

# I Getting Started

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*This section tells you how you can start using your Houdini animation system.*

## I WELCOME TO HOUDINI

The Houdini 3D animation system is the most powerful animation system available for Windows NT/2000/XP, Silicon Graphics Irix, Red Hat Linux, and Solaris SunOS platforms. Its component editors provide you with all the necessary tools to create animations and to integrate them with live footage.

For the Windows NT/2000/XP version of Houdini, see *Windows Installation* p. 9  
For the Irix, Linux, or Solaris versions of Houdini, see *UNIX Installation* p. 6

If you are experienced with other animation packages, you may want to read through the Installation, try the exercises in the Tutorial Guide, and look at some of the samples located in *\$HFS/demo*.

If you are having difficulty with any words used in these manuals, a Glossary is provided (at the end of Volume III) for your convenience.

Please take a minute to fill in the *Feedback Card* located at the end of the manual, and send it back to us.

### I.1 FEATURES

Houdini offers a full range of tools including:

- Integrated suite of tools for modeling, animation, character, particles, compositing, shading, and rendering.
- Unique immersive procedural modelling technology allows for rapid scene assembly and intuitive modification.
- Built-in expression language allows precise scripting of movement in an animation, and avoids jerkiness by ensuring smooth ease-in and ease-out transitions.
- Supports many popular file formats, including: *.geo*, *.bgeo*, *.poly*, *.bpoly*, *.sdl*, *.med*, *.eps*, *.dxf*, *.obj*, *.iges*, *.iv*, *.ifd*, and *.rib*.
- Built in programming language (VEX) for creating shaders and operators.
- Direct interface to high-quality ray-traced rendering via the *mantra* interactive renderer, and output to RenderMan®.

## 2 GETTING HELP

### 2.1 CHECK AVAILABLE HELP FIRST

You can get help from several sources:

- **This manual.** Use the index at the back to find a keyword relating to your problem. For example: you need to know what “Gouraud Mode” is and how to activate it. Looking it up in the index will point you to the pertinent information.
- **Tutorial Guide.** Step-by-step examples.
- **Demo files.** You can also find examples in the *\$HFS/demo* subdirectories. Examples exist for ideas in most aspects of Houdini.
- **On-line Manuals.** Display the on-line manuals by selecting the *Help* menu item (see the section *On-line Manuals* p. 41 for details).
- **Help Tags.** Activate these with the *Help > Help Tags* menu item. When checked, holding the mouse pointer over any icon or button for more than a few seconds displays a small information pop-up to assist you.

### 2.2 STILL HAVE PROBLEMS? REPORT THEM TO US

If you can't find the information in the manual or the on-line help system, and you have a valid support contract with Side Effects Software Inc., you can contact us:

**Side Effects Software Inc.**

477 Richmond Street West, Suite 1001  
Toronto, Ontario, M5V 3E7

Tel: 416.504.9876 Fax: 416.504.6648

e-mail: [support@sidefx.com](mailto:support@sidefx.com), web: <http://www.sidefx.com>

### 2.3 WHAT TO KNOW BEFOREHAND

When reporting problems please include the following information:

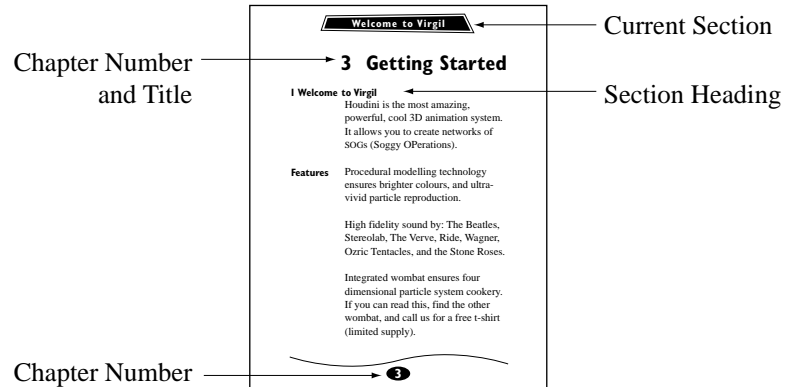
- The version number of the program you're using (get this via *Help->Version* in Houdini)
- The machine and processor type (e.g. Pentium IV, Octane, UltraSPARC II)
- For Windows and Linux, the video card and video drivers used.
- The operating system version.
- In many cases it's helpful to have a .hip file that shows the problem so we can reproduce it.

■ **Tip:** You can get hardware information in Irix with the *hinv* command.


## 3 CONVENTIONS USED IN THIS MANUAL

### 3.1 GENERAL NOTES

- Every Section begins with a Chapter Number and Title. This Chapter Number is found on the bottom of every page in that chapter.
- The top of every page contains the name of the Current Chapter within a Section.



- The keyboard font is used whenever explicit keys need to be typed to produce a result. For example, if you see:

Click in the Viewport using `Ctrl`  to bring up the menu...

You should hold down the key on your keyboard called `Ctrl`, and while holding down that key, click in the specified area with the right mouse button.

- Whenever a *filename*, or mathematical function (e.g. *cubic()*) appears in the text, they are in italic.
- Keyboard commands are represented in the Courier font, and the arguments for the command follow it in italics.

`opread filename`

- Optional items are displayed in square brackets [-n | -b | -c]. The separators: | mean either one or the other of these options can be used at a time.

`display [-l linewidth] [-d on/off] [-h on/off]`

- Words that appear in the glossary are in *italics* in their first instance.

## 3.2 KEYBOARD NOTES

Keyboard short-cuts are more understandable if you bear the general purpose of each key in mind. Below are some guidelines to remember:

**This Key:**

**Generally does this:**

`Tab`

Opens Operator listing.  
e.g. In any operator pane `Tab` opens the listing for adding new OPs. Also in parameters `Tab` moves the focus to the next edit field when entering data (`Shift Tab` to reverse focus).

`Ctrl` 

In most parts of houdini, it brings up a pop-up context

`Esc`

Escapes you out of what you're doing altogether.  
Think "Escape" or "Interrupt".

# 2 Installing Houdini

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## I INSTALLATION

This section gives an overview of the installation process. More details on Windows, Irix, Linux, and Solaris installations and license management follow.

### I.1 NECESSARY STEPS

The following steps are required to prepare the environment so that you can use Houdini on a workstation:

- Install the Houdini Software from the CD-ROM.
- Obtain and install license keys.

Houdini requires a license to run. If you have multiple licenses of houdini that you want to be able to float from machine to machine, see the instructions outlined in the *License Manager* p. 18.

Be sure to take a look at the section *Customising Your Installation* p. 12 after you have finished with your installation, and fill out the Feedback card at the back of the Volume III.

### I.2 DISTRIBUTION MEDIA

The software components for Houdini for all operating systems are contained on the same CD. A second CD contains documentation and a collection of demos and tutorials.

### I.3 WHAT THE DISTRIBUTION DISC CONTAINS

Directory	Contents
<i>Windows/</i>	Houdini for Windows NT, 2000, or XP.
<i>Linux6/</i>	Houdini for HP Red Hat Linux 6.x.
<i>Linux7/</i>	Houdini for Red Hat Linux 7.x or later.
<i>Irix/</i>	Houdini for Irix 6.5 or later.
<i>Solaris/</i>	Houdini for SunOS 5.8 or later (UltraSPARC II).

## 2 UNIX INSTALLATION

This section describes how to install Houdini 5 on Silicon Graphics Irix version 6.5 or higher, Red Hat Linux 6.x (on HP machines only), Red Hat Linux 7.x or higher, or Solaris SunOS 5.8.

### INSTALLATION SUMMARY

The following steps are required to prepare the working environment so you can use Houdini on a workstation:

- Log in as root.
- Mount the CD and change to the subdirectory corresponding to your operating system.
- Install the software by running *houdini.install*.
- Change to the directory where houdini was installed and run *source houdini\_setup*.
- Run *hkey* and submit the license server code to your Side Effects representative to obtain a license key.
- Install the key using *hkey*.

### 2.1 SIZE OF INSTALLATION

The size of Houdini, without any documentation or demo files, varies depending on the operating system:

Windows	67 MB
Red Hat Linux 6.x	88 MB
Red Hat Linux 7.x	68 MB
Irix	128 MB
Solaris	171 MB

The demo and documentation directories may be optionally installed, and although useful, are not critical to the operation of Houdini. These modules require approximately 380 MB of disk space. You might choose to access these files from a network file server if you have a large site.

