specifying a hostname.

See [Installing a license server on Windows](#) to walk through an example of setting up a Windows license server and checking that it is running normally.

## Comparison of license server parameters

To see and change license server parameters, refer to the chart below.

Action to perform	FlexNet/FLEXlm	LM-X
See if the license server is up or who is using the license server	lmutil lmstat lmutil lmdiag	lmxendutil -licstat -host <i>host</i> -port <i>port</i>
See the hostid of the client or server machine	lmutil lmhostid	lmxendutil -hostid
Remotely shutdown the license server	lmutil lmdown	lmxendutil -shutdownserver -host <i>host</i> -port <i>port</i> -password <i>password</i>
Remotely restart the license server	lmutil lmread	lmxendutil -restartserver -host <i>host</i> -port <i>port</i> -password <i>password</i>
Remove a user from the license server	lmutil lmremove	lmxendutil -removeuser -clientusername <i>username</i> -clienthostname <i>host</i> -host <i>host</i> -port <i>port</i> -password <i>password</i>

## Removed features

This section includes documentation for functionality that no longer applies to the current version of LM-X. If you are running an older version of LM-X, you may refer to these sections for information applicable to your LM-X version.

Removed or outdated functionality includes:

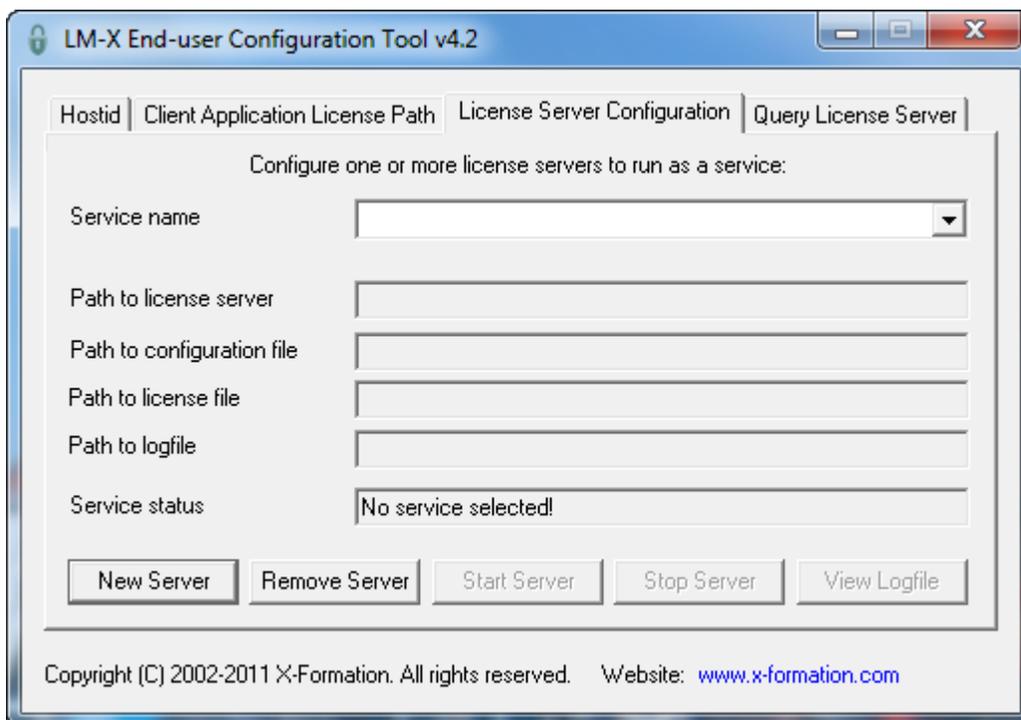
Feature	Removed in
<a href="#">Installing a license server on Windows</a>	v4.4.3
<a href="#">Installing a license server on Mac OS X</a>	v4.4.3

## Installing a license server on Windows

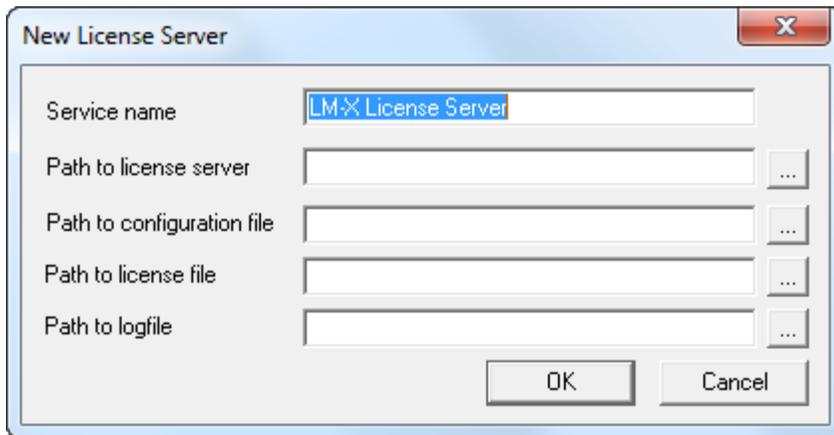
*The information on this page refers to versions prior to 4.4.3, which introduced an installation program that installs both the license server and the end-user tools. Manual installation is no longer required for Windows.*

