

A.D.A.M. Interactive Anatomy 4.0 License Server Administrator's Guide

Revision History

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Purpose

This document describes the Concurrent License Server for ADAM Interactive Anatomy 4. The target audience for this document is a Network Administrator who will be configuring the ADAM Interactive Anatomy clients and the License Server. This document will explain the differences between a Concurrent Licensing vs. a Per-Seat licensing, and provide guidance for installing and configuring the server and clients for a Concurrent License install. Additional information is provided for configuring networked clients to use shared folders for the large content files that come with ADAM Interactive Anatomy 4.

Concurrent vs. Per-Seat installs.

ADAM Interactive Anatomy 4, (henceforth referred to as AIA4 in this document) can be licensed in one of two ways.

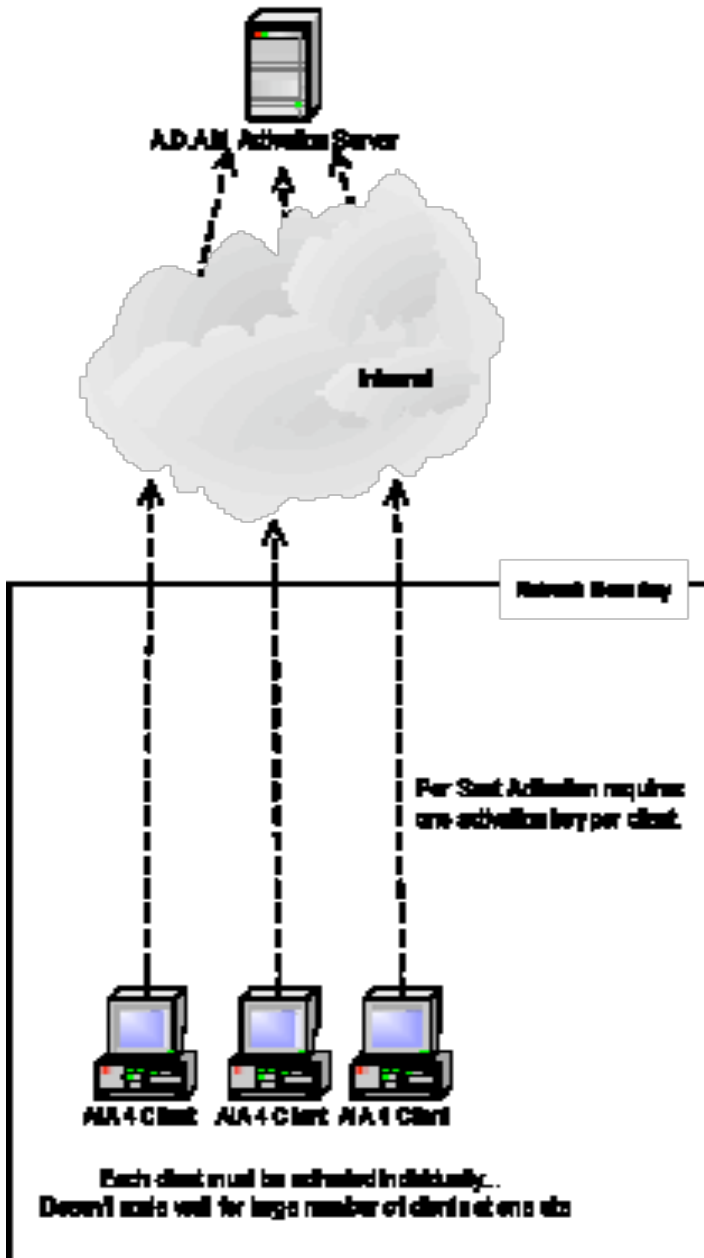
- 1 Per Seat. This is the default licensing scheme. An activation key is used for each client computer. The AIA4 install must be activated using this key before the product can be used.
- 2 Concurrent. This is a per-concurrent-user licensing scheme. AIA4 is installed on each client computer, but none of the clients will have activation keys, and none of them are activated. Instead, they are configured to use to a licensing server to determine their license status. The licensing server is installed on a dedicated machine, and it has a single activation key. This activation key allows up to a certain number of clients to be used simultaneously.