### 2.2 UPGRADING HOUDINI

If you are running the licensing tools of an older version of houdini and you want to upgrade to a newer version then you must first stop the old tools. First, exit any running houdini sessions. Then, as root, kill the *sesinetd* and *hserver* processes. Note that if you are running Linux, *sesinetd* and *hserver* cannot be restarted for one minute, so you need to wait one minute before running *houdini.install*.

## 2.3 THE HOUDINI.INSTALL UTILITY

The *houdini.install* script can be found in the directory on the CD that corresponds to your operating system. Start it as root by running

```
./houdini.install
```

The installation script will ask you a series of questions and then install Houdini and, optionally, install licensing.

## 2.4 INSTALLING A NODE-LOCKED LICENSE

Houdini has support for network licensing or node-locked licensing. If you will only run houdini on one machine then you can use node-locked licensing and also run the license server on that machine. If you do not want to restrict houdini to a certain machine then you will need network licensing. With network licensing, one machine is designated as the license server and other machines running houdini will connect to the license server to acquire a license. Please see the next chapter, *License Manager* p. 18, for an explanation of network licensing and how to set up a license server.

The license server can be installed for a node-locked license with the *houdini.setup* utility. Simply answer “yes” when it asks if you want to install the license server. Houdini license files and utilities are stored in */usr/lib/sesi*. The license server daemon is called *sesinetd* and it will start up by default when the machine is started.

Once *houdini.install* has finished, change to the directory where houdini was installed and run source *houdini\_setup* from that directory.

Sourcing *houdini\_setup* will add the *hkey* utility to the path. Run *hkey*. At the top of *hkey* window is a line that says “SERVER *server-name server-code*”. Send this information to your Side Effects Software representative to receive your license keys.

When you have the license keys, click on the “Install New Keys...” button. Paste them into the text fields by pressing Ctrl-v and press done. You should now be licensed to run houdini.

## 2.5 SETTING UP THE ENVIRONMENTS

Houdini needs certain environment variables to be set so it can find its program libraries and support files. These variables will be set by sourcing a file called *houdini\_setup* from a c-shell in the directory where houdini was installed.

The Houdini environment must be set up for every animator that will use the machine. To automatically set up the environment when you log in, add the following line in your .login file:

```
cd /usr/hfs5.0      # set to location of your Houdini install
source houdini_setup
```

**Note:** if you install Houdini into a directory other than the default */usr/hfs5.0* location, you must specify the correct directory with the *cd* command.

## 2.6 LAUNCHING HOUDINI ON UNIX

### LAUNCHING FROM A C-SHELL

Enter the command:

```
houdini Enter
```

### LAUNCHING WITH A .HIP FILE

To launch Houdini and load a hip file, enter the command:

```
houdini myHipFile.hip Enter
```

### SPECIFYING A .CMD SCRIPT FROM THE COMMANDLINE

To launch Houdini and execute a .cmd, enter the command:

```
houdini myHipFile.hip [myCmdFile.cmd] Enter
```

## 3 WINDOWS INSTALLATION

*Houdini 5 runs on Windows NT 4.0 (service pack 3 or higher), Windows 2000, or Windows XP.*

### 3.1 INSTALLATION SUMMARY

The following steps are required to prepare the working environment so you can use Houdini on a workstation:

- **Log in:**  
Log in as Administrator or a user with equivalent privileges.
- **Install the software:**  
Insert the CD and follow the on-screen instructions. If your CD-ROM drive does not support autoplay, run *setup.exe* from the *Windows* subdirectory on the CD.
- **Find your server code:**  
Run *Start > Programs > Houdini 5 > Key Installer* and submit the license server code to your Side Effects representative to obtain a license key.
- **Install your license:**  
Install the key using the *Key Installer*.

#### WINDOWS UPGRADE NOTICE

When upgrading Houdini for Windows, the *sesinetd* and *hserver* services should automatically be stopped and upgraded, so you should not need to do this manually.

### 3.2 INSTALLATION INSTRUCTIONS

1. Log in as Administrator or as a user with Administrator privileges.
2. Insert the Houdini 5 CD into your CD-ROM drive. If you have *AutoPlay* enabled the install process will begin automatically. If it does not, use the *Start* menu *Run* option and enter:

E:\Windows\setup.exe

Where E:\ is the drive letter of your CD Drive.

3. The install program first displays the Welcome screen. Use the *Next* button to advance.

**Note:** If you receive an error message containing the text “Cannot run 16-bit Windows program” when you attempt to install Houdini, you will need to install Microsoft Service Pack 3 or higher for Windows NT.

4. The next screen gives you the option of running an Express Installation or a Custom Installation. For almost all users, we strongly recommend you use the Express Installation option.

The other important choice in this screen is if you wish to install a local license server. Unless you are connecting to a license server to get floating licenses, you should install a local license server.

### 3.3 CUSTOM INSTALLATION

If you chose the Custom Installation option you may install any of the following components:

#### *Houdini Application*

Installs all files required to run Houdini and its related programs.

#### *Set Up Environment*

Sets up the registry on your machine to set several default environment variables when running Houdini or any of its related applications. These environment variables are not set as system environment variables. They are only set when one of the Houdini applications is run.

#### *Start Menu*

Creates a folder in your *Start > Programs* menu. Many of the most common Houdini applications are added as entries in this new folder.

#### *File Associations*

Creates system-wide file associations for all the file types that Houdini or its related applications know how to read. For example, it creates an association between “.hip” files and Houdini, and “.jpg” files and *mplay*.

#### *GNU Tools*

Installs the GNU Unix tools. These tools are provided as a convenience for users familiar with Unix. They are provided without warranty under the GNU General Public License and their source code is included on the CD.

If you install these tools you might want to add them to your path via the *Control Panel > System* dialog. On Windows NT, go to the *Environment* page. On Windows 2000/XP, go to the *Advanced* page and press the *Environment Variables...* button.

#### *License Server*

Installs a license server on the local machine. This option installs the server, sets all default options, and starts the server. It also sets the server to restart automatically when the machine is rebooted.

#### *HDK Toolkit*

This option installs the Houdini Developers Toolkit. The HDK requires a separate license and is intended to assist developers of custom Houdini tools.

### 3.4 RUNNING HOUDINI WITHOUT A NETWORK

Houdini no longer requires the loopback adapter to be installed to run without a network on Windows.

### 3.5 INSTALLING LICENSES

Because licenses are keyed to one specific server, Side Effects Software cannot issue a license key for houdini until we receive your server name and server code. The same program that computes the server code is used to install licenses. Run *Start > Programs > Houdini 5 > Key Installer* and find the line that says:

```
SERVER <server-name> <server-code>
```

Submit this line to your Side Effects representative to obtain license keys. Then run the key installer again, click *Install Keys*, and paste the keys into the text fields. Click the *Update Key Info* to verify that the keys were installed correctly. You should now be able to run Houdini.

### 3.6 LAUNCHING ON WINDOWS


You can start Houdini, or any associated programs such as *iply*, either by using the *Start* button or by typing within a Command Prompt window. Also, double clicking on a file with a *.hip* extension will launch houdini with that file.

#### USING THE START BUTTON

Using the *Start* menu, choose *Programs > Houdini 5 > Houdini*.

#### USING THE COMMAND PROMPT

To start from a Command Prompt, use the *Start* menu to go to *Programs* and choose *Command Prompt*. This should open a system window; at the prompt, type:

```
houdini 
```

### 3.7 UNINSTALLING HOUDINI ON WINDOWS

To uninstall Houdini, open *Start > Settings > Control Panel* and select *Add/Remove Programs*. Select “Side Effects Software Houdini” from the list and press *Add/Remove* to open the uninstaller.

If you want to install some components of Houdini that you did not install initially, you can simply run the Houdini Installation program from the CD again and choose the Custom Installation option.