The following steps describe how to easily install a license server on Windows using the LM-X End-user Configuration Tool (Windows only). If you are using a HAL (High Availability License) server configuration, see [High Availability Licensing](#) for HAL-specific installation information.

1. Copy `lmx-serv-vendor.exe` and, if your vendor included a configuration file, `lmx-serv.cfg` into the directory where your server will reside. For example, `C:\program files\application`.
2. Start the LM-X End-user Configuration Tool, `lmxconfigtool.exe`.
3. Click the License Server Configuration tab. This tab lets you manage license servers, including adding a new server, starting, stopping, and removing the server, monitoring its status and viewing its logfile.



4. In the License Server Configuration tab, click New Server.



5. In the New License Server dialog, specify the path to the license server location. For example, C:\program files\application\lmx-serv-vendor.exe. (You may browse for the file using the ... button.)
6. If your vendor included a configuration file, browse for and select the configuration file location. For example, C:\program files\application\lmx-serv.cfg. (You may browse for the file using the ... button.)
7. Additionally, you may add an optional license file and logfile to be used. Note that the logfile will override any settings for logfiles in the configuration file.
8. Click OK to install the license server as a service. (Note: The license server will not start until you reboot your computer or start it by clicking Start Server. You will do this later.)
9. If your vendor supplied a configuration file (lmx-serv.cfg by default), open it in a text editor, such as Notepad, and edit the entries for LOG\_FILE and LICENSE\_FILE to reflect the correct paths for your log file and license file.

If you specified a license file in the dialog, it will be read in addition to any specified in the configuration file. If you specified a logfile in the dialog, it will override any settings in the configuration file. (You may also need to make additional settings in the configuration file depending on your specific needs. For example, if you are using HAL licensing, you must edit the HAL settings as specified in [How to install HAL license servers.](#))

10. In the License Server Configuration tab, click Start Server.
11. Click View Logfile to verify the license server is started and working normally, indicated by the line "Ready to serve..." as shown in the following example.

```
[2009-01-25 20:43:07] LM-X License Server v2.1 on amilo (Win32 x86)
[2009-01-25 20:43:07] Copyright (C) 2002-2009 X-Formation. All rights
reserved.
[2009-01-25 20:43:07] Website: http://www.lm-x.com
http://www.x-formation.com
[2009-01-25 20:43:07] License server has pid 17228.
[2009-01-25 20:43:07] Serving licenses for XFORMATION.
[2009-01-25 20:43:07] License server using TCP port 6200.
[2009-01-25 20:43:07] License server using UDP port 6200.
[2009-01-25 20:43:07] Logfile path: lmx-server.log
[2009-01-25 20:43:07] License file(s):
[2009-01-25 20:43:07] application.lic
[2009-01-25 20:43:07] Serving following features:
[2009-01-25 20:43:07] F3 (v1.5) (5 licenses) license type: exclusive
[2009-01-25 20:43:07] F2 (v1.0) (5 licenses) license type: exclusive
[2009-01-25 20:43:07] Ready to serve...
```

If there are any problems running the license server, the log file will indicate the cause of the problem. If you cannot find a log file, check to make sure that the correct configuration file was specified in step 6, and the configuration file contains the correct information.

## Installing a license server on Mac OS X

*The information on this page refers to versions prior to 4.4.3, which introduced an installation program that installs both the license server and the end-user tools. Manual installation is no longer required for Mac OS X.*

The attached script can be used to run a Mac OS X license server at system startup. This file must be placed in the /System/Library/LaunchDaemons/ directory.

All files used by the license server (licenses, logfile, configuration file, server executable) should be placed in /usr/xformation and must be accessible for the "daemon" user. General privileges can be set to 755 using chmod, as follows:

```
chmod -R 755 /usr/x-formation
```

The owner and group for the license server executable must have sufficient rights to run it, which you can set using the commands chown and chgrp.

### Download file

[com.xformation.lmx.plist](#)