Honeywell

License Installation and Administration AXM

LA20-200
Release 200

Honeywell

License Installation and Administration AXM

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5/96

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About This Publication

This publication is intended for the System Administrator. It describes how to install and set up the software licenses for A^X^M Release 200 and/or OpenDDA R200. This publication identifies how to

- obtain license authorization
- install license software on the file server
- set up the licensing software
- troubleshoot the license installation
- customize the license administration options file
- facilitate administration with FLEX*lm* Utilities.

The publication is intended to supplement the existing installation and administration information provided in

- Application Module^X^ System Administration
- Application Module^X^ Customer Release Guide
- OpenDDA Customer Release Guide.

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Acronyms

AXM.....Application ModuleX (Application Module with Extensions)
DAT.....Digital Audio Tape
ID .....Identity
LCN ..... Local Control Network
NFS.....Network File System
OpenDDA ..... Open Data Definition and Access
PIN .....Plant Information Network
TCP..... Transmission Control Protocol
TDC..... Total Distributed Control
UDP ..... User Datagram Protocol

Definitions

Client	Honeywell software components that make licensing requests.
Daemon	Process that "serves" clients; sometimes referred to as a server. There are two daemons. The license manager daemon is named **`lmgrd`**. The Honeywell daemon is named **`hwiaclmgrd`**.
Feature	Any Honeywell software component that needs to be counted. For A^{X}M R200 examples of features are OpenDDA executable or A^{X}M Personality itself.
FLEX*lm*	A network-wide floating licensing package that allows a software application to be licensed on a concurrent-usage, as well as on a per-computer, basis.
Floating license	A type of license that allows anyone on the network to use the licensed software up to the limit specified in the license file. Floating licenses do not require hostids. For A^{X}M R200, OpenDDA executable is licensed as a floating license.
License	The right to use a feature. This right is restricted by various means including count, nodes, user names, etc. The restriction is defined in a license policy also known as a license file.
License file	An end-user ASCII file that contains descriptions of the server nodes that can run license daemons, the various vendor daemons and the licenses (features) for all supported products.
Node-locked license	A type of license where the licensed software can only be used on one node. A node-locked license requires a hostid for each node on which the licensed software is to execute. For A^{X}M R200, the A^{X}M Personality load is licensed as a node-locked license.
Server node	Computer system that is running the license daemon software. It contains all dynamic information regarding the usage of all the features and supports redundancy.

References

Publication Title	Publication Number	Binder Title	Binder Number
Application Module^X System Administration	AX11-200	Application Module^X	TDC 2094
OpenDDA Customer Release Guide	DD04-200	OpenDDA	TDC 680

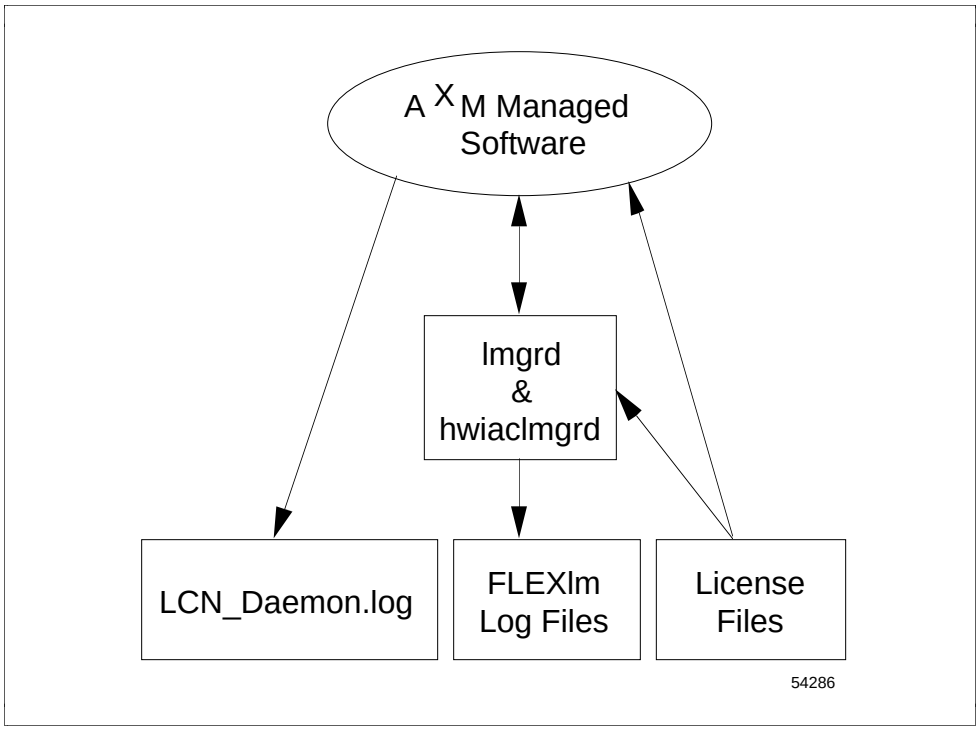
Section 1 – Licensing Overview

1.1 Licensing Concepts

Introduction

The Honeywell license manager is based on a network-wide floating license package, FLEX*lm*, provided by Globetrotter Inc. This package uses a client/server model with a license daemon (server) running on one or more servers and the managed software running on one or more clients. The managed software can run on the same machine as the license daemon. There are six main licensing components, including the AXM Managed Software. The figure below illustrates the relationship among these components.

Figure 1-1 Components of the AXM Licensing System



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Purpose of the licensing components

The following table summarizes the purpose of the various components of the AXM licensing system.

Table 1-1 Summary of Licensing Components

Component	Purpose
AXM Managed Software	For AXM R200, this is AXM personality load and OpenDDA build executable (/opt/DDA/bin/dda). These components are built with a license module which interfaces directly with the license file and lmgrd. AXM Managed Software is also referred to as licensed software components.
lmgrd	A background process which provides a common focal point for all applications to locate their vendor daemon, hwiaclmgrd. One AXM or HP-UX (or three, if license redundancy is desired) is selected as the license server. All other AXM and HP-UX nodes on the network communicate with the license server node via the license file.
hwiaclmgrd	The child process of lmgrd which monitors compliance with license policy.
license file	An ASCII human readable file with licensing policy. This file is provided to you by Honeywell upon receipt of hostid information.
log file	A log file of actions taken by FLEXlm and vendor messages. Any licensed component which relies on the license daemon (server) reports messages via this log.
LCN_Daemon.log	For AXM personality load, licensing messages are reported to this log.

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Types of licensing

Honeywell software components which are licensed are referred to as features in the license file. A feature is licensed as either floating or node-locked. Node-locked features are locked to the hostid of the HP-UX. This means only the licensed node(s) can execute the feature. A node-locked feature can be counted or uncounted. If uncounted, then there is unlimited use permitted on the node-locked node.

A floating license does not require a hostid but instead requires a license count; that is, the number of purchased licenses. This type of license allows you float the number of purchased licenses among the nodes on your network.

A^{X}M R200 is licensed as shown in the table below:

Table 1-2 A^{X}M License Types

Feature	License Type	Counted
A^{X}M Personality Load	node-locked	no
OpenDDA Build Commands	floating	yes

ATTENTION

The execution of an OpenDDA application is **not** licensed in A^{X}M R200.

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License request process

The following table describes the license request process. This process initiates when a licensed software component such as AXM Personality load or any OpenDDA build command (`/opt/DDA/bin/dda`) executes.