## 4 CUSTOMISING YOUR INSTALLATION

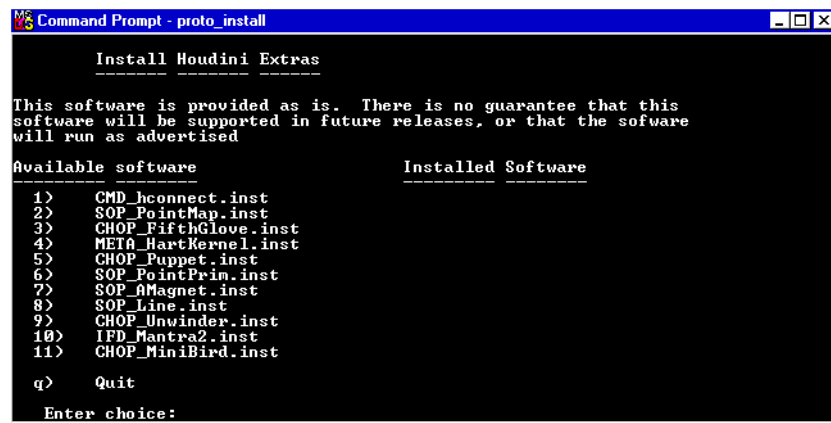
### 4.1 HOUDINI DEVELOPMENT KIT

The Houdini Development Kit (HDK) is an optional feature of Houdini which allows those with programming skills to customize the software to meet organizational or production-specific needs. The kit includes examples and documentation outlining its use. Every tool needed to write your own custom SOPs, COPS, CHOPS, POPS, ROPS, Objects and commands is contained in the HDK.

#### installation of the houdini development kit

Installation of the Houdini Development Kit (HDK) requires a specific license from the License Server. If you are installing Houdini for the first time on your network, you must configure the License Server(s) with the appropriate licenses before selecting HDK from the installation menu. Any of the options in the installation menu can also be installed at a later time.

### 4.2 INSTALLING OPTIONAL EXTENSIONS (PROTO\_INSTALL)



```

Command Prompt - proto_install

Install Houdini Extras
-----
This software is provided as is. There is no guarantee that this
software will be supported in future releases, or that the software
will run as advertised

Available software          Installed Software
-----
1)  CMD_hconnect.inst
2)  SOP_PointMap.inst
3)  CHOP_FifthGlove.inst
4)  META_HartKernel.inst
5)  CHOP_Puppet.inst
6)  SOP_PointPrim.inst
7)  SOP_AMagnet.inst
8)  SOP_Line.inst
9)  CHOP_Unwinder.inst
10) IFD_Mantra2.inst
11) CHOP_MiniBird.inst

q)  Quit

Enter choice:
  
```

The application called *proto\_install* provides an interactive installer for extensions to Houdini. Since many extensions are released just before software release, it is not always possible to document what these extensions are. By running the program, you will interactively get to see which extensions are available and install some or all of them.

## 4.3 SPECIAL HOUDINI DIRECTORIES & VARIABLES

### SPECIAL DIRECTORIES

- `$HFS` The directory where houdini was installed.
- `$HFS/bin` Contains Houdini programs and commands.
- `$HFS/demo` Contains Houdini demos and sample files, use `$HD`.
- `$HFS/document` Contains Houdini documentation in Acrobat format.
- `$HFS/houdini` To jump here, use `$HH`.
- `$HFS/houdini/config` Interface configuration files. These allow you to customise the Houdini interface.
- `$HFS/houdini/fonts_gl` This is a directory of site-specific fonts.
- `$HFS/houdini/pic` Standard Houdini images.
- `$HFS/houdini/sbin` Tools for Houdini administration.
- `$HOME/houdini5` User specific configuration files
- `/usr/lib/sesi` License Manager files

Note that on Unix systems, `HFS` is an environment variable that is set when you set up the houdini environment (see *Setting up the Environments* p. 8).

### THE HOUDINI PATH

The Houdini path is user definable, and is stored in the environment variable `$HOUDINI_PATH` where Houdini will look to load support files. By default, the path will search:

`$HIP:$HOME/houdini5:$HSITE/houdini5:$HFS/houdini`

- `$HIP` is typically the directory for the current shot, and may contain shaders, pics, etc. that are used by the hip file.
- `$HOME/houdini5` will contain support files specific to the user
- `$HSITE/houdini5` may contain company-wide support files
- `$HFS/houdini` contains the default support files

### CONVENIENCE ENVIRONMENT VARIABLES

The setup file contains sets many environment variables that are useful when operating Houdini. Some of the variables make it easy to navigate between Houdini directories, like `$HH`, which brings you to `$HFS/houdini`. Read the comments in the `houdini_setup` file for additional tips. It sets up the following convenience environment variables:

#### convenience environment variables

- `HFS` The main Houdini directory
- `$JOB` Job specific configuration files
- `HH` `$HFS/houdini`
- `HD` `$HFS/demo`
- `HB` `$HFS/bin`
- `HHH` `$HOME/houdini`
- `HIL` `/usr/local/houdini`

## THE HIP VARIABLE

\$HIP can be used in the path names of files in Houdini. HIP is the location of the .hip file as seen by the user on the local machine. If a .hip file and its support files, such as geometry files and images, are moved to a new location in the file system, \$HIP will always point to the support files correctly.

Moreover, if two users or more are accessing a project over the file system, and the path to the same .hip file is different from different machines, \$HIP will allow all the users to access the same support files correctly. This is not possible with any other mechanism.

## 4.4 INTERFACE COLORS

While Houdini 5 lets you choose a light or dark color viewport color scheme, colors can be further customized by editing houdini resource files.

Most of houdini's interface gets its look from houdini resource files. The file *\$HFS/houdini/config/resources* contains information about font types, font size, colors, and audio volume. Sample lines from the *resources* file look like this:

```
BackgroundColor:      grey50
PaperColor:           grey90
DefaultFont:          Helvetica-Bold
DefaultFontSize:      11.0
```

### HOW TO CUSTOMIZE THE INTERFACE COLORS

Resource files, like any other houdini support file, are found by houdini using the HOUDINI\_PATH (see *Special Houdini Directories & Variables* p. 13). To override the default houdini resources, you need to copy the resources file to a location that is searched earlier in the houdini path. For example, you can put the resources file in your home directory as follows:

1. Copy *\$HFS/houdini/config/resources* to *\$HOME/houdini5/config/resources*.
2. Modify *\$HOME/houdini5/config/resources* and try out colors and fonts. For a complete list of fonts, look in: *\$HFS/houdini/fonts\_gl*.

When specifying colors, you should use the standard X windows color names. The *AudioVolume* values must be in the range of 0 - 1. To turn off sound effects, set the *AudioVolume* to 0.

Note that when you change the font resources, menus may not line up exactly. This happens if you use a proportional font instead of a mono-spaced font.

## 4.5 VIEWPORT COLORS

While Houdini 5 lets you choose a light or dark color viewport color scheme, colors can be further customized by editing another houdini resource file:

*\$HFS/houdini/config/3DSceneColors*

Within the file, the color for each type is defined as a RGB value, with each number ranging from 0 to 1. Comments in the file indicate what parts of the viewport the color affects. Below is a sample of lines from the default color scheme:

```
BackgroundColor:      0.00 0.00 0.00 # viewer background
WireframeColor:       0.70 0.70 0.70 # non-selected primitives
SelectedPrimColor:    1.00 0.90 0.00 # selected primitives
```

Changing between the light and dark color scheme in houdini will switch between the *3DSceneColors.bw* and *3DSceneColors.wb* files. The default scheme (*.bw*) provides a black on white display, and the alternate scheme (*.wb*) provides a white on black display.

You can make a copy of the *3DSceneColors* in your home directory in the same way as described in *Interface Colors* p. 14.

## 4.6 CHANNEL TABLE RESOURCES

There are several resources in the main UI resource file to control the appearance of the channel table in the Channel Editor and the Animation Interface, and the fonts used in the object list. The defaults are:

```
OpListFont:           Helvetica
OpListSize:           9.0
OpListTitleFont:      Helvetica
OpListTitleSize:      9.0
SpreadsheetFont:      Courier
SpreadsheetSize:      9.0
SpreadsheetTitleFont: Helvetica
SpreadsheetTitleSize: 9.0
```

## 5 POTENTIAL PROBLEMS

### 5.1 REMOTE INSTALLATION AND X SERVER

If running from a remote server where the X server does not permit a remote user to open an xwsh on the local display, run the install script as:

```
./houdini.install THE_REAL_THING
```

### 5.2 THE HOUDINI WINDOW DRAWS AN OUTLINE AND HANGS/CRASHES ON LINUX

Make sure you have the latest drivers for your video card. We recommend that you use the drivers provided by the card manufacturer instead of the default drivers provided by XFree86.

