

**S-PLUS<sup>®</sup> 8**  
**Installation and**  
**Administration Guide**  
**for Windows<sup>®</sup> and**  
**UNIX<sup>®</sup>/Linux<sup>®</sup>**

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Insightful Corporation  
Seattle, Washington

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# S-PLUS BOOKS

The S-PLUS<sup>®</sup> documentation includes books to address your focus and knowledge level. Review the following table to help you choose the S-PLUS book that meets your needs. These books are available in PDF format in the following locations:

- In your S-PLUS installation directory (**SHOME\help** on Windows, **SHOME/doc** on UNIX/Linux).
- In the S-PLUS Workbench, from the **Help ► S-PLUS Manuals** menu item.
- In Microsoft<sup>®</sup> Windows<sup>®</sup>, in the S-PLUS GUI, from the **Help ► Online Manuals** menu item.

*S-PLUS documentation.*

Information you need if you...	See the...
Are new to the S language and the S-PLUS GUI, and you want an introduction to importing data, producing simple graphs, applying statistical models, and viewing data in Microsoft Excel <sup>®</sup> .	<i>Getting Started Guide</i>
Are a system administrator or a licensed user and you need guidance licensing your copy of S-PLUS and/or any S-PLUS module.	<i>S-PLUS licensing Web site</i> <i>keys.insightful.com/</i>
Are a new S-PLUS user and need how to use S-PLUS, primarily through the GUI.	<i>User's Guide</i>
Are familiar with the S language and S-PLUS, and you want to use the S-PLUS plug-in, or customization, of the Eclipse Integrated Development Environment (IDE).	<i>S-PLUS Workbench User's Guide</i>
Have used the S language and S-PLUS, and you want to know how to write, debug, and program functions from the <b>Commands</b> window.	<i>Programmer's Guide</i>

## S-PLUS documentation. (Continued)

Information you need if you...	See the...
Are familiar with the S language and S-PLUS, and you want to extend its functionality in your own application or within S-PLUS.	<i>Application Developer's Guide</i>
Are familiar with the S language and S-PLUS, and you are looking for information about creating or editing graphics, either from a <b>Commands</b> window or the Windows GUI, or using S-PLUS-supported graphics devices.	<i>Guide to Graphics</i>
Are familiar with the S language and S-PLUS, and you want to use the Big Data library to import and manipulate very large data sets.	<i>Big Data User's Guide</i>
Want to download or create S-PLUS packages for submission to the Comprehensive S Archival Network (CSAN) site, and need to know the steps.	<i>Guide to Packages</i>
Are looking for categorized information about individual S-PLUS functions.	<i>Function Guide</i>
If you are familiar with the S language and S-PLUS, and you need a reference for the range of statistical modelling and analysis techniques in S-PLUS. Volume 1 includes information on specifying models in S-PLUS, on probability, on estimation and inference, on regression and smoothing, and on analysis of variance.	<i>Guide to Statistics, Vol. 1</i>
If you are familiar with the S language and S-PLUS, and you need a reference for the range of statistical modelling and analysis techniques in S-PLUS. Volume 2 includes information on multivariate techniques, time series analysis, survival analysis, resampling techniques, and mathematical computing in S-PLUS.	<i>Guide to Statistics, Vol. 2</i>



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# INTRODUCTION

# 1

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## **OVERVIEW**

This manual contains information on installation, administration, and licensing for all editions of S-PLUS 8 for Windows<sup>®</sup>, UNIX<sup>®</sup>, and Linux<sup>®</sup>. All licensing scenarios (e.g., single-user and concurrent user) are discussed in this manual.

S-PLUS features a built-in license management using FLEXnet, discussed in Chapter 4, License Management.

This manual is written mainly for an audience of Windows, UNIX, and Linux systems administrators. Because the FLEXnet license management system is used for all editions of S-PLUS, there is helpful information for generating license keys for desktop users as well as administrators. In the typical scenario, a Windows or UNIX systems administrator uses this guide to install S-PLUS on a network so that a number of users can simultaneously access S-PLUS.

## SUPPORTED PLATFORMS AND SYSTEM REQUIREMENTS

### **S-PLUS for Windows**

S-PLUS 8 for Windows is supported on the following platforms:

- Windows<sup>®</sup> 2000
- Windows<sup>®</sup> XP Professional Edition
- Windows<sup>®</sup> 2003 Server
- Windows XP Media Center Edition
- Windows Vista<sup>™</sup>

To install S-PLUS, the minimum recommended system configuration is a Pentium III processor with 512MB of RAM and 450MB disk space. There are no 64-bit versions available on Windows with this release.

### **S-PLUS for UNIX/Linux**

The 32-bit and 64-bit versions of S-PLUS<sup>®</sup> 8.0 for UNIX<sup>®</sup>/Linux<sup>®</sup> are supported on the following platforms and operating systems. The minimum recommended disk space for installing and running S-PLUS is also included:

**Table 1.1:** *Supported 32-bit platforms for UNIX/Linux systems.*

Platform	Operating System	Disk Space
Sun SPARC	Solaris 2.8, 2.9, 2.10 on SPARC processors	340 MB
Intel/AMD x86	Red Hat Enterprise Linux WS 3.0 and 4.0 (32-bit and 64-bit)	340 MB

Note that HP Alpha running Tru64, or UNIX 4.0F or 5.1A, is no longer supported. It is also true that previous versions of the listed operating systems may function with S-PLUS, but they are not supported.

<b>Note to 64-bit Linux Users</b>
The 64-bit version of S-PLUS 8.0 on Red Hat Linux Enterprise Developer WS Version 3 requires Update 7 to update the <code>gcc</code> , <code>glibc</code> , and <code>binutils</code> . This update is needed only if you are compiling FORTRAN programs on this version of S-PLUS. The WS Version 4 has these updates already, so no further updates are required to compile FORTRAN code correctly.

You will need a minimum of 60 MB RAM to run S-PLUS from the command line, and the Java GUI requires an additional 100 MB to run. Note that these values are minima; if you work with moderate-sized data sets, these numbers may be insufficient for your needs.

## **SERIAL NUMBERS, LICENSE AUTHORIZATION CODES, AND LICENSE KEYS**

Your S-PLUS CD comes with a *serial number* printed on the jewel case. This serial number is linked to your *license authorization code* (LAC), which you should have received via e-mail. The license authorization code is used to generate your unique license keys which are required to running S-PLUS.

Your S-PLUS license authorization code identifies your account with Insightful Corporation, and is automatically generated by the license management system. Each license authorization code is unique to a specific order.

The license manager decrypts the key and uses it to monitor the available seats on your network. Go to the FLEXnet license manager site at

**<http://www.macrovision.com/products/flexnet/index.shtml>**

for more information.

