



LM-X End Users Guide

V e r s i o n 3 . 6 . 2

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Conventions

Throughout this document, we will refer to Unix-like systems, including Mac OS X, Solaris and Linux, as "Unix".

Acknowledgements

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Table of Contents

1 Introduction	1
1.1 Purpose	1
1.2 Resources	1
2 Getting started	2
2.1 License activation	2
2.2 Optional license features	2
3 How a protected application finds its license	4
3.1 License files	4
3.2 Search paths	5
3.3 Adding or removing license file paths	6
3.3.1 Adding or removing license files from the path using the LM-X End-user Configuration tool	6
3.3.2 Adding license files to the path manually	6
3.3.3 Formats for specifying license files	8
3.4 Environment variables	8
4 End-User Tools	12
4.1 License server	12
4.1.1 Running the license server	12
4.1.2 Protocols	13
4.1.3 License Server Configuration file	14
4.1.4 License server log file	21
4.2 LM-X End-user utility	21
4.3 LM-X End-user Configuration Tool	24
5 Pay Per Use	25
5.1 Enabling and using usage databases	25
5.2 Database structure	25
5.3 Usage table example	26
6 How to install a license server on Windows	28
7 How to activate a license in Windows	31
8 HAL license servers	34
8.1 How to install HAL license servers	34
9 License queuing	37

10 Logs	38
11 Error messages	41
12 Frequently Asked Questions	44
13 LM-X Reference for FlexNet/FLEXlm Users	45
13.1 License files.....	45
13.2 License paths.....	45
13.3 License server setup.....	46
13.4 Running the license server.....	46
13.5 License server parameters.....	47

1 Introduction

1.1 Purpose

This 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.

1.2 Resources

This document includes an [FAQ](#) and, as a helpful resource for those transitioning from a FlexNet/FLEXlm license management system to LM-X, a [reference of LM-X equivalencies](#) for some common FlexNet/FLEXlm actions.

As part of the LM-X user community, you also 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.

2 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 section 6, How to install a license server on Windows for details on installing network licenses.)

The LM-X End-user Configuration Tool (see section 4.3) 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, query a license server, and activate a license (when required by the vendor), 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 as described in section 4.2.

2.1 License activation

Your vendor may require their software license to be activated. You can find out more about license activation in section 7, How to activate a license in Windows.

2.2 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 section 4.1.3, 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)	Lets you specify backup (redundant) license servers that will continue to enable license hosting in the event that your primary license server goes down. See section 8.1, How to install HAL license servers for more information on HAL.

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 section 3.4, Environment variables. Also see section 9, License queuing 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 section 3.4, Environment variables.</p>
Grace licenses	<p>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.</p>

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 section 4.1.3, License Server Configuration file.

3 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.

3.1 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 section 4.1.3, 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.)
    