If you have the latest drivers and houdini still won't start, you might have a buggy version of libGLU. This library is the OpenGL utility toolkit. However, older MESA versions of this library have bugs in the tessellation functions it provides. Try backing up your existing version of this file (found in /usr/lib) and copy the provided version of libGLU.so.1 to /usr/lib. Then create a symbolic link to /usr/lib/libGLU.so.1 from /usr/lib/libGLU.so.

### 5.3 HOUDINI WINDOW WRONG SIZE OR SCROLLING OFF SCREEN

**Q:** My Houdini window sizes incorrectly, or scrolls off the screen whenever I perform certain actions in Houdini. How do I keep it from doing this?

**A:** Set these two resources in your *.Xresources* file:

```
4Dwm*transientDecoration:      none
4Dwm*maximumClientSize:        2048x1536
```

where  $2048 \times 1536$  is exactly *double* your screen resolution. i.e. In this case, the screen is  $1024 \times 768$  pixels. To find out what your screen resolution is on an Irix machine, select the *System Manager* item from the *System* menu. From the window that appears, select the *Hardware > Video* menu command.

**Note:** If this doesn't work, try setting the HOUDINI\_OVERRIDE... environment variables. These are listed in *Environment Variables* p. 146 in the Scripting section.

## 5.4 HOUDINI SOUNDS INTERFERING WITH CDMAN

**Q:** What to do if Houdini sounds are interfering with sound playback from CDman?

**A:** The problem stems from the fact that Houdini sounds are played back at a 8kHz sampling rate, whereas CDman plays audio CDs at 44.1kHz. This causes a conflict so that when the 8kHz sounds are played, the CD audio is no longer heard due to the audio hardware being switched to a 8kHz playback rate which is incompatible with the 44.1kHz playback rate of the CD. There are two solutions:

1. Change the houdini resources file to turn off the sounds. If you set the AudioVolume to 0, this will prevent the sounds from being made, and thus, your CD's will sound the same. To override the resources file, you can make a copy of the default resources file (found in *\$HFS/houdini/config/resources*) to your *\$HOME/houdini5/config* directory and make modifications there.
2. Change the sound files. These are *.aiff* files and can be found in *\$HFS/houdini/config/Audio*. If you use the *ainfo* command, you'll see that they are all sampled at 8KHz which is what causes the CD's sound to be problematic.

You can use the SGI provided *soundfiler* application to change the frequency of these to 44.1 KHz. Make sure to save out the files as AIFF format (not AIFC). Or you can use the *arecord* program to make your own warning sounds at 44.1 KHz.

# 3 License Manager

## I GETTING STARTED

The Side Effects license manager provides for the operation of network floating licenses and system node-locked licenses. At least one license manager must be accessible on the local area network or on the local host to permit Houdini to operate on a workstation.

This chapter will help you configure a workstation as a Side Effects license server. To install floating licenses, please refer to the next section. To install node-locked licenses, proceed to section *License Server Setup* p. 21.

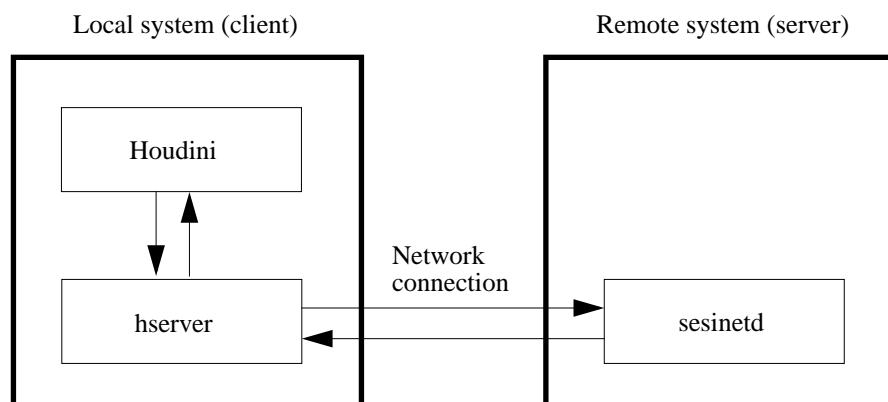
For information on simply adding a client to a license server, please refer to section *Client Environment Variables* p. 27.

**Note:** If you have upgraded from a prior version of Houdini, you will need to upgrade licenses from Houdini 3.1 (Elan) and earlier to the SESI-License Manager.

### I.1 BASED ON A CLIENT / SERVER MODEL

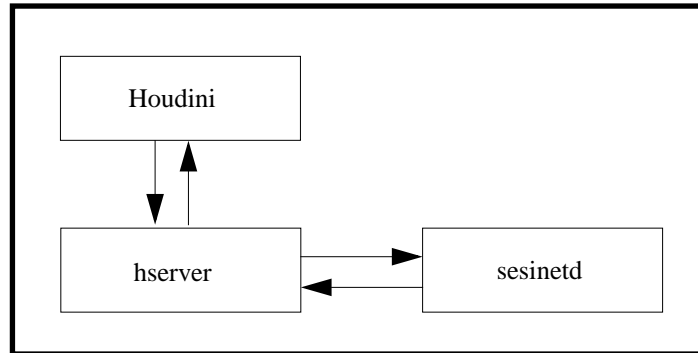
The license management system is based on a client/server model with a license manager running on one server and the applications running on one or more clients. Generally the server and client are different machines on a network.

The license manager (*sesinetd*) keeps track of a database of licenses and activity. When Houdini needs a license it communicates with *hserver* which in turn connects with *sesinetd*. It is *sesinetd* that grants licenses to valid clients and collects licenses when applications terminate.



The system is the same for a stand-alone computer except that *sesinetd* runs locally.

Local system



### 1.2 INITIAL SETUP TAKES THE MOST TIME

The license manager is meant to operate as transparently as possible to applications. Ninety percent of the administrator interaction with the license manager will be the initial setup and the installation of new license keys.

### 1.3 LOCATION OF LICENSES

Licenses are stored in a “key directory” - by default this is */usr/lib/sesi* (UNIX) or *C:\WINNT\keys* (NT - note: your *WINNT* directory maybe on a different drive or may be named slightly differently e.g. *WINNT40*).

### 1.4 LOG FILES

Log files are stored in */usr/adm/sesi.log* (UNIX) or *C:\WINNT\keys\logfile.log* (NT). The default maximum size before rotation is 250k.

### 1.5 ADMIN TOOLS

The main tools are stored in */usr/lib/sesi* (UNIX) or *C:\WINNT\system32* (NT). These are:

<i>sesinetd</i>	the license manager <i>daemon</i> .
<i>sesictrl</i>	to install and manage license key files.
<i>hserver</i>	to acquire licenses and control remote rendering.
<i>hkey</i>	for installing licences

## **1.6 SELECTING A SYSTEM TO BE A LICENSE SERVER**

When choosing systems to run as license servers you should consider the following:

### **AVAILABILITY AND LONGEVITY**

A network license server must have high availability on the network. Choose a system that will not require restarts on a frequent basis. You should expect the system to be in place and operational for some time. Don't choose a system that is likely to be sold or moved off your premises.

### **STABLE TIME OF DAY CLOCK**

If you will be installing temporary license keys (such as rental licenses or leased licenses) the system time clock is critical to the continuous operation of these licenses. Please ensure that the system clock is set correctly *before* installing the Side Effects License Manager.

### **IMPORTANT! SET THE SYSTEM CLOCK CORRECTLY!**

The licensing system is *very* sensitive to any manual adjustments made to the system clock after the *sesinetd* license daemon has been started.

If you must re-set the clock on a license server or if it has accidentally changed due to some system malfunction after the *sesinetd* license daemon has been in operation you may experience problems with the license manager software. Please contact your Houdini reseller or Side Effects Software Support for assistance. Extensive repair work may be required in this situation before the license manager software will operate again. *Avoid altering the system clock on a license server!*

The License Manager software will not be affected by changing the time zone, or adjusting the time by a few hours to correct a certain amount of drift. Operation of the *timed* or *timeslave* daemons on a license server should not affect the Manager.

### **SYSTEM LOAD AVERAGE**

Choose a system that is not loaded by heavy processing tasks or other extensive I/O tasks such as a film recorder system or renderer. Although the license manager itself does not represent high overhead for the system, availability of the server process to other systems on the network is important for the prompt servicing of license requests.

