

# HIPERLOGIC

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## **Activation Filter User Guide**

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## Section 1. Introduction

The HiperLogic Activation Filter (HAF) enables Windows HPC Server 2008 (HPCS) compute jobs that use application licenses to wait until the required application licenses are available. An easy to use GUI enables simple configuration and integration.

Most popular commercial HPC applications use FLEXlm™ technology for application licensing. HAF includes out of the box support for FLEXlm licensed applications.

## Section 2. Before You Begin

HAF requires the Microsoft HPC Pack 2008 be installed on the cluster head node before installing the Activation Filter. The cluster should be validated it is properly configured and functioning before integrating HAF.

## Section 3. Installation

To install the application, download and execute the **setup.exe** program on the head node of the cluster. Accept the EULA before continuing, or cancel the installation if you do not accept the license terms.

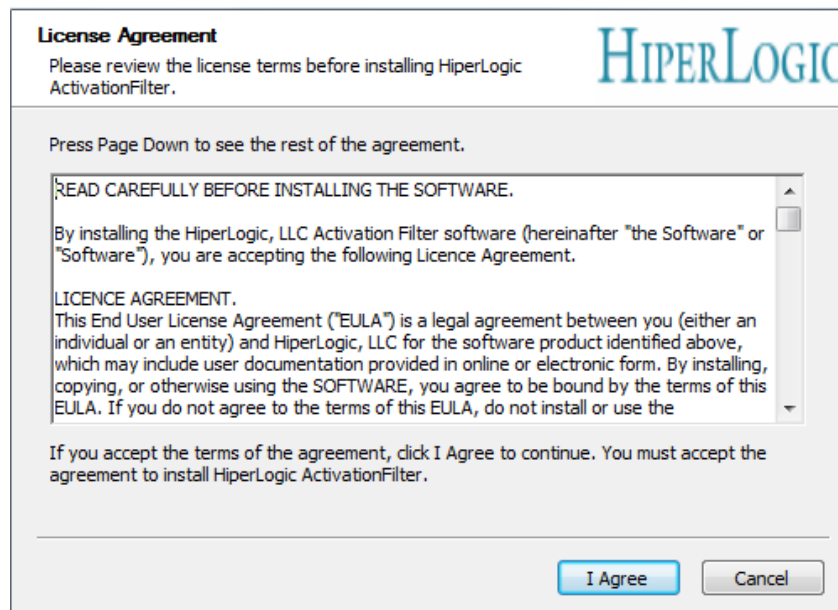


Figure 1. The license acceptance installation screen.

Next, you will choose the default installation directory for the software.

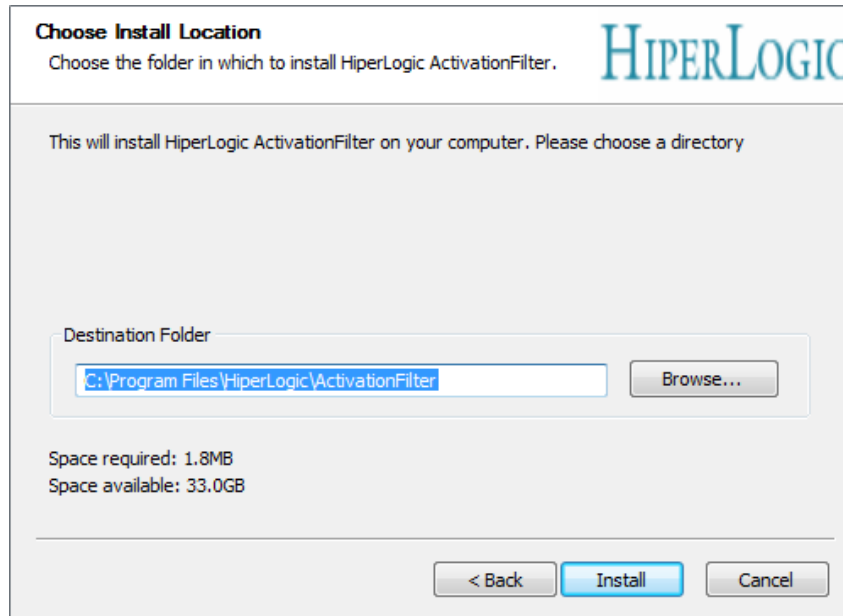


Figure 2. The software location installation screen.

Finally, the installation is complete.