```

3.2 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 <i>VENDOR_LICENSE_PATH</i> . The <i>VENDOR</i> name is the same as that specified in the license file.
3	The generic environment variable <i>LMX_LICENSE_PATH</i> , 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.

3.3 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.

3.3.1 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	<code>LMX_LICENSE_PATH = file1;file2;host%port;@host2;directory;...</code>
Unix	<code>LMX_LICENSE_PATH = file1:file2:host%port:@host2:directory:...</code>

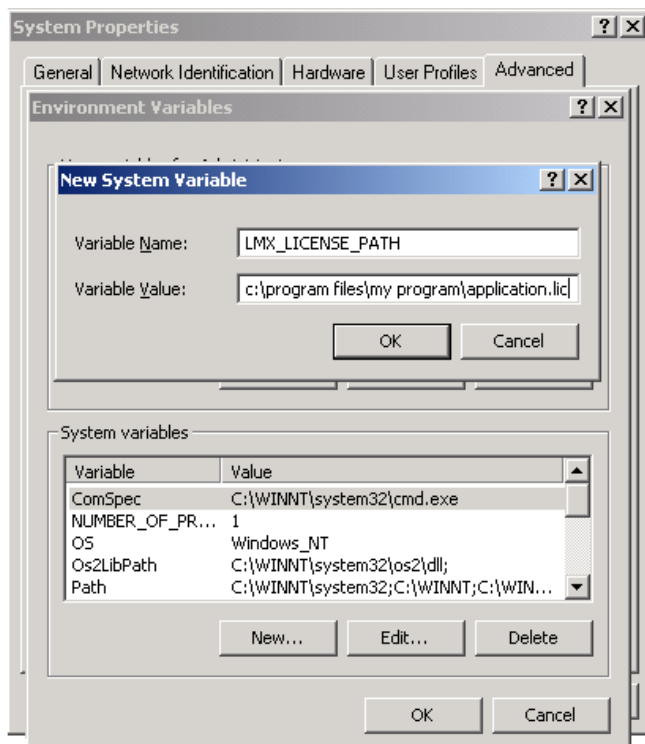
Note that multiple paths are separated with a semicolon (;) on Windows systems and a colon (:) on Unix systems.

See section 4.3, LM-X End-user Configuration Tool for more information about using the LM-X End-user Configuration tool.

3.3.2 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 section 3.4, 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`

3.3.3 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\ mylicense.lic Unix: /home/henrik/application/ nl.lic
Local license	Full path to license directory – all licenses (*.lic) in specified directory will be read	Windows: C:\application\licenses\ Unix: /application/licenses/	Windows: C:\application\licenses\ 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;@hostname2;@hostname3 Unix: @hostname1:@hostname2:@hostname3	Windows: @primary_ server;@secondary_ server;@third_server Unix: @primary_ server:@secondary_ server:@third_server

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

3.4 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></p> <p>or</p> <p><code>LMX_LICENSE_PATH</code></p>	<p>The path to one or more LM-X managed licenses.</p> <p>For example:</p> <p><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 section 3.2, Search paths for information on how an LM-X application searches for licenses.</p> <p>You can set the license path using the LM-X End-user Configuration tool, as described in section 3.3.1, 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></p> <p>or</p> <p><code>LMX_AUTOMATIC_SERVER_DISCOVERY</code></p>	<p>A string that can be set to enable using automatic server discovery.</p> <p>For example:</p> <p><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 section 3.3.2, Adding license files to the path manually.</p>
<p><code>VENDOR_BORROW</code></p> <p>or</p> <p><code>LMX_BORROW</code></p>	<p>The desired number of hours to allow license borrowing, from 1 - 8760.</p> <p>or</p> <p><0 (e.g., -1) to allow early checkin of borrowed licenses.</p> <p>Examples:</p> <p>To set the borrow limit to 2 days:</p> <p><code>LMX_BORROW=48</code></p> <p>To allow early checkin:</p> <p><code>LMX_BORROW=-1</code></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 <code>VENDOR_BORROW</code>, where <code>VENDOR</code> is the name of the application vendor, as specified in the license file. <code>LMX_BORROW</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 section 3.3.2, Adding license files to the path manually.</p>

Variable name	Value	Description
LMX_RANDOMIZE_PATH	A string that can be set to enable using a random path. For example: LMX_RANDOMIZE_PATH=1	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. You can set this environment variable in the same manner as described in section 3.3.2, Adding license files to the path manually.
VENDOR_EXTENDEDEDLOG or LMX_EXTENDEDEDLOG	The path to the extended client-side log. For example: LMX_EXTENDEDEDLOG=C:\LM-X\My_LM-X_Log_Directory\client.log	This environment variable lets you set the path and filename for the extended client-side log, which contains information about all client activity. 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. You can set this environment variable in the same manner as described in section 3.3.2, Adding license files to the path manually.
VENDOR_CONNECTION_TIMEOUT or LMX_CONNECTION_TIMEOUT	The desired number of seconds, from 1 - unlimited. The default value is 30. For example: LMX_CONNECTION_TIMEOUT=10	This environment variable lets you adjust the connection timeout setting. The connection timeout is set to 5 seconds by default unless you set it to a different value using this environment variable. Increasing the timeout value can be useful for highly loaded networks. For example, if you set <i>LMX_CONNECTION_TIMEOUT</i> = 60, the server can wait up to 60 seconds before timeout. You may specify a particular vendor using <i>VENDOR_CONNECTION_TIMEOUT</i> , where <i>VENDOR</i> is the name of the application vendor, as specified in the license file. <i>LMX_CONNECTION_TIMEOUT</i> 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 section 3.3.2, Adding license files to the path manually.

Variable name	Value	Description
<p><i>VENDOR_PROJECT</i> or <i>LMX_PROJECT</i></p>	<p>A string specifying a project name.</p> <p>For example: <i>LMX_PROJECT=Doorlatch_Design</i></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 <i>lmxendutil -licstat</i>. (See section 4.2, LM-X End-user utility.)</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><i>VENDOR_QUEUE</i> or <i>LMX_QUEUE</i></p>	<p>A string that can be set to enable license queuing.</p> <p>For example: <i>LMX_QUEUE=1</i></p>	<p>This environment variable enables license queuing for all checkout requests.</p> <p>You may specify a particular vendor using <i>VENDOR_QUEUE</i>, where <i>VENDOR</i> is the name of the application vendor, as specified in the license file. <i>LMX_QUEUE</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 section 3.3.2, Adding license files to the path manually.</p>

4 End-User Tools

This chapter describes LM-X end-user tools, which include the following.

Tool	Windows File Name	Unix File Name
LM-X license server	lmx-serv-vendor.exe	lmx-serv-vendor
LM-X end-user utility	lmxendutil.exe	lmxendutil
LM-X End-user Configuration Tool	lmxconfigtool.exe	N/A (Windows only)

4.1 License server

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 section 4.1.3, License Server Configuration file for more information about the license server configuration file.)

4.1.1 Running the license server

You can install the LM-X license server as a service under Windows or run it as a daemon under Unix. The lmx-serv command usage is as follows.

On Windows systems:

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

On Unix Systems:

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

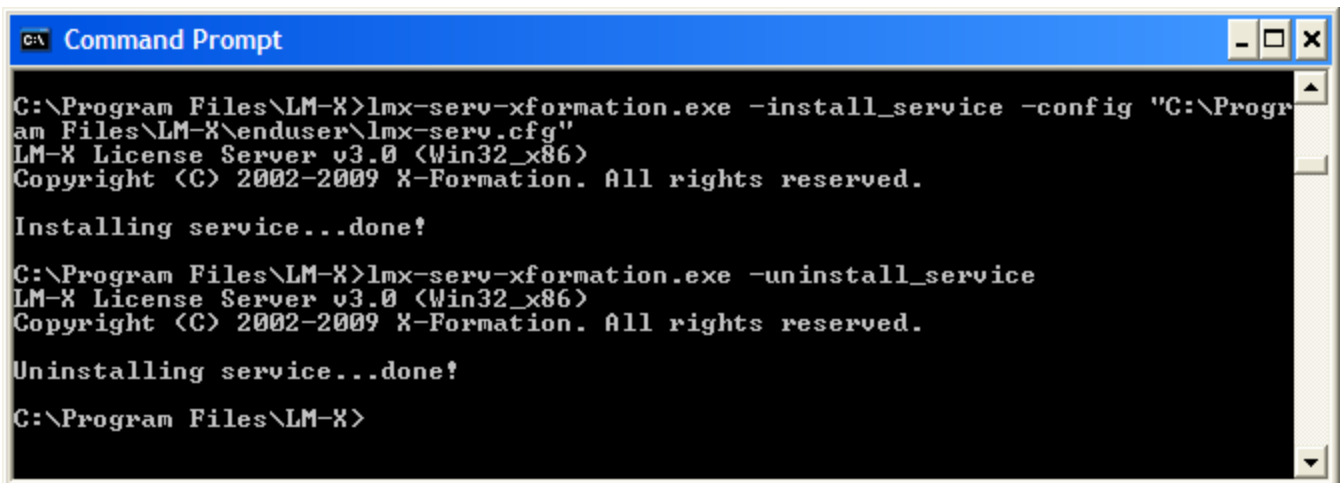
Where:

Command			Description
Long version	Short version	Applies to	
-install_service	-i	Windows	Install the license server as a service.
-uninstall_service	-u	Windows	Uninstall the license server as a service.
-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	Specify an optional license file path that will be read in addition to those specified within the lmx-serv.cfg configuration file. 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." 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.
-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 demonstrates the installation and uninstallation of the license server as a service on Windows.



