

PVF Installation Guide

Version 14.4



PGI Compilers and Tools

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Chapter 1.

INTRODUCTION

Welcome to PGI Visual Fortran[®], a set of Fortran compilers and development tools for 32-bit and 64-bit Windows integrated with Microsoft Visual Studio.

PGI Visual Fortran (PVF[®]) is licensed using FLEXnet, the flexible license management system from Flexera Software*. Instructions for obtaining a permanent license are included in your order confirmation. More information is available in [Licensing](#).

1.1. Product Overview

PVF is integrated with several versions of Microsoft Visual Studio. Currently, Visual Studio 2008, 2010, 2012 and 2013 are supported. Throughout this document, "PGI Visual Fortran" refers to PVF integrated with any of the supported versions of Visual Studio. Similarly, "Microsoft Visual Studio" refers to Visual Studio 2008, VS 2010, VS 2012, and VS 2013. When it is necessary to distinguish among the products, the document does so.

Single-user node-locked and multi-user network floating license options are available for both products. When a node-locked license is used, one user at a time can use PVF on the single system where it is installed. When a network floating license is used, a system is selected as the server and it controls the licensing, and users from any of the client machines connected to the license server can use PVF. Thus multiple users can simultaneously use PVF, up to the maximum number of users allowed by the license.

PVF provides a complete Fortran development environment fully integrated with Microsoft Visual Studio. It includes a custom Fortran Build Engine that automatically derives build dependencies, Fortran extensions to the Visual Studio editor, a custom PGI Debug Engine integrated with the Visual Studio debugger, PGI Fortran compilers, and PVF-specific property pages to control the configuration of all of these.

Release 2014 of PGI Visual Fortran includes the following components:

- ▶ PGFORTRAN OpenMP and auto-parallelizing Fortran 90/95/2003 compiler.
- ▶ PGF77 OpenMP and auto-parallelizing FORTRAN 77 compiler.
- ▶ PVF Visual Studio integration components.
- ▶ AMD Core Math Library (ACML), version 5.24.0 for Windows x64 and version 4.4.0 for 32-bit Windows.

- ▶ PVF documentation.

If you do not already have Microsoft Visual Studio on your system, be sure to get the PVF installation package that contains the Visual Studio 2013 Shell.

1.2. Microsoft Build Tools

PVF on all Windows systems includes the Microsoft Open Tools. On some systems (Windows XP, Windows Server 2003, Windows Server 2008), these files are all the additional tools and libraries required to compile, link, and execute programs on Windows. On other systems (Windows 2008 R2, Windows 7, Windows 8, Windows 8.1, Windows Server 2012), these files are required in addition to the files Microsoft provides in the Windows 8.1 SDK.

1.3. Terms and Definitions

This document contains a number of terms and definitions with which you may or may not be familiar. If you encounter an unfamiliar term in these notes, please refer to the online glossary at <http://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™, AMD Barcelona, AMD Shanghai, AMD Istanbul, AMD Bulldozer, and AMD Piledriver 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, Intel Core 2, Intel Core 2 Duo (Penryn), Intel Core (i3, i5, i7), both first generation (Nehalem) and second generation (Sandy Bridge) processors, as well as Ivy Bridge and Haswell processors.

1.4. Supported Processors

PGI Visual Fortran is supported on 32-bit and 64-bit Windows operating systems running on x86 and x64 compatible processors. The [Supported Processors](#) table lists the processors on which Release 2014 of PGI Visual Fortran is supported. The table also includes the CPUs available and supported in dual-core versions.

PVF uses the Fortran | Target Processors property to generate executables that utilize features and optimizations specific to a given CPU and operating system environment. You can accomplish the same results from the command line using the option `-tp <target>`.

1.4.1. Supported Processors

Table 1 Processors Supported by PGI 2014

Brand	CPU	Target Processor (-tp <target> [,target...])
AMD		
	Opteron Piledriver	piledriver
	Opteron Bulldozer	bulldozer
	Opteron Six-core Istanbul	istanbul
	Opteron Quad-core Shanghai	shanghai
	Opteron Quad-core Barcelona	barcelona
	Opteron Quad-core	k8
	Opteron Rev E, Turion	k8-64e
Intel		
	Sandy Bridge	sandybridge
	Core i7 - Nehalem	nehalem
	Penryn	penryn
	Pentium 4	p7
Generic		
	Generic	px

The `-tp` flag interacts with the `-m32` and `-m64` flags to select a target processor and 32-bit or 64-bit code. For example, specifying `-tp shanghai -m32` compiles 32-bit code that is optimized for the AMD shanghai processor.

1.5. Supported Operating Systems

PVF 2014 is supported on any operating system on which Visual Studio is supported. Visual Studio 2013, Visual Studio 2012, and Visual Studio 2010 have stricter installation requirements than Visual Studio 2008. To install VS 2013 or VS 2012, certain operating systems are required. To install VS 2010, some operating systems must have specific service packs installed. The following table lists the operating systems supported by PVF and the minimum additional requirements for VS 2013, VS 2012, and VS 2010.



