PGI® Server 8.0
PGI® Workstation 8.0

Installation Guide

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Installation Guide
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1 PGI Release 8.0 Introduction

Welcome to Release 8.0 of *PGI Workstation* and *PGI Server*, a set of Fortran, C, and C++ compilers and development tools for 32-bit and 64-bit x86-compatible processor-based workstations and servers running versions of the Linux, Windows, and Mac OS operating systems.

All workstation-class compilers and tools products from The Portland Group (*PGI Fortran Workstation*, for example) are subsets of the *PGI Workstation Complete* product. These workstation-class products provide a node-locked single-user license, meaning one user at a time can compile on the one system on which the *PGI Workstation* compilers and tools are installed.

PGI Server products are offered in configurations identical to the workstation-class products, but provide network-floating multi-user licenses. This means that two or more users can use the *PGI* compilers and tools concurrently on any compatible system networked to the system on which the *PGI Server* compilers are installed.

This installation information applies to all workstation-class and server-class compiler products from The Portland Group.

1.1 Product Overview

Release 8.0 of PGI Workstation and PGI Server includes the following components:

- *PGF95* OpenMP* and auto-parallelizing Fortran 90/95 compiler.
- *PGF77* OpenMP and auto-parallelizing FORTRAN 77 compiler.
- *PGHPF* data parallel High Performance Fortran compiler.
  NOTE: *PGHPF is supported only on Linux platforms.*
- *PGCC* OpenMP and auto-parallelizing ANSI C99 and K&R *C* compiler.

- *PGC++* OpenMP and auto-parallelizing ANSI *C++* compiler.
- *PGPROF* graphical MPI/OpenMP/multi-thread performance profiler.
- *PGDBG* graphical MPI/OpenMP/multi-thread symbolic debugger.
- *MPICH MPI libraries, version 1.2.7,* for both 32-bit and 64-bit development environments (Linux only).
- Online documentation in PDF, HTML and `man` page formats.
- A UNIX*-like shell environment for *Win32* and *Win64* platforms.

Depending on the product configuration you purchased, you may not have licensed all of the above components.

The MPI profiler and debugger included with *PGI Workstation* are limited to processes on a single node. *PGI Workstation* can be installed on a single computer, and that computer can be used to develop, debug, and profile MPI applications. The *PGI CDK Cluster Development Kit* supports general development on clusters.

1.2 Terms and Definitions

This Installation Guide contains a number of terms and definitions with which you may or may not be familiar. If you encounter a term in these notes with which you are not familiar, please refer to the online glossary at

www.pgroup.com/support/definitions.htm

These two terms are used throughout the documentation to reflect groups of processors:

AMD64 – a 64-bit processor from AMD designed to be binary compatible with 32-bit *x86* processors, and incorporating new features such as additional registers and 64-bit addressing support for improved performance and greatly increased memory range. This term includes the AMD™ Athlon64™, AMD Opteron™, AMD Turion™, Barcelona, and Shanghai processors.

Intel 64 – a 64-bit IA32 processor with *Extended Memory 64-bit Technology* extensions designed to be binary compatible with AMD64 processors. This includes Intel Pentium 4, Intel Xeon, and Intel Core 2 processors.

2 PGI Release 8.0 Installation Overview

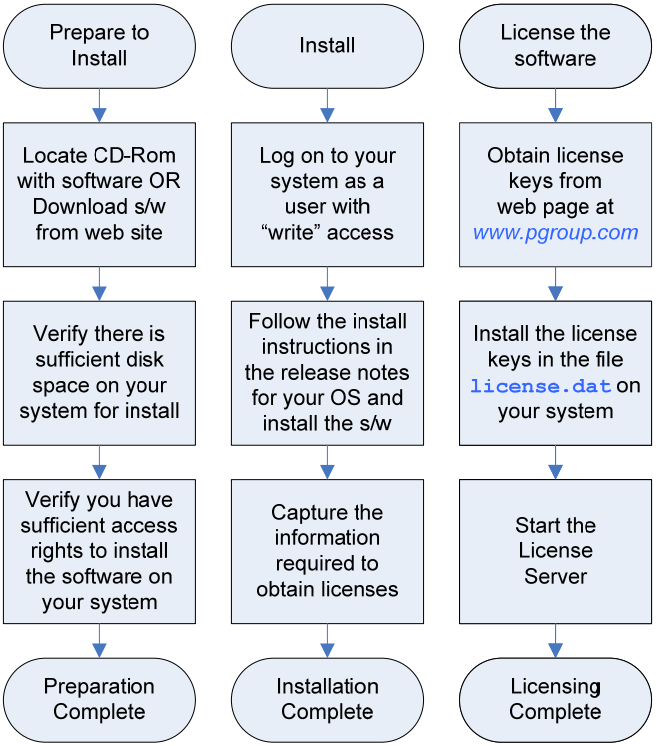
This section provides an overview of the steps required to successfully install *PGI Workstation* or *PGI Server*. The following chapters provide the details of each of the steps. Specifically, Chapter 3 describes licensing generally. Chapter 4 describes how to install *PGI Workstation* or *PGI Server* in a generic manner on Linux, including how to install and run a FLEXnet license daemon on Linux. Chapter 5 describes how to install on a Windows system, and Chapter 6 describes how to install on an Apple MacOS system.

2.1 Before You Begin

Before you begin the installation, it is essential that you understand the flow of the installation process. There are three stages of the process:

- Prepare to install – verifying that you have all the required information and software.
- Install the software – installing the software appropriate for your operating system
- Generation of license keys using the PGI website, installation of the license keys, and starting the license server.

The following illustration provides a high-level overview of the installation process.



For more complete information on these steps and the specific actions to take for your operating system, refer to the following chapters.

2.2 Support

All new PGI licenses include 60 days of PGI Subscription Service. The PGI Subscription Service provides support and other benefits including:

1) Ongoing technical support by electronic mail. Support requests may be sent in a number of ways:
   - By electronic mail to trs@pgroup.com
   - Faxed to +1-503-682-2637
   - By using the online support request form.
   - ***Note.*** Phone support is not currently available.

2) Release upgrades for licensed Product(s) at no additional cost, except for any administrative fee that may apply.

3) Full license fee credits on Product upgrades, except for any administrative fee that may apply. "Product upgrades" refer to exchanging one Product license for a more expensive Product license, and is not the same as a version or Release upgrade previously referenced.

4) Full license fee credits on user-count upgrades, except for any administrative fee that may apply.

To continue receiving these benefits after 60 days, you can purchase an extension to your PGI Service Subscription. Extensions are available in yearly increments. For more information, contact PGI sales at sales@pgroup.com.

3 PGI Release 8.0 Licensing

The PGI compilers and tools are license-managed. There are two types of license keys: permanent and trial. License keys are generated by logging in to your PGI web-user account at *www.pgroup.com/login*.

Note. You must install the PGI software before you obtain your license keys because the license key generation process requires information that is generated during the software installation.

Permanent keys can be generated if you purchase a permanent license. When your order is processed, a PGI web-user account is created automatically if necessary and the e-mail order confirmation you receive includes complete instructions for logging on at the URL listed above and generating permanent license keys using this account.

Trial keys can be generated if you register for a trial of the PGI software. When you register, your PGI web-user account is created and you can log in at the URL listed above and generate trial keys.

3.1 PGI Workstation Licensing

PGI Workstation is node-locked to a single system in a way that allows any user of the system to use the PGI compilers and tools. However, only a single user is allowed to run any of the PGI compilers or tools at a given time.

3.2 PGI Server Licensing

PGI Server supports multi-user, network floating licenses. Multiple users can use the PGI compilers and tools simultaneously from multiple systems on a network when those systems have a properly configured version of *PGI*

Server installed. The number of seats purchased for the license determines the limitation on the number of concurrent users.

On Linux, *PGI Server* may be installed locally on each machine on a network or may be installed once on a shared file system available to each machine. If you select the second method, a *network install*, adding another machine to the group running the compilers is a much simpler process in this release; you adjust to the unique characteristics of the newly added system with a customization script that must be executed on each machine in the group.

Note. On Windows and Mac OS, *PGI Server* must be installed locally on each machine.

3.3 The FLEXnet License Manager

PGI Workstation and *PGI Server* software licensing is managed using the FLEXnet license management system from Macrovision. As part of the process of installing the PGI compilers and tools in the following sections, you will install and configure the FLEXnet license management software. These sections describe how to configure license daemons for Linux, Windows or MacOS, including installation and start-up of the license daemon, and proper initialization of the `LM_LICENSE_FILE` environment variable.

3.4 Trial Licensing Key Constraints

NOTE

At the conclusion of the trial period, the PGI compilers and tools and any executable files generated prior to the installation of permanent license keys will cease to function.
Any executables, object files, or libraries created using the PGI compilers with a trial key must be recompiled with permanent license keys in place.

3.5 License Keys and System Configurations

Executable files generated with permanent license keys in place are unconstrained, and will run on any compatible system regardless of whether the PGI compilers are installed.

If you change the configuration of your system by adding or removing hardware, your license key may become invalid. Please contact The Portland Group if you expect to reconfigure your system to ensure that you do not temporarily lose the use of the PGI compilers and tools.

For the first 60 days after your purchase, you may send technical questions about these products to the e-mail address *trs@pgroup.com*. If you have purchased a PGI Software Subscription, you have access to e-mail support for an additional 12 months and you are notified by e-mail when maintenance releases occur and are available for electronic download and installation. Phone support is not currently available. Contact us at *sales@pgroup.com* if you would like information regarding the subscription service for the PGI products you have purchased.

The following chapters describe how to install *PGI Workstation* or *PGI Server*.

4 Installations on Linux

This chapter describes how to install *PGI Workstation* or *PGI Server* on a Linux system. It covers local and network installs and is applicable to permanent or trial installations.