```

C:\Program Files\LM-X>lmx-serv-xformation.exe -install_service -config "C:\Program Files\LM-X\enduser\lmx-serv.cfg"
LM-X License Server v3.0 (Win32_x86)
Copyright (C) 2002-2009 X-Formation. All rights reserved.

Installing service...done!

C:\Program Files\LM-X>lmx-serv-xformation.exe -uninstall_service
LM-X License Server v3.0 (Win32_x86)
Copyright (C) 2002-2009 X-Formation. All rights reserved.

Uninstalling service...done!

C:\Program Files\LM-X>

```

For Unix systems, to automate the execution of the license server, edit /etc/rc.boot, /etc/rc.local or other location from which your startup files get called. It is not recommended to run the license server as root, so run lmx-serv-vendor as follows:

```
sudo -u user /path/to/lmx-serv-vendor -b [-config /path/to/lmx-serv.cfg]
```

where the path to a configuration file is optional. See your Unix system documentation for further information on setting up execution of applications at system startup.

4.1.2 Protocols

The license server runs over the TCP protocol and requires very little memory (usually a few megabytes), so it should not require much CPU time for a small number of clients. 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.

For IPv4, 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.

IPv6 is limited to connectivity between client and license servers; therefore, you cannot use IPv6 IP addresses in the license server configuration file. 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 section 3.3, Adding or removing license file paths.)

4.1.3 License Server Configuration file

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.

Syntax	Description	Examples
<code>TCP_LISTEN_PORT = <i>port number</i></code>	<p>The TCP port number the license server will listen on.</p> <ul style="list-style-type: none"> TCP port is used for data traffic protocol. The default TCP port is 6200. UDP port is used for automatic server discovery protocol. The UDP port is fixed to 6200 and cannot be changed. <p>See http://www.iana.org/assignments/port-numbers for more information.</p>	<code>TCP_LISTEN_PORT = 6200</code>

Syntax	Description	Examples
<p>HAL_SERVER$server_number$ = [port]@hostname</p> <p>or</p> <p>HAL_SERVER$server_number$ = [port]@IP_address</p> <p>Note: Port is optional.</p>	<p>High Availability Licensing (HAL) servers (enables 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"> • HAL_SERVER1 is your master server, which allows both CHECKOUT and BORROW. HAL_SERVER1 should be your most powerful server. • 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. • 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. <p>Important: The HAL_SERVER list must be identical on all your servers for HAL to function properly.</p>	<p>HAL_SERVER1 = 6200@server1</p> <p>HAL_SERVER2 = 6200@server2</p> <p>HAL_SERVER3 = 6200@server3</p>
<p>LOG_FILE = <i>path</i></p>	<p>The log file path. Specifying the full path is preferred.</p> <p>If you do not specify a LOG_FILE path, the default log file path for Windows is <i>lmx-serv-vendor.log</i>, 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</p> <p>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</p> <p>LOG_FORMAT=EXTENDED</p>

Syntax	Description	Examples
LOG_EXCLUDE = <i>message1</i> , <i>message2</i> , etc.	Exclude messages from the log. The following messages can be excluded: CHECKOUT, CHECKIN, STATUS, BORROW, BORROW_RETURN, REMOVE_USER, REMOTE_RESTART or REMOTE_SHUTDOWN.	LOG_EXCLUDE = CHECKOUT, CHECKIN, STATUS
LOGFILE_ROTATE_INTERVAL = <i>rotation_interval</i>	The interval for log file rotation. 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). After rotation, the old log file will be named <i>filename.log.rotation_date</i> in the format yyyy-mm-dd. 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: "Log file was rotated and saved to <i>filename</i> ."	LOGFILE_ROTATE_INTERVAL = day
MIN_USER_REMOVE_TIME = <i>time in seconds</i>	Minimum time, in seconds, that must elapse from the connection before a user can be removed using <code>lmxendutil</code> . 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.	MIN_USER_REMOVE_TIME = 120
LICENSE_FILE = <i>path</i>	The license file path. On Windows: If no file is set, the license server will look for <i>vendor.lic</i> in the same directory as the license server. On Unix: If no file is set, the license server will look for <code>/usr/x-formation/vendor.lic</code> . In both cases, the filenames must be lowercase. You can specify one or multiple paths as needed.	LICENSE_FILE = d:\server\network.lic LICENSE_FILE = c:\extra_file.lic LICENSE_FILE = /home/user1/floating_license.lic LICENSE_FILE = /home/user1/floating_license2.lic
USAGE_DATABASE = <i>database path</i>	Pay-per-use usage database (used for billing purposes). See section 5, Pay Per Use for detailed information, including database format and an example of data printout.	USAGE_DATABASE = d:\server\usage.db USAGE_DATABASE = /home/user1/usage.db