For additional details that are not discussed in this manual, you may find it helpful to consult the *FLEXnet Licensing End User Guide*. This is located at **SHOME/adm/lic/cmd/LicensingEndUserGuide.pdf**

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# **INSTALLING S-PLUS<sup>®</sup> 8 FOR WINDOWS<sup>®</sup>**

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# **2**

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## INSTALLATION STEPS

1. Insert the S-PLUS 8 for Windows CD into the CD-ROM drive on your machine. If your machine has CD-ROM AutoPlay enabled, the installation program starts automatically. Otherwise, open Microsoft Windows Explorer and run the **setup.exe** program from the CD-ROM drive. The **Master Setup** screen appears, as shown below.

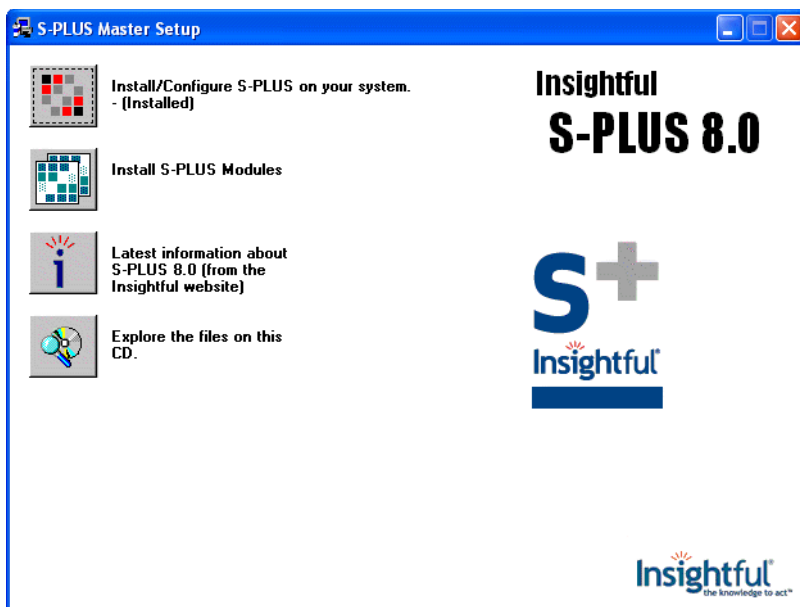


Figure 2.1: The S-PLUS 8.0 installation splash screen.

2. In the **Master Setup**, click the **Install/Configure S-PLUS on your system.** button. Accept all defaults in the screens that appear, except the installation directory and available options you want when starting S-PLUS. This installs the S-PLUS program files in the following default folder:

`C:\Program Files\Insightful\splus80`

3. After the S-PLUS installation has completed, return to the **Master Setup**. If you have purchased licenses for S-PLUS modules, click the **Install S-PLUS Modules** button.



Select a module from the menu that appears and accept all defaults in the screens that follow. This includes S+ARCVIEW, S+ARRAYANALYZER, S+ENVIRONMENTALSTATS, S+FINMETRICS, S+NUOPT, S+SEQTRIAL, S+SPATIALSTATS, or the S+WAVELETS module. By default, the module is stored in the corresponding **SHOME/module/[module name]** folder. For example, S+ARRAYANALYZER is installed by default at:

`C:\Program Files\Insightful\splus80\module\ArrayAnalyzer`

4. Installing S-PLUS also copies files related to the FLEXnet license manager in the following default folder:

`C:\Program Files\Insightful\splus80\adm\lic\cmd`

This should successfully complete your S-PLUS installation. To run S-PLUS, you will need a license key, which is discussed in the Chapter 4, License Management.

**Note**

To complete the S-PLUS installation, you need the license authorization code (LAC) for S-PLUS and any modules you have purchased in order to generate a license key. See Chapter 4, License Management for more information on license management.

## PUSH INSTALLATION (SINGLE USER LICENSING ONLY)

If you are a network administrator and want to automate the process of installing S-PLUS on a number of desktop machines in your network, this is easily done by using the **automate\_sample.ini** script, located at the top level of your CD. This script mimics the setup parameters, but allows you to customize the setup, such as setting the default installation type (**Typical**, **Compact**, or **Custom**) or default installation directory, and how to automatically use S-PLUS to fulfill a license request using a LAC number provided by Insightful. Using this script, you can also automatically install the single user (SU) license key on each of these machines, so users accessing the network do not have to run the license wizard before running S-PLUS. More information on licensing can be found at the bottom of **automate\_sample.ini** and in Chapter 4, License Management.

Open **automate\_sample.ini** by double-clicking it, and you see the keys and a description of the individual keys. This helps you understand the purpose of each key and what the available options are for the keys. If any key is not specified or is missing, a dialog for that value appears during setup.

Instructions are provided at the top of the script for running it, including the locations of build and log files.

<b>Note on setting the CustomComponentListFile key</b>
This key allows you to set which specific features you do want to install (e.g., PDF documentation and desktop icons) and those you may not want to install (e.g., example files). Copy <b>featurelist.txt</b> (located in the <b>iminer</b> directory at the top level of your CD) to another directory and modify it as needed. Double-click <b>featurelist.txt</b> for more information on how to use it.

# INSTALLING S-PLUS<sup>®</sup> 8 FOR UNIX<sup>®</sup>/LINUX<sup>®</sup>

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## BASIC INSTALLATION

The S-PLUS 8 for UNIX®/Linux® installation, configuration, and verification process consists of six steps:

1. Unpacking and copying the files from the distribution CD to an appropriate place on your system.
2. Obtaining and installing a license key.
3. Running the CONFIGURE script (to select various configuration options).
4. Running the INSTALL script.
5. Running the license manager.
6. Running S-PLUS.

Beginning with S-PLUS 7, the FLEXnet license manager is used for all license management. All installations require a new license key, and all steps must be completed whether this is an upgrade or a new installation.

The following section provides detailed information for each step.

### **Step 1: Unpacking and Copying the Files from the Distribution CD**

If you have a previous edition of S-PLUS already installed on your system, do not install the new edition in the same directory tree. The existing installation should be left intact until after the new installation is up and running, and until you are satisfied that it is no longer required for any reason. To unpack and copy the files:

1. Create a new directory for the S-PLUS tree, and `cd` to that directory.

Be sure the directory you create is on a file system with adequate disk space. This directory can be in your home directory if you are going to be the only user, or in a globally visible location if the installation is to be shared by multiple users. In the latter case, we recommend you create a special user account called `splus`, and use that account's home directory as the installation directory. If you create such an account, log in as `splus` to perform most of the installation; you will want to be superuser (or root) to actually install the S-PLUS script.

2. Set permissions so everyone on your system can use S-PLUS:

```
umask 022
```

3. As either a regular user (yourself or splus) or as root, unpack the tar file from the CD-ROM into the new directory using tar as follows:

```
cat /[mount_point]/SPLUS.TZ | uncompress | tar xvf -
```

where [mount\_point] is the absolute path to the CD-ROM drive.

