# ARM® FLEX*net*

## License Management Guide v4.1


ARM DUI 0209G

# ARM FLEX*net*
## License Management Guide v4.1



### Release Information

The following changes have been made to this book.

**Change History**

| Date | Issue | Change |
|---|---|---|
| July 2002 | A | First Release |
| January 2003 | B | Second Release |
| May 2003 | C | Third Release |
| January 2004 | D | Release 3.1 for RVDS v2.1 |
| December 2004 | E | Release 3.2 for RVDS v2.2 |
| March 2006 | F | Release 4.0 for RVDS v3.0 |
| March 2007 | G | Release 4.1 for RVDS v3.1 |

### Proprietary Notice



### Confidentiality Status

### Product Status

The information in this document is final, that is for a developed product.

### Web Address

`http://www.arm.com`

# Contents
# ARM FLEXnet License Management Guide v4.1

  

# Preface

This preface introduces the *ARM® FLEXnet License Management Guide v4.1* . It contains the following sections:

## About this book

This book introduces the FLEX*net* (formerly FLEX*lm*) license management system, developed by Macrovision, that is used by ARM to control the use of ARM software development tools.

### Intended audience

This book is written for anybody who installs license managed software development tools from ARM Limited. It describes the types of licenses that are available, and solutions to some of the problems you might encounter.

You must remember that parts of this book apply to a specific operating system only, or to a specific type of license only, so be sure that what you read applies in your case.

### Using this book

If your ARM tools are licensed with node locked licenses, read Chapter 2 for information on how to request your license, and Chapter 3 for instructions on how to install it.

If you are using floating licenses, read Chapter 2 for information on how to request your license, Chapter 4 for instructions on how to set up your license server, and Chapter 5 for configuring your client to use a floating license.

This book is organized into the following chapters:

**Chapter 1** ***Introduction***

Read this chapter for an overview of the license management software and possible licensing options.

**Chapter 2** ***Requesting Your License***

Read this chapter for details on what information is required to request a license, and how to use ARM's web licensing portal.

**Chapter 3** ***Installing a Node-Locked License***

Read this chapter for instruction on how to install a node-locked license using the ARM License Wizard. If you do not use node-locked licenses you may ignore this chapter.

**Chapter 4** ***Setting Up a Floating License Server***

Read this chapter for information on the FLEX*net* server software and server configuration. If you do not use floating licenses you may ignore this chapter.

  

**Chapter 5** ***Configuring a Client to Use a License Server***

Read this chapter for an explanation of how to set up your client computer to obtain its ARM development tools license from a server. If you do not use floating licenses you may ignore this chapter.

**Chapter 6** ***Frequently Asked Questions about Licensing***

This chapter contains answers to a number of frequently-asked questions and problems with node locked and floating licenses.

**Glossary** An alphabetically arranged glossary defines the special terms used.

## Typographical conventions

The following typographical conventions are used in this book:

| | |
|---|---|
| *italic* | Highlights important notes, introduces special terminology, denotes internal cross-references, and citations. |
| **bold** | Highlights interface elements, such as menu names. Denotes ARM processor signal names. Also used for terms in descriptive lists, where appropriate. |
| `monospace` | Denotes text that can be entered at the keyboard, such as commands, file and program names, and source code. |
| *`monospace italic`* | Denotes arguments to commands and functions where the argument is to be replaced by a specific value. |

## Further reading

This section lists publications from ARM Limited that provide additional information on developing code for the ARM software development tools.

See the *FLEXnet End User Guide* supplied as a PDF file with your ARM application. This file is located at:

*`install_directory`*`\Utilities\FLEXlm\`*`version`*`\release\enduser.pdf`

ARM Limited periodically provides updates and corrections to its documentation. See `http://www.arm.com` for current errata sheets, addenda, and the ARM Frequently Asked Questions.

## Feedback

ARM Limited welcomes feedback on license management and documentation.

### Feedback on license management

If you have any problems with license management that you cannot solve by using this document, the Tools Licensing FAQs on the ARM website, and the *FLEXnet End User Guide*, contact `license.support@arm.com`. To help ARM to provide a rapid and useful response, give:

- your name and company
- the serial number of the product
- details of the development tool release you are using
- details of the platform(s) you are running on, such as the processor, operating system type and version
- the license error messages from your ARM development tools and/or server log
- a copy of your license file.

If you have version 4.x of the ARM License Wizard installed on Windows, send the output from the license diagnostics.

### Feedback on this book

If you have any problems with this book, send an email to `errata@arm.com` giving:

- the document title
- the document number
- the page number(s) to which your comments apply
- a concise explanation of the problem.

General suggestions for additions and improvements are also welcome.

# Chapter 1
# **Introduction**

This chapter gives an overview of the license management software. It contains the following sections:

## 1.1 Supported platforms

You need to ensure that your ARM® software development tools are supported on your chosen platform before installing it. If you are also setting up one or more license servers for your ARM software development tools, you must confirm that the license management utilities are supported by each server's operating system.

This section contains the following sections:

- *Client platforms*
- *License server platforms*.

### 1.1.1 Client platforms

Your ARM software development tools are licensed to run on a client computer in one or more of the following environments:

- Microsoft Windows
- Sun Solaris
- Red Hat Enterprise Linux.

Each software development tool will specify which exact variant (for example, Windows XP, or Windows 2003 Server) of the above environments is supported.

**Caution**

Attempting to use an unsupported client platform may result in unexpected behaviour.

**Note**

HP-UX license utilities are no longer supplied with RealView Development Suite v3.0 and later.

### 1.1.2 License server platforms

License management utilities for all platforms supported by your ARM development tools are supplied on your development tools DVD-ROM or CD-ROM. The license server platform does not need to be the same as the tools platform. For example, you might have your development tools installed on Windows and use a Solaris license server. See your tools documentation for further information.

  

**Caution**

Attempting to use an unsupported server platform may result in licensing failures. Check the product documentation to confirm what specific operating system variants are supported.

License management of floating licenses for ARM applications requires TCP/IP software to be installed, configured, and running on every relevant computer.

## 1.2 Tool licensing options

Your ARM software development tools are license managed using FLEX*net*. This means that before the tools can be used a valid license file must be installed. Various licensing schemes are possible.

**Note**

Not all licensing options are supported by all products. Some tools also require an additional hardware dongle in order to work. Please check the documentation supplied with your product for details of which licensing options are supported.

This section contains the following sections:

- *Node-locked license (Windows only)*
- *Floating license (Windows and Unix/Linux)* on page 1-5.

### 1.2.1 Node-locked license (Windows only)

A node-locked license locks the tools to a particular computer, or more accurately a particular host ID. See *Host ID* on page 2-2 for information on how to determine the host ID. A node-locked license is a good choice for an installation to be used by a single user on a single computer.

*Limitations*

The installation of the tools is tied to a particular host ID. The host ID used cannot be changed without a replacement license being supplied by ARM Limited.

The example shown in Example 1-1 shows part of a typical node-locked license. This license allows the use of the specified ARM application on a single specific computer identified by the `hostid` value of `80FF12FEAB43`.

**Example 1-1 Typical node-locked license extract**

```
INCREMENT fromelf armlmd 3.1 permanent uncounted 6AB6805Z33A6 \
        HOSTID=80FF12FEAB43 ISSUER="ARM Limited" \
        NOTICE="For support please contact your supplier." \
        SN=ABCDE-12345-ZYXWV SIGN="9280 B58A 6ED0 814C 4D0C C3AD \
        5D85 ABC7 5FDF 5555 7772 F529 52E4 0C52 C836 1812 4492 3263 \
        61F4 5E7B 373F A4F4 0E6C 824B CB71 B8D8 2DB8 3D39 994F 7E1E" \
        SIGN2="ED41 1634 F698 AC5E 6645 E5B4 CEDA 97D1 A5D2 93E1 6E01 \
        937F CDD7 27A9 921B 1C0C F281 4DDE F1A2 6A20 9308 C5E1 4613 \
        8C4F AA7E A3BC 2ACE C483 0F2D B7CB"
INCREMENT rvd_iss armlmd 3.1 permanent uncounted 9C1DC8E05D50 \
```

  

```
        HOSTID=80FF12FEAB43 ISSUER="ARM Limited" \
        NOTICE="For support please contact your supplier." \
        SN=ABCDE-12345-ZYXWV SIGN="12F5 BD8E DD8C 0483 D013 BE4A \
        49F9 07AA BB72 9599 F366 690E B893 7B12 DA77 0EEA 05C8 7F4B \
        C301 4387 101C 8824 5F29 1246 DAA5 12A5 A05D 2E8E 2989 5CBF" \
        SIGN2="0763 DE5A A2F5 18EA EEBE 9DAF AC27 CF46 0241 7754 ED35 \
        2D4C A85E DD94 AB2A 17BC A1FE 1DF7 8108 1308 0124 5F4B CC5E \
        8624 6228 8889 2C77 0DBF C48E D12E"
INCREMENT rvd_arm armlmd 3.1 permanent uncounted 8E7DBBEE7465 \
        HOSTID=80FF12FEAB43 ISSUER="ARM Limited" \
        NOTICE="For support please contact your supplier." \
        SN=ABCDE-12345-ZYXWV SIGN="8EFA 780E 115E 8608 0489 2B62 \
        96E5 2609 7C87 8518 0489 14F7 3857 A879 6B16 487A B8EE 0108 \
        EFD5 BD84 F095 A54E 9CDA D789 ECAE 2EAB BB51 8CD1 8970 3159" \
        SIGN2="5798 A582 D789 5972 404E 04AA 20AB EBE5 1117 08A4 8DD5 \
        5BCB A58B 98EE B7FC 079A 38DE CA66 FE78 5024 AF17 4444 3E3F \
        2571 1624 87EA 75B0 3750 8752 AD63"
```

### 1.2.2 Floating license (Windows and Unix/Linux)

A floating license scheme is more flexible than a node locked license but requires more administration. It would typically be used where there are more potential tool users than purchased licenses.