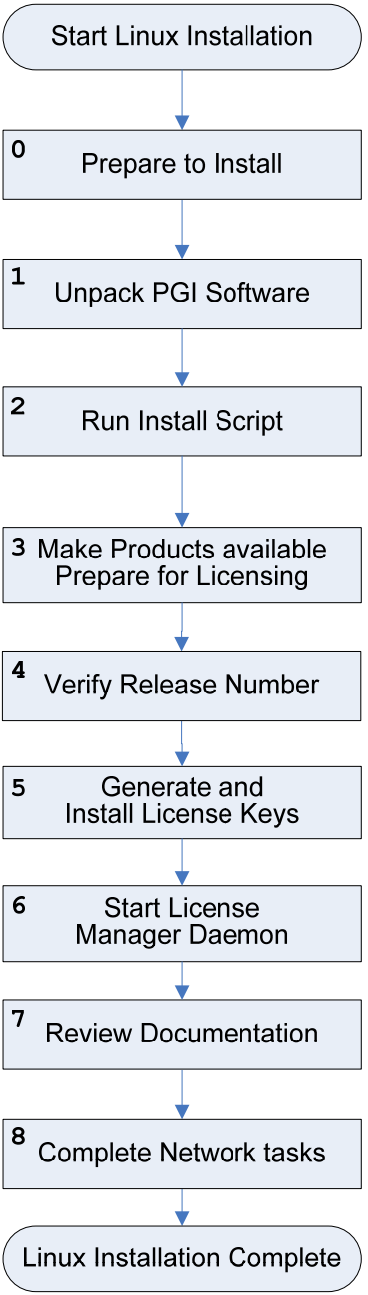
- For installations on 32-bit x86 systems, the PGI installation script installs only the linux86 versions of the PGI compilers and tools.
- For installations on 64-bit x64 systems running a linux86-64 execution and development environment, the PGI installation script installs the linux86-64 version of the PGI compilers and tools.
- If the 32-bit gcc development package is already installed on the system, the 32-bit linux86 tools are also installed on a 64-bit x64 system.

4.1 Prepare to Install on Linux

In preparation for installing *PGI Workstation* or *PGI Server* on Linux, first review the following overview of the Linux installation process.

Note. For Linux installations, **each user** must set their environment variables properly to access the software, as described in section 4.4, *End-user Environment Settings on Linux*.

The 32-bit and 64-bit compilers, tools, and supporting components have the same command names. Further, the environment you target by default (*linux86-64* or *linux86*) depends on the version of the compiler that comes first in your path settings.



- ❑ Select which products
- ❑ Select 32- or 64- bit
- ❑ Determine local or on network install
- ❑ Check disk space availability
- ❑ Start Shell Command Window

- ❑ Locate CD-ROM OR
- ❑ Download from web site and unpack the file

- ❑ Do I have write permissions?
- ❑ Can I access the software?
- ❑ Run the install script.
- ❑ Consent to the PGI end-user licence sgreement (EULA).

- ❑ Execute appropriate commands to make products available and to prepare environment for licensing

---

- ❑ Use the -V option on any compiler command to verify the release number

---

- ❑ Have your PGI username, password, FLEXlm hostid, and computer hostname
- ❑ Obtain licenses from web site
- ❑ Place licenses in `license.dat` file

- ❑ Issue the `lmgrd.rc start` command to start the license server and daemon

---

HTML and PDF versions are available

- ❑ Did I bookmark the location?

For Network Installations Only:

- ❑ Run local installation script on each system on network where compilers and tools are to be available

In a traditional local installation, the default installation base directory is `/opt/pgi`. If you choose to perform a network install, you should specify a shared file system for the installation base directory. You must also specify a second directory name that is local to each of the systems where the PGI compilers and tools are used. This local directory will contain the libraries to use when compiling and running on that machine. This approach allows a network installation to support a network of machines that run different versions of Linux.

To prepare for the installation:

1. Locate the email that contains your Order Confirmation.
   This email contains instructions on how to download the PGI software from the PGI web page as well as the PIN number associated with your licensing file.
2. Bring up a shell command window on your system.
   The installation instructions assume you are using csh, sh, ksh, bash, or some compatible shell. If you are using a shell that is not compatible with one of these shells, appropriate modifications are necessary when setting environment variables.
3. Verify you have enough free disk space.
   linux86 platform: PGI installation requires 250 MB of free disk space.
   linux86-64 platform: PGI installation requires 1.4 GB of free disk space.

4.2 Installation Steps for Linux

Follow these instructions to install the software:

Step 1. Unpack the PGI Software

If you received this software on a CD-ROM, please skip to step 2. If you downloaded the software from *http://www.pgroup.com* or another electronic distribution site, then in the instructions that follow, replace `<tarfile>` with the name of the file that was downloaded.

Note. The PGI products cannot be installed into the same directory where the tar file is unpacked. Use the following command sequence to unpack the tar file in a temporary directory before installation:

```
% mkdir /tmp/pgi
% mv <tarfile>.tar.gz /tmp/pgi
% cd /tmp/pgi
% tar xpfz <tarfile>.tar.gz
```

Step 2. Run the Install Script.

Note. The install script ***must*** be run to properly install the software.

If you downloaded the PGI software from the Internet, execute the following script in the directory where you unpacked the tar file:

```
% ./install
```

If you are installing from a CD-ROM, issue the following command:

```
% /mnt/cdrom/install
```

You will be asked to assent to the PGI end-user license agreement (EULA), whether to perform a traditional local installation or a network installation, whether to install the optional ACML math library from AMD, and where to place the installation directory. After the software is installed, the install script will perform some system-specific customization and then initialize the licensing.

Note. For a network installation, you are asked for a common local directory. This local directory will be created once on each system utilizing the network installation; further, it must be created on each system *before* adding that system to the network using the compilers.

Note. If you have difficulty running this script, especially on a Slackware Linux system, check the permissions on `/dev/null`. Permissions should be set to "`crw-rw-rw-`". If necessary, reset permissions to this value; to do this, super-user permissions are required.

Note. Some systems use a CD-ROM volume manager that may insert an additional directory in the above pathname, and require the longer pathname. For example, you may need to execute a script like this:

```
% /cdrom/pgisoft/install
```

If you are not sure how to access the CD-ROM drive, check with your system administrator.

At the end of the installation, the install script prints a message similar to this:

```
To obtain an evaluation license, go to:
    www.pgroup.com/login
and use your web-user access codes (email address and
password) and the information below to generate a trial
license.

For a permanent license, please read the order
confirmation that you received.  Connect to
   www.pgroup.com/login
with the username and password provided in the order
confirmation.

      FLEXlm hostid: <your host id>
      Hostname: <your host name>
      Installation: /opt/pgi
      PGI Release: 8.0-1
```

You will need the *FLEXlm hostid* and *Hostname* in Step 3 below. In case you need to retrieve this information at a later time, the preceding message is also saved to the file `/opt/pgi/license.info`, where `/opt/pgi` is the installation directory.

Step 3. Make PGI products accessible and Prepare for Licensing.

When install script has completed, execute the following commands to make the PGI products accessible and to initialize your environment for use of FLEXnet.

For *linux86-64:*

To use the *linux86-64* version of the compilers and tools, execute the following commands, assuming you have installed in the default `/opt/pgi` directory.

For `csh`:

```
% setenv PGI /opt/pgi
% set path=(/opt/pgi/linux86-64/8.0/bin $path)
% setenv MANPATH "$MANPATH":/opt/pgi/linux86-64/8.0/man
% setenv LM_LICENSE_FILE \
   "$LM_LICENSE_FILE":/opt/pgi/license.dat
```

For `bash`, `sh` or `ksh`:

```
$ PATH=/opt/pgi/linux86-64/8.0/bin:$PATH
$ export PATH
$ MANPATH=$MANPATH:/opt/pgi/linux86-64/8.0/man
$ export MANPATH
$ LM_LICENSE_FILE= \
      $LM_LICENSE_FILE:/opt/pgi/license.dat
$ export LM_LICENSE_FILE
```

For *linux86:*

To use only the *linux86* version of the compilers and tools, or to target *linux86* as the default, use a setup similar to the previous one, changing the path settings as illustrated in the following commands.

For `csh`:

```
% setenv PGI /opt/pgi
% set path=(/opt/pgi/linux86/8.0/bin $path)
% setenv MANPATH "$MANPATH":/opt/pgi/linux86/8.0/man
% setenv LM_LICENSE_FILE \
   "$LM_LICENSE_FILE":/opt/pgi/license.dat
```

For `bash`, `sh` or `ksh`:

```
$ PATH=/opt/pgi/linux86/8.0/bin:$PATH
$ export PATH
$ MANPATH=$MANPATH:/opt/pgi/linux86/8.0/man
$ export MANPATH
$ LM_LICENSE_FILE= \
      $LM_LICENSE_FILE:/opt/pgi/license.dat
$ export LM_LICENSE_FILE
```

You should add these commands to your shell startup files to ensure that you have access to the PGI products upon future logins.

Step 4. Verify the Release Number of the Installed Software.

To verify the release number of the products you have installed, use the *–V* option on any of the compiler commands, as illustrated in the following examples. If you use *–v* instead, you also see the sequence of steps the compiler will use to compile and link programs for execution on your system.

- For Fortran 77, use: `pgf77 -V x.f`
- For Fortran 95, use: `pgf95 -V x.f`

- For HPF, use: `pghpf -V x.f`
- For C++, use: `pgCC -V x.c`
- For ANSI C, use: `pgcc -V x.c`

Note. These commands can be successfully executed even if the files `x.f` or `x.c` do not exist and you have not completed the licensing phase of the installation. The PGI compiler drivers support this as a quick check that you have installed the proper version of the compilers and have initialized your environment to enable access to that version.

Step 5. Generate and Install License Keys.

All of the PGI compilers and tools are license-managed and require installation of license keys to make the PGI software operational. To obtain license keys, you need the following information:

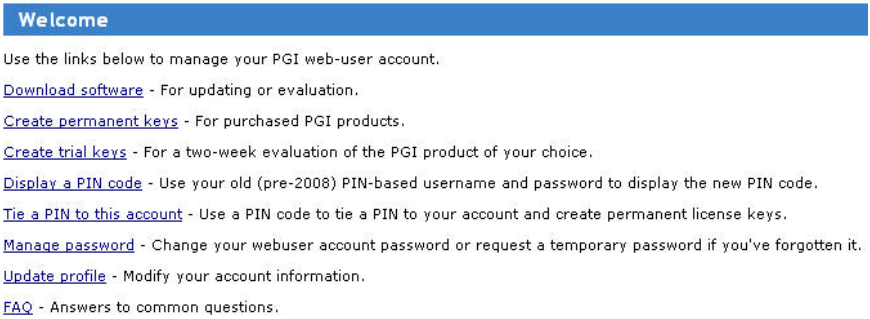
- A PGI web-user *username* and *password*. These are used to log on at *www.pgroup.com/login* and generate your license keys. If you received an order acknowledgment corresponding to a permanent license, an account was created automatically when the order was entered. The username for the account is the e-mail address to which the order acknowledgment was sent, and a separate e-mail was sent to that same address including the password for the account. If you registered for a trial of the PGI software, you created your PGI web-user account at the time you registered and received your password in a subsequent e-mail.
- The FLEXlm hostid and hostname of the computer on which the software is installed, which is echoed to your screen by the install script.