Depending on your platform, files on the CD may be listed in UPPERCASE, lowercase, or UPPERCASE;1. After mounting the CD-ROM drive, use the `ls` command to see the format shown on your system. Use the same format in the `cat` command as shown on your system.

If you are installing as superuser (or root), the files may be restored with the user and group identifiers that existed when the files were tarred. On some platforms (including Solaris), the `-o` flag to tar assigns these identifiers to the user extracting the files.

If your system has the `zcat` command, you can use it to shorten your extraction command (`zcat` combines the `cat` and `uncompress` commands):

```
zcat /[mount_point]/SPLUS.TZ | tar xvf -
```

## Step 2: Obtaining and Installing a License Key

Follow these steps to obtain and install a license key. A license key is required in order to run S-PLUS:

1. Run `./HOSTINFO` to display your `hostid`. Copy this `hostid`.
2. Point your browser to **<http://keys.insightful.com>**, enter the license authorization code (LAC), and click **Login**.

The LAC should have been provided in the e-mail you received from `keys@insightful.com`. If you did not receive this e-mail, contact Tech Support.

3. In the **Generate or View Licenses** page, click **Generate Licenses**.
4. Check the box next to each product you want to license (including any modules that were ordered).

5. If the license manager will be installed on the same machine that S-PLUS is installed, enter the information for each field in the **Generate Licenses** page, as shown in Table 3.1.

**Table 3.1:** Required information for license key installation in the **Generate Licenses** page.

Field	Enter	Comment
<b>Node-locked Hostid</b>	hostid of S-PLUS machine. This is displayed when you run <code>./HOSTINFO</code> (discussed in Step 1.)	This may be identical to the server hostid, if the license manager and S-PLUS are running on the same machine.
<b>Node-locked Hostid Type</b>	<b>Ethernet</b>	If your hostid (provided by the <code>./HOSTINFO</code> script) is eight (8) characters long, select <b>Long</b> . If it is 12 characters, select <b>Ethernet</b> . In most cases, this can be left blank, and the appropriate type will be used automatically.

8. Click the **Generate** button.

9. Verify that each hostid was entered correctly, and click the **Confirm** button.

10. Click the **Save to File** button, and save the file to **adm/lic/keys** in your new S-PLUS installation. Any file name is acceptable, but it must end in **.lic**.

### Step 3: Running the CONFIGURE Script

The purpose of running the `CONFIGURE` script is to select various options for creating the script for starting S-PLUS. We recommend that you ask your system administrator to create a new user called `splus`, and to run `CONFIGURE` as `splus`. The UNIX group of that user should include those users who are likely to want to run S-PLUS.

Within the new S-PLUS home directory, run the `CONFIGURE` script:

```
./CONFIGURE
```

The license agreement is displayed for your review. When you have finished reading this agreement, press `q` (quit), wait a moment for the text to appear, and when it is displayed, you have an option to accept (1) or to not accept (2) the agreement.

The `CONFIGURE` script displays the following:

Configuration Options:

- 1: About This Menu
- 2: Graphics Hard Copy Printing
- 3: Help File Printing
- 4: Destinations and Name of S-PLUS Script
- 5: License Management
- 6: Installation of S-PLUS man page
- 0: Exit this Menu

The selections you make during this step depend on whether you have an existing version of S-PLUS installed or whether this will be a new installation.

#### **If you have an existing S-PLUS installation:**

This section applies if you have a previous edition of S-PLUS already installed on your system, and you would like to run S-PLUS 8 alongside your currently installed version. If you are upgrading from a previous edition of S-PLUS, please skip to the section on new installations below.

Part of the configuration and installation process is to create a startup script for S-PLUS. The startup script for the new version of S-PLUS should be given a name that is separate and distinct from the name of the startup script for any existing installations of S-PLUS. For example, if you have S-PLUS 7.x or earlier installed with a startup script named `Sp1us` and you are currently installing S-PLUS 8, you have several choices, including the following:

1. Rename the existing script as `Sp1us7.x` and name the new script `Sp1us`
2. Leave the name of the existing script as `Sp1us` and name the new script `Sp1us8.0`.

For most upgrades, option 4, Destinations and Name of Splus Script, is the only option that you will need to deal with. In most cases, you should leave the default destination (**/usr/local/bin**) alone, and select a new name for the script as discussed above. After that, select option 0 to exit the script.

#### **If this is a new S-PLUS installation**

For most new installations, it is sufficient to accept all of the defaults. In that case, select each of the options to confirm the information, and select **Exit this Menu**. It is still necessary to run CONFIGURE, even if you accept all of the defaults.

The default is to name the startup script `Splus`, and to install it in **/usr/local/bin**. If you wish to give the startup script a different name or to install it in a different location, please select option 4, Destinations and Name of Splus Script.

#### **Step 4: Running the INSTALL Script**

After running CONFIGURE, the next step is to run INSTALL, which copies the information you entered in the CONFIGURE step to the appropriate directory.

You should run INSTALL as root (particularly if you accept the default location for the startup script of **/usr/local/bin**):

```
./INSTALL
```

from within your installation directory.

#### **Step 5: Running the License Manager**

Start the license server daemon using the command

```
Splus LICENSE server start
```

If you use a different name for your S-PLUS script, use it instead of `Splus`. You can check the status of the license server at any time by entering

```
Splus LICENSE server status
```

#### **Step 6: Running S-PLUS**

Before starting S-PLUS, you must do the following:

1. Set your DISPLAY environment variable to your local machine.

Check if your DISPLAY variable is set already by looking at the output from



```
echo $DISPLAY
```

to be sure. To set your display from a C-like shell (csh, tcsh, etc.), use the `setenv` command:

```
setenv DISPLAY <display_name>
```

where `<display_name>` is the name of your local machine. From the Bourne- and Korn-like shells (including sh, ksh, bash, etc.), use the following commands:

```
DISPLAY=<display_name>;export DISPLAY
```

To use the Java-related features of S-PLUS, you must be able to connect to your local X window server. Thus, you must have the environmental variable `DISPLAY` set, and the X window server on your local machine must allow the S-PLUS server to create windows on your machine; see the UNIX programs `xauth` or `xhost`. Typically, if you can run `xclock` on your machine, then S-PLUS should also be able to access the X server.

## 2. Create an S-PLUS chapter to hold your work.

Creating an S-PLUS chapter is necessary for storing the data objects and external files you create in S-PLUS. The following commands create an S-PLUS chapter named **mysplus** for you to work in (be sure you don't have a **mysplus** directory in your home directory before typing these commands):

```
% cd
% mkdir mysplus
% cd mysplus
% Splus CHAPTER
```

Note that if you do not create a chapter, S-PLUS automatically creates one for you named **MySworck** the first time you start S-PLUS.

You are now ready to start S-PLUS. S-PLUS may be launched in a variety of modes, and the following lists each mode and the corresponding UNIX command-line expression for launching it. In all of the commands below, `Splus` refers to the script you use to launch S-PLUS 8 on your system.