The list at www.pgroup.com/support/install.htm includes any new Windows distributions that may be explicitly supported by the PGI compilers. If your operating system is newer than any of those listed in the following table, the installation may still be successful.



PGI support for Windows versions XP, Windows Server 2003, and Windows Server 2008 is being deprecated in 2014.

Table 2 Operating Systems and Features Supported in PVF Release 2014

Microsoft OS	VS 2008	VS 2010	VS 2012	VS 2013
Windows 8.1	Any	Any	Any	Any
Windows 8	Any	Any	Any	Any
Windows Server 2012	Any	Any	Any	Any
Windows 7	Any	Any	Any	Any
Windows Server 2008 R2	Any	Any	Any	Any
Windows Server 2008	Any	SP1	None	None
Windows Vista	Any	SP1	None	None
Windows Server 2003	Any	SP2	None	None
Windows Server 2003 R2	Any	SP2	None	None
Windows XP	Any	SP3	None	None
Windows XP Professional x64	Any	SP2	None	None

1.6. Product Support

All new PGI licenses include free PGI Subscription Service during the money-back guarantee period.

The PGI Subscription Service provides support and other benefits including:

- ▶ 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 available at www.pgroup.com/support/support_request.php

Phone support is not currently available.

- ▶ Release upgrades for licensed Product(s) at no additional cost, except for any administrative fee that may apply.
- ▶ Notification by email when maintenance releases occur and are available for electronic download and installation.
- ▶ 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.

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



Important To continue receiving these benefits after the money-back guarantee period days, you can purchase an extension to your PGI Service Subscription. Extensions are available in yearly increments.

Contact sales@pgroup.com if you would like information regarding the subscription service for the PGI products you have purchased.

Chapter 2.

INSTALLATION OVERVIEW

There are a number of steps required to successfully install PGI Visual Fortran. This document provides the details related to these steps.

- ▶ [Licensing](#), including successfully generating either a trial or a permanent license.
- ▶ [Installing PGI Visual Fortran](#) using single-user, node-locked licensing.
- ▶ [Multi-User Installation and Licensing](#) using multi-user, network floating licensing.
- ▶ [Using Licensing Environment Variables](#), which includes how to use the optional FLEX environment variables.
- ▶ Familiarity with the PGI Visual Fortran [default directory structure](#) of the installed product.
- ▶ Awareness of [common installation issues](#).
- ▶ [Co-installing](#) PGI Visual Fortran and PGI Workstation.
- ▶ [Uninstalling](#) PGI Visual Fortran.

2.1. Before You Begin

Before you begin the installation, it is essential that you understand the flow of the installation process, illustrated in the following diagram.



Figure 1 PVF Installation Overview

For more complete information on these steps and the specific actions to take for your operating system, refer to the remainder of this document.

Chapter 3.

LICENSING

PGI Visual Fortran is a license-managed product.

PGI software licensing uses the FlexNet Publisher (FNP) license management system from [Flexera Software](#).

3.1. Licensing Terminology

Before discussing licensing, it is useful to have common terminology.

License

A legal agreement between NVIDIA and PGI end-users, to which users assent upon installation of any PGI product. The terms of the License are kept up-to-date in documents on [pgroup.com](#) and in the \$PGI/<platform>/<rel_number> directory of every PGI software installation.

License keys

ASCII text strings that enable use of the PGI software and are intended to enforce the terms of the License. License keys are typically stored in a file called `license.dat` that is accessible to the systems for which the PGI software is licensed.

PIN

Product Identification Number, a unique 6-digit number associated with a license. This PIN is included in your PGI order confirmation. The PIN can also be found in your PGI license file after `VENDOR_STRING=`.

License PIN code

A unique 16-digit number associated with each PIN that enables users to "tie" that PIN to their [pgroup.com](#) user account. This code is provided by PIN owners to others whom they wish tied to their PIN(s).

3.2. Licensing Keys

PGI Visual Fortran includes the PGI License Setup tool to help automate your license retrieval and installation process. You use this tool to obtain either a trial or a permanent license key.

3.2.1. Licensing Key Options

PGI offers licenses for either x64+GPU or x64 only platforms. *PGI Accelerator* products, the x64+GPU platform products, include support for the directive-based PGI Accelerator programming model, OpenAcc, CUDA Fortran and PGI CUDA-x86. PGI Accelerator compilers are supported on all Intel and AMD x64 processor-based systems with CUDA-enabled NVIDIA GPUs running Linux, OS X, or Windows.

There are three types of license key options: starter, trial, and permanent.

Starter License Keys

When you first register for a PGI web account, your account activation email includes *starter* license keys. Starter keys are valid for 30 days from the date the account activation email is sent.

Trial License Keys

If you already have a PGI web account, you can use it to generate *trial* license keys. Trial license keys are valid for 15 days from the date they are generated.

Permanent License Keys

When you purchase a PGI license, your email order confirmation includes complete instructions for logging in to the pgroup.com web page and generating *permanent* license keys. Permanent license keys are perpetual, meaning they remain valid indefinitely with eligible versions of PGI software.

