2021 R1

Ansys

Licensing Guide

Table of Contents

Introduction

ANSYS, Inc. uses the FlexNet license manager for all its licensed products. This guide provides you with the instructions necessary to configure the client-side license manager settings.

Supported Hardware Platforms

• Linux x64 (linx64)

• Windows x64 (winx64)

For specific operating system requirements, refer to the installation guide for the platform you are running. For platform support information, see the Platform Support section of the ANSYS Website.

Summary of New and Changed Features

Listed below is a summary of those licensing items that are either new or have been changed since the last release. For a list of all major new and changed features of any product, see the *Release Notes* document for that product.

• For ANSYS release 2021 R1 and newer, the Ansys Licensing Interconnect has been replaced with Ansys Common Licensing (ACL). Ansys Common Licensing creates direct communication from all Ansys applications to the FlexNet Publisher server.

1. Understanding Ansys Common Licensing

ANSYS Common Licensing (ACL) creates direct communication from all Ansys applications to the FlexNet Publisher server. ACL is launched when an application makes its first licensing call and continues to run until all connected clients exit. ACL uses a random port to listen for all the clients. There is one ACL per process tree, meaning the parent and all the children connect to the same ACL launched by the parent.

1.1. License Sharing with Ansys Common Licensing

By default, licenses are shared in a parent/child process tree. Ansys Common Licensing follows parent/child/max logic. Here are a few examples of this logic:

• If the parent checks out the increment "meba" and the child tries to check out the same increment "meba" then the net result is there is only one increment "meba" consumed from the license server/pool.

• If the parent checks out increment "meba" and the child tries to check out the 2 counts of the same increment "meba" then the net result is there are two tasks of "meba" consumed from the license server/pool. This is an example of max logic

• If the parent checks out 1 count of the increment "meba" N number of times, then the net result is there is only increment "meba" consumed from the licensing server/pool.

Parent/Child max across machines/process tree: This process enables the parent child sharing for the specified license features with child being on a different machine.

User Host Display: This process enables applications to share the same listed features across multiple instance of the applications for a specific user tied to the host/display.

HPC Parametric Sharing: HPC parametric sharing enables applications to use a single solver license and anshpc_pack or 8 anshpc features for each additional variance. This also allows applications to share anshpc_pack increments for core checkouts from the solves started as variances of the same context. For more information on HPC Licensing, see HPC Licensing (p. 17).

Chapter 1: ANSYS Client Settings Utility

This chapter explains how to use the **Client Settings Utility** to configure connections with both FlexNet Publisher and Elastic Licensing servers. The **Client Settings Utility** is installed automatically when the product is installed; you do not have to take any further steps to run as a client if you have installed a product.

1.1. Understanding the ansyslmd.ini File

A number of the options in the **ANSYS Client Settings Utility** modify the `ansyslmd.ini` file that is located in the licensing directory. Because of this, it is generally a good idea to have an understanding of the contents and purpose of the file. Entries in the `ansyslmd.ini` file tell ANSYS, Inc. products which license server(s) to query to find a valid license. Using this option allows all users at your site to use this setting without having to individually set the **ANSYSLMD_LICENSE_FILE** environment variable to specify the license server machine(s). It also eliminates the need to have a copy of the license file on every system at your site.

The order that the SERVER lines are listed in the `ansyslmd.ini` file dictates the order in which the license servers are queried when attempting to check out a license.

You are not limited to designating one set of license server machines for your network. You can have multiple single-server or three-server (redundant triad) licensing systems on your network. In this situation, you would have certain licenses connected to a set of server machines (one or three) on the network, and other licenses connected to a different set of server machines (one or three) on the network.

Each server's specification entry in this file will typically begin with SERVER= to specify the server port numbers.

On a single server:

```
SERVER=<flexnetport>@<host>
```

For multiple single servers, each server should have its own SERVER= lines.