To run S-PLUS from the command line without Java:

```
Splus
```

To run S-PLUS from the command line supporting Java calls, Java graphics, and the Java help interface:

```
Splus -j
```

To run S-PLUS from the command line with the graphical user interface:

```
Splus -g or Splus -g &
```

The second command (using the ampersand &) puts the GUI process into the background, freeing your xterm for other uses.

To attach the S-PLUS Big Data Library before running S-PLUS:

```
Splus -bigdata
```

To run the S-PLUS Workbench:

```
Splus -w | -workbench
```

The `-e` flag may be added to either of the first two modes to enable command-line editing. The Commands window in the graphical user interface always allows basic editing.

S-PLUS includes two additional flags, `-jit` and `-helpoff`:

The `-jit` flag works with the `-g`, `-j`, and `-userapp` flags and allows you to turn on the Java just-in-time compiler. This makes the graphical user interface and help system run faster but introduces instabilities that often lead to crashes. In particular, the just-in-time compiler often crashes while repainting graphical user interface elements such as the JavaHelp window and the Data window.

The `-helpoff` flag is useful only with the `-g` flag. It turns off the automatic invisible startup of the help system. The invisible startup improves initial responsiveness of the help system but adds a significant memory footprint to the current session. If you wish to optimize your available memory, this flag may prove useful.

## LINUX-SPECIFIC INFORMATION

### Installation Issues

For the license manager to work, your Linux<sup>®</sup> system must be running network system services. If it is not, you should receive the following error when starting S-PLUS:

```
Terminating S Session: License Server
localhost.localdomain
[S-PLUS] Network error: unable to send message to
license server.
```

To see if network services are running on your system, type the following at your shell prompt:

```
ping localhost
```

If you cannot ping localhost, networking is not turned on. Run the following command as root at the superuser prompt:

```
chkconfig network on
```

After turning on the network system services, reboot your system and start S-PLUS.

If your system is sometimes connected to a network, but not always, you need to be able to ping your machine using either its stand-alone name or its network name. For example, if your machine name is `cleo` and it can exist in the domain `insightful.com`, you need to be able to ping both `cleo` and `cleo.insightful.com`.

You can ensure this by changing your host table, `/etc/hosts`, so that it contains only the following:

```
# loopback
127.0.0.1    localhost loghost cleo
cleo.insightful.com
```

### Starting the License Manager Daemon at Boot Time

You can modify your system's boot sequence so that the license manager daemon starts automatically whenever you boot or reboot your system. The basic procedure is described in the section "Starting the License Server Manager on UNIX Platforms" in the *FLEXnet Licensing End User Guide* located at

**SHOME/adm/lic/cmd/LicensingEndUserGuide.pdf**

Adobe Acrobat reader is required to view this file.

**Note**

To complete the S-PLUS installation, you need the license authorization code (LAC) for S-PLUS and any modules you have purchased in order to generate a license key. See the section License Types on page 22.

# LICENSE MANAGEMENT

# 4

---

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## LICENSE TYPES

Licensing S-PLUS is handled by the FLEXnet license management system, which replaced the previous Insightful license management system starting with S-PLUS 7.0. We describe the licensing types by platform in the following section.

Note that fulfilling a license key request must be completed through **keys.insightful.com**, except for single-user (SU) licensing on Windows.

### Windows

- **Single User (SU)** This is a *node-locked* license type used which allows computations to take place at the desktop machine where the software is installed and the user is physically sitting. Multiple sessions on the desktop machine are allowed, and this consumes only one license. A SU license applies to a maximum two (2) CPU machine (with hyperthreading, the same machine appears to have four (4) CPUs), and is licensed to a single user. Remote access is permitted via Terminal Services.
- **Concurrent User (CU)** This is a *floating* license type used which allows computations to take place at the desktop machine where the software is installed. Multiple sessions on the desktop machine are allowed, and this consumes one license per user. One central license manager holds license keys, and any desktop machine can check a key out. A CU license applies to a maximum two (2) CPU machine (with hyperthreading, the same machine appears to have four (4) CPUs), and is licensed to a fixed number of users. Remote access is permitted via Terminal Services.

### Windows and UNIX/Linux

- **Concurrent Session (SESS)** This is a *floating* license type allowing access to S-PLUS from any machine, and there are no limits to one machine. The total number of simultaneous S-PLUS sessions (initiated by any authorized user) is capped by the number of purchased concurrent session licenses. Should a user attempt to start S-PLUS when the number of active sessions is already at the limit, S-PLUS won't start. A user can run multiple simultaneous sessions, but each counts

towards the limit. This type of licensing allows you to run sessions on one machine or to span multiple machines. A SESS license is not limited by number of CPUs. Remote access is permitted via Terminal Services.

## GENERATING A LICENSE KEY

For all platforms, you need a *license authorization code* or LAC and *hostid* in order to generate the license key the FLEXnet license manager requires to run S-PLUS. The LAC should have been e-mailed to you after you purchased S-PLUS. If you attempt to start S-PLUS without a license key, the license key wizard is automatically invoked to help fulfill your license.

Obtaining a license key for S-PLUS depends on the type of licensing you purchased:

1. Run the license key wizard on your machine (single-user licensing on Windows only).
2. Access the Web-based Insightful License Fulfillment Center (all license types on Windows and UNIX) at

**<http://keys.insightful.com>**

The following scenario describes how to fulfill a license key on a single-user desktop. For information on all other license types and how to fulfill them, see the Insightful Fulfillment Center (above).

### Note to Windows Vista Users

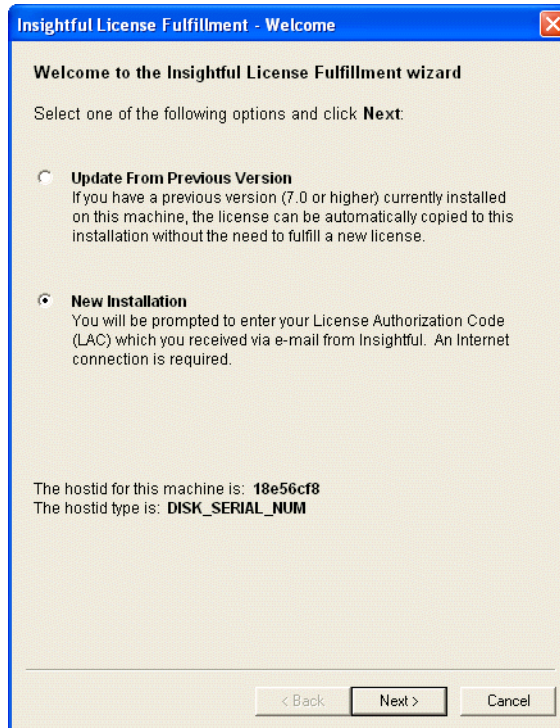
You must be elevated to Administrator to run the license key wizard to fulfill a single-user (SU) Windows desktop license request (described in the following section). If you are a Vista user but do not have this privilege, an error message is displayed when you attempt to run this wizard.

