

# GASP INSTALLATION

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# Chapter 1

## Getting Started

### 1.1 Overview of Steps

The following list provides a general overview of the steps needed to install *GASP*.

1. Downloading and installing the software
2. Setting any necessary environment variables
3. Generating your machine's hostId
4. Requesting a license key
5. Installing the license
6. Running the license manager
7. Documentation and tutorial information

The *GASP* software package can be installed on either linux or windows based platforms. Depending on the platform, the user will download either specific linux files or windows files. The specifics of each are explained in the following sections.

<p><b>Note:</b> If a <i>GASP</i> license has already been installed on the local network, the user can skip steps 3 to 6. For installations where the license server is run on a different machine, the <code>aerosoft/etc/keys/gasp.lic</code> file should be modified to reflect the correct license server host. This is done using a text editor and changing “localhost” to the license server host name.</p>
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## 1.2 Installing *GASP* on Linux Platforms

For linux installation, the user will need to install a common (platform independent) file archive, and a binary (platform specific) file archive. Both the common file archive and platform file archive help create the `aerosoft` directory (for more information about the directory structure, see the *GASP* users manual).

The common file archive contains files that are independent of platform (*i.e.*, operating system and hardware). Specifically, the common file archive has files related to the following:

- The thermo-chemical database
- GTK user interface resource files
- Tutorials
- Documentation

The platform file contains executable binary files that were compiled specifically for a certain type of hardware architecture and operating system. The executables in the platform file archive normally consist of the `gaspr` executable and the license server executables. The specific use of the binaries is described in the *GASP* users manual.

In addition to the common file archive and platform file archive, there may also be an MPI file archive to download and install. This file will contain specific binaries and support files related to the MPI package against which *GASP* was compiled. This is sometimes available when *GASP* is statically built against the MPI package (only select packages are statically built).

Both the common and platform file archives can be downloaded from the AeroSoft web site ([www.aerosoftinc.com](http://www.aerosoftinc.com)). Once downloaded, the archives can be installed by running the following command on each download archive (shown here is the common file archive).

```
tar -xzf common.tgz
```

Once the downloaded archives have been installed, they will create the `aerosoft` directory. The directory name can be renamed as desired.

### 1.2.1 Setting necessary environment variables

#### Setting the `AEROSOFT_HOME` variable

*GASP* v5 requires the user to identify the default location of a number of dependent files. *GASP* does this by reading the environment variable `AEROSOFT_HOME`.

**Note:**

Simultaneous installation of GASP Version 5.3 and a previous version of GASP, such as Version 5.2 is supported with the addition of a version specific environment variable, `GASP53_HOME`. Version 5.3 will first attempt to read the `GASP53_HOME` variable in order to locate the default location of the installation. If not defined, then the executable will search for the `AEROSOFT_HOME` variable. If the user wishes to maintain an older Version of GASP, set the location of the older Version using the `AEROSOFT_HOME` variable, and set the location of Version 5.3 using the `GASP53_HOME` variable.

The recommended location for linux installation of the *GASP* distribution is in `/opt`, but this is not a requirement. For the remainder of this chapter, all references to the file structure will be with respect to the recommended installation location.

```
setenv AEROSOFT_HOME /opt/aerosoft
```

**Note:**

The above linux command is suitable for use with a `csh` or `tcsh`. Please see the on-line man pages for assistance with alternate command shells.

### Setting the execution path

For linux users, the `gaspr` binary should be added to the users execution path. This can be done by adding the `/opt/aerosoft/bin` directory to the users execution path as shown below.

```
setenv PATH "$AEROSOFT_HOME/bin:$PATH"
```

or

```
set path=($AEROSOFT_HOME/bin $path)
```

**Note:**

On some GNU based unix systems, there is a program called `gasp`, which is a preprocessor for assembly programs. In particular, this binary is distributed by many early Linux systems. This `gasp` executable may be in the default path, and will be called instead of the AeroSoft executable, if it appears before the AeroSoft directory. AeroSoft advises its users to place the `/opt/aerosoft/bin` directory at the beginning of the path environment, so that the proper `gaspr` executable is called.

## 1.2.2 Generating Your Machine's HostId

New to Version 5.1 of *GASP* is the RLM (reprise license manager) software. This is now the default license manager for all supported platforms of *GASP*. Similar to other licensing software, the RLM software supports both node-locked and floating licenses. In most cases the user will be supplied with a floating license (one machine runs the license server which allows other machines on the local network to access the license). For a floating license setup, the user needs to select a machine that will run the license server.

In order for AeroSoft to create a license file for the user, information needs to be supplied to AeroSoft by the user. This information can be obtained in one of two ways:

1. Open the *GASP* GUI by running `gaspr`. Once open, go to the menu bar located at the top of the GUI and select the File menu. In the File menu select **Generate HostId**. Follow the instructions to generate a `hostId` file and send it to AeroSoft (see the next section). Be sure to run this from the machine that will serve as the license server.
2. From an open shell, run the command `rlmutil rlmhostid` located in the `$AEROSOFT_HOME/bin` directory. The `rlmutil rlmhostid` program will print a *hostId* for the machine. Be sure to run this from the machine that will serve as the license server.