Note. You can also obtain your FLEXlm hostid by using the following command, after you have executed the install script:

```
% lmutil lmhostid
```

Generate License Keys

Once you have logged on at *www.pgroup.com/login* using your PGI web-user email and password, you will see a screen similar to the following:



To generate permanent license keys:

1) Click Create permanent keys.
2) Click the PIN associated with the product for which you wish to generate license keys.
3) Click License keys to generate the keys.

To generate trial license keys:

1) Click Create trial keys.
2) Accept the terms of the agreement.
3) Enter the hostid exactly as it appears in the message that is displayed during installation.
4) Click the Generate license key button.

Install License Keys

Once you have generated your trial or permanent license keys, copy and paste them into the file `/opt/pgi/license.dat`, or substitute the appropriate installation directory path if you have not installed in the default `/opt/pgi` directory. For example, if you have purchased *PGI Fortran Workstation* for Linux, the `license.dat` file should look similar to the following:

```
SERVER <hostname> <hostid> 27000
DAEMON pgroupd
PACKAGE pgi72-workstation-fortran \
  pgroupd 8.0 2A64FB18DEBE COMPONENTS= \
 "pgi-f95-lin64:8.0 pgi-f77-lin64:8.0 \
  pgi-hpf-lin64:8.0 pgi-cc-lin64:8.0 \
  pgi-cpp-lin64:8.0 \
  pgi-f95-lin32:8.0 pgi-f77-lin32:8.0 \
  pgi-hpf-lin32:8.0 pgi-cc-lin32:8.0 \
  pgi-cpp-lin32:8.0 \
  pgi-prof:8.0 pgi-dbg:8.0 pgi-dbg-gui:8.0" \
  OPTIONS=SUITE_RESERVED SIGN= \
 "0D91 C4A7 3569 5A7C 65EE 91EC A9AA 706C \
  5EB8 C207 2DE8 9086 3926 4F84 BAF4 1C9D \
  EC65 00BF 51A2 9A8D DF53 C460 7C10 663F \
  9C41 92B9 F9B2 6150 D6C1 A942"
FEATURE pgi-workstation-fortran pgroupd 8.0 \
  31-dec-0 5 8B15A3507BE4 \
  VENDOR_STRING=107209:8:ws DUP_GROUP=U \
  SUITE_DUP_GROUP=U BORROW=336 TS_OK SIGN= \
 "0501 9540 017D 9D8C CE97 E26B F967 A848 \
  864E 6ECD 2705 E535 3E6B B6B6 7ED3 0F83 \
  8FDC 48FE 3AD5 E6D0 5B2E 26E5 D18C 2E6B \
  BC30 1838 1526 C3BF F081 D19F"
```

In your license file:

- `<hostid>` should match the *hostid* you submitted above when you generated your license keys.
- If necessary, you *can* enter or edit the `<hostname>` entry manually, but you *cannot* edit the `<hostid>` entry or you will invalidate the license keys.
- The six digits immediately following the = in the feature line component, `VENDOR_STRING=107209:8` represent the Product ID Number (PIN) for this installation, in this example `107209`. You have a similar unique PIN number for your installation.

Note. Please include your PIN number when sending mail to us regarding technical support for the products you have purchased. This PIN number is also on your order confirmation email.

Step 6. Start the license manager daemon.
Important: If you are evaluating *PGI Workstation* with trial keys, you do not need to perform this step and can proceed to Step 7.

Note. The following refers to the shell script template for *linux86-64*. If you have installed only *linux86*, please substitute *linux86* for *linux86-64*.

If you installed the compilers in a directory other than `/opt/pgi`, edit the shell script template `$PGI/linux86-64/8.0/bin/lmgrd.rc` and substitute the correct installation directory for `/opt/pgi` in the section of the script entitled *Where to find the PGI Software*. Then save the file and exit the editor.

Issue the following command to start the license server and *pgroupd* license daemon running on your system:

```
% lmgrd.rc start
```

If you wish to stop the license server and license daemon at a later time, you can do so with the command:

```
% lmgrd.rc stop
```

To make sure that the license server and *pgroupd* daemon are started each time your system is booted, log in as root, set the `PGI` environment variable as described in Step 4 above, and then execute the following two commands:

```
% cp $PGI/linux86/8.0/bin/lmgrd.rc  /etc/init.d/lmgrd
% ln -s /etc/init.d/lmgrd  /etc/rc.d/rc3.d/S90lmgrd
```

Note. You must be logged in as root to successfully execute these commands, and there are two values in this example that may be different on your system:

- Your system's default `runlevel` may be something other than '3', the level used in this example. You can run `/sbin/runlevel` to check the system's runlevel. If the runlevel on your systems is different, then you must set the correct subdirectory; use your system's runlevel in place of the "3" in the preceding example.
- Your `rc` files may be in a directory other than the one in the example: `/etc/init.d`. If the `rc` files are in a directory such as `/etc/rc.d/init.d`, then substitute that location in the example.

Most Linux distributions include the *chkconfig(8)* utility that manages the runlevel scripts. If your system has this tool and you wish to use it, then run the following commands:

```
% cp $PGI/linux86/8.0/bin/lmgrd.rc /etc/rc.d/init.d/
% chkconfig --add lmgrd.rc
```

The appropriate links will be created in the `/etc/rc.d` directory hierarchy. For more information on *chkconfig*, please see the manual page.

IMPORTANT NOTE: Release 7.2 included a newer version of the Macrovision FLEXnet software. The updated *lmgrd* and *pgroupd* daemons must be used in preference to versions shipped with previous releases of the PGI products. You can co-install Release 8.0 with Release 7.1, 7.0, 6.*X* and/or 5.2; and you can use any of these versions of the compilers and tools with the new versions of *lmgrd* and *pgroupd* and a single Release 8.0 license file. Further, if you use this file to start *lmgrd* automatically after a reboot of your system, you must modify your `lmgrd.rc` file in the `/etc/rc.d` or `/etc/init.d` directory to use the new *lmgrd*.

For example, your `lmgrd.rc` file may look like this one, where `<target>` is replaced appropriately with `linux86` or `linux86-64`.

```
## Path to master daemon lmgrd
# Commented out previous path to 5.2:
#LMGRD=$PGI/<target>/5.2/bin/lmgrd
LMGRD=$PGI/<target>/8.0/bin/lmgrd

## Command to stop lmgrd
#Commented out previous path to 5.2:
#LMUTIL=$PGI/<target>/5.2/bin/lmutil
LMUTIL=$PGI/<target>/8.0/bin/lmutil
```

Step 7. Review Documentation.

You can view the online HTML and PDF documentation using any web browser by opening the file:

```
$PGI/linux86-64/8.0/doc/index.htm
```

or

```
$PGI/linux86/8.0/doc/index.htm
```

You may want to bookmark this location for easy future reference to the online manuals.

Step 8. Complete Network Installation Tasks.
Skip this step if you are not using a network installation.

For a network installation, you must run the local installation script on each system on the network where the compilers and tools will be available for use.

If your installation base directory is `/opt/pgi` and the common local directory is `/usr/pgi/shared/8.0`, run the following commands on each system on the network.

```
/opt/pgi/linux86/8.0-1/bin/makelocalrc \
       -x /opt/pgi/linux86/8.0-1 \
       -net /usr/pgi/shared/8.0

/opt/pgi/linux86-64/8.0-1/bin/makelocalrc \
       -x /opt/pgi/linux86-64/8.0-1 \
       -net /usr/pgi/shared/8.0
```

These commands create a system-dependent file *localrc.machinename* in both the `/opt/pgi/linux86/8.0-1/bin` directory and in `/opt/pgi/linux86-64/8.0-1/bin`. The commands also create the following three directories containing libraries and shared objects specific to the operating system and system libraries on that machine: `/usr/pgi/shared/8.0/lib, /usr/pgi/shared/8.0/liblf, and /usr/pgi/shared/8.0/lib64.`

Note. The `makelocalrc` command does allow the flexibility to have local directories that have different names on different machines. However, using the same directory on different machines allows users to easily move executables that use PGI-supplied shared libraries between systems.

Installation of the PGI products for Linux is now complete. For assistance with difficulties related to the installation, send e-mail to *trs@pgroup.com*. The following two sections contain information detailing the directory structure of the PGI installation, and instructions for how PGI end-users initialize environment and path settings in order to use the PGI compilers and tools.

4.3 Typical Directory Structure for Linux

If you specify `/opt/pgi` as the base directory for installation, the following directory structure is created by the PGI installation script:

Name of directory	Contents
`/opt/pgi/linux86/8.0/bin`	*linux86* 32-bit compilers & tools
`/opt/pgi/linux86/8.0/lib`	*linux86* 32-bit runtime libraries
`/opt/pgi/linux86/8.0/liblf`	*linux86* 32-bit large-file support libs (used by *–Mlfs*)

Name of directory	Contents
/opt/pgi/linux86/8.0/include	*linux86* 32-bit header files
/opt/pgi/linux86-64/8.0/bin	*linux86-64* compilers & tools
/opt/pgi/linux86-64/8.0/lib	*linux86-64 –mcmodel=small* libs
/opt/pgi/linux86-64/8.0/libso	*linux86-64 –fpic* shared libraries for *–mcmodel=medium* development
/opt/pgi/linux86-64/8.0/include	*linux86-64* header files
/opt/pgi/linux86/8.0/REDIST /opt/pgi/linux86-64/8.0/REDIST	Re-distributable runtime libraries
/opt/pgi/linux86/8.0/EXAMPLES /opt/pgi/linux86-64/8.0/EXAMPLES	Compiler examples
/opt/pgi/linux86/8.0/doc /opt/pgi/linux86-64/8.0/doc	Documentation
/opt/pgi/linux86/8.0/man /opt/pgi/linux86-64/8.0/man	UNIX-style man pages
/opt/pgi/linux86/8.0/jre /opt/pgi/linux86-64/8.0/jre	JAVA environment for *PGDBG* and *PGPROF* graphical user interfaces
/opt/pgi/linux86/8.0/src /opt/pgi/linux86-64/8.0/src	Fortran 90 source files for included modules.
/opt/pgi/linux86/8.0/mpi/mpich /opt/pgi/linux86-64/8.0/mpi/mpich	MPICH tools and libraries.