Syntax	Description	Examples
USAGE_LEVEL= <i>detail level</i>	Specify pay-per-use detail level. <ul style="list-style-type: none"> STANDARD includes basic usage information. DETAILED includes user information in addition to the basic usage information. 	USAGE_LEVEL = STANDARD
REMOTE_ACCESS_PASSWORD = <i>password</i>	Remote administration password (used when remotely stopping and restarting the license server and removing users from it). The password is case-sensitive.	REMOTE_ACCESS_PASSWORD = MyPassword123
FAST_QUEUE = <i>feature1, feature2, etc.</i> or FAST_QUEUE = ALL	Fast queuing allows requests that can be fulfilled immediately to be fulfilled. 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. Default behavior of license queuing is to put the client at the end of the queue regardless whether the license request could be satisfied.	FAST_QUEUE = f2, d5, app2

Syntax	Description	Examples
<p>ALLOW_IPADDR_ALL = <i>one or more IP addresses</i></p> <p>ALLOW_IPADDR_feature name = <i>one or more IP addresses</i> (must be either specific A.B.C.D or with wildcards A.*.B.*)</p> <p>DENY_IPADDR_ALL = <i>one or more IP addresses</i></p> <p>DENY_IPADDR_feature name = <i>one or more IP addresses</i> (must be either specific A.B.C.D or with wildcards A.*.B.*)</p> <p>ALLOW_HOST_ALL = <i>one or more hosts</i></p> <p>ALLOW_HOST_feature name = <i>one or more hosts</i></p> <p>DENY_HOST_ALL = <i>one or more hosts</i></p> <p>DENY_HOST_feature name = <i>one or more hosts</i></p> <p>ALLOW_USER_ALL = <i>one or more users</i></p> <p>ALLOW_USER_feature name = <i>one or more users</i></p> <p>DENY_USER_ALL = <i>one or more users</i></p> <p>DENY_USER_feature name = <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 (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"> Rules are attempted to be matched in the order they are written. If no rule matches the specific client, then that client is allowed. 	<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>

Syntax	Description	Examples
<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 (A.*.B.*).</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</p> <p>DENY_BORROW_HOST_ALL = server1 machine5</p> <p>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</p> <p>DENY_BORROW_IPADDR_f2 = *.*.*.*</p>

Syntax	Description	Examples
<p>LIMIT_USER <i>feature name</i> <i>limit count</i> = one or more users</p> <p>LIMIT_HOST <i>feature name</i> <i>limit count</i> = one or more hosts</p> <p>LIMIT_IPADDR <i>feature name</i> <i>limit count</i> = 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 (A.*.B.*).</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</p> <p>LIMIT_IPADDR_f3_3 = 192.168.2.* 192.168.4.*</p>
<p>RESERVE_USER <i>feature name</i> <i>reserve count</i> = one or more users</p> <p>RESERVE_HOST <i>feature name</i> <i>reserve count</i> = one or more hosts</p> <p>RESERVE_IPADDR <i>feature name</i> <i>reserve count</i> = 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 (A.*.B.*).</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</p> <p>RESERVE_IPADDR_f3_3 = 192.168.2.* 192.168.4.*</p>
<p>BORROW_LIMIT_COUNT_ALL = <i>limit count</i></p> <p>BORROW_LIMIT_COUNT_ <i>feature name</i> = <i>limit count</i></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</p> <p>BORROW_LIMIT_COUNT_ABCDEF = 5</p>
<p>BORROW_LIMIT_HOURS_ALL = <i>limit hours</i></p> <p>BORROW_LIMIT_HOURS_ <i>feature name</i> = <i>limit hours</i></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</p> <p>BORROW_LIMIT_HOURS_ABCDEF = 5</p>

Syntax	Description	Examples
<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>

4.1.4 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.

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. Extended logging results in greater detail in the log file.
- 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 section 4.1.3, License Server Configuration file for more details about the above log settings.

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.

4.2 LM-X End-user utility

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
- Activate a license

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.

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

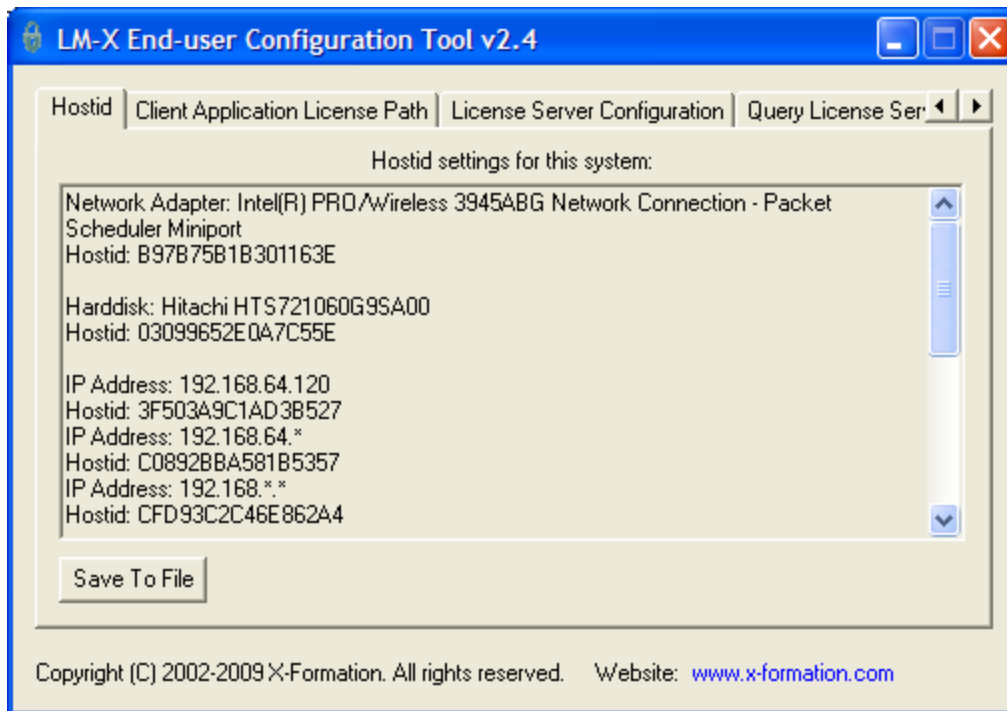
-licstat	Imxendutil -licstat [-host <i>host</i> -port <i>port</i> -network -borrow -grace -trial]	Displays statistics and lists which users are currently using which licenses on a specific license server, and the borrow, grace and trial licenses currently checked out. See below for descriptions of optional parameters -host and -port. Information for all options is returned unless one or more options are specified (for example, specifying -borrow will result in only borrow information being returned).