Other Windows platforms (e.g., Windows 2000, XP Pro) do not require administrative privilege to use this license key wizard for single-user desktop license key fulfillment.



## SINGLE-USER (SU) LICENSING (WINDOWS)

You can generate and install the license key required to run S-PLUS by navigating to **Start ► Programs ► S-PLUS 8.0 ► Wizard for License Manager**. This invokes the **Insightful License Fulfillment** wizard, shown in Figure 4.1. Note that you must have an Internet connection from your machine to fulfill your license request through the wizard.



**Figure 4.1:** The *Insightful License Fulfillment - Welcome* dialog. The dialog is automatically displayed if you try to run S-PLUS without a license key. Note the hostid (your disk serial number) and hostid type is displayed at the bottom. Click **Next**

If you attempt to run S-PLUS without a license key, the license manager wizard is automatically invoked to help you generate and install this license key. When the dialog is launched, the wizard utility searches for an existing version of S-PLUS 7.0 or higher on your machine. The radio button is selected automatically, based upon successfully locating an S-PLUS 7.0 or higher installation.

If it is not found, **New Installation** is automatically selected, and the procedure for fulfilling your license key is found in the section **If You Do Not Have S-PLUS 7.0 (or Higher) Installed on Your Machine** on page 27.

If it is found, **Update From Previous Version** is automatically selected, and the procedure for fulfilling the license key is found in the section **If You Have S-PLUS 7.0 (or Higher) Installed on Your Machine** on page 30.

In either case, click **Next** to continue your license key fulfillment. Note that you can also obtain a license key through the Web-based Insightful License Fulfillment Center, discussed on page 31.

**If You Do Not  
Have S-PLUS  
7.0 (or Higher)  
Installed on  
Your Machine**

Input your LAC (which should have been e-mailed to you) in the **License Authorization Code** field, as shown in Figure 4.2. If you are using a proxy server to connect to the Internet, select **I connect to the Internet using a proxy server** and click **Next**, which takes you to the **Proxy Server** dialog, shown in Figure 4.3. If you connect to the Internet by any other means, type the LAC and click **Next**, which takes you to the **Ready to Fulfill** dialog (Figure 4.4). If you aren't sure, leave this option set to the default and click **Next**.

**Insightful License Fulfillment - Confirm**

To activate the license for this product, enter the License Authorization Code (LAC) you received via e-mail from Insightful.

If you did not receive an LAC, contact your site administrator or [keys@insightful.com](mailto:keys@insightful.com).

License Authorization Code:

**NOTE:** You must have an Internet connection from this machine to use this wizard. If you do not have an Internet connection on this machine, from a machine with a connection go to <http://keys.insightful.com>. You will need your License Authorization Code and the following hostid information:

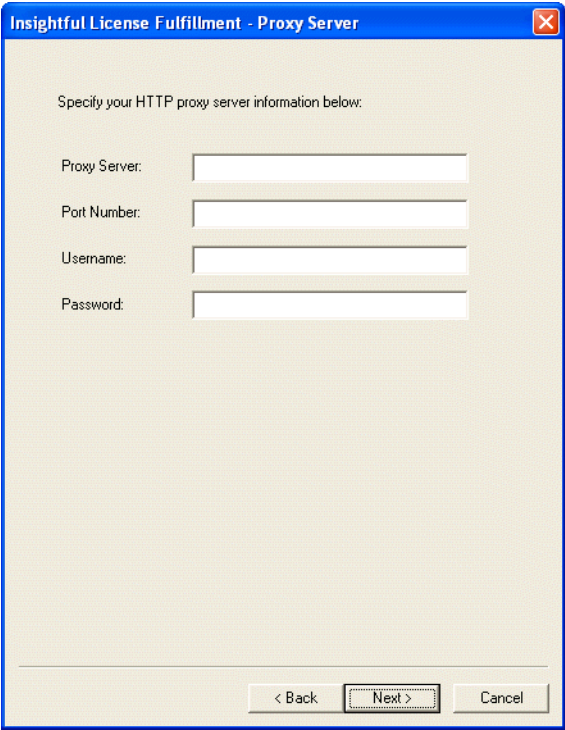
The hostid for this machine is: **18e56cf8**  
The hostid type is: **DISK\_SERIAL\_NUM**

If a proxy server is required to connect to the internet, check the following option. If you are unsure, leave this set to the default.

☐ I connect to the Internet using a proxy server.

< Back    Next >    Cancel

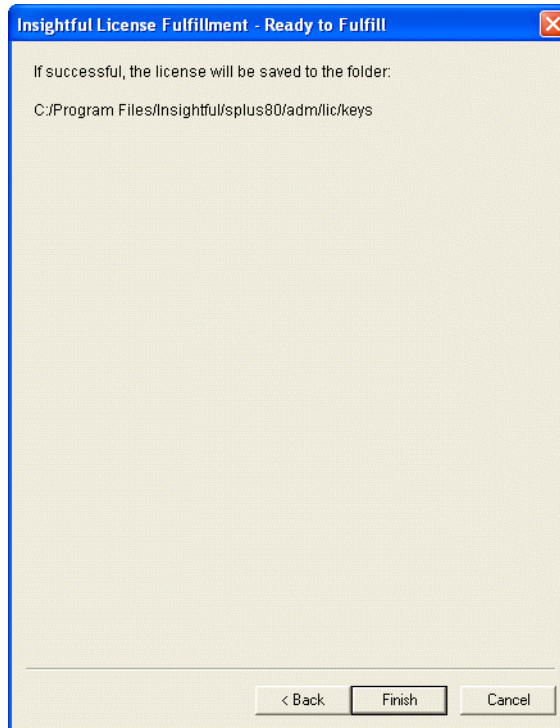
**Figure 4.2:** *The Insightful License Fulfillment - Confirm dialog.*



The image shows a Windows-style dialog box titled "Insightful License Fulfillment - Proxy Server". The dialog has a blue title bar with a close button (X) in the top right corner. The main area has a light beige background with a fine grid pattern. At the top, it says "Specify your HTTP proxy server information below:". Below this are four labels with corresponding text input fields: "Proxy Server:", "Port Number:", "Username:", and "Password:". At the bottom of the dialog, there are three buttons: "< Back", "Next >" (which is highlighted with a dashed border), and "Cancel".