For specific details on how to obtain a license key, refer to Step 2 of [Basic PVF Installation](#).

3.2.2. Licensing Key Capabilities

At the conclusion of the starter license key or trial license key evaluation interval, the PGI compilers and tools and any executable files generated cease to function. To retain functionality, any executables, object files, or libraries created using the PGI compilers with starter or trial license keys must be recompiled once permanent license keys are in place.

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

3.2.3. Licensing Key Comparisons

Table 3 License Key Comparisons

License Key Type	Starter	Trial	Permanent
Node-locked	No	Yes	Yes
Limited duration	Yes - 30 days	Yes - 15 days	No
Limited functionality	Yes	Yes	No

3.2.4. Licensing Key Dependencies

When using trial or permanent license keys, you must install the PGI software before obtaining your license keys. The license key generation process requires information generated during software installation. Starter license keys do not have this dependency.



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

3.3. The FLEXnet License Manager

PGI Visual Fortran is licensed using the FLEXnet software license management system from Flexera Software.

As part of the installation process, you install and configure the FLEXnet license management software. There are two permanent licensing options using FLEXnet-style licensing.

- ▶ **Node-locked** allows any user on a single system to run the software, with access restricted to that prespecified machine.
- ▶ **Network floating license** supports a more flexible licensing system.
 - ▶ There is one license server on a network and any system on that network with a properly configured version of PGI Visual Fortran installed can run the software.
 - ▶ Multiple users can use PGI Visual Fortran simultaneously from multiple systems on the network.
 - ▶ The limitation on the number of users is determined by the number of seats that were purchased with the license.



A user continues to keep a license checked out as long as they have a PVF project open or the PVF debugger is attached to a process.

3.4. PGI Licensing Considerations

PGI licensing is the common method used by all PGI products to control access. The License Service is made up of two components:

- ▶ The `lmgrd` daemon is the common license manager component used by all FlexNet licenses. It oversees the distribution of *license seats*.
- ▶ The `pgroupd` daemon is unique to PGI and reads and decodes the PGI license file.

A license is created using the *hostname* and the *hostid* of the license server. These rules apply:

- ▶ Only one copy of `lmgrd` runs on the license server, and is used by all FlexNet-type licenses. For both floating or node-locked licenses, only a single license server is required.

- ▶ Only one PGI license per license server. You may have FlexNet licenses for other non-PGI software packages, but you may only have one PGI license per server. More than one causes the license server to malfunction.
- ▶ The *hostname* used in the license file should be understood by all the systems using the compilers. Entering the command `ping hostname` should result in the same IP address on all the systems, including the license server itself.
- ▶ The *hostid* is usually the MAC (inet address) of a device (`/sbin/ifconfig` on Linux and OS X, `ipconfig /all` on Windows), which can be detected by the FlexNet utilities. It is usually best to choose the MAC associated with the IP address of the server.
- ▶ There is a sequence in which the PGI compilers look for environment variables.
 - ▶ The PGI compilers look first at the environment variable `$PGROUPD_LICENSE_FILE` for the location of the PGI license. This variable is set in the registry on Windows machines, and is specific to PGI products.
 - ▶ The PGI compilers next look at the environment variable `$LM_LICENSE_FILE` for the location of the PGI license. This is a generic variable used by every FlexNet licensed product.
 - ▶ The PGI compilers then look at the default location for `$PGI/license.dat`.
- ▶ On the license server itself, `$PGROUPD_LICENSE_FILE` and/or `$LM_LICENSE_FILE` must be the full license pathname, as in `/opt/pgi/license.dat` on Linux and OS X, or `C:\Program Files\PGI\license.dat` on Windows.
- ▶ On machines other than the license server, `$PGROUPD_LICENSE_FILE` and/or `$LM_LICENSE_FILE` can either be a full pathname to the license file, or *port@host*, such as `27000@hostname`.
- ▶ When changing a license file, take care to ensure the license software can read the new license. On Windows and OS X, this means having Admin privileges or *sudo* capability to copy the license file to its destination. If the license service is already running, you may need to STOP and START it again to make sure the new file is read and not the old file that is stored in cache.
- ▶ When the FlexNet license service detects a problem or an event, it records it in either the `flexlm.log` file (Linux) or the `License.log` file (Windows, OS X). If you're having licensing problems, check this file for information.

3.5. License Support

All new PGI licenses include free PGI Subscription Service during the money-back guarantee period. For more information about this service and how to extend it, refer to [Product Support](#).

Chapter 4.

INSTALLING PGI VISUAL FORTRAN

The following process of installing PGI Visual Fortran on a Windows system is applicable to permanent or trial installations. This installation process involves:

- ▶ Installing PVF on a single system.
- ▶ Setting up the license service for permanent licenses.



The following instructions guide you in installing PGI Visual Fortran on a single Windows system. If you are setting up PGI Visual Fortran for use with a network floating license, first refer to [PVF Installation on Client](#).