-licstatxml	Imxendutil -licstatxml [-host <i>host</i> -port <i>port</i> -network -borrow -grace -trial]	Displays statistics and lists currently used licenses on a specific license server as XML. See below for descriptions of optional parameters -host and -port. Information for all options is returned unless one or more options are specified (for example, specifying -borrow will result in only borrow information being returned).
-restartserver	Imxendutil -restartserver [-host <i>host</i> -port <i>port</i> -password <i>password</i>]	Remotely restarts the license server. See below for descriptions of optional parameters -host, -port and -password.
-shutdownserver	Imxendutil -shutdownserver [-host <i>host</i> -port <i>port</i> -password <i>password</i>]	Remotely shuts down the license server. See below for descriptions of optional parameters -host, -port and -password.
-removeuser	Imxendutil -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 'myport'. 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).
-readusedb	Imxendutil -readusedb <i>usage.db</i>	Reads the specified usage database and performs a verification, then prints the usage information to the screen. (See section 5, Pay Per Use.)

-activate	<pre> lmxendutil -activate -orderid <i>order</i> -url <i>url</i> [-output <i>output_file</i> -hostid <i>type=value,...</i> -proxyhost <i>host</i> -proxyport <i>port</i> -proxyuser <i>username</i> -proxypassword <i>password</i>] </pre>	<p>Activates a license from a specified License Distribution Service URL using the Ethernet hostid of the current machine. Parameter descriptions are as follows:</p> <p>-orderid <i>orderid</i> The Order ID provided by the application vendor, with the format AAAAA-BBBBB-CCCCC-DDDDD.</p> <p>-url <i>url</i> The activation URL provided by your application vendor, such as http://licservice.company.com.</p> <p>Optional parameters:</p> <p>-output <i>output_file</i> Specifies the name of the output file that will contain the activated license. By default, this filename is named <code>license-current_date.lic</code> and is saved to the current directory. Note that you should save the license to the location recommended by your application vendor.</p> <p>-hostid <i>type=value,...</i> Specifies the hostid of the machine used to activate the license. By default, the Ethernet hostid of the current machine is used.</p> <p>This default can be overridden to perform offline activations for other machines by specifying one or more hostids, which may be of the same or different types. For example, <code>-hostid LONG=11223344556677,ETHERNET=AABB1122CCDD3344,...</code></p> <p>Valid hostid types are: LONG, USERNAME, IPADDRESS, CUSTOM, DONGLE_HASPHL, ETHERNET, HOSTNAME, HARDDISK and WIN_PRODUCT_ID.</p> <p>-proxyhost <i>host</i> Specifies the web-proxy hostname required to access the web.</p> <p>-proxyport <i>port</i> Specifies the web-proxy port associated with the proxy hostname.</p> <p>-proxyuser <i>username</i> Specifies the web-proxy user name.</p> <p>-proxypassword <i>password</i> Specifies the web-proxy user password.</p>
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4.3 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 section 3.3.1, Adding or removing license files from the path using the LM-X End-user Configuration tool for more information)
- Install or remove license servers as services (see section 6, How to install a license server on Windows for more information)
- Query a license server
- Activate a license (see section 7, How to activate a license in Windows for more information)



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

5 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/>.

5.1 Enabling and using usage databases

The vendor enables Pay Per Use by editing the USAGE_DATABASE entry (disabled by default) in the license server configuration file (see section 4.1.3, License Server Configuration file). The configuration file contains a description and examples for using the USAGE_DATABASE setting.

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 ipaddress for each checkout and checkin request. The USAGE_LEVEL setting is set to STANDARD in the configuration file by default.

The usage database can be verified and printed to screen using the lmxendutil -readusagedb command. (See section 4.2, 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.

5.2 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.

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: 5E7100EE3F98F68F559AB09D57AA8BA154F77907A48D2487 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: 1ECA6DB5DDEAA15E565AE7C78AFBB6F67DC9F35593CCBFBO 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 section 5.1, Enabling and using usage databases).</p>

5.3 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

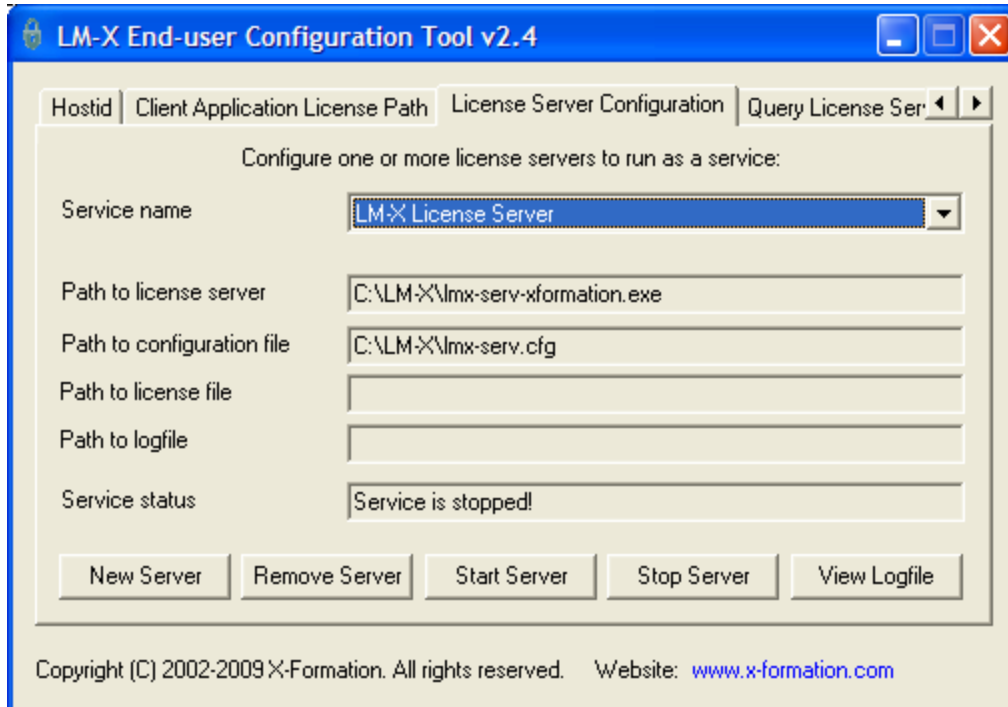
```

```
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:
```