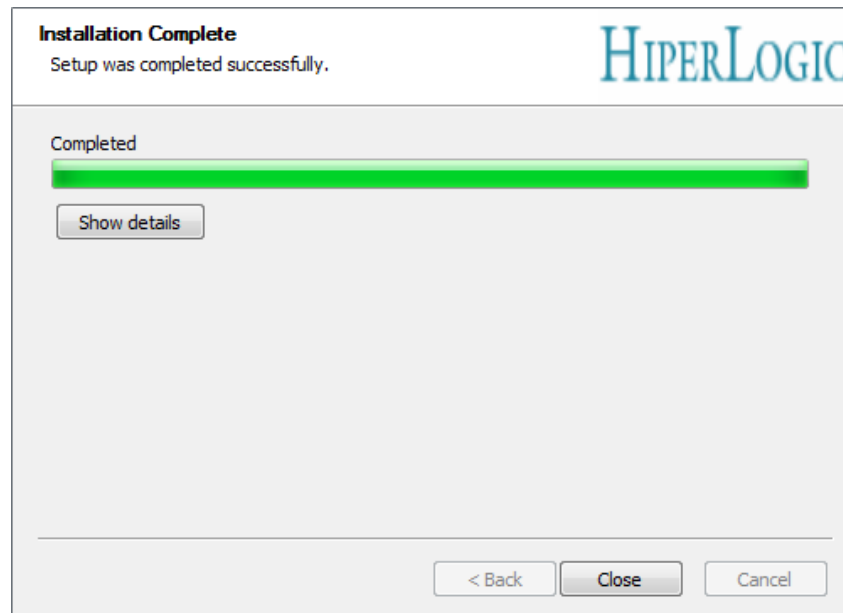


Figure 3. The installation is complete.

### **Step 1. Launch the Application Filter Configurator**

Click **Start->HiperLogic ->Activation Filter Configurator** to launch the HAF Configurator. The HAF Configurator is responsible for testing and creating the master configuration file used by the HAF console tool.

Next enter a license key, see Figure 4. If this is an evaluation, click **Continue Evaluation**. If you have purchased the Activation Filter, click **Install License** and paste the license key from the email received from HiperLogic.

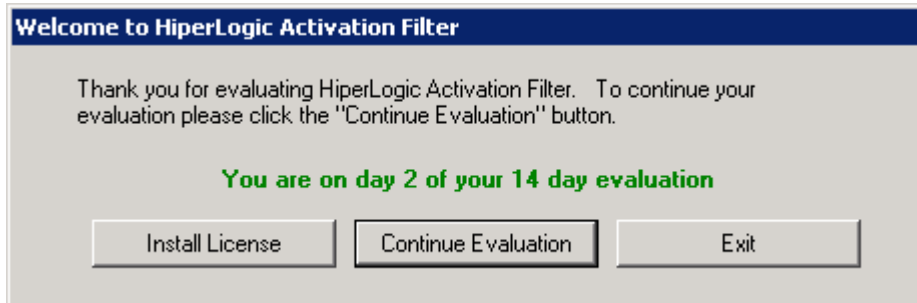


Figure 4. Enter the license key.

After entering your license key the application will launch, see Figure 5.

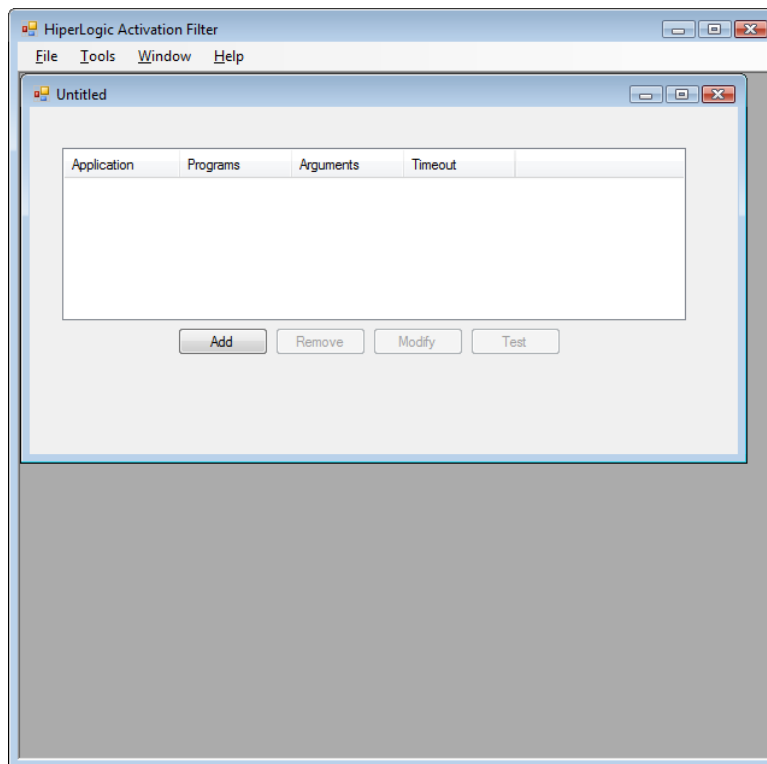


Figure 5. The Activation Filter Configurator.

### Step 2. Add FLEXIm licensed applications

The next step is to add the FLEXIm applications that will be checked by HAF. **Only those applications configured here will be checked by HAF.** To add your first application, click on the **Add** button shown in Figure 5. The application dialog shown in Figure 6 will appear.

There are four required pieces of information for each application: feature name, program path, program arguments, and the program timeout.