Table 1-3 License Request Process

Step	Action
1	The license module in the licensed software component finds the license file. If the licensed component is node locked and not counted, then the license request is serviced without communication with the license server. This is the case with AXM Personality load. Otherwise, the license module within the license component uses the host name of the license server and the port number of the license manager daemon. The request process continues.
2	The licensed software component establishes a connection with the license manager daemon, *lmgrd*, and tells it that it needs to talk to *hwiaclmgrd*.
3	*lmgrd* determines which machine and port correspond to the master vendor daemon and sends that information back to the client.
4	The licensed software component establishes a connection with hwiaclmgrd and sends its request for a license.
5	*hwiaclmgrd* checks in its memory to see if any licenses are available and sends a grant or denial back to the licensed software component.
6	The license module in the licensed software component grants or denies use of the feature, as appropriate.

Section 2– Software Package

2.1 Overview

Software Media

Honeywell licensing is distributed on a 4mm DAT tape.

Tape Contents

The tape is an HP-UX update format tape. The software on this tape can be loaded into an AXM or HP-UX workstation that has a local DAT drive by using the ***update*** command. It can be loaded into a net distribution server by using the ***updist*** command.

Refer to Section 3, Installing and Updating LicenseSoftware for additional information on the installation procedure.

Section 3 – Installing and Updating License Software

3.1 Overview

What will be covered

This section references the procedures for loading the Honeywell License software from:

- a tape drive onto the local HP-UX node or Application Module^{X}
- a tape drive onto the netdist server
- a netdist server to the Application Module^{X}

Updist Procedure

Refer to OpenDDA R200 Customer Release Guide, Section 3, Installing OpenDDA 200, paragraphs 3.2, Load from a Tape Drive to a Local HP-UX Node, 3.3, Installing OpenDDA on the netdist Server and 3.4, Loading OpenDDA from a netdist Server. The partition name is HONEYWELL-LMGR. The partition description is Honeywell IAC License Mgr.

3.2 Directories and Files Created

Summary of files and directories

The following are the directories and files generated by the Honeywell License installation procedure.

/opt/hwiaclicense/bin

Directory: /opt/hwiaclicense/bin

Files:
hwiaclmgrd
lmcksum
lmdiag
lmdown
lmgrd
lmhostid
lmremove
lmreread
lmstat
lmver

lmgrd and *hwiaclmgrd* are license daemon (server) executables. Refer to Section 6, Installing the License Server, for details. The remaining files are license utility executables. Refer to Section 8, License Administration FLEXlm Utilities, for details.

/opt/hwiaclicense/etc

Directory: /opt/hwiaclicense/etc

Files:
hwlicenserc
license.default

hwlicenserc is a script file to automatically start the license daemons (servers) on a reboot. *hwlicenserc* is called by */etc/rc* during setup. */etc/rc* is Honeywell's modified version of the HP-UX script that is executed each time HP-UX boots up. This modified version of */etc/rc* is installed from the AXM personality tape. *license.default* is a skeletal license file from which an authentic license file can be created.

/var/hwiaclicense/log

Directory: /var/hwiaclicense/log

Files: None as a result of the install. This is the default directory for license activity log.

Section 4 – Installing the License File

4.1 Overview

Privileges

You must have system administrator privileges (i.e., root) in order to install the license file and servers.

License Type

Honeywell licensed software must use one of the following:

- node-locked licensing, where a specific machine is licensed for use
- network (floating) licensing, where a specific number of licenses are available to any machine on the network which can access the software
- a combination of both.

Your site's licensing depends on the software and license options that you purchased.

Enabling software with the temporary license

The R200 A^{X}M and OpenDDA software is distributed with a paper copy of a temporary license. Unlike your permanent license, the temporary license has a 90-day limit and does not require the license servers *lmgrd* and *hwiaclmgrd*. You can use this to quickly enable your software. However, you must install your permanent license file within the time specified in the temporary license file. You must do the following to enable your software with the temporary license:

- Edit the license file with the temporary file information
- Set up the license environment variable

Enabling Software

You must do the following to enable your software:

- Obtain keys.
- Edit the license file.
- Set up the license environment variable.
- Determine if an options file is required. Refer to Section 5, End-User Licensing Options, for setting an option file.
- Install the license servers.

ATTENTION

ATTENTION — Refer to Section 6, Installing the License Server, to select your license server nodes.

Continued on next page

4.1 Overview, Continued

Obtaining Keys

Perform the following steps to obtain your permanent license file.

Table 4-1 Procedure to Obtain Keys

Step	Action
1	Get the server name and IP address of each license server node. Refer to Section 6, "Installing the License Server," to select your license server node(s). Run **`/opt/hwiaclicense/bin/lmhostid internet`** to get the IP address of the server machine(s) on the machine you are using. Use the following command as an alternative: **`/etc/ping hostname`**. Use CTRL C to quit the ping command. If you are only licensing OpenDDA on a standalone HP-UX with no IP address, then you must get the hostid. Run **`/opt/hwiaclicense/bin/lmhostid`** to get the hostid of the server machine(s) on the machine you are using. Use the following command as an alternative: **`echo `uname -i` 16op	dc`**  Note: the ` symbols in the above line are accent grave characters, **not** single quotation mark characters. Use the following to obtain the server name: **`uname -n`**
2	Get the IP address for each node-locked license purchased for a different node other than the server node(s). Refer to step 1. For A^{X}M R200 you will provide the IP address of each A^{X}M purchased.
3	Contact Honeywell World Wide Software Control Center with the information obtained in steps 1 and 2 to receive the necessary information to create your license file.

Continued on next page

4.2 License File Management

Editing the License File

The default license file, `license.default` located at `/opt/hwiaclicense/etc` consists of the following lines:

```
SERVER <server_name> <server host-id> 7304
DAEMON hwiaclmgrd /opt/hwiaclicense/bin
FEATURE OpenDDA Executable hwiaclmgrd 299.999 1-jan-00 <# of licenses> <key> \
         VENDOR_STRING=anyhost DUP_GROUP=U ck=<##>
FEATURE AxM Personality hwiaclmgrd 299.999 1-jan-00 0 <key> \
         VENDOR_STRING=<axm host namd> HOSTID=<axm host id> ck=<##>

#NOTE: You can edit the hostname on the server line (1st arg),
#      the port address on the server line (3rd arg), the path
#      to the daemon line (2nd arg), or any
#      right-half of a string (b) of the form a=b where (a) is all
#      lowercase. (For example, xxx in vendor_info="xxx" can be
#      changed). Any other changes will invalidate this license.
```

Copy **`license.default`** to **`license.dat.`**

ATTENTION

ATTENTION — Use any text editor to make the following changes. For your convenience, fields that require editing are identified in the default file with < >. You must replace those fields with the information as received from Honeywell. Note that the < > must be deleted. Any amount of white space of any type can separate the components of license file lines. To insert a comment line, begin the line with a '#' character. Lines can be continued with a '\' character.

Table 4-2 Procedure to edit License File

Step	Action
1	Edit the SERVER line, entering the server name and hostid that were used to obtain your license file input. Insert 2 additional SERVER lines if you are using redundant servers.
2	Edit the path of the DAEMON line if you do not use the default location of **`hwiaclmgrd.`** If you are using a license options file, you must specify the path of that file. Refer to Section 4, End-User Licensing Options.
3	**CAUTION** You must enter the feature lines exactly as directed by the Honeywell World Wide Software Control Center. Failure to do so will result in an invalid license file. All entries are case sensitive. Replace the default FEATURE line with those received from Honeywell World Wide Software Control Center.