**Figure 4.3:** *The **Proxy Server** dialog. If you use a proxy server to connect to the Internet, fill in the appropriate fields. For all other types of connections, this dialog box is skipped. Click **Next**.*

Figure 4.4 shows FLEXnet is ready to fulfill your license, and shows the path where the license key will be stored. Click **Finish**



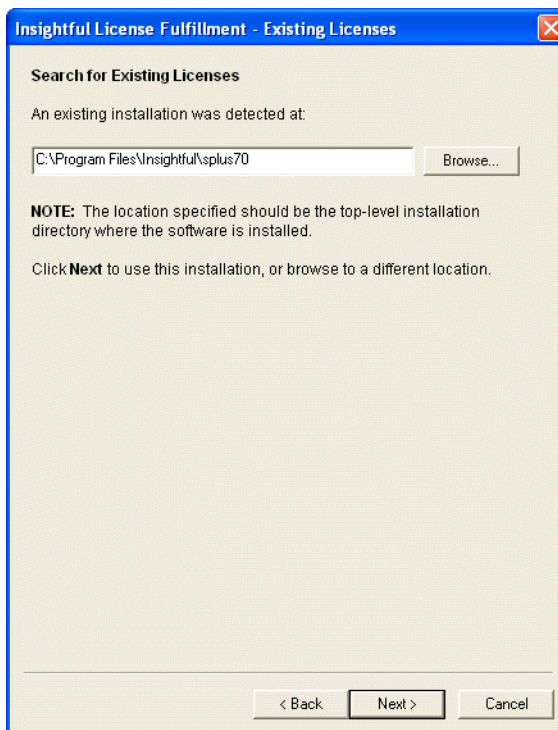
**Figure 4.4:** *Insightful License Fulfillment - Ready to fulfill* dialog. FLEXnet is ready to fulfill your license when the license authorization code has been confirmed.

The license key has now been generated and copied to **SHOME/adm/lic/keys** by default, where **SHOME** is your S-PLUS base installation directory.

If you entered the LAC incorrectly or the license cannot be fulfilled for some reason, an error message is displayed providing hints on how to proceed. Read the information carefully before proceeding; if you still experience difficulties, contact Technical Support.

**If You Have  
S-PLUS 7.0 (or  
Higher)  
Installed on  
Your Machine**

If you do have S-PLUS 7.0 (or higher) installed on your machine, **Update From Previous Version** in the wizard (Figure 4.1) is selected. After you click **Next**, the dialog in Figure 4.5 is displayed. If the path to the previous installation is not automatically displayed, enter the path or browse to it. Note that the top-level installation directory (also called **SHOME**) is path you should enter.



**Figure 4.5:** *Fulfilling a license for S-PLUS 8.0 if you have a pre-existing installation of S-PLUS 7.0 or higher.*

This copies the license key from your S-PLUS 7.0 (or higher) installation to your new S-PLUS 8.0 installation. When you click **Next**, you should see the same dialog shown in Figure 4.4 that indicates your license key request is ready to be fulfilled. The path to the license key is then displayed for your confirmation.

S-PLUS should now start, and you do not need to repeat this process for license fulfillment. If you continues to have problems with the installation, please go to **keys.insightful.com** or contact Technical Support.

**Accessing the  
Insightful License  
Fulfillment  
Center**

This is a Web site hosted by Insightful that allows you to perform a number of tasks related to license management, including generating, installing, re-hosting, and viewing license keys, and editing registration information. You can access this site by pointing your browser to

**<http://keys.insightful.com>**

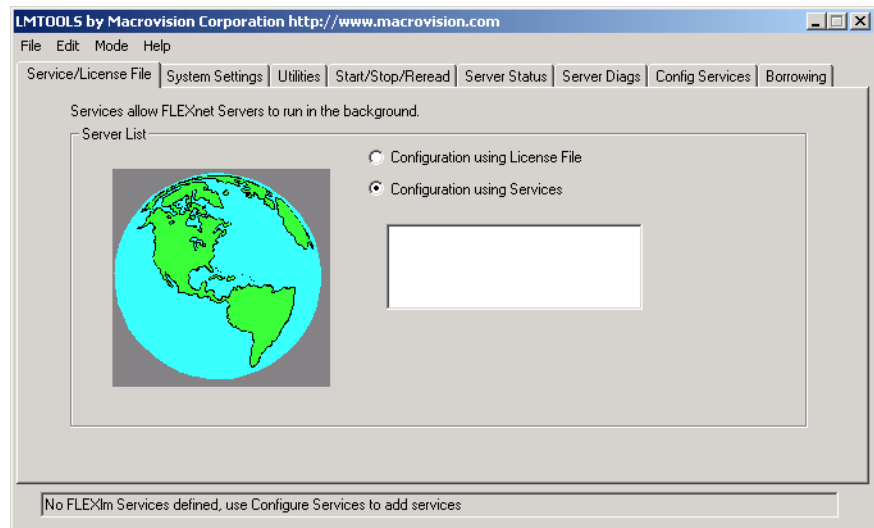
## MODIFYING THE LICENSE MANAGER FOR CONCURRENT USER (CU) AND WINDOWS TERMINAL SERVICES USERS (SESS)

Special instructions are required to install and modify the license manager for concurrent user (CU) licensing and server licensing for Windows Terminal Services users with concurrent session (SESS) licensing. For a description of these license types, see the section License Types on page 22.

This section shows how to change the settings for the FLEXnet license manager for any of these licensing scenarios.

After you've generated a license key, do the following:

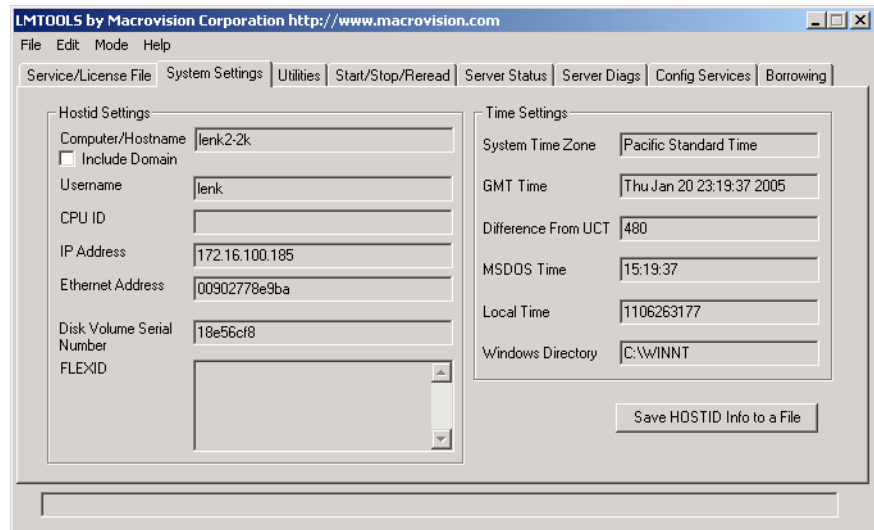
1. Go to your **SHOME/adm/lic/cmd** (where **SHOME** is your base installation directory) and double-click **lmtools.exe**. This invokes the **LMTOOLS** dialog, shown in Figure 4.6.