A list of the key differences between these two schemes:

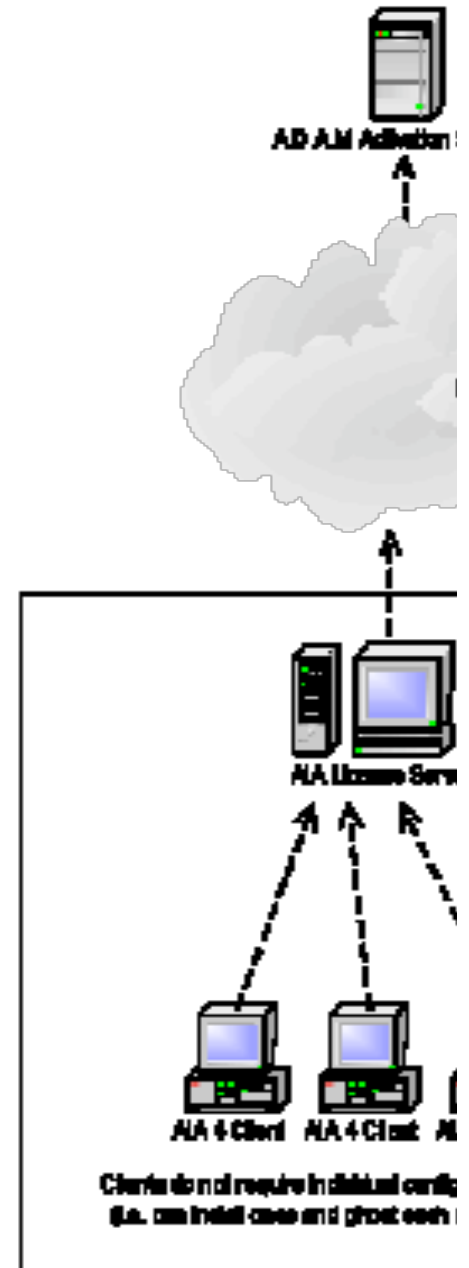
	Per Seat Activation	Concurrent Licensing
Number of Activation keys	One key per client computer	One key for license server only. Client machines do not have any keys of their own.
Client requires internet connectivity	Instructor Edition - No Student Edition - No Lab edition - Yes	No, client only requires network access to License Server. License Server itself requires internet connectivity, however.
Allows for “roaming” license use	No (1 license per computer)	Yes, clients can be installed on as many machines as desired, only concurrent use is counted for licensing
Clients can be backed up and restored at will (i.e. Deep Freeze, Norton	No (restoring usually requires re-activation)	Yes, clients never need to change after initial setup. Note: Deep Freeze should not

Ghost applications)		be used on server.

Per Seat Licensing



Concurrent L



System requirements/prerequisites

The requirements and prerequisites for the AIA4 client are described elsewhere. The AIA License Server has the following requirements:

Windows 2000 Pro or higher (Server, XP Pro, etc). *XP Home not supported.*

256 MB RAM

Server requires internet access in order to contact ADAM servers periodically.

The Microsoft .NET framework 1.1 must be installed prior to installing the License Server (free download from Microsoft, also included on AIA4 client DVD)

You should choose a machine to use for a server that will have maximal uptime. Keep in mind that if the License Server is down, the clients will not be able to run.