4.1. Prerequisites

The Microsoft Windows 8.1 Software Development Kit (SDK) is a prerequisite for PVF when installing on these systems: Windows 2008 R2, Windows 7, Windows 8, Windows 8.1, and Windows Server 2012. You must install the Windows 8.1 SDK before PVF will install. The Windows 8.1 SDK includes tools and libraries required to compile, link, and execute programs on Windows. Download the [Windows 8.1 SDK](#).

The PVF installer detects the versions of Visual Studio on your system and installs the PVF integration components for those versions.

- ▶ To install PVF for Visual Studio 2013, there are no prerequisites. However, if you do not already have Visual Studio 2013 installed on your system, be certain to invoke the installation package that includes the Visual Studio 2013 Shell.
- ▶ To install PVF for Visual Studio 2012, you must have Visual Studio 2012 already installed on your system. The PVF 13.10 release for VS 2012 was the last release that included the VS 2012 Shell.
- ▶ To install PVF for Visual Studio 2010, you must have Visual Studio 2010 already installed on your system. The PVF 12.10 release for VS 2010 was the last release that included the VS 2010 Shell.
- ▶ To install PVF for Visual Studio 2008, you must have VS 2008 already installed on your system. The PVF 10.9 release for VS 2008 was the last release that included the VS 2008 Shell.

4.2. MPI and VS 2008

Several updates to VS 2008 are required to use the MPI features of PVF.

- ▶ **VS 2008 SP1** - Visual Studio 2008 must be upgraded to release SP1 before using PVF's MPI features. You can determine which version of VS you are using in the About Microsoft Visual Studio dialog accessible from the Help menu. If VS 2008 SP1 is installed, you see entries in the Installed products box similar to this:

Microsoft Visual Studio 2008 Professional Edition - ENV Service Pack 1 (KB945140)

- ▶ **KB960075** - VS Dev Environment crash after undocking windows or changing layouts.

This patch fixes a problem with Visual Studios' windowing which may crash VS during debugging. Install this patch after upgrading to VS 2008 SP1. Download this patch from code.msdn.microsoft.com/KB960075.

- ▶ **KB971932** - VS 2008: VS Debugger hangs when guid is used to ID a process. Download this patch from code.msdn.microsoft.com/KB971932.

4.3. Basic PVF Installation

Once you have completed the prerequisites, you are ready to install. Follow these steps:

1. Run the PVF installation package as Administrator.

Administrative privileges are required to install PVF.

- ▶ Run the PVF installation executable on the target machine.
- ▶ Follow the directions printed to your screen.



Be sure to download the right package for your target platform. The 64-bit package will not install on 32-bit systems, and vice versa.

How to Choose the Correct PVF Download

The name of the PVF executable depends on several factors. The following list shows the different package names, where 'xxx' refers to the release number, such as 144 for release 14.4.

For Windows Server 2008 R2, Windows 7, Windows 8, Windows 8.1 and Windows Server 2012 Systems:

To install this ...	Choose this executable ...
PVF (32-bit)	pvf32-xxx.exe
PVF With VS Shell (32-bit)	pvf32-shell-xxx.exe
PVF (64-bit)	pvf64-xxx.exe
PVF With VS Shell (64-bit)	pvf64-shell-xxx.exe

For Windows XP, Windows Server 2003, Windows Server 2003 R2, and Windows Server 2008:

To install this ...	Choose this executable ...
PVF (32-bit)	pvf32-xp-xxx.exe
PVF (64-bit)	pvf64-xp-xxx.exe

2. Run PGI Licensing.

At the conclusion of the installation process, the PVF installer runs the PGI License Setup tool. This tool automates [Manual PVF Licensing](#).

To use the tool, your computer must meet these prerequisites:

- ▶ 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. For PVF 14.4 with Visual Studio 2013, IE version 10.0 or newer is required.

If your computer is not connected to the Internet or does not meet these minimum prerequisites, then click the tool's Cancel button and run the PGI License Setup tool later. You can locate this tool in the PGI Visual Fortran folder.

PGI Visual Fortran | Licensing | Generate License

When you run the program, the PGI License Setup tool walks you through the license installation process. It prompts you for your PGI web account login, which is your email address, your password, and the type of license you wish to install, such as a two-week trial license or a permanent license. The tool also informs you of any problems it experiences with installation and instructs you how to proceed.

3. Optionally, install a Visual Studio Service Pack.

Updates to Visual Studio 2012 or 2013 are supported by PVF but you are not required to upgrade.

- ▶ Service Pack 1 (SP1) for Visual Studio 2010 is available. PVF 2010 is compatible with VS 2010 SP1; however, you are not required to upgrade.
- ▶ Service Pack 1 (SP1) for Visual Studio 2008 is also available. PVF 2008 is compatible with VS 2008 SP1; however, you are not required to upgrade unless you plan to use PVF's MPI features.

You can obtain Visual Studio updates from the Microsoft web page: www.microsoft.com/downloads.

4. Start PGI Visual Fortran.

Your installation is now complete and you should be able to start up PVF.

- ▶ On Windows 8, 8.1, or Server 2012, click on the Visual Studio icon on the Start screen.
- ▶ For systems with a Start menu, select Start | All Programs | PGI Visual Fortran. Click on the entry for the version of PVF that you want to start.