A floating license-managed installation of the tools consists of the following computers:

**Client** This is the computer upon which the ARM development tools are installed and run by a user.

**Server** This is the computer upon which the license is installed. A license server may also be a client, though this is not normal operation.

The license server is used to control the number of copies of the tools in use at any one time up to the maximum number of licenses purchased. The license extract shown in Example 1-2 on page 1-6 shows part of a typical floating license. In this example the fully qualified `SERVER` name is `license1.somedomain.com`, the host ID is `785f2170` and port `8224` is being used. A three server license would have three `SERVER` lines at the start of the license. This example license allows up to 10 concurrent users of the specified ARM application, and each user obtains permission to run the application from the license server. Due to the flexible way the individual parts of the tools are license managed, this floating license allows up to 10 users to be using the `armulate` feature, while a different 10 users can use the `fromelf` feature.

**Example 1-2 Typical single-server floating license extract**

```
SERVER license1.somedomain.com 785f2170 8224
VENDOR armlmd
USE_SERVER
INCREMENT fromelf armlmd 3.1 permanent 10 7E338B2771EA DUP_GROUP=NONE \
        ISSUER="ARM Limited" NOTICE="For support please contact \
        your supplier." SN=ABCDE-98765-ZYXWV SIGN="8674 FEE3 \
        5830 D004 2F8D 8C07 E75C 84AA 14EB 37A0 9AD7 4D73 D34A F83A \
        EE22 B1F1 3579 54C8 54BA D9D7 5B87 E024 632C B7E0 1DF2 8526 2312 \
        27F2 DD78 C020 ABB9" SIGN2="1E17 F524 7987 9CD4 3BC2 FB34 E2FB \
        04AA 2C79 4B4C 776D 0FC3 9797 7653 2FBA 044B 2854 608B D8B9 \
        6F8A 7B69 3BFA 4AE4 2234 B9A0 0ACA 3E21 1CF8 0F58 54FE"
INCREMENT rvd_iss armlmd 3.1 permanent 10 8EE2C29A2DB3 DUP_GROUP=UHD \
        ISSUER="ARM Limited" NOTICE="For support please contact \
        your supplier." SN=ABCDE-98765-ZYXWV SIGN="2B77 780F \
        37C5 CAD3 ED05 AECA 0424 0876 6E3D 2EAC 64EB C78E 7015 6E99 \
        2119 08ED 4889 AF20 CD05 9E76 EA75 72FE 0154 CC8F CD78 AA01 \
        1824 C650 A7B5 0696" SIGN2="20EA 4015 0356 5FF8 2DE5 083A 2C9F \
        5645 B14E 220C 00E1 8970 F32E B873 AC7E 182A 20EF 27EA 7BB8 \
        B25E 08DB 70D3 AB8B 7847 DB87 B88A 5700 A079 BEB7 E3D2"
INCREMENT rvd_arm armlmd 3.1 permanent 10 D3C61DCC1FFE DUP_GROUP=UHD \
        ISSUER="ARM Limited" NOTICE="For support please contact \
        your supplier." SN=ABCDE-98765-ZYXWV SIGN="878E E524 \
        BCC7 9C50 1512 D42D 0707 DA8E B727 78EE A48B 913E DC88 A4B7 \
        BEF5 7DD7 FB2D 078C 7C9C AF10 945C 386E 661A 048E 1474 FEE7 \
        08B3 BAE4 E8E2 24EA" SIGN2="237E C75E 17A6 9687 8C94 DA87 27BE \
        5912 FA64 2406 E6D6 2EC4 F19B BFEB A7ED 1CC2 A0FE 0435 8701 \
        2EC9 1137 9D13 8F8D 5237 1BC7 C785 1374 A804 E9EF A91D"
```

**Note**

The use of Windows 95, 98 or Me on license server machines is neither recommended nor supported by ARM Limited.

Windows and Unix/Linux license servers and clients can be mixed in any installation. Client machines must be able to access the server machines over the local network.

ARM supports two different server models for floating license installations.

### Single server model

The license file is locked to the host ID of a single server which is used to control the licensing process. A single server floating license model requires that the server machine is running at all times and that the client machines can access this server machine over the network.

  

*Limitations*

- Should the server fail, the tools cannot be used until the server is repaired.

Figure 1-1 illustrates the single server model. On the server, a license file with the corresponding server details is loaded by the license server processes. The client must be configured so that it references the license server and the port through which the license is issued. The recommended method for doing this is to set the `ARMLMD_LICENSE_FILE` environment variable on the client to "port@server". For the example in Figure 1-1, the environment variable should be set to "8224@Server_A". More information on client configuration can be found in Chapter 5 *Configuring a Client to Use a License Server*.


**Figure 1-1 Single server model**

### Three server model

The license file is locked to the host ID of three separate license servers. This permits more reliable licensing of the tools as failure of one server will not stop users from checking out licenses. A three server floating license model requires that:

- a minimum of two server machines are running at all times
- the servers can access each other over the network
- the client machines can also access these server machines over the network.

*Limitations*

- More complicated to setup than a single server system
- Three servers are required, of which two must be operational at all times.

Because of the additional complexity of the three server model, it is more suitable for managing large numbers of licenses (greater than 10), when many users will be relying upon the servers being operational.

Figure 1-2 on page 1-8 illustrates the three server model. On each of the servers, an identical license file with details of all three servers is loaded by the license server processes. The client must be configured so that it references all the license servers as well as the ports through which the license is issued. The recommended method for

doing this is to set the ARMLMD_LICENSE_FILE environment variable. More information on client configuration can be found in Chapter 5 *Configuring a Client to Use a License Server*.

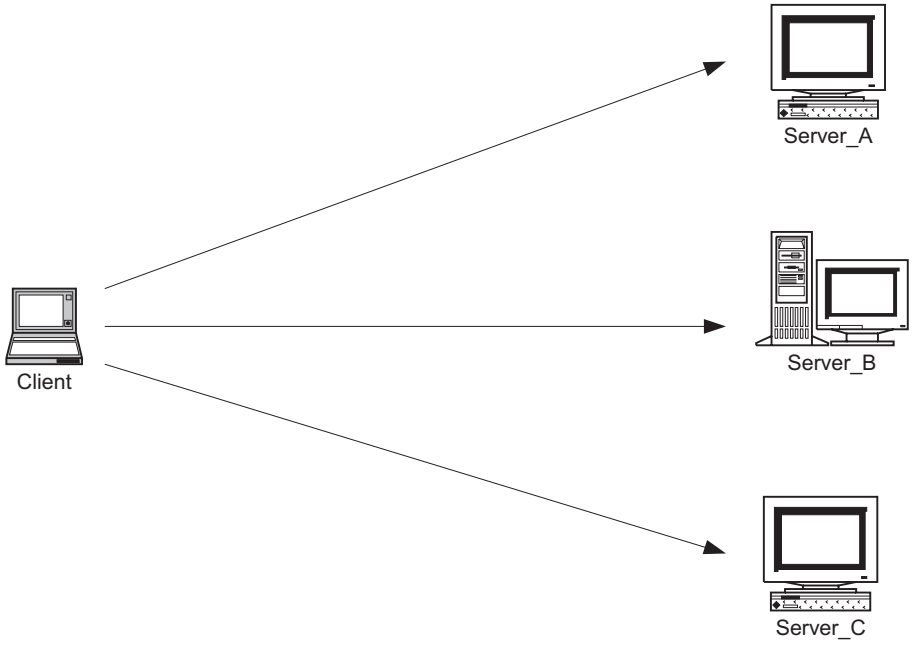


**Figure 1-2 Three server model**

For the example in Figure 1-2, on Windows, the environment variable should be set to "8224@Server_A;8224@Server_B;8224@Server_C". The first server in the list, Server_A, is the master server, and must be started before the other two servers.

Depending on your operating system, the separators for the values in the environment variable may be different. On Unix/Linux, the separator is a colon ":" rather than a semicolon ";" as on Windows.

  

## 1.3 ARM License Wizard

The ARM License Wizard is a Windows-only utility for requesting or installing licenses. More information on using the License Wizard to request licenses is in *Access from the License Wizard v4.x* on page 2-6. Using the License Wizard to install node-locked licenses is described in *Using the ARM License Wizard* on page 3-2. Using the License Wizard to configure floating licenses for clients is detailed in *Configuring the client licensing on Windows* on page 5-2.