6 How to install a license server on Windows

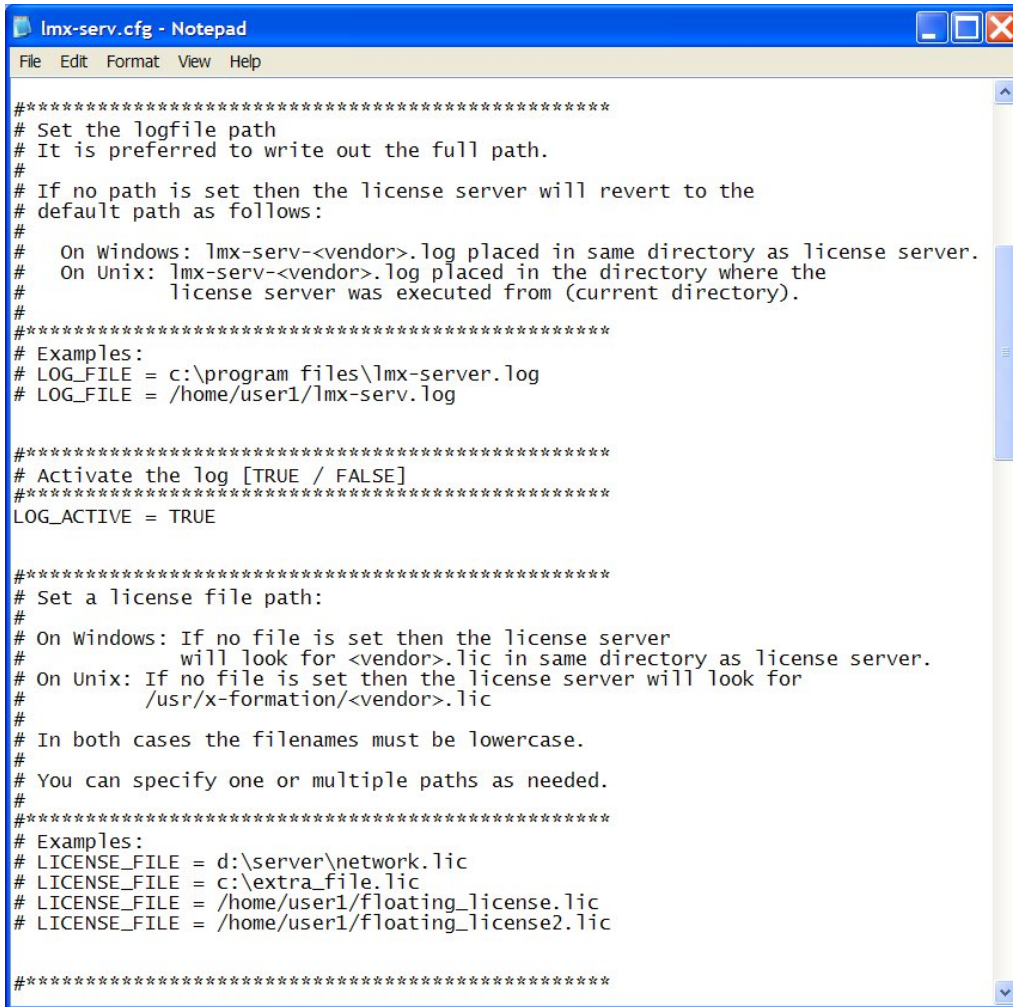
The following steps describe how to easily install a license server on Windows using the LM-X End-user Configuration Tool (Windows only). If you are using a HAL (High Availability License) server configuration, see section 8, HAL license servers for HAL-specific installation information.

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 "New Server." In the New License Server dialog that appears:
 - a. 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.)
 - b. Browse for and select the configuration file location, if your vendor included a configuration file. For example, *C:\program files\application\lmx-serv.cfg*. (You may browse for the file using the ... button.)
 - c. 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.
 - d. 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.)
4. If your vendor supplied a configuration file (*lmx-serv.cfg* by default), open it in your favorite text editor, such as Notepad, and edit the entries for `LOG_FILE` and `LICENSE_FILE` (see screenshot below) to reflect the correct paths for your log file and license file. If you specified a license in the dialog, it will be read in addition to those 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 section 8.1, How to install HAL license servers.)



```

lmx-serv.cfg - Notepad
File Edit Format View Help

*****
# Set the logfile path
# It is preferred to write out the full path.
#
# If no path is set then the license server will revert to the
# default path as follows:
#
#   On Windows: lmx-serv-<vendor>.log placed in same directory as license server.
#   On Unix: lmx-serv-<vendor>.log placed in the directory where the
#             license server was executed from (current directory).
#
*****
# Examples:
# LOG_FILE = c:\program files\lmx-server.log
# LOG_FILE = /home/user1/lmx-serv.log

*****
# Activate the log [TRUE / FALSE]
*****
LOG_ACTIVE = TRUE

*****
# Set a license file path:
#
# On Windows: If no file is set then the license server
#              will look for <vendor>.lic in same directory as license server.
# On Unix: If no file is set then the license server will look for
#           /usr/x-formation/<vendor>.lic
#
# In both cases the filenames must be lowercase.
#
# You can specify one or multiple paths as needed.
#
*****
# Examples:
# LICENSE_FILE = d:\server\network.lic
# LICENSE_FILE = c:\extra_file.lic
# LICENSE_FILE = /home/user1/floating_license.lic
# LICENSE_FILE = /home/user1/floating_license2.lic

*****

```

5. In the LM-X End-user Configuration Tool, click “Start Server.”
6. Open the log file 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 3, and the configuration file contains the correct information.

