Pulsonix Design System

Network Licensing
Installation and Operation

Contents

Chapter 1. Network Licensing Basics

Introduction

Pulsonix support two types of licensing; node-locked and network (or 'floating').

This supplement details the installation and operation of network licensing only. Node-locked licensing is covered in the main users guide or in the *ReadMe First* documentation that was supplied with your Pulsonix product.

Node-locked licensing

Node-locked is a single installation of Pulsonix which has the product and security device (a key or Network Address) on the same PC. This system can be 'network aware' but will not look at any other 'node' or server for its security. Installation and operation of node-locked licensing is described in the 'Node Locked & Network Installation Start-up Notes' document.

Network Licensing

What is network licensing?

Network licensing provides the ability to have an installation of Pulsonix on one PC, and its security on another, which removes the need for a security device on each machine on which Pulsonix is to be used.

This is sometimes called 'floating' licensing, and because the licensing is 'floating', this means that as long as a particular PC has an installation of Pulsonix, and it points at the correct server PC for its licensing, then it can book out the necessary licenses for use. This can happen on any PC on a given network provided enough licenses are available from the server. The number of any particular license available is predefined based on the number purchased.

Network licensing should not be confused with the use of a network card address as the security device for a node-locked license.

How network licensing operates

Network licensing is managed centrally by a network license 'server' that controls access to the licensed options, protected by a security device. This mechanism allows licenses to be 'floated' to any machine within a network, as long as that machine can access the server. The scheme works on a book out / book in system for each available product license.

The server application can also be configured to allow particular combinations of licenses, users and/or machines to be granted or denied access to particular licenses. For example, user *Bert* might be able to use a Pulsonix Schematic license but not a PCB one, while user *Fred* can use Schematics, PCB and the Autorouter. This example also applies for machines, so that a user can log in as his name on any machine but will still only have the products available to him, ones that have been allocated to him through the administration options in the server.

The floating license scheme uses a special set of licenses; you can't 'float' normal licenses. The Network License Server will not run unless the license file contains the right type of licenses.

Terminology used

Below is a list of some of the basic terminology used in network licensing and in this documentation:

Client – a computer on which Pulsonix is to be used, and which communicates with the License Server to request licenses.

Connected – in Pulsonix terms, this means a Pulsonix Client has made a successful connection to the server.

Floating license – in this instance, when a license is referred to as floating it means that the license can be used on any client on the network.

Heartbeat – a 'heartbeat' message is sent by the Pulsonix client to the server to indicate that it is still running.

License – a license is an authorisation code to enable an option or feature in the Pulsonix product.

License file – a license file is an encrypted file that contains licenses.

License Manager – a program which you use to configure a client to locate the licenses needed to allow the main Pulsonix application to run. It is used for both node-locked and network licensing. When used for network licensing it is used to specify the computer name and port on which the license server is situated.

Log Viewer - a program that is used to view diagnostic and usage log files. Sometimes referred to as "NLSL".

Network License Daemon – a program that runs on the server computer and actually implements the network license server features. Sometimes referred to as "NLSD".

Network License Manager – a program that provides a user interface to assist with managing the NLS operation. Sometimes referred to as "NLSM".

NLS – a short-cut way of referring to "Network License Server".

Network licensing – a licensing scheme that centralises access to licenses, allowing them to be used from any machine on the network.

Network Manager or **System Administrator** – this is the person who looks after your network and is knowledgeable enough to know how to get the Pulsonix network licensing running.

Node-locked – a system installation where the license file (and the licenses contained within it) are locked to one PC with a local security device.

Port – a number that identifies the particular TCP/IP socket used by Pulsonix to communicate between client and server.

Security device – this is an item of hardware that provides a specific unique identification used to control access to licenses. This is usually a physical key (a "dongle") that plugs into either the USB or parallel communications port on your computer. It can also be a network card.

Service – an application that is run automatically by the system, and is not reliant on user action to start it up.

Server or License Server – an application controlling the central repository of licenses, which is capable of being accessed across the network from other computers.

Sockets – an industry standard network communication protocol.

System Admin rights or permissions – these are system rights that you have as a user. With certain permissions, you are able to access, view or edit drives, folders and files within your network.

Chapter 2. Network Licensing Installation

Installation overview

Below is an overview of the order in which to install the various facets required to run network licensing:

- Use the Pulsonix Network License Server Setup program to install the Network License Server and associated tools. This Setup program is separate from the main Pulsonix Setup program and can be downloaded from the web site.

- Start the Network License Server and review or alter the settings to prepare it for use by clients.

- On each of the machines on which the Pulsonix application is to be used, use the main Pulsonix Setup program to install Pulsonix as a Network License Client, or use the Pulsonix License Manager to configure an existing client installation to use network licensing.

Backing up data

If you are an existing user, it is recommended that you take a copy of the existing license file before installing the latest version of the software. Other than for any particular reason, this is good working practice, although you should have a backup already!

System permissions and storage of settings

As for most software installations, installing NLS requires administrator rights on the computer on which you are running the Setup program.

The settings needed for the network licensing are stored in a configuration file called "License.ini". This file is created and maintained automatically by the installer and the various Pulsonix and NLS applications, in a folder called "C:\PulsonixConfiguration". If you prefer this file to be written to a different hard drive, you can create a "PulsonixConfiguration" folder on any hard drive up to drive letter "H" before running the installer.

Running the Server and Pulsonix on the same machine

If you intend running the Network License Server and the Pulsonix program on the same machine (and it is perfectly okay to do so) then you must install both the **Server** program and the **Client** on the same machine.

In this case, once the Server is installed and the Client is installed, the network license server is run as normal but the client is simply looking at its own machine rather than looking across the network for this service. The name given for the server will be that of the machine hosting it, the one which you are on.

Server and Workstation editions of Windows

Although NLS is termed a "server", it does not require any special features present only on Server editions of Windows, so it will run perfectly well on a Workstation edition of Windows such as Windows 10. The only requirement is that it runs on a computer that will stay switched on and accessible to the rest of the network for as long as Pulsonix clients need to use it.

Updating servers and clients

In general it is best to update all your software (both server and client) to the latest version, although it is not always strictly necessary. Software updates (patches) for the main Pulsonix application are released more frequently than any changes to the licensing programs; if the notes accompanying the software update don't include any changes specifically related to licensing then you can leave your NLS installation alone and simply update your clients.

Note: in some cases, changes in a software update may require you to update both server and client at the same time. This will be clearly noted in the notes for the update.

Installing the Network License Server

Security Devices and License Files

The Network License Server (NLS) is locked to a particular server machine, generally this will be a network drive MAC Address. In some circumstances, it can also be a HASP key but this is not recommended as the kaye can easily be removed by someone who doesn't recognise it, which in turn, takes down your Pulsonix licensing.

You need to provide the MAC address on your server computer to your Pulsonix supplier so that the correct license file can be generated for you.

The simplest way to do this is to install the Network License Server as described below, choosing the option **No change in licensing** when you reach the **Licensing** page of the install wizard.

Once the NLS software is installed, you will then find a shortcut on your start menu to a **Security Devices** application that will give you a list of the available security devices for you to copy-and-paste to email back to us. We will then be able to generate you the correct license file for use with the new server.

Installing the Network License Server

A **Pulsonix Network License Server** installation has its own setup program.

It will only install the files required to be able to run the license server. You will not be able to run Pulsonix as well from this PC unless you also install the Pulsonix Network License Client (see next section).

Before you install the Network License Server, if your license mechanism uses a USB key, ensure that it is **not** connected. The server software supplied with the program must be installed first. This installation contains the HASP driver required by the key to enable it to run.

Important note: if you are using a HASP USB key for license protection you cannot install the HASP driver or access the HASP key via Remote Desktop. This is a feature of the HASP driver to prevent unauthorised access from multiple desktops and cannot be altered. You must in this situation perform the installation either from the server console itself or via another mechanism such as VNC that accesses the console screen remotely.

Run the NLS installation program that you would have downloaded via the Pulsonix web site.

On the welcome page, press **Next>** to continue.

Select the **I Accept…** radio button to accept the terms and conditions of the agreement displayed.
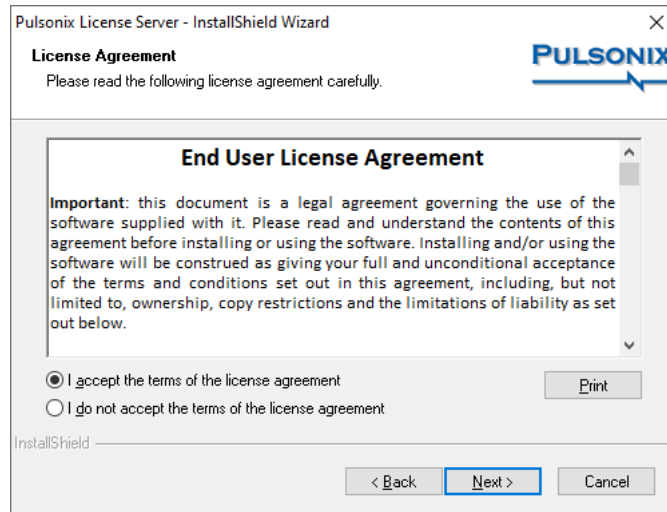
Press **Next>** to continue.

From the **Licensing** page there is an option to specify whether or not you want to install a license file. If you are installing on a system that already has NLS installed and you have a license file in place, you can choose **No Change in Licensing**. With this option selected, Setup will not alter the settings for accessing the license file.

However, if you are installing on a new system or have a new license file to apply, choose the option to **Install a license file** and you will be prompted later on in the Setup process to browse to the location of that license file.
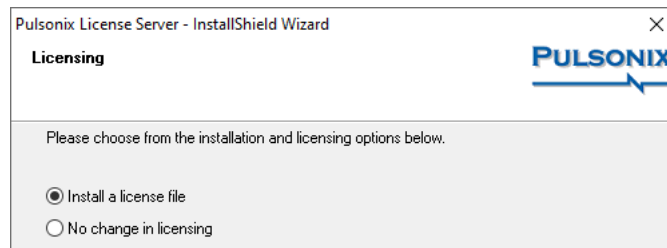
Depending on your system configuration, you may also be prompted to install a HASP driver for a server installation. If you are using a dongle, an appropriate HASP driver must be installed otherwise the program will not run. Setup will install the HASP driver for you.
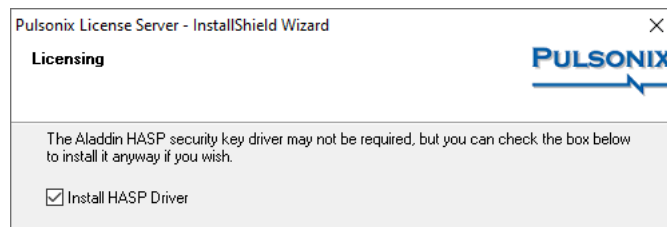
Once the installation is complete, if you connect the USB key, the Windows Plug & Play option will automatically detect the key and install the driver. The key will now be ready for use. DO NOT connect the USB <u>before</u> installing the Pulsonix-supplied HASP USB driver.

Server License

If you have chosen to install a license file, you will now be prompted to select the file. This would have been provided to you by email. If you have the file on email, save the attachment somewhere convenient, then use the popup dialog in the Setup program to point to that file:
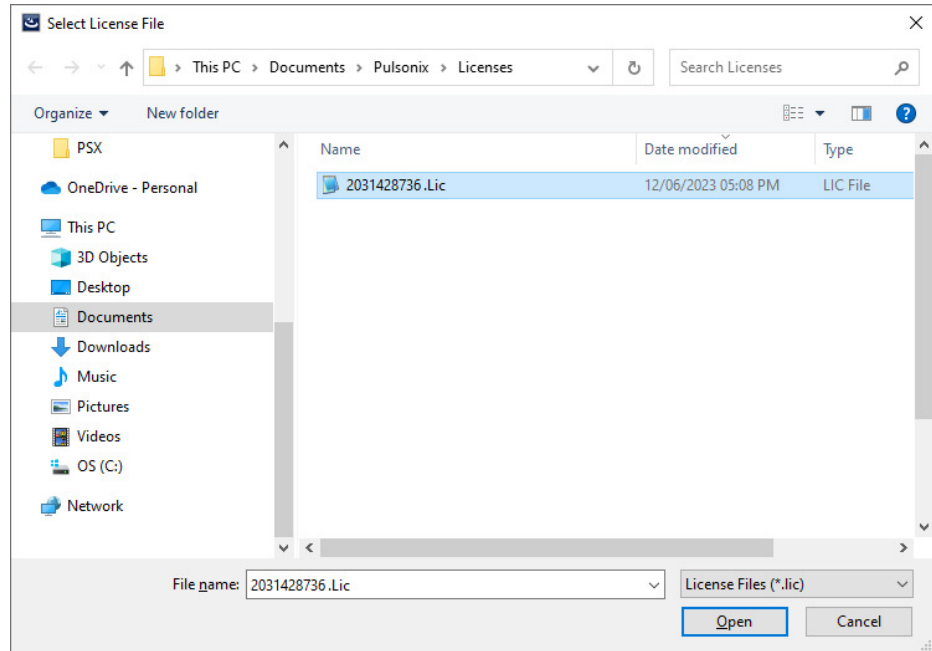
Later in the Setup process, the installer will take a copy of that file and place it in the folder "C:\Users\Public\Documents\Pulsonix\NLServer", in a file called "License.lic". This is to ensure that it is placed somewhere that is accessible to the NLS Daemon whether running as an application or a service.