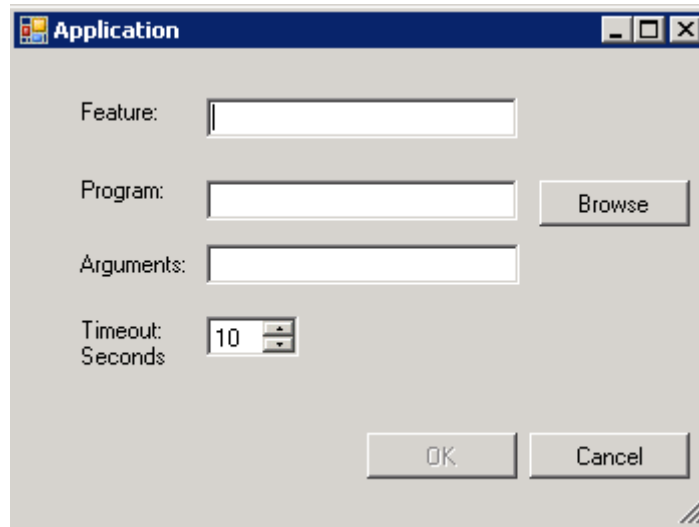


Figure 6. The Add Application Dialog.

#### **Feature Name**

Enter the name of the licensed FLEXlm feature to check for. This name must also match the name in the HPCS job license definition. (See step five in this section).

#### **Program**

Enter the full path to the FLEXlm **lmutil.exe** executable. You can download the latest Microsoft Windows 64-bit x64 **lmutil.exe** free of charge from Macrovision® at the follow URL:

[http://www.globes.com/support/fnp\\_utilities\\_download.htm](http://www.globes.com/support/fnp_utilities_download.htm)

**NOTE: You must rename the binary to **lmutil.exe** for the binary to work properly.** The examples in this document assume the binary is installed into **c:\flexlm\lmutil.exe**.

#### **Arguments**

The last text box is for the arguments to the **lmutil.exe** command. The recommended argument for **lmutil.exe** is **lmstat -a -c port@licenseserver** where the *port* and *licenseserver* are to be filled in for your application. See Figure 7 for an example. Contact your license administrator or software vendor if you are unsure of the correct port and server for your application.

#### **Command Timeout**

The timeout increment indicates how long HAF should wait in seconds for a response from **lmutil.exe** before deciding that the job should not start. If you increase this value beyond fifteen seconds, there is an additional step to perform. (See section six for more details.)

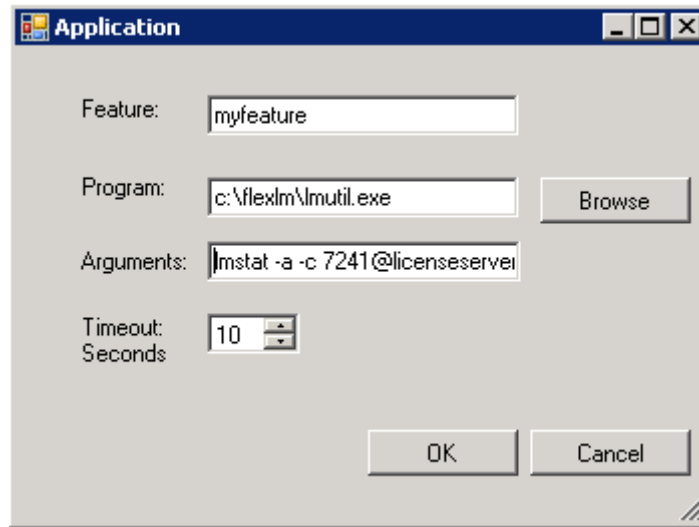


Figure 7. An example application configuration.

### Step 3. Testing the configuration

After configuring the application settings, you will see the application will be listed in the list box. Highlight the application to test, and click the **Test** button to test the communication to your license server. If the settings are correct the output from **lmutil.exe** and the number of currently free licenses for the specified feature will be displayed, see Figure 8.

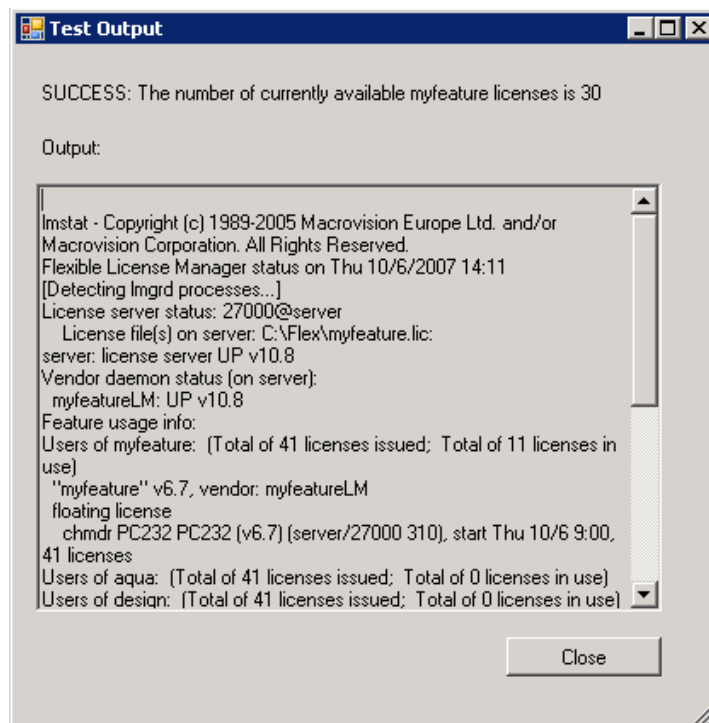


Figure 8. Example test output from license server communication test.