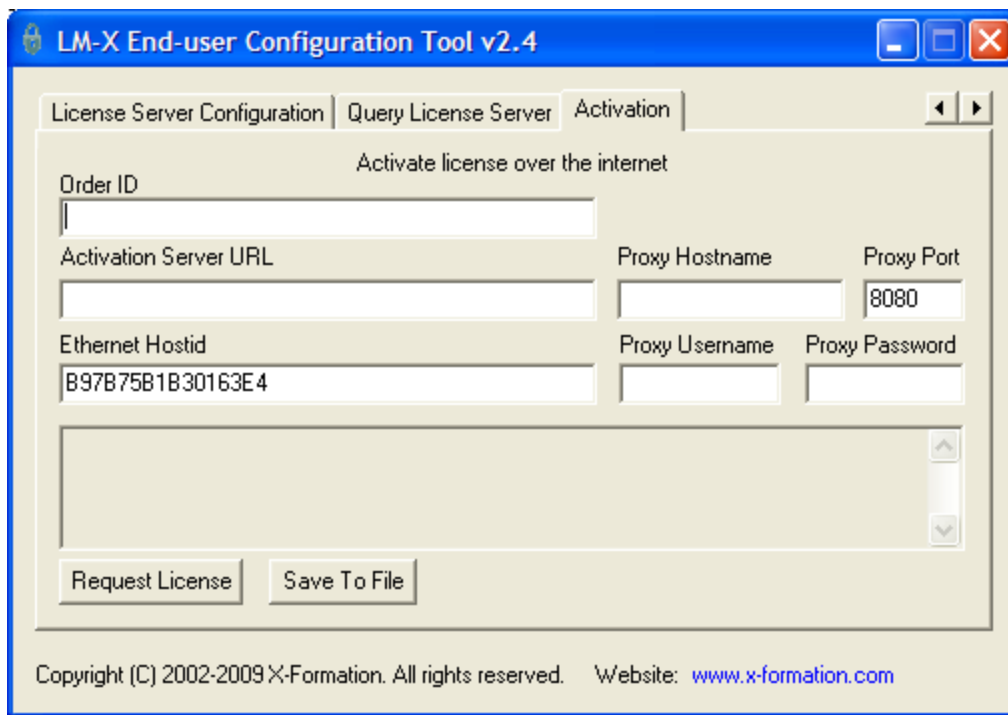
7 How to activate a license in Windows

This section describes how to activate an LM-X license using the LM-X End-user Configuration Tool, `lmxconfigtool.exe`. This tool is for Windows only. For instructions on using the command line for activation, see section 4.2, LM-X End-user utility.

Activation should be done whenever your application vendor indicates it is necessary.

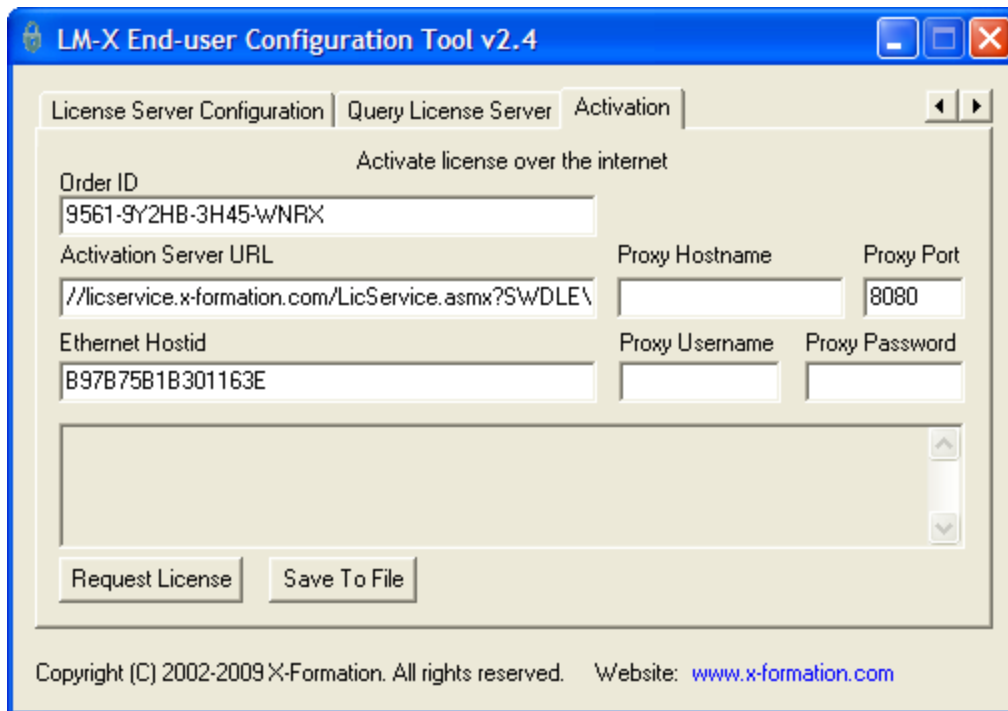
To activate a license:

1. Obtain your Order ID and Activation Server URL from your application vendor.
2. Open the LM-X End-user Configuration Tool and go to the Activation tab.



The screenshot shows the 'LM-X End-user Configuration Tool v2.4' window with the 'Activation' tab selected. The window title bar includes standard Windows window controls. The main area is titled 'Activate license over the internet' and contains several input fields: 'Order ID' (empty), 'Activation Server URL' (empty), 'Proxy Hostname' (empty), 'Proxy Port' (8080), 'Ethernet Hostid' (B97B75B1B30163E4), 'Proxy Username' (empty), and 'Proxy Password' (empty). There are two buttons at the bottom: 'Request License' and 'Save To File'. A scrollable area is present below the input fields. The footer contains the copyright information: 'Copyright (C) 2002-2009 X-Formation. All rights reserved. Website: www.x-formation.com'.

3. Enter your Order ID and Activation Server URL into the appropriate fields.
4. The Ethernet Hostid field is already filled in, but you can change the hostid if needed. Your Activation tab contents should look similar to the following example.



5. If you must go through web-based proxy, specify the proxy information. If you're unsure about the proxy information, see your system administrator.
6. Click Request License. This sends your hostid to activation server and requests a license using web service protocol (SOAP web service). The license is created and printed to the Activation tab:

The screenshot shows the 'LM-X End-user Configuration Tool v2.4' window with the 'Activation' tab selected. The window title bar includes standard Windows window controls (minimize, maximize, close). The main content area is titled 'Activate license over the internet' and contains several input fields and buttons. The 'Order ID' field contains '9561-9Y2HB-3H45-WNRX'. The 'Activation Server URL' field contains '//licservice.x-formation.com/LicService.aspx?S\WDLE\'. The 'Proxy Port' field contains '8080'. The 'Ethernet Hostid' field contains 'B97B75B1B301163E'. The 'Proxy Username' and 'Proxy Password' fields are empty. A text area displays the following license information: 'FEATURE licstat', '{', 'VENDOR = X-FORMATION', and 'VERSION = 1.0'. At the bottom of the form are two buttons: 'Request License' and 'Save To File'. The footer of the window contains the text: 'Copyright (C) 2002-2009 X-Formation. All rights reserved. Website: www.x-formation.com'.

Order ID	Activation Server URL	Proxy Hostname	Proxy Port	Ethernet Hostid	Proxy Username	Proxy Password
9561-9Y2HB-3H45-WNRX	//licservice.x-formation.com/LicService.aspx?S\WDLE\		8080	B97B75B1B301163E		

```
FEATURE licstat
{
VENDOR = X-FORMATION
VERSION = 1.0
```

Request License Save To File

Copyright (C) 2002-2009 X-Formation. All rights reserved. Website: www.x-formation.com

7. Click Save To File and save the license file (named `license-current_date.lic`, by default) in the license directory recommended by your application vendor.
8. You can now start your LM-X licensed software.