On redundant (triad) servers on Linux platforms:

```
SERVER=<flexnetport>@<host1>:<flexnetport>@<host2>:<flexnetport>@<host3>
```

Windows platforms use semicolons (;) instead of colons:

```
SERVER=<flexnetport>@<host1>;<flexnetport>@<host2>;<flexnetport>@<host3>
```

Do not use commas as separators; use colons (:) on Linux machines and semicolons (;) on Windows machines.

The order of the SERVER lines in the `ansyslmd.ini` file specifies the order in which the requested license will be granted.

You must use the port@host format; you cannot enter a path or a filename in place of the hostname.

Overriding the ansyslmd.ini File

If you want to override the server specification settings in the `ansyslmd.ini` file, you can do so by setting the **ANSYSLMD_LICENSE_FILE** environment variable on individual machines. These environment variables are useful if you want to temporarily point to a different license server machine without disrupting the machine's configuration. Use the **ANSYSLMD_LICENSE_FILE** to specify the FlexNet port number.

If you set the **ANSYSLMD_LICENSE_FILE** environment variable on a three-server (redundant) system, specify all three systems in the same order as the SERVER lines are listed in the license file. If you specify only the master and it is down, you could see a "License Server Down" or "No License Found" message and the search for a license could fail. Join redundant or multiple single server systems by separating the system names with colons on Linux systems and semicolons on Windows systems.

1.2. Using the ANSYS Client Settings Utility

To run **Client Settings Utility** on Windows, choose **Start> ANSYS 2021 R1> Client Settings Utility**.

To run the utility on Linux, type the following:

```
ansys_inc/v211/licensingclient/linx64/ClientSettings/ClientSettings
```

To use the utility, select an action from the list of options on the left.

1.2.1. Defining FlexNet Publisher License Servers

You are asked to specify your license server during the product installation if you have not done so during a previous product installation. If you did not specify your license server during the product installation or if your license server has changed, use the **FlexNet Publisher** option to define the FlexNet Publisher server, default communications port and usage order. This information is stored in the `ansyslmd.ini` file.

- To add license servers, click the "plus" icon (located below the existing servers) and enter the communications port and server hostname(s) then click **Test** to verify the configuration. If the

server is available, a green check mark is displayed to the right of the server information. Click **Save** to complete this process.

Note:

To specify redundant triad servers, enter the hostname for each of the three servers in the spaces available.

- To remove a license server, click the "minus" icon to the left of the appropriate server and then click **Save** to complete this process.

- To adjust the order of the servers in your list, click and hold the "double arrow" icon to the left of the appropriate server and drag the selection to the new postion within your list. Click **Save** to complete this process. The order of the servers dictates the order in which they are queried when attempting to check out a license.

1.2.2. Enabling Elastic Licensing

Click the **Elastic Licensing** option to enable elastic licensing and import your Elastic License Server and Elastic License Server PIN.

To enable elastic licensing:

1. Click the **Enable Elastic Licensing** check box option.

2. Click **Import CLS ID and CLS Pin** and browse to the directory containing json file supplied by your elastic licensing administrator.

3. Select the file and click **Open**.

4. Click **Save**.

   This information is saved to your `ansyslmd.ini` file.

To disable elastic licensing:

1. Uncheck the **Enable Elastic Licensing** check box option.

2. Click **Save**.

To import new elastic server information:

If license administrator changes the PIN for the Elastic License Server, client-side users should perform the following steps.

1. From the **Elastic Licensing** screen, click the **Import CLS ID and CLS Pin** button.

2. Browse to the directory containing json file supplied by your elastic licensing administrator.

3. Select the file and click **Open**.

4. Click **Save**.

Your `ansyslmd.ini` file is updated, and the ID and PIN are displayed in the **ANSYS Client Settings Utility**.

1.2.3. Setting HPC User Preferences

Clicking the **User Preferences** option displays the HPC products that are available and the order in which HPC licenses are checked-out.

- To change the license priority, click and hold the "double arrow" icon to the left of the appropriate license and drag the selection to the new position within your list. After you have modified your list, click **Save** to retain your changes.

- To disable an HPC license, disable the check box to the left of the appropriate license and then click **Save**.