Additionally, a network install creates the following directories:

Name of directory	Contents
/opt/pgi/linux86/8.0/lib-linux86-g	*linux86* 32-bit *libpgc* library dependent on the version of *glibc* installed on each machine
/opt/pgi/linux86/8.0/include-g	*linux86* 32-bit header files dependent on the version of glibc or gcc installed on each machine

Name of directory	Contents
`/opt/pgi/linux86-64/8.0/include-g`	*linux86-64* 64-bit header files dependent on the version of *glibc* or *gcc* installed on each machine

4.4 End-user Environment Settings on Linux

Now that you have installed the compilers in, for example, `/opt/pgi`, an end-user of the PGI compilers and tools must initialize their shell environment to use the compilers successfully. Assume the license file is in `/opt/pgi/license.dat`, and the *lmgrd* license manager is running.

Note. **Each user** must issue the following sequence of commands to initialize the shell environment before using the PGI compilers and tools.

To make the 64-bit PGI compilers and tools the default

In csh, use these commands:

```
% setenv PGI /opt/pgi
% setenv MANPATH "$MANPATH":$PGI/linux86-64/8.0/man
% setenv LM_LICENSE_FILE $PGI/license.dat
% set path = ($PGI/linux86-64/8.0/bin $path)
```

Once the 64-bit compilers are the defaults, you can make the MPICH commands and MPICH man pages accessible using these csh commands:

```
% set path = ($PGI/linux86-64/8.0/mpi/mpich/bin $path)
% setenv MANPATH \
      "$MANPATH":$PGI/linux86-64/8.0/mpi/mpich/man
```

In bash, sh or ksh, use these commands:

```
$ PGI=/opt/pgi; export PGI
$ MANPATH=$MANPATH:$PGI/linux86-64/8.0/man
$ export MANPATH
$ LM_LICENSE_FILE=$PGI/license.dat
$ export LM_LICENSE_FILE
$ PATH=$PGI/linux86-64/8.0/bin:$PATH
$ export PATH
```

Once the 64-bit compilers are the defaults, you can make the MPICH commands and MPICH man pages accessible using these commands.

```
$ PATH=$PGI/linux86-64/8.0/mpi/mpich/bin:$PATH
$ export PATH
$ MANPATH=$MANPATH:$PGI/linux86-64/8.0/mpi/mpich/man
$ export MANPATH
```

To make the 32-bit PGI compilers and tools the default…

In csh, use these commands:

```
% setenv PGI /opt/pgi
% setenv MANPATH "$MANPATH":$PGI/linux86/8.0/man
% setenv LM_LICENSE_FILE $PGI/license.dat
% set path = ($PGI/linux86/8.0/bin $path)
```

Once the 32-bit compilers are the defaults, you can make MPICH commands and MPICH man pages accessible using these csh commands.

```
% set path = ($PGI/linux86/8.0/mpi/mpich/bin $path)
% setenv MANPATH \
  "$MANPATH":$PGI/linux86/8.0/mpi/mpich/man
```

In bash, sh or ksh, use these commands:

```
$ PGI=/opt/pgi; export PGI
$ MANPATH=$MANPATH:$PGI/linux86/8.0/man
$ export MANPATH
$ LM_LICENSE_FILE=$PGI/license.dat
$ export LM_LICENSE_FILE
$ PATH=$PGI/linux86/8.0/bin:$PATH
$ export PATH
```

Once the 32-bit compilers are the defaults, you can make MPICH commands and MPICH man pages accessible using these commands.

```
$ PATH=$PGI/linux86/8.0/mpi/mpich/bin:$PATH
$ export PATH
$ MANPATH= $MANPATH:$PGI/linux86/8.0/mpi/mpich/man
$ export MANPATH
```

4.5 Common Linux Installation Issues

If you are having problems with the installation, check out these tips.

4.5.1 Java Runtime Environment (JRE)

Although the PGI installation on Linux includes a 32-bit version of the Java Runtime Environment (JRE), sufficient 32-bit X Windows support must be available on the system for the JRE and the PGI software that depends on it to function properly. On some systems, notably recent releases of Fedora Core, these libraries are not part of the standard installation.

The X Windows support generally includes these libraries:

libXau	libXdmcp	libxcb
libX11	libXext	

5 Installations on Windows, SFU, and SUA

This section describes how to install PGI Workstation on a Windows system. These instructions are valid for Win64, Win32, SFU, SUA32, and SUA64 platforms, though supported platforms vary by product. Further, this installation information is applicable to both permanent and trial installations.

For installations on 64-bit x64 systems running a 64-bit operating system, the PGI installer installs the 64-bit and 32-bit versions of the PGI compilers and tools. For installations on 32-bit x86 systems, the PGI installer installs only the 32-bit versions of the PGI compilers and tools.

5.1 Preparing to Install on Windows, SFU, SUA

PGI Workstation for Windows and SFU/SUA includes the *Microsoft Open Tools*, essential tools and libraries required to compile, link, and execute programs on Windows. No additional Microsoft tools or libraries are needed. The *Microsoft Open Tools* includes a subset of the full Microsoft Platform SDK. *PGI Workstation 8.0* can also compile and link against the Microsoft Platform SDK. For information about how to download the Platform SDK, visit *http://msdn.microsoft.com/platformsdk*.

For SFU and SUA installations, the GNU SDK and GNU utilities must be installed.

- For SUA, you must download the *Utilities and Software Development Kit (SDK) for UNIX-based Applications* from *www.microsoft.com* and install the Base SDK and GNU SDK.
- For SFU, at installation time you must select both the "Interix SDK" and "Interix GNU SDK" components from the Custom Installation.

Note. For more information on Windows interoperability with Unix and Linux Systems, go to www.interopsystems.com.

5.1.1 Installing Required Utilities for SUA

For SUA installations, the GNU SDK and GNU utilities must be installed. You must download the *Utilities and Software Development Kit (SDK) for UNIX-based Applications* from *www.microsoft.com* and install the Base SDK and GNU SDK.

To install the Base SDK and GNU SDK, follow these steps.

1. Verify SUA is installed on your system.
2. Go to *www.microsoft.com/downloads*.
3. Type `SDK for SUA` in the Search box and click Go.
4. Click *Download details: Utilities and Software Development Kit (SDK) for UNIX-based Applications.*
5. Read the description and scroll down to the download area, selecting the file that is most appropriate for your system.
6. Download the appropriate package.
   Tip. Save the file in your desktop or to My Documents so you can recover the disk space once the software is loaded.
7. Navigate to where you stored the downloaded package and double-click the installer to unzip the package to a temporary directory. Then click Next.
8. Accept the license agreement, and click Next.
9. Select Custom Installation, and click Next.
   Note. The standard installation does not provide a complete UNIX development environment. In the Custom Installation allows you to obtain all the GNU compilers, build tools, and other SDK components.
10. Select all available components, and click Next.
11. Read the information in the GNU SDK dialog, which describes the GNU Library General Public License (LGPL), and click Next.
12. In the Security Settings dialog, check these two boxes, and click Next.
    □ Enable setui behavior for SUA programs
    □ Change the default behavior to case sensitive.
13. Click Finish to complete the installation.

5.1.2 Installing Required Utilities for SFU

For SFU installations, the GNU SDK and GNU utilities must be installed. In addition, at installation time you must select the Custom Installation and install both the "Interix SDK" and "Interix GNU SDK" components.

To install SFU:

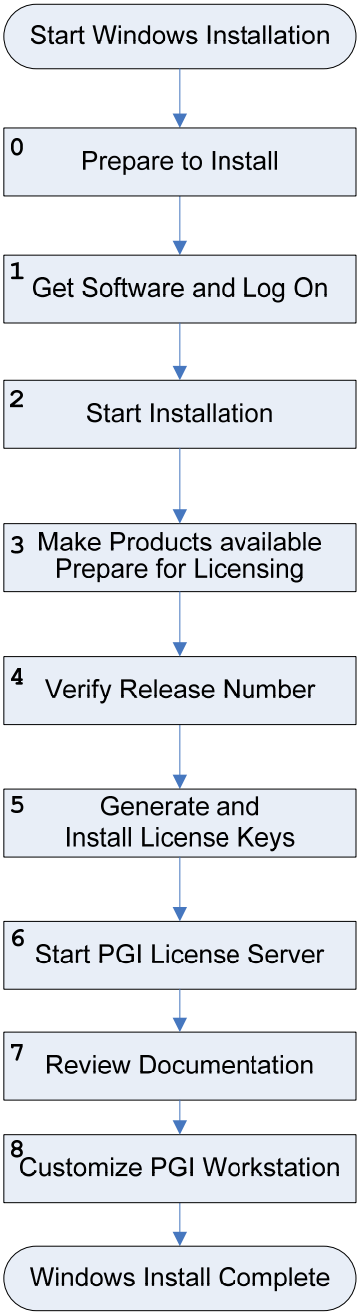
1. Go to *www.microsoft.com/downloads*.
2. Type `Windows Services for UNIX` in the Search box and click Go.
3. Click *Download details: Windows Services for UNIX Version 3.5*.
4. Read the description and scroll down to the download area, clicking Download to start the download.
   Tip. Save the file in your desktop or to My Documents so you can recover the disk space once the software is loaded.
5. In the location where you saved the file, double-click it to unzip it, again, unzipping it into your My Documents area so you can recover the space.
6. Run `My Documents\SFU\SfuSetup.msi`.
7. When you see the Welcome dialog box, click Next.
8. Fill in or use the default for the Customer Information, and click Next.
9. Accept the license agreement and click Next.
10. Select Custom Installation and click Next.
11. Select the software components to install:
    - Utilities → Base Utilities
    - Utilities → UNIX Perl
    - Interix GNU Components → Interix GNU Utilities
    - Interix GNU Components → Interix GNU SDK
    - No NFS
    - No Password Synchronization
    - Remote Connectivity → Windows Remote Shell Service
    - No Authentication tools for NFS
    - Interix SDK
    - ActiveState Perl

12. When you see the Interix GNU SDK dialog, read the information about the GNU Library General Public License (LGPL), and click Next.
13. Accept the ActiveState Perl License and Support agreement.
14. In the User Name Mapping dialog, , check these two boxes, and click Next.
    □ Local User Name Mapping Server
    □ Network Information Service [NIS].
15. Configure the Local User Name Mapping using NIS by providing a Windows domain name, such as PGI.
16. In the Installation location, select the default location, which is SFU directory on your system drive, typically: C:\SFU.
17. Click Next to begin the installation.
18. When the Windows Services for Unix installation is complete, click Finish.

Tip. You may wish to remove the installation folder created when you unpacked the software package so that you can recover that disk space.

Once all the required utilities are installed, in preparation for installing PGI Workstation for Windows, review the following overview of the Windows installation process.

