

AUTODESK® STONE® AND WIRE®  
2007

# Filesystem and Networking Guide



Autodesk®

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# contents

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## Contents

<b>1</b>	<b>Introduction</b>	<b>1</b>
	Summary .....	1
	Welcome.....	1
	About Autodesk Storage .....	1
	Autodesk Wire .....	2
	Using This Guide .....	3
	Notation Conventions .....	4
	Related Documentation.....	4
	Contacting Customer Support .....	6

## Section 1 Setting Up Stone and Wire

<b>2</b>	<b>Basic Network Configuration Guidelines</b>	<b>11</b>
	Summary .....	11
	Changing the IP Address on Linux or IRIX .....	11
	Modifying the Loopback Host Name on Linux .....	12
	Enabling Multicasting on Linux .....	13
	Configuring Jumbo Frames on IRIX .....	14
	Configuring a Multi-Port Network Card for Load-Balancing on IRIX.....	14
	Configuring InfiniBand Networking on Linux .....	17
	Configuring HIPPI Networking.....	18

<b>3</b>	<b>Creating the Stone Filesystem</b>	<b>19</b>
	Summary .....	19
	Workflow for Creating the Stone Filesystem .....	19
	Stopping Stone and Wire and Unmounting the Filesystem .....	20
	Starting sw_config .....	21
	Clearing Partitions .....	22
	Setting Partition Configuration Parameters .....	24
	Selecting the Disks to Include in a Partition .....	27
	Setting Up Software RAID Parity and Spare Disks .....	27
	Saving the Filesystem .....	30
	Restarting Stone and Wire and Mounting the Stone Filesystem .....	31
	sw_config Reference .....	32
<b>4</b>	<b>Setting Up the Wire Network</b>	<b>39</b>
	Summary .....	39
	Workflow for Setting Up Wire and Wiretap .....	39
	Stop All Stone and Wire Daemons .....	40
	Licensing Wire .....	40
	Defining Network Interfaces in the Framestore Configuration File .....	41
	Configuring probed to Automate Connections between Wire Hosts .....	42
	Exporting Folders to Enable Sharing of Projects and Clips .....	43
	Restarting Stone and Wire .....	44
	Configuring Wiretap .....	45
	<b>Section 2 Administering Stone and Wire</b>	
<b>5</b>	<b>Upgrading Stone and Wire</b>	<b>57</b>
	Summary .....	57
	Workflow for Upgrading Only Stone and Wire .....	57
	Compatibility .....	57
	Verifying the Stone and Wire Version .....	58
	Upgrading Stone and Wire .....	58
<b>6</b>	<b>Monitoring and Repairing the Filesystem</b>	<b>61</b>
	Summary .....	61
	Workflow for Monitoring and Repairing the Stone Filesystem .....	61

	Configuring Email Notification of Disk Failure on Software RAID . . . . .	62
	Configuring Notification of Disk Failure on IR-Series Hardware RAID . . . . .	62
	Configuring Email Notification of Disk Failure on XR-Series Hardware RAID . . .	64
	Identifying Failed Drives on a Software RAID System . . . . .	64
	Checking the Replacement Drive Size (in Blocks) for Software RAID . . . . .	66
	Performing a Software RAID Heal with a Hot Spare Disk . . . . .	67
	Performing a Software RAID Heal with a Cold Spare Disk . . . . .	74
<b>7</b>	<b>Troubleshooting Stone and Wire</b>	<b>77</b>
	Summary . . . . .	77
	Basic Troubleshooting Procedures . . . . .	77
	Common Stone Filesystem Problems and Resolution Steps . . . . .	80
	Common Wire Network Problems and Solutions . . . . .	90
<b>A</b>	<b>Advanced Stone and Wire Configuration</b>	<b>99</b>
	Summary . . . . .	99
	Understanding the sw_framestore_map File . . . . .	99
	Changing the Framestore ID . . . . .	101
	Extending Wire Over Multiple Networks . . . . .	102
<b>B</b>	<b>Management Utilities</b>	<b>103</b>
	Summary . . . . .	103
	Stone and Wire Utilities . . . . .	103
	Application Utilities . . . . .	114
	<b>Index</b>	<b>115</b>



## Summary

- [Welcome](#) ..... 1
- [About Autodesk Storage](#) ..... 1
- [Autodesk Wire](#) ..... 2
- [Using This Guide](#) ..... 3
- [Notation Conventions](#) ..... 4
- [Related Documentation](#) ..... 4
- [Contacting Customer Support](#) ..... 6

## Welcome

Welcome to the *Autodesk Stone and Autodesk Wire 2007 Filesystem and Networking Guide*. This guide explains how to create, configure and troubleshoot an Autodesk® Stone® 2007 filesystem and an Autodesk Wire® 2007 network. It also provides information on how to configure basic networking.

## About Autodesk Storage

Autodesk storage is required for all Autodesk Editing and Effects products. It provides scalable, resolution-independent storage for uncompressed video and audio material. Autodesk storage consists of a number of inter-working components.

### Stone Filesystem

The Stone filesystem is an optimized media filesystem based on a specialized kernel driver. It provides optimized data transfer and playback performance as it reads and writes frames to the Autodesk Stone Direct disk arrays.

## Stone Direct Disk Arrays

Stone Direct is Autodesk's high-performance direct-attached storage. Performance and throughput is provided by fibre channel links and, with the new XR-series disk arrays, 4-Gigabit adapters.

## RAID

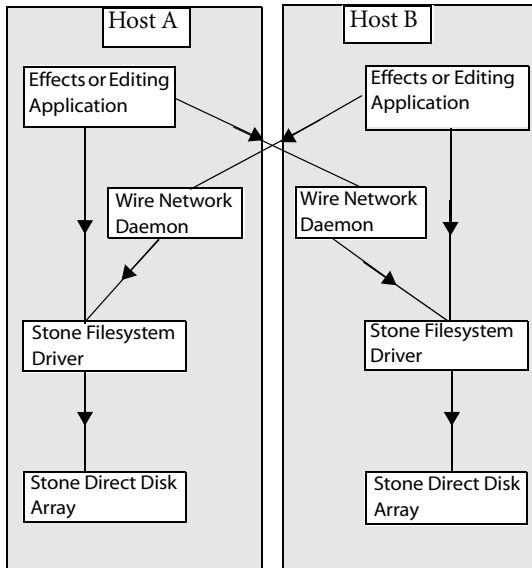
RAID (Redundant Array of Independent Disks) combines many hard disks into a single logical disk to obtain I/O performance levels that cannot be obtained with a single disk. In addition to improving I/O performance, RAID provides fault-tolerance features.

With the release of Autodesk Stone and Wire 2007, hardware RAID is provided by the latest XR-series Stone Direct storage. With hardware RAID, creating and rebuilding parity is managed by the RAID controller. Software RAID procedures documented in this guide are provided for legacy systems that have software RAID implementations from previous releases of Autodesk Effects and Editing applications.

## Autodesk Wire

Wire is an optional component that enables the high-speed transfer of uncompressed video, film, and audio between Autodesk workstations, over industry-standard TCP/IP, InfiniBand, and HIPPI networks.

Wire allows an Autodesk Effects or Editing application to transfer material to and from any clip library on any framestore on the Wire network. This is provided by a network daemon running on each local host. The use of a local daemon means that network access is independent of the main Effects or Editing application. Applications running on other hosts can read and write material on the local framestore by communicating with the Wire network daemon.



## Wiretap

Wiretap is a networking protocol that allows products that do not run Stone and Wire (like Autodesk® Lustre®) to access the Stone filesystem of an Editing or Effects product. The Wiretap clients must implement the Wiretap API to access the services provided by Wiretap.

## Using This Guide

The *Autodesk Stone and Autodesk Wire 2007 Filesystem and Networking Guide* begins with this introductory chapter. The rest of the guide is divided into the following sections.

**Section 1 - Setting Up Stone and Wire** — Describes how to create and configure Stone and Wire. It includes the following chapters:

- [Chapter 2, “Basic Network Configuration Guidelines.”](#) on page 11
- [Chapter 3, “Creating the Stone Filesystem.”](#) on page 19
- [Chapter 4, “Setting Up the Wire Network.”](#) on page 39

**Section 2 - Administering Stone and Wire** — Describes how to upgrade Stone and Wire independently of your Editing and Effects application. It also describes how to monitor Stone and Wire and troubleshoot common problems. This section includes the following chapters:

- [Chapter 5, “Upgrading Stone and Wire.”](#) on page 57
- [Chapter 6, “Monitoring and Repairing the Filesystem.”](#) on page 61

- [Chapter 7, “Troubleshooting Stone and Wire.”](#) on page 77

**Appendix** — Describes the `sw_framestore_map` file and provides instructions on how to extend Wire over multiple networks. It also includes information on Stone and Wire utilities. This section includes the following chapters:

- [Appendix A, “Advanced Stone and Wire Configuration.”](#) on page 99
- [Appendix B, “Management Utilities.”](#) on page 103

## Intended Audience

Basic knowledge of computer networking in a professional video/film production environment is assumed throughout this guide. Do not attempt to carry out the outlined procedures if you are not familiar with computer networking or hardware. Contact Autodesk Media and Entertainment Customer Support if you require further assistance. See [“Contacting Customer Support”](#) on page 6.

**NOTE:** Most procedures described in this guide require root privileges (super-user).

## Notation Conventions

A number of style conventions are used throughout this guide. These conventions and examples of their use are shown as follows.

Convention	Example
Text that you enter in a command line or shell appears in Courier bold. You must press the Enter key after each command.	<b>rpm -qa</b>
Variable names appear in Courier, enclosed in angle brackets. No spaces are allowed in variable names.	<variable_name>
Variables that appear enclosed in square brackets are optional.	[<filename>]
Feedback from the command line or shell appears in Courier.	limit coredumpsize
Directory names, filenames, URLs, and command line utilities appear in italics.	<i>/usr/discreet</i>

## Related Documentation

The following tables list the documentation associated with the current release. For details on each of these documents, as well as for help obtaining them, refer to your application’s release notes.

<b>User and Reference Guides</b>	<b>Description</b>
<i>User's Guide</i>	Detailed instructions on using the software
<i>What's New</i>	A complete list of the new features for this release
<i>Online Help</i>	All of the information in the User's Guide along with powerful search functionality
<i>Hot Keys Reference Guide</i>	A complete list of hot keys for commonly used functions
<i>Hot Keys Card</i>	A list of the most frequently used hot keys
<i>Release Notes</i>	A complete list of documentation and information on late-breaking features
<i>Fixed and Known Bug List</i>	A complete list of fixed and known bugs for this release
<b>Installation and Configuration Guides</b>	<b>Description</b>
<i>Hardware Setup Guide (for your workstation)</i>	Information on how to set up your workstation's video I/O components and other peripherals
<i>Installation and Configuration Guide (for your operating system)</i>	Information on how to install and configure the Linux® or IRIX® operating system on your workstation should you be required to do so
<i>Stone Direct Configuration Guide (for this release)</i>	Detailed connectivity diagrams and configuration procedures for your Stone storage arrays
<i>Software Installation Guide (for Linux or IRIX workstations)</i>	Information about installing and licensing your Autodesk Editing or Effects software and installing and configuring Autodesk Cleaner® XL
<i>Configuration File Reference Guide (for Linux or IRIX workstations)</i>	Information on how to modify the initialization and project configuration files associated with your Autodesk application
<b>Other Product Reference Guides</b>	<b>Description</b>
<i>Autodesk Cleaner XL User's Guide</i>	Information on how to use Cleaner XL
<i>Autodesk Cleaner XL Troubleshooting Guide</i>	Troubleshooting information for Cleaner XL
<i>Using QuickTime with Linux Workstations</i>	Information on how to use Cleaner XL to convert QuickTime® files for use on Linux workstations
<i>Autodesk Burn Installation and User's Guide</i>	Information on how to install, set up, and use Autodesk Burn™
<i>Autodesk Backburner Installation and User's Guide</i>	Information on how to install, set up, and use Autodesk Backburner™
<i>Autodesk Wiretap Web Installation and User's Guide</i>	Information on how to install, set up, and use Wiretap Web

Consult the Autodesk Web site at [www.autodesk.com/discreet-documentation](http://www.autodesk.com/discreet-documentation) for the latest version of all documents.