This document describes how to use version 4.x of the ARM License Wizard. Versions of the License Wizard older than version 4.x might be installed with your ARM development tools. If so, refer to the license management documentation provided with your tools for detailed instructions on how to use the older License Wizard.

## 1.4 ARM web licensing portal

ARM Limited provides a web-based system that you can use to generate and view licenses for your development tools. This allows you to obtain a license for your tools as soon as you receive a serial number. The web licensing portal can be accessed at the following URL:

`https://license.arm.com`

More details on using the ARM web licensing portal can be found in the documentation available on the front page of the portal itself.

  

# Chapter 2
# **Requesting Your License**

This chapter explains how to request a license for your ARM® software development tools. It contains the following sections:

## 2.1 Information needed for a license

In order to apply for a licence from the ARM web licensing portal (described in *ARM web licensing portal* on page 2-6), you must have certain information available:

- *Product serial number*
- *Host ID*.

### 2.1.1 Product serial number

Your product serial number is normally of the form `xxxxx-xxxxx-xxxxx` or `xxxxx-xxxxx-xxxxx-xxxxx`, where `x` represents an alphanumeric character. The serial number can typically be found on a sticker on the product outer box and on a card inside the product packaging. If you have an evaluation serial number, it will be of the form `WTxxxx-xxxxxxxxx`, where `x` represents an alphanumeric character. The number of characters immediately after `WT` might be different.

### 2.1.2 Host ID

The host ID is an identifier unique to a particular computer, and is used by FLEX*net* to lock licenses to a specific client or server machine. If the host ID provided at the time the license is generated is wrong, then the license will not enable the tools.

The method of obtaining a host ID will differ depending upon the type of license, the hardware platform and the operating system used.

#### Node-locking to network cards

Node locked licenses (only available on Windows) are normally locked to the physical address (also known as “MAC address”) of the computer's network card. If you change this network card, you must apply to ARM for a new license. See *How do I move my license to another computer?* on page 6-4 for more information. You might want to lock your license to a portable network card such as a USB or PCMCIA network card if you want to use your license on more than one computer, though only one at a time.

To enable a network card address to be used as the host ID for a node-locked license the system must be configured as follows:

**Windows 2000/XP**

One of the following must be installed:

- the SNMP service
- the NETBEUI Transport Protocol
- the NW Link (IPX/SPX) Transport Protocol.

  

If the specified conditions are not met then the network card ID is either not returned, or might be incorrect.

To obtain the computer's network card address, type the command `ipconfig /all` at the command prompt and look for the "Physical address" line for the network card:

```
Description ............: 3Com 10/100 Mini PCI Ethernet Adapter

Physical Address ......: 00-00-12-42-41-BC
```

The host ID is the `Physical Address` with the "-"s removed, so in this example it is `0000124241bc`. Alternatively if you have installed the FLEX*net* software onto your machine you can instead type `lmutil lmhostid`.

**Note**

- To use the physical address of the network card as the host ID, you must be careful to choose the address of the actual network card, not a virtual network address nor the address of another device. Using the address of a virtual network card is not suitable because there is no guarantee that the addresses will remain the same after a reboot.
- You should ensure that the network device to which you lock your license will not be shut down should your computer have a power saving mode.

### Node-locking to the hard disk volume number

It is also possible, though not normally recommended, to use the hard disk volume number for drive C: as the host ID for a node locked license. If you change or reformat your hard disk, you must apply to ARM for a new license. If your computer is a laptop that uses different network cards when docked and undocked, then you must use its hard disk serial number as the host ID to ensure that you can use your application at all times.

To obtain this value, at the command prompt change to the C: drive and enter the command `vol`. This will return a value similar to:

```
Volume Serial Number is 789A-D123
```

The host ID is the `Volume Serial Number` with the "-" removed and prefixed with DISK_SERIAL_NUM=, so in this example it is `DISK_SERIAL_NUM=789ad123`. Alternatively if you have already installed the FLEX*net* software onto your machine you can instead type `lmutil lmhostid -vsn` to obtain this information.

**Note**

The hard disk checked by FLEX*net* software is the first fixed drive on your computer. This is assumed by FLEX*net* to be drive C:. You cannot use network drives or alternate fixed drives as the host ID.

### Floating license server host ID

The host ID(s) required will belong to the license server(s) and not to the client machines running the tools. If you have already installed the FLEX*net* server software onto the server, then you can find the host ID using the command `lmutil lmhostid`. If you have not yet installed the FLEX*net* server software, then you can use the standard operating system commands listed in Table 2-1 to obtain the correct host ID.

**Table 2-1 Commands for obtaining host IDs**

| OS | Command | Server host ID type | Comments |
|---|---|---|---|
| Windows | `ipconfig /all` | ETHERNET | The host ID will be returned as the 12 character hexadecimal Physical Address. Remove the hyphens, '-', for the host ID. |
| Linux | `/sbin/ifconfig eth0` | ETHERNET | Returns a 12 character hexadecimal 'HWaddr'. Remove the colons, ':', for the host ID. |
| Solaris | `/usr/bin/hostid` | LONG | Returns the 8 character hexadecimal host ID. |

**Note**

- Not all ARM software development tools allow the use of floating licenses.
- If you are requesting a three server (redundant server) license then you will need a valid and different host ID for each of the three servers. These servers do not need to be running the same operating system.
- If you are requesting a three server license, the host ID of master server must be given first when you request your license.
- You cannot use a volume serial number as the host ID for a Windows license server.

  

- On Linux, the device used as the server host ID must reside on eth0. You can reassign this address to a removable USB network device if you are using a Linux laptop, for example, and wish to transfer the license between standalone computers.
- As of RVDS v3.0, ARM no longer supports the use of HP-UX as a license server and does not include the HP-UX license daemons with the ARM development tools.

## 2.2 ARM web licensing portal

Once you have the information required to generate a license, you can retrieve your license directly from ARM's web licensing system. This should be done in preference to emailing a license request form because you can obtain your license immediately. The ARM web licensing portal is located at the following URL:

```
https://license.arm.com
```

Detailed information on how to use the ARM web licensing portal is provided on the main page of the website.

**Note**

If you are saving a copy of your license file onto your computer, you must save it in plain text format. Using other file formats, such as rich text format (.rtf), may result in an unreadable license file and subsequent licensing failure.

This section contains the following section:

- *Access from the License Wizard v4.x*.

### 2.2.1 Access from the License Wizard v4.x

On Windows platforms, you can access the ARM web licensing portal directly from the ARM License Wizard version 4.x. This allows you to obtain a license and install it on your Windows client or license server.

1. Start the ARM License Wizard by selecting **Start → Programs → ARM → License Wizard v4.x**.
2. Click **Next** to display the Action Selection screen. This screen is shown in Figure 2-1 on page 2-7.

  

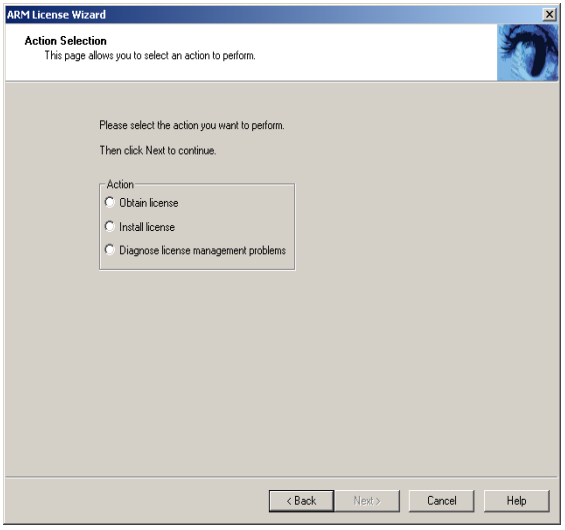


**Figure 2-1 Action Selection screen**

3. Select **Obtain license**, then click **Next**. This will open a web browser and take you to the ARM web licensing portal welcome page. See the documentation available on the portal itself for information on how to use it.

   **Note**

   The License Wizard may be covered by the web browser window. To return to the License Wizard, click on the **ARM License Wizard** button on the Windows Taskbar.

4. The License Wizard will display the valid host IDs for the computer on which it is running. Select the one to which you want the license to be locked, then click **Copy to clipboard**. This will make it easier to enter your host ID into the web licensing portal.

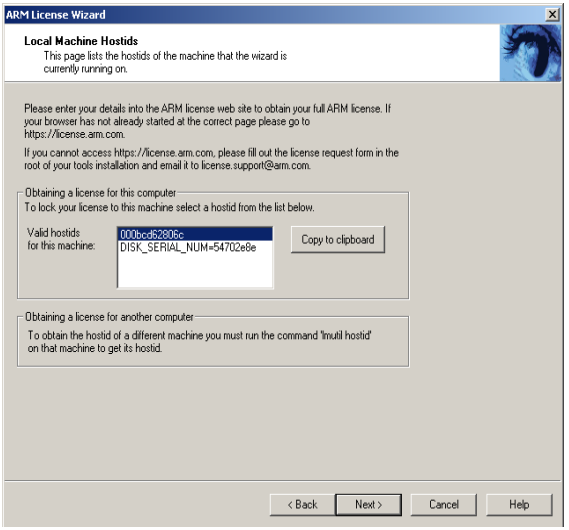


**Figure 2-2 Local machine host ID screen**

5. Once you have obtained your license from the web licensing portal you can then save it locally. If you are using a node locked license, you can install it using the License Wizard as described in *Installing a node-locked license* on page 3-2. Floating license users should follow the procedure given in *Installing the server license* on page 4-4.