Adding a license file after installation

If you have installed your license server without a license (for example if you need to identify the correct security device using the Security Devices application as described above), you will need to tell NLS where to find your new license file once you have received it.

Save the license file to an accessible location, run the NLS Manager application, and click the **License File** button and browse to the file you have just saved.

Running the license server

Refer to the detailed instructions in the next chapter to get your license server running.

Protection considerations

The NLS Manager application (NLSM) is configured to request elevation to Admin rights automatically, so that it is guaranteed access to certain areas such as Program Files or other folders. If you have Windows User Account Control (UAC) enabled, then on running NLSM you will be prompted to allow the application to run with admin rights.

Installing the Network License Client

A **Network License Client** is installed using the main **Pulsonix Application Setup** available from the **Setup** dialog**.**

During installation it will ask you to select an installation type, select **Network License Client** installation.
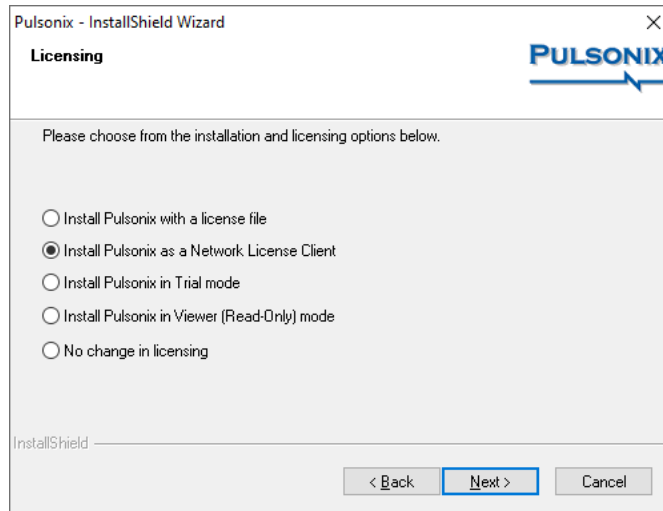
You are also requested for the **Computer name** on which the License Server will run (or is already running). The License Server does not need to be running at the time, as the Setup program will not actually attempt to communicate with the server.

If you don't know the name of the License Server Computer, you can skip this step by leaving the Computer name blank. You can set up the name of the License Server later by using the Pulsonix License Manager program once you have finished installing Pulsonix.
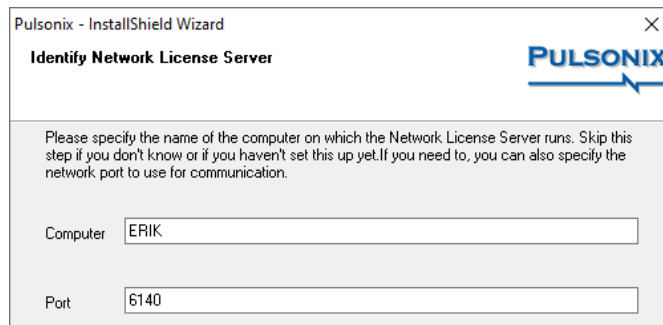
You will also be requested for the **Port** number of the license server, by default this is **6140**.

If necessary, you can also change the network **Port** used by Pulsonix to communicate with the License Server. This should only be necessary if you are already using other software that uses a network 'Socket' on this port number. You should then choose a port number that is not already in use on your network. The License Server and all its clients must use the same port number. This number is generally only changed with the assistance of a member of our Technical Support Team.

Once you have set up the Computer and/or Port, click **Next** to proceed. The values you have specified will be stored in the system registry for later use by the various Pulsonix programs that need to use the Network Licensing scheme.

The remaining installation will be as a normal Pulsonix user.

Using a Network License Client Licenses if you already have Pulsonix installed

If you have swapped your node locked license to a floating license server, your client license will need to also be changed to now point at the license on the NLS.

To do this, run the **License Manager**.
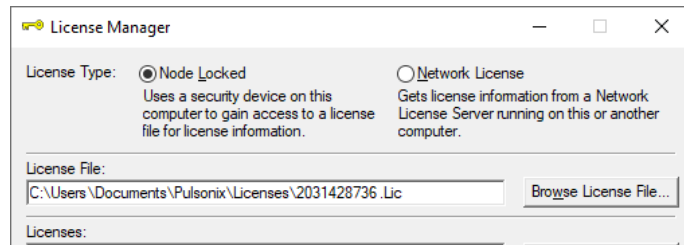
Select the **Network License** radio button.

Select the **Find Server** button:
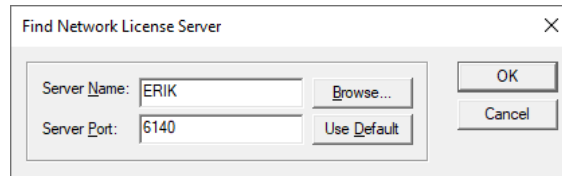
Type or **Browse** to the **Server Name**. The **Server Port** will default to the number offered during the NLS installation. If this is different, type the number you used.

The **Licenses:** list will update and will show your license now connected to the server.

Obtaining the MAC Address to use for Licensing

This is chicken and egg really but it doesn't matter whether you obtain a license first or install the NLS program, then obtain a license, the process for locating the MAC address is the same.

One important note is that you should use the MAC address that Pulsonix reports and not the one reported using one of your system tools, susch as ipconfig. That can often be the same but not always.

From personal experience, it is easier to install NLS first, locate the MAC address then request a license. Here's how to do this:

With NLS installed and running, click the **Security Devices** button:
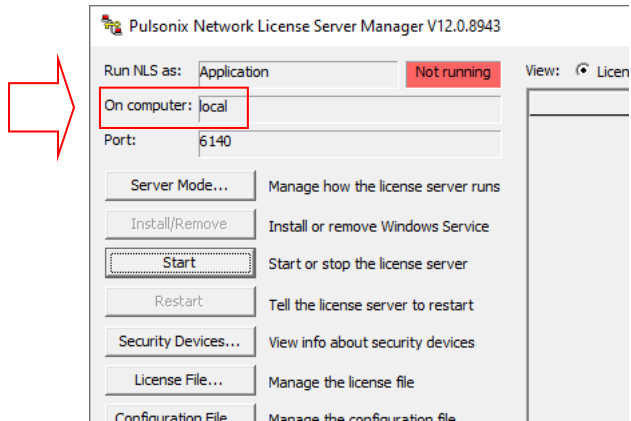
This opens the dialog:
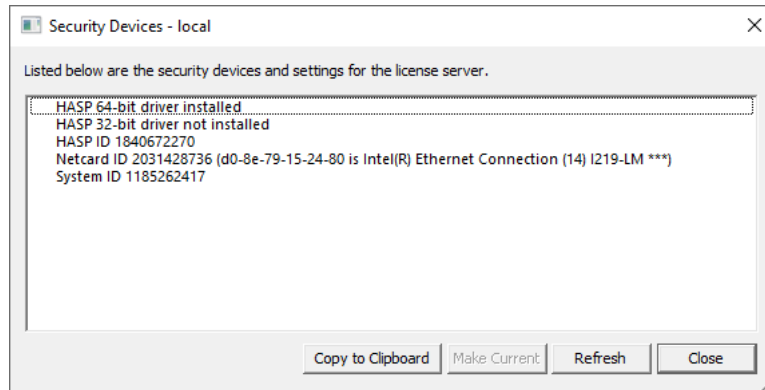
Click the **Copy to Clipboard** button. This will save all the information required. Open a new email or a reply to our sales office (sales@pulsonix.com) Press **Paste** (Ctrl-V) and paste the clipboard contents into your email reply to us. We will then generate a license based on this and based on the products you have purchased.

Chapter 3. Running the License Server

How to get the license server running

With the **Pulsonix Network License Server** installed, there are two methods for running the license server: as an application, or as a Windows service. Depending on your operating system and how it is configured, it is possible that only one method will be available to you.

It is recommended that you use the second method (run as a Service) if possible, as this means that NLS will be available to all Pulsonix users even when no-one is logged in on the server.

During Setup, a shortcut to the **Network License Manager** application (nlsm.exe) is added to the 'Pulsonix' group on your Start menu. Clicking on this shortcut will start the Manager application. From here, you can choose the mode in which the NLS Daemon (nlsd.exe) is to be invoked. Although you can use NLSM later on to manage the license server remotely (i.e. from your own workstation computer), to get things going initially you should run it directly on your actual server computer.

It is recommended that you use 'as an application' first to verify that the server and license will run, and only then switch to run as a service to provide an 'always on' licensing capability.
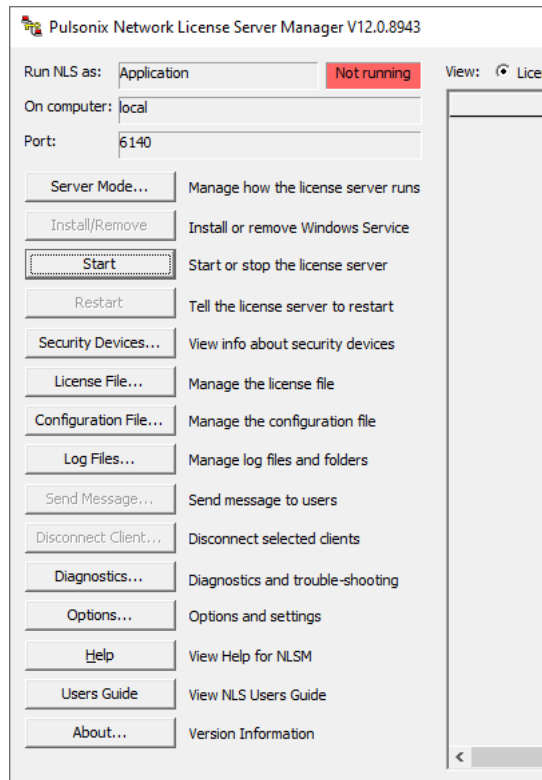
Running the license server as an application

From the Network License Manager, click the **Server Mode** button and choose to run the license server as a normal application:
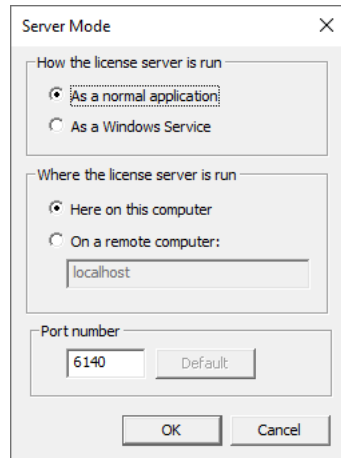
Click OK to confirm this setting. Now click the Start button, and you should see a text window appear on the screen showing that the license server is starting up.

If the installation process has been successful, the license file is in place and the correct security device is available, you should see some messages that confirm that NLS has loaded a number of features from the license file and startup is successful:

```
Pulsonix Network License Server Daemon Version 10.0.7075
Running on tirano.main.pulsonix.com/david
nlsd.exe 10.0.7075
license.dll 10.0.7160
nlutils.dll 10.0.7161
Utility.dll 10.0.7158
Log folder "C:\Users\Public\Documents\Pulsonix\NLServer\Logs"
Config file "C:\Users\Public\Documents\Pulsonix\NLServer\Config.nlc"
Listening on port 6140
Max client idle time 180 seconds
License File "C:\Users\Public\Documents\Pulsonix\NLServer\License.Lic"
Ethernet Address 426204624 Connected
Loaded 64 licenses from file
Successful server startup
```

Problems during startup

If there are problems, you should see messages that describe the issue. Here for example we can see that the wrong license file has been used, it doesn't actually match the current security device so although the NLS Daemon has been able to start it has no valid license features to serve out:

```
Pulsonix Network License Server Daemon Version 10.0.7075
Running on tirano.main.pulsonix.com/david
nlsd.exe 10.0.7075
license.dll 10.0.7160
nlutils.dll 10.0.7161
Utility.dll 10.0.7158
Log folder "C:\Users\Public\Documents\Pulsonix\NLServer\Logs"
Config file "C:\Users\Public\Documents\Pulsonix\NLServer\Config.nlc"
Listening on port 6140
Max client idle time 180 seconds
License File "C:\Users\Public\Documents\Pulsonix\NLServer\License.Lic"
Ethernet Address 426204624 Connected
ERROR: Loaded 0 licenses from file
ERROR: License file may not match current security device
ERROR: License file intended for serial 1624062539
Successful server startup
```

Note: NLSD will still report that it has been able to start successfully, even if it has been unable to find the correct license file. This is to allow you to adjust the settings for the NLS Daemon using NLSM and try again; NLSM can still communicate with NLSD via the TCP/IP socket interface even if the license file hasn't worked.