## Contacting Customer Support

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Within Asia Pacific (Excluding India, China, Australia, New Zealand and Japan)	Hotline (from Singapore): +65-6555-0399 9 AM to 6 PM (local time) Monday to Friday, excluding holidays <a href="mailto:me.support.singapore@autodesk.com">me.support.singapore@autodesk.com</a>
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Within China	Direct dial: +86-10-6505-6848 9 AM to 6 PM (local time) Monday to Friday, excluding holidays <i>me.support.china@autodesk.com</i>
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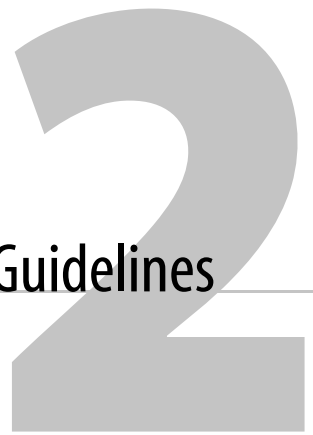
# Section 1

# Setting Up Stone and Wire

<a href="#">Basic Network Configuration Guidelines</a>	11
<a href="#">Creating the Stone Filesystem</a>	19
<a href="#">Setting Up the Wire Network</a>	39



Image courtesy of Impossible Pictures



# Basic Network Configuration Guidelines

## Summary

<a href="#">Changing the IP Address on Linux or IRIX</a> .....	11
<a href="#">Modifying the Loopback Host Name on Linux</a> .....	12
<a href="#">Enabling Multicasting on Linux</a> .....	13
<a href="#">Configuring Jumbo Frames on IRIX</a> .....	14
<a href="#">Configuring a Multi-Port Network Card for Load-Balancing on IRIX</a> .....	14
<a href="#">Configuring InfiniBand Networking on Linux</a> .....	17
<a href="#">Configuring HIPPI Networking</a> .....	18

## Changing the IP Address on Linux or IRIX

Your workstation is shipped to you with a default IP address. You can change the IP address of your workstation to integrate it into your facility.

You must update the following configuration files with the network configurations necessary for your facility. See the following tables for the files you must modify on your operating system.

Regardless of the operating system you are running, the IP address of your workstation must match the one in the main configuration file for Stone and Wire, *sw\_framestore\_map*. See [“Understanding the sw\\_framestore\\_map File”](#) on page 99.

Linux Networking Configuration File	Description
/etc/hosts	Contains IP/host name pairs for host name resolution.
/etc/sysconfig/network	Contains global networking settings.
/etc/sysconfig/network-scripts/ifcfg-*	Contains interface-specific configuration.
/etc/resolv.conf	Contains DNS server information.

IRIX Networking Configuration File	Description
/etc/hosts	Contains IP/host name pairs for host name resolution.
/etc/sys_id	Contains the host name.
/etc/config/ifconfig-1.options	Contains interface-specific settings, like netmask and MTU for jumbo frames.
/etc/config/static-route.options	Contains the default gateway address.

**NOTE:** Stone and Wire does not support dynamic IP address configuration.

**NOTE:** You must always reboot the workstation after changing the host name.

## Modifying the Loopback Host Name on Linux

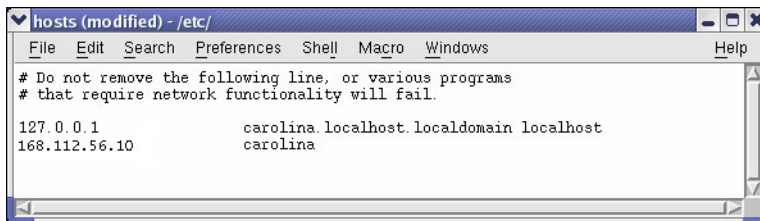
Stone and Wire require a generic host name in the loopback setting so that the network functions correctly. By default, Linux sets the loopback setting with the host name of the Linux workstation. To enable communication with Stone and Wire, during installation the Discreet Kernel Utility (DKU) modifies the loopback host name in the */etc/hosts* file on the Linux workstation.

If an error occurred during installation, you can use the following procedure to verify and, if necessary, correct the loopback host name.

### To verify or modify the loopback host name:

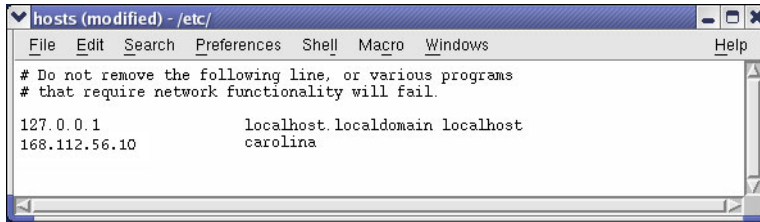
1. Open a shell and log in as root.
2. Go to the */etc* directory. Type:  
**cd /etc**
3. Using a text editor, open the *hosts* file.

By default, the loopback setting is identified on all systems by the address 127.0.0.1.



```
hosts (modified) - /etc/
File Edit Search Preferences Shell Macro Windows Help
# Do not remove the following line, or various programs
# that require network functionality will fail.
127.0.0.1 carolina.localhost.localdomain localhost
168.112.56.10 carolina
```

4. Remove the explicit host name from the loopback domain name. In this example, the explicit host name is carolina.



5. Save and close the *hosts* file.

## Enabling Multicasting on Linux

If you are planning to share setups and projects between Autodesk Effects and Editing applications running on IRIX and Linux workstations, multicasting must be enabled for Stone and Wire, as well as the connected IRIX and Linux networks. To enable multicasting, you define a gateway by specifying an IP address in */etc/sysconfig/network*.

If you do not define a gateway for your network in */etc/sysconfig/network*, you must define default routes associated with specific interfaces in */etc/sysconfig/network-scripts/ifcfg-*<xxx>**, where *<xxx>* specifies your ethernet adapter. However, a default route specified in */network* overrides any */ifcfg-*<xxx>** default routes.

Contact your system administrator to determine the method for enabling multicasting that is best suited for your network.

### To modify the */etc/sysconfig/network* file:

1. Open a shell and log in as root.
2. Type:
 

```
cd /etc/sysconfig
```
3. Open the *network* file in a text editor.
4. Enter the GATEWAY keyword and specify the IP address.
 

```
NETWORKING=yes
HOSTNAME=carolina
GATEWAY=192.168.60.1
```

Verify this information with the system administrator.

5. Save and close the file.

## Configuring Jumbo Frames on IRIX

You must modify the *ifconfig-<xxx>.options* file for your network interface to enable jumbo frames support.

### To configure jumbo frames on an IRIX workstation:

1. Open a shell and log in as root.
2. Open the */etc/config/ifconfig-<xxx>.options* file for the network interface in a text editor. For example, the name of this file for network interface number three is *ifconfig-3.options*.
3. Enter the subnet mask for your network and `mtu 9000` to enable jumbo frames.
 

```
netmask <subnet_mask> mtu 9000 up
```
4. Save and close the file.

## Configuring a Multi-Port Network Card for Load-Balancing on IRIX

To distribute network communication across multiple ports on an IRIX workstation, you must use Network Load Balancing Software (NLBS) to bind network interfaces together. NLBS creates a virtual network interface, with its own IP address, to represent all the bound network interfaces.

See the following table for a summary of the steps you must follow to configure your multiple-port network card for load balancing.

Step:	Refer to:
1. Install NLBS and all required patches.	<a href="#">"Installing Network Load Balancing Software"</a> on page 14.
2. Create an IP address for the virtual network interface and choose arbitrary values for the physical interfaces.	<a href="#">"Configuring the Hosts File"</a> on page 15
3. Configure the network interfaces in the <i>netif.options</i> file.	<a href="#">"Configuring the netif.options File"</a> on page 15
4. Configure and start NBLs.	<a href="#">"Activating NLBS"</a> on page 16.

### Installing Network Load Balancing Software

NLBS binds two network interfaces together and creates a third virtual network interface. A "published" IP address is assigned to the virtual network interface. The two physical network interfaces that are bound are assigned arbitrary IP addresses.

You must install the NLBS version 2.0 and patch 5586.

Contact SGI® for information on acquiring NLBS 2.0 and the required patch.

## Configuring the Hosts File

You must configure the *hosts* file with the IP address of the virtual network interface and the physical interfaces you are going to bind. The IP address you use for the virtual interface must be a valid address for the subnet that the network port is connected to.

### To configure the hosts file for the virtual and physical interfaces:

1. Open a shell and log in as root.
2. Open the */etc/hosts* file in a text editor.
3. Add the hostname and IP address of the virtual interface and the physical network interfaces you are binding to the */etc/hosts* file. You can give any IP address and hostname to the physical interfaces.

In the following example from the *hosts* file, the virtual network interface has an IP address of 192.16.1.10, which is on the house network:

```
192.168.1.10 <name>-gig
10.0.0.1 <name>-gig-a
10.0.0.2 <name>-gig-b
```

## Configuring the *netif.options* File

After you have configured the IP address in the *hosts* file, you must configure the *netif.options* file with the network interfaces.

### To configure *netif.options* file:

1. Open a shell and log in as root.
2. Determine the device name of the physical interfaces. Type:

```
hinv -c
```

Look at the output for *tg<x>* devices. Gigabit Ethernet devices from the a dual-network interface card should result in output similar to the following:

```
Gigabit Ethernet: tg4, module 001c02, PCI bus 2 slot 1 port 0
Gigabit Ethernet: tg5, module 001c02, PCI bus 2 slot 1 port 1
Integral Gigabit Ethernet:tg0,module 001c01, PCI bus 1 slot 4
```

3. Record the name of the interfaces. From the previous example, the two physical interfaces are *tg4* and *tg5*.
4. Open the */etc/config/netif.options* file in a text editor.
5. Add the virtual and physical network interfaces to the file.

The following example uses the hostnames we created previously:

```

if2name=lb0
if2addr=$HOSTNAME-gig
if3name=tg4
if3addr=$HOSTNAME-gig-a
if4name=tg5
if4addr=$HOSTNAME-gig-b

```

where `lb0` is the name of the load balancing interface, and `$HOSTNAME-gig` is the hostname that you have defined in `/etc/hosts`.

6. Save and close the file.

## Activating NLBS

Finally, you must configure NLBS to indicate the virtual interface and the two slave interfaces and start the NLBS process.

### To activate NLBS:

1. Open a shell and log in as root.
2. Open the `/etc/config/nlb.options` file in a text editor.  
Based on the previous examples, you must add the following information to this file:

```

lb1name=lb0
lb1devs=tg4, tg5
lb_num=1

```

3. Turn on NLBS. Type:  
**chkconfig nlb on**
4. Reboot the machine.
5. After the machine has rebooted, open a shell and log in as root.
6. Type:  
**netstat -in**

This command should have the output similar to the following to show that `lb0` has been configured. The following example is for a jumbo frames configuration:

Name	Mtu	Network	Address	Ipkts	Ierrs	Opkts	Oerrs	Coll		
tg0	1500	192.168.50	192.168.50.74	6456421	0	2063819	0	2063819	0	0
lb0	9000	192.168.1	192.168.1.10	3450691	0	18895	0	18895	0	0
tg4	9000	10.0.1.1	10.0.1.1	1724082	0	14832	0	14832	0	0
tg5	9000	10.0.1.2	10.0.1.2	1726609	0	4063	0	4063	0	0

## Configuring InfiniBand Networking on Linux

InfiniBand drivers are installed on all Linux workstations by the DKU. To use your InfiniBand network interface, you must configure the IP address of the interface and restart your workstation.

The following procedure describes how to use the `/sbin/iba_config` script to configure the IP address of the InfiniBand network interface.

**NOTE:** The `iba_config` script writes the IP address of the interface to the `/etc/sysconfig/network-scripts/ifcfg-ib1` file.

### To configure InfiniBand networking on Linux:

1. Open a shell and log in as root.
2. Start the InfiniBand configuration utility. Type:

```
/sbin/iba_config
```

The InfiniBand configuration utility menu appears:

```
SilverStorm Technologies Inc. InfiniBand 3.2.0.2.1G Software
1) Show Installed Software
2) Reconfigure IP over IB
3) Reconfigure Driver Autostart
4) Update HCA Firmware
5) Generate Supporting Information for Problem Report
6) Host Setup via Fast Fabric
7) Host Admin via Fast Fabric
8) Chassis Admin via Fast Fabric
9) Uninstall Software
X) Exit
```

3. Open the Reconfigure IP over IB menu. Type:  
**2**
4. Follow the on-screen instructions to configure the IP address and netmask of your InfiniBand interface.  
You return to the main menu when you have completed the configuration of the IP address.
5. When you have completed the configuration, exit the InfiniBand configuration utility. Type:  
**x**
6. You must restart your workstation for your changes to take effect.

## Configuring HIPPI Networking

For information on configuring HIPPI networking interfaces on IRIX workstations, refer to the *Autodesk Stone and Wire Filesystem and Networking User's Guide, 4th Edition*. You can find this guide on the Autodesk Web site at [www.autodesk.com/discreet-documentation](http://www.autodesk.com/discreet-documentation).

# 3

## Creating the Stone Filesystem

### Summary

<a href="#">Workflow for Creating the Stone Filesystem</a> .....	19
<a href="#">Stopping Stone and Wire and Unmounting the Filesystem</a> .....	20
<a href="#">Starting <code>sw_config</code></a> .....	21
<a href="#">Clearing Partitions</a> .....	22
<a href="#">Setting Partition Configuration Parameters</a> .....	24
<a href="#">Selecting the Disks to Include in a Partition</a> .....	27
<a href="#">Setting Up Software RAID Parity and Spare Disks</a> .....	27
<a href="#">Saving the Filesystem</a> .....	30
<a href="#">Restarting Stone and Wire and Mounting the Stone Filesystem</a> .....	31
<a href="#">sw_config Reference</a> .....	32

### Workflow for Creating the Stone Filesystem

You must create the Stone filesystem on your disk array before you can begin using your Autodesk Editing or Effects application.