1.2.4. Setting Borrowed Increments

Clicking the **Borrow** option, displays a drop-down menu containing a list of borrowable licensing increments (available only on Windows machines). License borrowing allows a user to take a license for use while not connected to the network.

Note:

This feature is available after defining a FlexNet server.

To borrow license increments:

1. From the **Borrow** screen, select the license increments you wish to borrow from the **Borrowable Increments** drop-down menu.

2. Set the return date for each increment.

3. When you have finished selecting your increments and setting the dates for each, click **Borrow**.

4. When you are finished with the license increments, return to the **Borrow** screen and click **Return** for the appropriate increment or **Return All** to return all increments.

1.2.5. Gathering Diagnostics

Clicking the **Gather Diagnostics** option and then clicking **Generate** gathers various licensing-related files, logs and related information about your license client system and places them in a single directory as well as a compressed file. This feature is useful if you want to easily review the files from a single location, or if you need to send them to a technical support representative.

Chapter 2: End-User Configuration

This section contains licensing configuration instructions for ANSYS Workbench and client environment variable settings used to modify licensing behavior on indivdual machines.

2.1. Migrating Custom User Licensing Preferences

For ANSYS Workbench users, customized user licensing preferences (if present), are automatically migrated when you install a new ANSYS release. For example, if you already have ANSYS release 2020 R2 installed on your computer and you upgrade to release 2021 R1, your customized user licensing preferences (if present), are automatically migrated to the new version.

If you are using an ANSYS product other than workbench, you can manually migrate your customized user licensing preferences by running the ansysli_util.exe file.

To run the ansysli_util.exe, follow the steps for your platform below:

Windows:

Where <Installation Directory> represents the path to the latest ANSYS Product install, open an administrator command prompt window and issue the following command:

```
"<Installation Directory>\<Version Number>\licensingclient\winx64\ansysli_util.exe" -updateuserprefs -fromrevn <previous release>
```

Example:

```
"C:\Program Files\ANSYS Inc\v211\licensingclient\winx64\ansysli_util.exe" -updateuserprefs -fromrevn 190
```

Linux:

Where <Installation Directory> represents the path to the latest ANSYS Product install, open a command line window and issue the following command:

```
"<Installation Directory>/<Version Number>/licensingclient/linx64/ansysli_util" -updateuserprefs -fromrevn <previous release>
```

Example:

```
"/ansys_inc/v211/licensingclient/linx64/ansysli_util" -updateuserprefs -
fromrevn 190
```

> **Note:**
>
> For both the automatic and the manual user licensing preferences migration, ansysli_util
> reads the ansyslmd.ini file or the ANSYSLMD_LICENSE_FILE environment variables to determine
> the correct license server.

2.2. ANSYS Workbench Licensing Methods

ANSYS Workbench users can specify which of two licensing methods to use:

• Share a single license between applications (shared mode). The **Share a single license between applications if possible** is enabled by default in ANSYS Workbench.

• Use a separate license for each application (separate mode) by disabling the **Share a single license between applications if possible** option in ANSYS Workbench.

Single License Sharing

ANSYS Workbench allows you to work across multiple instances of the same applications in ANSYS Workbench while consuming only one of a single type of license per user per session. Using shared licensing, the active application holds the license, preventing other applications that are sharing that same license increment/key from using it during that time. For example, trying to do multiple solves of same type at the same time would be a concurrent event.

Sharing licenses is tied to the license keys the application is using. For example, if the application is using license key "meba" then you cannot run other application instances or applications sharing the license key "meba" at the same time.

Single license sharing allows you to progress through your analysis, from specifying engineering data through building, setup, solving, and finally, reviewing your results, all under the same licenses. The application holding the license must close or issue a PAUSE command or receive an automatic release request to release the license and allow another application to use it. Licenses cannot be released while an application is actively performing a concurrency event (for example, an application cannot release a license in the middle of a solve operation because the license cannot be released until the solve operation is completed).

Single license sharing applies only to licenses of the same type (for example, ANSYS Mechanical Enterprise). Choosing this option does not affect your ability to use licenses of different types simultaneously (for example, ANSYS Mechanical Enterprise for one task and ANSYS CFD for another).