If you experience problems getting the license server running properly, there is a Diagnostics button on the main NLS Manager dialog that should help gather relevant information, and the Trouble-Shooting section later in this document describes how to use the Diagnostics and how to resolve common issues.

Running the license server as a 'service'

The process of starting up the server can be automated, by installing it as a special kind of program called a 'service'. This service will then be started up automatically as the operating system itself starts up, thus allowing the license server to run entirely independent of whoever is logged onto the server computer.

You can use the NLSM program to install the service. First use the **Server Mode** button to change the setting to run the license server as a **Windows Service**:
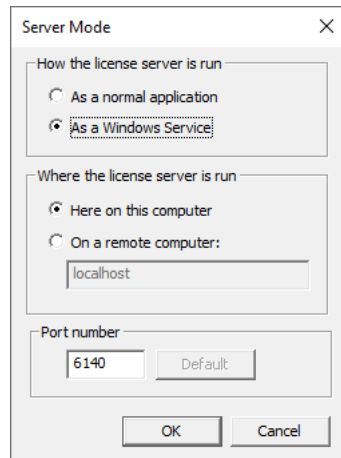
Click OK, and you should then find that the Install button on the main dialog is enabled. Click this to start installing the service.
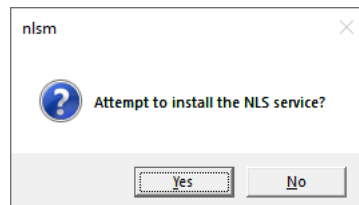
NLSM will now instruct the Windows Service Control Manager (SCM) to install the NLS Daemon (NLSD) as a service called "Pulsonix Network License Daemon". If this works, you will get a confirmation message:
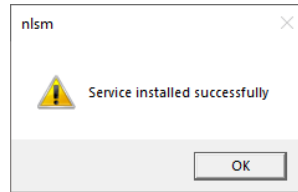
If there were errors when attempting to install NLSD as a service, the relevant error description and/or code will be displayed instead, to help you work out why the attempt failed.

Once the service is installed, you can use the Start button on the NLSM dialog to instruct the service control manager to start the network license service.

Alternatively, you can use the **Services** feature of the **Windows Control Panel** to locate the service in the list, and start it from there:
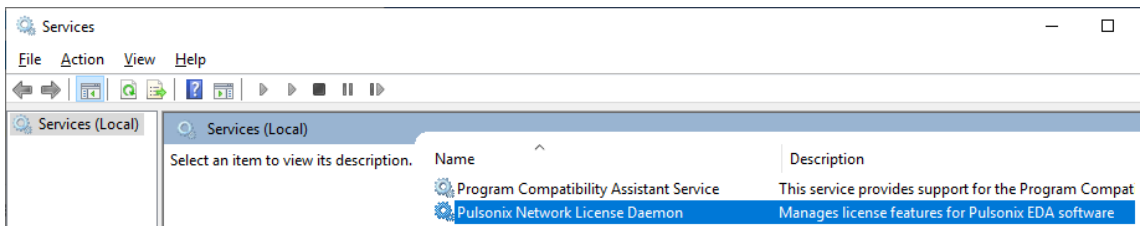
Note that you will only need to install and manually start the service once. Once properly installed, whenever the operating system is restarted (re-booted) the O/S will take care of restarting the service for you, as the service is added to the system with startup type "Automatic".

Once the service is running, the client (once installed) can then find this service and request to book out the licenses it wants.

Updating the NLS program files

Even if you later install an updated copy of NLS (you would have to stop the service while you do this) you don't have to go through the process of installing the service again, as long as the NLS programs are in installed into the same location as before. Just stop the service, run the Setup program to update the NLS modules, then start the service again.

Running the Server and Pulsonix on the same machine

If you intend running the Network License Server and the Pulsonix program on the same machine (and it is perfectly okay to do so) then you must install both the **Server** program (as described above) and the **Client** (as described in the 'Startup Notes') on the same machine.

In this case, once the Server is installed and the Client is installed, the network license server is run as normal but the client is simply looking at its own machine rather than looking across the network for this service. The name given for the server will be that of the machine hosting it, the one which you are on.

Monitoring the license server

When the license server is being run as a service it doesn't have any user interface, so you can't directly see what it is doing. The NLS Manager application (NLSM, described in the next chapter) can be used instead to 'interrogate' the status of the license service.

You can also use NLSM to 'monitor' the operation of NLSD remotely (from another computer), although there will some limitations on what changes you can make.

Select the **Network License Manager** program from your Start menu and 'Pulsonix' group. The Manager application will start up show you the status of the network license service. This Manager provides the user interface to change permissions and options on the server. It can also be used on a client machine to monitor a service running on another computer.

If you want to use NLSM on a completely different machine, simply run the NLS installation process again, and select the option for 'No Change in Licensing' when prompted about using a license file. Finish the installation, and use the shortcut on the Start menu to run the NLSM application.

Complete details of the various configuration and management options available in the manager application are given in the next chapter.

Stopping the license server

Using the network license manager

You can use the Network License Manager application to stop the license server. Depending on your access permissions, you can do this directly on the server computer itself or remotely from a different computer.

Simply click the Stop button to instruct the license server to stop. You will be asked to confirm this action before the stop instruction is sent to the license server.

Stopping the license service

When running the license server as a service, you can also stop the service by typing the following command at an Administrator command prompt:

```
net stop nlsd
```

You can also use the Services section of the Windows Control Panel to locate the service in the list ("Pulsonix Network License Daemon") and stop it from there.

Stopping the license server application

When running the license server as an application, stopping the server is as simple as closing the application by pressing Esc or Control+C in the command window in which it is running, or simply closing the command window.

Stopping when users are still connected

Care should be taken when stopping or restarting the Network License Server when there are still users connected to it. A warning message is displayed if you attempt to do this from the NLS Manager application, but not when running as a service (because the service does not have any user interaction) or when stopping the command-line application directly.

If the server is simply being restarted, the server will attempt to re-establish the link to those connected clients/users, but depending on what the client applications are doing there is no guarantee that communication will be successfully re-established, or it may take longer than expected and the client end may assume the server has gone and will then start closing itself down.

Therefore, it is recommended that you **do not** stop or restart the server when client applications are connected. It may however be necessary to restart the server if client/server communications

have been disrupted for some reason. Before doing so, it is recommended that you ensure that all the users who might be affected have saved their work. Generally the client application protects itself against this kind of issue by still enabling important functions such as Save and Exit even if communication with the license server has been lost.

Loan license information is cached between application runs, so any loans that are known to NLSD when it is closed will be reloaded into the application when it starts again. The only loans that will not be reloaded are those whose expiry date has already passed.

Command-line parameters for NLSD application

If you wish, the NLSD application can be run directly from a command prompt with various command-line parameters to specify certain behaviour or over-ride previous settings stored in the system registry. Some (those relating to managing the service) will only work from an Administrator command prompt.

Running the license server

To start NLSM as a license server:

```
nlsd start
```

Specifying the port number

The default or stored settings for the TCP/IP port to use can be over-ridden from the command-line if required:

```
nlsd start port:portnumber
```

Install as a service

To install NLSD as a service:

```
nlsd install
```

Remove as a service

To remove NLSD as a service:

```
nlsd remove
```

Command-line example

This is an example command-line:

```
nlsd start port:14420
```

This would launch the license server program to act as a server using a non-standard port number.

Chapter 4. Managing the License Server

Overview

This chapter covers the various administration options that allow you to control the operation of network licensing.

These options work in the same way whether running the NLS Daemon (NLSD) as an application or as a service. The NLS Manager (NLSM) can be used on the same computer as NLSD, or remotely from another computer (in which case some features are limited in their operation).

Controlling permission to manage the License Server

In a default installation, anyone is able to launch the NLS Manager can gain access to the license server and hence manage its operation.
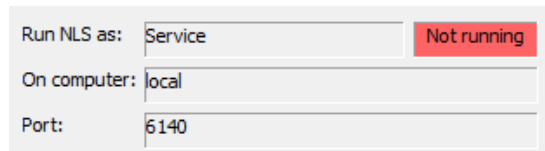
To prevent this happening, you should use the commands available in the configuration file (see "Chapter 5. Configuration File Commands" starting on page 32) to create an administrators group; if the configuration file used by the server specifies an administrators group, only those people specified as members of that group will be able to change any settings when managing the license server. Without an administrators group, permission to modify the server operation is 'wide open' to anyone who can run the Manager application.

If you are restricting access to administrators, you should also use the operating system permissions to control access to the configuration file. Otherwise anyone could edit the configuration file to add themselves to the administrators group!

Using NLS Manager

The main dialog of the NLS Manager has three main areas. The first is a status area that you can use to quickly check the status of your NLS installation.

In this example we can easily see that NLS is not currently running, and is configured to run as a service on the local computer, using the default port number of 6140.

Below this are some buttons that you can use to manage the NLS parameters. The action and enabled state of these buttons will depend on your configuration and whether NLS is running or stopped, the service is installed or not, and so on. Each of these buttons is described in more detail below.

Server Mode...	Manage how the license server runs
Install/Remove	Install or remove Windows Service
Start	Start or stop the license server
Restart	Tell the license server to restart
Security Devices...	View info about security devices
License File...	Manage the license file
Configuration File...	Manage the configuration file
Log Files...	Manage log files and folders
Send Message...	Send message to users
Disconnect Client...	Disconnect selected clients
Diagnostics...	Diagnostics and trouble-shooting
Options...	Options and settings
Help	View Help for NLSM
Users Guide	View NLS Users Guide
About...	Version Information

The third area allows you to view information about the server and its operation. Here we can see an example of the Licenses view, showing how some of the licenses that are available, how many are currently booked out or loaned out, and how many are still free to use.

View: ⦿ Licenses   ○ Clients   ○ Server Log   ○ Manager Log

License	Total	Booked out	Loaned out	Free
Pulsonix Application	22	1	4	17
Save PCB Designs	16	1	4	11
PCB Layout	22	1	4	17
Schematic Capture	22	1	4	17
Pin Limit	12		4	8
Unlimited Pin Count	4	1	4	0
Save Schematic Designs	22	1	4	17

Server Mode

The Server Mode dialog is used to specify how the NLS Daemon is to run.

When you are using NLSM on the server computer, changing setting on this dialog will alter the action that is carried out by the Install/Remove and Start/Stop buttons, allowing you to directly influence how NLSD runs.

When using NLSM on a different computer to remotely monitor what is happening with NLS, NLSM will interact with NLSD using the normal NLS communication.

You also use the Server Mode dialog to specify the Port number for communicating with NLS.
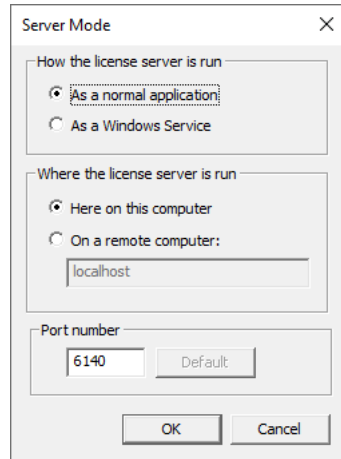
Install/Remove

When Server Mode is set to run the license server as a service, and NLSM is running on the same computer as the server, the Install/Remove button will update its caption to show Install (if NLSD is not yet installed as a service) or Remove (if NLSD is currently installed). When running NLSM remotely, this button is not enabled.

Clicking this button will first prompt you to confirm the action, then it will use the functions of the Service Control Manager (SCM) to install or remove NLSD as a system service. Successful installation or removal will be acknowledged, or if unsuccessful then the appropriate error message is displayed.

Start/Stop

The Start/Stop button will update its caption to show Start if NLSD is not running, or Stop if it is running. Clicking on this button will first prompt you to confirm the action.