If there is an error, check the settings are correct. If they are correct see section five on debugging HAF.

#### Step 4. Saving the Configuration

The configuration now needs to be saved for use by HAF. Go to the **File** menu and choose **Save**. Click OK to accept the default filename **ActivationFilter.config** in the same directory where HAF was installed. See Figure 9.

**NOTE: The filename must be ActivationFilter.config**

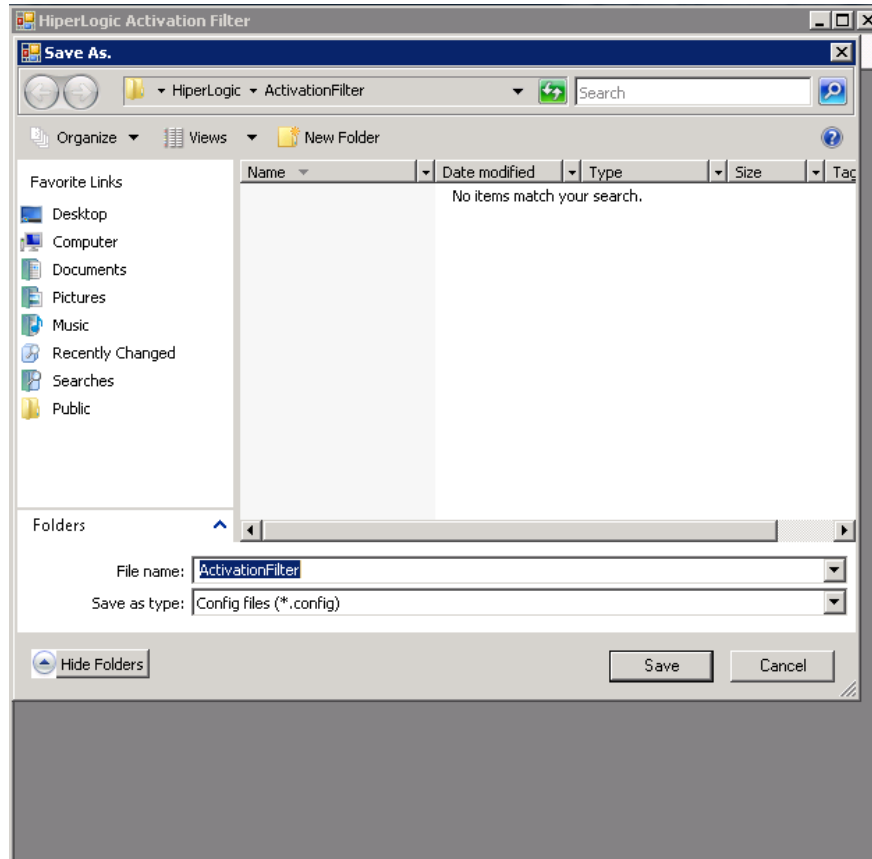


Figure 9. Save the configuration file.

#### Step 5. Create an example job for testing

To create a test example job, launch the Windows HPCS Job Manager and fill in the job information, see Figure 10. Click the **Licenses** section on the left hand side, and then click the **Add** button.

In the **Feature** text box type in the name of the FLEXlm feature this application requires.

**NOTE: The Feature should match the Feature name you entered in Step 2.**

Next in the **Amount** text field type in the amount of feature tokens/licenses required.

Finally, save this job XML to **c:\temp\testjob.xml** by clicking on the **Save Job as** button in the lower right hand corner, see Figure 10.