  

# Chapter 3
# **Installing a Node-Locked License**

This chapter explains how to install a permanent, node-locked license for your ARM® software development tools. It contains the following section:

- *Installing a node-locked license* on page 3-2.

## 3.1 Installing a node-locked license

You will normally retrieve your license yourself from the ARM web licensing portal (see *ARM web licensing portal* on page 2-6). You can then install your license using the ARM License Wizard. Should you wish to install your license manually, refer to *How do I manually install a node-locked license?* on page 6-8.

**Note**

This section describes how to use the ARM License Wizard version 4.x. If you are using an older version of the License Wizard, refer to the corresponding documentation provided with your development tools.

### 3.1.1 Using the ARM License Wizard

The ARM License Wizard is a graphical tool for Windows that will help you to set up your ARM licensing environment.

The simplest way to install a node-locked license is as follows:

1. Start the ARM License Wizard by clicking on **Start** → **Programs** → **ARM** → **License Wizard v4.x**.
2. Click **Next** to display the Action Selection screen (see *Action Selection screen* on page 2-7).
3. Select **Install license**.
4. Click **Next**.
5. Read the information about installing a node-locked license. When you have completed the tasks required for your license type, click **Next**.
6. Use **Browse** to locate and select the permanent license file you have received.
7. Click **Add** to add the license file to the list of possible license sources for your computer. If it is not already in the licenses subdirectory of your ARM tools installation, you will be asked whether you want to copy your license file to that location. ARM recommends that all ARM license files are in a single directory so that they are easier to administer.
8. Click **Next**.
9. Click **Finish**. This will make the requested changes to your ARM licensing environment.

  

# Chapter 4
# **Setting Up a Floating License Server**

This chapter describes the installation of FLEX*net* server software and the configuration of the client machines. If you do not use floating licenses, you do not require FLEX*net* server software and you can safely ignore this chapter. This chapter contains the following sections:

## 4.1 Installing the server software

Before any floating license can enable the use of your ARM® software development tools, you must install the FLEX*net* server software on your license server(s) and start it.

**Note**

You do not have to install the ARM software development tools if the computer is acting only as a license management server.

Each ARM product that supports floating licensing will contain the software for all supported license servers on the DVD-ROM or CD-ROM.

This section describes the procedures for:

- *Installing server software on Windows*
- *Installing server software on Unix/Linux*.

### 4.1.1 Installing server software on Windows

On a Windows license server, install the server software as follows:

1. Copy the FLEX*net* files for your ARM application DVD-ROM or CD-ROM into a directory called `C:\FLEXlm` on the server. The files are in the directory `Utilities\FLEXlm\`*`version`*`\release\win_32-pentium`.
2. Add `C:\FLEXlm` to the `PATH`.

If you are using a triple server arrangement then you must repeat this FLEX*net* server software installation for each Windows server.

**Note**

Using a Windows 95, 98 or Me machine as a license server is not supported by ARM Limited.

### 4.1.2 Installing server software on Unix/Linux

The license server software is normally supported on platforms of the same version or higher as supported by the ARM software development tools. See *What version of the license server daemons should I use?* on page 6-16 for known exceptions.

  

The subdirectory of the ARM application DVD-ROM or CD-ROM containing the appropriate software for the Unix/Linux platforms are:

**Solaris** `Utilities/FLEXlm/`*`version`*`/release/solaris-sparc`

**Linux** `Utilities/FLEXlm/`*`version`*`/release/linux-pentium`

On any Unix/Linux server, install the server software as follows:

1. Copy the files from the directory for your platform onto the server license machine. The destination directory must be on your `PATH`.
2. On the license server machine, change into your license utilities directory, and type:

   ```
   sh ./makelinks.sh
   ```

If you are using a triple server arrangement then you must repeat this FLEX*net* server software installation for each Unix/Linux server.

## 4.2 Installing the server license

You will normally retrieve your license yourself from the ARM web licensing portal (see *ARM web licensing portal* on page 2-6 for more information).

Before you can use this license file, you must make some changes:

1. Copy the license file to a known location on the server(s). A suitable place would be in the same directory as your license server software. The suggested file name is `license.dat`, and this name is used throughout this document to refer to the license file. If you wish to call the file something else, substitute your file name for `license.dat`.

2. Replace `this_host` in the license file with the corresponding server name. If you are using a triple server arrangement, replace `this_host`, `this_host2` and `this_host3` with the server names that match the host IDs. The first server listed is the master.

3. Add the port number after the host ID. Normally this port number will be 8224. If you do not define a port, the operating system will choose one in the range from 27000 to 27009. This number may change if the server is rebooted.

   **Note**

   If the host ID in the license file is incorrect or if the server host ID has changed, you must apply to ARM Limited for a new license file.

For example, if the web-generated license file contained the following line:

```
SERVER this_host 001002A34BC5
```

and you wanted to use port number 8224 on your license server called “synchrotron”, you would need to change the line to:

```
SERVER synchrotron 001002A34BC5 8224
```

You may not edit anything in the license file other than the server name and port number, otherwise it will not work. If you are using a triple server license, on each server you must change the default host names in the license file from `this_host`, `this_host2` and `this_host3` to the actual names of your server machines. You must also ensure that, if you are adding this license to a license server that is already used for licensing ARM development tools, the license utilities are upgraded to the latest version of the FLEX*net* tools provided by the various ARM tools that you have.

  

## 4.3 Starting the license server

This section describes how to start a license server on the supported platforms:

- *Starting a Windows server*
- *Starting a Unix/Linux server* on page 4-7.

**Note**

- If you are adding a new license to a system with a running license server, you must stop the server, point the server to the new license file, then restart the server. If this is not done the new license information will not be recognized by the license daemons. ARM does not recommend the use of the `lmreread` command.
- If you are using a three server arrangement, you must start the master server first before starting the secondary servers. The master server is listed first in your license file.

### 4.3.1 Starting a Windows server

To configure and start the license server software on a Windows server using the graphical user interface:

1. Start the `lmtools.exe` program. Refer to *Installing server software on Windows* on page 4-2 for the location of this program.
2. Select the **Configuration using Services** option, as shown in Figure 4-1.

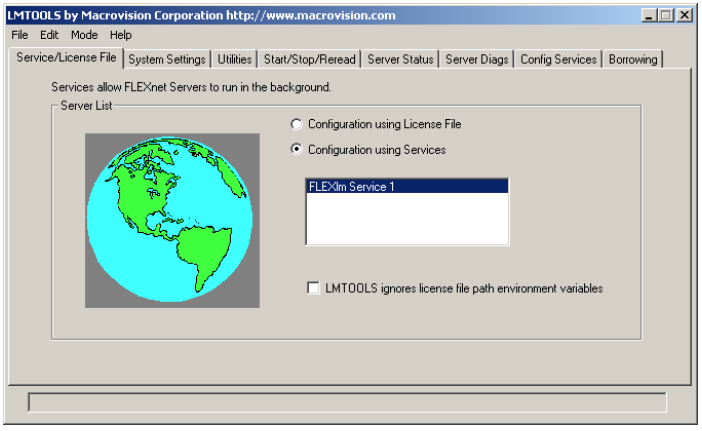


**Figure 4-1 Selecting Configuration using Services**

3. Click the **Configure Services** tab to display the dialog shown in Figure 4-2. This example shows the dialog with typical paths entered.

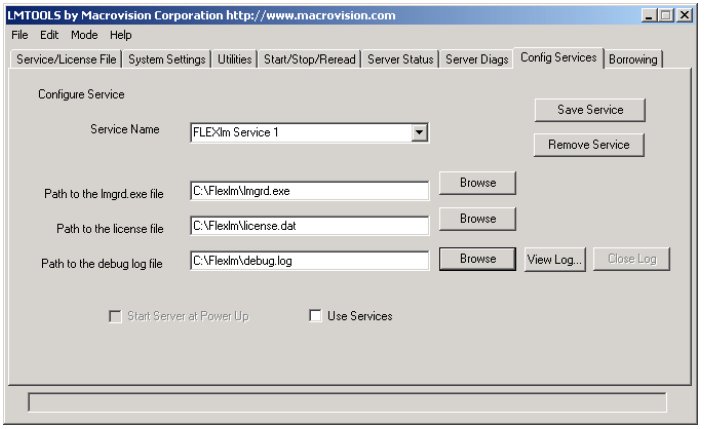


**Figure 4-2 Server setup dialog**

4. Enter the paths that specify the required files, or click the browse buttons to locate and select the files. You must specify paths for:
   - executable file `lmgrd.exe`
   - license file `license.dat`
   - log file `debug.log`.

5. If you want the server software to start running automatically whenever the server is powered up, click the **Use Services** checkbox, then click the **Start Server at Power Up** checkbox.