Note. **You must install the software prior to getting the licenses.**


Start Windows Installation
0 Prepare to Install
1 Get Software and Log On
2 Start Installation
3 Make Products available Prepare for Licensing
4 Verify Release Number
5 Generate and Install License Keys
6 Start PGI License Server
7 Review Documentation
8 Customize PGI Workstation
Windows Install Complete
❑ Install 32- or 64- bit?
❑ Check disk space availability
❑ If SUA or SFU, verify GNU SDK and GNU utilities are installed
❑ Know Administrator logon
❑ Locate CD-ROM OR Download from web site
❑ Log on as administrator.
❑ Access the software
❑ Follow directions to automatically invoke installation script
❑ Win32/Win64 users: Have your PGI username and pssword
❑ Execute appropriate commands to make products available and to prepare environment for licensing
❑ Open PGI Workstation from your desktop and verify the release number
❑ On SFU or SUA, open a shell window and use the -V option
❑ Have your PGI username, password, FLEXlm hostid, and computer hostname
❑ Obtain licenses from web site
❑ Place licenses in license.dat file
❑ Open Services dialog and start the PGI License Server
PDF versions are available
❑ Did I bookmark the online location?
Optional Setup Step:
❑ Change screen appearance
❑ Use LM_LICENSE_FILE to override default license location search

5.2 Installation Steps for Windows, SFU, SUA

Once you have prepared for the installation, follow these instructions to install the software:

Step 1. Have the software available and log on as Administrator.

Note. Administrator privileges are required to install *PGI Workstation*.

If you received this software on a CD-ROM, please skip to step 2. If not, download the software from ***http://www.pgroup.com*** or another electronic distribution site.

Step 2. Start the installation.

If you are installing from a CD-ROM, insert the CD-ROM into the CD-ROM drive on the system on which the install is to take place. An installation script is automatically invoked and the installation process begins. Choose the software you wish to install, and follow the directions printed to your screen.

If you have configured your system so that CD-ROM autorun is disabled, run the installation executable from the CD. If you obtained *PGI Workstation* from PGI electronically, execute this file on the target machine. The installation executables are:

`pgiws-801.exe`	*32-bit Windows*
`pgiwsx64-801.exe`	*64-bit/32-bit Windows*
`pgiws-sfu-801.exe`	*32-bit SFU*
`pgiws-sua-801.exe`	*32-bit SUA*
`pgiwsx64-sua-801.exe`	*64-bit/32-bit SUA*

For Win32 or Win64:

The Win32/Win64 installer runs the *PGI Licensing Setup* tool at the conclusion of the install process. This tool automates steps three through six in this process.

To use the *PGI Licensing Setup* tool, your computer must meet these requirements:

- Be connected to the Internet
- Have Microsoft .NET Framework 2.0 (or higher) installed
- Have Internet Explorer Version 6.0 or higher installed and configured.

If your computer does not meet these prerequisites, then you can either make any necessary changes to your system and run the *PGI Licensing Setup* tool later, or follow steps three through six in this process. If you choose to run the *PGI Licensing Setup* tool later, you can find it in the *PGI Workstation* folder under the *Start* menu.

When you run the program, the *PGI Licensing Setup* tool walks you through the license installation process. It prompts you for your PGI web account (Email address) and password, as well as the type of license you wish to install, such as a 2-week trial license or a permanent license. The tool also informs you of any problems it experiences with installation and provides instructions on how to proceed.

Note. If the *PGI Licensing Setup* tool reports a successful license installation, then skip to step 7.

Step 3. Make PGI products accessible and Prepare for Licensing.

When installation executable has completed, execute the following commands to make the PGI products accessible and to initialize your environment for use of FLEXnet.

For *Win32* or *Win64:*

The PGI compilers and tools are accessible and your environment pre-initialized whenever you bring up a PGI command window by double-left-clicking on the PGI Workstation desktop icon. Proceed to Step 4 below.

For *SFU, SUA32* or *SUA64:*

Bring up an SFU, SUA32 or SUA64 shell window. In the commands below, substitute `<platform>` with `sfu32`, `sua32` or `sua64` respectively, depending on the platform on which you are installing:

If you are using `csh`:

```
% setenv PGI /opt/pgi
% set path=(/opt/pgi/<platform>/8.0/bin $path)
% setenv MANPATH "$MANPATH":/opt/pgi/<platform>/8.0/man
% setenv LM_LICENSE_FILE \
   "$LM_LICENSE_FILE":/opt/pgi/license.dat
```

If you are using `bash`, `sh` or `ksh`:

```
$ PATH=/opt/pgi/<platform>/8.0/bin:$PATH
$ export PATH
$ MANPATH=$MANPATH:/opt/pgi/<platform>/8.0/man
$ export MANPATH
$ LM_LICENSE_FILE= \
      $LM_LICENSE_FILE:/opt/pgi/license.dat
$ export LM_LICENSE_FILE
```

You should add these commands to your shell startup files to ensure that you have access to the PGI products upon future shell invocations.

Step 4. Verify Release Number.

Verify the release number of the products you have installed. On *Win32* or *Win64* systems, open *PGI Workstation* from your desktop by double-left-clicking the PGI icon and read the first line displayed in the *BASH* shell window.

To verify the release number of PGI products you have installed on SFU, SUA32 or SUA64, open a shell window with your environment and path initialized as outlined in Step 3, and then issue the following commands:

- For Fortran 77, use: `pgf77 -V x.f`
- For Fortran 95, use: `pgf95 -V x.f`
- For HPF, use: `pghpf -V x.f`
- For C++, use: `pgCC -V x.c`
- For ANSI C, use: `pgcc -V x.c`

Note. These commands can be successfully executed even if the files `x.f` or `x.c` do not exist and you have not completed the licensing phase of the installation. The PGI compiler drivers support this as a quick check that you have installed the proper version of the compilers and have initialized your environment to enable access to that version.

Step 5. Generate and Install license keys.

All of the PGI compilers and tools are license-managed and require installation of license keys to make the PGI software operational. To obtain license keys, you need the following information:

- A PGI web-user *username* and *password*. These are used to log on at *www.pgroup.com/login* and generate your license keys. If you received an order acknowledgment corresponding to a permanent license, an account was created automatically when the order was entered. The username for the account is the e-mail address to which the order acknowledgment was sent, and a separate e-mail was sent to that same address including the password for the account. If you registered for a trial of the PGI software, you created your PGI web-user account at the time you registered and received your password in a subsequent e-mail.
- The FLEXlm hostid and hostname of the computer on which the software is installed, which is echoed to your screen by the installer.

Note. After you have installed the PGI software, you can obtain your FLEXlm hostid by double-left clicking on the *PGI Workstation* desktop icon to open a *PGI Workstation* command window, or opening an SFU, SUA32 or SUA64 shell window, and typing these commands:

```
PGI$  cd $PGI
PGI$  cat license.info
```

You should see information similar to the following:

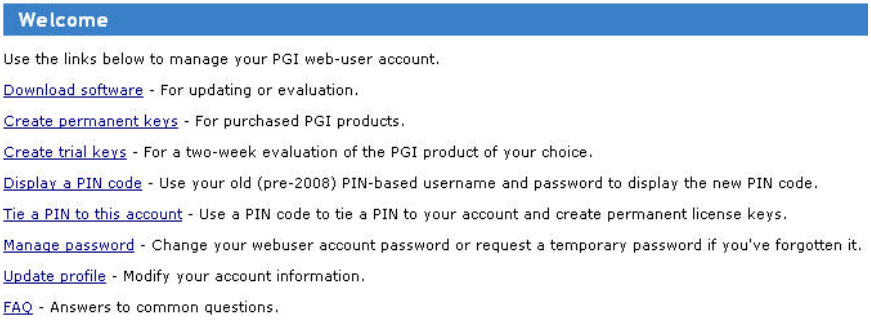
```
For a permanent license, please read the order
acknowledgment that you received.  Connect to
          www.pgroup.com/login
with the registered email and password in your order
acknowledgment.

   FLEXlm Host ID:  001234A98765
   Installation: C:\Program Files\PGI\
   PGI Release: 8.0
```

You can also obtain evaluation license keys for the PGI products by connecting to the URL *www.pgroup.com/login* with a web browser and logging in using an existing PGI web-user account or creating a new account if you have not previously registered with PGI.

Generate License Keys

Once you have logged on to *www.pgroup.com/login* using your registered email and password, you will see a screen similar to the following:



To generate permanent license keys:

1) Click Create permanent keys.
2) Click the PIN associated with the product for which you wish to generate license keys.
3) Click License keys to generate the keys.

To generate trial license keys:

1) Click Create trial keys.
2) Accept the terms of the agreement.
3) Enter the hostid exactly as it appears in the message that is displayed during installation.
4) Click the *Generate license key* button.

Install License Keys

Once you have generated your trial or permanent license, cut and paste them into your `license.dat` file. In a typical configuration, where `C:\` is the system drive and you installed the software using the default location, this file would be found in:

```
C:\Program Files\PGI\license.dat
```

- If you have not received license keys from PGI previously, replace the contents of the `license.dat` file created during installation with the *PGI Workstation* keys you generated above.
- If your `license.dat` file already contains keys you have received from PGI previously, overwrite the keys if they are for a previous release of *PGI Workstation* or *PGI Server*; append the new keys to the keys already in this file if they are for a different PGI product (for example *PGI Visual Fortran*).
- If you are evaluating *PGI Workstation* with trial keys, skip to Step 5. You do not need to start the license server.

Step 6. Start the PGI License Server.

The FLEXnet license system requires that a license server be running. The installation process creates a Windows Service called *PGI License Server*. As soon as a valid `license.dat` file is in place, as described in Step 5, this service can be started.

Important: You do not need to start the license server with trial keys.

The PGI License Server is a Windows Service. Therefore, to start it, do this:

1.) Open the Services dialog from the Start menu:
(Start | Control Panel | Administrative Tools | Services).
2.) Select "PGI License Server".
3.) Select "Start."

Note. The PGI License Server service starts automatically on system reboot, provided that the `license.dat` file contains valid keys.

Step 7. Review Documentation.

You can view the online HTML and PDF documentation using any web browser by opening the file:

`www.pgroup.com/resources/docs.htm`

You may want to bookmark this location for easy future reference to the online manuals.

Step 8. Customize *PGI Workstation* for Win32 or Win64

Optionally, customize the setup, as described in section 5.3, *Customizing the Command Window*, and in section 5.4, *PGI Workstation Directory Structure*.