If NLSD is configured to run as a service, both Start and Stop will use the SCM to start or stop the service. In some circumstances, particularly when administering remotely, additional operating system permissions may be required to do this; you will be informed about any issues by the error messages displayed.

When configured as an application, the button will not be enabled if NLS is not running and you are administering remotely, as it is not possible to start an application on a different computer. Otherwise, it is generally possible to start NLS as an application locally, or to issue a stop command to the server if it is already running.

Restart

If NLS is running, this button will first prompt you to confirm the action, then it will issue a Restart command to the server. This is normally handled very quickly, and the server will restart itself. The restart is 'internal' to the NLSD program, it doesn't actually stop and restart the application. Also, the server will restart on being given this command even if there are clients currently connected to the server.

Security Devices
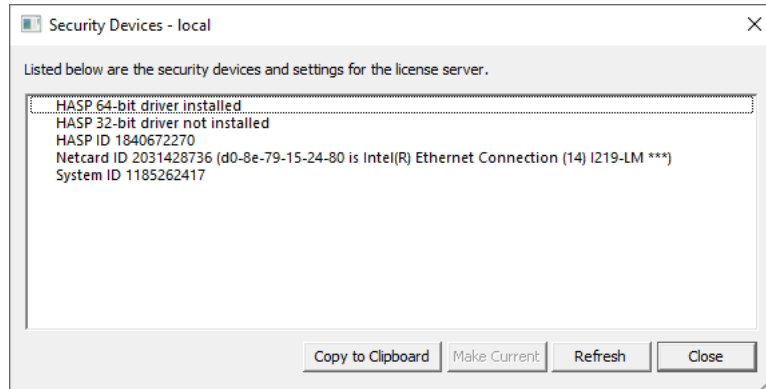
The Security Devices dialog shows information about the security devices on the server computer. The currently selected security device will be prefixed by *.

In some circumstances it may be necessary to select a specific security device to match your license file. For example, if your computer has multiple network devices it may be necessary to indicate the specific device which should be used to unlock your license file.

To do this, select the required entry in the list of devices and click the Make Current button. You will be asked to confirm the change, and the server will then be instructed to change its security device type. If successful, you will be asked whether you wish to restart the server, and if not, then whether you wish to ask the server to reload its license file.

License File

The server uses a license file to determine how many of each licensed option are available to be handed out to clients that request them. The License File section of the dialog is where you specify where that license file lives, and manage other aspects of the license.
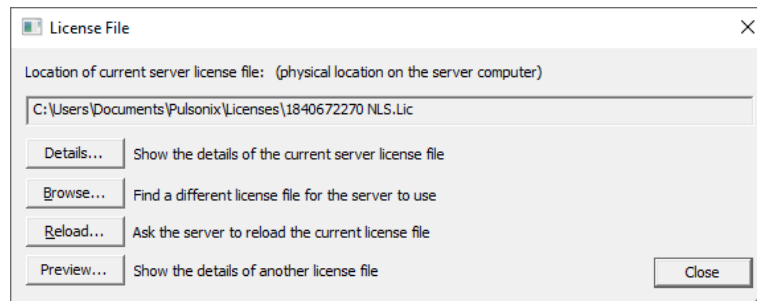
Use the Details button to view the list of features included in the current license file.
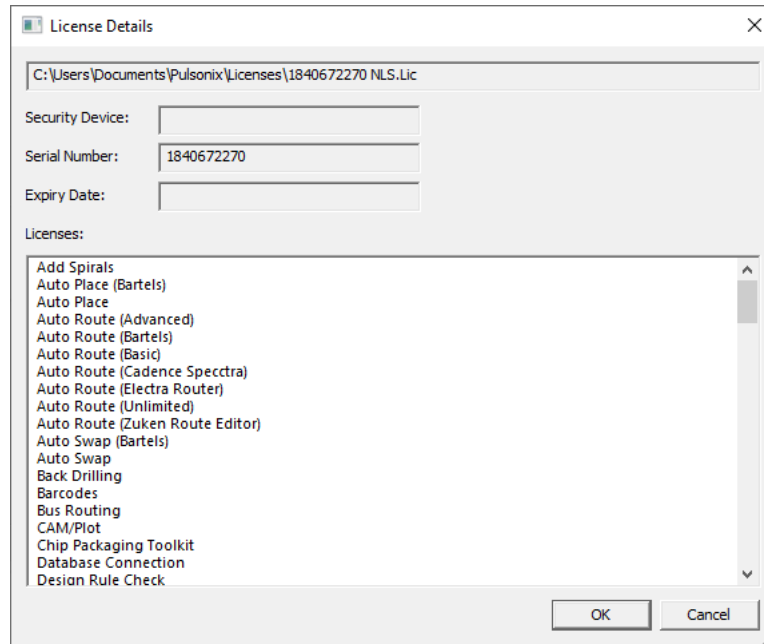
Use the Browse button to locate the license file if you have not yet specified its location, or to change to a different license file. The details of the selected license will be listed to give you the opportunity to review the contents before committing the change.

Use the Reload button to request that the server re-read the existing license file. This can be useful for example if you have been sent a new license file with a higher license count for some options and have dropped it over the existing file.

Both Browse and Reload can be used to load a license file into a server that is already running. Existing client connections will not be lost or broken by doing this. Any increased license counts will become available immediately to be requested by clients. Any reduced license counts will also be taken into account; if this means that the count on a particular license option is lower than the number of that option currently booked out, those licenses will be automatically removed from the server's internal license table as they are returned to the server.

You can also use the Preview button to look at the details of a completely different license file without altering any of the settings.

Configuration File

Many of the settings for the license server are controlled from a Configuration File.

The server will run without a configuration file, so you would only need to create and use one if you need to specify any of the additional controls or features that are not available directly from the Options dialog, or to over-ride any of the default settings such as port numbers.
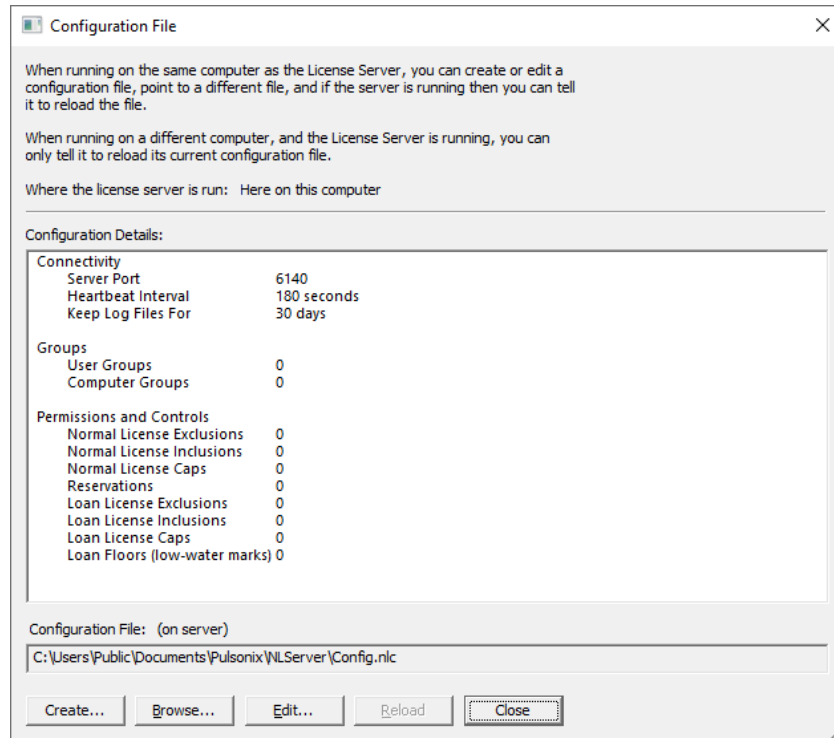
Note: when running the server application as a 'monitor' connected to the actual license server on another computer, the buttons for creating and editing the configuration file are not available. This is because the file lives on that other computer and is not directly accessible on the machine on which you are running the monitor.

To create a new configuration file, use the Create button. This will prompt you to specify the name and location of your new configuration file, then open that empty file in your normal text editor so you can start adding your configuration commands.

If you already have a configuration file and wish to change commands in it, use the Edit button to open your file in your normal text editor.

Use the Browse button to instruct the server to use a different configuration file.

Use the Reload button to instruct the server to re-read the configuration file after you have finished editing it, or perhaps after you have restored a previous version of the file from backup.

Below these buttons is a list of the key information that has been loaded from the current configuration file. This list is useful to verify that you have set up the correct commands in your configuration file before pressing OK to commit the server to using it.

For full details of all the commands that can be used in a configuration file refer to "Chapter 5. Configuration File Commands" starting on page 32.

Log Files

The Server writes log files to record many of the things that happen to the server as it is running. These files are written to the location specified here for the Log File Folder.

Each log file is named for the date on which it is written. The server automatically 'rolls over' to start a new log file for the first message it needs to record after midnight.
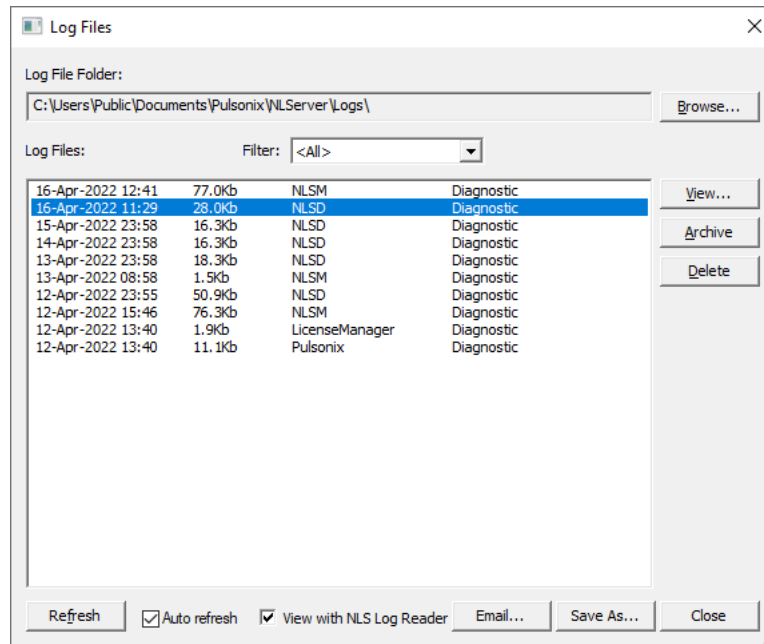
This dialog will list all the files it finds in the designated log folder. You can use the buttons on this dialog to view a log file, move one or more to an 'Archive' sub-folder or even delete them permanently.

The Email button allows you to Zip the selected log files and send them using your normal mail client to your Technical Support contact to help with diagnosing issues.

Disconnect Client

You may occasionally have issues where colleagues working in other locations leave their Pulsonix applications running for long periods (for example overnight) when they are not at their desks. This may cause problems for you if you are nearing capacity on the number of used licenses, and could prevent other users from being able to get onto the system.

The Disconnect Client option allows you to select one of those users and instruct their Pulsonix application to disconnect itself from the server and thus release its licenses with no manual intervention needed at the client end.