Additional requirements for the AIA 4 clients:

- 1 The AIA4 clients will need network connectivity to the server (clients will need to contact server via TCP/IP).
- 2 The AIA4 clients should have their clocks set to roughly the same Date/Time as the License server. Small errors (as much as several hours) will not cause problems, however, if a client has a date that differs by more than 24 hours from the server, license validation may fail for that client (see Communications section below)

Communications

The license server will automatically communicate with the ADAM Activation Server on a periodic basis, by default roughly once a day. It does this “phone home” to update its license keys. This serves two purposes: The keys expire after a pre-determined length of time (by default, a little over a week), so new keys are obtained each time the license server successfully contacts ADAM’s server. Also, if additional licenses are purchased, these will be added during the next “phone home” communication.

This communication is via HTTPS to preserve privacy. The information sent from the License Server consists of the local time of the machine, the activation key, and a set of sequence numbers provided on the previous phone home request. By virtue of the fact that TCP/IP is used, the IP address of the License server will be sent as well. In response, ADAM’s Activation Server will return updated licensing information.

If the license server is unable to phone home for an extended period of time (by default, longer than a week), eventually the license keys will expire, and the AIA4 clients will no longer run.

Due to the time-sensitive nature of the license keys, it is important that the real-time clocks for the license server and all of its clients be roughly synchronized. Differences of a few hours can be tolerated without error, but differences in excess of 24 hours can cause the client to not be able to obtain a license.

Installation and Configuration

Installing the License Server

The License Server installer is **not** included on the client DVD. The installer can be downloaded from <http://ws.adam.com/applications/aia4/networkserver/licenseserver.zip>. Please contact A.D.A.M. technical support if you have problems downloading this file.

Before installing the License Server, be sure to review the System requirements/prerequisites section. If you have not already done so, you will need to install the Microsoft .Net Runtime Version 1.1.

Installing the License Server service is easy, simply double click on the “AIA License Server.msi” and follow the prompts (you will need to unzip the file you downloaded first). Upon completion it will install the License Server as a windows service called “AIA License Service”, and an administrative utility that is used to activate and administer the License Server

Activating the License Server

Once installed, the License Server needs to be activated before it can be used. To do this, run the “AIA License Server Administration Utility”. When first run, this application will start an Activation Wizard which will prompt you for your Activation key and other information.

Figure 1: First page of Activation Wizard

Once you have completed filling out all of the registration info pages, the wizard will contact the ADAM Activation server to validate the Activation Key. You should see a screen indicating that the Activation was successful.

Once the Activation is complete, you will be prompted for the TCP/IP port number that the license server should use to listen for clients connections. Choose this port number carefully! It should not conflict with any existing TCP/IP services on the machine that the License Server is installed on. Also, each of the clients will need to be configured with this same port number in order to connect to the License Server. Although you can choose any port number between 1 and 65535, *it is recommended that you choose a port number above 1024*. Port numbers below 1024 are generally reserved for “well-known” TCP/IP services. You are free, however, to choose any port number between 1 and 65535.

Figure 2: Port configuration screen

Once you have chosen a port number, it will be saved to a “Network.cfg” file in the license service “application data” folder (typically “C:\Documents and Settings\All Users\Application Data\A.D.A.M., Inc\ADAM Interactive Anatomy\4.0”). This is a text file that you can edit if you need to change the port number at a later date. Once you have configured the port number, you will not be presented with the port configuration dialog again. The admin utility window will be displayed. More information about the admin utility is in the next section.

Figure 3: AIA License Server Admin Utility

Activation server configuration

Once you have activated the License Server and set the port number for the service to listen on, very little configuration that remains. You should open the services applet and verify that the service is configured to launch on startup:

- 1 Go to Start → Run
- 2 Type “services.msc” and press enter.
- 3 The services applet will be displayed. Look for an entry called “AIA License Service”. The installer should have created this service and set its startup type to “Automatic”, so that it will start automatically on boot up.

Figure 4 The services applet, showing the License Server service highlighted

You can now start the license service. You can either use the services applet, or the administration utility that comes with the license server.