Continued on next page

4.2 License File Management, Continued

Updated license file

A license file updated from the `license.default` consists of athe following lines:

```
SERVER whoami INTERNET=164.145.136.209 7304
DAEMON hwiaclmgrd /opt/hwiaclicense/bin
FEATURE OpenDDA_Executable hwiaclmgrd 299.999 25-dec-95 15 1BDC6021D55977156DF6
\
        VENDOR_STRING=anyhost DUP_GROUP=U ck=55
FEATURE AxM_Personality hwiaclmgrd 299.999 25-dec-95 0 8BDC20D173BE6F9450BA
\
        VENDOR_STRING=tomba HOSTID=INTERNET=164.145.136.208 ck=27
FEATURE AxM_Personality hwiaclmgrd 299.999 25-dec-95 0 6BDC20614958697DFE2E
\
        VENDOR_STRING=whoami HOSTID=INTERNET=164.145.136.209 ck=236
FEATURE  AxM_Personality hwiaclmgrd 299.999 25-dec-95 0

#NOTE: You can edit the hostname on the server line (1st arg),
#      the port address on the server line (3rd arg), the path
#      to the daemon on the daemon line (2nd arg), or any
#      right-half of a string (b) of the form a=b where (a) is all
#      lowercase. (For example, xxx in  vendor_info="xxx" can be
#      changed).  Any other changes will invalidate this license.
```

License File Update

You can edit only the following four data items in the license file without contacting Honeywell:

- servernames on SERVER lines
- port-numbers on SERVER lines
- daemon pathname on DAEMON lines
- options file pathname on DAEMON lines

All other changes require a new license file issued from Honeywell.

Continued on next page

4.2 License File Management, Continued

License file validation

Run the license utility `lmcksum` to validate that your license file is correct. `lmcksum` is located at `/opt/hwiaclicense/bin/` To validate the license file, type:

```
/opt/hwiaclicense/bin/lmcksum -c /opt/hwiaclicense/etc/license.dat
```

Thefollowing is an example of using the `lmcksum` utility:

```
>: /opt/hwiaclicense/bin/lmcksum -c
/opt/hwiaclicense/etc/license.dat
lmcksum - Copyright (C) 1989-1994 Globetrotter Software, Inc.
lmcksum: using license file "/opt/hwiaclicense/etc/license.dat"

     178: SERVER ws21 INTERNET=164.145.178.119 7304
      38: DAEMON hwiaclmgrd /opt/hwiaclicense/bin
OK:   43: FEATURE OpenDDA_Executable hwiaclmgrd 299.999 1-jan-96
35BDCC08117A7CF0E9563
VENDOR_STRING=anyhost
DUP_GROUP=U ck=43
OK:   57: FEATURE AxM_Personality hwiaclmgrd 299.999 1-jan-00
05B8CE031D9FDE4F64E27
VENDOR_STRING=ws21
HOSTID=INTERNET=164.145.178.119 ck=57
      61: (overall file checksum)
>:
```

License File Copies

Copy the updated license file `license.dat` to:

`/opt/hwiaclicense/etc`

of each AXM or HP-UX that will execute the products identified in your license file. This is required in order to eliminate a point of failure when licenses are requested. This is particularly critical to the feature AxM_Personality. Save `license.dat` to the backup file.

License File Environment Variable

Set the environment variable LM_LICENSE_FILE to the pathname of your license file. If you use the default location and name of the license file and C shell, then type:

`setenv LM_LICENSE_FILE /opt/hwiaclicense/etc/license.dat`

Honeywell recommends that you add the above command line to your shell startup.

Continued on next page

ATTENTION

Setting the environment variable as described above applies not only to the system administrator, but, to all users of licensed products.

ATTENTION

ATTENTION — LM_LICENSE_FILE is also defined in /etc/opt/TDC_Open/common/tdc3krc and /opt/hwiaclicense/etc/hwlicenserc. It is defined as /opt/hwiaclicense/etc/license.dat. If you do not use the default location and file name you will need to

- update /etc/opt/TDC_Open/common/tdc3krc and /opt/hwiaclicense/etc/hwlicenserc by using any text editor

or

- copy your license file to the default location and name.

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4.2 License File Management, Continued

Licensed Node Unavailability

In general, no licensing changes are required in the event that one of your licensed nodes becomes unavailable. There are two exceptions that apply only to the use of OpenDDA build commands:

- You are running OpenDDA build commands on a standalone HP-UX node that is node-locked to the HP-UX hostid.
- The license server node becomes unavailable for an unacceptable period of time.

In either case, you need to notify Honeywell of the situation. You will receive instructions on how to create a temporary license file. Unlike your license file, this temporary license file has an expiration date and does not require the license servers **`lmgrd`** and **`hwiaclmgrd`**. This situation requires that you copy the temporary license file to `/opt/hwiaclicense/license.dat` on each licensed node.

If it is necessary to change the CPU board of a standalone node, or to select a new license server node, you must follow the steps identified in subsection 4.1 to obtain a new license file. Replace the temporary license file with the new license file on each node. On the license server node, use the **`lmreread`** utility to signal the servers to read the changes. (Refer to Section 8.)

ATTENTION

License server failure has no impact on the AXM personality load function.

Multiple License Files

It may be necessary to support multiple license files if you are running software from another vendor which uses the FLEX*lm* licensing package provided by Globetrotter Software Inc. (formerly Highland Software). Refer to Section 7, Multiple Vendor Support of FLEX*lm* Licensed Products, for the various options to handle this situation.

Section 5 – End-User Licensing Options

5.1 Option File Management

Options File

You can customize your use of the licensing software via the license daemon options file which you create with any text editor. This options file allows you to reserve licenses for specified users or groups of users, to allow or disallow use of your software to certain people, and to set software timeouts. The daemon options file is specified in the license file on the DAEMON line as the fourth parameter as follows:

DAEMON daemon-name path [options-file]

Honeywell recommends that you store your options file along with your license file in the installed directory, /opt/hwiaclicense/etc. It must be copied to each node where licensed products are executed. For an option file named license.options, the DAEMON line must be updated as follows:

```
DAEMON  hwiaclmgrd  /opt/hwiaclicense/bin  /opt/hwiaclicense/etc/license.options
```

Continued on next page

Options File Keywords

Table 5-1 Available Options

Option	Description
INCLUDE	Specifies a list of users allowed access to a particular feature. EXCLUDE overrides INCLUDE.
INCLUDEALL	Specifies a list of users who are allowed access to all supported features.
EXCLUDE	Disallows a list of users use of a particular feature. EXCLUDE overrides INCLUDE.
EXCLUDEALL	Disallows a list of users use of all features.
HOST_GROUP	Allows the specification of a group of hosts for use in the other commands. Multiple HOST_GROUP lines for the same group name will have the effect of concatenating all members specified on all the HOST_GROUP lines.
GROUP	Specifies a group of users for use with other commands.
LINGER	Causes license to be held by **`hwiaclmgrd`** for a period after the licensed software checks them in or exits.
NOLOG	Causes messages of the specified type to be filtered out of the license daemon's log output; useful to save disk space.
RESERVE	Insures that the licensed software will always be available to one or more users on one or more host computer systems.
TIMEOUT	Specifies idle timeout for a feature, returning it to the free pool for use by another user

Continued on next page

5.1 Option File Management, Continued

Options File Format

A license daemon options file consists of lines in the following format:

INCLUDE *feature type name*
INCLUDEALL *feature type name*
EXCLUDE *feature type name*
EXCLUDEALL *feature type name*
GROUP *name user1 user2 ...*
HOST_GROUP *name host1 host2 ...*
LINGER *feature seconds*
NOLOG {IN | OUT | DENIED | QUEUED}
RESERVE number feature *type name*
TIMEOUT *feature seconds*
Where *type* is one of the following: USER, HOST, DISPLAY, GROUP, or INTERNET.

Lines beginning with a pound sign character ("#") are ignored, and can be used as comments. Lines can be up to 2000 characters, with backslash '\' continuation character used to make a line easier to read and type.