Simply select the entry for this user and click Disconnect. Depending on various parameters such as heartbeat intervals and network traffic, it could take several minutes for this instruction to take effect, but eventually the client will disconnect and vanish from the list.

```
┌─────────────────────────────────────────────────────────────────────┐
│ ▪▌ Disconnect Clients                                             ✕  │
├─────────────────────────────────────────────────────────────────────┤
│ ┌─────────────────────────────────────────────────────────────────┐ │
│ │ artemis.india.pulsonix.com/rav                                    │ │
│ │ intrix.main.pulsonix.com/ant                                      │ │
│ │ tirano.main.pulsonix.com/dennis                                   │ │
│ │                                                                   │ │
│ └─────────────────────────────────────────────────────────────────┘ │
│  ┌─────────┐              ┌────────────┐ ┌────────────┐ ┌─────────┐  │
│  │ Refresh │              │ Disconnect │ │ Loan Reset │ │  Close  │  │
│  └─────────┘              └────────────┘ └────────────┘ └─────────┘  │
└─────────────────────────────────────────────────────────────────────┘
```

Diagnostics

The **Diagnostics** dialog requests information the license server about its current status.

```
┌─────────────────────────────────────────────────────────────────────┐
│ ▪▌ Diagnostics                                                   ✕   │
├─────────────────────────────────────────────────────────────────────┤
│ ┌───────────────────────────────────────────────────────────────┐ ▲ │
│ │Diagnostic Information                                          │   │
│ │---------------------                                          │   │
│ │                                                               │   │
│ │Nlsdiag Build             8939                                 │   │
│ │Timestamp                 17:05 23-Apr-2022                    │   │
│ │                                                               │   │
│ │Performance                                                    │   │
│ │-----------                                                    │   │
│ │                                                               │   │
│ │Current licenses          89                                   │   │
│ │Current clients           1                                    │   │
│ │Peak clients              2                                    │   │
│ │Packets received          43                                   │   │
│ │Data received             5Kb                                  │   │
│ │Unrecognised data         0                                    │   │
│ │Malformed data            0                                    │   │
│ │Licenses granted          3                                    │   │
│ │Licenses not granted      1                                    │   │
│ │Loans granted             0                                    │   │
│ │Loans not granted         0                                    │   │
│ │Loans returned            0                                    │   │
│ │Loan returns failed       0                                    │   │
│ │Expired loans             0                                    │   │
│ │Monitor denied access     0                                    │   │
│ │Closed on lost heartbeat  0                                    │   │
│ │Caught exceptions         0                                    │   │
│ │Process Run Time          0h 7m 19s                            │   │
│ │Memory Working Set        30.95Mb                              │   │
│ │CPU average %             0.3                                  │   │
│ │CPU time                  1d 0h 0m 4s                          │   │
│ │                                                               │   │
│ │Security                                                       │   │
│ │--------                                                       │   │
│ │                                                               │   │
│ │HASP 64-bit driver installed                                   │   │
│ │HASP 32-bit driver not installed                               │   │
│ │HASP ID 1624062539                                             │   │
│ │Netcard ID 2115690204 (d4-3d-7e-1a-de-dc is Hyper-V Virtual Ethernet Adapter│
│ │Netcard ID 1540031065 (ca-15-a4-34-fd-a7 is Hyper-V Virtual Ethernet Adapter│
│ │Netcard ID 2081254660 (00-15-83-f2-92-fc is Bluetooth Device (Personal Area │
│ │Netcard ID 1656469209 (20-68-9d-44-49-27 is Realtek RTL8188CE Wireless LAN &│
│ │System ID 989428488                                            │   │
│ │Preselected security device 1656469209                         │   │
│ │                                                               │   │
│ │Settings                                                       │   │
│ │--------                                                       │   │
│ │                                                               │   │
│ │[Header]                                                       │   │
│ │Time=Mon Apr 23 17:02:55 2022                                  │   │
│ │                                                               │   │
│ │[License]                                                      │   │
│ │LicenseFile=C:\Programs\Pulsonix\Licenses\1624062539.lic       │ ▼ │
│ └───────────────────────────────────────────────────────────────┘   │
│ ┌─────────┐ ☑ Auto refresh    ┌─────────┐ ┌───────┐ ┌─────────┐ ┌───────┐│
│ │ Refresh │                   │ Upload… │ │ Email…│ │ Save As…│ │ Close ││
│ └─────────┘                   └─────────┘ └───────┘ └─────────┘ └───────┘│
└─────────────────────────────────────────────────────────────────────┘
```

The precise details displayed depends on the capability of the diagnostic module currently installed at the server end.

You may be given an enhanced copy of the diagnostic module by your Technical Support contact if there are specific problems with your server that require additional analysis. Use the **Upload** button to upload the new copy of the diagnostic module (nlsdiag.dll) to the server, after which the next refresh of the dialog will display the new information.

Options
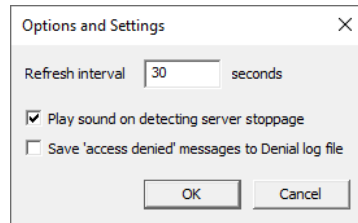
The **Refresh Interval** setting controls how often the current status (as shown on the Connections, Servers and Licenses screens) is updated.

You can also tell the application to play a sound when it detects that the license server has stopped (this only works while NLSM itself is running).

View Licenses

The **Licenses** view shows you a table of the licenses from the license file, and how many of each license are currently booked out or still available to be booked out.

License	Total	Booked out	Loaned out	Free
Pulsonix Application	22		3	19
Save PCB Designs	16		3	13
PCB Layout	22		3	19
Schematic Capture	22		3	20
Pin Limit	12		3	10
Unlimited Pin Count	4		3	2
Save Schematic Designs	22		3	20
Chip Packaging Toolkit	2		2	0
Interactive High Speed	2		2	0

The values shown in the Free column are green when there are still licenses available, or red when all the copies of the particular license feature are currently in use.

View Clients

The **Clients** view shows you information about the client applications connected to the server. For each one you can see the total number of licenses assigned to that user.

App	Computer	User	Assigned	Loaned	Expiry
NLSM	tirano.main.pulsonix.com	david	0	0	
Pulsonix	neptune.vernax.com	marco	24	0	
Pulsonix	jupiter.vernax.com	jennifer	22	0	

If your server has the Loan capability enabled, you may also see entries for users who have loaned out some licenses, including the date and time their loan will expire.

App	Computer	User	Assigned	Loaned	Expiry
Pulsonix	sirius.india.vernax.com	sam	0	66	09:14 31-Mar-2018
Pulsonix	altares.india.vernax.com	raj	0	66	16:01 30-Mar-2018
NLSM	tirano.main.pulsonix.com	david	0	0	

View Server Log

When you are using NLSM on the server itself, it has direct access to the server log files. In this situation, the Server Log radio button is enabled, and the contents of the server log are displayed.

The view is refreshed at intervals so you can see new messages appear on the screen as they are added to the log.

The log file shows you what is happening as the server runs and clients 'talk' to the server. This includes information about clients connecting and disconnecting, licenses being booked out and returned, and so on.

Time	Name	Action	
2018-03-26 14:08:57	NLSM.13432/tirano.main.pulsonix.com/design4	Client app is NLSM with NLS Level 4	∧
2018-03-26 14:08:57	NLSM.13432/tirano.main.pulsonix.com/design4	Client is david on tirano.main.pulsonix.com	
2018-03-26 14:08:57	NLSM.13432/tirano.main.pulsonix.com/design4	nlsm.exe version 10.0.7135	
2018-03-26 14:08:57	NLSM.13432/tirano.main.pulsonix.com/design4	nlutils.dll version 10.0.7135	
2018-03-26 14:08:57	NLSM.13432/tirano.main.pulsonix.com/design4	Command:GetStatus	
2018-03-26 14:09:04	NLSM.13432/tirano.main.pulsonix.com/design4	Command:GetStatus	
2018-03-26 14:09:17	Pulsonix.6540/DX603/john	Command:RequestLicense 'Import Master	
2018-03-26 14:09:17	Pulsonix.6540/DX603/john	Command:RequestLicense 'Import visECAI	
2018-03-26 14:09:34	Pulsonix.11672/AC7019/admin	Command:Heartbeat	
2018-03-26 14:10:49	Pulsonix.6540/DX603/john	Command:RequestLicense 'Database Con	
2018-03-26 14:10:49	Pulsonix.6540/DX603/john	License 'Database Connection' acquired f	
2018-03-26 14:11:09	Pulsonix.6540/DX603/john	Command:RequestLicense 'Export Accel'	
2018-03-26 14:11:09	Pulsonix.6540/DX603/john	Command:RequestLicense 'Export Cadsta	
2018-03-26 14:11:09	Pulsonix.6540/DX603/john	Command:RequestLicense 'Export PADS'	
2018-03-26 14:11:09	Pulsonix.6540/DX603/john	Command:RequestLicense 'Export P-CAD'	

View Manager Log

This view shows you what is recorded in the log file for the Manager application itself. This includes information about connecting to and disconnecting from the server, settings that the NLS interface is using, and other details that could be useful for diagnosing problems.

Time	Action
2018-03-26 16:07:36	connection attempt failed
2018-03-26 16:07:36	ProcessEvent error WSAECONNREFUSED
2018-03-26 16:14:59	Client disconnecting
2018-03-26 16:14:59	Send to 27 failed with error WSAENOTCONN
2018-03-26 16:15:00	Client connecting
2018-03-26 16:15:00	EventTimeout is 50ms
2018-03-26 16:15:00	WaitForResponse is 15s
2018-03-26 16:15:00	MaxIdleTime is 300s
2018-03-26 16:15:00	Connect to server 89.1.1.225:6140
2018-03-26 16:15:00	Connection granted Y
2018-03-26 16:15:00	Command:GetStatus
2018-03-26 16:15:00	Status granted Y
2018-03-26 16:15:00	License count 56

Chapter 5. Configuration File Commands

Overview

Locating your Configuration file

You should place your Configuration file where it is going to be 'safe'. Anyone who has the rights to edit the configuration file can potentially alter the permissions and other settings for your license server. You may therefore wish to place the file in a folder for which only selected users have write permissions. You will need to use your operating system features to set this up.

Your file should also be placed somewhere where your server can always reach it. Don't place it on external media that may sometimes be disconnected, or on a network or subst'd drive that the server may not have permission to reach.

Order of precedence of commands

If there are no PERMIT or DENY commands in the file, there are no restrictions on how license requests are granted or denied. This is the default setting, and access to licenses is only controlled by the total number of each license available in the license file.

Once the file contains a PERMIT or DENY list for a particular license, all other entities are automatically outside the group. If for example the file contains one or more PERMIT commands for a license option, anyone not covered by the names or groups in those commands will not be granted access to that license.

Other licenses not mentioned with PERMIT or DENY commands will default to being free of any access restrictions. You can change this using the command PERMITUNLISTEDOPTIONS (see below).

Depending on how you wish to structure the access rights, you can quickly cover all basic possibilities without having to list every possible user or computer in your configuration file. You can either:

- Permit access by most users and only DENY those not permitted, or

- Heavily restrict access for most, and only PERMIT those for whom access is granted

When using PERMIT and DENY commands in combination to define access to the same licenses, rules defining the order of precedence are applied to decide whether that requests for that license can be granted to particular users or groups. The rules are as follows:

- If there is only a DENY list, everyone who is not on the list is allowed to use the feature.

- If there is only a PERMIT list, only those users on the list is allowed to use the feature.

- If neither list exists, everyone is allowed to use the feature.

- The DENY list is checked before the PERMIT list; someone who is on both lists is not allowed to use the license.

For the License Loan feature, the PERMIT_LOAN and DENY_LOAN commands work together in the same way as described above for PERMIT and DENY.

Option names

Various commands in the configuration file use names for licenses in the license file. The following table lists the name and description for each license or group of licenses that can be managed using the configuration file:

Name	Description
Application	The main license for the Pulsonix application itself
PcbLayout	Access to PCB designs
ScmLayout	Access to Schematic designs
SavePCBDesigns	The ability to save PCB designs
SaveSCMDesigns	The ability to save Schematic designs
PCBViewer	Put PCB designs into 'viewer-only' mode
SCMViewer	Put SCM designs into 'viewer-only' mode
SaveLibraries	The ability to save to Pulsonix libraries
UnlimitedPins	Designs with no pin limits
PinLimit	Designs with a limit on the number of pins
PinLimit2	Secondary pin limit where multiple pin limits are defined
HighSpeed	Interactive High-Speed command set
AutoRoute	Advanced PCB auto-router
BasicAutoRouter	Basic PCB auto-router
ElectraAutoRouter	Output to Electra standalone PCB auto-router
AutoPlace	PCB automatic placement
AutoSwap	PCB automatic gate and pin swap
Embedded	Embedded Components command set
Spirals	Add Spirals
Barcodes	Add and edit barcode text
NetTestability	Net testability checker
PDC	Pulsonix Database Connection
LibKit	Library Integration Toolkit
ChipKit	Chip Packaging Toolkit
IntegratePLM	Interface with 'Integrate' toolkit for PLM system
RouteEditor	Interface with Zuken Route Editor
Specctra	Interface with Cadence Specctra
Spice	Run Pulsonix-Spice simulator
ExportSpice	Export SPICE netlist
OtherSpiceTypes	Access to SPICE outputs for simulators other than Pulsonix-Spice
CamPlot	CAM/Plot dialog for manufacturing output
FPGA	FPGA links
DRC	Design Rule Check
RulesBar	Rules dockable bar
BusRouting	Bus routing
MicroVias	Micro-via features
Vault	Pulsonix Vault
DiffPairs	Creation and editing of differential pairs
Serpentine	Serpentine routing
SigPaths	Signal paths
RF	RF design features
FullEdition	Full-capability edition of the Pulsonix application
LiteEdition	Reduced-capability edition of the Pulsonix application

There is also a special license name "*" (asterisk, star) that means all possible licenses. This can be used in commands requiring a license name where access to the complete set of licenses needs to be controlled, for example to permit one person to access any license that might be available on the server.