See the following table for a summary of the steps you must follow to create the Stone filesystem on your disk array.

**NOTE:** The procedures in this chapter assume that there is a filesystem already created on your storage arrays.

Step:	Refer to:
1. Connect and power up the disk array.	The <i>Autodesk Stone Direct Configuration Guide</i> . This guide is available from the Autodesk Web site.
2. Install your Editing or Effects application.	The installation guide for your application.

Step:	Refer to:
3. Archive any pre-existing clip, metadata, or project information on the disk array.	The User's Guide for your application.
4. Stop Stone and Wire and unmount the filesystem.	<a href="#">"Stopping Stone and Wire and Unmounting the Filesystem"</a> on page 20.
5. Start the filesystem configuration utility <i>sw_config</i> .	<a href="#">"Starting sw_config"</a> on page 21.
6. Clear any pre-existing partitions.	<a href="#">"Clearing Partitions"</a> on page 22.
7. Determine how you will partition your filesystem and set configuration values in <i>sw_config</i> .	<a href="#">"Setting Partition Configuration Parameters"</a> on page 24.
8. Select the disks that you want to include in each partition.	<a href="#">"Selecting the Disks to Include in a Partition"</a> on page 27.
9. Optional: If you are running software RAID, you must create a parity disk. You may also decide to set up a spare disk that you can use to heal your system when a disk fails.	<a href="#">"Setting Up Software RAID Parity and Spare Disks"</a> on page 27.
10. Save the filesystem configurations for the partition. Saving commits all changes you have configured for your filesystem and can result in data loss. Be sure to archive all projects, media, and data before you save changes to your filesystem.	<a href="#">"Saving the Filesystem"</a> on page 30.
11. Restart Stone and Wire and mount the filesystem. Then, check that your filesystem is mounted. After the filesystem is created, you are ready to use your Editing and Effects application.	<a href="#">"Restarting Stone and Wire and Mounting the Stone Filesystem"</a> on page 31.

## Stopping Stone and Wire and Unmounting the Filesystem

You must stop Stone and Wire and unmount the filesystem before you create a new filesystem.

By default, Stone and Wire is started and the filesystem is mounted whenever you restart your system after installing your Editing or Effects application.

### To stop Stone and Wire and unmount the filesystem:

1. Open a shell and log in as root.

2. Stop Stone and Wire. Type:

```
/usr/discreet/sw/sw_stop
```

A message appears in the shell indicating that Stone and Wire is stopped.

3. Unmount all Stone filesystems. Type:

```
/usr/discreet/sw/sw_unmount all
```

4. Verify that the filesystems have been unmounted. Type:

```
/usr/discreet/sw/sw_df
```

A report appears in the shell identifying all unmounted partitions.

## Starting `sw_config`

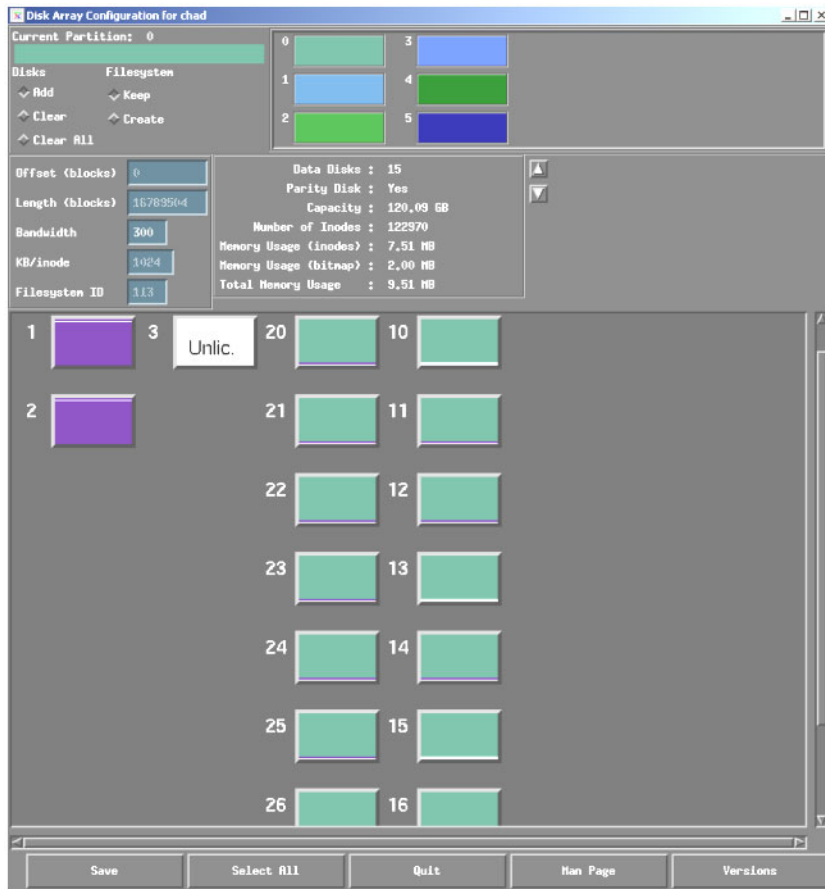
Use `sw_config` to configure and create the Stone filesystem on your disk array.

**To start `sw_config`:**

1. Open a shell and log in as root. You can use the same shell as you were using in the previous procedure.
2. Type:

```
/usr/discreet/sw/sw_config
```

The *sw\_config* window appears. The following figure shows the *sw\_config* interface for a JBOD storage configuration. See [“sw\\_config Reference”](#) on page 32 for descriptions of all interface elements.



- Next you must clear any existing partitions. See [“Clearing Partitions”](#) on page 22.

## Clearing Partitions

Clear all pre-existing partitions before you begin configuring your filesystem.

**⚠ WARNING:** Clearing partitions erases your filesystem. Be sure to archive all projects, media, and metadata before you clear the partitions on your Stone disk array.

**To clear all partitions:**

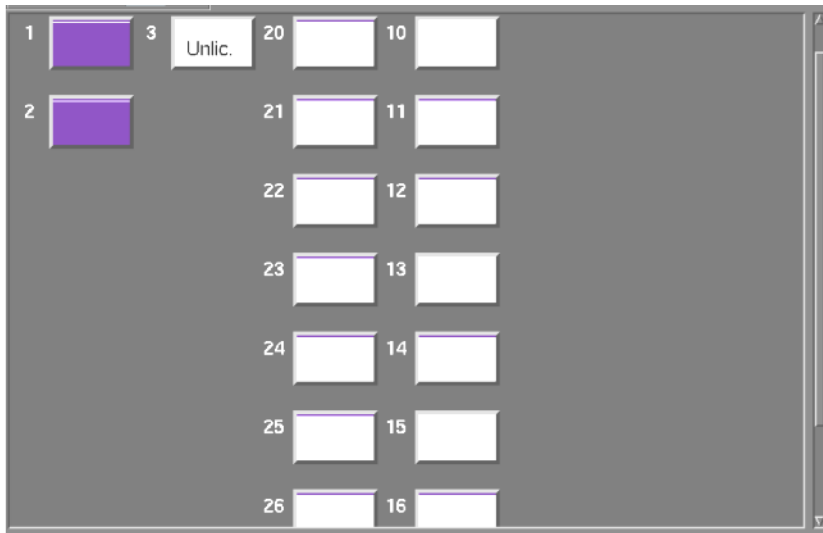
1. Under Disks in the upper-left corner of the window, click Clear.



2. Select all drives you want to clear.

To:	Do this:
Select all drives automatically	Click the Select All button.
Select all drives manually	Click and drag the cursor over the disks you want to select.

All partitions become white to indicate that they are clear.



3. After you clear existing partitions, you must configure the parameters for the partition. See [“Setting Partition Configuration Parameters”](#) on page 24.

## Setting Partition Configuration Parameters

Typically, you configure your disk array(s) as a single partition using the default configuration parameters.

If your storage array is larger than the maximum size supported for your application, you must create multiple partitions. See the following table for the maximum filesystem size that you can configure per partition on Linux.

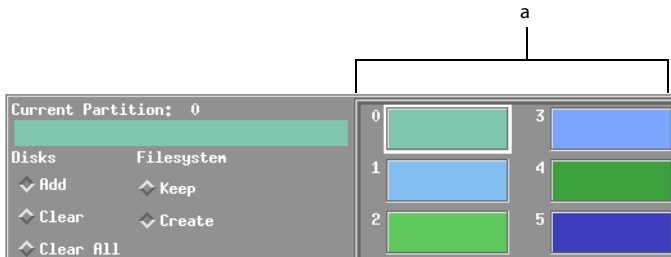
Effects and Editing Application Version	Maximum Filesystem Size
2007, running 64-bit Linux OS	8 TB
Pre-2007 releases	4 TB

To modify partition configuration parameters, you must create a new filesystem.

### To set partition configuration parameters:

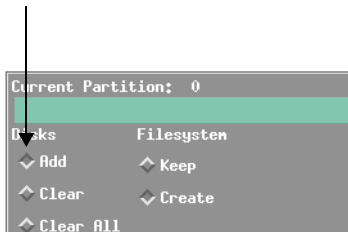
1. From the partition buttons in the top-right corner of the window, click partition 0.

If you must create more than one partition, then you must create them in order, starting with partition 0. To use the partition, you must set up the project configuration file (in the FrameStore keyword) to use a specific partition. The first partition is known as stonefs. Additional partitions are numbered in order; that is, stonefs1, stonefs2, and so on.



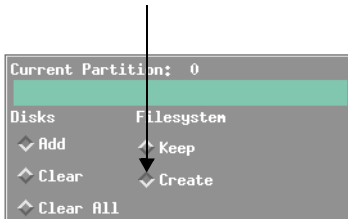
a) Partition buttons

2. Under Disks in the upper-left corner of the window, click Add.



3. Under Filesystem in the upper-left corner of the window, click Create.

**WARNING:** Using Create will delete all existing data on the selected disks when you save your changes.



4. Under most circumstances, you can accept the default values for Offset, Length, Bandwidth, KB/inode, and Filesystem ID. See the sections that follow for details on these parameters and circumstances when you would change them.
5. After you set partition configuration parameters, you must select the disks you want to include in the partition. See [“Selecting the Disks to Include in a Partition”](#) on page 27.

## Offset and Length

The offset is the partition’s physical starting point on each disk in blocks of 512 bytes. A value of 0 indicates that the partition starts at the beginning of the disk.

The length is the physical size in blocks of 512 bytes. A value of 0 indicates that the entire disk is used for the partition.

- If you are using the entire disk array for the partition, make sure the offset value is 0 and the length value is 0.
- If you are creating more than one partition, enter appropriate offset and length values to use the full capacity of your disk array.

## Bandwidth

Use the Bandwidth value to reserve bandwidth on the fibre channel adapters connected to the Stone Direct storage for the Editing or Effects application running on the local system. This ensures that the Editing or Effects application gets the bandwidth it requires for real-time playback, and real-time playback on the local system is not jeopardized by requests from remote hosts.

A default value is selected for you based on the type of fibre channel adapter on your system. You can change this value and tune the performance of your system to the type of production work performed by this system.

**To determine the optimal bandwidth reservation value:**

1. Open a shell and log in as root.
2. Run the `stone_test` utility to determine the amount of bandwidth you have available to you based on the type of production work you are doing. If you are working on multi-resolution projects, use the largest frame size value you work on to evaluate your bandwidth requirements.



**WARNING:** Be sure you use the `-r` option in the following command. Do not use the `-w` option; this will erase the contents of your filesystem.

In the shell, type:

```
/usr/discreet/sw/tools/stone_test -r -R 0 -f <frame_size>
```

where `<frame_size>` is the type of production frames you write to this Stone filesystem. The values for this option are: NTSC, PAL, HDTV, Film, NTSC+Alpha, and ProxyNTSC.

The `stone_test` utility displays information similar to the following example:

```
Partition /dev/swr00 capacity = 143283735 per disk...
frame = 1054208 bytes (2059 blocks) frame_interval = 71
4 concurrent I/O requests, 300 frames:
Head, forward : 595.08 MB/S 591.9 frames/sec
```

**HINT:** For more information about `stone_test` options, display the Man pages for the utility. Type `man stone_test` in a shell.

3. To reserve the maximum amount of bandwidth to your local system, enter the MB/S value reported by `stone_test` in the Bandwidth field of `sw_config`.

## KB/Inode Ratio

An inode is a data structure that holds information about a single frame stored in a partition. Each frame or clip in your library is described by a single inode in the partition.

The inode ratio is used to calculate the total number of inodes available per partition. For example, you might have one inode for every 1024 KB of filesystem space. If you have a 4 TB filesystem, this would provide you with 4 million inodes, and therefore, the possibility of storing 4 million frames.

The default KB/inode value is 1024. The minimum value is 512 and the maximum value is 6656. The inode ratio value is rounded up to the nearest 512 KB block (i.e. 513 rounds up to 1024).

Generally, the number of inodes is related to the frame size of your most common production format and the size of your partition. See the latest edition of the *Stone Direct Configuration Guide* for recommended inode ratios for your storage configuration and workflow.