## 1.2.3 Requesting a License Key

The `hostId` must be generated using either the *GASP* GUI or running `rlmutil rlmhostid` (see the previous section). Once the `hostId` is generated, a license key can be requested by mailing the `hostId` file (or output from the command line) to [support@aerosoftinc.com](mailto:support@aerosoftinc.com). When sending the `hostId` file, please include your name, organization and a contact phone number.

## 1.2.4 Installing the License Key

Once AeroSoft has received your license key request, it will be processed as quickly as possible. AeroSoft will then send the user a license file (`gasp.lic`). Copy this file to the `$AEROSOFT_HOME/etc/keys` directory.

The `$AEROSOFT_HOME/etc/keys` directory may contain a default license file from the installation process. If you are installing the license on the machine used to run the license server, then replace the existing `gasp.lic` file.

For installations where the license server is run on a different machine, the `gasp.lic` file should be modified to reflect the correct license server host. This is done using a text editor and changing “localhost” to the license server host fully qualified domain name.

## 1.2.5 Running the License Manager

Once the license key is installed, you can start the RLM license manager. For floating licenses, the license manager *must* be active before you can run the *GASP* flow solver.

To launch the RLM license manager, execute the following command:

```
$AEROSOFT_HOME/bin/rlm -c $AEROSOFT_HOME/etc/keys
```

By default, the RLM server will search for the license file in the same directory where `rlm` is run. The `-c` option is used to specify either the license file or the directory where it resides. If a directory is given, RLM will load all license files with the `.lic` extension. A log file is written to `license.log` by default, which is set using the RLM options file `$AEROSOFT_HOME/etc/keys/aerosoftlm.opt`.

More information on the license server binary (`rlm`) and RLM utility binary (`rlmutil`) can be found in the GASP users manual. An on-line users guide to RLM can be found at [http://www.reprisesoftware.com/RLM\\_Enduser.html](http://www.reprisesoftware.com/RLM_Enduser.html).

## 1.2.6 Documentation and Tutorial Information

Since you are reading this document, you have found some documentation. However, you may also find documentation for *GASP* in pdf form in the directory `aerosoft/share/doc`. Note that documentation efforts are on-going, and we will be adding chapters from time to time.

You can find tutorials in the `aerosoft/share/tutorial` directory as follows:

- **Duct-1** A simple 2-dimensional single zone duct problem. This problem is designed to be the first tutorial when learning *GASP* v5.
- **Rocket-2** A more complex, multi-zone, 3-dimensional problem. This problem is designed to be the second tutorial when learning *GASP* v5. *Note:* This problem is over 2.5 million grid points, and requires more file space and computational resources than the Duct-1 tutorial.
- **Forebody-3** A simple, 3-dimensional analytic problem. This problem is designed to cover aspects of the space marching algorithm in *GASP*.
- **Cavity-4** An axi-symmetric high speed blunt body with a cavity located in the nose. This example discusses the techniques used to obtain a time dependent solution about a simple geometry.
- **Chimera-5** A complex, 3-dimensional wing-body problem discretized using an overset grid topology. This example discusses aspects of the Chimera zonal boundary set-up.
- **Visualization-1** An introduction to solution visualization using the *GASP* GUI. This tutorial begins with a completed solution and discusses different visualization features and techniques.

**Note:**

The Tutorials as distributed in `common.tar.gz` contain only the grid file and documentation. *GASP* v5 input decks which are ready to run, as well as completed solutions can be found on our sftp site: <sftp://gasp53r@ftp.aerosoftinc.com/outgoing/Tutorial>

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## 1.3 Installing *GASP* on Windows

### 1.3.1 Downloading the Software

AeroSoft provides an MPI (message passing interface) version of *GASP* for the Windows platform. MPI allows users to run the *GASP* flow solver on multiple processors.

Installation of *GASP* requires the user to download a single package installer from the AeroSoft sftp or web site. The installer is supported on current 64-bit Windows operating systems. The file for installing will contain the *GASP* executable and common files and will be named:

`GASP53-x64-Setup.exe`

Once the installer has been downloaded, users should install *GASP* by executing the installer package. When installing the package, select the full install when asked. In some cases, the user may need to restart their computer after installing all the files.

Some of the installation packages (like OpenMPI) have options for setting the environment variable for the user. Be sure to select this option during the installation process.

By default, the *GASP* files will be installed in the directory AeroSoft located in Program Files. The user will find documentation and tutorial information there as well.

### 1.3.2 Downloading on Windows

AeroSoft requires all downloads to be performed using the SFTP protocol using a public SSH key. If you are not familiar with this process, the following steps can be followed to assist you. To begin, a user must have a public/private SSH key pair. One way to create this is to use the “Putty” software (free to download and use).

1. Download and install the “Putty Key Generator” software, which contains a key generator that is needed for this task. The Putty software can be downloaded from [www.putty.org](http://www.putty.org)
2. Run PuTTYgen. Select the “SSH-2 RSA” key type. The number of bits in the generated key should be set to at least 1024
3. Generate a public/private key pair and save both files. Make note of the location of both files. The public key file is to be given out to confirm your identity. The private key file should never be given out, and should be secured using a pass phrase.
4. Send the public SSH key file to aerosoft (email to [support@aerosoftinc.com](mailto:support@aerosoftinc.com)).