**Figure 4.6:** *The **Service/License File** page of the **LMTOOLS** dialog. This is used to modify the license manager settings, primarily for concurrent user (CU) licensing and Terminal Services users (SESS).*



2. Click the **Service/License File** tab (displayed by default) and select **Configuration Using Services**. The field below the option indicates what FLEXnet services are currently installed on this machine, if any.
3. Click the **System Settings** tab, and in the **Hostid Settings** group, verify that **Disk Volume Serial Number** is the hostid you used when obtaining your S-PLUS license key from the Insightful License Fulfillment Center (<http://keys.insightful.com>). This is shown in Figure 4.7.



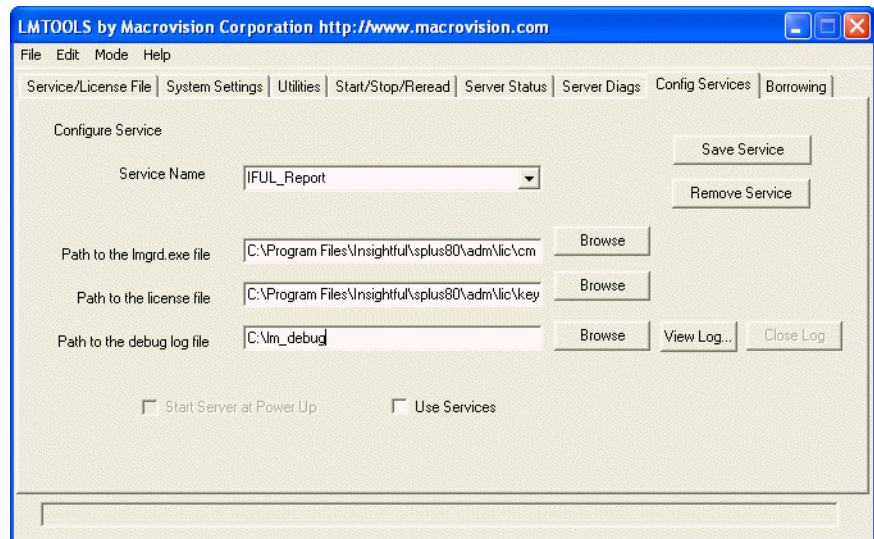
**Figure 4.7:** The *System Settings* page of the *LMTTOOLS* dialog. Verify that **Disk Volume Serial Number** is the hostid used when you obtained your S-PLUS license key.

4. Click the **Config Services** tab, enter (or browse to) each of the following fields, and type the requested information as shown in Table 4.1

**Table 4.1:** Enter the following in the *Config Services* page.

Field	Enter or Type
Service Name	IFUL  Note: This can be any name you select to identify this service on your system.
Path to the lmgrd.exe file	C:\Program Files\Insightful\splus80\adm\lic\cmd\lmgrd.exe
Path to the license file	C:\Program Files\Insightful\splus80\adm\lic\keys
Path to the debug log file	C:\lm_debug\iful.log

The page should look like Figure 4.8 when complete.

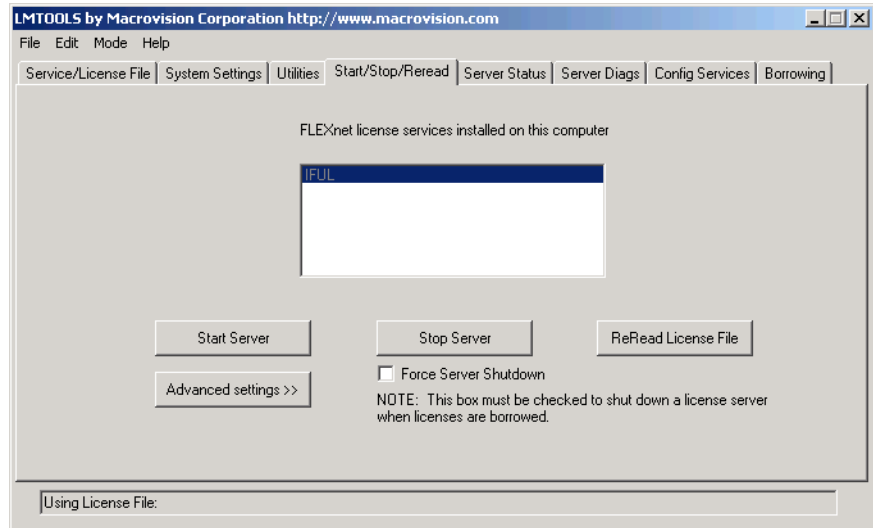


**Figure 4.8:** The *Config Services* page of the *LMTTOOLS* dialog. Type the path for each of the required fields.

Click **Save Services** when you are done.

Note that if S-PLUS is installed in a different directory, you must change the paths you entered above accordingly.

5. Go to the **Start/Stop/Reread** tab. You should see the service name you specified in Step 4. in this list (Figure 4.9). Make sure it is highlighted and click **Start Server**.



**Figure 4.9:** The **Start/Stop/Reread** page of the **LMTTOOLS** dialog. This displays the available services, and you can start, stop, re-read the license file, force a server shutdown, and change advanced settings.

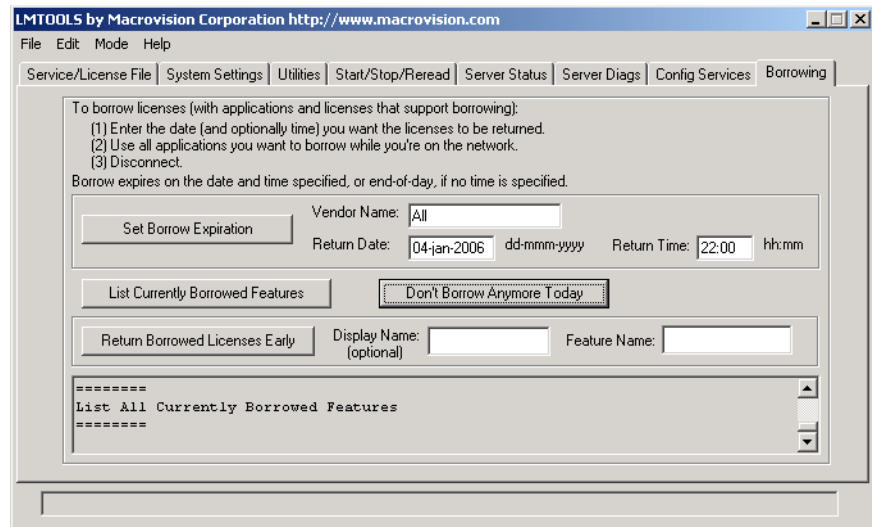
6. The license server should now be running. Close the **LMTTOOLS** dialog.

## BORROWING A LICENSE (CU AND SESS)

If you want to use a license on a computer that is intermittently connected to a license server system, that license can be issued as a floating license with specific features. This borrowed license is generated from a license server system via a special checkout, and can be used later to run an application on a computer that is no longer connected to the license server system. License borrowing must be enabled by a vendor before an end user can borrow licenses.