4.4. Manual PVF Licensing

If you did not successfully run the PGI License Setup tool as described in step 2 of [Basic PVF Installation](#), you can manually install PVF licensing.

The instructions in this section help you obtain a license, put it on your system, and start the PGI License Service so you can use PVF. Manual PVF Licensing requires four basic tasks:

1. Get a PVF License.
2. File your license key.
3. Start the PGI License Service.
4. Start PGI Visual Fortran.

The following sections describe how to perform these tasks.

1. Get a PVF license.

The PGI Visual Fortran compilers and tools on Windows are license-managed using FLEXnet licensing. This system requires that you possess a valid license for the licensed product. You get the license from the PGI website, www.pgroup.com/login. If you do not have a web account, go to www.pgroup.com/register to create one.

To obtain a license, you first need to gather the following information:

- ▶ The username and password required to connect to the pgroup.com website. This username and password are the same username (email address) and password you used to download the installation software from the web site.
- ▶ The FLEXlm hostid and hostname of the computer on which PGI Visual Fortran is installed.



It is easy to get the hostid and hostname of your system once you have installed the products.

Open a PVF Command Prompt window. If you have a Start menu, select **All Programs | PGI Visual Fortran Command Shells | PVF Cmd**. If you have a Start screen, navigate to All Apps, then select the PVF Cmd icon.

To get the hostid, enter this command at the prompt:

CMD> lmutil lmhostid

You see output similar to the following in which 12345678abcd is unique to your system.

```
lmutil - Copyright (c) 1989-2011 Flexera Software, Inc.
All Rights Reserved.
The FLEXnet host ID of this machine is "12345678abcd"
```

To get the hostname, enter this command at the prompt:

CMD> lmutil lmhostid -hostname

You see output similar to the following in which 12345678abcd is unique to your system.

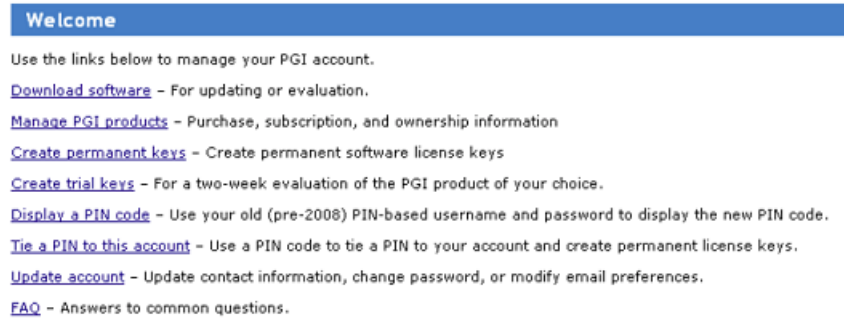
```
lmutil - Copyright (c) 1989-2011 Flexera Software, Inc.
All Rights Reserved.
The FLEXnet host ID of this machine is "HOSTNAME=yourHostName"
```

Though the above command returns output in the form `HOSTNAME=yourHostName`, when you create a license, use only the actual hostname, that is, `yourHostName` in the `hostname` field. For example, if the information displayed is `HOSTNAME=abcd1234`, then use only `abcd1234`.

Using this information, go to the PGI license generation website, log in using your username and password, and generate your license.

Generate License Keys

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



Generate a Permanent License Key

1. Click **Create permanent keys**.
2. Click the PIN associated with the product for which you wish to generate license keys. If you don't see any PINs listed, you first need to tie one to your account:
 - a. Obtain your PIN code from your original PGI order confirmation email, in the section labeled: "SHARING ADMINISTRATION" or contact license@pgroup.com.
 - b. Click the link: Tie a PIN to this account.
 - c. Enter the 16-digit PIN code and follow the instructions provided.
3. Click **License keys** to generate the keys.

Generate a Trial License Key

1. Click **Create trial keys**.
 2. Accept the terms of the agreement.
 3. Enter any one of the FLEXnet hostids detected, exactly as it appears in the message that is displayed during installation or when you issue the command: **CMD> lmutil lmhostid**
 4. Click the **Generate License keys** button.
2. File Your License Key.

Once you have a PVF license, you must store it with Administrator privileges in the license file on your system, a file called `license.dat`. In a typical installation configuration, where `C:` is the system drive, put the license in this file:

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

- ▶ If you have not previously received license keys from PGI and the `license.dat` file exists, replace the contents of the `license.dat` file created during installation with the license keys you generated using the preceding steps. Otherwise, you must create the file.
- ▶ If the license keys in the file are for a previous release of the same product, overwrite the keys.
- ▶ If your `license.dat` file already exists and contains PGI license keys, such as PGI Workstation keys, then append the PVF keys to the keys already in this file.
- ▶ If you have not previously received a license from PGI, you must create this file.



You must have Administrator privileges to modify or replace the `license.dat` file.

If your `license.dat` file already contains keys that you previously received from PGI, first make a copy of the existing `license.dat` file in case you encounter a problem with the new license.