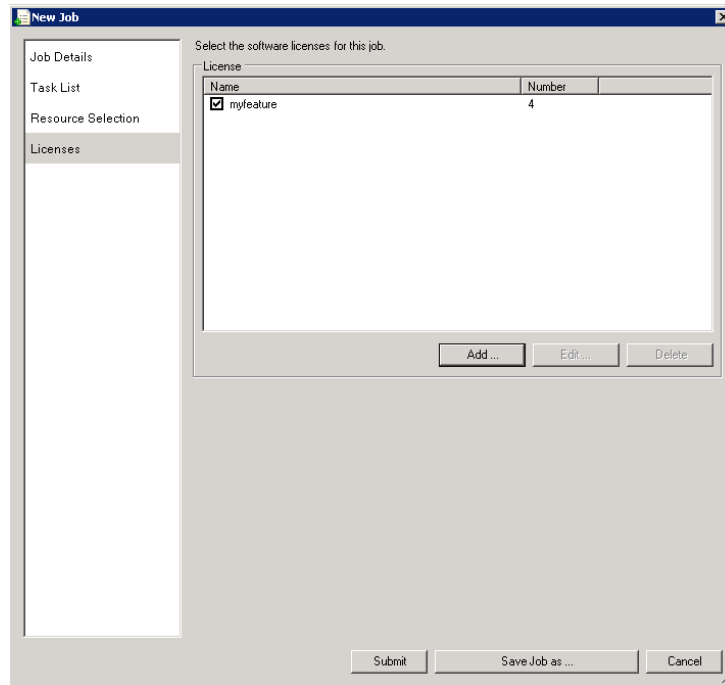


Figure 10. Creating a job template.

### Step 6. Testing HAF with the test job

To test HAF with the test job created, click on the HAF **Tools->Test** menu item, see Figure 11.

**NOTE: If the configuration file ActivationFilter.config described in Step 4 was not saved, this menu item will not be enabled.**

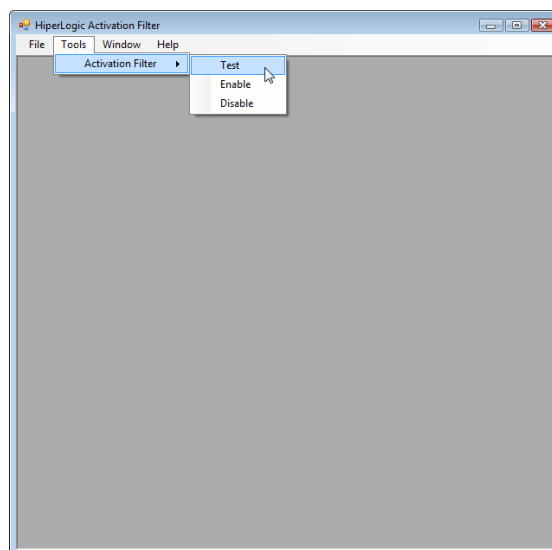


Figure 11. The HAF test menu item

Enter the path to the test job saved from Step 5, then click the **Test** button. See Figure 12.

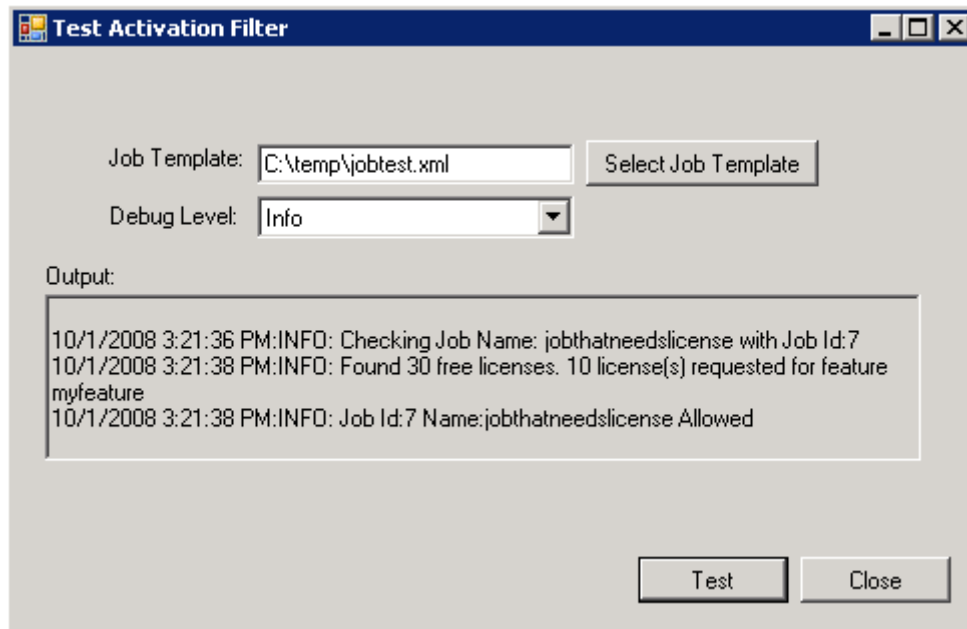


Figure 12. The Test Activation Filter allowing the test job.

A dialog box will indicate if the job would have been allowed to run by HAF. The HAF log output is then displayed in the **Output** window area.

### Step 7. Enable HAF for production

There are three different ways to enable HAF. The simplest way to enable HAF is to click the **Tools->Activation Filter->Enable** menu item. See Figure 13.