Any IRIX, LINUX or Windows NT workstation can be configured as a Side Effects license server. The license server does not need to have Houdini installed on it. It can be a completely separate system to your "file server" if that is how your network is setup.

### **PORTS**

You may choose to block services to these ports on your firewall for security purposes. The ports used are:

`sesinetd` – TCP/IP 1715

`hserver` – TCP/IP 1714

## 2 LICENSE SERVER SETUP

**Warning!** Have you chosen one or more appropriate systems to be established as license servers? If not, please review the previous section.

### 2.1 INSTALLING THE LICENSE MANAGER SOFTWARE ON A UNIX SERVER

The license server does not need to have Houdini software installed locally. License servers can operate independent of Houdini software installations. Only the tools required for administering license keys needs to be copied from the Houdini software installation.

The license manager software is provided on the Houdini distribution CD-ROM. This can be accessed either from the *license\_tools* directory on the CD-ROM or by running *houdini.install*, and selecting *Install License Server Tools* (Option 7).

The *houdini.install* script allows you to choose a directory to install the license manager software into. You do not need to install Houdini or other options if not required.

The *license\_tools* directory is provided so that you have easy access to an unarchived copy of the license management software. Use this directory for quick access to *sesictrl* for generation of a server code (see *Manual license Setup* p. 24).

1. Login as the Super User on the workstation that will be established as a license server. The following steps must be carried out on each system in turn.

2. Change directory to the CD-ROM

```
cd /CDROM
```

3. Run the *houdini.install* script

```
houdini.install
```

Follow the prompts to select the License Tools option for installation. Then follow the next series of prompts to choose the installation directory for the license tools.

The default installation directory */usr/lib/sesi* will be satisfactory for most installations. Do not choose a directory that is used by other license manager programs. Critical files for both license managers may be over-written if you do, causing problems for running Houdini and other programs.

The installation script creates a directory called */usr/lib/sesi* (this can't be renamed) and installs all of the license manager files into that directory. It creates the files */etc/init.d/sesinetd*, */etc/config/sesinetd*, */etc/config/sesinetd.options*, and */etc/rc.d/S89sesinetd*. These system files are required so that the license manager daemon *sesinetd* will start up each time the system is re-booted. A system configuration variable, */etc/config/sesinetd*, is set to "on" to enable the automatic starting of *sesinetd* upon re-boot.

**Note:** It is imperative that */usr/lib/sesi* has write permissions for the *sesinetd* process. The *sesinetd* process is not required to run as *root*.

## 2.2 INSTALLING THE LICENSE MANAGER SOFTWARE ON A WINDOWS SERVER

The License Manager can be installed on Windows by choosing the Custom Installation option and selecting the license manager from the list of components to install. In the list of components select only License Server and press *Finish* to install.

## 2.3 LICENSE KEY MANAGEMENT

### LICENSE SETUP WITH THE KEY INSTALLER UTILITY (HKEY)

*Note to UNIX users:* Before running *hkey* you must source the *houdini\_setup* script found in the \$HFS directory. This initializes the environment to allow *hkey* to run correctly.

To install the licences run *hkey*, it is located in \$HFS/bin or on NT run *Start > Programs > Side Effects Software Houdini > Key Installer*.

The opening screen displays your license server code, your server host name, plus a list of any licenses already available. If the name in the license server field is not the name of the host on which you installed and started your license key server then select and change the name to your key server and press Enter. If this is a newly installed server you should see a response in the lower text area such as:

Server <name>: No licenses active.

This indicates that *hkey* has successfully contacted the key server and that no keys have been installed so far.

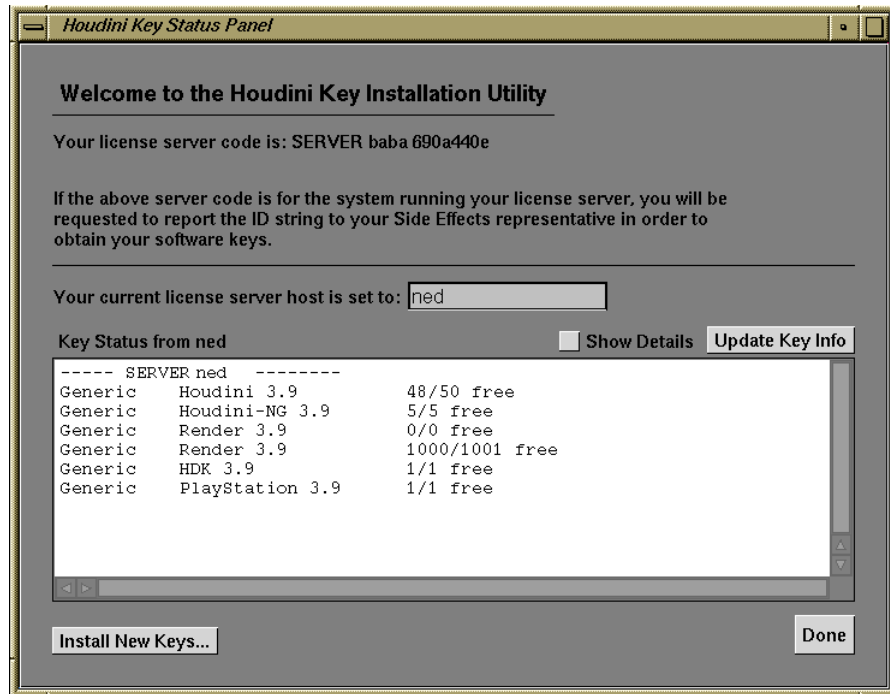
If you received a response:

Cannot connect to server <name> - verify that *sesinetd* is running, try the *Update key info* button or restart your system and run *hkey* again.

If you still have problems contact your Side Effects representative.

## License Server Setup

To add a new license you need to first submit the server code to your Side Effects representative.



You will be sent a series of keys as strings of text. Each line should be something like the following:

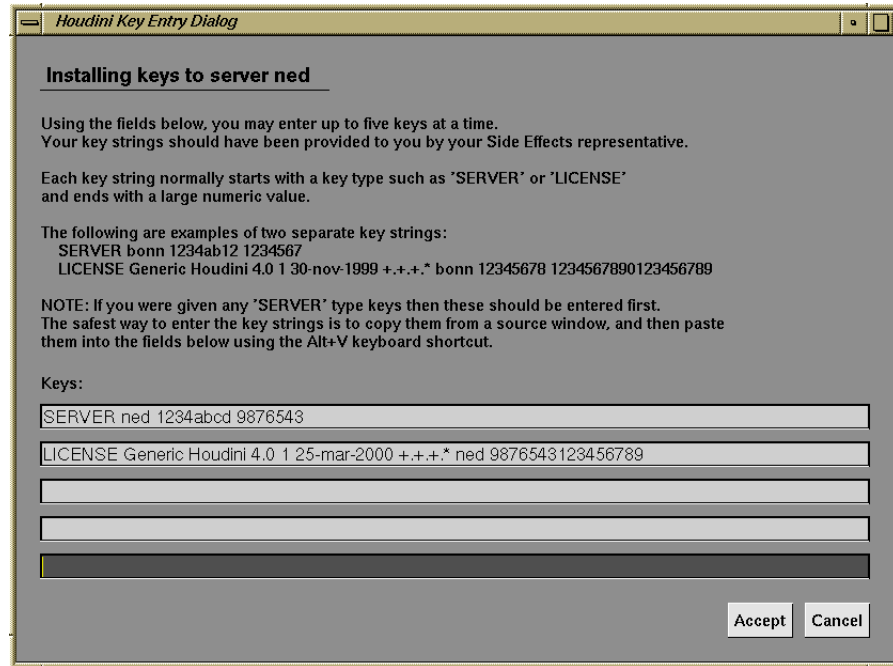
*SERVER hostname 12345678 3365395*

or

*LICENSE Generic Houdini 3.9 1 23-jul-1999 204.92.\*.\* hostname ca186a87 8092949617772600*

Once you have these, in *hkey*, click on *Install New Keys*. A second screen opens with several blank fields. Copy and paste the key strings into the blank fields, one string

per field. If you received a SERVER string put it in the top field. Press *Accept* to install the keys.



You should receive confirmation that the licenses have been accepted.

When running the install file, the keys should install immediately. However, it may take a few seconds before the key files are installed on the hard disk. It isn't wise to kill the license server during this time. However, if this happens, then it should be possible to re-install the keys.