3. Start the PGI License Service.

The PVF installation creates a Windows Service called PGI License Service. The actions related to this service depend on the type of license you are using:

- ▶ **Trial or starter** — If you have obtained a trial or starter license, then no action is required.
- ▶ **Permanent** — If you have obtained a permanent license, the FLEX license system requires that a license server be running. Thus you must now start the PGI License Server.

As soon as a valid `license.dat` file is in place, as described in "Step 2. File Your License Key", you can start the PGI License Server.

1. Open the Services dialog from the Control Panel: Control Panel | Administrative Tools | Services
2. Scroll through the list and select "PGI License Server".
3. Select **Start**, if the PGI service is stopped. If the PGI service is running, STOP and then START it. This process guarantees that the new PGI license is served and that the older, cached PGI license is no longer active.



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

4. Start PGI Visual Fortran.

Your license setup is now complete and you should be able to start up PVF.

- ▶ On Windows 8, 8.1, or Server 2012, click the Visual Studio icon on the Start screen.
- ▶ For systems with a Start menu, select Start | All Programs | PGI Visual Fortran. Click the entry for the version of PVF that you want to start. .

Chapter 5.

PVF MULTI-USER INSTALLATION AND LICENSING

If you are installing PGI Visual Fortran for multiple users, you set up one system as a license server and one or more different systems as clients. As you see in scenario A that follows, the license server can also be a client.

When PVF is invoked on one of the client systems, it contacts the license server to check out a network floating PVF license. The steps you take to set up the license server are different than the steps you take to set up the clients. This section describes the entire process.

Server Designation

When you are installing PGI Visual Fortran with the intention of using a multi-user network floating license, you must designate a machine to be the system that serves PGI Visual Fortran licenses. Let's call this machine the FLEX license server.

There are a number of different ways to set up the FLEX license server, and how you choose to proceed depends on your needs. Before you begin the installation, select the scenario that best matches the configuration that you want for your FLEX license server.

This installation guide covers the following situations:

Scenario A: The FLEX license server is a Windows system. You want to install PGI Visual Fortran on it as well as on the client systems.

Scenario B: The FLEX license server is a Windows system. However, you do not want to install PGI Visual Fortran on it.

Scenario C: The FLEX license server is a Linux system.

Once you have determined the scenario that fits your needs, move on to the section that provides the specific steps for your licensing server scenario.

5.1. Scenario A - License Server (Windows) with PVF Installed

Use these steps if your FLEX license server is a Windows system and you want to install PGI Visual Fortran on it as well as on the client systems.

1. Install PVF on the license server.

To do this, follow the instructions in [Basic PVF Installation](#).

2. Enable licensing on the license server.

To do this, follow the instructions in [Manual PVF Licensing](#).

3. Install PVF on each client.

To do this, follow the instructions in [PVF Installation on Client](#).

5.2. Scenario B - License Server (Windows) without PVF Installed

Use these steps if your FLEX license server is a Windows system but you do not want to install PGI Visual Fortran on it.

1. Install the PGI License Server on the license server.

To use a Windows system as the FLEX license server for PVF, the system must have the PGI License Server components installed on it. These components are included in all PGI products, but they are also available in a standalone installation package.

First, use the system's Add or Remove Programs Dialog to check for the presence of PGI FLEXlm License Server components:

- ▶ If the PGI FLEXlm License Server 11.10 is installed, proceed to Step 2.
- ▶ If any PGI product is installed that is version 2013 or newer, the system already has the components that it needs. Proceed to Step 2.
- ▶ If any previous version of PGI FLEXlm License Server is installed, use the Add or Remove Programs dialog to uninstall this product. A PVF license requires a newer version of the FLEX tools. Proceed with this step.

Next, download the PGI License Server 11.10 installation package from www.pgroup.com/support/download_licensing.php.

- ▶ If your system is running a 32-bit OS, choose the 32-bit package.
- ▶ If your system is running a 64-bit OS, choose the 64-bit package.

Finally, log on to the system as Administrator and run the PGI License Server 11.10 installer.

2. Enable licensing on the license server.

To do this, follow the instructions in [Manual PVF Licensing](#).

3. Install PVF on each client.

To do this, follow the instructions in [PVF Installation on Client](#).

5.3. Scenario C - License Server (Linux)

Use these steps if you use a Linux system as your FLEX license server.



This scenario is only recommended for users already familiar with using FLEX on Linux.

1. Install the 11.10 FLEX Tools on the Linux license server.

To use a Linux system as the FLEXnet license server for PGI Visual Fortran, FLEXnet tools must be installed on the Linux system. Further, these FLEXnet tools must be version 11.10 or newer.

To download a version of FLEXnet tools for Linux that will support PGI Visual Fortran network floating license keys, go to www.pggroup.com/support/download_licensing.php.

2. Obtain a PVF license from PGI.

Using the information in your order confirmation, and the hostid and hostname of the Linux FLEX license server system, obtain PVF license keys from www.pggroup.com.

3. Add the PVF license to `license.dat`.

Add the PVF license to the `license.dat` file used by the FLEXnet Tools on the Linux FLEX license server.