Because this method is the default, you do not have to take any action to run this way.

Explanation of License Type and Examples

License type is primarily by license increment. It is possible to use different license increments based on the operations performed within a single ANSYS Workbench session. For example, Geometry import, meshing and solving will checkout different license keys based on the capabilities the application is requesting. For all applications, ANSYS licensing will first look at what other licenses

are opened within this session: if any other licenses being used within this session fulfill the needed capabilities ANSYS licensing will share an existing license. If not, a new, different license is checked out.

Restrictions for Single License Sharing:

You cannot run two concurrency events simultaneously (for example, you cannot solve two models of the same type simultaneously) with one license.

If you are using a license for one application, other applications may still not be able to share that license if those applications require capabilities not supported by the license. For example, you cannot share a Mechanical Enterprise license with a Fluent application.

Single License Sharing in ANSYS Workbench Applications

ANSYS Workbench applications handle single license sharing differently:

Mechanical:

You can launch the Mechanical application and move between its components (such as Meshing, Setup, and Solve). The active component will control the license while completing its operations and will release the license as soon as the operation is completed. For example, when you mesh, the meshing component will control the license during the meshing operation and then immediately release the license when the operation is completed. During the meshing operation you cannot use the meshing increment in any other systems under ANSYS Workbench until the first system mesh is done and the license is released. The other meshing component, if present in the subsequent systems, will go into read-only mode while the first system mesh is still in progress.

> **Note:**
>
> Applications in read-only mode because of shared licensing do not refresh their license status automatically. Once the shared license is released by the editor that had consumed it, you must trigger Mechanical to query the license status. The most straightforward way to do this is click outside the Mechanical application window and then click back in the window to cause the license availability to be rechecked.

Mechanical APDL:

This application consumes a license as soon as you launch it and retains that license until it is finished. If you launch the Mechanical APDL application interactively, the license is retained until you either close the application or issue a **PAUSE** command at the Mechanical APDL command line. **PAUSE** allows you to temporarily release the license for another application to use. No other operation other than **SAVE** or **EXIT** is permitted while **PAUSED**. When the second application has finished and releases the license, issue an **UNPAUSE** command from the Mechanical APDL command line to resume its use of the license.

CFX, Fluent, Autodyn, Polyflow:

These applications consume a license when launched and retain the license until they receive a request from another application to release it. For example, when you open CFX-Pre, it will obtain and control the license. It will retain the license until you close the application or until another application (such as the CFX solver) requests it.

Autodyn and Polyflow also provide a manual **PAUSE** increment that allows you to interrupt Autodyn or Polyflow and release the license, temporarily, for another application to use.

Electronics:

Electronics applications do not support license sharing.

Separate Licenses

By using the separate-licenses method, ANSYS Workbench requires a separate license for each application. By using this method, you can move freely between the many applications that you might require during an analysis in ANSYS Workbench if you have sufficient licenses. You can leave each application running and easily move between them at any point during the analysis, even if one of the applications is actively using the license (such as during a solve process). The disadvantage to this method is that you could potentially consume many licenses.

To activate the separate licenses method, open ANSYS Workbench and click **Tools>Options**. From the **Project Management** view, disable the **Share a single license between applications if possible** option. After disabling this option, close options dialog box and restart ANSYS Workbench.

Examples of Using Separate Licenses

You have two "ansys" increments. When you open and solve a model in the Mechanical application, you consume one "ansys" increment. If you link that Mechanical analysis to a Mechanical APDL system, you would consume a second "ansys" increment when you launch the Mechanical APDL application, if you have not closed out of the Mechanical application. Neither of these licenses would then be available for other users until you closed out of one or both applications.

2.3. Client Environment Variable Settings

You can set the following environment variables on individual machines to control their behavior, especially if you need it to be different from the general site configuration. These settings are especially useful for situations where you are testing a new product installation/license manager installation on a single machine before full site deployment, or other similar situations.