**NOTE: If the configuration file ActivationFilter.config described in Step 4 was not saved, this menu item will not be enabled.**

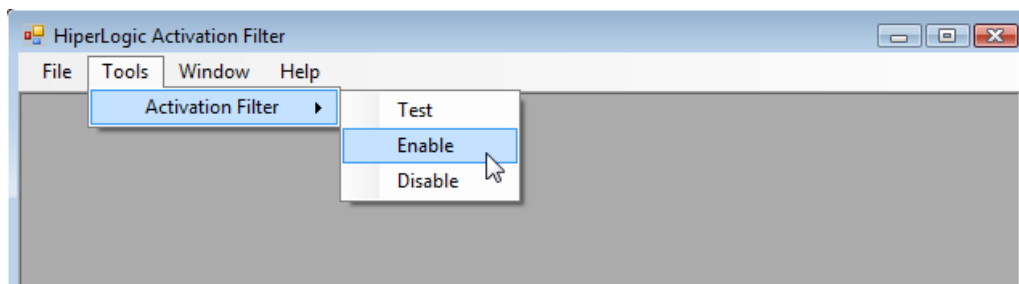


Figure 13. Enabling HAF.

The filter can also be enabled manually using the Microsoft HPC Cluster Manager tool that comes with Windows HPCS under the **Configuration tab-> Job Management section->Configure job scheduler policies and settings->Filter Tab**. See Figure 14.

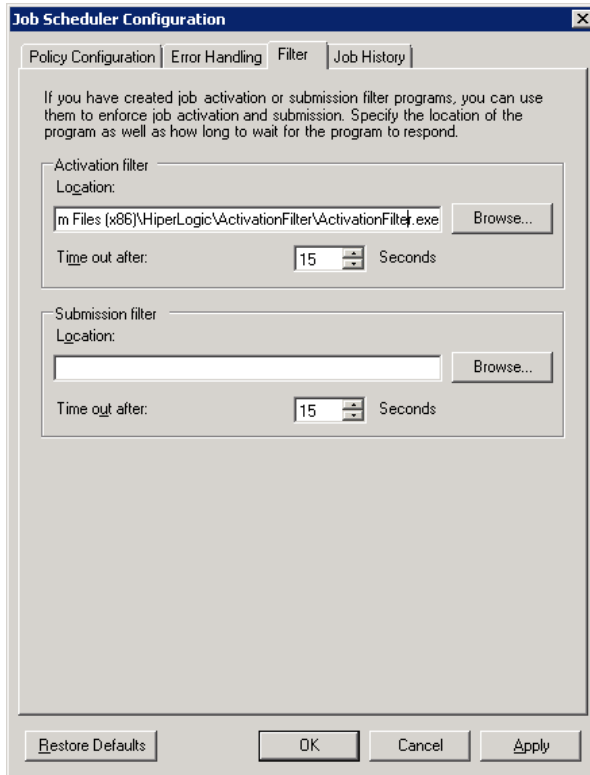


Figure 14. Enabling HAF through the Microsoft HPC Cluster Manager

Alternatively, HAF may be enabled using the Windows HPCS **cluscfg** command. See section six on how to do this.

After HAF is enabled, any queued and submitted jobs will now be subject to the HAF filter.

### Step 8. Monitoring HAF actions

All actions performed by HAF are logged to the log file in **%INSTALLDIR%\ActivationFilter.log** where **%INSTALLDIR%** is the location HAF was installed, by default **c:\Program Files (x86)\ActivationFilter\**.

Open this log file with a text editor to see what allow/deny actions HAF is performing on jobs.

## Section 4. Disabling HAF for Production

To disable HAF so Windows HPCS will schedule jobs without using the Activation Filter, click the **Tools->Activation Filter->Disable** menu item. See Figure 15.

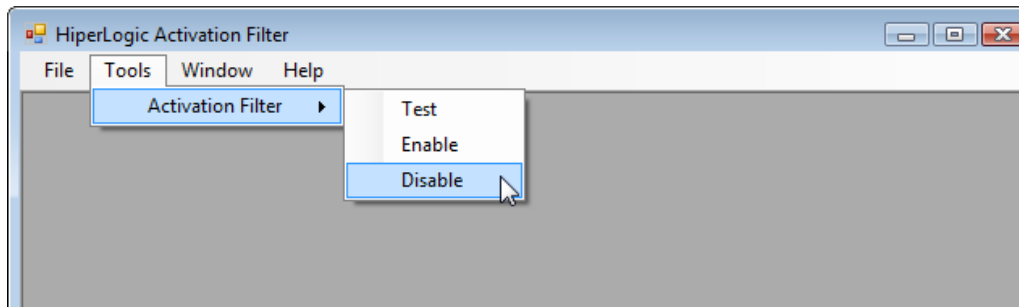


Figure 15. Disable HAF

The filter can also be disabled manually using the Microsoft HPC Cluster Manager tool that comes with Windows HPCS under the **Configuration tab-> Job Management section->Configure job scheduler policies and settings->Filter Tab**.

Alternatively, HAF can be disabled using the Windows HPCS **cluscfg** command. See section six.

## Section 5. Debugging HAF Activation Issues

All actions performed by HAF are logged to the log file in `%INSTALLDIR%\ActivationFilter.log` where `%INSTALLDIR%` is the location HAF was installed to, by default `c:\Program Files (x86)\ActivationFilter\`.