6. Click **Save Service**.

7. When prompted, confirm that you want to save the FLEX*net* License Manager service.

8. Click the **Start/Stop/Reread** tab, and ensure that the FLEX*net* License Manager service is selected.

9. Click **Start Server** to start running the license server software.

You can also start the license server on Windows by using the command line. From the directory where the license server software is installed, type:

`lmgrd -c` *`license_file_name`* `-l` *`logfile_name`*

  

where:

*license_file_name*

Specifies the fully qualified path name of the license file.

*logfile_name* Specifies the fully qualified path name to a log file.

When you have started the license server, you can inspect the log file by using a text editor such as Notepad.

For further details on the server graphical user interface, see the *FLEXnet End Users Guide* supplied as a PDF file with your ARM software development tools.

### 4.3.2 Starting a Unix/Linux server

To start the license server software on a Unix/Linux server, go to the directory containing the license server software and type:

```
nohup lmgrd -c license_file_name -l logfile_name
```

where:

*license_file_name*

Specifies the fully qualified path name of the license file.

*logfile_name* Specifies the fully qualified path name to a log file.

**Note**

Since `lmgrd` does not require root privileges, it should be started by a non-privileged user, not by root.

When you have started the license server, you can type, for example:

```
tail -f logfile_name
```

to see the most recent output from the license server.

For more information on how to start and configure a license server on Unix/Linux, see the *FLEXnet End Users Guide* supplied as a PDF file with your ARM software development tools.

  

# Chapter 5
# Configuring a Client to Use a License Server

This chapter describes the procedure for configuring your client computer to obtain its ARM software development tools license from a server. It assumes that you have already set up one or more license servers as described in Chapter 4. If you do not use floating licenses, you can safely ignore this chapter. This chapter contains the following sections:

## 5.1 Configuring the client licensing on Windows

On Windows clients, you can set the environment variable `ARMLMD_LICENSE_FILE` using one of the methods described in this section. The client must support the ARM development tools you are using. The method you choose to configure client licensing will depend on what Windows platform you are using:

- *ARM License Wizard*
- *Using the Control Panel* on page 5-4
- *Using the Command Line* on page 5-4.

### 5.1.1 ARM License Wizard

The ARM License Wizard can configure a Windows 2000 or XP client to use a floating license.

To configure your Windows client to use a floating license:

1. Start the ARM License Wizard by clicking on **Start → Programs → ARM → License Wizard v4.x**.
2. Click **Next** to display the Action Selection screen (see *Action Selection screen* on page 2-7).
3. Select **Install license**.
4. Click **Next**.
5. Read the information about installing a floating license. When you have completed the tasks required for your license type, click **Next**.
6. The Install License dialog, shown in Figure 5-1 on page 5-3, will be opened.

  

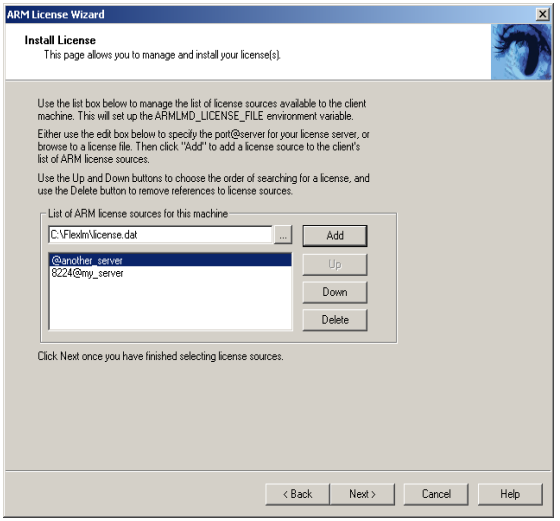


**Figure 5-1 The Install License dialog**

Enter the server port@server name in the Install License dialog text box. If a default server port in the range between 27000 and 27009 (inclusive) is used, then the port number is omitted. If you are using a three server arrangement, you must list the three servers here, starting with the master server. Each entry should be separated by a semicolon character, ";".

Alternatively, use the **...** button to browse to a local or remote license file that contains the relevant server details, then click **Add**. The License Wizard will prompt you to choose whether to extract the reference(s) to the license server(s), or to add the file itself to your license environment variable. ARM Limited recommends that the server reference(s) be used. The port@server name(s) or license file(s) will then be added to the list of license sources.

In Figure 5-1, `8224@my_server` has been already entered as a possible license source so it is visible in the list of available license sources. A second source, `@another_server`, has been entered without a port number. This means that a default port in the range between 27000 and 27009 will be used. The file `C:\Flexlm\license.dat` has not yet been added so appears only in the text entry box.

You can remove an entry from the list of license sources by highlighting it, then clicking **Delete**.

When you have added your license sources, click **Next**.

7. Click **Finish**. This will make the requested changes to your ARM licensing environment.

### 5.1.2 Using the Control Panel

You can use the Control Panel to set environment variables in Windows 2000 and XP.

**Note**

You must have administrator privileges to set system environment variables.

If you are using the Control Panel, then you can set the environment variable as follows:

1. Open the Control Panel by clicking on **Start** → **Settings** → **Control Panel**.
2. Double click on the **System** icon in the Control Panel.
3. Locate the environment variables setting tab. This is on the **Advanced** tab.
4. Create a new system environment variable `ARMLMD_LICENSE_FILE` and set its value. This must include valid port@server information. If a default port in the range between 27000 and 27009 is used on the server, then the port number is omitted in the environment variable.

   If you are using a single server floating license, you would set the environment variable value to something similar to:

   ```
   8224@my_server
   ```

   If you are using a three server license, or wish to refer to more than one license server, you would set the environment variable value to something similar to:

   ```
   8224@my_serverA;8224@my_serverB;@my_serverC
   ```

   The master server appears first, and in this example is `my_serverA`. The entry for `my_serverC` is not preceded by a port number because in this example a default port number is being used.

### 5.1.3 Using the Command Line

You can use the command line on Windows 2000 or XP to set system environment variables for that instance of the command line. If a default port in the range between 27000 and 27009 is used on the server, then the port number is omitted. If you are using the command line, you can set the environment variable for a single server as follows:

```
set ARMLMD_LICENSE_FILE=8224@my_server
```

If you are using a three server license, or wish to refer to more than one license server, you can add these values as shown here:

```
set ARMLMD_LICENSE_FILE=8224@my_serverA;8224@my_serverB;@my_serverC
```

  

If this example is used in a three server environment, the master server is `my_serverA`. The entry for `my_serverC` is not preceded by a port number because in this example a default port number is being used.

**Note**

Using the command line on Windows to set an environment variable only sets the variable for that instance of the command line, not for the entire system.

## 5.2 Client license on Unix/Linux

On Unix or Linux clients, you must set the environment variable ARMLMD_LICENSE_FILE to include port@server information. If a default port in the range between 27000 and 27009 is used on the server, then the port number is omitted.

The ways in which you can configure your Unix/Linux client to obtain its license from a server are:

- *Shell commands*
- *.flexlmrc*.

### 5.2.1 Shell commands

If you are using csh or tcsh, you can set the environment variable for a single server as follows:

```
setenv ARMLMD_LICENSE_FILE 8224@my_server
```

If you are using bash or sh, an example would be:

```
ARMLMD_LICENSE_FILE=8224@my_server

export ARMLMD_LICENSE_FILE
```

If you are using a three server license, or wish to refer to more than one license server, you can add these values to your environment variables. For example, in csh or tcsh:

```
setenv ARMLMD_LICENSE_FILE 8224@my_server1:8224@my_server2:@my_server3
```

In this example, the port number is omitted for `my_server3` because a default port is being used. Should you be using a three server license, the master server would be `my_server1`. In all cases you may wish to add the above environment variable settings to your startup scripts so that your licensing is set up automatically when you log in.

### 5.2.2 .flexlmrc

You can edit a file in your home directory called `.flexlmrc` in order to set up client licensing. To do this, add the following line to `.flexlmrc`:

```
ARMLMD_LICENSE_FILE=value
```

where *value* is the value to which you want to set the environment variable, such as `8224@my_server`.

  

# Chapter 6
# Frequently Asked Questions about Licensing

This chapter includes details on common license client or server problems and gives possible solutions. It contains the following sections:

## 6.1 General licensing questions

This section includes information on licensing issues that are not specific to a particular licensing configuration.



### 6.1.1 How do the ARM development tools implement FLEX*net*?

If you are an experienced user of FLEX*net* then you might find the following information about the ARM implementation of this software useful:

- You can run the license management software under Windows (2000 and XP), Sun Solaris, or Red Hat Enterprise Linux.
- The ARM vendor daemon program is called:

  **Windows** `armlmd.exe`

  **Unix/Linux** `armlmd`

- The default license file for computers running the ARM development tools is specified by the `ARMLMD_LICENSE_FILE` environment variable.
- If you are configuring FLEX*net* license management servers, you are recommended to place a copy of the license file in the same directory as the FLEX*net* server software on each server.