## Filesystem ID

This is a unique identifier for the local framespace. By default, the Stone and Wire installation script uses the last digits in the IP address of the machine to populate the Filesystem ID value. You do not need to change the Filesystem ID when you change the IP address of your system.

If you will be using Wire to move clips between different framespace, you must be sure that each framespace has a unique filesystem ID.

If you must change your filesystem ID, you must reformat your framespace and update the `sw_framespace_map` file. See [“Changing the Framespace ID”](#) on page 101.

## Selecting the Disks to Include in a Partition

After you have configured the values for your partition, you are ready to select the disks you want to include in the partition.

### To select the disks to include in the partition:

1. Be sure that Add and Create are selected in the top-left corner of the window.
2. To select the disks you want to include, do one of the following.

To:	Do this:
Select a single disk	Click the disk in the Disk Display area.
Select multiple disks	Click and drag the cursor over the disks you want to select.
Select all disks	Click the Select All button at the bottom of the window.


To avoid bandwidth issues, select an equal number of disks per adapter; that is, select the same number of disks in every column.

**NOTE:** Do not select unlicensed disks (identified by the label “Unlic”) or system drives (identified as purple disks).

3. After you have selected the disks that are included in a partition, you are ready to set up parity or spare disks, if necessary. See [“Setting Up Software RAID Parity and Spare Disks”](#) on page 27.

## Setting Up Software RAID Parity and Spare Disks

To protect the data stored on your disk array using software RAID, you must set up parity disks. You must configure only one parity disk per partition.

 **WARNING:** Do not create parity disks or spare disks if you are using hardware RAID. In hardware RAID, parity and spare disks are managed by the RAID controller, which is inside the storage array enclosure.

**NOTE:** Software RAID is only supported on IRIX systems.

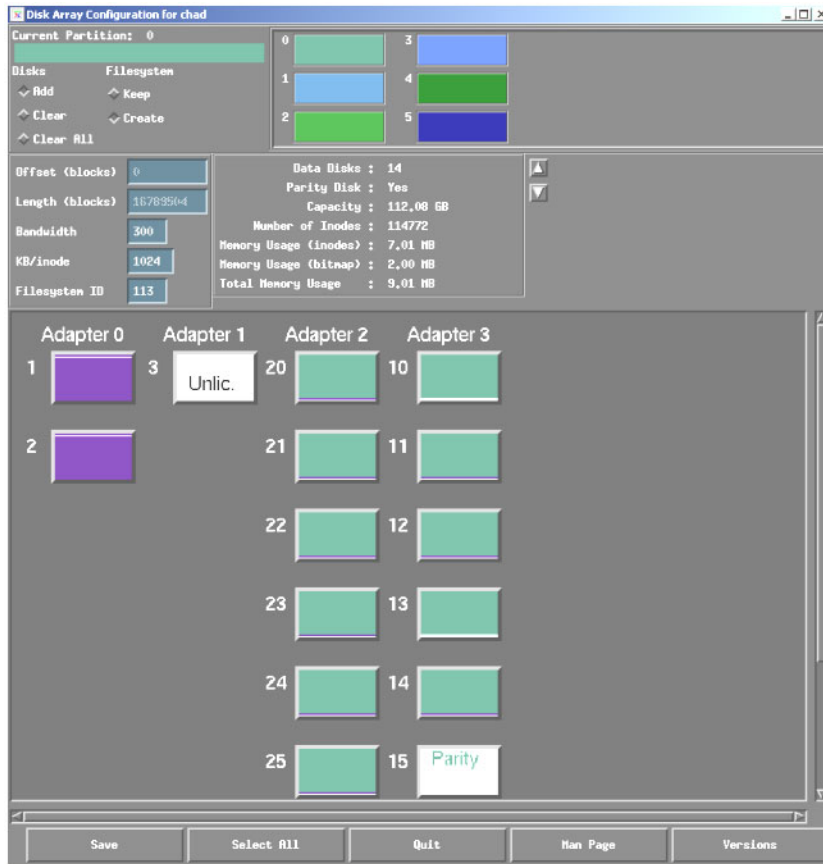
You can also set up a spare disk in your disk array to be ready to recover from a disk failure. Although the spare disk is turned on and immediately ready to replace a bad disk, keeping it in your storage array is an inefficient use of storage space. Autodesk provides you with spare disks that you can use in the case of a disk failure. Instructions for setting up a spare disk are provided here just in case you want to include a spare disk in your array.

It is recommended to have a balanced number of disks across your adapters. When selecting parity and spare disks, try to maintain an equal number of disks across all adapters.

**To set up software RAID parity disks:**

- Right-click a disk and select Add Parity.

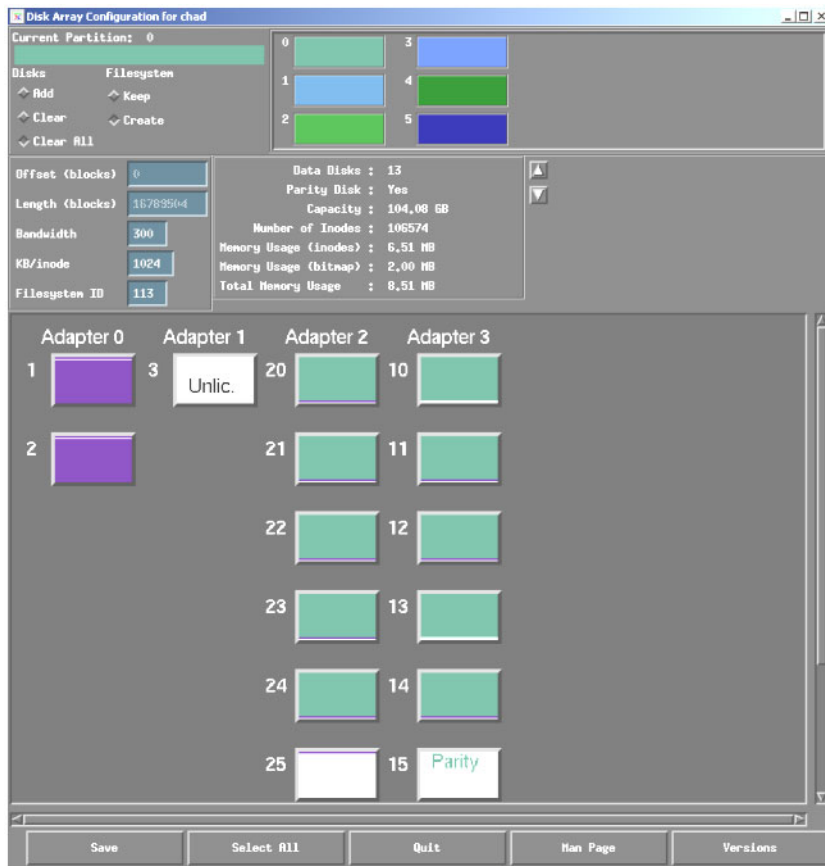
The word Parity appears in the selected disk.

**To set up spare disks:**

1. Under Disks in the upper-left corner of the window, click Clear All.
2. Click the disks you want to remove from the partition.

### 3 Creating the Stone Filesystem

Cleared disks appear white. These cleared disks are part of the disk array and are ready to be used in a heal procedure.



## Saving the Filesystem

After you have configured the partitions in your filesystem, you are ready to save your configuration.

Saving your configuration creates the filesystem, overwriting any previous configuration information.



**WARNING:** Saving the filesystem with the Create option enabled overwrites all previous configurations. Be sure that all projects, libraries, clips, frames, and data you want to save is archived before you save the filesystem.

**To save the filesystem:**

1. Click Save at the bottom of the *sw\_config* window.  
Your changes to the configuration are saved and a new filesystem is created. The window remains open.
2. Click Quit to exit *sw\_config*.
3. Before you can start using your application, you must restart Stone and Wire and mount the filesystem. [“Restarting Stone and Wire and Mounting the Stone Filesystem”](#) on page 31.

## Restarting Stone and Wire and Mounting the Stone Filesystem

After you have finalized the configuration of your filesystem, you must restart Stone and Wire and mount the filesystem to make it available to your Editing or Effects application.

**To restart Stone and Wire and mount the filesystem:**

1. Open a shell and log in as root.
2. Type:  
**`/usr/discreet/sw/sw_start`**

This restarts Stone and Wire and mounts the filesystem. Messages in the Console window indicate that the filesystem is loaded for each partition.

3. Make sure your filesystem is mounted. Type

**`/usr/discreet/sw/sw_df`**

Each partition is listed in a report that provides information about the total, free, and used memory and inodes in the partition.

**NOTE:** You can use the frame size options with the *sw\_df* command to see how much free space you have for the type of production you are working on. See the *sw\_df* man pages for information about the options you can use with this command.

4. To verify that the Stone filesystem is configured, start your Effects or Editing application and look for error messages.

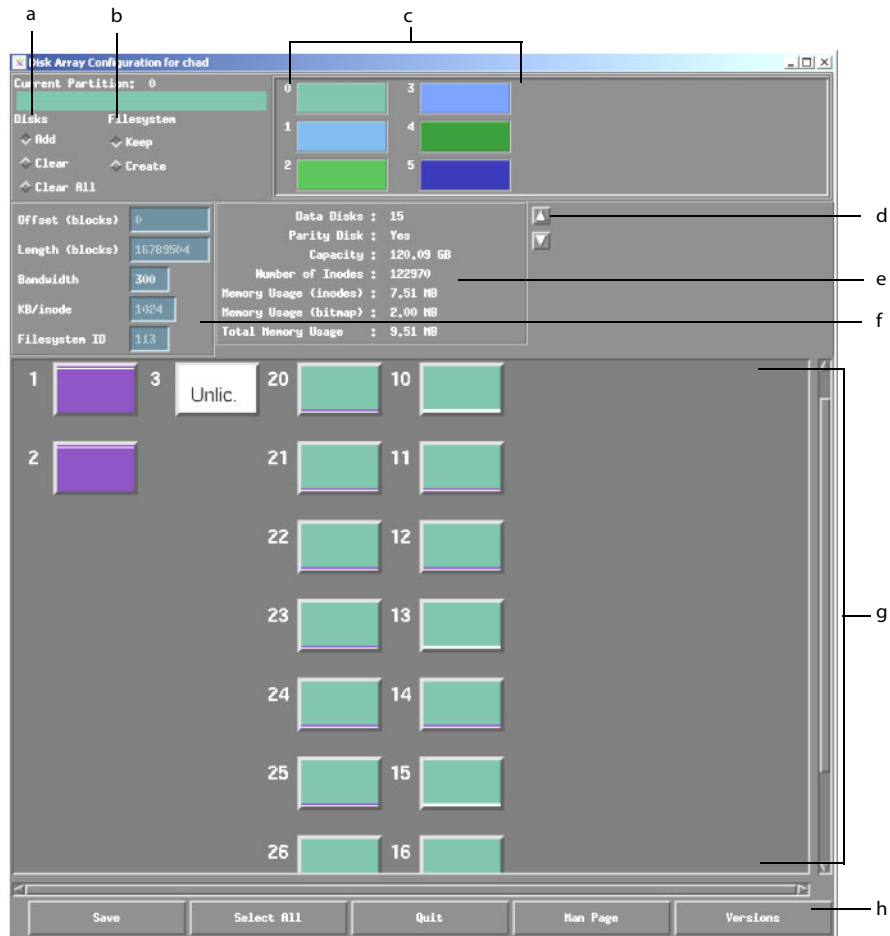
If you have any problems starting your application, review the procedures in this chapter. In addition, for information on monitoring and troubleshooting your Stone filesystem, see

[Chapter 6, “Monitoring and Repairing the Filesystem.”](#) on page 61 and [Chapter 7, “Troubleshooting Stone and Wire.”](#) on page 77.

## ***sw\_config* Reference**

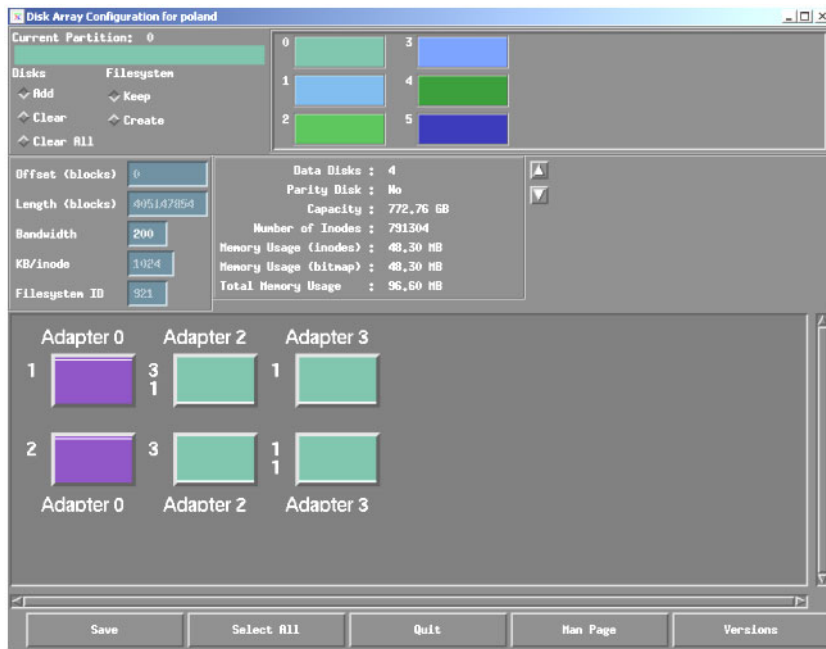
The following figure shows the *sw\_config* interface as it appears on a software RAID system.