For those options which take an internet address, the address is specified as follows:

a.b.c.d

where any of a,b,c,d can be "*". For example:

INCLUDEALL INTERNET 192.*.*.*

allows any user from network number 192 to access any feature supported by **`hwiaclmgrd`**.

Options File Example

The following options file would reserve a copy of feature OpenDDA_Executable for user "pat", three copies for user "lee", and a copy for anyone on a computer with the hostname of "terry", and would cause QUEUED messages to be omitted from the log file. In addition, user "joe" would not be allowed to use the compile feature:

RESERVE 1 OpenDDA_Executable USER pat
RESERVE 3 OpenDDA_Executable USER lee
RESERVE 1 OpenDDA_Executable HOST terry
EXCLUDE OpenDDA_Executable USER joe
NOLOG QUEUED

If this data were in the file /opt/hwiaclicense/license.options, then you would modify the license file DAEMON line as follows:

```
DAEMON  hwiaclmgrd  /opt/hwiaclicense/bin    /opt/hwiaclicense/etc/license.options
```

Section 6 – Installing the License Server

6.1 Overview

Introduction

The network license management package included within A^{X}M R200 and OpenDDA R200 requires that the daemon **`lmgrd`** be running on one network node, or , optionally, on three network nodes, if redundant license servers are deemed necessary. You can start the **`lmgrd`** daemon directly or modify your system files to start it automatically at boot time.

Choose a License Server

If your X-side data (for example, OpenDDA applications) is split among two or more server nodes and work is still possible when one of these nodes goes down or off the network, then multiple license server nodes can be used. Otherwise, only one license server is required. Regardless of the redundancy option, an effort should be made to choose stable systems as license server nodes; in other words, do not pick systems that are frequently rebooted or shut down. You should not run the license server on diskless nodes. **`lmgrd`** and **`hwiaclmgrd`** should be LOCAL to the system which will run them.

Redundant License Servers

The network license management system supports a set of three redundant license servers. If any two of the three license servers are up and running, the system is operational. To create a license file that uses redundant servers, specify three SERVER lines with three different hostids. When redundant servers are started, they elect a master, which performs all licensing operations. Should the master fail, if two servers are still running, one of the remaining two will be elected master. Licensing operations will continue.

ATTENTION

ATTENTION — If you already have the license manager daemon, **`lmgrd,`** running, refer to Multiple Vendor Support of FLEXlm License Products, Section 7.

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Start the License Server

You can only start the **lmgrd** on the server node(s) specified in the license file. **lmgrd** automatically runs in the background. **lmgrd** automatically starts the vendor daemon, **hwiaclmgrd.** Execute the following C shell command to start **lmgrd**:

```
/opt/hwiaclicense/bin/lmgrd  >&  /var/hwiaclicense/log/log
```

Make sure LM_LICENSE_FILE is set to `/opt/hwiaclicense/etc/license.dat`.

In order to automate the startup of **lmgrd**, you must update the appropriate script file for boot startup on the license server node only. For an AXM, this file is `/etc/rc`. This is Honeywell's modified version of the HP-UX script that is executed each time HP-UX boots up. The modified version of `/etc/rc` is available if you have installed the AXM Personality tape.

Uncomment the following line in /etc/rc to start **lmgrd** automatically every time you reboot the server:

```
audit_start
# hwl_start   # uncomment if this is a license server node
;;
```

To uncomment, remove the left-most "#" symbol.

ATTENTION

Only make the above change to /etc/rc on AXM node(s) where **lmgrd** is to execute.

ATTENTION

If your license server node is not an AXM, then you can update the appropriate boot startup script rile to call the following script file:

`/opt/hwiaclicense/etc/hwlicenserc`

Verify that `lmgrd` and `hwiaclmgrd` are running

You can verify that **lmgrd** and **hwiaclmgrd** are running by typing

```
ps  -ef  |  grep  lmgrd
```

You can also look at the log located at /var/hwiaclicense/log/log on the license server node.

6.2 Options

Startup options

The usage of **lmgrd** is as follows:

```
lmgrd [ -c license_file ] [ -t timeout_interval ]
[ -s timestamp_interval ] [ -p ] [ -2 ] -v [-x
lmdown] [-x lmremove]
```

Where:

-c license_file	Use the license file named. If this option is not specified, **lmgrd** looks for the environment variable, LM_LICENSE_FILE.
-t timeout_interval	Sets a timeout interval, in seconds, during which redundant daemons must complete their connections to each other. The default value is 10 seconds. A larger value may be desirable if the daemons are being run on busy systems or a very heavily loaded network.
-s timestamp_interval	Specifies the logfile timestamp interval in minutes. The default is 360 minutes.

6.2 Options, Continued

Startup options, Continued

-p	Restricts the usage of **lmdown**, **lmreread**, and **lmremove** to a license administrator who is by default root. If there is a UNIX group called "lmadmin" then use is restricted only to members of that group. If root is not a member of this group, then root does not have permission to use any of the above utilities. Requires the **-2** option.
-2	Uses the FLEX*lm* v2.x daemon startup protocol.
-v	Prints **lmgrd**'s version number and copyright and exits.
-x lmdown	Disallows the **lmdown** command (no user can run lmdown).
-x lmremove	Disallows the **lmremove** command (no user can run **lmremove**).

6.3 License Administration

License Activity Log Administration

The daemon log file output can be switched after the daemons are running. The technique to do this involves piping the stdout of **lmgrd** to a shell script that appends to the file for each line.

Instead of the "normal" startup type:

```
lmgrd  >  /var/hwiaclicense/log/log
```

Start **lmgrd** this way typing:

```
lmgrd | sh -c 'while read line; do echo "$line" >>
/var/hwiaclicense/log/log  ;  done'
```

With this startup method, the output file 'log' can be renamed and a new log file will be created. You could even make 'log' a symbolic link and change the value of the link to switch the log file.

Section 7 – Multiple Vendor Support of FLEX*lm* Licensed Products

7.1 Overview

Available options

In order to avoid conflicts between products from multiple vendors using FLEX*lm*, you have the following choices:

- Multiple license server nodes; each running one **`lmgrd`** and one license file (option #1)
- One license server node running one **`lmgrd`** and one license file (option #2)
- One license server node running multiple **`lmgrd`**s and multiple license files (option #3)

It is important to understand that there is a one-to-one relationship between **`lmgrd`** and the license file. In other words, each **`lmgrd`** controls only one license file. Option #1 is simpler from an installation point of view but requires more administration effort. With option #3, you would have only one server to administer, but many **`lmgrd`**s.

Combining License Files

If you have two or more products whose license servers run on the same node (as defined in the license files on the SERVER lines), you may be able to combine the license files into a single license file. If the SERVER lines in those files have identical hostids, then you can combine the files into a single file. If the SERVER lines have different hostids, then you must keep the license files separate. Specifically, you can combine two license files if

- the number of SERVER lines in each file is the same
- the hostid of each SERVER line in one file exactly matches the hostid field of each SERVER line in the other file.

If your license files meet the above conditions, then you may choose to combine license files and run a single lmgrd. Refer to subsection 7.2, Combining License Files from Multiple Vendors, to combine the files. If your license files do not meet the above conditions, then you are required to keep the license files separate and run separate copies of **`lmgrd`** for each license file. Refer to subsection 7.3, Using Separate License Files on the Same Server Node.

Continued on next page

7.2 Combining License Files from Multiple Vendors

Edit Procedure

Use any text editor to read all the compatible license files into a single file. Edit out the extra SERVER lines so that only one set of SERVER lines remains. Save this file as your new combined license file. Update the environment variable, LM_LICENSE_FILE if you wrote the file to a different filename than currently used.