5.3 Customizing the Command Window

By default, when you double-left-click on the *PGI Workstation* desktop icon, a standard black-background command window appears on your screen. This window is pre-initialized with environment and path settings for use of the *PGI Workstation* compilers and tools. If you prefer different background or text colors, font style, window size, or scrolling capability, you can customize the "shortcut" that creates the *PGI Workstation* command window.

To customize your window, right-click the *PGI Workstation* desktop icon, and select "Properties" from the pop-up menu. In the PGI Workstation Properties dialog box, select the tabs for the features you want to customize, and make the desired modifications.

5.4 PGI Workstation Directory Structure

This section contains information about the directory structure that the installation process builds.

5.4.1 Default Installation Directories

The PGI Workstation default installation directory depends on your platform.

On **Win32**, the default installation directory is

```
%SYSTEMDRIVE%\Program Files\PGI\win32\8.0-1\
```

On **Win64** platforms, the default installation directories are

```
%SYSTEMDRIVE%\Program Files\PGI\win64\8.0-1\
```

```
%SYSTEMDRIVE%\Program Files (x86)\PGI\win32\8.0-1\
```

On **SFU** platforms, the default installation directory is

```
/opt/pgi/sfu32/8.0-1/
```

On **SUA64** platforms, the default installation directory is

```
/opt/pgi/sua64/8.0-1/
```

On **SUA32** platforms, the default installation directory is

```
/opt/pgi/sua32/8.0-1/
```

In addition to the product directories, the Microsoft Open Tools and, optionally, cygwin, are installed here for Win32 and Win64 installations.

```
%SYSTEMDRIVE%\Program Files\PGI\Microsoft Open Tools 9
%SYSTEMDRIVE%\cygwin
```

For SFU, SUA32, and SUA64 installations, the Microsoft Open Tools are installed here:

```
/opt/pgi/Microsoft Open Tools 9
```

Note. The *cygwin* directory is not installed with *PGI Workstation* for *SFU* and *SUA*. Instead, any *SUA* or *SFU* shell can be used.

5.4.2 PGI Workstation Directories on a Win64 System

The following directory structure is created during installation on a Win64 system, where C is your system drive:

Name of directory	Contents
`C:\Program Files\PGI\win64\8.0\bin` `C:\Program Files (x86)\PGI\win32\8.0\bin`	*PGI Workstation 8.0* compilers and tools binaries
`C:\Program Files\PGI\win64\8.0\lib` `C:\Program Files (x86)\PGI\win32\8.0\lib`	*PGI Workstation 8.0* runtime and support libraries
`C:\Program Files\PGI\win64\8.0\include` `C:\Program Files (x86)\PGI\win32\8.0\include`	*PGI Workstation 8.0* header files
`C:\Program Files\PGI\win64\8.0\REDIST` `C:\Program Files (x86)\PGI\win32\8.0\REDIST`	Re-distributable runtime libraries
`C:\Program Files\PGI\win64\8.0\doc` `C:\Program Files (x86)\PGI\win32\8.0\doc`	Documentation
`C:\Program Files\PGI\win64\8.0\man` `C:\Program Files (x86)\PGI\win32\8.0\man`	Man pages for commands
`C:\Program Files\PGI\Microsoft Open Tools 9`	Microsoft tools
`C:\cygwin`	Cygwin tools

5.4.3 PGI Workstation Directories on a Win32 System

The following directory structure is created during installation on a Win32 system, where C is your system drive:

Name of directory	Contents
`C:\Program Files\PGI\win32\8.0\bin`	*PGI Workstation 8.0* compilers and tools binaries
`C:\Program Files\PGI\win32\8.0\lib`	*PGI Workstation 8.0* runtime and support libraries
`C:\Program Files\PGI\win32\8.0\include`	*PGI Workstation 8.0* header files
`C:\Program Files\PGI\win32\8.0\REDIST`	Re-distributable runtime libraries
`C:\Program Files\PGI\win32\8.0\doc`	Documentation
`C:\Program Files\PGI\win32\8.0\man`	Command Man pages
`C:\Program Files\PGI\Microsoft Open Tools 9`	Microsoft tools
`C:\cygwin`	Cygwin tools

5.4.4 PGI Workstation Directories on an SFU System

The following directory structure is created during installation on an SFU system:

Name of directory	Contents
`/opt/pgi/sfu32/8.0/bin`	*sfu32* 32-bit compilers & tools
`/opt/pgi/sfu32/8.0/lib`	*sfu32* 32-bit runtime libraries
`/opt/pgi/sfu32/8.0/include`	*sfu32* 32-bit header files
`/opt/pgi/sfu32/8.0/doc`	Documentation
`/opt/pgi/sfu32/8.0/man`	UNIX-style man pages
`/opt/pgi/sfu32/8.0/src`	Fortran 90 source files for included modules.

5.4.5 PGI Workstation Directories on an SUA32 System

The following directory structure is created during installation on an SUA 32-bit system:

Name of directory	Contents
/opt/pgi/sua32/8.0/bin	*sua32* 32-bit compilers & tools
/opt/pgi/sua32/8.0/lib	*sua32* 32-bit runtime libraries
/opt/pgi/sua32/8.0/include	*sua32* 32-bit header files
/opt/pgi/sua32/8.0/doc	Documentation
/opt/pgi/sua32/8.0/man	UNIX-style man pages
/opt/pgi/sua32/8.0/src	Fortran 90 source files for included modules.

5.4.6 PGI Workstation Directories on an SUA64 System

The following directory structure is created during installation on an SUA 64-bit system:

Name of directory	Contents
/opt/pgi/sua32/8.0/bin	*sua32* 32-bit compilers & tools
/opt/pgi/sua32/8.0/lib	*sua32* 32-bit runtime libraries
/opt/pgi/sua32/8.0/include	*sua32* 32-bit header files
/opt/pgi/sua64/8.0/bin	*Sua64* compilers & tools
/opt/pgi/sua64/8.0/lib	*Sua64 –mcmodel=small* libs
/opt/pgi/sua64/8.0/include	*Sua64* header files
/opt/pgi/sua32/8.0/doc /opt/pgi/sua64/8.0/doc	Documentation
/opt/pgi/sua32/8.0/man /opt/pgi/sua64/8.0/man	UNIX-style man pages
/opt/pgi/sua32/8.0/src /opt/pgi/sua64/8.0/src	Fortran 90 source files for included modules.

5.4.7 End-user Environment Settings for SFU and SUA

Now that you have installed the compilers in, for example, `/opt/pgi`, an end-user of the PGI compilers and tools must initialize their shell environment to use the compilers successfully. Assume the license file is in place and the *PGI License Service* is running.

Note. **Each user** must issue the following sequence of commands to initialize the shell environment before using the PGI compilers and tools.

In the commands below, substitute `<platform>` with `sfu32`, `sua32` or `sua64` respectively, depending on the platform on which you are using:

In csh, use these commands:

```
% setenv PGI /opt/pgi
% setenv MANPATH "$MANPATH":$PGI/<platform>/8.0/man
% set path=($PGI/<platform>/8.0/bin $path)
```

In bash, sh or ksh, use these commands:

```
$ PGI=/opt/pgi; export PGI
$ MANPATH=$MANPATH:$PGI/<platform>/8.0/man
$ export MANPATH
$ PATH=$PGI/<platform>/8.0/bin:$PATH
$ export PATH
```

5.5 LM_LICENSE_FILE and FLEXLM_BATCH

This section describes two environment variables that you can use with FLEXnet:

- LM_LICENSE_FILE
- FLEXLM_BATCH

5.5.1 LM_LICENSE_FILE

The system environment variable LM_LICENSE_FILE is not required by *PGI Workstation* on Windows but you can use it to override the default location that is searched for the `license.dat` file.

To use the system environment variable LM_LICENSE_FILE, set it to the full path of the license key file. To do this, follow these steps:

1. Open the System Properties dialog (Start | Control Panel | System).
2. Select the 'Advanced' tab.
3. Click the 'Environment Variables' button.
   - If `LM_LICENSE_FILE` is not already an environment variable, create a new system variable for it. Set its value to the full path, including the name of the file, for the license key file.
   - If `LM_LICENSE_FILE` already exists as an environment variable, append the path to the license file to the variable's current value using a semi-colon to separate entries.

5.5.2 FLEXLM_BATCH

By default, on Windows, the license server creates interactive pop-up messages to issue warning and errors. This behavior is controlled by the environment variable `FLEXLM_BATCH`. Although it is not recommended, you can prevent interactive pop-ups from appearing. To do this, set the environment variable `FLEXLM_BATCH` to 1.

5.6 Windows Firewall and PGI Debugging

Microsoft Windows Firewall runs by default on some types of systems, such as Windows XP and Windows Vista. If this firewall is running on your system, it may try to block the PGI debug engine when you debug a program. If this happens, Windows Firewall displays a dialog that allows you to Unblock the application named `pgdebug`. If you choose the Unblock option, Windows Firewall adds `pgdebug` to its list of Exceptions and you do not see the pop-up dialog again unless you reinstall.

On rare occasions, this pop-up may prevent your very first debug session from starting correctly. If this occurs, use the Task Manager to end the debug session.

To prevent any Firewall issues, you can manually add `pgdebug` to the Windows Firewall list of Exceptions. To do this, follow these instructions:

1. From the Control Panel, open your system's Security Center.
   If your system does not have a Security Center, then you do not have Windows Firewall.
2. In the Windows Security Center, examine the Windows Firewall settings.
   If the Firewall is OFF, no further action is required.
   If you do not see the setting, proceed to the next step.
3. In the *Manage Security Settings for:* section, click **Windows Firewall**.
4. Select the Exceptions tab in the Windows Firewall dialog box.

The next steps depend on your OS.

If your OS is 32-bit, continue with these instructions.
Note: These instructions assume the system drive is C.

5. Add `pgdebug` to the Exceptions list.
   a. Click Add Program…
   b. Use the Browse button to navigate to C:\Program Files\PGI\win32\8.0-1\bin\pgdebug.exe.
   c. Select pgdebug.exe.
   d. Click Open
   e. Click OK.

If your OS is 64-bit, continue with these instructions.
Note: These instructions assume the system drive is C.

5. Add the `32-bit pgdebug` to this list.
   a. Click Add Program…
   b. Use the Browse button to navigate to C:\Program Files (x86)\PGI\win32\8.0-1\bin.
   c. Select pgdebug.exe.
   d. Click Open.
   e. Click OK.
6. Add the 64-bit pgdebug to this list.
   a. Click Add Program…
   b. Use the Browse button to navigate to C:\Program Files\PGI\win64\8.0-1\bin.
   c. Select `pgdebug.exe`.
   d. Click Open
   e. Click OK.