On software RAID systems, you see each disk in the storage array. Each of those disks is numbered.



- |                                |                                       |                    |
|--------------------------------|---------------------------------------|--------------------|
| a) Partitioning modes          | d) Zoom arrows                        | g) Hard disks      |
| b) Filesystem Creation options | e) Partition summary                  | h) General Buttons |
| c) Partition buttons           | f) Partition configuration parameters |                    |

The following figure shows the *sw\_config* interface as it appears on a hardware RAID system. With hardware RAID, you see the logical disks (sometimes referred to as a logical unit number, LUN), not the individual disks.



## Partitioning Modes

Partitioning modes are used to add and remove disks from a partition.

Mode	Description
Add	Add the disk to the partition.
Clear	Remove disks from the current partition.
Clear All	Remove disks from any partition.

## Filesystem Creation Options

These options only take effect when you click the Save button in the lower-left corner of the window.

**!** **WARNING:** Do not use Keep to save a new partition layout. This can be destructive.

Option	Description
Keep	Updates the filesystem configuration without recreating the filesystem. Use this option to add disks to a configuration after a heal.
Create	Create a new configuration and filesystem. This will destroy any existing data in this partition. To use this option, all partitions must be unmounted.

## Partition Buttons

Use the partition buttons to select the partition you want to create and identify the different partitions in the Hard Disks area.

## Partition Configuration Parameters

You can configure the following parameters of each partition. See [“Setting Partition Configuration Parameters”](#) on page 24.

Label	Description
Offset	The partition’s physical starting point on each disk in blocks of 512 bytes.
Length	The physical size of the partition in blocks of 512 bytes.
Bandwidth	The bandwidth reserved for the application.
KB/inode	The number of kilobytes allotted to each inode.
Filesystem ID	A unique value identifying the filesystem.

## Partition Summary

The following information is displayed in the Partition Summary.

Label	Description
Data Disks	Number of disks in the partition.
Parity Disk	Presence of a parity disk.
Capacity	Total available storage space for the partition.
Number of Inodes	Total number of inodes for the partition. This is derived by dividing the Capacity by the KB/inode ratio.
Memory Usage (inodes)	Amount of RAM used to load the inode table.
Memory Usage (bitmap)	Amount of RAM required to map the filesystem.
Total Memory Usage	Total RAM used by the partition. This should be less than the total free RAM on the system.

## Hard Disk Area

This area is a representation of all disks currently available to your system, including system and audio disks.

Attribute	Description
Purple	This is the system disk.
White	Disk is not part of a Stone filesystem partition (usually a spare disk, audio disk or other available device).
Grey	Disks that were present at boot time, but were missing or unavailable when <i>sw_config</i> started.

Attribute	Description
ULic	Disks that are not licensed for use with the Stone filesystem (for example, audio disk).
Sick	Indicates a “sick” disk. Sick disks are write-protected to prevent the Autodesk application from writing on the spare disk while a heal procedure is in progress. The spare disk is labelled as “sick” automatically during the heal procedure (see <a href="#">Chapter 6, “Monitoring and Repairing the Filesystem,”</a> on page 61).
Dead	Indicates a “dead” disk. When the system detects a problem with a disk, it automatically labels it as dead. You cannot read or write to a dead disk.
Parity	Disk contains parity information.
Other Colours	Indicate the partition.

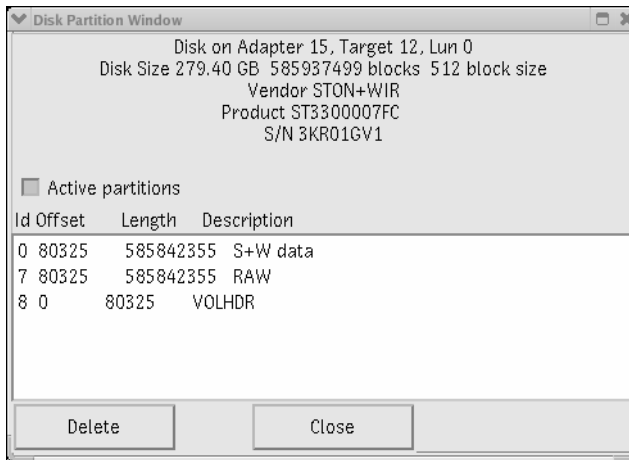
### Disk Menu

You can open the Disk menu by right-clicking a disk. It contains the following commands.

Command	Description
Partition Info	Displays information about the partition. See <a href="#">“Disk Partition Window”</a> on page 36.
Set Sick	Do not use this command. The spare disk is set to “sick” automatically during a heal procedure. Sick disks are write-protected.
Set Dead	Sets a disk as “dead.” You may set a disk to dead to locate a dead disk that has not been identified by the system. See <a href="#">“Locating Dead Disks Manually (Software RAID Only)”</a> on page 86.
Set Well	Makes a disk writable and readable. See <a href="#">“Setting “Dead” Disks Well”</a> on page 86.
Ping Disk	Used to locate a disk in a chassis. A dialog box reports which disk should be blinking. If the light on the disk does not blink, the disk is dead.
Test Speed	Measures the speed of a disk. Disk speed is evaluated by sending eight packets of different lengths to eight different locations on the disk. Results are displayed in a dialog box.
Add	Adds the disk to the currently selected partition.
Add Parity	Adds parity to the disk.
Clear	Removes the disk from the current partition.
Clear All	Removes the disk from any partition.

### Disk Partition Window

Open the Disk Partition Window from the Disk menu.



Item	Description
Controller number	Host adapter number.
Disk address	Position of disk on the host adapter.
Disk size	Size of disks in GB and blocks of 512 KB.
Vendor	Hard disk vendor (AUTODESK, STON+WIR, or DISCREET indicates that the disk is licensed for use with the Stone filesystem).
S/N	Hard disk serial number.
Active partitions	Lists all UNIX, Linux, and Stone filesystem partitions (labelled S+W Data) for the current hard disk drive.
Inactive area	Displays the unused area of the current hard disk drive. In almost all cases this area will be empty since the entire disk is usually reserved for the Stone filesystem.
Delete	Removes a hard disk from the selected Stone filesystem partition.

## General Buttons

The following buttons appear at the bottom of the window.

Button	Description
Save	The behaviour when you save your changes depends on whether you have selected Create or Keep as your filesystem creation option. Create overwrites the existing filesystem with the partition information you configured. Keep updates the configuration information without overwriting the filesystem. Use Keep to replace a disk in your partition after you have performed a heal.
Select All	Select all disks that are available for the current partition.
Quit	Quit <i>sw_config</i> . Nothing is saved if you did not save changes to the configuration in the current session.
Man Page	Display the <i>sw_config</i> man page.
Versions	Display the version of Stone and Wire.

### Zoom Arrows

Use the Zoom arrows to increase or decrease scaling in the hard disk area.



# Setting Up the Wire Network

## Summary

- [Workflow for Setting Up Wire and Wiretap](#) ..... 39
- [Stop All Stone and Wire Daemons](#) ..... 40
- [Licensing Wire](#) ..... 40
- [Defining Network Interfaces in the Framestore Configuration File](#) ..... 41
- [Configuring probed to Automate Connections between Wire Hosts](#) ..... 42
- [Exporting Folders to Enable Sharing of Projects and Clips](#) ..... 43
- [Restarting Stone and Wire](#) ..... 44
- [Configuring Wiretap](#) ..... 45

## Workflow for Setting Up Wire and Wiretap

Use Wire and Wiretap to improve your production workflow and data management by sharing your projects, libraries, clips and frames with other Autodesk Editing and Effects products, such as Smoke and Flame, as well as other Autodesk products such as Autodesk Toxik, Autodesk Cleaner, or Autodesk Lustre, and even third-party products.

**NOTE:** All Autodesk Editing and Effects applications on your Wire network must be running the same version of Stone and Wire. See [Chapter 5, "Upgrading Stone and Wire,"](#) on page 57.

See the following table for a summary of the steps you must follow to set up Wire and Wiretap.

Step:	Refer to:
1. Stop all Stone and Wire daemons.	<a href="#">"Stop All Stone and Wire Daemons"</a> on page 40.
2. Add the Wire license string to the <code>/usr/local/flexlm/licenses/DL_license.dat</code> license file.	<a href="#">"Licensing Wire"</a> on page 40.
3. Configure the network interfaces that you will use for Wire networking in the <code>sw_framestore_map</code> file. This must be done on every host that is a part of the Wire network.	<a href="#">"Defining Network Interfaces in the Framestore Configuration File"</a> on page 41.

Step:	Refer to:
4. Make sure that all the hosts that you want to access with Wire are using the same <i>probed</i> port number.	<a href="#">“Configuring probed to Automate Connections between Wire Hosts”</a> on page 42.
5. Export all folders that you want remote hosts to be able to access.	<a href="#">“Exporting Folders to Enable Sharing of Projects and Clips”</a> on page 43.
6. Restart Stone and Wire.	<a href="#">“Restarting Stone and Wire”</a> on page 44.
7. Test that Wire is working.	<a href="#">“Testing Wire Using sw_framestore_dump”</a> on page 92.
8. If you will use Wiretap, you must configure it.	<a href="#">“Configuring Wiretap”</a> on page 45.

## Stop All Stone and Wire Daemons

You must stop all Stone and Wire daemons before you configure Wire networking.

It is best to use an *init.d* script to ensure that all Stone and Wire daemons are stopped.

**NOTE:** Before you stop Stone and Wire daemons, you must exit your Autodesk Effects or Editing application and be sure that there are no remote hosts connected to your framestore.

### To stop all Stone and Wire daemons:

1. Open a shell and log in as root.

2. Stop Stone and Wire. Type:

```
/etc/init.d/stone+wire stop
```

Messages appear in the shell indicating that Stone and Wire is stopped.

3. You are ready to begin setting up Wire. See [“Licensing Wire”](#) on page 40.

## Licensing Wire

You need a valid Wire license on your Wire server to enable transfers with remote hosts. Wire clients do not require a license.

To license Wire, you must send Autodesk licensing your host ID and Autodesk will send you a Wire license string. You must add this license string to the `/usr/local/flexlm/licenses/DL_license.dat` license file.

The Wire license string looks similar to the following: `wire_all_r_2007`

For detailed instructions on how to obtain and install your Wire license, see the Software Installation Guide for your release.

## Defining Network Interfaces in the Framestore Configuration File

To enable communication between Wire servers and remote hosts, you must set up the network interfaces on your workstation in the framestore configuration file, *sw\_framestore\_map*.

You can define more than one network interface on a host for Wire transfers. For example, if your host has both an InfiniBand and a Gigabit Ethernet (GigE) network card, you can set up both of those interfaces in the *sw\_framestore\_map* file. Wire tries to communicate with other hosts using the first interface listed in the file. If it is unable to connect to the host using that interface, it tries the next one.

For more information on the *sw\_framestore\_map* file, see [“Understanding the sw\\_framestore\\_map File”](#) on page 99.

**NOTE:** Before editing this file, be sure you exit your Autodesk Effects or Editing product and stop all Stone and Wire daemons.

### To set up network interfaces in *sw\_framestore\_map*:

1. Open a shell and log in as root.
2. Open the framestore configuration file in a text editor. The framestore configuration file is located in the following path: */usr/discreet/sw/cfg/sw\_framestore\_map*
3. Configure all the network interfaces on your workstation in the [INTERFACES] section of the *sw\_framestore\_map* file.

**HINT:** To find the IP addresses of all the network interfaces on your workstation, open another shell, log in as root, and type **ifconfig**. You can copy the IP address values from the shell to the *sw\_framestore\_map* file.

The following is an example for a framestore named london, which has two network interfaces, one InfiniBand and one GigE:

```
[FRAMESTORES]
FRAMESTORE=london HADDR=172.16.129.32 ID=30

[INTERFACES]
FRAMESTORE=london
PROT=IB_SDP IADDR=172.16.129.32 DEV=1
```

```
PROT=TCP    IADDR=192.168.15.53    DEV=1
```

**NOTE:** The framestore name in the [FRAMESTORES] and [INTERFACES] section of the file must match the local machine.

The [INTERFACES] section uses the following syntax:

```
FRAMESTORE=<framestore_name>
```

```
PROT=<protocol> IADDR=<interface_address> DEV=<device#>
```

Keyword	Description
FRAMESTORE	The name of the framestore. This is the name that appears when remote hosts attempt to connect to this framestore. This name must match the framestore name in the [FRAMESTORES] section of the file.
PROT	Network protocol used to communicate with the framestore. <ul style="list-style-type: none"> <li>• Use TCP for TCP/IP.</li> <li>• Use IB_SDP for InfiniBand interfaces.</li> <li>• Use HIPPI for Hippi interfaces.</li> </ul>
IADDR	The IP or HIPPI address of the network card. <ul style="list-style-type: none"> <li>• If you selected the TCP/IP protocol (PROT=TCP), the interface address is the IP address of the TCP/IP network card.</li> <li>• If you selected the InfiniBand protocol (PROT=IB_SDP), the interface address is the IP address of the InfiniBand card.</li> <li>• If you selected the HIPPI protocol (PROT=HIPPI), the interface address is the I-Field address for the HIPPI interface such as 0x03000001. Refer to your HIPPI network configuration document for more information on how to determine the I-Field value.</li> </ul>
DEV	Set the DEV keyword to 1 in all cases.