FLEX*lm* Compatibility Rules

It is possible that other FLEXlm-licensed products are using a different version of FLEXlm. Honeywell IAC licensed products use version 4.1 of FLEX*lm*. In order to ensure compatibility, comply with the following two compatibility rules:

- Use the newest version of **`lmgrd`** and the newest version of each vendor daemon (for example, **`hwiaclmgrd`**)
- Use the newest FLEX*lm* utilities if they are FLEX*lm* v2.4 or later.

Use **`'what'`** or **`'lmver'`** command to determine the version of a license utility. Refer to Section 8, License Administration FLEX*lm* Utilities.

7.3 Using Separate License Files on the Same Server Node

Incompatible license Files

Incompatible license files means you must run a separate copy of **lmgrd** for each license file. Remember the following when running **lmgrd** separately:

- The port number on the SERVER line of each license file must be unique. You can use any text editor to change the port number in each license file.
- You must make sure that you are using a compatible version of lmgrd when you start it up for a particular license file. This can be done by either using an explicit path to **lmgrd**, or by renaming **lmgrd** to something specific for that product.

LM_LICENSE_FILE Environment Variable

Set the LM_LICENSE_FILE environment variable to point to multiple license files as follows:

```
setenv LM_LICENSE_FILE <license path 1>:<license path 2>
```

Running lmgrd

You must execute **lmgrd** separately for each license file. Invoke **lmgrd** with the **-c** option in order to specify the explicit location of your license file. You should also specify the exact location of **lmgrd** if you are using separate versions.

Section 8 – License Administration FLEX*lm* Utilities

8.1 Overview

What will be covered

The following FLEX*lm* utilities assist the System Administrator to manage the licensing activities on the network. These utilities are included in the /opt/hwiaclicense/bin directory:

- **lmcksum**
- **lmdiag**
- **lmdown**
- **lmhostid**
- **lmremove**
- **lmreread**
- **lmstat**
- **lmver**

8.2 Utilities

lmcksum

The **lmcksum** utility will calculate a checksum of the license file. This is helpful to verify data entry errors at your site. **lmcksum** will print a line by line checksum for the file as well as an overall file checksum.

lmcksum ignores all fields that do not enter into the license key computation, such as server node name and port number.

By default, **lmcksum** operates on license.dat in the current directory. Use **-c license_file** if you want to checksum another license file.

lmdiag

The **lmdiag** utility allows you to diagnose problems when you cannot check out a license.

Usage:

```
lmdiag  [-c <license_file>] [-n]  [feature]
```

Where:

-c license_file	Path to the file to diagnose.
-n	Runs in non-interactive mode; **lmdiag** will not prompt for any input in this mode. In this mode, extended connection diagnostics are not available.
feature	Diagnoses this feature only.

Continued on next page

lmdiag, Continued

If no feature is specified, **lmdiag** will operate on all features in the license file(s) in your path. **lmdiag** will first print information about the license, then attempt to check out each license. If the checkout succeeds, lmdiag will indicate this. If the checkout fails, **lmdiag** will give you the reason for the failure. If the checkout fails because lmdiag cannot connect to the license server, then you have the option of running "extended connection diagnostics".

These extended diagnostics attempt to connect to each port on the license server node, and can detect if the port number in the license file is incorrect. **lmdiag** will indicate each port number that is listening, and if it is an **lmgrd** process, **lmdiag** will indicate this as well. If **lmdiag** finds the vendor daemon for the feature being tested, then it will indicate the correct port number for the license file to correct the problem.

lmdown

The **lmdown** utility allows for the graceful shutdown of **lmgrd** and **hwiaclmgrd** on all nodes.

The valid license file is located at /opt/hwiaclicense/etc directory. If you wish to restrict the use of **lmdown** to license administrators, start **lmgrd** with "**-2 -p**" switch. It is reasonable to protect the execution of **lmdown,** since shutting down the servers will cause loss of licenses and thus cause severe disruption to the use of licensed software components. To disable **lmdown**, the license administrator can use "**lmgrd -x lmdown**".

Usage: **lmdown [-c <license_file>]**

Where:

-c <license_file>	Uses the specified license file. If this option is not specified, **lmdown** looks for the environment variable LM_LICENSE_FILE.

ATTENTION

The **lmdown** utility is the preferred shutdown method rather then use of 'kill' command.

lmhostid

The **lmhostid** utility is used to print the correct hostid value on any machine supported by FLEX*lm.* On HP-UX, the machine ID as returned from the uname command is displayed.

Usage: **lmhostid**

The output form **lmhostid** will be similar to the following:
lmhostid-Copyright (C) 1989, Globetrotter Software, Inc.
The FLEX*lm* host ID of this machine is "1200abcd".

Continued on next page

ATTENTION

ATTENTION — If the application is still active when it is removed with **lmremove**, it will simply checkout the license again.

lmremove

The **lmremove** utility allows the system administrator to remove a single user's license for a specified feature. This may be necessary when the licensed user was running the software on a node that subsequently crashed. Due to the way TCP works, it can take several hours for the license server to detect that the user is gone. This situation will sometimes cause the license to remain unusable.

lmremove will allow the license to return to the pool of available licenses.

Usage:

lmremove [-c license_file] <feature> <user> <host> <display>

-c *license_file*	Use the license file named.
feature	The name of the feature checked out by the user (for example, OpenDDA_Executable or AxM_Personality).
user	The name of the user whose license you are removing.
host	The name of the host the user is logged in to.
display	The name of the display where the user is working.

ATTENTION

ATTENTION — If the **-c** option is used, the license file specified will be read by **lmreread**, not by **lmgrd**; **lmgrd** re-reads the file it read originally. Also, **lmreread** cannot be used to change server node names or port numbers. **hwiaclmgrd** will not re-read its option file as a result of **lmreread**.

lmreread

The **lmreread** utility causes the license daemon to reread the license file and start any new vendor daemons that have been added. In addition, all pre-existing daemons will be signaled to re-read the license file for changes in feature licensing information. If the optional daemon name is specified, only the named daemon will re-read the license file (in this case, **lmgrd** does not re-read the license file either).

Usage: **lmreread [*daemon*]**

Continued on next page

ATTENTION

ATTENTION — **`lmstat -a`** is a potentially expensive command. With lots of active users, this call can generate a lot of network activity, and therefore should not be used too often.

lmstat

The **`lmstat`** utility allows the user to monitor the status of all network licensing activities.

Usage:

`lmstat [-a] [-S [daemon] ] [-f [feature] ] [-i feature] [-s [server] ] [-t value]] [-A] [-c license_file]`

Where:

`-a`	Displays everything.
`-A`	Lists all active licenses.
`-c license_file`	Uses license_file.
`-S [daemon]`	Restricts output to one daemon, and the features and users of that daemon.
`-f [feature]`	Lists users of ***`feature`*****`(s)`**.
`-i [feature]`	Prints information about the named ***`feature`***, or all features if no feature name is given.
`-s [server]`	Displays status of ***`server`*** nodes(s).
`-t [value]`	Sets **`lmstat`** timeout to ***`value`***.

lmver

The **`lmver`** utility reports the FLEX*lm* version of a binary.

Usage: **`lmver`** ***`filename`***

The FLEX*lm* version incorporated into the file named by *`filename`* is displayed.