There is also a long list of export and import features that are generally not required to be named in configuration files. If you have a specific requirement for controlling access to any of the import, export or plotting features, then please contact your Pulsonix supplier for details about the feature names to use.

Case sensitivity

All the commands in the configuration file are case insensitive; that is, all names are compared ignoring their case.

Keywords and commands are shown in upper case for clarity in the Command Reference below, but are always compared ignoring their case.

Comments

Any line starting with # or ; will be treated as a 'comment' line and ignored when the configuration file is loaded.

User management commands

ADMINISTRATOR

ADMINISTRATOR type name

This command is used to control who is allowed to perform administration tasks on the license server using the 'monitor' application. If no administrators are specified in the configuration file, no control is imposed and anyone running the monitor can administer the server.

type   USER, COMPUTER, USERS or COMPUTERS.

name   Name of the entity allowed to administer the server.

For example, the following lines in the configuration file create a user group called admins, then sets that group as having admin rights, thus allowing the two named users to administer the server:

```
USERS admins michael alice
ADMINISTRATOR USERS admins
```

This command does not control operating-system access to the server application or service, or to the configuration file itself. Control over those aspects of the license server should be exercised using the permissions or policies available through your operating system. The definition of an 'administrators' group in a configuration file does not stop someone else – provided they have operating system permissions – from stopping the network license service.

Care should be taken when setting up administrator groups, to avoid the possibility that no valid users would be able to administer the server. In the event that the server is using an ADMINISTRATOR command that does not specify any valid users, recovery would require you to edit the configuration file to correct the error, then manually stop and restart the server (assuming you have operating system permissions to do so).

USERS

USERS group_name user_list

This command defines a name to be used for a group of users for use in other commands in the file. Multiple USERS lines for the same group name will add all the specified users into the same named group.

group_name   Name of the group being defined.

user_list   List of user names in that group.

For example, this command defines a group of users called "fabshop" with 4 members:

```
USERS fabshop peter martin susan toni
```

COMPUTERS

COMPUTERS group_name computer_list

This command defines a name to be used to identify a group of computers, for use in other commands. Multiple COMPUTERS lines with the same name will add all the specified computers into the same named group. An IP address can be used in place of a computer name.

group_name   Name of the group being defined.

computer_list   List of computer names in that group.

For example, the following commands will add four computers to a group called "drawing_office"

```
COMPUTERS drawing_office neptune pluto 216.43.12.11
COMPUTERS drawing_office mars
```

License management commands

DENY

DENY license type name

Denies a named entity or group access to the specified license. See Order of Precedence above for details on how this command works in combination with others.

license   Name of the license being affected, or ALL for all licenses.

type   USER, COMPUTER, USERS or COMPUTERS.

name   Name of the entity which is excluded from accessing this license.

For example, to prevent the user "ramiro" from being able to use the license "autoroute":

```
DENY autoroute USER ramiro
```

DENY_LOAN

DENY_LOAN license type name

Prevents a named entity or group from Loaning out copies of a license to take away using the License Loan feature.

license   Name of the license being denied, or ALL for all licenses.

type	USER, COMPUTER, USERS or COMPUTERS.
name	Name of the entity which is excluded from Loaning this license.

For example, to prevent the user "fred" from loaning an Autoroute license:

```
DENY_LOAN autoroute USER fred
```

LOAN_FLOOR

LOAN_FLOOR license number [type name]

Where a particular license has Loans enabled, this command is used to reduce the number of copies of that license can be loaned out. You can use this command to ensure that more licenses are kept available 'in-house' for general use (i.e. cannot be loaned out) than the level that the license file originally specified.

license	Name of the license to be controlled.
number	Number of Loan copies of this license to be held back.
type	USER, COMPUTER, USERS or COMPUTERS.
name	Name of the entity which is excluded from Loaning this license.

For example, if the license "HighSpeed" has a Loan count of 9, the following line in the configuration file keeps 2 of those back, allowing only 7 licenses to be taken out on loan:

```
LOAN_FLOOR highspeed 2
```

MAX

MAX license number type name

Limits usage for a particular group to a maximum number of a given license. This command only applies to groups, as an individual user or computer can only acquire one instance of a given license at any one time. Specifying a limit larger than the total number of this license available in the license file will have no effect.

license	Name of the license to be controlled.
number	Maximum number of instances of this license the group can acquire.
type	USERS or COMPUTERS.
name	Name of the group for which license usage is limited.

For example, to limit the group "designers" to 5 licenses for the option "savepcbdesigns", include the following line in the configuration file:

```
MAX savepcbdesigns 5 USERS designers
```

MAX_LOAN_HOURS

MAX_LOAN_HOURS license hours

Reduces the maximum length of time a license can be loaned out from that defined in the license file or by the application. Setting a time longer than that specified in the license file has no effect.

license	Name of the license to be controlled.
hours	The maximum number of hours this license can be loaned out.

PERMIT

PERMIT license type name

Allows a named entity to be granted access to this license. See Order of Precedence above for details on how this command works in combination with others.

license   Name of the license being permitted.

type   USER, COMPUTER, USERS or COMPUTERS.

name   Name of the entity which is permitted to use this license.

To allow user "francois" to use an "autoplace" license:

```
PERMIT autoplace USER francois
```

PERMIT_LOAN

PERMIT_LOAN license type name

Allows a named entity to Loan out a particular license.

license   Name of the license being affected, or ALL for all licenses.

type   USER, COMPUTER, USERS or COMPUTERS.

name   Name of the entity which is permitted to Loan out this license.

To allow user "tom" to Loan out an "autoplace" license:

```
PERMIT_LOAN autoplace USER tom
```

PERMITUNLISTEDOPTIONS

PERMITUNLISTEDOPTIONS   true | false

Specifies whether any license option not mentioned in any PERMIT command will be automatically denied or not. The default setting is TRUE, which means that any unlisted option will remain as permitted.

RESERVE

RESERVE license number type name

This command will reserve one or more instances of a license for a specific entity. Reserving licenses in this way will reduce the number available to other users, even if the named user/group is not currently using that license. When specifying an individual user or computer, the value of 'number' will be ignored as any individual can only book out one instance of any particular license anyway.

license   Name of the license to reserve.

type   USER, COMPUTER, USERS or COMPUTERS.

name   Name of the entity for which the license is reserved.

Number   How many licenses to reserve.

For example, to reserve 2 autoroute licenses for the design_office:

```
RESERVE autoroute 2 USERS design_office
```

Configuration commands

HEARTBEAT

HEARTBEAT seconds

Specifies how often clients should send a 'heartbeat' signal to the server to indicate that the connection is still live. Although you can in theory stop the heartbeat signal completely (by setting the interval to zero), this is not recommended in a normal configuration because it can result in the server holding client connections open for long periods when the client application has actually closed. High values should also be avoided for the same reason.

A reasonable value for this setting is within the range 30 – 180.

seconds   Integer number of seconds

KEEPLOGFILES

KEEPLOGFILES number

Specifies the number of days for which log files will be kept. The default setting for this is 7 days.

PORT

PORT portnumber

Specifies the port number to be used for communication from client to server or between cluster servers. The default value for this port is 6140 which has been assigned by IANA (Internet Assigned Names Authority) as the port for Pulsonix Network Licensing. This should not generally clash with other applications, but you can use this command to choose an alternative number if you find you have problems establishing communication with the default setting.

portnumber   Integer port number in the range 1024 - 49151.

It is recommended that you do not use port numbers outside this range. Even within this range you may find problems with other software in some networks. Refer to this web page:

> http://www.iana.org/assignments/port-numbers

for a complete list of assigned port numbers if you need to resolve clashes with other 'known' applications.

SERVER

SERVER servername [servername servername]

Identifies the name of one or more servers that are to be part of a Server Cluster (see page **Error! Bookmark not defined.**). You can specify your cluster server names either using separate SERVER commands or by listing them all together in one command.

servername   Computername of a server

SERVERHEARTBEAT

> SERVERHEARTBEAT seconds
>
> Specifies how often cluster servers should communicate with each other to indicate that the connection is still live.
>
> A reasonable value for this setting is within the range 5 – 20.
>
> seconds　　　　　Integer number of seconds

Alternative command names

> For users who have previously administered network license servers for other products using floating license services such as Flex/LM, you may prefer to use the following alternative commands in place of those shown above.

Standard command	Alternative command
COMPUTER	HOST
COMPUTERS	HOST_GROUP
DENY	EXCLUDE
DENY_LOAN	EXCLUDE_LOAN
LIMIT	MAX
LOAN_FLOOR	BORROW_LOWWATER
MAX_LOAN_HOURS	MAX_BORROW_HOURS
PERMIT	INCLUDE
PERMIT_LOAN	INCLUDE_BORROW
USERS	GROUP

Example Configuration File

> Here is an example configuration file with comments to explain what each command is doing. It is important to remember when managing configuration files that the order of commands in the file can be significant.
>
> Let's pretend we have a business with several departments, with people in each department using Pulsonix but for different reasons:
>
> o　　　　a data management group who look after Libraries
>
> o　　　　a design group who create Schematic drawings
>
> o　　　　a layout group who take those Schematic drawings and produce PCB designs
>
> o　　　　a research group who need guaranteed access to some of the 'extra' tools in the application
>
> o　　　　a production group who generate production data but don't modify any design files
>
> We have a license file that allows us to use the license features listed below. Obviously in a real license file you would have more features available but this is enough to provide a reasonable idea about how to manage access to your features.

- o   Application   14
- o   SavePCBDesigns   6
- o   SaveSCMDesigns   14
- o   Differential Pairs   3

Our first task is to define the groups that tell us who's who, including an 'administrators' group. Next, we control who has access to some of the important license features. Note that configuration commands and parameters are not case-sensitive, but for this example we will make all the commands and keywords upper-case and all names lower-case.

```
; create a group for the administrators

USERS admin peter thomas william
ADMINISTRATOR USERS admin

; create groups for each department

USERS library bridget martin michael
USERS design anna jacob peter
USERS layout charlie helena olivia
USERS research jack nellie
USERS production erica fred

; only allow 'save pcb' for the groups that need it
; when we 'permit' a license feature for someone, this
; automatically stops it from being granted to anyone else

PERMIT savepcbdesigns USERS layout
PERMIT savepcbdesigns USERS research

; some groups do not need to save Schematic drawings

DENY savescmdesigns USERS library
DENY savescmdesigns USERS production

; we have 3 high-speed features but want to make sure
; that our research team always has access to them;
; first we make sure that only the "pcb guys" get them,
; then we make sure that layout group cannot use them all

PERMIT diffpairs USERS layout
PERMIT diffpairs USERS research
RESERVE diffpairs 2 USERS research

; Force NLS to always reserve Pulsonix for a specific user.
; This is useful if you have 2x floating licenses say, 3x users
; who can use Pulsonix but one dedicated design person who should
; always have access to Pulsonix regardless.

USERS design Geoff Simon Ian
RESERVE Application USER Geoff
```

Chapter 6. Log Files

Overview

Log files are written by the server as it processes client connections, license requests and other events.

Two types of log file are written, one recording diagnostic information about startup, shutdown and connectivity, and the other recording information about license check-out and check-in.

Log file location

Log files are written to the location specified on the Options dialog (see page 30). This location should ideally be on a hard drive on the computer on which the server is running to avoid problems of the log file location becoming unavailable if the server experiences network problems.

The default location for log files is within the "Public Documents" folder. This is

        C:\Users\Public\Documents\Pulsonix\NLServer\Logs

or the equivalent local folder if you are using a non-English edition of Windows.

Log files for each application contain the application name in their file name, for example NLSD or NLSM.

Log file ageing

Each log file contains events for one day, with the name of the file showing the date. Thus a diagnostic log file for NLSD on March 7th 2018 would be called "Diag.NLSD.20180307.log".

The log files are 'rolled over' automatically as the system clock passes through midnight, so each file should not usually grow too large to manage. However, over time your log file folder may grow to contain many log files, so you should review this folder from time to time and remove any old log files you no longer require.

How long you keep them is up to you, as it depends largely on how much analysis of the license usage you are going to do (see "Reading usage log files" below).

Reading diagnostic log files

Diagnostic log files are comma-separated plain text files that can be read using any text editor. They are intended for use in tracking and trouble-shooting connectivity-related issues, and generally record the information shown in the Server Log view of the Manager application.

You can also view them directly from the Log Files dialog of the Manager application, where they can be opened either as plain text or using the built-in Log Viewer application (NLSL).

You are unlikely to need to access these files yourself, but you may be asked to provide copies of the files to Technical Support as part of the diagnostic process for resolving operational issues. You can use the Email button on the Log Files dialog to assist with collecting and sending files.