4. Save the `sw_framestore_map` file and exit the text editor.

## Configuring *probed* to Automate Connections between Wire Hosts

The *probed* daemon on each Wire server uses a self-discovery mechanism to locate all other Wire hosts and their framestores on your network. The *probed* daemon listens to a specific port for broadcasts by other Wire servers. When *probed* locates other Wire servers, it stores configurations required for communication between the two hosts in memory.

By default, all Wire hosts have self-discovery enabled and are set to use port number 7001. You can change the port number to create different Wire networks of Autodesk Editing and Effects products.

**NOTE:** Before editing this file, be sure you exit your Autodesk Effects or Editing product and stop all Stone and Wire daemons.

**To configure *probed* to automate connections between Wire hosts:**

1. Open a shell and log in as root.
2. Open the *probed* configuration file in a text editor. The *probed* configuration file is located in the following path: `/usr/discreet/sw/cfg/sw_probed_cfg`
3. Check that the Port keyword is appropriate for your network configuration. The default value 7001 is often correct.
4. Check that the SelfDiscovery keyword is set to “yes”.
5. Save and close the file.

**NOTE:** The *probed* daemon cannot cross routers to locate Wire servers located on remote subnets. To access Wire servers on other subnets, you must hard-code their configuration information in the `sw_framestore_map` file. See [“Extending Wire Over Multiple Networks”](#) on page 102.

## Exporting Folders to Enable Sharing of Projects and Clips

Both Linux and IRIX systems can use the Wire network to share Autodesk Effects and Editing projects, clips, setups, and user preferences. You enable this sharing by modifying the settings in the *exports* file, located in the */etc* directory. For example, if you want to share files that reside on a given Linux or IRIX system, in the */etc/exports* file on that system you specify the folders you want to share and the security you want to enable. You can enable access to the complete */usr/discreet* directory or to any subset of the directories it contains.

Enable access to directory:	To:
<code>/usr/discreet/clip</code>	Enable remote access to clip libraries for Wire.
<code>/usr/discreet/project</code>	Enable remote access to projects at start-up.
<code>/usr/discreet/user/editing/&lt;user name&gt;</code> <code>/usr/discreet/user/effects/&lt;user name&gt;</code>	Enable remote access to user preferences and setups.
<code>/usr/discreet</code>	Enable remote access to all clip libraries, projects, user preferences, and setups.

The example in the following procedure provides full read/write access to all users. Depending on your local network security policies, you may decide to use more restrictive permission settings.

**To export shared folders:**

1. Log in as root to the host from which you want to export directories.
2. Open the */etc/exports* file in a text editor.

3. Add a line at the end of the *exports* file using the appropriate syntax for your operating system. The entry must be in a single line. For Linux, type:

```
/usr/discreet/<EXPORT_DIRECTORY> *(rw,synch,no_root_squash)
```

For IRIX, type:

```
/usr/discreet/<EXPORT_DIRECTORY> -rw,anon=0
```

4. Save the file and exit.
5. Export all the shared directories in the */etc/exports* file. Type:

```
/usr/etc/exportfs -a
```

6. To verify that the share is properly exported, type:

```
cd /usr/etc
```

```
exportfs
```

A list of all exported directories appear in the shell. If your clip library directory does not appear, check the */etc/exports* file.

## Restarting Stone and Wire

After you have completed all the Wire networking configurations, you must restart all Stone and Wire daemons.

### To restart Stone and Wire:

1. Open a shell and log in as root.
2. To restart Stone and Wire, type the following in a shell:

```
/etc/init.d/stone+wire start
```

The messages that appear in the shell should indicate that Stone and Wire started successfully and was able to mount.

3. To test that Wire is working, type:

```
/usr/discreet/sw/tools/sw_framestore_dump
```

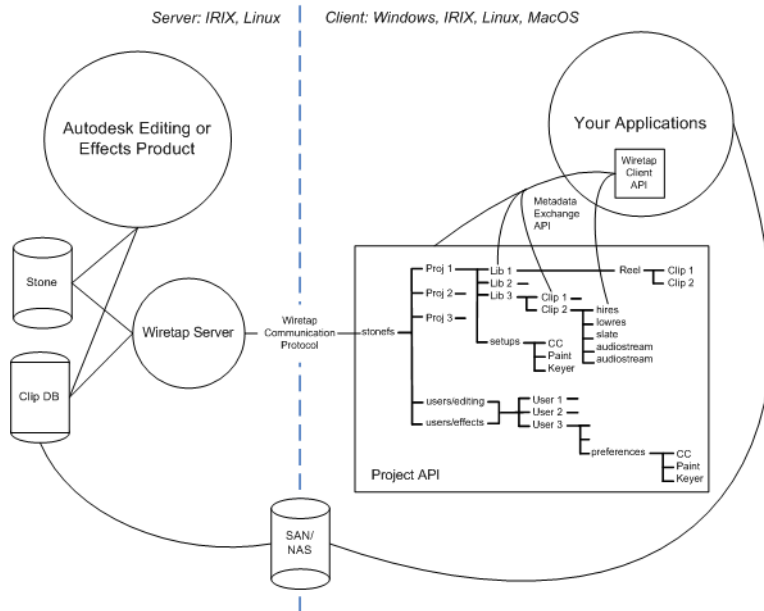
This command should show all Wire hosts on your network. For additional troubleshooting procedures, see [Chapter 7, “Troubleshooting Stone and Wire.”](#) on page 77.

When all Wire hosts are configured, you are ready to use Wire to share projects, libraries, clips, and frames, between your Autodesk Editing and Effects products.

## Configuring Wiretap

Wiretap is an enabling technology that uses client-server architecture to allow applications running on a client system to access projects, libraries, clips, and frames on a remote storage device accessed through an Autodesk Editing or Effects product. The data is presented in a tree-like hierarchy and is accessible via the Wiretap Client API.

Wiretap is comprised of a Client API that taps into the remote storage filesystem through a Wiretap Server running on the remote system via a high-performance network protocol.



**NOTE:** Wiretap does not support the HIPPI networking protocol.

### Workflow for Configuring Wiretap

You must configure Wiretap if you want to exchange projects, libraries, clips, or frames between Autodesk Editing and Effects products and any other Autodesk or third-party products.

The recommended steps for configuring Wiretap are as follows.

Step:	Refer to:
1. Verify that the Wiretap server and Stone and Wire are running.	<a href="#">“Verifying that the Wiretap Server and Stone and Wire Are Running”</a> on page 46.
2. Configure network interfaces that you want Wiretap to use.	<a href="#">“Configuring Wiretap Network Interfaces”</a> on page 47.
3. Configure Wiretap path translation so that each host can access files referred to by hosts running different operating systems.	<a href="#">“Configuring the Path Translation Database”</a> on page 48.
4. Rather than creating, updating, and managing multiple copies of the path translation database, you can set up one copy of the database so that it can be shared with multiple workstations.	<a href="#">“Sharing the Database Among Multiple Wiretap Servers”</a> on page 53.
5. After you have finished configuring Wiretap, you should test the path translation database to verify that it is working as expected.	<a href="#">“Testing the Path Translation Database”</a> on page 53.

## Verifying that the Wiretap Server and Stone and Wire Are Running

The Wiretap server must be running on your Autodesk Editing or Effects product for any other Autodesk application or third-party system to be able to access projects, libraries, clips, or frames on remote storage.

By default, the Wiretap server and Stone and Wire are running.

The procedure for starting a Wiretap server and Stone and Wire is different on Linux and IRIX. See the following two procedures and select the appropriate one for your operating system.

### To verify that the Wiretap server is running on a Linux workstation:

1. Open a shell and log in as root.
2. Open the `/etc/sysconfig/stone+wire` file.
3. Scroll down the file to the `dl_wiretap` entry and do one of the following:
  - If the entry says `dl_wiretap=on`, go to the next step.
  - If the entry says `dl_wiretap=off`, use a text editor to change the entry to say `dl_wiretap=on`.
4. Restart Wiretap and Stone and Wire. Type the following in a shell:
 

```
/etc/init.d/stone+wire restart
```

Wiretap and Stone and Wire restart.

**To verify that the Wiretap server is running on an IRIX workstation:**

1. Open a shell and log in as root.
2. Type:
 

```
chkconfig | grep wiretap
```
3. Scroll down the file to the *dl\_wiretap* entry and do one of the following:
  - If the entry says *dl\_wiretap on*, proceed with the next step.
  - If the entry says *dl\_wiretap off*, set Wiretap on by typing:
 

```
chkconfig dl_wiretap on
```
4. Restart Stone and Wire. Type the following in a shell:
 

```
/etc/init.d/stone+wire restart
```

Wiretap and Stone and Wire restart.

**Configuring Wiretap Network Interfaces**

You must configure Wiretap to use specific network interfaces for transfers. This allows you to prioritize network interfaces used by Wiretap so that you can, for example, take advantage of high-speed networking provided by an InfiniBand or GigE network card.

If you do not configure a network interface, Wiretap uses the house network IP address that is broadcast by the Wiretap server.

You must configure Wiretap network interfaces in the */usr/discreet/sw/cfg/wiretapd.cfg* file.

**To configure Wiretap network interfaces:**

1. Open */usr/discreet/sw/cfg/wiretapd.cfg* in a text file editor.
2. Configure all the network interfaces you want to use for Wiretap in the [Server] section of the file.

The [Server] section uses the following syntax:

```
IP=<IP_address_of_network_interface>
```

You can add multiple IP addresses to this section. Wiretap attempts each interface in the order it appears in the file.

The following is an example of a host which has two network interfaces, one InfiniBand and one GigE:

```
[Server]
IP=172.16.129.3
```

```
IP=192.168.15.53
```

3. Save and close the file.

## About Wiretap Path Translation

The Wiretap path translation service converts the syntax of a file path referred by a Wiretap server running on an IRIX or Linux workstation to a format that the client can understand. This service allows Wiretap clients, who might be running Windows or Mac OS X, to understand file paths that are referenced by an Autodesk Editing or Effects product to clips that have been soft-imported from a NAS, SAN, or any remote mounted storage.

For example, Cleaner XL running on a Windows workstation can work with an Autodesk Editing or Effect product's soft-imported clip on a SAN or NAS.

For the Windows workstation, the syntax of the path to the media files may resemble this:

```
N:\myclips\clip1\frame1.dpx
```

On an IRIX or Linux workstation, the path to the same media files may resemble this:

```
/CXFS/myclips/clips1/frame1.dpx
```

When the Wiretap client tries to locate this clip, the path translation service converts the syntax of the path so that the client can access the soft-imported clip from a remote storage device it has mounted locally.

## Configuring the Path Translation Database

The path translation service uses a translation database. The path translation database contains a set of rules that specify how to convert (or “translate”) a file path referred to by a source workstation (the host running the Wiretap server) into a path that the client can understand. These rules are contained in the *sw\_wiretap\_path\_translation\_db.xml* configuration file, which is located in the */usr/discreet/sw/cfg* directory of each Autodesk Editing or Effects product workstation and read by the Wiretap server.

The translation database is an XML file that must be updated by hand as the network configurations change. The file should be created and maintained by a system administrator who is aware of the configuration of the network.

**NOTE:** Upgrading an installation of Stone and Wire will preserve the file, but a new or fresh installation will install the default empty database.

**To configure the path translation database:**

1. Consider your network environment and how you can organize hosts to simplify the path translation process.

Do you have many hosts accessing the same storage device? Do they mount the central storage using the same syntax and drive names? Are these hosts running the same application? Are they running the same operating system?

2. In a text editor, open `/usr/discreet/sw/cfg/sw_wiretap_path_translation_db.xml`.
3. Create the rules for translating the file path. The rules are applied in the order that they appear in the file. The first rule is applied. If that rule matches, then the translation is complete. If the rule doesn't match, the next rule is examined.

If your network includes groups of hosts that mount their storage using the same syntax, you may be able to use a group or platform rule to translate the syntax for all similar hosts. If, however, all of your hosts use different syntax and mount points for their storage, you will have to create a host/path rule for each source and destination host.

See the sections that follow for a description of the possible path translation rules you can create.

4. Save the file.
5. You do not have to restart Stone and Wire to apply changes in the path translation database. The Wiretap server periodically checks the timestamp of the file and, if there are changes, it updates itself accordingly. However, if you want to test the results of your changes you can restart Stone and Wire manually.