- 4 Go to Start → Programs → ADAM → AIA License Server Administration Utility
- 5 When the applet appears (see figure 3), check the status of the service. If it is “stopped”, you can click “Start” to start the service (note, this is functionally the same as starting the service from the services applet).
- 6 Once the status changes to “Running”, you can verify the proper functioning of the application by examining the systems application event logs. The admin utility has a handy list box at the bottom of its window which will display these logs, filtered for only those entries generated by the License Server service. Click “Refresh” to update this listing. If the service started properly, the last entry in the window should say “The License server started successfully”. (see figure 5)

Figure 5 The AIA License Server Administration Utility

The license service will write any errors that it encounters to the application event logs. These logs can be checked in the event of a problem, to gather troubleshooting information. You can view them through the system event viewer, in the application logs. Alternatively, you can view a filtered copy of these logs in the Admin Utility.

Installing the AIA Clients

The AIA4 clients have their own installation instructions, and these should be used up until the point of Activation. If you are going to use a license server, do not try to activate the AIA4 client; instead follow the configuration instructions below. Also, when using concurrent licensing, it is possible to make a “ghosted” or “cloned” image of the hard drive of one machine that has already been configured in order to deploy AIA4 onto multiple client machines. This is different from the single-user licensing, where the product activation must be done independently on each machine.

Configuring the AIA clients to point to the License Server

Once the AIA4 client is installed, you should configure it to access the License Server by running it from the command line with a /NETLIC switch. This command creates a "Network.cfg" file in the "All Users\Application Data" folder for AIA4. When AIA4 is started normally, it will detect the configuration info in this file and use the license server to request a license.

*If you are using Vista be sure that you are logged in as the administrator and you have the User Account Controls turned off.

To run the program with the /NETLIC switch, first open a CMD window and change to the directory where AIA was installed:

- 1 Click on Start → Run...
- 2 Type "cmd.exe" and press enter.
- 3 In the command window, type:

```
CD "C:\Program Files\A.D.A.M., Inc\ADAM Interactive Anatomy 4.0"
```

(Note that the actual directory may be different if you did not use the default directory when installing AIA.)

Now you are ready to run the AIA4 client network license configuration.

The syntax for this command is:

```
AIA.exe /NETLIC <server name> <port> <edition>
```

The 3 options are as follows:

- 1 **<server name>** is the network name of the machine that will run the License Server. If the machine has a static IP, you can optionally use the IP address in "dotted-quad" format.
- 2 **<port>** this is the port number that the License Service runs on . This should be the same number used to configure the License Server service.
- 3 **<edition>** This is the edition code for the client machine. In some cases, a license server may be set up to licenses different AIA4 editions, such as Lab editions vs. Instructors edition. The client machine must be configured with the edition type that it will request from the License server. You should have received a list of edition codes from ADAM when you purchased the software. In most cases, this code will be either "AIA4ID" for instructor edition or "AIA4L" for the lab edition. (The edition codes are case sensitive)

An example client configuration might look like this:

```
AIA.exe /NETLIC myserver 9999 AIA4L
```

This sample indicates that the clients should use a server called “myserver” as it’s license server, connecting to in on port 9999, and that the client is configured to be a lab edition.

If entered correctly, this command should immediately return to command line, and the AIA application will not start at this point. If the application has a problem processing the command, it should present a Usage dialog for the /NETLIC command.

As mentioned previously this command creates a file called “Network.cfg” in the “All Users\Application Data” folder for AIA4. This folder is typically located in “C:\Documents and Settings\All Users\Application Data\A.D.A.M., Inc\ADAM Interactive Anatomy\4.0”. The format of the Network.cfg file is a simple .INI text format, and the example command above will produce a file that looks like this:

```
EDITION=AIA4L
PORT=9999
SERVER=myserver
```

If you wish, this file can be copied to other machines to set the License Server configuration. Also, once the AIA4 product has been installed and this file has been created, the machine may be cloned (using a hard drive “ghosting” utility) for the purposes of replicating the client onto other desktops.