You should now be able to run Houdini. For details on starting Houdini in UNIX and NT see Chapter 3 *Getting Started*.

### USING HKEY TO DISABLE, EXTEND OR UPGRADE KEYS

Run *hkey* and click the *Show Details* checkbox to get full information on your keys. Submit this information to your Side Effects representative who will issue you with a new key string which should be installed as described above.

### MANUAL LICENSE SETUP

If you are unable to run *hkey* you can enter the keys using a shell or Command Prompt as follows:

1. In a shell or Command Prompt enter:

```
sesictrl -n 
```

2. Send the information that is displayed, along with the class of license, to your Side Effects Software representative.

3. You will receive a text file which will install your keys.

The file sent to you will look something like:

```
SERVER hostname 12345678 3365395
LICENSE Generic Houdini 3.9 1 23-jul-1999 204.92.*.*
hostname ca186a87 8092949617772600
```

1. Save the text to a file and make it an executable or batch file.
2. Ensure that *sesinetd* is running on the license server (run *sesinetd -v*).
3. The *SESI\_LMHOST* variable is set to point at the correct server (see *Is hserver running?* p. 26).
4. Note that some mail or text programs may break up the lines in the script; to run correctly the lines should be continuous as shown above.

The meaning of the *SERVER* line is:

hostname - is the name of the server generated by “*sesictrl -n*”

12345678 - is the host id of the server

253187211- is a unique key identifying the server as valid

The meaning of the *LICENSE* line is:

Generic - Specifies the hardware platform that this key is good for

Houdini - The product that this key is for

4.0 - The version of Houdini that this key is issued for

6 - The number of “tokens” available for this key

23-jul-1999 - The expiry date of this key

204.92.\*.\* - The IP addresses serviceable by this key

hostname - The name of the server which can issue this key

b798cf91 - A unique identifier for this key

885898141134921 - A validation code for this key

5. Save the script as a batch file and then run it from a command prompt to authorise the licenses. You should receive confirmation that the licenses have been accepted.

When running the install file, the keys should install immediately. However, it may take a few seconds before the key files are installed on the hard disk. It isn't wise to kill the license server during this time. However, if this happens, then it should be possible to re-install the keys.

### license details

To check the license key server installation, execute this command:

```
sesictrl -i
```

This will return information on the current server and licenses.

Another place you can get license information is from `license.dat` and `license.auth`, in `/usr/lib/sesi/` (UNIX) or `C:\WINNT\keys` (NT). **Caution:** you can view these files but they should not be edited or changed in any way.

### adding or extending a license key

To install or modify a license or server use:

```
sesictrl -I <key info>
```

### disabling a license key

To disable a license key please contact your Side Effects Software representative.

## 2.4 DIAGNOSTICS

Sometimes difficulties occur with the license server or with the workstation client. Following are some suggested procedures to help you diagnose the problem and develop a solution.

### IS HSERVER RUNNING?

In a shell or Command Prompt enter:

```
hserver -l
```

You should details of the server and the `SESI_LMHOST` setting.

### CHANGING SESI\_LMHOST

To change the `SESI_LMHOST` name use:

on UNIX run; `setenv SESI_LMHOST <new name>`

On NT; run the install program and choose only the *Set up Environment* from the Custom Install option.

Note that if *hserver* is already running you change the license server by running `hserver -S <new name>`.

### IS SESINETD RUNNING?

To confirm that the *sesinetd* daemon (license server process) is running. Execute this command:

```
sesictrl -v
```

This provides information on the licenses available.

### DOES SESINETD HAVE WRITE PERMISSIONS (UNIX)

It is imperative that `/usr/lib/sesi` has write permissions for the *sesinetd* process.

### SESINETD DOESN'T START (UNIX)

Normally, *sesinetd* would be started at system boot time as part of the start-up process. The following lists configuration files required to make this happen:

**1. `chkconfig -f sesinetd on`**

Use this command to set the configuration variable “sesi” to the on state. This variable is checked during system startup, and must be “on” to allow the license daemon startup script to proceed.

**2. Does `/etc/init.d/sesinetd` exist? Is it readable?**

A copy of this startup script is maintained in the `/usr/lib/sesi` directory, and an original copy may also be found on the installation CD. This script is responsible for starting the license manager daemon process

**3. Does `/etc/rc2.d/S89sesinetd` exist?**

It should be a symbolic link that points back to `../init.d/sesinetd` (the file described in the previous note). If this link does not exist, or points to a non-existent entity, the daemon will not be automatically started when the system goes to run level 2 (multi-user mode).

### SESINETD RUNS, BUT CLIENTS CAN'T GET LICENSES

**1. Verify that licenses are available on the server by running:**

```
sesictrl -i
```

**2. Check the server log file to verify that licenses are being loaded on the server.**

```
more /usr/adm/sesinetd.log (Irix)
more /var/log/sesinetd.log (Linux)
type C:\WINNT\keys\sesinetd\log (NT)
```

**3. In some cases it may be possible that the product you are attempting to run may not be licensed on your server. This might happen with new versions of Houdini which require a new license key. Contact your Side Effects Software distributor if you suspect that this is the case.**

### CLIENT ENVIRONMENT VARIABLES

In some cases, it may be necessary to set the license manager environment variable on the client workstations to identify from which server they should be obtaining licenses. Such cases might exist if you have multiple license servers (not redundant sets) providing different keys. These environment variables should be setup in the login file for each user.

The following example would identify the server “newyork” as the license server.

```
setenv SESI_LMHOST newyork
```

### FOR CLIENTS NOT ON A NETWORK

You will need to run the *sesinetd* daemon and set the *SESI\_LMHOST* variable to your local machine name. This ensures that the daemon will not attempt to communicate with other servers if the machine is not attached to a network.

```
setenv SESI_LMHOST <local host name>
```

### LOGGING

Server transactions are logged in a file. By default this file is */var/log/sesinetd.log* (Linux) or */usr/adm/sesinetd.log* (Irix). The name and location of the log file can be altered by modifying the options file */etc/config/sesinetd.options*, or by using *sesictrl*.

## 3 LICENSING MODELS

### 3.1 GENERAL INFORMATION

When a user runs any portion of Houdini the license server decides if there are any licenses available and if so gives the application permission to run. A user may run as many applications as desired or even multiple copies of the same application and still consume only one license. This is referred to as sharing a license.

Licenses are allocated on the basis of hostname. For example, a user on one system might run Houdini. This requires one license from the server. A second user logs into the same system from a remote host and runs a rendering script. The second user's process will run on the license already allocated to the first user for that host. This situation requires only one license for the two users because both are executing Houdini programs on the same host system.

### 3.2 LICENSE TYPES

Houdini uses different license types for different applications as follows:

- Houdini – runs the normal graphical version of Houdini.
- Houdini NG (no graphics) – runs non-graphical applications such as hscript.
- Render – required to render using mantra, mantra3, or wren.
- HDK – Required to run the Houdini Developers Kit.
- Playstation – Required to run *gpsx* and *itim*.

### 3.3 FLOATING LICENSES

Licenses float around the network; each license may be used by any user on the network until all of the available licenses are used.

**Note:** there are some restrictions on who may use the licenses on a particular network. All of the licenses for Houdini have the restriction that license requests will only be granted to machines on the same network as the server or as specified when the enable key was generated (See *Networking Basics* for more on exactly what that means). The broadcast range of the license server will depend on the address class of the network (Class-B or Class-C).

The simplest floating license system consists of one license server and zero or more client machines on the network. When a you wish to run some component of Houdini the application will send a request to the server asking if there are any licenses available. If there are, the program will run as normal. Otherwise, an error message will be displayed telling you what went wrong.

While the program is running it is in constant communication with the server. If for some reason it cannot communicate with the server you will be notified and after a suitable delay that program will exit. This can happen for a number of reasons, most commonly, if the server machine is rebooted or a network error occurs.

### **3.4 NODE-LOCKED LICENSES**

In this case, the server and the client are the same machine. For this reason, node-locked licenses are available only on a single machine.

## 4 NETWORKING BASICS

The Side Effects License Management system uses the local area network to connect client applications with the license server to obtain license keys. One of the things it must know about is the IP address for each machine that wishes to obtain a license. This section outlines the requirements of the license manager system for your network.

### NETWORK ADDRESS CLASSES

**Note:** Network licensing requires TCP/IP. NetBEUI and IPX are not supported.

Network IP addresses can be expressed in many formats but in this context is we will use the following:

*a.b.c.d* where a, b, c and d are all integers over the range 1-255.