The Firewall no longer blocks PGI debugging.

5.7 Common Windows Installation Problems

The most common installation problems on Windows are related to licensing.

To troubleshoot your installation, first check that the `license.dat` file you are using contains valid license keys. Second, check that the PGI License Server, a Windows Service, has been started.

Typical FLEXnet errors encountered may include the following:

- When using a PGI compiler or tool, a FLEXible License Manager dialog appears that states 'LICENSE MANAGER PROBLEM: No such feature exists.'
  This message may appear because the license.dat file accessed by the FLEXnet License Manager does not contain valid license keys.
- When using a PGI compiler or tool, a FLEXible License Manager dialog appears that states 'LICENSE MANAGER PROBLEM: Cannot connect to license server system.'
  This message may appear because the PGI License Server has not been started.
- When starting the PGI License Server, a system message appears that states 'The PGI License Server service on Local Computer started and then stopped. Some services stop automatically if they have no work to do, for example, the Performance Logs and Alerts service.'
  This message may appear because the license.dat file accessed by the FLEXnet License Manager does not contain valid license keys.
- A message stating 'LICENSE MANAGER PROBLEM: Failed to checkout license' appears.
  This message may appear because the PGI License Server has not been started.
- By default, on Windows, the license server creates interactive pop-up messages to issue warning and errors. You can use the environment variable FLEXLM_BATCH to prevent interactive pop-up windows. To do this, set the environment variable FLEXLM_BATCH to 1.
- On SFU, if the compilers get segmentation faults or produce core dumps, the problem might be related to Windows Data Execution Prevention. The solution to these errors is to modify the system boot.ini file to set /noexecute=AlwaysOff; and then reboot. For more information, refer to this online resource for SFU: *www.interopsystems.com*.

For assistance with difficulties related to the installation, send e-mail to *trs@pgroup.com*.

6 Installations on Apple Mac OS X

This section describes how to install *PGI Workstation* on an Apple system. It covers local installs, and is applicable to permanent or trial installations.

Note: *PGI Workstation* and *PGI Server* for Mac OS are only supported on Intel Core and Core 2 Duo processors running Mac OS X version 10.4.11 or greater. Previous versions of Mac OS may be unstable for 64-bit programs. Using this release requires that Apple Xcode 2.5 or greater be installed. Xcode is available from *http://developer.apple.com*.

- For installations on 32-bit *x86* systems, the PGI installation process installs only the *osx86* versions of the PGI compilers and tools.
- For installations on 64-bit *x64* systems running an *osx86-64* execution and development environment, the PGI installation process installs the *osx86-64* version of the PGI compilers and tools.
- If the 32-bit *gcc* development package is already installed on the system, the 32-bit *osx86* tools are installed on a 64-bit *x64* system.

The 32-bit and 64-bit compilers, tools, and supporting components have the same command names, and the environment you target by default, either *osx86-64* or *osx86*, depends on the version of the compiler that comes first in your path settings.

The default installation base directory is `/opt/pgi`.

6.1 Preparing to Install on Apple Mac OS X

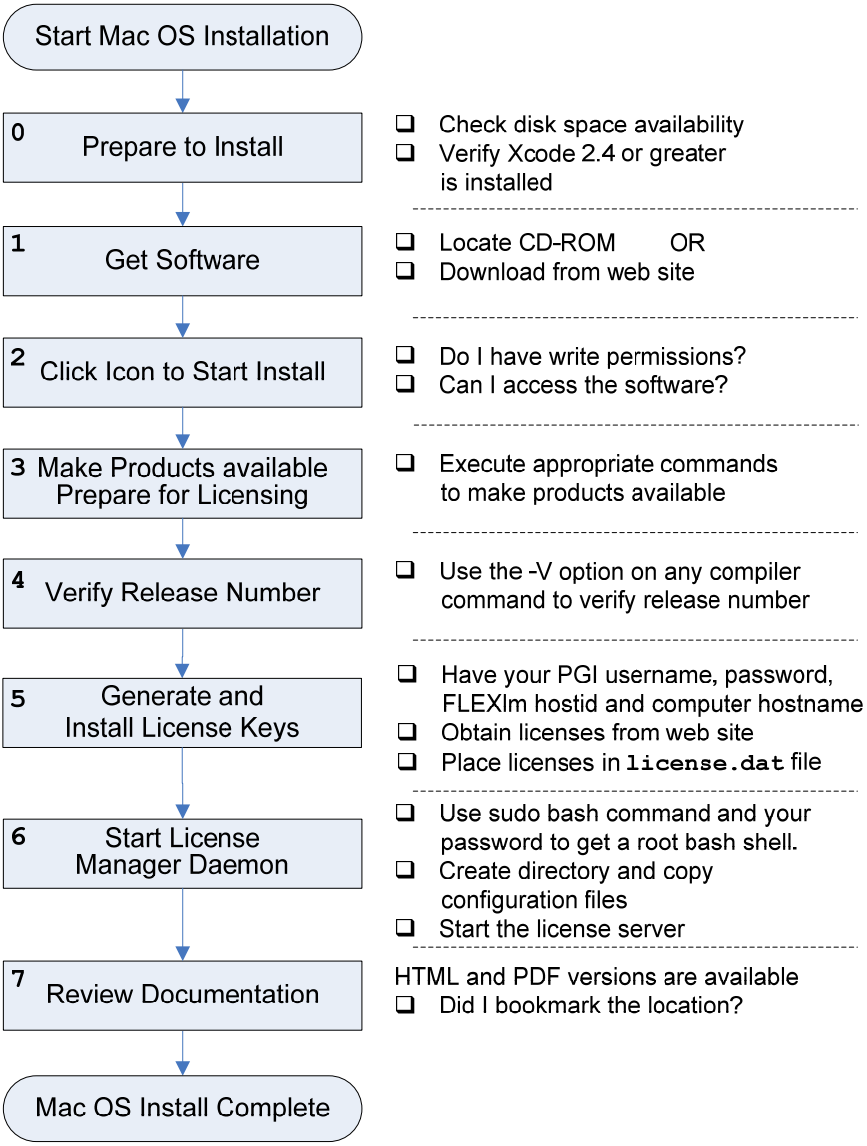
To prepare for the installation:

- Verify you have enough free disk space.
  - On the osx86 platform, PGI installation requires 250 MB of free disk space.
  - On the osx86-64 platform, PGI installation requires 500 MB of free disk space.
- Verify that Xcode 2.5 or greater is installed.
  - If you know how to run Xcode, start Xcode and click About Xcode to verify the version is 2.5 or greater.
  - If you do not know how to run Xcode or are uncertain if it is installed on your system, do the following:

    1.) From the Apple Menu, select About This Mac.
    2.) Click More Info.
    3.) Select System profiler | Software | Applications.
    4.) Scroll through the alphabetical list and verify Xcode is in it.
    5.) Verify the version is 2.5 or greater.

Note. *PGI Workstation* for Mac OS requires the Xcode application, which provides several components of the tool chain, including the system assembler, linker, and run-time libraries. However, *PGI Workstation* runs in a Terminal, not in the Xcode IDE, and the *PGDBG* debugger and *PGPROF* profiler open Java windows.

In preparation for installing PGI Workstation on Mac OS, first review the following overview of the Mac OS installation process.


Start Mac OS Installation
0 Prepare to Install
❑ Check disk space availability
❑ Verify Xcode 2.4 or greater is installed
1 Get Software
❑ Locate CD-ROM OR
❑ Download from web site
2 Click Icon to Start Install
❑ Do I have write permissions?
❑ Can I access the software?
3 Make Products available Prepare for Licensing
❑ Execute appropriate commands to make products available
4 Verify Release Number
❑ Use the -V option on any compiler command to verify release number
5 Generate and Install License Keys
❑ Have your PGI username, password, FLEXlm hostid and computer hostname
❑ Obtain licenses from web site
❑ Place licenses in license.dat file
6 Start License Manager Daemon
❑ Use sudo bash command and your password to get a root bash shell.
❑ Create directory and copy configuration files
❑ Start the license server
7 Review Documentation
HTML and PDF versions are available
❑ Did I bookmark the location?
Mac OS Install Complete

6.2 Installation Steps for Mac OS

Once you have prepared for the installation, follow these instructions to install the software:

Step 1. Access the installation package.

If you received this software on a CD-ROM, place the CD-ROM in the CD drive and wait for the disk to mount of your system.

If you do not have a CD-ROM, download the software from *http://www.pgroup.com* or another electronic distribution site. The file you download appears on your system as `pgiosx-801.dmg`. Open this file to mount it.

Step 2. Install the software.

Click `PGI Workstation 8.0-1.pkg`, which is part of the mounted disk. Follow the installation instructions.

When you see the initial system check dialog, click continue to allow the install script to check that your system has the required components for installing the software, such as Xcode 2.5 or greater and `gcc`.

While you must select the hard drive on your system for the installation, the install program does not allow you to select an installation directory other than the default one: `/opt/pgi`.

After the software is installed, the install script performs some system-specific customization and then initializes for licensing.

Step 3. Make PGI products accessible and Prepare for Licensing.

When the license file is in place, execute the following commands to make the products you purchased accessible, and to initialize your environment for use of FLEXnet. These commands assume that you use the default installation directory: `/opt/pgi`

In bash, zsh or ksh, use these commands, substituting `osx86` for `osx86-64` if you are installing on a 32-bit MacOS system:

```
$ PGI=/opt/pgi
$ export PGI
$ PATH=/opt/pgi/osx86-64/8.0/bin:$PATH
$ export PATH
```

```
$ MANPATH=$MANPATH:/opt/pgi/osx86-64/8.0/man
$ export MANPATH
$ LM_LICENSE_FILE=$LM_LICENSE_FILE:/opt/pgi/license.dat
$ export LM_LICENSE_FILE
```

In csh, use these commands, substituting `osx86` for `osx86-64` if you are installing on a 32-bit MacOS system::

```
% setenv PGI /opt/pgi
% set path=(/opt/pgi/osx86-64/8.0/bin $path)
% setenv MANPATH "$MANPATH":/opt/pgi/osx86-64/8.0/man
% setenv LM_LICENSE_FILE \
              "$LM_LICENSE_FILE":/opt/pgi/license.dat
```

You should add these commands to your startup files to ensure that you have access to the PGI products upon future logins.

Step 4. Verify Release Number.

To verify the release number of the products you have installed, use the *–V* option on any of the compiler commands, as illustrated in the following examples. If you use *–v* instead, you also see the sequence of steps the compiler uses to compile and link programs for execution on your system.