The log file will display the job ID and the reason the job was or wasn't permitted. This section will list some things to check if HAF did not take the correct action for a job.

### **Job is starting even though licenses are not available**

If a job starts when a license is not available, there are several reasons this could occur:

1. The job license did not specify the correct feature name, or the feature name is misspelled.
2. The job license did not specify all required FLEXlm features required by the application.
3. The job license(s) did not specify enough token(s).
4. The application feature name is not configured in HAF. HAF will ignore unknown license features in the job file and allow the job to run.
5. The licenses were available when HAF checked, but by the time the application was launched on the compute nodes all licenses were in use.
6. HAF was not enabled.

Check the `ActivationFilter.log` file to see the root cause.

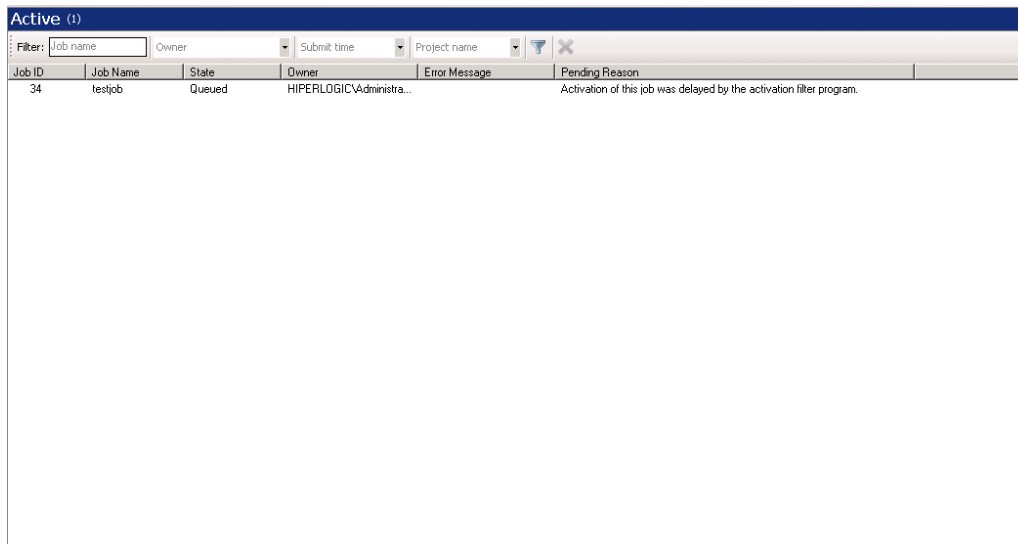
### Job is not starting even though licenses are available

If a job will not start because HAF is not allowing it, **Pending Reason** will be listed in the Job Manager. See Figure 16. If there is any other message in **Pending Reason** other than “**Activation of this job was delayed by the activation filter program**”, then HAF is not the reason the job is not starting.

### Job is not starting even though nodes are available

As of this writing Windows HPCS reserves a node that is currently being held up by the activation filter in the Q state. This can result in case that all jobs are in the Q state while all nodes are idle. Subsequent jobs will have a **Pending Reason** indicating that sufficient resources are not available. Windows HPCS will not consider other jobs to run after it has reserved nodes that the activation filter would not allow, even if those jobs could run.

HiperLogic has submitted a request to Microsoft to change this behavior to release the node reservation if the activation filter will not allow the job to start.



The screenshot shows a window titled "Active (1)" with a table of job information. The table has columns for Job ID, Job Name, State, Owner, Error Message, and Pending Reason. A single row is visible with Job ID 34, Job Name testjob, State Queued, and Pending Reason "Activation of this job was delayed by the activation filter program." The Owner column is partially visible as "HIPERLOGIC\Administra...".

Job ID	Job Name	State	Owner	Error Message	Pending Reason
34	testjob	Queued	HIPERLOGIC\Administra...		Activation of this job was delayed by the activation filter program.

Figure 16. A job being held by HAF.

Otherwise if HAF is not allowing the job to run, check the ActivationFilter.log file (See Step 8) for why HAF is not allowing the job to start.

### lmutil.exe is unable to talk to the FLEXlm server

If there appears to be a communication error like the server is down, double check your server and port settings are correct. Also make sure there is no firewall between the cluster head node and your FLEXlm server.

If **lmutil.exe** is communicating, but you are getting erroneous output, make sure the **lmutil.exe** being used is the same or greater than the version used by the application server. Download the latest version as recommended in Section One/Step Two to avoid this issue.

## Section 6. Advanced Topics

### Increasing the Windows HPCS activation filter timeout

Windows HPCS by default has a fifteen second timeout for the activation filter program. If HAF takes longer than fifteen seconds for a query, Windows HPCS will kill HAF and not allow the job to start.

If HAF is configured to have an application query wait for longer than fifteen seconds, the Windows HPCS activation filter timeout will have to be greater than your HAF settings.