A network address can be described as composed of two parts: the first part identifies the *network* and the second identifies the *host* (machine) within that network.

The scope or size of these parts can vary according to the address class. The following table describes the scope of the three address classes. Each N represents part of

Address Class	First Octet Value	Network Number Octets	Host Number Octets	Address Form	Number of Hosts
Class A	1 - 126	1	3	N.H.H.H	254*254*254 (about 16M)
Class B	128 - 191	2	2	N.N.H.H	254*254 (about 64,000)
Class C	192 - 223	3	1	N.N.N.H	254

the Network portion of the address, and each H represents part of the Host portion of the address. Network addresses with a first octet value in the range 224-254 are reserved for future use. Network number 0, 127 and 255 are also reserved.

Most organizations will use Class C addresses. Larger installations, such as universities may use Class B addresses due to the large number of hosts they must accommodate. Large companies might use several Class C networks. Since there are only 126 Class A network numbers, addresses in this range are allocated only to entire networks or countries.

Side Effects Software license managers can provide licenses to other systems that are on the same network, within their class mask range. This implies that all of the network portion (a.b.c in a Class C address) must be the same for each workstation and server. Thus if the address of your server is 192.234.92.10 and the client is 192.234.93.11 the license will not be granted. The reason for this is that even though both address are class C, they are on different networks (192.234.92 vs. 192.234.93)

By default, Side Effects will provide Class C masked keys.

## **4.1 SOLUTIONS FOR RESOLVING AD-HOC IP ADDRESS ISSUES**

### **SUBNETS**

If you can route to the subnet, then you should be able to obtain a floating license. A subnet is usually defined by the high order Host octet of a Class B network. Subnets may also be defined within the Host octet of a Class C network by redefining the netmask to utilize only a limited range of the octet for hosts and the other bits for the network (i.e. using three bits for network and five bits for host address of the eight bits defining the octet). Subnets on the same network are available to license servers. “Subnets” defined as alternate networks are not available to license servers without explicitly specifying the network IPs.

### **NETWORK MASKS**

It is possible to create complicated network masks such as:

204.\*.\*.\*

209.\*.\*.\*

etc.

## 5 COMMAND OVERVIEW

There are a number of support applications required for the operation of the license manager and are stored in `/usr/lib/sesi` (UNIX) or `C:\WINNT\system32` (NT).

### 5.1 HKEY

#### USAGE

`hkey`

Opens a graphical interface which displays the server code, lists current keys installed, and can install new keys.

### 5.2 SESINETD

#### USAGE

`sesinetd [options]`

This program runs on the license server host. It must also run for node-locked systems. The program runs as a daemon listening for license related requests.

The server listens on a TCP/IP socket which defaults to port 1715. The port can be overridden by adding the line:

`houdini-lm port/tcp`

to `/etc/services`.

The server does not need to be run as root. In fact, since this application can write to disk, running the server as root is discouraged. One caveat is that the server must be able to write to the license file directory (`/usr/lib/sesi` on UNIX machines).

#### OPTIONS

**-v**

Print version information. When this option is present, the server will not start.

**-l <file>**

Log information into the file specified. This file should reside on the license host. Note that if no log file is specified, it logs to `/var/log/messages` on Linux systems.

**-v <level>**

Specify the level of logging:

- 0 - No logging
- 1 - Log error messages only
- 2 - Log minimal useful information
- 3 - Log almost every transaction

**-z <size>**

Limit the log file to the size specified.

**-m <ipmask>**

Specify read IP mask. Only clients whose address matches will be granted access to query the server.

**-M <ipmask>**

Specify read IP mask. Only clients whose address matches will be granted access to modify the server.

**CAVEATS**

- Redundant servers are not supported at this time.
- Logging levels aren't all that distinct.

## 5.3 SESICTRL

**USAGE**

```
sesictrl -I <key_information>
```

or

```
sesictrl <options>
```

This program can be run on any host. It communicates with the server and performs various actions.

With the -I option, sesictrl will install key information. Users typically don't have to worry about this since key information is sent in script files which run this automatically.

**OPTIONS****-q**

Shut down the license server (sesinetd). You will be prompted whether you really want to shut the server down.

**-Q**

Force a shut down of the license server (sesinetd) - no prompt.

**-i**

Prints out a long list of licenses available for acquisition. This list also shows which hosts have licenses checked out and how long they have been checked out.

**-s**

Prints a short list of licenses out. This list shows how many licenses are available and how many are in use.

**-n**

Generate a server code.

**-R <id>**

Revoke a license.

**-l <file>**

Tells the server to start logging information into the file specified. This file resides on the license host.

**-v**

Print sesinetd version.

**-V <level>**

Specify the level of logging:

- 0 - No logging
- 1 - Log error messages only
- 2 - Log minimal useful information
- 3 - Log almost every transaction

**-z <size>**

Limit the log file to the size specified.

## ENVIRONMENT

**SESI\_LMHOST** – Specifies the host where the license server resides.

**license.dat** – File containing licenses. This file should not be modified by users.

**license.auth** – License file authentication. This file should not be modified by users.

## 5.4 HSERVER

The *hserver* daemon is used for a variety of Houdini applications from license acquisition through to remote rendering. The UNIX and Windows versions have slightly different options as described below.

### USAGE

`hserver [options]`

This program runs on the local host. Licensed applications will attempt to start *hserver* if they do not find one running.

By default, the server will run on the TCP/IP socket at port 1714.

### OPTIONS ON UNIX

There are two sets of options, the first used when starting *hserver* the second to query or control *hserver* when it is running.

1. Starts a houdini server on the local host to allow remote access by other houdini sessions (on remote hosts)

*Options:*

**-d**

Do not run as a daemon process (debug)

**-r <N>**

Allow only N remote renders to run. By default, N will be the number of processors found on the machine.

**-a <pct>**

Load average to refuse remote tasks (0-101). If the threshold is 100 or more, then remote renders will always be allowed.

*Warning:* Since load averages are the system load averaged over time, when doing sequences of renders, it's possible that the prior render will cause the load average to be too high for the next render, causing a stall in rendering.

**-n**

Allow only render-only licenses

2. Control or query a running version of *hserver* (possibly on a remote machine)

*Options:*

**-h <host>**

Optionally specify a remote host to query/control

**-q**

Terminate the server

**-l**

Get load information about the server

**-S <host>**

Change the license server host

**-P <id>**

Pause a task on the server

**-R <id>**

Resume a paused task on the server

**-K <id>**

Kill the task on the server

## OPTIONS ON WINDOWS

There are two sets of options, the first used when starting *hserver* the second to query or control *hserver* when it is running.

1. Starts a houdini server on the local host to allow remote access by other houdini sessions (on remote hosts)

*Options:*

**-d**

Do not run as a daemon process (debug)

**-r <N>**

Allow only N remote renders to run. By default, N will be the number of processors found on the machine.

### **-a <pct>**

Load average to refuse remote tasks (0-101). If the threshold is 100 or more, then remote renders will always be allowed.

*Warning:* Since load averages are the system load averaged over time, when doing sequences of renders, it's possible that the prior render will cause the load average to be too high for the next render, causing a stall in rendering.

### **-n**

Allow only render-only licenses

## 2. Control or query a running version of hserver (possibly on a remote machine)

### *Options:*

#### **-h <host>**

Optionally specify a remote host to query/control

#### **-q**

Terminate the server

#### **-l**

Get load information about the server

#### **-S <host>**

Change the license server host string

#### **-K <id>**

Kill the task on the server

#### **-P <id>**

Pause a task on the server

#### **-R <id>**

Resume a paused task on the server

#### **-i**

Installs the service

#### **-q**

Stops the service

#### **-s**

Starts the service

#### **-u**

Uninstalls the service

#### **-v**

Prints the service's version number

When installed, you can control *hserver* using the Windows Services application in the Control Panel.

### ENVIRONMENT

- SESI\_LMHOST - Specifies the host where the license server resides
- HOUDINI\_PATH - Specifies search path for *hserver.opt* file.
- \$HFS/houdini/hserver.opt - Specifies options for hserver. Please see the sample file in the distribution.

## 6 REVIEW OF KEY TERMINOLOGY

### **License**

A license or token is acquired from the key server to allow a unique combination of machine+user+display to run as many Houdini applications as allowed by the key feature. See also *Token*.