### 6.1.2 How does FLEX*net* find a license file?

The locations to be searched by ARM license-managed software are stored in the `ARMLMD_LICENSE_FILE` environment variable. You can set `ARMLMD_LICENSE_FILE` so that it contains one or more file names, directory names, or port@server information. If you specify a directory name, you must not include the final slash character. The locations are searched in order until a valid license is found. If a directory name is found then each

  

file within the directory that has a `.lic` extension is searched. For ARM licensed tools, the contents of `ARMLMD_LICENSE_FILE` are searched before the contents of the generic FLEX*net* environment variable, `LM_LICENSE_FILE`.

#### ARM license search algorithm

A summary of the algorithm used in ARM licensed products when searching for a license file is:

```
if (ARMLMD_LICENSE_FILE env-var set)
{
    Search ARMLMD_LICENSE_FILE for feature.
    if (feature found)
    {
        Stop searching
    }
}
if (LM_LICENSE_FILE env-var set)
{
    Search LM_LICENSE_FILE for feature.
    if (feature found)
    {
        Stop searching
    }
}
else
{
    Search c:\FLEXlm\license.dat (Windows)
    Search /usr/local/FLEXlm/licenses/license.dat (Unix/Linux)
    if (feature found)
    {
       Stop searching
    }
}
Print error saying that license was not found.
```

### 6.1.3 Can I use FLEX*net* with more than one product?

FLEX*net* (formerly known as FLEX*lm*) is a widely used product for license management, so it is possible that you have more than one product using FLEX*net*. If you are using floating licenses, the latest version of the FLEX*net* license server daemon `lmgrd` is backwards compatible with vendor daemons built using previous versions.

**Note**

If your products are supplied with different versions of FLEX*net*, you must use the latest version of the FLEX*net* server daemon, `lmgrd`, for all your products.

Refer to the version of the *FLEXnet End User Guide* provided with your tools for further information on using multiple vendor's licenses together.

You might be able to combine multiple license files together. See *How do I combine licenses?*

### 6.1.4 How do I combine licenses?

You may wish to combine license files together if you are using more than one licensed application, or are adding a new feature to an existing license.

Node locked licenses can be combined if they have been generated for the same host ID.

Floating licenses can be combined if:

1. The number of `SERVER` lines in each file is the same
2. The host ID field of each `SERVER` line in one file exactly matches the host ID field of each `SERVER` line in the other file.

#### Manual method

If you are using a node-locked license, and want to combine multiple licenses into a single file, then copy and paste all of the `INCREMENT` lines from your separate license files into a new license file.

To combine floating license files, use a text editor and open one license file, copy the other license file into the text editor and then remove any duplicate `SERVER` and `VENDOR` lines. Be sure to always use the newest version of `lmgrd` used by either product and the newest version of each vendor daemon (for example, `armlmd`).

There are some examples of license file merging in the *FLEXnet End Users Guide* that can be found in the `Utilities/FLEXlm` subdirectory of your ARM development tools installation.

#### Web licensing portal method

You can use the ARM web licensing portal to combine ARM development tools licenses. Further details on how to do this are provided in the documentation available on the portal.

### 6.1.5 How do I move my license to another computer?

If you want to move your development tools license from the original computer for which it was generated to another computer within the same company, then you will need to obtain a new license file from ARM Limited with a new host ID. A host ID is

  

usually generated from an ethernet card MAC address. For node locked licenses, the hard disk volume number can be used instead. For more details about host IDs please see *Host ID* on page 2-2.

For further information on license rehosts, see the ARM website, in the Technical Support FAQs under Tools Licensing.

### 6.1.6 Do the ARM development tools support BORROW?

ARM development tools do not support the use of the FLEX*net* `BORROW` attribute in its development tool license files.

If you want to use your development tools on a separate network to your license server (including standalone), then you will require a node locked license.

If you have a number of different machines that will need to have access to the development tools whilst away from your license server network, then you should obtain one or more node locked licenses that are locked to network cards that can easily be transferred between machines as required, such as a USB or PCMCIA network cards.

### 6.1.7 Do ARM licenses support queuing?

RVDS 2.x and 3.x floating licenses support license queuing when used with the appropriate version of the FLEX*net* server software.

When a server receives a request for a license but no seats are currently available, the request is queued. The request will be fulfilled when a seat becomes available. The server log will report a DENIED message (see *Why am I getting "DENIED" messages in the server log?* on page 6-18) but there will not be a corresponding license failure on the client side.

**Note**

License queuing will not work if the server is hosting both RVDS and ADS licenses. If you require the license queuing feature, you should consider moving the ADS licenses to a separate server. See *How do I move my license to another computer?* on page 6-4.

### 6.1.8 Why can I not find the LMHOSTID utility?

If you are using Unix/Linux, you have probably not run the `makelinks.sh` script. The script creates a series of links to the `lmutil` program, one of which is for `lmhostid`. This script is in the appropriate directory for your platform:

`Utilities/FLEXlm/`*`version`*`/release/`*`platform`*

  

where *platform* is one of `solaris-sparc` or `linux-pentium`. You can now type `lmutil lmhostid` at the command prompt to run the utility.

If you are using Windows, this script is not available. Instead, open a command prompt, change to the directory where your license utilities are installed, normally `C:\FLEXlm`, then type `lmutil lmhostid` .

  

## 6.2 Problems with client configuration

This section deals with issues relating to the configuration of clients in either node locked or floating license systems. The following items are discussed:

- *License apparently missing*
- *My node-locked tools fail with an "Invalid license key (inconsistent authentication code" error* on page 6-8
- *How do I manually install a node-locked license?* on page 6-8
- *How can I change the order in which my license sources are accessed?* on page 6-8
- *What does the "Diagnose license management problems" option do in the License Wizard?* on page 6-9
- *How can I optimize floating license checkout times?* on page 6-9
- *Problems communicating with the server* on page 6-10.

### 6.2.1 License apparently missing

When you try to run an ARM licensed product, you might see a message that says that a license cannot be obtained.

If so, one possible reason is that a valid license file cannot be found on the license search path(s) shown in the error message itself. If your computer is running Windows, use the ARM License Wizard to install the permanent license file. See *Using the ARM License Wizard* on page 3-2 if you are using a node-locked license, or *Configuring the client licensing on Windows* on page 5-2 if you are using a floating license. If your computer is running Unix or Linux, you must install the permanent license file yourself. See *Client license on Unix/Linux* on page 5-6 for details.

If instead you see a license error message stating that no such feature exists, you might be trying to use a component for which there is no corresponding line in the license file. For example, you may have previously used a license for an evaluation version of the ARM development tools but have since installed the full version. If you do not reconfigure your client computer to use the full tools license, you will not be able to use the full version, even if the evaluation license has not expired. You must use a license compatible with the type of tools you have installed on your computer.

### 6.2.2 My node-locked tools fail with an "Invalid license key (inconsistent authentication code" error

This error can arise if your license file has been corrupted or modified. If this has happened, reinstall a clean version of your license file, for example, by using the ARM web licensing portal to retrieve your original license. See *ARM web licensing portal* on page 2-6 for details.

### 6.2.3 How do I manually install a node-locked license?

Instead of using the ARM License Wizard as described in *Installing a node-locked license* on page 3-2, you can set up your node-locked license yourself.

**Note**

Node locked licenses are only available for Windows platforms.

To manually install a node-locked license:

1. Retrieve your license from the ARM web licensing portal, as described in Chapter 2.
2. Save the license file as `license.dat` and place it in `C:\Program Files\ARM\licenses`, or another location where you have installed your ARM development tools. You should save your license file in a `licenses` directory to make it easy to find later.

   If you are installing a license for the *ARM Developer Suite* (ADS), you must not overwrite the `license.dat` file in the ADS root directory. If you do, the CodeWarrior IDE will fail to start and will report a license error. Should you overwrite the `license.dat` file, you can replace it with one that can be found in the root directory of your ADS CD-ROM.
3. Create or modify a Windows environment variable called `ARMLMD_LICENSE_FILE` to point to `C:\Program Files\ARM\licenses\license.dat`, or the equivalent location if you have installed your ARM development tools in a different place. If you are using Windows 2000 or XP, see *Using the Control Panel* on page 5-4.

### 6.2.4 How can I change the order in which my license sources are accessed?

If you have more than one license source, you might want to change the order in which they are used. For example, you might have two separate license servers, each with its own distinct license file, and one of these servers has more available licenses for a given product than the other. In this case you would want to point to the server with more seats first.

  

If you are using Windows 2000 or XP, you have the option of using the License Wizard. Start the License Wizard as described in *ARM License Wizard* on page 5-2. When you reach step 6, you will see the Install License dialog as shown in *The Install License dialog* on page 5-3. Select one of the existing entries in the list, and click on the **Up** or **Down** buttons as required to reorder the list. When you have finished, click **Next**, then click **Finish** to change your ARM licensing environment.

If you are unable to use the License Wizard on Windows, or are using Unix/Linux, you must manually edit the value of the `ARMLMD_LICENSE_FILE` environment variable yourself to change the order in which license sources are searched.

If you are using Windows 2000 or XP, you can use the methods described in *Using the Command Line* on page 5-4 or *Using the Control Panel* on page 5-4 to modify the environment variable.