If necessary, restart the FLEX license server, typically `lmgrd`.

4. Install PVF on each client.

To do this, follow the instructions for [PVF Installation on Client](#).

5.4. PVF Installation on Client

Use the following steps to install PVF on a client system. You should have already completed the steps listed for setting up the FLEX license server. Your actions, outlined in the previous sections, depend on whether you chose Scenario A, B, or C.

1. Install PVF on the client.

To do this, follow the instructions in [Basic PVF Installation](#).

2. Fix the `license.dat` file on the client.

This step involves these actions:

- ▶ Put the `license.dat` file from the FLEX license server on each client. If a `license.dat` file already exists on the client, then replace it with the one from the server.
- ▶ Change the Startup Type for the PGI License Server on the client from "Automatic" to "Manual".

This change stops the PGI License Server from automatically starting when the client is rebooted.

To set the startup type to Manual, do this:

1. Open the Services dialog from the Control Panel: **Control Panel | Administrative Tools | Services**
2. Scroll through the list and select "PGI License Server."
3. Select "Properties."
4. In the Properties dialog, from the Startup Type drop-down list, select "Manual."
5. Click OK.



The default action after a PVF installation is for this service to automatically start after a reboot. The client is obtaining a license from the system on the network that contains the licenses. Setting the client PGI License Server startup type to Manual is an important step.

Test the licensing setup by starting Visual Studio on the client system and verify that you can create a PVF project.

3. Repeat both steps 1 and 2 *for each client*.

Chapter 6.

USE LICENSING ENVIRONMENT VARIABLES

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

```
PGROUPD_LICENSE_FILE  
FLEXLM_BATCH
```

6.1. PGROUPD_LICENSE_FILE

The system environment variable `PGROUPD_LICENSE_FILE` is not required by PVF, but you can use it to override the default location that is searched for the `license.dat` file.

To use the system environment variable `PGROUPD_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 from the Control Panel's System option.
2. Select the **Advanced** tab.
3. Click the **Environment Variables** button.
 - ▶ If `PGROUPD_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, `license.dat`.
 - ▶ If `PGROUPD_LICENSE_FILE` already exists as an environment variable, append the path to the license file in the variable's current value using a semi-colon to separate entries.

6.2. FLEXLM_BATCH

By default, on Windows, the license server creates interactive pop-up messages to issue warnings 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.

Chapter 7.

PGI VISUAL FORTRAN DEFAULT DIRECTORY STRUCTURE

This section shows the default installation location of the contents of PGI Visual Fortran. This default installation directory depends on your platform.



Throughout this section, we assume that the Windows system drive is C.

On Windows x64 platforms, the default installation directories are

```
C:\Program Files\PGI
C:\Program Files (x86)\PGI
C:\Program Files (x86)\PGI\Microsoft Visual Studio <N>\PGI Visual Fortran
```

where <N> can be any or all of 10.0, 11.0, and 12.0, depending on the versions of Visual Studio installed on your system.

On 32-bit Windows platforms, the default installation directory is

```
C:\Program Files\PGI
C:\Program Files\PGI\Microsoft VisualStudio <N>\PGI Visual Fortran
```

where <N> can be any or all of 10.0, 11.0, and 12.0, depending on the versions of Visual Studio installed on your system.

In addition to these product directories, the FLEXnet license management tools are installed here:

```
C:\Program Files\PGI\flexlm
```

Chapter 8.

COMMON INSTALLATION ISSUES

This section contains information about problems that may occur during the installation process as well as tips on setup information.

8.1. Windows Firewall and PVF Debugging

Microsoft Windows Firewall runs by default on some types of systems, such as Windows XP and Windows Vista. Suppose this application is running on your system. Unless the PVF debug engine components are included in the Windows Firewall Exceptions list, Windows Firewall may try to block the PVF debug engine when you debug a program.

Automatic Additions to Windows Firewall Exceptions List

When PVF is installed

If Windows Firewall is enabled when PVF is installed, certain components are automatically added to the Exceptions list. For PGI Visual Fortran, these components appear as follows:

- Microsoft Visual Studio 2012/2010/2008 (respectively)

- PGI Debugger 2014 (32-bit)

- PGI Debugger 2014 (64-bit) - not added to the Exceptions list on 32-bit systems.

When PVF is uninstalled

If Windows Firewall is enabled when PVF is uninstalled, the components previously listed are automatically removed from the Exceptions list.

When using PVF to Debug

If the PVF Debug Engine components are not listed in the Exceptions list and Windows Firewall is enabled when you use PVF to debug, the Firewall displays a dialog that allows you to Unblock the PVF debug engine components. If you choose the Unblock option, Windows Firewall adds

the component to its list of Exceptions and you do not see the pop-up dialog again unless you reinstall.



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



You can manually add these components to the Windows Firewall list of Exceptions.

8.2. Troubleshooting

The most common installation problems are related to licensing.

To troubleshoot your installation, first check that the `license.dat` file you are using contains a valid license. Then, if you are using permanent node-locked licensing, check that the PGI License Server, a Windows Service, is started on the system that is providing the licensing.