### **Key**

This is the list of numbers generated by Side Effects Software and is created using one or more machine server codes provided by the licensee. If this is a floating key, it will have a number of licenses or tokens associated with it. Each key is generated for a particular feature. For Houdini there are three features: Houdini, Houdini Render\_Only, and Houdini Multi\_Processing. Each feature requires a separate key with the number of requested tokens or licenses for each.

### **Server Code**

This is a unique identifying number for each server that is used to generate feature keys. The server code is based in part on the IP address of the server system. This code does not change for Houdini for a specific key server.

### **Token**

A license is acquired from the key server to allow a unique machine to run as many Houdini applications as allowed by the key feature.

### **sesinetd**

This is the license serving daemon that must be running in order for any key to be acquired. If you are unable to get a license, ensure that the *sesinetd* daemon process is still running on the server.

### **hserver**

Hserver communicates between the host and the server and should be running on the host system.

### **sesictrl**

Sesictrl can be run on the host and performs various actions including installing key information. Users typically don't have to worry about this since key information is sent in script files which run this automatically.

### **hkey**

Opens a graphical key installer.

## 7 SOME QUESTIONS AND ANSWERS

**Q.** Can I run multiple sessions of Houdini?

**A.** Yes but you must have multiple key tokens. The usual Houdini license has one Houdini token and five render tokens.

**Q.** How do I choose a key server?

**A.** Any IRIX, LINUX or Windows NT workstation on your network may function as a license key server. Choosing a key server involves considering the following points: system clock stability, location on the network, how long will the machine be available to act as a server (will its lease expire soon or is soon to be obsolete?), high availability on the network, and will the server exist as a single server or in a multi-server environment? The server should have a stable environment and the system clock should not be reset for any reason during the usage of the system as a license key server. (See *Selecting a System to be a License Server* p. 20)

**Q.** Can Houdini run concurrently with PRISMS 7.1?

**A.** Yes. Each product will require a separate license token, but both licenses can be installed on the same server.

**Q.** Can Houdini 3.0 / 3.1 (ELAN) licenses run Houdini 3.2 / 4.0 / 5 applications?

**A.** No. Because of changes to the licensing system, you will need new SESI-LM keys to run Houdini 3.2 / 4 / 5, but both licensing systems can run concurrently.

# 4 On-line Manuals

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## I ADOBE ACROBAT

The complete content of the printed manuals is available in on-line format via the Adobe® Acrobat™ Reader. All graphics and formatting are maintained exactly as seen on paper, with the advantage that you can search the contents for any word(s).

### I.1 HOW TO INSTALL ACROBAT

You can also obtain the latest version of Acrobat from:

<http://www.adobe.com/>

### I.2 HOW TO LAUNCH ACROBAT

Acrobat is launched indirectly by the Side Effects help system. This gives you consistent access to Side Effects help from any program, and spares you from having to find where the PDF files are located. To launch the on-line Acrobat help:

- The *Help* menu lists the names of all sections in this manual. Select one from the menu to display it with the Acrobat reader.
- To launch manually from within the Houdini Textport, type:  
`unix acread manualname`
- From a UNIX shell, type:  
`acread manualname`

**Tip:** If Acrobat doesn't open the file, you may have to change your *path* variable to include *\$HFS/document*, and/or install Adobe Acrobat first.

#### VALID MANUAL NAMES FOR ACROREAD

*manualname* is one of the following:

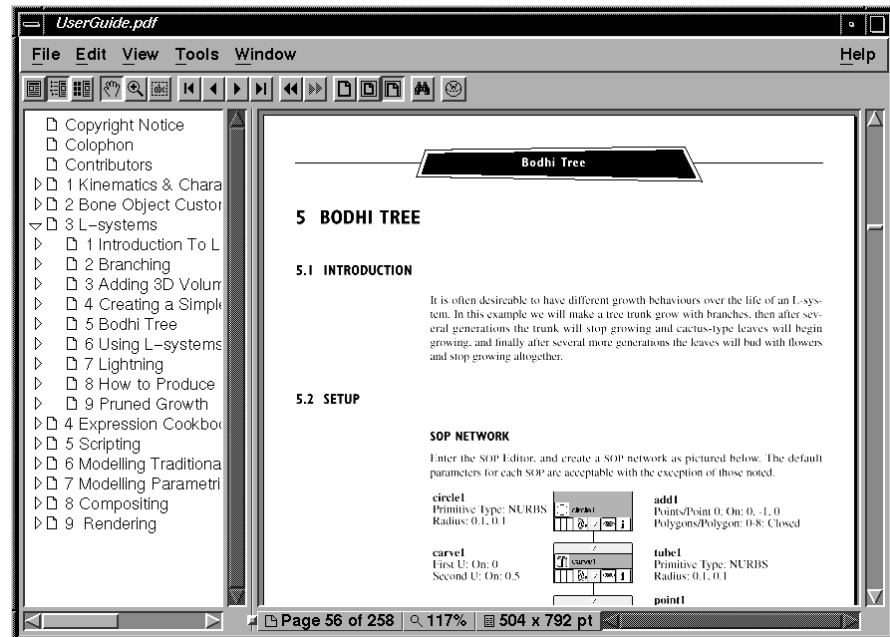
- 01-GettingStarted.pdf
- 02-Interface.pdf
- 03-Objects.pdf
- 04-Geometry.pdf
- 05-Channels.pdf
- 06-Particles.pdf
- 07-Materials.pdf
- 08-Animation.pdf
- 09-Outputs.pdf

- 10-Compositing.pdf
- 11-ExpressionLang.pdf
- 12-Scripting.pdf
- 13-GeometryTypes.pdf
- 14-Formats.pdf
- 15-spy.pdf
- 16-StandAlone.pdf
- TutorialGuide.pdf
- Glossary.pdf

You need the number prefix – it is an integral part of the name.

## WHAT YOU SEE

After launching Acrobat, the specified section is displayed in a window:



## 1.3 SEARCHING



Find

Click on the Find icon, or use the *Tools > Find...* menu to display the *Find* dialog box. Enter the word(s) you want to find, and click *Ok*. Acrobat will search the currently open document and display the page containing the word.

To find subsequent instances of the word use the *Tools > Find Again* command.

## ACROBAT WITH SEARCH



Search Search Results

If you have *Acrobat Reader with Search 3.0* or higher installed (not the same as *Acrobat Reader 3.0*), you can search all the online manuals simultaneously. Acrobat with Search allows you to use wildcards like \* and ? in your searches, and also use phonetic “sounds like” search criteria. If you don’t have Acrobat with Search, check

for the latest version on Adobe's web site, whose URL is listed in *How to Install Acrobat* p. 41.

### **WHERE'S THE PDX FILE?**

Acrobat with Search uses a very fast hashing algorithm which requires a file called *index.pdx*. This file is located in:

*\$HFS/document/index.pdx*


Once you point Acrobat to this file using the Open Dialog it prompts you with, you will be able to perform very fast searches on all of the online documentation.

Once you have executed a search, a search results window is displayed. To get back to this Search Results window after looking into one of the matches, click on the *Search Results* icon right beside the *Search* icon.

## **I.4 USING BOOKMARKS**

In Acrobat, select *View > Bookmarks and Page* menu to get a hierarchical listing of the contents of a manual section. This makes it really easy to get to a specific SOP/COP/TOP/etc. Often, this is even faster than using the Search feature.

## **I.5 COPY / PASTE FROM ACRBAT**

You can copy/paste text from Acrobat into a csh or the Houdini Textport. To do so, select the *Tools > Select Text* menu, select the text, and then click in a shell window using the middle-mouse (  ) to paste the text.

## **I.6 ACRBAT HELP**

Acrobat has a very good online help file. Get help for Acrobat from the *Help > Acrobat Reader Help* menu located in the top-right corner of the Acrobat window. Follow the instructions in the window that appears for comprehensive help on every Acrobat feature.

## **I.7 WHERE ARE THE ACTUAL PDF FILES?**

The manuals are stored as Acrobat *.pdf* (portable document format) files. You normally don't need to explicitly go to the manuals and open them with Acrobat, because the Side Effects help system automatically locates and runs Acrobat for you. However, if you do wish to do so, you can access the pdf files in the directory:

*\$HFS/document/*

To launch Acrobat directly from a UNIX shell, type:

*acroread <pdf\_filename>.pdf*