Configuring clients to share large content files over the network.

The AIA4 client machines may be configured so that the large content files will be accessed from a networked share rather than the local hard drive. This will allow for a much smaller install on the client machine (roughly 50 MB rather than 1600 MB for a full install). Please note that if there are a lot of clients using the same shared files, there may be a lot of network contention for this resource and the client applications may run very slowly. This contention will be most prevalent for the Dissectible Anatomy and 3D viewers, as these have the most interactive content. You should make sure that the machine used to share the content files has reasonably fast disk I/O, and that there is good network connectivity between it and all of the clients. In some cases, it may be desirable to create content shares on multiple servers, and point some of the clients to different servers to spread the load.

To set this up, you will need to copy the content directory from the DVD to a machine that can share the files as a networked file share. This directory is called “D:\files\Program Files\A.D.A.M., Inc\ADAM Interactive Anatomy 4.0\content” on the AIA4 install DVD. Once copied, share this “content” folder where the client machines can see it. Then, when installing the AIA4 client, choose the “minimal” install. When configuring the AIA4 client, use the /CONTENT_DIR command line option to configure the location of this content dir.

For example, if the content dir is on a network share called “\\myserver\AIA\content”, then configure the client using:

```
AIA.exe /CONTENT_DIR "\\myserver\AIA\content"
```

Note: This can be done before or after configuring with the /NETLIC command. This will add an option to the “Network.cfg” file which will direct the application to look in that shared folder if the content file does not reside locally.

Once configured, you should test the client by opening some content (such as the Anterior Male Dissectible view). If the content opens correctly, then the configuration is successful. If the application cannot find the content folder, it will show a dialog with the configured folder listed, and an error indicating what the problem is. Check that the file share is configured properly and try again. If necessary, you can re-run the program with the /CONTENT_DIR switch to change the content directory.

Manual client configuration

The configurations for server and content directory are both contained in a file called “network.cfg” in the application directory for AIA4. Typically this is in the hidden folder in “C:\Documents and Settings\All Users\Application Data\A.D.A.M., Inc\ADAM AIA License Server\4.0”. Although we recommend using one of the methods listed in the previous sections, you can edit this file manually to change the settings. Some care should be taken, however, as the program does not tolerate extra spaces, tabs, etc. An example of the file is shown below

Usage

If an AIA4 client is configured to use a License Server, when the application is run you will see a “Contacting Server...” dialog.

Under normal circumstances, this dialog will only be visible momentarily. In fact, you may not even get a chance to see it before the client obtains a license from the License Server. Once the client obtains a license this dialog will disappear, and the user can start using the application.

The troubleshooting section has a list of possible error conditions, and tips on how to resolve them.

Administering the server

The license server is designed to run indefinitely without human interaction, however, there might be exceptional cases where manual control is desired. The AIA License Server Administration Utility provides some minimal functions for administering the license server service, in addition to its use during the initial configuration and activation

of the product. These include starting and stopping the service, viewing the event logs generated by the service, as well as an “Update License” and “Drop All Clients” function.

If additional licenses are purchased from ADAM, and you want to update the local counts immediately, you can force a “phone home” manually by opening the admin client and clicking “Update License”. The event logs will reflect this request. The actual process may take several seconds to complete. Under normal circumstances, there is no need to initiate this process manually, as it will happen periodically (~ once daily) when the license service is running.

The admin utility also has a facility for dropping all client licenses. This will force the end users to have to re-acquire a license for the instances that they are running. They can generally do this by clicking “retry” on the dialog that is displayed. This function, while somewhat invasive to the end user, can be useful when you have clients that are consuming licenses that you believe to be unused (for instance, if someone started AIA then walked away from the computer). By forcing all users to re-acquire their license, any instances that are not being actively used will return their licenses to the license server. Note that even though the licenses are revoked immediately, the clients may take up to a minute or longer to realize that they have lost their license when using this function.