If you are using Unix/Linux, see *Shell commands* on page 5-6 or *.flexlmrc* on page 5-6 for how to set `ARMLMD_LICENSE_FILE`.

### 6.2.5 What does the “Diagnose license management problems” option do in the License Wizard?

This option in the ARM License Wizard will run a script that will analyze your computer’s licensing configuration. You should only use this option when directed to by ARM License Support.

### 6.2.6 How can I optimize floating license checkout times?

When using a license server (or servers), each time a client computer starts one of the ARM development tool executables, a license checkout request will be sent across the network to the license server to obtain a license. There are a number of ways of configuring a client machine to check out a floating license from a license server and it is worth ensuring that your system is configured in such a way that the time taken for these checkout requests is minimized. These are:

- Use the `ARMLMD_LICENSE_FILE` environment variable to point to your license server(s). This environment variable is examined first by the tools, so it is preferable to use this rather than `LM_LICENSE_FILE` (the generic FLEX*lm* environment variable).
- Set `ARMLMD_LICENSE_FILE` to `port@server` rather than pointing it to a local copy of the license file. This removes the delay incurred by the tools having to process the local copy of the license file to find out the name of the license server. Note that this variable can also be used to specify multiple locations (using a list separated by semi-colons on Windows, or colons on Unix/Linux) and each location will be checked in turn until a valid license is found.

- Check for network problems. If everything is working as it should be, then a license should be granted in about the same time it takes to 'ping' the server on which the license resides.

  If the checkout takes longer, domain name resolution issues can be a cause of such problems. If this is the case you can sometimes overcome the problem by substituting the server's IP address for the server name where it appears in the license search paths.

- Check for server problems, particularly if you have set up the `ARMLMD_LICENSE_FILE` environment variable to point to multiple servers.

  If any of the license search paths point to a server which is no longer running the license management software, there will be a delay while FLEX*net* waits for the license request to time out before moving onto the next location in the search path. You should ensure that there are no spurious entries here which may cause such a delay and that all referenced servers are running. To temporarily work around this problem you can modify the order in which the servers appear in the `ARMLMD_LICENSE_FILE` environment variable. This is described in *How can I change the order in which my license sources are accessed?* on page 6-8.

### 6.2.7 Can I use a remote license server?

Although it is technically possible for a client machine to obtain a license from a remote license server across a wide area network (WAN), this is not a supported mode of operation for ARM development tools and you are strongly discouraged from attempting it. When setting up your licensing system, you should ensure that client machines have access to local license servers (meaning, across your site's local area network (LAN)).

If you do attempt to use a WAN server, the additional network delays connecting to the server can dramatically increase the time taken by the ARM build tools to build your code. In many cases builds may actually fail if the time delays caused are too great. The high license traffic caused will also greatly increase the traffic on your WAN, which could lead to more general problems on your network.

### 6.2.8 Problems communicating with the server

If you are using ARM development tools with a floating license, your workstation must be able to communicate with a server running FLEX*net* server software. If such communication cannot be established, a commonly reported FLEX*net* error code on the client is -15. Possible reasons for this are:

- the wrong license file is being referenced by the application program
- the server machine or machines specified in the license file are not running
- you are using the wrong port@host information

  

- the vendor daemon specified in the license file is not running
- the hostname in the license file is not recognized by the system
- the network between the client machine and the server machine is down

To solve these issues, refer to Chapter 5 *Configuring a Client to Use a License Server* and the Tools Licensing FAQs on the ARM Technical Support website.

You can try running tests on your server or client computers to identify possible causes of the failure:

1. Try running the `lmutil lmdiag` utility, which is designed primarily for this purpose.
2. Verify that the application is referencing the correct license file.
3. Verify that the vendor daemon, `armlmd`, is running (you can use `ps` on the server to look for it on Unix/Linux, or the Windows Task Manager).
4. Examine the server log file to see if any problems are reported, particularly messages indicating that the vendor daemon has quit.
5. Run `lmutil lmstat -a` on the server machine to verify that the vendor daemon is alive.
6. Run `lmutil lmstat -a` on the client machine to verify the connection from client to vendor daemon across the network.

If none of the above tests identifies the cause of the licensing failure, check whether your client machine can communicate to the server via TCP/IP using a utility such as `ping`. If this fails then it is possible that communication is being blocked between the server and client.

### Firewalls

Your license server and client may be on opposite sides of a firewall. If so, you must configure the firewall to allow access to fixed ports for both the lmgrd and armlmd license daemons. Define these ports in the server license file by modifying the top of the license file as shown, substituting your own values:

```
SERVER myserver server_hostid 8224

VENDOR armlmd port=portnumber
```

### Subnets

If your license server and client are on different subnets, then using the server's fully qualified domain name or IP address may solve the problem. Using the IP address should circumvent issues surrounding domain name resolution.

### Server hostname length

There is a character length limit for server hostnames used in the license files. For FLEX*net* 8.1b and older, this limit is 32 characters. If you are using newer versions of FLEX*net*, the limit is 64 characters. Should your license server name be too long, you should use the server's IP address in the license file and client license environment variable instead of the hostname.

### Intermittent failures

You might encounter intermittent licensing failures if your server is under very heavy load, for example, if you use automated build scripts. These failures can be caused by intermittent networking failures. The current versions of the ARM development tools are more resilient with respect to such temporary network interruptions. Users of older tools should consider adding retry capability to their build scripts to work around the behaviour.

  

## 6.3 Problems with server configuration

This section deals with issues relating to the configuration of floating license systems. The following items are discussed:

- *Server log reports "Invalid license key (inconsistent authentication code)"*
- *How do I update the license file my server uses?*
- *Can I define the order in which licenses in a mixed version license file are issued?* on page 6-14
- *How can I tell how many floating licenses are in use?* on page 6-15
- *Server log reports "(armlmd) cannot open lock file"* on page 6-15
- *What version of the license server daemons should I use?* on page 6-16
- *How can I limit users' access to particular licensed features?* on page 6-16.

### 6.3.1 Server log reports "Invalid license key (inconsistent authentication code)"

A common cause for this error message is that you have changed non-user editable parts of your license file. For example, you may have a three server license and have commented out two of the three server lines. The only parts of the license you are allowed to change are the host name (not the host ID) and the license server daemon port numbers. If you are using FLEX*net* v10.8 license server software, then you could also optionally add `SORT=` to the required license file INCREMENT lines. See the *FLEXnet End Users Guide*, which is supplied with your ARM development tools.

This message can also indicate that you are running an older version of the FLEX*net* license server software that is not compatible with the format of the license file that you have installed. This can happen if you upgrade your development tools, for example from ADS 1.2 to RVDS 3.x.

Refer to the FAQs in the ARM technical support website, under Tool Licensing, for further information about what versions of license server software are compatible with what versions of the ARM software development tools.

### 6.3.2 How do I update the license file my server uses?

If you want to change the license file used by a license server that is already running, you should shutdown your server, then restart it, referencing the new license file (users will not be able to check out licenses for the short period while the server is down).

Further information on these procedures can be found in the *FLEXnet End Users Guide*, which is supplied as a PDF with your ARM development tools.

  

### 6.3.3 Can I define the order in which licenses in a mixed version license file are issued?

Whether you can control the order in which licenses are issued by the server is dependent upon the version of the license server software you are using.

#### FLEX*net* v10.8 license server software

If you are using version 10.8 of the FLEX*net* license server software, there is a defined default order in which license files are sorted when parsed by the license server at startup. The default basic sorting rules within a single license file, from highest to lowest priority, are:

1. INCREMENTs are sorted alphabetically.
2. Uncounted INCREMENTs are issued before counted INCREMENTs.
3. Higher versions for an INCREMENT are issued before lower versions.
4. Licenses with the most recent START= date, if specified, are issued before older licenses.

This means that the default behaviour for a mixed version license file is that the server will issue licenses for the highest version of the tools first. This may be undesirable if you want to ensure that users requesting older licenses do not consume licenses for your latest development tools.

To define the use order of your licenses, you can add a `SORT=nnn` entry in the required INCREMENT line, where *nnn* is an integer from 001 to 999. The lower the `SORT` value, the higher the priority. The default sort value is 100. As this value is used when no `SORT` is defined by the user, lines with values less than 100 will appear before unmodified lines, and lines with values greater than 100 will appear after unmodified lines.

For example, if you have `compiler` INCREMENTs in your license file with versions 2.2 and 3.1, you can ensure that the 2.2 license will be made available first if you add a `SORT` attribute to the 2.2 INCREMENT as follows:

```
INCREMENT compiler armlmd 2.2 permanent 5 271940CDEFA0 \
SORT=010 DUP_GROUP=UHD ISSUER="ARM Ltd" ...
```

#### FLEX*lm* v9.2 or earlier license server software

If you are using version 9.2 or earlier of the FLEX*lm* license server software, there is no fixed order in which licenses for different versions of tools will be issued. This may mean that you may find that older versions of the development tools check out your licenses for a newer version, even though the older licenses are available. You may find

  

an options file allows you to limit which users have access to what versions of a tools license, as described in *How can I limit users' access to particular licensed features?* on page 6-16.