Section 9 – License Troubleshooting Guide

9.1 General Debugging Hints

Troubleshooting Guide

Table 9-1 Troubleshooting Guide

Trouble	Symptom	Cause	Solution
HostID Problem	When you run the license servers, **`lmgrd`** and **`hwiaclmgrd`** on your machine, you receive an error message stating wrong hostid.	**`hwiaclmgrd`** checks the hostid on the SERVER line in the license file; if it does not match the hostid of the machine it is running on, this message will be issued. Possible causes include: (1) you are trying to run the license server on a different machine from the machine the file was made for; (2) the hostid of the machine you are running was changed (for example, the HP ID module was moved, or the CPU board was replaced); (3) the hostid in the license file was modified.	Verify that the hostid of the machine on which **`hwiaclmgrd`** (or node-locked licensed software) is being run matches the hostid specified in the license file (on the SERVER line for the vendor, or on the FEATURE line for a node-locked licensed component). You can run the **`lmhostid`** program to see what FLEXI*m* thinks the hostid is. Do not modify the hostid in the license file. If you gave the wrong hostid to Honeywell World Wide Software Control Center you have to re-contact it with the correct hostid.

Continued on next page

Troubleshooting Guide,
Continued

Table 9-1 Troubleshooting Guide, Continued

Trouble	Symptom	Cause	Solution
Connection Problems	The application program (or **lmstat**) can't connect to the server to check out a license.	The licensed software is unable to make a TCP connection to the server and port specified in the license file. Possible reasons are: (1) the wrong license file is being referenced by the application program; (2) the server machine specified in the license file is down; (3) the vendor daemon specified in the license file is not running; (4) the hostname in the license file is not recognized by the system; (5) the network between the client machine and the server machine is down; (6) TCP is not running on your machine.	Verify that the licensed software is using the proper license file by examining the value of LM_LICENSE_FILE. Verify that specified server machine is up and reachable by executing another command that uses TCP, such as **rsh** or **rlogin**, from the client to the server. Verify that the **hwiaclmgrd** is running (you can use **ps** on the server to look for it). Examine the license log file to see if any problems are reported, particularly messages indicating that the **hwiaclmgrd** has quit. Run **lmstat -a** from the server machine to verify that **hwiaclmgrd** is alive. Run **lmstat -a** from the client machine to verify the connection from client to **hwiaclmgrd** across the network. Try using **telnet <hostname> <portnum>** where **hostname** and **portnum** are the same as on the SERVER line in your license file. Try using the **lmdiag** utility.

Continued on next page

Troubleshooting Guide, Continued

Table 9-1 Troubleshooting Guide, Continued

Trouble	Symptom	Cause	Solution
Licensed Software Problems	**I.** When you run the licensed software (or **`hwiaclmgrd`**), you get the error bad code or inconsistent encryption code.	**I.** Possible causes for this are: (1) the license file was modified (either hostid on a SERVER line or anything on the FEATURE line was changed); (2) the license file was improperly generated from Honeywell.	**I.** You can only modify the following fields of the license file: • server names on the SERVER lines(s) • port numbers on the SERVER line(s) • pathname on the DAEMON line(s) • options file pathname on DAEMON line(s) Everything else must be entered exactly as supplied by Honeywell. All data in the license file is case sensitive, unless otherwise indicated. If you need to make other changes then you must notify Honeywell to receive valid fields for your license file.
	II. When the second user tries to check out a license, **`hwiaclmgrd`** issues an error concerning Parameter mismatch in the log file and refuses the license.	**II.** The most likely cause of this problem is that you are simultaneously trying to run two different versions of the licensed software, and Honeywell has not specifically set up the new version for this kind of compatibility. Check the license log file for a `"com version mismatch"` warning message; this indicates that someone is running older version of the license software component than the license server, **`lmgrd.`**	**II.** Run only the new version of the licensed software (or only the old version).

Continued on next page

Troubleshooting Guide,
Continued

Table 9-1 Troubleshooting Guide, Continued

Trouble	Symptom	Cause	Solution
Other Server Problems	When you start up **lmgrd**, it says exec1 failed on **hwiaclmgrd**.	**lmgrd** uses exec1 to start **hwiaclmgrd**. If there is a problem starting **hwiaclmgrd**, this message is output to the log file. This error is typically caused by one of the following: (1) there is no executable at the location referred to by the license file (and printed out in the log file); (2) the executable does not have proper permissions to be run (the file does not have the "x" bit set, or one of the directories in the path is not readable); (3) there was an error building the executable, and it can not be run; (4) the executable is for a different machine architecture.	Verify that the path to **hwiaclmgrd** is absolute (i.e. starts with a slash character, "/",) and that it points to the executable program itself, not the containing directory. Ensure that the file exists by doing an **ls -l** of **hwiaclmgrd** filename specified in the log file. Make sure you do this as the same user that started **lmgrd**. Verify that the file is executable. If you are running as root and using an NFS-mounted filesystem, the relevant protection bits are the "other" bits (not the "user" bits), even if the file is owned by root. Run **hwiaclmgrd** directly form the command line. If **hwiaclmgrd** is properly linked, it will tell you that it must be run from **lmgrd;** if it crashes or fails to execute, then it is not properly linked.

Continued on next page

Troubleshooting Guide,
Continued

Trouble	Symptom	Cause	Solution
Other Server Problems (continued)	The license server keeps reporting "lost lock" errors in the log file and exiting.	The lockfile (normally placed in /usr/tmp) is being removed by someone else. There could be another **`hwiaclmgrd`** process running, or the license administrator could have deleted the file.	Check to see if there is more than one copy of **`hwiaclmgrd`** running: use a command like **`ps -ef | grep hwiaclmgrd`** to search for it. Check for more than one **`lmgrd`** running as well, since it will restart your **`hwiaclmgrd`** when it is killed. If more than one **`lmgrd`** is running, kill them all (using **`kill`** command, not **`kill -9`**), then kill any remaining **`hwiaclmgrd`** processes (try a simple kill, if that fails, then try **`kill -9`**) and start one fresh copy of **`lmgrd`**. Check to see if there is a shell script running that cleans out /tmp (or /usr/tmp). If so, try modifying it so that it does not delete zero length files.

Appendix A

A.1 License Log Messages

Message Format

lmgrd and **hwiaclmgrd** both generate messages in the following format:

mm/dd hh:mm (DAEMON NAME) message

Where:

mm/dd hh:mm	message timestamp
DAEMON NAME	Either **lmgrd** or **hwiaclmgrd**. In the case where a single copy of the daemon cannot handle all of the requested licenses, an optional "_" followed by a number indicates that this message comes from a forked daemon.
message	message text

ATTENTION

ATTENTION — AXM Personality load errors are located in the following log files:

/var/opt/TDC_Open/common/LCN_daemon.log
and

/var/opt/TDC_Open/common/old.LCN_daemon.log

Informational Messages

Table A-1 Informational Messages

Message	Description
Connected to node	This daemon is connected to its peer on node "node".
CONNECTED, master is name	The license daemons log this message when a quorum is up and everyone has selected a master.
DEMO mode supports only one SERVER host!	An attempt was made to configure a demo version of the software for more than one server host.
DENIED: N feature to user (mm/dd/yy hh:mm)	"user" was denied access to "N" license of "feature".
EXITING DUE TO SIGNAL nnn **EXITING with code nnn**	All daemons list the reason the daemon has exited.