ANSYSLMD_LICENSE_FILE

Can be used to identify a license server machine or license file. If set, this specification is used before any other license path information. The default port number assigned to ANSYS, Inc. is 1055. Therefore, if your server has the hostname alpha1 and the IP address of 10.3.1.69, you can identify the server to use as 1055@alpha1 or 1055@10.3.1.69.

ANS_FLEXLM_DISABLE_DEFLICPATH

Indicates that the default license path should not be searched when determining the licensing path in the ANSYS product. When this environment variable is set:

- Only **ANSYSLMD_LICENSE_FILE** environment variable setting is used.

- Only the **ANSYSLMD_LICENSE_FILE** environment variable setting is required.

- Settings in the `ansyslmd.ini` file and the license file in the licensing directory will NOT be used. It will ignore the local server and will ignore the Specify the License Server setting.

ANSYSLI_TIMEOUT_CONNECT

Used to specify the amount of time that elapses before the client times out if it cannot connect to the server. Default is 20 seconds. Minimum timeout period you can specify is 5 seconds and the maximum is 60 seconds. If the client determines that a server is not available in less time, it will cancel immediately.

ANSYSLI_TIMEOUT_TCP

Used to specify the amount of time that elapses before the client times out if it cannot get a response from the server. This setting applies only when the license server is running but is responding slowly (generally because of network issues or server load). Default is 60 seconds. Minimum timeout period you can specify is 30 seconds and the maximum is 300 seconds.

Chapter 3: HPC Licensing

ANSYS, Inc. offers multiple high performance computing license options, described below.

The HPC license options below cannot be combined with each other in a single solution; for example, you cannot use both ANSYS HPC and ANSYS HPC Pack licenses in the same analysis solution.

See the applicable product documentation for instructions on configuring and running a distributed solution.

ANSYS HPC

These physics-neutral licenses can be used to run a simulation across multiple cores and work with most ANSYS applications. Some ANSYS applications can utilize any combination of CPU and GPU processors. Other applications are limited to CPU processors only. Contact your ANSYS sales representative for a complete list of products that can be used with ANSYS HPC.

A number of ANSYS applications allow you to use four cores without using any HPC licenses; ANSYS HPC licenses add to this base functionality. For example, an ANSYS CFD Enterprise user using twelve cores will consume only eight ANSYS HPC licenses. Contact your ANSYS sales representative for a complete list of applications with this option.

You cannot combine ANSYS HPC licenses with any other type of HPC licenses, including HPC Pack licenses, in the same solution.

ANSYS HPC licenses cannot be borrowed.

ANSYS HPC Pack Licenses

These physics-neutral licenses can be used to run a simulation across multiple cores and work with most ANSYS applications. Contact your ANSYS sales representative for a complete list of applications that can be used with ANSYS HPC Pack Licenses. n HPC Packs enables 2*4^n parallel cores, so for instance 1 pack enables 8 cores, 2 packs enable 32 cores, etc. Individual HPC Pack Licenses cannot be split between multiple users or between multiple analyses.

A number of ANSYS products allow you to use four cores without using any HPC licenses. ANSYS HPC Pack licenses add to this basic functionality. For example, an ANSYS Mechanical Enterprise user using twelve cores will consume only one ANSYS HPC Pack license.

You may only borrow one ANSYS HPC Pack license at a time.

3.1. Shared HPC Licensing for Concurrent Parametric Variations

Starting with ANSYS release 2020 R2, HPC licenses may be used for concurrent simulation of parametric variations, allowing you to leverage standard HPC licenses instead of extra solver licenses. Each variation, after the first, requires 8 HPC increments or 1 HPC Pack increment. Similar to non-parametric simulations,

each variation provides 4 included parallel cores per variation. Additional HPC parallel cores are shared across all variations, using the same HPC rules. All licenses that are consumed during a concurrent parametric simulation are held for the duration of the simulation, based on the max count of each license required for a given variation.

You can use the Ansys Parametric Licensing Calculator (https://ansys.com/parametric) to determine the number of HPC Workgroup or HPC Pack licenses required.