- For Fortran 77, use: `pgf77 -V x.f`
- For Fortran 95, use: `pgf95 -V x.f`
- For C++, use: `pgCC –V x.c`
- For ANSI C, use: `pgcc -V x.c`

Note. To successfully execute these commands, the files `x.f` or `x.c` need not exist.

Step 5. Generate and Install License Keys.

All of the PGI compilers and tools are license-managed and require installation of license keys to make the PGI software operational. To obtain license keys, you need the following information:

- A PGI web-user *username* and *password*. These are used to log on at *www.pgroup.com/login* and generate your license keys. If you received an order acknowledgment corresponding to a permanent license, an account was created automatically when the order was entered. The username for the account is the e-mail address to which the order acknowledgment was sent, and a separate e-mail was sent to that same address including the password for the account. If you registered for a trial of the PGI software, you created your PGI web-user account at the time you registered and received your password in a subsequent e-mail.
- The FLEXlm hostid and hostname of the computer on which the software is installed, which is echoed to your screen by the installer.

Note. You can also obtain your FLEXnet hostid by using the following command after you have installed the products and initialized the environment variables:

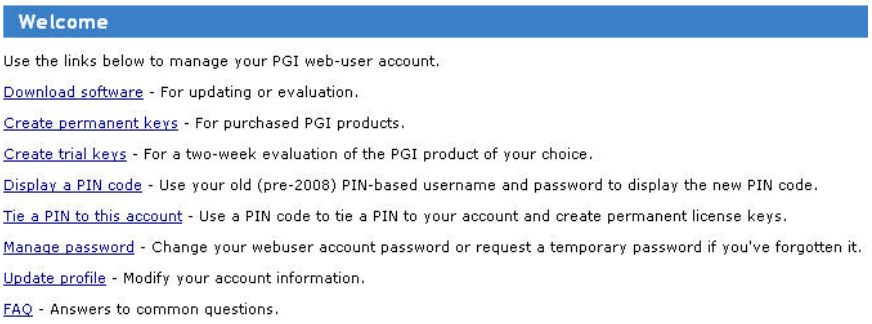
```
% lmutil lmhostid
```

You see a message similar to the following one, in which `12345678abcd` is unique to your machine:

```
The FLEXnet host ID of this machine is "12345678abcd".
```

Generate License Keys

Once you have logged on using your registered email and password, you see a screen similar to the following:



To generate permanent license keys:

1) Click Create permanent keys.
2) Click the PIN associated with the product for which you wish to generate license keys.
3) Click License keys to generate the keys.

To generate trial license keys:

1) Click Create trial keys.
2) Accept the terms of the agreement.
3) Enter the hostid exactly as it appears in the message that is displayed during installation.
4) Click the *Generate license key* button.

Install License Keys

Once you have generated your license keys, copy and paste them into the file `/opt/pgi/license.dat`. If you did not install in the default `/opt/pgi` directory, substitute the appropriate installation directory path.

For example, if you have purchased *PGI Workstation* for MacOS, the `license.dat` file should look similar to the following:

```
SERVER <hostname> <hostid> 27000
DAEMON pgroupd
PACKAGE pgi72-workstation-complete \
  pgroupd 8.0 2A64FB18DEBE COMPONENTS= \
 "pgi-f95-osx64:8.0 pgi-f77-osx64:8.0 \
  pgi-hpf-osx64:8.0 pgi-cc-osx64:8.0 \
  pgi-cpp-osx64:8.0 \
  pgi-f95-osx32:8.0 pgi-f77-osx32:8.0 \
  pgi-hpf-osx32:8.0 pgi-cc-osx32:8.0 \
  pgi-cpp-osx32:8.0 \
  pgi-prof:8.0 pgi-dbg:8.0 pgi-dbg-gui:8.0" \
  OPTIONS=SUITE_RESERVED SIGN= \
 "0D91 C4A7 3569 5A7C 65EE 91EC A9AA 706C \
  5EB8 C207 2DE8 9086 3926 4F84 BAF4 1C9D \
  EC65 00BF 51A2 9A8D DF53 C460 7C10 663F \
  9C41 92B9 F9B2 6150 D6C1 A942"
```

```
FEATURE pgi-workstation-complete pgroupd 8.0 \
  31-dec-0 5 8B15A3507BE4 \
  VENDOR_STRING=107209:8:ws DUP_GROUP=U \
  SUITE_DUP_GROUP=U BORROW=336 TS_OK SIGN= \
 "0501 9540 017D 9D8C CE97 E26B F967 A848 \
  864E 6ECD 2705 E535 3E6B B6B6 7ED3 0F83 \
  8FDC 48FE 3AD5 E6D0 5B2E 26E5 D18C 2E6B \
  BC30 1838 1526 C3BF F081 D19F"
```

In your license file:

- `<hostid>` should match the *hostid* you submitted above when you generated your license keys.
- You *can* edit the `<hostname>` entry, but you *cannot* edit the `<hostid>` entry or you will invalidate the license keys
- The six digits immediately following the = in the feature line component, `VENDOR_STRING=107209:8` represent the Product ID Number (PIN) for this installation, in this example `107209`. You have a similar unique PIN number for your installation.

Note. Please include your PIN number when sending mail to us regarding technical support for the products you have purchased. This PIN number is also on your order confirmation email.

Step 6. Start the license manager daemon.

Important: If you are evaluating *PGI Workstation* with trial keys, you do not need to perform this step. Proceed to Step 7.

Follow these steps to start the license server and *pgroupd* license daemon running on your system:

i.) Use the "sudo" command to get a root bash shell; enter your password:

```
% sudo bash
 <password>
```

ii.) Create the directory `/Library/StartupItems/PGI`:

```
% mkdir /Library/StartupItems/PGI
```

iii.) Copy the PGI license configuration files:

```
% cp /opt/pgi/PGI /Library/StartupItems/PGI/PGI
% cp /opt/pgi/StartupParameters.plist \
      /Library/StartupItems/PGI/StartupParameters.plist
```

iv.) Start the license server:

```
% cd /Library/StartupItems/PGI
% ./PGI start
```

The license server should now be running. It should restart automatically whenever you reboot.

Installation of your FLEXnet-style licensing of our products is now complete. For assistance with difficulties related to the installation, send e-mail to *trs@pgroup.com*.

Step 7. Review documentation.

You can view the online HTML and PDF documentation using any web browser by opening the file:

```
file:/opt/pgi/osx86/8.0/doc/index.htm
```

or

```
file:/opt/pgi/osx86-64/8.0/doc/index.htm
```

You may want to bookmark this location for easy future reference to the online manuals.

6.3 Typical Directory Structure for Mac OS X

If you specify `/opt/pgi` as the base directory for installation, the following directory structure is created during the PGI installation process:

Name of directory	Contents
`/opt/pgi/osx86/8.0/bin`	*osx86* 32-bit compilers & tools
`/opt/pgi/osx86/8.0/lib`	*osx86* 32-bit runtime libraries
`/opt/pgi/osx86/8.0/include`	*osx86* 32-bit header files
`/opt/pgi/osx86/8.0/doc`	Documentation
`/opt/pgi/osx86/8.0/man`	UNIX-style man pages
`/opt/pgi/osx86/8.0/src`	Fortran 90 source files for included modules.
`/opt/pgi/osx86-64/8.0/bin`	*osx86-64* compilers & tools
`/opt/pgi/osx86-64/8.0/lib`	*osx86-64 –mcmodel=small* libs
`/opt/pgi/osx86-64/8.0/include`	*osx86-64* header files

Name of directory	Contents
/opt/pgi/osx86-64/8.0/doc	Documentation
/opt/pgi/osx86-64/8.0/man	UNIX-style man pages
/opt/pgi/osx86-64/8.0/src	Fortran 90 source files for included modules.

6.4 End-user Environment Settings on Mac OS X

Now that you have installed the compilers in, for example, /opt/pgi, you must initialize your environment to use the compilers successfully. Each user must issue the following sequence of commands to initialize the shell environment before using the PGI compilers and tools.

Issue these commands that assume this:

- The license file is in /opt/pgi/license.dat.
- The lmgrd license manager is running.

The following commands make the 32-bit compilers the default.

In bash, zsh, or ksh, use these commands:

```
$ PGI=/opt/pgi; export PGI
$ MANPATH=$MANPATH:$PGI/osx86/8.0/man
$ export MANPATH
$ LM_LICENSE_FILE=$PGI/license.dat
$ export LM_LICENSE_FILE
$ PATH=$PGI/osx86/8.0/bin:$PATH
$ export PATH
```

In csh, use these commands:

```
% setenv PGI /opt/pgi
% setenv MANPATH "$MANPATH":$PGI/osx86/8.0/man
% setenv LM_LICENSE_FILE $PGI/license.dat
% set path = ($PGI/osx86/8.0/bin $path)
```

To make the 64-bit compilers the default, use these commands:

In bash, zsh, or ksh, use these commands:

```
$ PGI=/opt/pgi; export PGI
$ MANPATH=$MANPATH:$PGI/osx86-64/8.0/man
$ export MANPATH
$ LM_LICENSE_FILE=$PGI/license.dat
$ export LM_LICENSE_FILE
$ PATH=$PGI/osx86-64/8.0/bin:$PATH
$ export PATH
```

In csh, use these commands:

```
% setenv PGI /opt/pgi
% setenv MANPATH "$MANPATH":$PGI/osx86-64/8.0/man
% setenv LM_LICENSE_FILE $PGI/license.dat
% set path = ($PGI/osx86-64/8.0/bin $path)
```

7 Contact Information and Documentation

You can contact The Portland Group at:

The Portland Group
STMicroelectronics, Inc.
Two Centerpointe Drive
Lake Oswego, OR 97035 USA

The PGI User Forum is monitored by members of the PGI engineering and support teams as well as other PGI customers. The forum newsgroups may contain answers to commonly asked questions. Log in to the PGI website to access the forum:

`www.pgroup.com/userforum/index.php`

Or contact us electronically using any of the following means:

Fax: *+1-503-682-2637*
Sales: *sales@pgroup.com*
Support: *trs@pgroup.com*
WWW: *www.pgroup.com*

All technical support is by e-mail or submissions using an online form at *www.pgroup.com/support*. Phone support is not currently available.

Many questions and problems can be resolved at our frequently asked questions (FAQ) site at `www.pgroup.com/support/faq.htm`.

PGI documentation is available at `www.pgroup.com/resources/docs.htm` or in your local copy of the documentation in the release directory *doc/index.htm*.