Continued on next page

Informational Messages, Continued

Table A-1 Informational Messages (Continued)

Message	Description
EXPIRED: feature	"feature" has passed its expiration date.
IN: feature by user (N licenses) (used: d:hh:mm:ss)	"user" has checked back in "N" licenses of "feature" at mm/dd/yy hh:mm.
IN server died : feature by user (number licenses) (used: d:hh:mm:ss)	"user" has checked in "N" licenses by virtue of the fact that his server died.
License Manager server started	The license daemon was started.
Lost connection to host	A daemon can no longer communicate with its peer on node "host". This can cause the clients to have to reconnect, or cause the number of daemons to go below the minimum number, in which case clients may start exiting. If the license daemons lose the connection to the master, they will kill all the vendor daemons; vendor daemons will shut themselves down.
Lost quorum	The daemon lost quorum, so will process only connection requests from other daemons.
MASTER SERVER died due to signal nnn.	The license daemon received fatal signal nnn.
MULTIPLE xxx servers running. Please kill, and restart license daemon	The license daemon has detected that multiple licenses for vendor daemon "xxx" are running. The user should kill all "xxx" daemon processes and re-start the license daemon.
OUT: feature by user (N licenses) (mm/dd/yy hh:mm)	"user" has checked out "N" licenses of "feature" at mm/dd/yy hh:mm.
Removing clients of children	The top-level daemon logs this message when one of the child daemons dies.
RESERVE feature for HOST name RESERVE feature for USER name	A license of "feature" is reserved for either user "name" or host "name".
REStarted xxx (internet port nnn)	Vendor daemon "xxx" was restarted at internet port "nnn".

Continued on next page

Informational Messages, Continued

Table A-1 Informational Messages (Continued)

Message	Description
Retrying socket bind (address in use)	The license servers try to bind their sockets for approximately 6 minutes if they detect "address in use" errors.
Selected (EXISTING) master node	This license daemon has selected an existing master (node) as the master.
SERVER shutdown requested	A daemon was requested to shut down via a user-generated kill command.
[NEW] Server started for: feature-list	A (possibly new) server was started for the features listed.
Shutting down xxx	The license daemon is shutting down the vendor daemon xxx.
SIGCHLD received. Killing child servers.	A vendor daemon logs this message when a shutdown was requested by the license daemon.
Started name	The license daemon logs this message whenever it starts a new vendor daemon.
Trying connection to node	The daemon is attempting a connection to "node".

Continued on next page

Configuration Problem Messages

Table A-2 Configuration Problem Messages

Message	Description
hostname: Not a valid server host, exiting	This daemon was run on an invalid hostname.
hostname: Wrong hostid, exiting	The hostid is wrong for "hostname."
BAD CODE for feature-name	The specified feature name has a bad encryption code.
CANNOT OPEN options file "file"	The options file specified in the license file could not be opened.
Couldn't find a master	The daemons could not agree on a master.
license daemon: lost all connections	This message is logged when all the connections to a server are lost, which often indicates a network problem.
lost lock, exiting	Error closing lock file.
Unable to re-open lock file	The vendor daemon has a problem with its lock file, usually because of an attempt to run more than one copy of the daemon on a single node. Locate the other daemon that is running via a **`ps`** command, and kill it with **`kill -9.`**

Continued on next page

Informational Messages, Continued

Table A-2 Configuration Problem Messages (Continued)

Message	Description
NO DAEMON line for daemon	The license file does not contain a "DAEMON" line for "daemon".
No "license" service found	The TCP "license" service did not exist in /etc/services.
No license data for "feat", feature unsupported	There is no FEATURE line for "feat" in the license file.
No features to serve!	A vendor daemon found no features to serve. This could be caused by bad data in the license file.
UNSUPPORTED FEATURE request: feature by user	The "user" has requested a feature that this vendor daemon does not support. This can happen for a number of reasons: • the license file is bad • the feature has expired • the daemon is accessing the wrong license file.
Unknown host: hostname	The hostname specified on a "SERVER" line in the license file does not exist in the network database (probably /etc/hosts).
lm_server: lost all connections	This message is logged when all the connections to a server are lost. This probably indicates a network problem.
NO DAEMON lines, exiting	The license daemon logs this message if there are no DAEMON lines in the license file. Since there are no vendor daemons to start, there is nothing to do.
NO DAEMON line for name	A vendor daemon logs this error if it cannot find its own DAEMON name in the license file.

Continued on next page

Daemon Software Error Messages

Table A-3 Daemon Software Error Messages

Message	Description
accept: message	An error was detected in the "accept" system call.
ATTEMPT TO START VENDOR DAEMON xxx with NO MASTER	A vendor daemon was started with no master selected. This is an internal consistency error in the daemons.
BAD PID message from nnn: pid: xxx (msg)	A top-level vendor daemon received an invalid PID message from one of its children (daemon number xxx).
BAD SCONNECT message: (message)	An invalid "server connect" message was received.
Cannot create pipes for server communication	The "pipe" call failed.
Can't allocate server table space	A malloc error. Check swap space. Connection to node TIMED OUT. The daemon could not connect to "node".
Error sending PID to master server	The vendor server could not send its PID to the top-level server in the hierarchy.
f-do-notify called with no valid features	This is an internal consistency error.
Illegal connection request to DAEMON	A connection request was made to "DAEMON", but this vendor daemon is not "DAEMON."
Illegal server connection request	A connection request came in from another server without a DAEMON name.
KILL of child failed, errno = nnn	A daemon could not kill its child.
No internet port number specified	A vendor daemon was started without an internet port.
Not enough descriptors to re-create pipes	The "top-level" daemon detected one of its sub-daemon's death. In trying to restart the chain of sub-daemons, it was unable to get the file descriptors to set up the pipes to communicate. This is a fatal error, and the daemons must be restarted.

Continued on next page

Daemon Software Error Messages, Continued

Table A-3 Daemon Software Error Messages , Continued

read: error message	An error in a "read" system call was detected.
recycle_control BUT WE DIDN'T HAVE CONTROL	The hierarchy of vendor daemons has become confused over who holds the control token. This is an internal error.
return_reserved: can't find feature listhead	When a daemon is returning a reservation to the "free reservation" list, it could not find the listhead of features.
select: message	An error in a select system call was detected.
Server exiting	The server is exiting. This is normally due to an error.
SHELLO for wrong DAEMON	This vendor daemon was sent a "server hello" message that was destined for a different "DAEMON".
Unsolicited msg from parent!	Normally, the top-level vendor daemon sends no unsolicited messages. If one arrives, this message is logged. This is a bug.
WARNING: CORRUPTED options list (o->next == 0) **Options list TERMINATED at bad entry**	An internal inconsistency was detected in the daemon's option list.

Continued on next page

A.1 License Log Messages, Continued

Licensed Application errors

Table A-4 contains errors reported by the following licensed components:

- /opt/DDA/bin/dda
- A^{X}M Personality load

Table A-4 Licensed Application Errors

Error Number	String	Description
-1	“cannot find license file”	The license file cannot be opened or cannot be found.
-2	“invalid license file syntax”	A server name is > MAX_SERVER_NAME A feature specifies no hostid and # of licenses <= 0.
-3	“cannot connect to a license server”	The daemon name specified in the license file FEATURE line does not match the vendor daemon name (**`hwiaclmgrd`**).
-4	“licensed number of users already reached”	The licensed number of users has been reached.
-5	“no such feature exists”	The feature could not be found in the license file.
-6	“no TCP “license” service exists”	This happens if a SERVER line does not specify a TCP/port number and the TCP license service does not exist in /etc/services.
-7	“no socket connection to license manager server”	*lc_disconn()* was called after the process had been disconnected from the socket.
-8	“encryption code in license file is inconsistent”	The code in a license file line does not match the other data in the license file. This is usually the result of not building all the software components with the same encryption seeds. Contact Honeywell to report that you have an invalid Honeywell License Manager tape.
-9	“invalid host”	The hostid specified in the license file does not match the node on which the software is running.