8 HAL license servers

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.

8.1 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 section 6, How to install 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 3 in section 6, How to install a license server on Windows.
2. Edit the configuration file as described in step 4 in section 6, How to install a license server on Windows. In addition to the required edits to the configuration file, edit the HAL server settings.

```

lmx-serv.cfg - Notepad
File Edit Format View Help
#*****
# Specify High Availability Licensing (HAL) servers.
# HAL enables 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.
#
# 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:
#
# HAL_SERVER1 is your master server, which
# allows both CHECKOUT and BORROW.
# HAL_SERVER1 should be your most powerful server.
#
# 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.
#
# 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.
#
# Syntax:
#
# HAL_SERVER<server_number> = [port]@hostname
# or
# HAL_SERVER<server_number> = [port]@ipaddr
#
# Port is optional.
#
# Important: the HAL_SERVER list must be identical
# on all your servers for HAL to function properly.
#
# See the LM-X End Users Guide for further information
# about setting up HAL servers.
#*****
# Examples:
# HAL_SERVER1 = 6200@server1
# HAL_SERVER2 = 6200@server2
# HAL_SERVER3 = 6200@server3
#*****

```

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.

9 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. With queuing enabled, applications will be placed on hold until the necessary license(s) become available. (See section 3.4, Environment variables)

When license queuing is enabled, all license requests are appended to the end of the queue by default, regardless whether the request can be fulfilled immediately. Alternatively, you can enable fast queuing, which allows requests that can be fulfilled immediately to be fulfilled. 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 specify fast queuing for specified features or for all features; for example:

```
FAST_QUEUE = f1, f3
```

or

```
FAST_QUEUE = ALL
```

10 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 section 4.1.3, License Server Configuration file.</p> <p>Example of normal license server log:</p> <pre>[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\..\examples/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 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</pre>
Extended client log	<p>This log lists client actions, entirely for diagnostic purposes. This log is disabled by default. You can enable it using the LMX_EXTENDEDLOG environment variable as described in section 3.4, Environment variables.</p> <p>This log will be generated or appended to every time a checkout request occurs.</p> <p>Example:</p> <pre>[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></pre>

	<pre>[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</pre>
<p>Imxendutil -licstat output</p>	<p>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 section 4.2, LM-X End-user utility for information on generating this report.</p> <p>Example:</p> <pre>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</pre>

<p>lmxendutil -licstatxml output</p>	<p>This report contains license usage statistics and lists currently used licenses on a specific license server as XML. See section 4.2, LM-X End-user utility for information on generating this report.</p> <p>Example:</p> <pre><?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" TOTAL_ LICENSES="5" SHARE="VIRTUAL"/></pre>
<p>Pay-per-use data- base file</p>	<p>This database file lists pay-per-use information that can be sent to your vendor for billing purposes. See section 5, Pay Per Use for more information.</p> <p>Example:</p> <pre>Timestamp: 2009-01-30 07:37:06 Action: CHECKOUT Comment: FEATURE: TEST_MULTIIUSER UNIQUEID: C48E3CC9D201846D8FC3F2C0B22289323D64E026750ECBFE COUNT: 3 Timestamp: 2009-01-30 07:37:06 Action: USAGE Comment: FEATURE: TEST_MULTIIUSER UNIQUEID: C48E3CC9D201846D8FC3F2C0B22289323D64E026750ECBFE COUNT: 402 Timestamp: 2009-01-30 07:37:06 Action: CHECKOUT Comment: FEATURE: TEST_MULTIIUSER UNIQUEID: C48E3CC9D201846D8FC3F2C0B22289323D64E026750ECBFE COUNT: 3 Timestamp: 2009-01-30 07:37:06 Action: USAGE Comment: FEATURE: TEST_MULTIIUSER UNIQUEID: C48E3CC9D201846D8FC3F2C0B22289323D64E026750ECBFE COUNT: 405 Timestamp: 2009-01-30 07:37:06 Action: CHECKIN Comment: FEATURE: TEST_MULTIIUSER UNIQUEID: C48E3CC9D201846D8FC3F2C0B22289323D64E026750ECBFE COUNT: 32 Timestamp: 2009-01-30 07:37:06 Action: USAGE Comment: FEATURE: TEST_MULTIIUSER UNIQUEID: C48E3CC9D201846D8FC3F2C0B22289323D64E026750ECBFE COUNT: 373</pre>

11 Error messages

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	Software not allowed to run on terminal server clients.
20	LMX_VIRTUAL_DENY	Software 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	License server returned borrow error. (Note: This message is deprecated and is replaced by return code 41.)
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.
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 network license as a local 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	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 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.

12 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.

13 LM-X Reference for FlexNet/FLEXlm 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.

13.1 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 license files, see section 3.1, License files.

13.2 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: LM_LICENSE_FILE=C:\application\ license.dat	Windows: LMX_LICENSE_PATH=C:\application\ myapplication.lic
Unix: LM_LICENSE_FILE=/usr/application/ license.dat	Unix: LMX_LICENSE_PATH=/usr/application/ myapplication.lic

Examples of specifying the path to a network license:

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

13.3 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	License server
Windows: lmgrd.exe	Windows: lmx-serv-vendor.exe
Unix: lmgrd	Unix: lmx-serv-vendor
Vendor daemon	Vendor daemon
Windows: <i>vendord.exe</i>	Windows: lmx-serv-vendor.exe
Unix: <i>vendord</i>	Unix: lmx-serv-vendor
License file	License file
license.dat	networkapp.lic
Option file	Configuration file
<i>vendord.opt</i>	lmx-serv.cfg

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 configuration file, lmx-serv.cfg (see section 4.1.3, License Server Configuration file). Some settings, such as license file and log file paths and port number, may also be specified at the command line, as described in section 4.1.1, Running the license server.

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.

13.4 Running the 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 section 6, How to install a license server on Windows to walk through an example of setting up a Windows license server and checking that it is running normally.

13.5 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 alive 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 lmreread	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>