Monitoring usage with performance counters

In addition to the event logs, the license server service creates performance counters which can be used to monitor license usage.

There are four different performance counters defined by the license server service:

- 1 In Use Licenses: the number of licenses in currently in use.
- 2 Free Licenses: the number of licenses still available.
- 3 Failed License Attempts: a count of failed license attempts. This value will increment each time someone attempts to use the client product when there are no free licenses for the license server to return to the client. Note that this counter resets to zero each time the service is restarted.
- 4 Clients using Shared License: this is a count of the total number of client instances that are “sharing” a license. This happens when a single end user has more than one copy of the client application running on one computer. For example, if a single user had 3 copies of AIA4 running in one session, this counter would normally indicate the 2 of those clients that were sharing a license with the third.

For each of these counters, a separate instance is defined for each license type (typically AIA4ID for Instructors edition and AIA4L for Lab edition), as well as an aggregate total of all license types called “total”.

These performance counters can be used to track license usage in various ways. The counters can be displayed as a real-time graph, or logged to files for future analysis.

Figure 6: PerfMon running under Windows 2000, with two performance counters selected.

You can view these by using the Windows Performance:Monitor (perfmon). To display one or more of the counters in a real-time graph, do the following.

- 1 Goto Start → Run...
- 2 Type “perfmon.exe” and press enter.
- 3 The performance monitor should be displayed, with a graph. (See figure 6)
- 4 Right click on the graph and select “Add counters...” from the context menu.
- 5 When the add counters dialog is displayed, select “A.D.A.M. AIA License Counters” from the “Performance object” dropdown (see figure 7).
- 6 You can then select from the four counter types on the bottom left. You will also need to select instances from the bottom right. For each counter, there is an instance created for each license type (i.e. Lab or Instructor), as well as a “total” instance which sums all license types for that counter. You can select as many combinations of instances and counters as you like to add to the graph display.

Figure 7: Adding Performance counters for AIA licenses

Troubleshooting

When setting up the server and clients for the first time, connectivity is the most common problem encountered. A list of obvious and not-so-obvious things to look for:

- 1 Make sure that the license server service is running, and check the application event logs for errors.
- 2 Verify that the Client and Server are on the same network. *Can you ping the server machine from the client?*
- 3 Verify that the server port number is configured the same for both the server and client.
- 4 Make sure that the Server is not blocking access to the License Server service at the firewall level. If the server runs a firewall, you may need to exempt the port used by the License Server service from being blocked. The same holds true if the client must go thru a firewall elsewhere to connect to the server
- 5 Make sure that the *client machine* is not blocking access to the License Server using a personal firewall. (The Windows XP firewall will generally not do this, but some third-party firewall products may)

Client error messages

This section will attempt to catalog all of the error messages related to Concurrent Licensing that might be displayed by the AIA4 client, with a description that may aid in

resolving the problem.

Message	Description
"All licenses are currently being used";	Occurs when starting AIA4, if all of the licenses are in use. User can click retry to attempt to acquire a license again. See section below for more information.
"Could not connect to server." - or - "Connection refused."	Server could not be located by client. Verify that the client is configured properly, and that server can be reached by client. Make sure service is running
"Connection lost (underlying socket was closed)." - or - "Connection lost (remoting exception)." - or - "Could not connect to server (connection lost)."	Typically occurs because of a network failure between client and server. Can also occur if server service has been stopped or restarted.
"License could not be renewed."	Typically occurs if admin uses "drop all clients" function.
Session public key has expired, license is no longer valid	This should only occur if the license service has not been able to contact ADAM servers for a very long period of time (> 7 days). Check license server event logs, and try to do an "update license" manually. (These updates should occur automatically and you should never normally need to do this)
"Policy could not be verified." "Could not verify signature (challenge)." "Could not verify license." "Could not verify session public key."	Should never occur. Indicates that the information received from ADAM's servers could not be verified for authenticity. Contact ADAM technical support.
"Unable to create id for license: Error querying machine information "	This error occurs typically on non-English localized versions of Windows. To get rid of this error, see the section below entitled "Fixing problems with localized versions of Windows"

Additional information on "All licenses are currently being used": This is a normal message that indicates that all licenses of the requested type are currently in use. If this

happens frequently, it may be indicative of the need to purchase additional licenses. In cases where the AIA client is being started and left unused, admin can manually “drop all clients” to force unused copies to release their license.