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Licensed Application Messages, Continued

Table A-4 Licensed Application Messages, Continued

Error Number	String	Description
-10	"feature has expired"	The feature has expired, i.e., today's date is after the expiration date in the license file.
-11	"invalid date format in license file"	The start or expiration date in the license file is invalid.
-12	"invalid returned data from license server"	The port number returned from lmgrd is invalid. An attempted connection to a vendor daemon did not result in a correct acknowledgement from the daemon. The daemon did not send back a message within the timeout interval. A message from the daemon had an invalid checksum.
-13	"no SERVER lines in license file"	There is no SERVER line in the license file. All non-zero license count features need at least one SERVER line.
-14	"cannot find SERVER hostname in network database"	The *gethostbyname()* system call failed for the SERVER nodename in the license file
-15	"cannot connect to license server"	The *connect()* system call failed, while attempting to connect to the daemon. The attempt to connect to the vendor daemon on all SERVER nodes was unsuccessful. *lc_status()* returns this status if the feature had been checked out but the program is in the process of reconnecting. If reconnection fails, this status is returned to the application.
-16	"cannot read data from the license server"	The process cannot read data from the daemon within the timeout interval. The connection was reset by the daemon (usually because the daemon exited) before the process attempted to read data.
-17	"cannot write data to license server"	The process could not write data to the daemon after the connection was established.

Continued on next page

Licensed Application Messages, Continued

Table A-4 Licensed Application Messages, Continued

Error Number	String	Description
-18	“license server does not support this feature”	The feature has expired (on the server node), or has not yet started, or the version is greater than the highest supported version.
-19	“error in select system call”	The *select()* system call failed. Honeywell licensed software should not report this error.
-20	“license server busy (no majority)”	The license server is busy establishing a quorum of server nodes so that licensing can start.
-21	“license file does not support this version”	The version requested is greater than the highest version supported in the license file FEATURE line.
-22	“feature checkin failure detected at license server”	The checkin request did not receive a proper reply from the hwiaclmgrd. Honeywell licensed software should not report this error.
-23	“license server temporarily busy (new server connecting)”	`hwiaclmgrd` is in the process of establishing a quorum condition. New requests from clients are deferred during this period.
-24	“users are queued for this feature”	Same as error # -4 except that there are users queued. Honeywell licensed software should not report this error.
-25	“license server does not support this version of this feature”	The version specified in the checkout request is greater than the highest version number the daemon supports.
-26	“request for more licenses than this feature supports”	A checkout request was made for more licenses than are supported in the license file. Honeywell licensed software should not report this error.
-27	not used	not used
-28	not used	not used
-29	“cannot find ethernet device”	The ethernet device could not be located on this system.

Continued on next page

Licensed Application Messages, Continued

Table A-4 Licensed Application Messages, Continued

Error Number	String	Description
-30	"cannot read license file"	The license file could not be read (errno == EPERM or EACCES).
-31	"feature not yet available"	The feature is not enabled yet (current date is before the feature start date). Honeywell licensed software should not report this error.
-32	"no such attribute."	Honeywell licensed software should not report this error.
-33	"Bad encryption handshake with daemon"	The client performs an encryption handshake operation with the daemon prior to any licensing operations. This handshake operation failed.
-34	"Clock difference too large between client and server.	The date on the client system does not agree closely enough with the date on the server (daemon) system.
-35	"in the queue for this feature"	Honeywell licensed software should not report this error.
-36	"feature database corrupted in daemon"	The daemon's run-time feature data structures have become corrupted. This is an internal daemon error.
-37	"duplicate selection mismatch for this feature"	Honeywell licensed software should not report this error.
-38	"User/host on EXCLUDE list for feature"	The USER | HOST | DISPLAY has been excluded from this feature by an end-user's daemon option file.
-39	"User/host not on INCLUDE list for feature"	The USER | HOST | DISPLAY has NOT been included in this feature by an end-user's daemon option file.
-40	"Cannot allocate dynamic memory"	The *malloc()* call failed to return sufficient memory.
-41	"Feature was never checked out"	This code is returned by `lc_status()` if the feature requested has never been checked out. Honeywell licensed software should not report this error, however FLEXlm utilities may report this error.

Continued on next page

Licensed Application Messages, Continued

Table A-4 Licensed Application Messages, Continued

Error Number	String	Description
-42	"Invalid parameter"	Honeywell licensed software should not report this error.
-43	"No FLEXlm key data supplied in license initialization."	Honeywell licensed software should not report this error.
-44	"Invalid FLEXlm key data supplied"	Honeywell licensed software should not report this error.
-45	"FLEXlm function not available in this version"	Honeywell licensed software should not report this error.
-46	"FLEXlm software is demonstration version"	Honeywell licensed software should not report this error.
-47	"Clock setting check not available in daemon"	Honeywell licensed software should not report this error.
-48	"FLEXlm platform not enabled"	Honeywell licensed software should not report this error.
-49	"date too late for binary format"	The expiration date format in FLEXlm licenses are good until the year 2027. This is probably a bogus date. For Honeywell licensed software, this would apply only to demo or temporary licenses.
-50	"FLEXlm key data has expired"	Honeywell licensed software should not report this error.
-51	"FLEXlm not initialized"	Honeywell licensed software should not report this error.
-52	"Server did not respond to message"	UDP communications failure. Honeywell licensed software should not report this error.
-53	"Request rejected by vendor-defined filter"	Honeywell licensed software should not report this error.
-54	"No FEATURESET line present in license file"	Honeywell licensed software should not report this error.
-55	"Incorrect FEATURESET line in license file"	Honeywell licensed software should not report this error.
-56	"Cannot compute FEATURESET line"	Honeywell licensed software should not report this error.

Continued on next page

Licensed Application Messages, Continued

Table A-4 Licensed Application Messages, Continued

Error Number	String	Description
-57	“socket () call failed”	This can occur when the UNIX OS runs out of system resources.
-58	“setsockopt() failed”	The *setsockopt()* call has failed. This is likely due to an OS error.
-59	“message checksum failure”	Communications error--messages between client and server are encrypted and checksummed for security and integrity. The checksum will usually fail because of poor networking communications.
-60	For internal use	
-61	“Cannot read license file from server”	This occurs when the license file, via LM_LICENSE_FILE is incorrectly defined. This only occurs when LM_LICENSE_FILE is set to *port@host*.
-62	“network software (tcp/ip) is not available”	This is reported on systems where this is detectable. Some systems may have this problem, but this error will not be reported -- system calls will simply fail.
-63	“Not a license administrator”	Various functions require that the user be a license administrator, depending on how `lmgrd` was started. See *`lmgrd, lmremove`* and *`lmdown.`*
-64	“lmremove request too soon”	An *lc_remove()* request occurred, but *ls_min_lmremove()* seconds have not elapsed since the license was checked out. Honeywell licensed software should not report this error.
-65	“Bad VENDORCODE struct passed to lc_init()”	Honeywell licensed software should not report this error.

Continued on next page

Licensed Application Messages, Continued

Table A-4 Licensed Application Messages, Continued

Error Number	String	Description
-66	“FLEXlm include file/library mismatch”	Honeywell licensed software should not report this error.
-67	For internal use	
-68	For internal use	
-69	For internal use	
-70	For internal use	
-71	“Invalid TZ environment variable”	Detection that the date has significantly changed using the TZ environment variable.
-72	“Old-style’ vendor keys”	Honeywell licensed software should not report this error.
-73	“Local checkout filter requested request”	Honeywell licensed software should not report this error.
-74	“Attempt to read beyond the end of LF path”	An error occurred with the colon-separated list of license files.
-75	VMS only error	
-76	“Internal FLEXlm Error”	Please report this error to Honeywell TAC.
-77	“Bad version number - must be floating point number, with no letters”	A line in the license file has an invalid version number.
-78	“FLEXadmin API functions not available”	Honeywell licensed software should not report this error.
-79	For internal use	
-80	For internal use	
-81	For internal use	
-82	“Invalid PACKAGE line in license file”	Honeywell licensed software should not report this error.

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