To restart Stone and Wire manually, type the following in a shell:

```
/etc/init.d/stone+wire restart
```

Stone and Wire restarts.

**About XML Syntax**

You must respect XML syntax standards when editing the path translation file. For example, the values assigned to attributes must not include ampersands (&) or left angle brackets (<) in their literal form. All instances of these characters, except left and right angle brackets used to delimit XML tags, should be replaced with `&amp;` and `&lt;`; respectively. Do not concern yourself with the white-space between attributes; it is ignored when the file is parsed.

**Creating a Host/Path Rule for Host-to-Host Translation**

Create a host/path rule to translate the path syntax used by the source workstation (the workstation running the Wiretap server) to the path syntax used by the destination workstation.

The syntax of the host/path rule is as follows:

```
<map src_host="<src_host_attribute>"
src_path="<src_path_attribute>"

      dst_host="<dst_host_attribute>"
dst_path="<dst_path_attribute>">
```

You must enter a value for each attribute that is appropriate to your network. See the table that follows for a description of the valid values for each attribute.

Attribute	Description
src_host	The host name or IP address of the Autodesk Editing or Effects product's workstation to which a client connects. If you create a group rule for source workstations, the value of this attribute can be the group name.
src_path	The path to the remote storage as referred to by source host (or hosts, when mapping a group).
dst_host	The host name or IP address of the client that mounts the same storage referred to by the source, using a different syntax. If you create a group rule for destination workstations, the value of this attribute can be the group name.
dst_path	The path to the remote storage as referred to by destination host (or hosts, when mapping a group).

Example:

```
<map src_host="flame1"    src_path="/stoneShared/new_clips"
      dst_host="windows1" dst_path="M:\">
```

Setting up a host-to-host translation for every machine in your network is inefficient. If you have many hosts that will use the same path translation rule, you can set up a group or platform rule. See the sections that follow.

### Creating a Rule for Groups of Hosts

Use the group rule when you have several workstations that will use the same rule to convert the path syntax of a single source or group of source workstations. This rule is effective in larger installations where numerous workstations mount storage using identical syntax.

To work, all of the hosts in a group rule must mount directories using exactly the same syntax. For example, all Cleaner workstations must mount the NAS on the Z:\images mount point to use the same path translation rule for the NAS.

**NOTE:** Group names must be unique and must not conflict with host names or platform names.

The syntax of the group rule is as follows:

```

<group name="<group_name>" os="<os_name>">
  [<host name="<host_name>">]
</group>

```

You must enter a value for each attribute that is appropriate to your network. See the table that follows for a description of the valid values for each attribute.

Attribute	Description
group name	Identifies the name of the group. Create a group name of your choosing. Each group name must be unique. Use the value of this attribute in a host-to-host rule to map all members of the group to the same storage mount point.
host name	Identifies the name of a host that is in the group.
os	This attribute is optional. It allows you to link all of the hosts in the group to a single operating system. You can then use a platform rule to map all the hosts in a group to the same mount point. The os attribute is restricted to the following values: Irix, Linux, WindowsNT, and MacOSX.

Example:

```

<group name="Autodesk_Stations" os="Irix">
  <host_name="flame1">
  <host_name="inferno1">
  <host_name="smoke1">
</group>

<group name="CleanerRenderNodes" os="WindowsNT">
  <host_name="cleaner1">
  <host_name="cleaner2">
  <host_name="cleaner3">
</group>

```

After you have defined a group, you can use the host/path rule to map all the hosts in the group to the same path by using the group name for either the `src_host` or `dst_host` attribute value.

In the following example, all hosts in the `CleanerRenderNodes` group map the `Autodesk_Stations` storage path to `Z:\images`, a mount point they all share:

```

<map src_host="Autodesk_Stations" src_path="/shared_storage/
images"

```

```
dst_host="CleanerRenderNodes" dst_path="Z:\images">
```

You can also use a platform rule to map all the hosts in a group to the same destination path based on the operating system they all run.

In the following example, the platform rule is used to map all Windows users to N: \ when translating /usr/ from an IRIX system:

```
<map src_os="Irix" src_path="/usr/"
dst_os="WindowsNT" dst_path="N:\">
```

### Creating a Rule for a Group of Hosts Running on the Same Operating System

The platform rule is similar to the group rule in that the rule is applied to all hosts running the same operating system.

To work, all hosts running the same operating system must mount directories using exactly the same syntax. For example, all Windows workstations must mount the NAS on the N: \ mount point to use the same path translation rule for the NAS.

**NOTE:** Platform names must be unique and must not conflict with host names or group names.

The syntax of the platform rule is as follows:

```
<map src_os="<src_os>" src_path="<src_path>"
dst_os="<dst_os>" dst_path="<dst_path>">
```

You must enter a value for each attribute that is appropriate for your network. See the table that follows for a description of the valid values for each attribute.

**NOTE:** The `src_os` and `dst_os` attributes are restricted to the following values: Irix, Linux, WindowsNT, and MacOSX.

Attribute	Description
<code>src_os</code>	The operating system of the Autodesk Editing or Effects product's workstation to which a client connects.
<code>src_path</code>	The path to the remote storage as referred to by all hosts using the same operating system.
<code>dst_os</code>	The operating system of the client that mounts the same storage referred to by the source.
<code>dst_path</code>	The path to the remote storage as referred to by the hosts running the destination operating system.

Example:

```
<map src_os="Irix" src_path="/usr/"
```

```
dst_os="WindowsNT" dst_path="N:\">
```

## Sharing the Database Among Multiple Wiretap Servers

When you have many Wiretap servers, you must update the path translation database on each server every time there is a change to the network configuration.

To simplify the management of the database, you can create a symbolic link from the path translation file on all hosts running the Wiretap server to one machine that contains the actual file.

## Testing the Path Translation Database

After the path translation database is updated by the system administrator, it must be tested. The *sw\_wiretap\_translate\_path* command verifies that a path requested from the Wiretap server on the local machine can be translated into a path that can be understood by the client machine.

### Synopsis

```
sw_wiretap_translate_path [-h <host name>] [-p <path>] [-f
<file containing paths>] [-H <destination host name>] [-O
<destination OS>]
```

The *sw\_wiretap\_translate\_path* options are described in the following table.

Option	Description
-h	Specifies the host name or IP address of the Wiretap server. The default is <code>localhost</code> .
-p	Specifies the path on the Wiretap server host to translate.
-f	Specifies the file containing the paths on the remote host to translate to the path on the local host, delimited by new lines.
-H	Specifies the destination host name. The default is <code>localhost</code> .
-O	Specifies the destination operating system (Irix, Linux, Windows NT, Mac OSX).

**NOTE:** Either `-p` or `-f` must be specified, but not both.

### To test the path translation database:

1. On an IRIX or Linux workstation, open a shell and log in as root.
2. Change to the Stone and Wire tools directory. Type:

```
cd /usr/discreet/sw/tools
```
3. Type the *sw\_wiretap\_translate\_path* command with the appropriate options.

For example, suppose you have a SAN mounted as “/stoneShared” on your Flame workstation (flame1). A Windows PC (windows1) will mount the SAN as “M:\”. The path translation file contains the following entries:

```
<map src_host="flame1"   src_path="/stoneShared"  
      dst_host="windows1" dst_path="M:\">
```

From the workstation, open a new shell and type:

```
./sw_wiretap_translate_path -h flame1 -p /stoneShared/new_clips  
-H windows1
```

The result should return the value of the destination path, which represents how “windows1” will mount “/stoneShared” on “flame1”.

M: \

**NOTE:** If the result returns the value of the source path, the translation database entry was not successfully applied.

# Section 2

# Administering Stone and Wire

<a href="#">Upgrading Stone and Wire</a>	57
<a href="#">Monitoring and Repairing the Filesystem</a>	61
<a href="#">Troubleshooting Stone and Wire</a>	77



Image courtesy of Golden Square

# Upgrading Stone and Wire



## Summary

<a href="#">Workflow for Upgrading Only Stone and Wire</a> .....	57
<a href="#">Compatibility</a> .....	57
<a href="#">Verifying the Stone and Wire Version</a> .....	58
<a href="#">Upgrading Stone and Wire</a> .....	58

## Workflow for Upgrading Only Stone and Wire

When you install an Autodesk Editing or Effects application, the latest version of Stone and Wire is automatically installed on the system.

However, you can upgrade only Stone and Wire, without upgrading the Autodesk Editing or Effects application, by running the stand-alone Stone and Wire installation script. There is no risk of performance degradation or data corruption when upgrading to the latest version of Stone and Wire. This is tested extensively.

See the following table for a summary of the steps you must follow to upgrade Stone and Wire.

<b>Step:</b>	<b>Refer to:</b>
1. Consider compatibility issues before you decide to upgrade Stone and Wire.	<a href="#">"Compatibility"</a> on page 57.
2. Check to see what version of Stone and Wire you are running.	<a href="#">"Verifying the Stone and Wire Version"</a> on page 58.
3. Run the stand-alone Stone and Wire installation script.	<a href="#">"Upgrading Stone and Wire"</a> on page 58.

## Compatibility

If you want to use Wire to transfer media between Autodesk Editing and Effects applications, all of those applications should be running the same version of Stone and Wire. See the installation or release note documentation provided with your application to determine which versions of Stone and Wire are supported.

There may be clip library compatibility issues between application versions. For example, an older version of an application may only be able to read the clip libraries of more recent versions. Please see the “Compatibility” chapter in the application user’s guide for more information.

## Verifying the Stone and Wire Version

Before you upgrade Stone and Wire, check to see which version of Stone and Wire you are running on all systems on your Wire network.

### To verify the version of Stone and Wire installed on a Linux system:

1. Open a shell and log in as root.
2. Type:

```
rpm -qa | grep Stonewire
```

The output should be similar to the following example:

```
Stonewire.filesystem.driver-2007
```

```
Stonewire.filesystem.sw-2007
```

```
Stonewire.base.sw-2007
```

3. Check the versions listed in the output. In the previous example, all Stone and Wire components are at version 2007.

### To verify the version of Stone and Wire installed on an IRIX system:

1. Open a shell and log in as root.
2. Type:

```
versions -bn | grep Stone
```

The output should be similar to the following example:

```
I Stonewire 1653000915 discreet Stone+Wire 2007
```

3. Check the versions listed in the output. In the previous example, all Stone and Wire components are at version 2007.

## Upgrading Stone and Wire

Run the Stone and Wire stand-alone installation script to upgrade only Stone and Wire. The Stone and Wire installation script does not upgrade your application.

**To upgrade Stone and Wire:**

1. Open a shell and log in as root.
2. Download the upgrade package for Stone and Wire. For help locating the Stone and Wire upgrade package, see your Editing or Effects release notes or contact Customer Support. See [“Contacting Customer Support”](#) on page 6.

3. Uncompress and untar the Stone and Wire package you downloaded by typing the following two commands:

```
gunzip <filename.tar.gz>
```

```
tar -xvf <filename.tar>
```

The file is uncompressed and an install directory is created on your system.

4. Change to the newly created install directory.
5. Start the installation script by typing:  

```
./INSTALL
```
6. (IRIX only) Reboot the system to complete the installation.
7. Confirm that you are running the new version of Stone and Wire. See [“Verifying the Stone and Wire Version”](#) on page 58.



# 6

## Monitoring and Repairing the Filesystem

### Summary

<a href="#">Workflow for Monitoring and Repairing the Stone Filesystem</a> .....	61
<a href="#">Configuring Email Notification of Disk Failure on Software RAID</a> .....	62
<a href="#">Configuring Notification of Disk Failure on IR-Series Hardware RAID</a> .....	62
<a href="#">Configuring Email Notification of Disk Failure on XR-Series Hardware RAID</a> .	64
<a href="#">Identifying Failed Drives on a Software RAID System</a> .....	64
<a href="#">Checking the Replacement Drive Size (in Blocks) for Software RAID</a> .....	66
<a href="#">Performing a Software RAID Heal with a Hot Spare Disk</a> .....	67
<a href="#">Performing a Software RAID Heal with a Cold Spare Disk</a> .....	74

### Workflow for Monitoring and Repairing the Stone Filesystem

The procedures in this chapter describe how to monitor your Stone filesystem for disk failure.

In the event of disk failure, the steps you must take to recover depends on whether you have a software or hardware RAID system:

- If your storage is managed by the software RAID features provided by the Stone filesystem and a disk fails, you must perform a “heal” to recover.

**NOTE:** Software RAID is not supported on Linux systems.

- If your storage is managed by a hardware RAID solution and a disk fails, parity is automatically rebuilt by the RAID controller. The only thing you must do is replace the dead disk. See the documentation provided with your storage hardware for instructions on how to replace failed disks.

See the following table for a summary of the steps to monitor and heal a filesystem.