Client application version numbers

Version and build numbers of the main program modules are recorded in the diagnostic log as part of the process of connecting clients to NLS. This can be useful if you need to determine what versions or builds of software your client are using, for example if you want to work out whether any of the client installations have yet to be patched to the latest build.

Reading usage log files

The Network License Report application

The **Network License Report** application is used to analyse the log files and report on license usage over time. It does this by collecting log file information into a database, then analysing this information to produce summary reports of license usage.

The **Network License Report** program is installed as part of the Network License Server setup, and is accessed from the installation folder by double clicking on the **NLReport**.exe program.
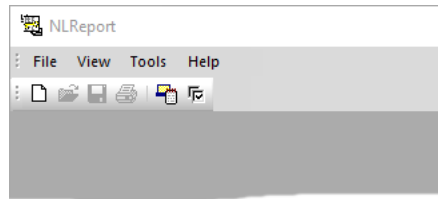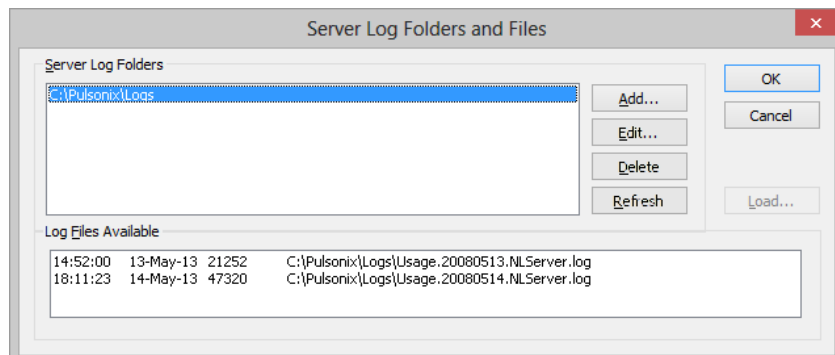

Collecting log file information

The first stage is to set up the location of the log file folder (or folders if you are using a server cluster).

From the **View** menu choose **Server Logs**, or click on the **Check Server Logs** button on the main toolbar. The upper part of this dialog specifies the locations of the folder or folders containing server log files. You will need to have network read access to these folders and files.

Use the **Add**, **Edit** and **Delete** buttons to set up or modify the server log folder locations. Once you have a list of the folders prepared, selecting any of the folders in the list will update the lower part of the dialog to show you a list of the log files present in that folder. The **Refresh** button simply re-reads the currently selected server folder to update this list of log files.

For each log file, the list shows the last modification time and date, the size of the file, and the full pathname of the file.

Assuming there are some log files present, select one or more of those files in the **Log Files Available** list, and click **Load** to load the information from the log files into the reporting database.

As each log file is loaded, the name of the file is changed from 'Usage…' to 'Archive…' to indicate that the information has already been loaded into the database. These archive files can be backed up and/or removed as you see fit.

Which log files you choose to load into the database at any one time will depend on which information you would like to report. For example, if you only want to look at information up to the previous day, you can leave the log files for today in place. But you can if you wish load all the files into the database, the License Server will simply carry on logging where it left off and you can load that information later on.

Producing reports

To create a report, from the **File** menu choose **New**, or click the **New** button on the toolbar. This will open a dialog where you can specify the parameters for your report.

Chapter 7. Loan Licenses

Overview

Loan Licenses refers to the ability to 'loan out' licenses from the license server and take them away with you. This feature can be used for example to set up a notebook computer ready to take away and run the Pulsonix application at an exhibition where you cannot directly access the license server. The Loan Licenses feature is a cost option and is not automatically available.

The act of Loaning licenses creates a new license file to contain all the details of the licenses being loaned out.

Licenses borrowed from the server in this way have an 'expiry date'. When this date passes, those loan licenses are automatically returned on the server into the available 'pool' of licenses for other users to access, and the loan license file is no longer useable.

Enabling license loans

The ability to loan out licenses is initially controlled by settings in the license file. These are set up when your license file is generated by the Pulsonix sales team and sent to you. If your server license file does not have loan licensing enabled at all, you will not have access to the loan features described in this chapter.

Assuming loans are enabled in the license file, access to the loan features are then controlled by settings in the Configuration file. These settings allow you for example to permit only certain groups of users to loan out licenses, and to control how many of the available licenses for a particular option can be loaned out.
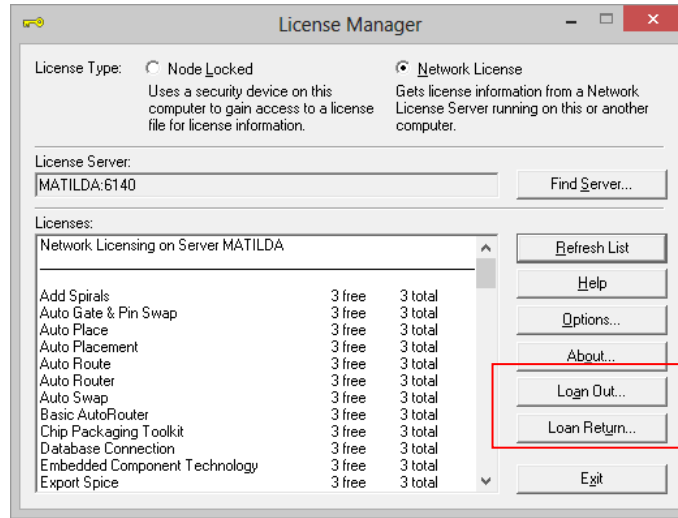
How to loan licenses

Any user that has permission to loan licenses can do so using the License Manager application. This is done in one of two ways, depending on whether or not the computer on which the licenses are to be used is currently connected to the server.
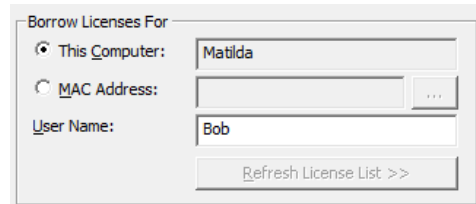
Loaning licenses for a connected client

If your computer is already connected to the license server as a client, you can loan out the licenses you require by launching the **License Manager** application.

As the action of loaning out licenses will be making changes to the way your Pulsonix application is licensed on this computer, you should first close down the Pulsonix application if it is currently running.

From the License Manager dialog, click **Loan Out** to open the **Loan Licenses** dialog:

In the section **Loan Licenses For**, choose **This Computer**.

Loaning licenses when not connected as a client

If you need to loan licenses for a computer that is not connected to the license server, you can still do this, but it cannot be done from that computer. Instead, you need to run the **License Manager** on a computer that *is* connected. It needs to be connected because the **Loan Licenses** dialog needs to communicate with the license server to actually book out the loan licenses.

You will also need to know the 'MAC Address' for the 'target' computer. This is a 12-character string of letters and numbers like '00-12-CF-3D-49-00'. You can find the number you need on the target computer by running the License Manager on that machine and clicking on the **About** button. The MAC address is shown as the Address at the end of this dialog.
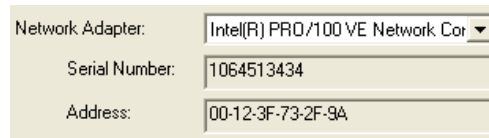
Once you have the MAC address and username for which the loan is to be made, run the License Manager on the connected computer and click **Loan Out**.

Using the Loan Licenses dialog

Using the **Loans Out** button from the **License Manager**, the **Loan Licenses** dialog is divided into three main sections:
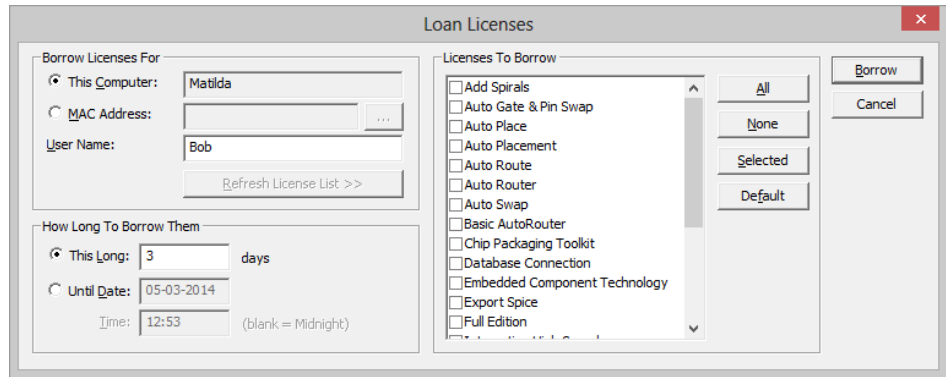
Loan Licenses For

Under this section, you specify the computer for which the loan is to be made (as described above).

If you change the settings in this section, the button **Refresh License List** will become enabled. Click this button to update the list of the **Licenses To Loan** to show those which the selected computer and/or user is permitted to use. This allows you to see whether any of the licenses you think you need are not permitted for use by the selected computer and/or user.

How Long To Borrow Them

Choose how long the licenses need to be loaned out. You should bear in mind that while the licenses are loaned out they will not be available to other users on the network until the chosen 'return date', so you should not loan out licenses for longer than is strictly necessary.

Licenses to Loan

From this list, you can choose which of the licenses you would like to loan out.

Although you can choose to loan out individual licenses, Pulsonix requires a minimum set of licenses to operate correctly so these will always be added to the requested set anyway. You can click the **Default** button to select those licenses in the list if you want to see which ones they are.

What happens next?

When you have set up the necessary information about your loan, click **Loan Now** to begin the loan process.
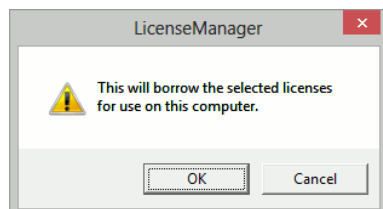
Confirm that you wish to proceed with the loan by clicking **OK**, at which point you are prompted with a standard file browser dialog to specify the name and location of the license file to be created to contain your loaned licenses.

Next, the License Manager will contact the license server with the information you have provided, to make sure that the licenses you have requested are still available and you have permission to loan them out, and that the loan period you have chosen fits with the rules defined by the server.

If any of the licenses you have chosen are not available for any reason, the loan process will stop and you will be told which of the licenses are affected. You can then choose either to try again later, or deselect those licenses if you decide you can work without them.

If the server is happy to loan out the chosen licenses to you, there will be a short delay while the license information is transferred from the server to create a new node-locked license file on your system. During this time, a progress bar is displayed as the license file is generated.
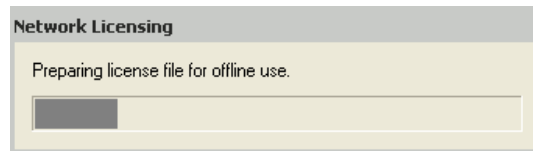
If you are loaning out licenses for the computer on which you are working, when the loan process is complete the License Manager will automatically switch from networked to node-locked operation, at which point you are ready to close down your computer and disconnect it from the network.

For licenses loaned out for a different computer, once the new license file has been created you can send it to the intended recipient. They will then be able to copy it onto their machine and use their License Manager to point to it, just like any normal node-locked license file.

What happens at the end of the loan period?

When the end of the loan period arrives, the expiry date and time built into the node-locked loan license file will automatically prevent the file being used to launch Pulsonix.

On the server, as the expiry date and time passes, the licenses booked out on that loan will be automatically returned to the pool of available licenses.

Returning loan licenses early

We have already recommended that you don't loan out licenses for longer than is strictly necessary. However, you may discover that for some reason you need to return the loaned licenses earlier than originally planned.

Starting the early return process

Early return of loaned licenses can only be initiated on the computer for which the licenses were loaned. On that computer, start the License Manager and click **Loan Return** to start the return process.
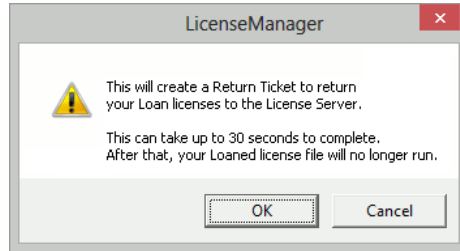

As the message box shows, this will create a 'Return Ticket', a special kind of license file which you will need to return the loaned licenses to the free pool on the server.
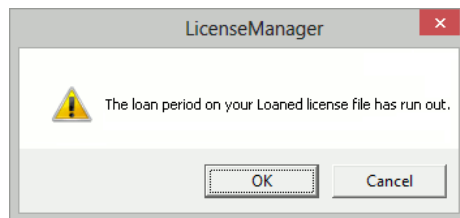
Generating the loan Return Ticket

A standard file browser will open, so that you can specify the name and location of this Return Ticket. The Return Ticket license file will then be generated, which can take around 30 seconds to complete.