Fixing problems with localized versions of Windows

Many users running non-English localized versions of Windows will encounter an error on the client when it is first started that looks like this:



This is caused by an inability to query the performance counters due to localization issues in Windows. The performance counters are used in part to uniquely identify each client machine. In order to fix this, the client install needs to be changed to use a different identity scheme. Starting with *AIA version 4.0.20, the MAC address(es) of the client machine can be used to uniquely identify the AIA client. To enable this scheme, on the client, navigate to the “Network.cfg” file (typically in the folder “C:\Documents and Settings\All Users\Application Data\A.D.A.M., Inc\ADAM Interactive Anatomy\4.0”). Open this file in notepad and add the following line:

```
USEMACADDRESS=true
```

*To check the version of AIA4 insert the DVD/CD into the drive and browse the CD look for the file called version and open it the version number will be located in the top left-hand corner of the document. If you are running version 4.0.19 please contact Technical Support at ADAM.

This will tell the client to use the local machines’ MAC addresses as the unique identifier for the client machine. *You do not need to make any changes to the license server; this is a client-side only change.*

Please note that there is one caveat to keep in mind if you use this scheme: under certain narrow circumstances a client can inadvertently consume more than one license. If the MAC addresses on the client box change (either new ones are added, or some are removed, or existing ones somehow change) *while AIA is in use*, AND multiple instances of AIA are used on the client machine, under the right circumstances multiple licenses may be consumed for that client. This caveat is not a concern unless users are allowed to change Ethernet devices on the client machine while AIA is in use. In general, most lab environments will have fixed Ethernet adapters, and will not allow hardware to be changed by the user, in which case this is a non-issue.

Server event log messages

Since the License Server runs as a background service, all server error messages will appear in the systems application event log. This can be viewed by using the system Event Viewer, or by using the AIA License Server Admin Utility. This section attempts to catalog all of the possible error messages that might occur, with a description that may aid in resolving the problem.

Message	Description
"All active clients have been dropped by admin and will have to reacquire a license."	Occurs when admin uses the "Drop All Clients" function in the admin utility.
"Client (# 0x#####) tried to acquire license of type 'AIA4xx', but none were free"	Occurs when a client attempts to get a license, but all of the licenses of the requested type were already in use by someone else.
"Port not configured properly"	Port number may not be configured properly in the network.cfg file (on server). Verify that this file is correct.
"The License server started successfully"	Normal message during service start.
"Error initializing service: xxxx"	Unexpected error encountered while starting the license server service. The service will probably not be running properly if this error occurs. Try to resolved the error (based on the exact reason given) and restart the service.
"The License server stopped successfully";	Normal message when service is stopped
"Error shutting down service: xxxx"	Unexpected error stopping the service.
"License Server has not been activated; please use the Service Administration Application to activate the product"	Occurs if you attempt to start the service before activating the license server. Stop the service and run the Admin Utility to activate.
"Deactivation is in progress, cannot start service. Please close Deactivation application."	Occurs when trying to start the service while the deactivation utility is running. Close the deactivation utility and restart the service.
"No network configuration file found ("xxx") or file is corrupted"	The "network.cfg" file is missing or corrupt. Verify that this file exists and is correct. If file is missing, run the Admin Utility to generate a new one. (it will create this file when you enter the port number to run the license server on.)