Typical FLEX errors encountered may include the following:

- ▶ **Error:** 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.'

Possible Solution: This message may appear because the `license.dat` file accessed by the FLEX License Manager does not contain a valid license or the license you have does not allow PGI License Server to run. Verify your PVF license is valid.

- ▶ **Error:** When starting PGI Visual Fortran, a FLEXible License Manager dialog appears that states 'pvf: LICENSE MANAGER PROBLEM: No such feature exists.'

Possible Solution: This message may appear because the `license.dat` file accessed by the FLEX License Manager does not contain a valid license. Verify your PVF license is valid.

- ▶ **Error:** When starting PGI Visual Fortran, a FLEXible License Manager dialog appears that states 'pvf: LICENSE MANAGER PROBLEM: Cannot connect to license server system.'

Possible Solution: This message may appear because the PGI License Server has not been started. Start the server manually, if necessary.

- ▶ **Error:** When using a compiler or tool from the PVF command line, a message stating 'LICENSE MANAGER PROBLEM: Failed to checkout license' appears.

Possible Solution: This message may appear because the PGI License Server has not been started. Start the server manually, if necessary.

8.3. Installation Errors to Ignore

Occasionally an installation produces one of the following error messages, or something similar. These errors do not interfere with proper installation and can safely be ignored.

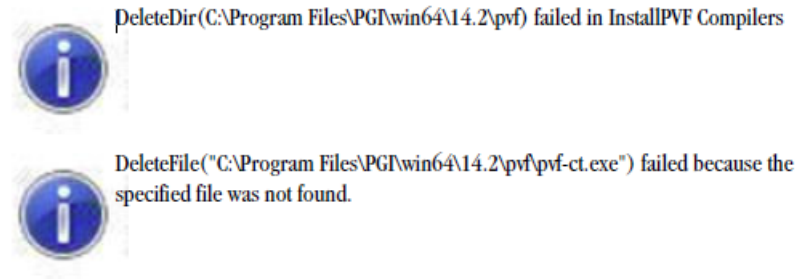


Figure 2 PVF Installation Errors to Ignore

Chapter 9.

CO-INSTALLATION

This section describes how to co-install PGI Workstation with PGI Visual Fortran.

Co-installation of PGI Workstation and PGI Visual Fortran

PGI Workstation compilers and tools can be co-installed with PGI Visual Fortran as long as the version of PGI Workstation being installed has the same or newer version than the version of PGI Visual Fortran.



If it is necessary to install an older version of PGI Workstation on a system where PVF 14.4 has already been installed, uninstall PVF 14.4, install PGI Workstation, then re-install PVF.

Any version of PVF can be installed on a system where PGI Workstation has been installed.

Chapter 10.

UNINSTALLING PVF

To uninstall PVF, use the following guidelines:

- ▶ Administrative privileges are required to uninstall.
- ▶ Make sure that Visual Studio is not running when uninstalling PVF.
- ▶ There are two components to PVF:

Compilers, tools, and libraries

Visual Studio integration components

These components may be uninstalled separately, allowing users to maintain multiple versions of the compilers on their system. These components appear in the Control Panel | Add or Remove Programs dialog as follows:

PGI Visual Fortran (compilers only) 14.4

PGI Visual Fortran

- ▶ On Windows 2008 R2/7/8/8.1/2012 systems, the Windows 8.1 SDK is installed by the PVF installer (if it was not already on your system). This component appears listed in Add or Remove Programs as follows:

Windows Software Development Kit

- ▶ If your installation of PGI Visual Fortran included installation of the Microsoft Visual Studio Shell, then several other components appear in the Add or Remove Programs dialog. The names of these components may appear slightly different on your system than they appear in the following list, depending on localization settings and whether the system is running a 64-bit operating system, and are similar to these:

Microsoft Visual Studio 2013 Shell (Integrated)

Microsoft Visual Studio 2013 Shell (Isolated)

Microsoft SQL Server 2012 Management Objects

Microsoft System CLR Types for SQL Server 2012

Microsoft Help Viewer 2.0

Microsoft .NET Framework 4.5 SDK

Microsoft .NET Framework 4.5 Multi-Targeting Pack

Microsoft .NET Framework 4.5



Take care when uninstalling these components to ensure that no other software on the system depends on them. Further, always uninstall the Microsoft .NET Framework components last.

If there are problems while uninstalling PVF, try reinstalling the product, then uninstall again.

Chapter 11.

CONTACT INFORMATION

You can contact PGI at:

Two Centerpointe Drive, Suite 320
Lake Oswego, OR 97035 USA

Or electronically using any of the following means:

Fax: +1-503-682-2637
Sales: sales@pgroup.com
Support: trs@pgroup.com
WWW: <http://www.pgroup.com>

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:

<http://www.pgroup.com/userforum/index.php>

Many questions and problems can be resolved by following instructions and the information available at our frequently asked questions (FAQ) site:

<http://www.pgroup.com/support/faq.htm>

All technical support is by e-mail or submissions using an online form at:

<http://www.pgroup.com/support>

Phone support is not currently available.

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

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