Once completed, the next message indicates that the Return Ticket is now ready to be used to free up the loaned licenses on the server.
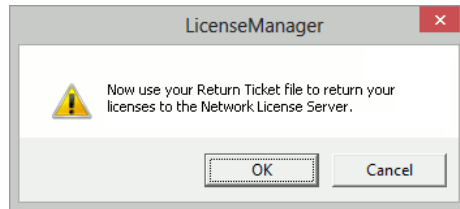
Loan license now expired

How you actually apply the Return Ticket to the server will be explained in a moment, but first your own License Manager will recognise that you have returned your loan licenses, and tell you that the loans have 'expired'.

As you have elected to return your loans earlier than planned, they are now marked as expired just as if the expected expiry date had passed.

Applying the Return Ticket to the server

You will now be able to use the Return Ticket to release the loaned licenses back into the available pool on the server.

On a computer which is connected to the license server computer, launch the License Manager and click **Loan Return**. On the 'Early Return' dialog, click **Open Return Ticket** and browse to where you have stored the Return Ticket file.

The dialog will refresh to show you the details of the licenses and loan period, so that you can confirm that this is the correct Return Ticket. Click **Return Now** to return the loaned licenses to the license server. The number of available licenses on the server should then be updated, and the loan computer/user will disappear from the Connections screen on the server.

Chapter 8. Remote Network Licensing

Overview

The Pulsonix "floating network licensing" scheme allows you to run any number of licenses from one central server without the need for a dongle on each machine machine that will run the product.

The usual configuration for network licensing is to run the Pulsonix Network License Server on a computer on your LAN (Local Area Network), and connect the Pulsonix 'client' applications to this server.

This Chapter explains how this can be extended to allow remote (off-site) users to access the License Server, and hence use network licensing from almost any location.

Basic requirements

The basic requirements and the technology used for the Network License Server are unchanged:

- Windows-based computer (does not need to be a Windows 'Server')

- A TCP/IP network connection

- TCP/IP "sockets" (should be standard with all Windows later than '95)

To allow remote access to your License Server, you will also need:

- A permanent Internet connection at the remote location

- A static IP address at your 'office' location

- A router or gateway that allows 'inbound' connections to be set up

The diagram on the next page gives you an example of how this configuration might look.

Example network diagram

Shown below is an example of how a simple network might be configured. Note that the addresses and ports shown here are only examples.
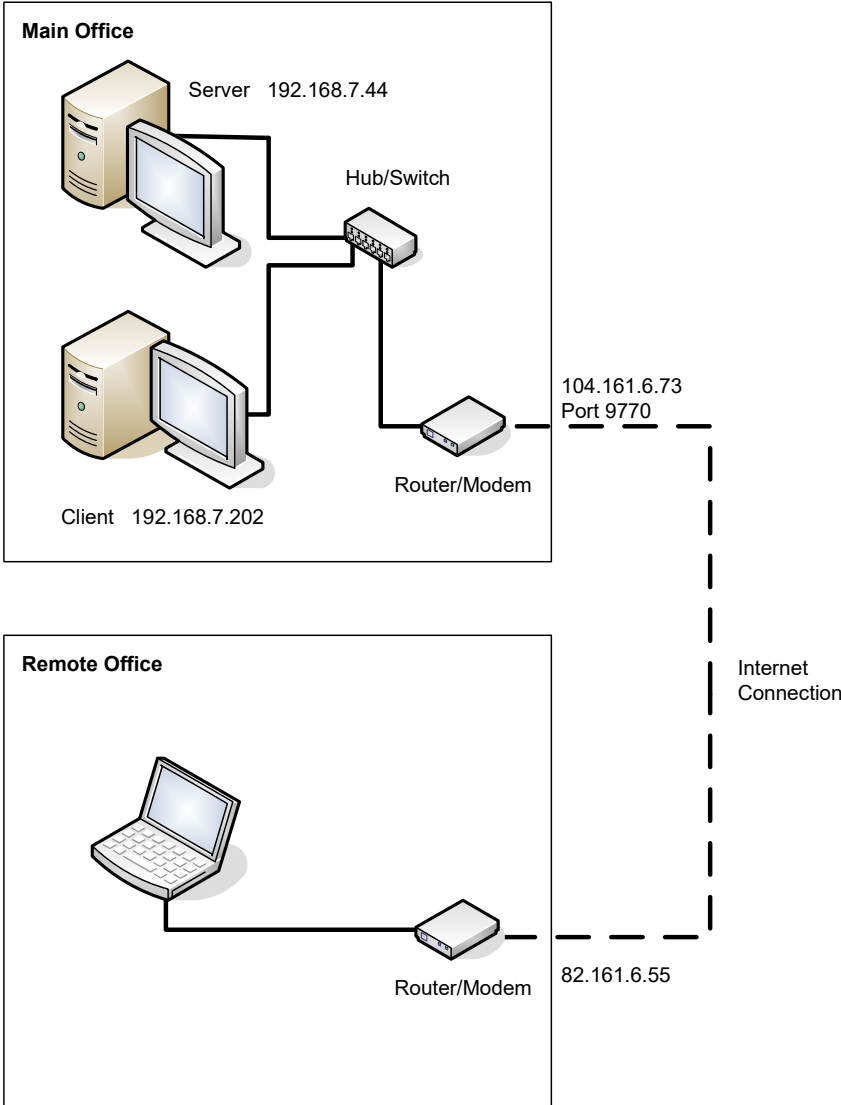
Installing the network license server

The Network License Server should be installed in the same way as for normal (LAN) operation. The procedure for this is described in "Installing the Network License Server" on page 10.

Once you have test that the server is working properly within the LAN, you can move on to setting up for remote access.

Opening a port for remote access

The procedure described here assumes that you have a router or similar network device at the 'point of entry' into your network from the Internet. If you use a gateway computer or other device, the procedure will be different, but the basic principles will be the same.

The key element to enabling remote access is to allow the network licensing code on your remote system to establish a connection through your router to the license server running on your office LAN.

This is generally done with a procedure called "port forwarding". You may need to consult the documentation for your router to find the specific means of doing this, but the basic principle is described below.

Decide on a port number

Decide on a port number to use. The default one for Pulsonix network licensing is 8083, and it is probably easiest to use this because it means less to change at the remote (client) end.

In our example network diagram above, we have decided to open port 9770 on the router, but there is nothing wrong with using the default port.

Set up port forwarding

Add an entry in the port forwarding table on the router, to forward TCP port 8083 (or whatever port number you have chosen) to port 8083 on the computer on which the License Server is running.

Some routers can look up your computer by name, others need you to specify the IP address so you may need to look that up yourself.

In our example, we would need to forward incoming port 9770 to the default license server port 8083 on the computer with IP address 192.168.7.44 on our LAN.

Update your firewalls

Update your hardware or software firewalls to allow inbound connections on the designated port, otherwise your remote client will not be able to connect.

If your remote location uses a static IP address for its Internet connection, you may be able to restrict inbound connections on your open port to only be accepted from that IP address, which will clearly be more secure than a 'fully open' port.

In our example network, we would be able to do this because we have a static IP address at the remote office. This would allow us to specify that we would only accept incoming connections on the designated port from IP address 82.161.6.55.

Making it secure

> As with any connection to or from the 'outside world', you should take steps to ensure that the security of your network is not compromised, or at least be aware of the possible security implications.
>
> If you are not already using hardware and/or software firewalls, we strongly suggest you consider doing so.
>
> If you are in any doubt about security issues, we suggest you contact a network security expert for advice.

Installing the remote client

> Installation of Pulsonix on the remote 'client' system is done in the usual way, as described in the Startup Notes under "Installing a network client machine".

Configuring main office access

Connecting to the server

> When you reach the point in the client installation where you need to enter the name of the computer on which the Network License Server is running, you will need to specify something other than just the machine name.
>
> This is because your remote system is not part of the same network as your main office computers, so will not know how to locate them.

Specifying the server computer

> Instead, you need to enter the 'external' (WAN) IP address of the 'access point'. In our example above, this is 104.161.6.73, the address of the Internet connection at the main office.
>
> If your office is accessible using a 'published' domain name, you may be able to access it using that domain name instead of the explicit IP address, but in most situations it is the actual IP address of your office Internet connection you need to use. That is why you need a static IP address at the office, otherwise the client will not be able to find it.

Specifying the server port

> As well as the server address, you also need to specify the port number on which you need to connect. This is the 'incoming' port number you specified when setting up the port mapping on your office router.
>
> In our example, this is port 9770.

Testing the connection

> The connection can be tested by starting the Pulsonix License Manager. This should then establish a connection through your various network and Internet devices to the license server, and display a list of the available licenses.
>
> Once this is working correctly, you are ready to start work with Pulsonix itself.

Limitations

Other than the requirements listed above, there are no particular limitations to using network licensing in this configuration. You may find that the performance (the time taken to establish the initial connection, and to book out/release licenses) may be longer than would be the case when operating in a LAN environment, but as long as your Internet connection is solid then any additional delays should be small.

Disconnection and reconnection

The issues around disconnection and reconnection are the same as those for 'in-house' operation, and are described in "Chapter 9. " on page 55.

The only difference when working remotely is that any loss of communication is likely to be longer and perhaps require more direct action to resolve.

Chapter 9. Trouble-Shooting

Issues with running the server

### Unable to change settings

If you find you are changing settings and the changes are not being saved, then you may need to check your Windows permissions to make sure you do actually have access to save those changes.

Connectivity problems

Disconnection Issues

Pulsonix network licensing uses TCP/IP "sockets" as the underlying communication mechanism. If for any reason you should lose the connection between client and server, for example if your Internet connection goes down, this will limit what you can do with Pulsonix at the client end.

If Pulsonix is already running when the connection is lost, you should be able to continue working for a short time with the licenses already "booked out". You will receive a warning message about the connection being lost, prompting you to save your work.
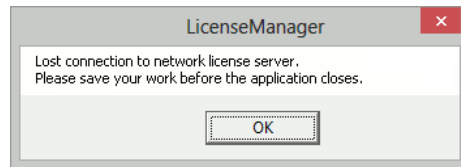

So, if you have a PCB design open for example, and are already holding a license to save PCB files, then you will be able to save your work before closing the program. A short while later if the connection is still down, you will receive a second warning message that the application is about to close down.
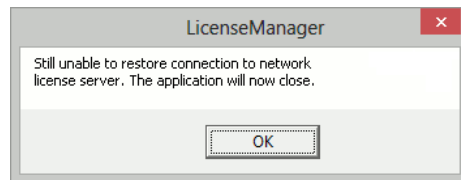
Recovering From Disconnection

If the disconnection is only temporary, you may see the first warning about losing the connection to the server, or a brief message telling you that the program is attempting to re-establish connection to the server.
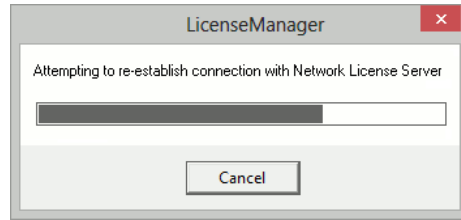
If you should find that the loss of connection to the server is more than just temporary, then you should save the work you are doing, close down Pulsonix, sort out the connection problem and then restart Pulsonix.

Error Messages

The table below lists some of the error messages you might see while setting up or using network licensing, together with some suggestions for how the issues might be resolved.

Message/Problem	Usual Reason	Action
License File may not match security device.	Either there is no license server running on the stated computer and/or port, or network issues prevent you from accessing it.	Use the error description shown at the end of this message to resolve the issue.
Server instance already exists. Cannot run multiple copies of license server.	There is already a license server running on the specified computer.	None possible. Only one instance of the Network License Server can be run on any one computer. **Note**: this message can appear even if no server process is actually running, as Windows can sometimes hold ports in a 'waiting close' state for some time after the program has quit.
	Another application is using the same port number as the License Server is trying to use.	Use a command-line switch or a configuration file command to change the port number for the server.
Missing NLS license, file appears to be a node-locked license	The license file to which the server is pointing does not contain the feature code needed to allow it to be used to run a network license server.	If you are certain that you should be enabled for network licensing, contact Pulsonix for assistance. **Note:** a normal node-locked license file cannot be used for floating licensing and will give this message if you try to use that file with the Network License Server.
Attempt to start Network License Service gives message "path not found".	Network License Service (NLSD) cannot be run from a subst'd drive.	Install and run NLSS from a 'real' drive.
This license file has passed its expiry date.	You are working with a time-locked license file that has now run out.	Contact Pulsonix for assistance, or swap to the full license file if you have already been sent one.