### 6.3.4 How can I tell how many floating licenses are in use?

To find out how many floating license seats are in use at a given point in time, you should run the `lmutil lmstat` command, with appropriate arguments, on the server. The license server log is not suitable for the purpose of usage analysis, as at high server loading or with certain types of license file configuration, you may get incomplete or misleading results.

The `lmutil lmstat` command can generate text output which will indicate which user is using what version of a license component, and when the license was granted. By selecting the appropriate arguments, such as `-i` for information from the FEATURE/INCREMENT line for the specified feature, or `-a` for all information, you can collect snapshot information of your license usage. You can then run the output through a text parser if you wish to analyze the data in more detail. Further information on the `lmutil lmstat` command can be found in the *FLEXnet End Users Guide*, which is supplied as a PDF with your ARM development tools.

You should be aware that there is a trade-off between increased temporal resolution of your usage data and server loading, especially if you have a high turnover licensing environment. The `lmutil lmstat` command can consume a significant fraction of your server's CPU resource, especially if the `-a` switch is used. At very high loadings (>1000 checkouts/minute) the resulting data are known to be inaccurate simply because not all transactions can be recorded during the data collection period.

### 6.3.5 Server log reports "(armlmd) cannot open lock file"

This error most commonly occurs on a Unix/Linux system if a previous instance of the `armlmd` license daemon was not shut down properly. Only one copy of `armlmd` can run on your license server at any given time. Attempting to start another copy of this daemon will cause an error.

When the ARM license daemon (`armlmd`) is started, it creates a file called `/var/tmp/lockarmlmd`. If `lmgrd` terminates abnormally, `armlmd` does not release the lock file because it will still be running.

To solve this problem, locate any license daemon processes. You can do this using the following command:

```
ps -a | grep daemon_name
```

where *daemon_name* is `lmgrd` or `armlmd`.

Next terminate these processes with:

`kill PID`

where *PID* is the process ID for the license daemon.

Delete the `/var/tmp/lockarmlmd` if it still exists.

You should now be able to restart the license server.

### 6.3.6 What version of the license server daemons should I use?

License server software consists of two parts: the ARM license server vendor daemon `armlmd` and the Macrovision FLEX*net* license server daemon `lmgrd`. You can upgrade to later versions of `lmgrd`, but should use the version of `armlmd` provided with the latest ARM tools you have installed. The latest Macrovision utilities, including `lmgrd`, can be downloaded from their website at `http://www.macrovision.com`. Newer versions of `armlmd` can only be obtained through ARM, either on your development tools installation media or from ARM License Support.

Older releases of the ARM license daemon are forwards compatible with later releases of `lmgrd`. For example, you could use `armlmd` version 7.2i together with `lmgrd` version 10.8.

**Note**

If your license server is running Solaris 5.6, you will not be able to use FLEX*net* version 9.0 utilities. Instead you should use version 9.2 utilities or higher. These newer utilities, including the `armlmd` vendor daemon, can be requested from ARM if you do not already have a product DVD-ROM or CD-ROM with this version of FLEX*net*.

License management utilities to run a license server on Windows x86, Solaris Sparc, and Linux x86 32 bit platforms can be found in the `/Utilities/FLEXlm/` or `/flexlm/` subdirectory of your ARM development tools CD.

At time of writing (February 2007), the latest ARM license daemon version was 10.8.

### 6.3.7 How can I limit users' access to particular licensed features?

As a floating license administrator, you can set aside specific features for named users or named client computers by using an options file. You can also prevent certain users or computers from being issued with a license of a particular type. This is particularly useful if you have a license that enables more than one version of the ARM development tools and you want to control what users have access to what versions. The mechanism to achieve this is an options file.

  

To use an options file, first you must write it, then configure your license server to use it.

### Writing your options file

You can create an options file in any text editor. ARM recommends that your options file has an .opt extension. When complete, copy the options file to each of your ARM license servers.

A sample options file is shown here, with some of the key syntax demonstrated. In this example, it is assumed that the license file contains both RVDS 3.0 and ADS 1.2 seats. There are two defined project groups with defined users, and a set of build computers. The administrator wants to limit the number of seats of a given feature on a group basis, and also wants to reserve RVDS 3.0 compiler seats for particular users and clients. A specific user is not to be granted an RVDS 3.0 compiler license.

The following permissions and restrictions are required:

- The build computers in the host_group "buildbox" must always have 2 compiler seats available, of no particular version.
- Users in group "project_talisker" (user1 to user5) must not be given more than three fromelf licenses of any version between them.
- Users in group "project_macallan" must always have one seat of compiler version 3.0 available.
- User7 cannot ever obtain a compiler license of version 3.0, despite being in group "project_macallan".

The options file to enable the above would look like this:

```
# License Options File example by ARM Limited
# ------------------------------------------
# This example should be modified as required for your own licensing
# environment.
# environment.
# Turn off case sensitivity for group and hostnames
# (Only valid in FLEXnet 10.x.  In FLEXlm 9.x, you need to ensure that
#  case of groups and
#  hostnames is consistent, and comment out the following line.)
#
GROUPCASEINSENSITIVE ON

# Groups are defined here
# --> use the form:  GROUP group_name user_list
#
GROUP project_talisker user1 user 2 user 3 user4 user5
GROUP project_macallan user6 user7 user8
```

```
# Host Groups are defined here
# --> use the form:  HOST_GROUP group_name host_list
#
HOST_GROUP buildbox buildpc01 buildpc02

# Define usage restrictions below
# --> use the form:  OPTION feature[:keyword=value]
# type {name | group_name}
#
RESERVE 2 compiler               HOST_GROUP buildbox
MAX 3 fromelf                    GROUP project_talisker
RESERVE 1 compiler:version=3.0   GROUP project_macallan
EXCLUDE compiler:version=3.0     USER user7
```

- The `RESERVE` option puts aside a defined number of seats. You can specify an exact version of the feature (e.g., 3.0) if required.
- The `MAX` option puts a limit on the number of seats of a given feature.
- The `EXCLUDE` option prevents a user or group from being granted a license. This overrides any settings to include the user.

Other options are available and are described in Chapter 5 of the*FLEXnet End User Guide*.

#### Configuring your license server to use the options file

You will need to edit your ARM tools license file so that the options file is called on the VENDOR line. For example, if your options file is called `armlmd.opt`, in your license file you need to add `VENDOR armlmd option=armlmd.opt`. This must be done on each of your ARM license servers.

Restart your license server(s). If you examine the server log you will see confirmation that the options file is being used and that your restrictions defined in the options file are being used.

### 6.3.8 Why am I getting “DENIED” messages in the server log?

DENIED is not necessarily an error message. It only indicates a real problem if there is a corresponding license failure on the client side. This real failure can occur if a client invokes a tool and it cannot find a valid license file for it, and the failure is reported back to the client.

You might be getting a DENIED message if there are no seats available and the request is queued. See *Do ARM licenses support queuing?* on page 6-5.

  

However the message can also occur if you are using a merged license file with multiple versions of the tools. For instance, consider a floating license with both RVDS 3.1 and RVDS 2.2 components. If a user requests an RVDS 3.1 compiler license and the license server locates the RVDS 2.2 compiler license first, there is an immediate version mismatch and the request is denied and recorded in the server log. However the server then continues to look through the available licenses and will find the RVDS 3.1 license. The server will then let the user check out the license.

In the server log, a typical sequence of an initial license failure followed by a successful checkout looks like this:

```
6:35:09 (armlmd) DENIED: "compiler" user@mycomputer (License server does not
support this version of this feature (-25,334))

6:35:09 (armlmd) OUT: "compiler" user@mycomputer
6:35:09 (armlmd) IN: "compiler" user@mycomputer
```

The initial DENIED is followed immediately by a successful checkout.

If you wish to suppress such messages in the server log, you can use the command `NOLOG DENIED` in a server options file. Further information on options files can be found in the *FLEXnet End User Guide*.

  

# Glossary

The items in this glossary are listed in alphabetical order, with any symbols and numerics appearing at the end.

**Client** The computer on which you are running the ARM development tools. Also known as *Host*.

**Counterfeit Resistance Option (CRO)**
Counterfeit Resistance Option enables the encryption of license keys using Public Key Encryption.

**CRO** *See* Counterfeit Resistance Option.

**FLEX*lm*** The license management software (see *License management software*) used to control the use of an ARM application.

**Host** In this manual, host means the computer on which you are running ARM applications or FLEX*lm*. In other contexts the term can mean a computer that provides data and other services to another computer. Also referred to as *Client*.

**License management software**
Software that controls the usage of software applications programs. For example, a program might be licensed for use on one specific computer only, or for simultaneous use by a limited number of users on a network. See also FLEX*lm*.

**Master server** The server, in a three server redundant arrangement, that issues licenses. The master server must be started before the two secondary servers, and must be listed first in the license file and client license environment variables. Should the master server fail, one of the two secondary servers becomes the master.

**Permanent license** A license that enables you to use an ARM application. See also *License management software*.

**Platform** A combination of a particular type of computer hardware meeting a minimum specification with a particular operating system of a specific release or later.

**Server** A computer that issues floating licenses to a *client* computer. ARM licenses can be used with either a single server, or triple (redundant) server arrangement.

# Index

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