Once the public and private SSH keys are generated, the user can use any supported file transfer software to perform SFTP. One such software package is WinSCP. This can be installed and used as follows.

1. Download and install the WinSCP software (free to download and use). The software can be downloaded from [www.winscp.net](http://www.winscp.net)
2. Create and save a new session with the following settings:
  - Host name: `ftp.aerosoftinc.com`
  - User name: `gasp53`
  - Private key file: select your private key file generated above
  - File protocol: SFTP
3. Attempt to login to AeroSoft's sftp site. If you receive an error or warning, please contact AeroSoft via e-mail at [support@aerosoftinc.com](mailto:support@aerosoftinc.com) and provided the exact time you attempted to login. As an extra layer of security, we only allow access from known IP addresses, and we may need to add your IP address to our list.

### 1.3.3 Setting Necessary Environment Variables

*GASP* v5 requires the user to identify the default location of some common files. *GASP* does this by reading the environment variable `GASP53_HOME`. This environment variable is set automatically during the install. The default location is

`C:\Program Files\AeroSoft.`

### 1.3.4 Generating Your Machine's HostId

*GASP* uses the RLM (reprise license manager) software to control use of the flow solver. Similar to other licensing software, the RLM software supports both node-locked and floating licenses. In most cases the user will be supplied with a floating license (one machine runs the license server which allows other machines on the local network to access the license). For a floating license setup, the user needs to select a machine that will run the license server.

In order for AeroSoft to create a license file for the user, machine specific information needs to be supplied by the user. This information can be obtained in one of two ways:

1. Open the *GASP* GUI by running `gaspr`. Once open, go to the menu bar located at the top of the GUI and select the File menu. In the File menu select **Generate HostId**. Follow the instructions to generate a `hostId` file which you will send to AeroSoft (see the next section).
2. From an command shell, run the command `rlmutil rlmhostid` located in the `Program Files\AeroSoft\bin` directory. The `rlmutil rlmhostid` program will print a *hostId* for the machine. Be sure to run this from the machine that will serve as the license server.

### 1.3.5 Requesting a License Key

The `hostId` was generated using either the *GASP* GUI or running `rlmutil rlmhostid` (see the previous section). In either case, a license key can be requested by mailing the `hostId` file (or output from the command line) to [support@aerosoftinc.com](mailto:support@aerosoftinc.com). When sending the `hostId` file, please include your name, organization and a contact number.

### 1.3.6 Installing the License Key

Once AeroSoft has received your license key request, it will be processed as quickly as possible. AeroSoft will then send the user a license file (`gasp.lic`). Copy this file to the `AeroSoft\etc\keys` directory.

The `AeroSoft\etc\keys` directory may contain a default license file from the installation process. If you are installing the license on the machine used to run the license server, then replace the existing `gasp.lic` file.

For installations where the license server is run on a different machine, the `gasp.lic` file should be modified to reflect the correct license server host. This is done using a text editor and changing “localhost” to the license server host name.

### 1.3.7 Running the License Manager

Now that you have the installed the license key file, you need to start the RLM license manager. For floating licenses, the license manager *must* be active before you can use the *GASP* flow solver.

To launch the RLM license manager, execute the following command:

```
C:\Program Files\AeroSoft\bin\rlm -c <path_to_keys>
```

By default, the RLM server will search for the license file in the same directory where `rlm` is run. The `-c` option is used to specify either the license file or the directory where it resides. If a directory is given, RLM will load all license files with the `.lic` extension.

More information on the license server binary (`rlm`) and RLM utility binary (`rlmutil`) can be found in the *GASP* users manual.

### 1.3.8 Documentation and Tutorial Information

You may find documentation for *GASP* in pdf form at

```
C:\Program Files\AeroSoft\share\doc\gasp_usersguide.pdf
```

Note that documentation efforts are on-going, and we will be adding chapters from time to time.

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### 1.3.9 Running the *GASP* Flow Solver

The solver must be run from the command line. You can access a Windows command line prompt from the Start Menu/Run/cmd or Start Menu/All Programs/Accessories/Command Prompt.

There two ways to run the flow solver. The first is using the auto solver method. This method is intended to take care of the MPI calls and solve on the run definitions specified in the GUI. If your environment is set up correctly, you can run the flow solver with

```
<path-to-gasp>\gasp.exe --solve -i input-deck.gsp
```

The second method to run *gasp* is more manual and is normally used with batch scripts. Because *GASP* is compiled with OpenMPI, the mpirun command must be used to execute the *GASP* flow solver. In this case, the solver is executed with the MPI command and looks like the following

```
mpirun -np $ <path-to-gasp>\gasp.exe --mpi -i input-deck.gsp --run #
```

where \$ is the number of processors to use and path-to-gasp is typically

C:\Program Files\AeroSoft\bin,

# is the run definition to execute. For the manual launch, the user must specify which run definition to execute.