For example, to increase the Windows HPCS activation filter program timeout to thirty seconds type the following command on the head node at the Windows command prompt:

```
cluscfg setparams ActivationFilterTimeout=30
```

To view that the current setting type the following at the command prompt:

```
cluscfg listparams
```

### Disabling/Enabling HAF using cluscfg

The **cluscfg** command included with Windows HPCS allows the activation filters to be enabled or disabled. To use this command to disable HAF type the following command at the Windows HPCS command prompt:

```
cluscfg setparams ActivationFilterProgram=""
```

Alternatively use the **Tools->Activation Filter->Disable** menu command in HAF.

To enable HAF, use the

```
cluscfg setparams ActivationFilterProgram="prog"
```

Where *prog* is the full path to the **ActivationFilter.exe** executable. Alternatively use the **Tools->Activation Filter->Enable** menu command in HAF.

### Using HAF with the job command

License features can be added with the Windows HPCS **job** command line by using the **/license** option. For example, to submit a job that requires four licenses of *MYFEATURE*, the command line would be

```
job submit /numprocessors:4 /license:myfeature:4 myapp.exe
```

## Command line usage

The HAF Configurator graphical user interface is a front end that interacts with the console HAF ActivationFilter.exe application.

To change the default logging level, change the location of the default configuration file, or the default location of the log file, then interact directly with the ActivationFilter.exe command instead of using the HAF Configurator.

To use HAF directly, start a Windows command prompt and change to the HAF installation directory.

Next, type the ActivationFilter.exe /? to see the example usage. See Figure 17.

```
Administrator: Command Prompt
c:\Program Files (x86)\HiperLogic\ActivationFilter>ActivationFilter.exe /?
/Debug:<Off|Error|Warning|Info|Verbose> The debugging level for the logfile.
Default value: 'Info' (short form /D)
/Silent[+|-] Do not print logging output to the
console. Default value: '-' (short form
/S)
/LogFile:<string> The output logging file. Default
value: ActivationFilter.log (short
form /L)
/ConfigFile:<string> The 1.1 required configuration file.
Default value: ActivationFilter.config
(short form /C)
<InputFile> Windows HPC Server 2008 Xml Job File.
c:\Program Files (x86)\HiperLogic\ActivationFilter>_
```

Figure 17. Using ActivationFilter.exe

There are several options to **ActivationFilter.exe** to override the default settings. For example, to increase the logging from Info to Verbose type:

```
ActivationFilter.exe /Debug:Verbose <Job File>
```

Where <Job File> is the HPCS XML job created in Step 6.

## Section 7. Contacting Support

Please read our Frequently Asked Questions in this section before contacting support:

Q: I installed HAF, but my jobs still go through when there are no licenses, what is wrong?

A: There are several things to check for:

1. Is HAF enabled?
2. Does the job license feature match what is configured in HAF?

3. Was the license information added to the job?

4. Did the ActivationFilter.log file indicate anything?

Q: Can I release a single job from the Activation Filter?

A: The current release does not allow control of individual job activation. If a job is held by the Activation filter in the Q state that needs to continue (for example the user made a typo in the number of licenses required) then right click on the job in the Job Manager and choose modify to change the licenses.

Q: We had a job HAF allowed through with sufficient licenses, but we received a job error that the application couldn't obtain license, what causes this?

A: There are several possibilities:

1. The user did not specify the correct number of licenses required in the job.
2. The user did not have the complete list of required features in the job.
3. The user spelled the feature wrong, or used the wrong case in the job.
4. It is possible HAF allowed the job to run by checking for sufficient licenses, but in the window of time it took to start the licensed application another user grabbed the needed licenses.

Q: When a license is not available, the job holds up the node in the Q state leaving it idle for an extended period instead of considering another job to run. Can this be fixed?

A: This is a design issue with Microsoft HPC Server 2008. The scheduler will assign resources to the job and wait indefinitely until the ActivationFilter allows the job to start.

HiperLogic has requested Microsoft change this behavior so that if a license is not available, the job releases its resources and returns to the queue instead of holding onto resources until licenses are available. If you encounter this problem, please contact us so we can give this feedback to Microsoft.

Q: We use a commercial application that submits directly to the cluster, the application does not use the **job** command or the HPC Job Manager to submit jobs. We contacted the vendor, and they do not have a workaround to add license information to the job through the application. Can this application work with HAF?

A: Yes, but a HPC Server Submission Filter is required to dynamically add the required license information at submit time. HiperLogic can provide a custom Submission Filter on a consulting basis. Please contact [sales@hiperlogic.com](mailto:sales@hiperlogic.com) for a quote if you encounter this issue during your trial.

If you do not find an answer to your question, please email [support@hiperlogic.com](mailto:support@hiperlogic.com) with your question. Please include your **ActivationFilter.config** and **ActivationFilter.log** file from **C:\Program Files (x86)\HiperLogic\ActivationFilter** in your email.

## **Section 8. Extending HAF**

HAF has an extensible plug-in framework to allow for other license technologies for your site. Please contact [sales@hiperlogic.com](mailto:sales@hiperlogic.com) to discuss a consulting engagement if you require special customization.