After you've generated a license key, do the following:

1. Go to your **SHOME/adm/lic/cmd** (where **SHOME** is your base installation directory) and double-click **lmtools.exe**. This invokes the **LMTTOOLS** dialog.
2. Click the **Borrowing** tab, which takes you to the dialog shown in Figure 4.10. You can set the date and time when a borrowed license should be returned, list borrowed features, and return borrowed licenses early.



**Figure 4.10:** The *Borrowing* page of the **LMTTOOLS** dialog.

To learn about other ways of borrowing licenses, see p.96 of the *FLEXnet Licensing End User Guide*, located in your **SHOME/adm/lic/cmd** directory. The file name is **LicensingEndUserGuide.pdf**.

## SETTING THE LICENSE KEY ENVIRONMENT VARIABLE

S-PLUS needs to know the location of the license manager server for Windows and UNIX in order to obtain a license to start up. You can set an environment variable to do this:

```
IFUL_LICENSE_FILE=@server
```

where *server* is the name of the machine where the license manager is running. Setting the license key environment variable is discussed in the following section.

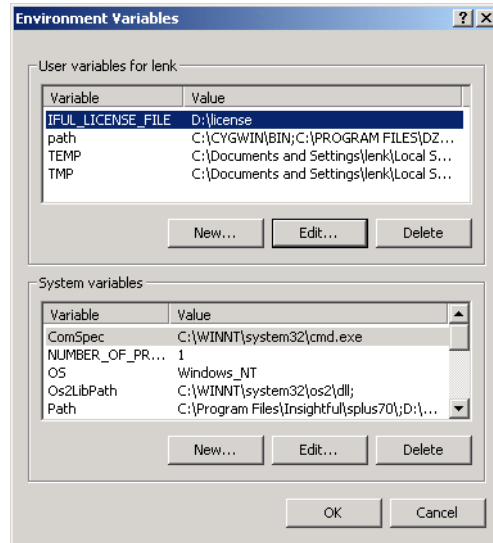
You can save the license key to any location on your machine, but if you do not use the default location (**\$HOME/adm/lic/keys**), you have to set the license key variable `IFUL_LICENSE_FILE` as a system environmental variable.

### Windows

Setting the environment variable this way is typical for concurrent user (CU) licensing or if the license manager is installed on a different machine.

When starting S-PLUS for the first time, the Insightful License Fulfillment Wizard appears. When this appears, click **Cancel**. You should then see the **FLEXlm License Finder**. Choose **Specify the License Server System** and click **Next**. In the box that appears, type the name or IP address of the machine where the license server is running. Click **Next** and then **Finish** to use S-PLUS. The name of the license server is stored in the registry so you don't have to type it again the next time you start S-PLUS.

If the **FLEXlm License Finder** does not display, you can set a system environmental variable. To set a system environmental variable, go to **Start ► Settings ► Control Panel**, and select **System**. Select the **Advanced** tab, click **Environmental Variables**, and in the **User variables** field, set the `IFUL_LICENSE_FILE` and its associated path, as shown in Figure 4.11.



**Figure 4.11:** *Setting the system environmental variable.*

S-PLUS should start normally. If not, check the path and make sure the license key is there. If this doesn't work, contact Insightful Technical Support.

## UNIX/Linux

The `IFUL_LICENSE_FILE=@server` environment variable should be added to your S-PLUS script when you run the `CONFIGURE` script. If it has not been added, add it:

```
export IFUL_LICENSE_FILE=@server
```

When you run S-PLUS, a file called **.flexlmrc** is added to your home directory. License key information for `IFUL_LICENSE_FILE`, such as the name(s) of license servers on the network, is stored in this file.

## INSTALLING THE LICENSE MANAGER ON A SEPARATE MACHINE

In some cases, you may want to install the license manager on a different machine than the one where S-PLUS is installed. This is typically done on networks, where a machine is dedicated to license management.

### Windows

1. On the machine where you want to install the license manager only, run **FLEXnetInstall.exe** from the top level of the S-PLUS 8.0 CD. This invokes the FLEXnet license manager installation wizard:

2. Request a license key for the license manager by navigating to **<http://keys.insightful.com>**

and entering your license authorization code (LAC). You also need the hostid of the license manager machine to fulfill your license; to find this, run

**lmhostid -vsn**

from a **Command Prompt** (**Start ► Run**, and type **cmd**) in the **SHOME/adm/lic/cmd** directory, where **SHOME** is your installation directory (**C:\Program Files\Insightful\splus80** by default).

3. Configure the license manager as shown in the section **Modifying the License Manager for Concurrent User (CU) and Windows Terminal Services Users (SESS)** on page 32.
4. Install S-PLUS on your client machine(s). Instructions are in Chapter 2, **Installing S-PLUS® 8 for Windows**.
5. Set the environment variable **IFUL\_LICENSE\_FILE** as described in section **Setting the License Key Environment Variable** on page 37.

This completes the installation, and you should now be able to run S-PLUS on one machine and the FLEXnet license manager on another.

## UNIX/Linux

The **FLEXNET.TZ** file contains the stand-alone FLEXnet license manager. The steps to unpack this tar file and install it on your network follows.

1. Make a directory for unpacking the distribution and cd to it:

```
mkdir flextest
cd flextest
```

2. As either a regular user (yourself or `splus`) or as root, unpack the tar file from the CD-ROM into the new directory using tar as follows:

```
cat /[mount_point]/FLEXNET.TZ | uncompress | tar xvf -
```

where `[mount_point]` is the absolute path to the CD-ROM drive.

If your system has the `zcat` command, you can use it to shorten your extraction command (`zcat` combines the `cat` and `uncompress` commands):

```
zcat /[mount_point]/FLEXNET.TZ | tar xvf -
```

3. Find your server hostid by running this script:

```
lmshostid
```

and copy this hostid.

4. Go to <http://keys.insightful.com>, type your license authorization code (LAC), and click **Login**.
5. Click **Generate Licenses**.
6. Paste your server hostid (from Step 3.) in **Node-locked Hostid**, and enter the appropriate license type in **Node-locked Hostid Type**: If your hostid provided by the `./HOSTINFO` script is eight (8) characters long, select **Long**. If it is 12 characters, select **Ethernet**. Click **Generate**.
7. Save the license key to the directory you created in the first step. For example,

```
/homes/username/flextest/license_123.lic.
```

8. Navigate to your **FLEXHOME** directory, where **FLEXHOME** is the location of the FLEX license manager. Run the `lmgrd` utility to run the license manager:

```
./lmgrd -c /homes/username/flextest/license_123.lic
```



**Note**

If you are having difficulty obtaining licenses after installing your license manager, try setting an environmental variable:

```
setenv IFUL_LICENSE_FILE @denny
```

Refer to section Setting the License Key Environment Variable on page 37.



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