HPC Parametric Example

6 Parametric Variations, 24 Cores/Variation

Example: Position slot at various distances from right end of tee.
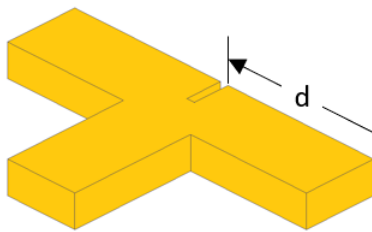
Variation	d
1	2 cm
2	3 cm
3	4 cm
4	5 cm
5	6 cm
6	7 cm

HPC Workgroup		
Solver		1 Solve
Parallel	6 variations x 24 cores	120 HP
4 Included Cores	*- 6 variations x 4 cores*	
Parametric	6 variations	40 HPC
TOTAL		**1 Solve** **160 HP**

HPC Pack		
Solver		1 Solve
Parallel	6 variations x 24 cores	3 HPC Pa
4 Included Cores	*- 6 variations x 4 cores*	
Parametric	6 variations	5 HPC Pa
TOTAL		**1 Solve** **8 HPC Pa**

Chapter 4: Troubleshooting

This section contains information that may be useful when working with ANSYS customer support.

4.1. Getting Additional License Debug Information

Use the following suggestions to display or generate additional error messages and debugging information.

- View the `licdebug` file. The `licdebug` file is generated when you run an ANSYS, Inc. application and resides in the `.ansys` subdirectory under the directory specified by the **TEMP** environment variable (Windows) or in the $HOME directory (Linux). The `licdebug` filename will vary depending on the product but will follow the format `licdebug.<product>.211.out`. For example:

  If a `licdebug` file already exists and is dated today, the information is appended. If it is dated before today, the existing file will be renamed with a `.old` extension and a new file will be started.

  – Mechanical APDL (ANSYS): `licdebug.ANS_SOLVER.211.out`

  – ANSYS Workbench: `licdebug.ANS_WB.211.out`

  – Mechanical: `licdebug.MECH.211.out`

  – ANSYS Fluent: `licdebug.FLUENT_SOLVER.211.out`

  – ANSYS Polyflow: `licdebug.POLYFLOW.211.out`

  – ANSYS CFX-Pre: `licdebug.CFX_PRE.211.out`

  – ANSYS CFX Solver: `licdebug.CFX_SOLVER.211.out`

  – ANSYS CFD-Post: `licdebug.CFD_POST.211.out.`

  – ANSYS ICEM CFD (includes AI*Environment): `licdebug.ICEM_AM.211.out`

  – ANSYS Icepak: `licdebug.ICE_PAK.211.out`

  – ANSYS LS-DYNA: `licdebug.DYNA_SOLVER.211.out`

  – Connection functionality: `licdebug.ANS_PM.211.out`

  > **Note:**
  >
  > The license debug file names include the current release of the application. Because not all applications are updated with each release, it is possible to have lic\debug file names that are appended with older release numbers. For example, it is possible to be running

ANSYS Release 16.1 but still have a product license debug log file name include 160 as in **licedbug.POLYFLOW.160.out**.

The directory specified by the **TEMP** environment variable may be hidden on your system. To view the directory and file, click My Computer. Choose **Tools** from the menu, and then click **Folder** options. Click the **View** tab and select **Show hidden files and folders**. Click **OK**.

If after following these suggestions, the resulting debug information does not make sense, try these suggestions:

- Confirm that the license manager was restarted or the license file was reread after any changes were made to the license file. If you did not make any changes to the license file for the server, check the date/time that it was last changed. Get the relevant path information from the debug output. Also, confirm that the same path is being used.

- Try restarting the license manager and then attempt to run again. See if the same situation occurs.

- If you installed a new license file but are not seeing it even after restarting the license manager, confirm that the correct license file is being used to start the license manager. In this case, neither the client application nor the license manager is using the changed file. Also confirm that if site or user license preferences were set, the preferences were updated with the new license information.

- If the `ansyslmd.lic` file is at the end of the path and it is a license file that uses the license manager daemon/service, then confirm that the license manager is started with the same path as the `ansyslmd.lic` file's path. The license manager could be looking at one file in the client application but the license manager daemon/service was started with another file.