Step:	Refer to:
1. Enable automatic notification of disk failures.	<ul style="list-style-type: none"> <li>• For software RAID: <a href="#">“Configuring Email Notification of Disk Failure on Software RAID”</a> on page 62.</li> <li>• For IR -Series storage using hardware RAID: <a href="#">“Configuring Notification of Disk Failure on IR-Series Hardware RAID”</a> on page 62.</li> <li>• For XR-Series storage using hardware RAID: <a href="#">“Configuring Email Notification of Disk Failure on XR-Series Hardware RAID”</a> on page 64.</li> </ul>
2. If you are running software RAID, identify the dead drives in your storage array.	<a href="#">“Identifying Failed Drives on a Software RAID System”</a> on page 64.
3. Before you heal your software RAID system, you must check that the number of blocks is the same across all disks in the array.	<a href="#">“Checking the Replacement Drive Size (in Blocks) for Software RAID”</a> on page 66.
4. Recover from the disk failure by performing a heal on the software RAID system	<a href="#">“Performing a Software RAID Heal with a Hot Spare Disk”</a> on page 67 or <a href="#">“Performing a Software RAID Heal with a Cold Spare Disk”</a> on page 74.

## Configuring Email Notification of Disk Failure on Software RAID

If your storage is managed by software RAID, your Autodesk Effects or Editing application alerts you to disk failures. The following error message appears in the message bar of the application to indicate a bad disk in the framestore:

```
VOLUMEMGT: WARNING: The disk array has 1 bad disk(s)
```

You can also be notified by e-mail when a bad disk is detected by the application. See the Configuration File Reference Guide for your application for instructions on setting up the DiskHealthNotification keyword in the software initialization configuration file (*init.cfg*).

## Configuring Notification of Disk Failure on IR-Series Hardware RAID

If you are using hardware RAID to manage IR-Series storage, the RAID controller automatically rebuilds parity. You must, however, replace the failed disk with a new spare disk to ensure that a spare is available in the enclosure in the event that the RAID controller must rebuild another drive.

To be notified of disk failure on IR-Series hardware RAID, you must set up the *dsm\_rebuild\_check* script:

- To enable notification in the application, the *dsm\_rebuild\_check* script must run regularly as a Cron job. When enabled, an error message appears in the application when it restarts, informing the user of dead and rebuilt drives.

After you have replaced the dead disk, you must delete the files that generate the disk health messages in the application.

- To enable email notification, you can set up the *dsm\_rebuild\_check* script to send emails informing the recipient of dead and rebuilt drives.

**NOTE:** The *dsm\_rebuild\_check* script is over-written if you must re-install DSM. If you must re-install DSM, make a back-up of the script and restore it when you have finished.

**To configure the *dsm\_rebuild\_check* script for email notification:**

1. Open a shell and log in as root.
2. Open the *dsm\_rebuild\_check* script in a text editor. This script is located in */usr\_discreet/dsm*.
3. Locate the following section in the script:
 

```
# e-mail notification settings
emailNotification="yes"
email="root"
```
4. To turn on email notification, check that the value for the `emailNotification` keyword is "yes".
5. To configure an email address to receive the notifications, set the value of the `email` keyword to the email address of the recipient. For example:
 

```
email="administrator@mycompany.com"
```
6. Save and exit the file. Press **ESC** and then type:
 

```
:wq!
```

**To create a cron job to run the *dsm\_rebuild\_check* script:**

7. Open a shell and log in as root.
8. Edit the crontab. Type:
 

```
crontab -e
```

The crontab file opens in a text editor.
9. Enter the following:

```
# DSM rebuild check
0,30 * * * * /usr/discreet/dsm/dsm_rebuild_check > /dev/null
2>&1
```

**NOTE:** The second and third line in the previous example must appear on one line.

This crontab entry runs the *dsm\_rebuild\_check* script at the beginning of the hour and 30 minutes past the hour every day.

**NOTE:** Do not execute the cron jobs at intervals of less than 10 minutes. This could cause two processes to conflict with each other.

10. Write the changes to the file and then quit the editor. Press **ESC** and then type:

```
:wq!
```

The cron job is now set to run.

11. Confirm that the crontab job is set up. Type:

```
crontab -l
```

This returns a list of the cron jobs that are set to run.



**WARNING:** Complete the following procedure only after you have replaced the dead disk.

**To delete the message that appears in the application:**

1. Open a shell and log in as root.

2. Change to the DSM directory. Type:

```
cd /usr/discreet/dsm/
```

3. Remove the files in the rebuild\_notice directory. Type:

```
rm -f .rebuild_notice/*
```

## Configuring Email Notification of Disk Failure on XR-Series Hardware RAID

You can configure email notification of disk failure on XR-Series hardware RAID storage.

See the *Autodesk Stone Storage Manager User's Guide* for instructions.

## Identifying Failed Drives on a Software RAID System

Use *sw\_config* to identify failed drives on a software RAID Stone filesystem.

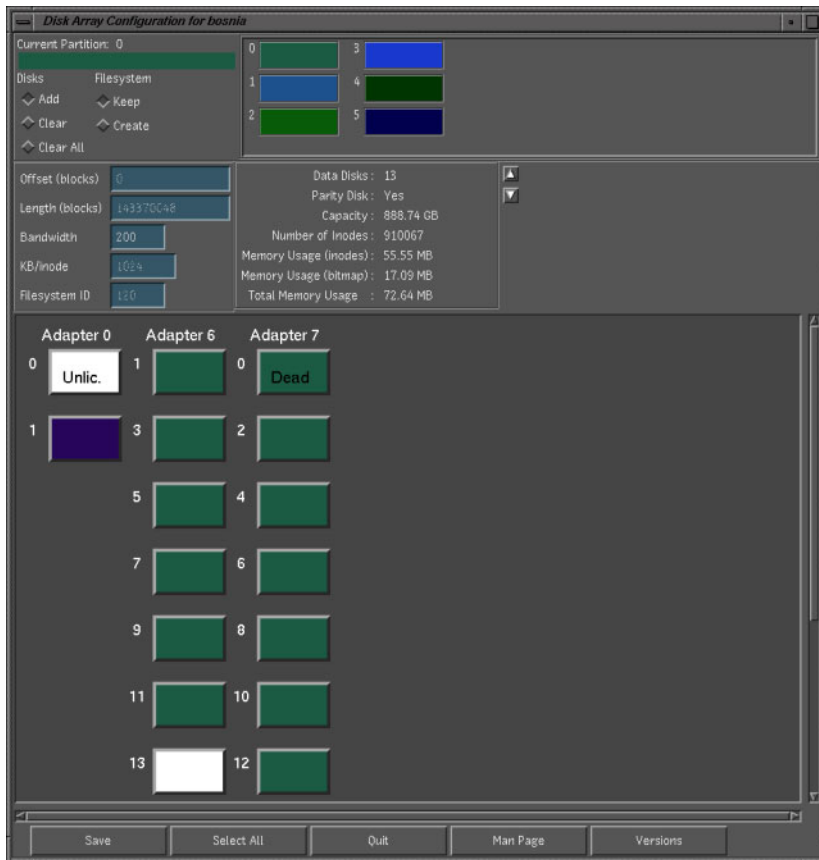
Before you try and rebuild parity and replace a failed disk, it is important to confirm that the disk is dead. You do this by first setting the disk to “well”. Disks can get flagged “dead” when they are in fact not dead. Setting them to “well” and verifying their operation helps you ensure that a drive is in fact dead.

### To identify failed drives:

1. Open a shell and log in as root.
2. Start `sw_config` and look for dead drives. Type:

```
/usr/discreet/sw/sw_config
```

Dead drives are labelled “dead”.



3. In `sw_config`, try and set dead drives well. Right-click the dead disk and select Set Well.
4. Press Quit to exit `sw_config`.

- Restart Stone and Wire. Open a shell, log in as root, and type:

```
/usr/discreet/sw/sw_restart
```

This restarts Stone and Wire and mounts the filesystem.

- Start the application and check the message bar. If error messages continue, call Customer Support and do a Heal on the dead disk.

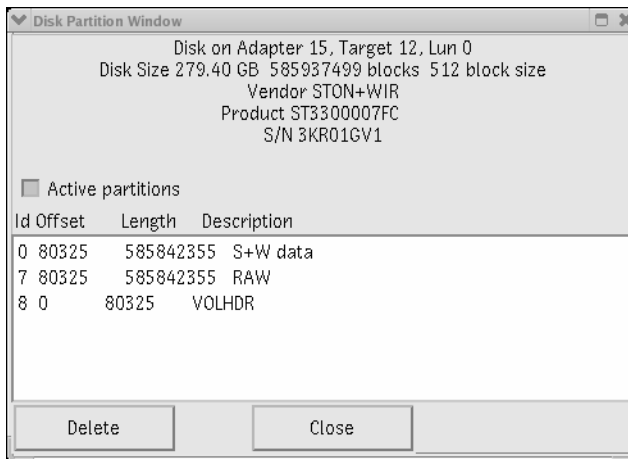
## Checking the Replacement Drive Size (in Blocks) for Software RAID

Before doing a heal on a software RAID system, it is extremely important to verify that the number of blocks available on the spare disk is equal to or greater than the overall length of the framestore. If it is smaller, contact Customer Support to get a new spare disk.

**To verify that all drives have the same number of blocks in a software RAID system:**

- Start `sw_config`.
- Make a note of the Length value (this value may be greyed).
- Right-click the spare disk and choose Partition Info.

The Partition Info dialog box appears.



The maximum number of blocks you can format on your disk is indicated by the Disk Size value. If the number shown is smaller than the overall length, you may need a replacement disk. Contact Customer Support. If it is larger than the overall length, then you will have to resize the disk.

## Resizing the Spare Disk

You need the following information to resize a disk:

- Controller ID number (ctrl#)
- Disk ID number (disk#)
- Total length of the framestore

**NOTE:** As software RAID is supported only on IRIX, only the IRIX version of the following procedure is provided.

### To resize a disk:

1. Open a shell and log in as root.
2. Type:
 

```
fx -x
```
3. Enter a device name at the prompt.
4. Provide the following information, when prompted.

ctrl#	Adapter ID number
disk#	Disk ID Number
lun#	Type "0"

5. Go to the Repartition/Resize menu, type:
 

```
r/re
```
6. At the warning prompt, type:
 

```
y
```
7. To choose block as the partitioning method, type:
 

```
block
```
8. Enter the disk's new length value.
9. To exit the *fx* utility, type:
 


```
/exit
```
10. Return to the Configuration utility to make sure the repartition was successful.

## Performing a Software RAID Heal with a Hot Spare Disk

Use this procedure if you already have at least one spare disk in your disk array configuration. If you do not know whether you have a spare disk in the configuration, start with this procedure.

If there is a dead disk in your array but you can still access your footage, make an archive of your footage before attempting the heal.

Before getting started, exit the Effects or Editing application and make sure the disk array you want to repair is *not* currently being locked by another workstation transferring media using Wire.

 **WARNING:** It is strongly recommended to back up the media on the framestore prior to running a heal. If you cannot archive your framestore, contact Customer Support for assistance with the heal procedure.

**Be sure to complete each of the steps as follows:**

1. [“Identify the Dead and Spare Disks”](#) on page 68.
2. [“Run the Heal Utility”](#) on page 69.
3. [“Verify the Heal Operation”](#) on page 71.
4. [“Replace the Dead Disk with a New Spare Disk”](#) on page 71.
5. [“Verify and Configure the Disk Array”](#) on page 72.
6. [“Obtain a New Spare Disk”](#) on page 72.
7. [“Apply the Disk Array Configuration to the Spare Disk”](#) on page 73.
8. [“Verify the Clips and Playback in the Effects or Editing Application”](#) on page 73.

The heal procedure is not finished until you have completed the last step. It is recommended that you confirm the proper functioning of the disk by playing back clips in the Effects or Editing application. If you cannot launch the application, contact Customer Support.

## Identify the Dead and Spare Disks

**To identify the dead and spare disks:**

1. Open a shell and log in as root.
2. Start `sw_config`. Type:
 

```
cd /usr/discreet/sw/sw_config
```
3. Obtain information about the dead disk.

The dead disk is either marked as Dead or appears as a grey box. (Also, it might not appear in the list at all.)

4. Write down the adapter number and the ID number of the dead disk:
  - Dead adapter: \_\_\_\_\_
  - Dead SCSI ID (disk): \_\_\_\_\_
5. Obtain the spare disk information required for the *sw\_heal* command.  
The spare is a white disk. (The white parity disk is not a spare disk.)
6. Write down the adapter number and the ID number of the spare disk:
  - Spare adapter: \_\_\_\_\_
  - Spare SCSI ID (disk): \_\_\_\_\_
7. You are now ready to run the *sw\_heal* command.

**NOTE:** If you are missing a dead disk, a spare disk, or a parity disk, contact Customer Support for assistance.

## Run the Heal Utility

### To run the Heal utility:

1. Open a shell and log in as root.
2. Synchronize your filesystem so that everything is written to disk before you run the heal.  
Type:

```
/usr/discreet/sw/tools/sw_sync_fs
```

3. Stop Stone and Wire. Type:

```
/usr/discreet/sw/sw_stop
```

A message appears in the shell indicating that Stone and Wire is stopped.

4. Unmount all Stone filesystems. Type:
- ```
/usr/discreet/sw/sw_unmount all
```
5. Go to the *tools* directory. In a shell, type:

```
cd /usr/discreet/sw/tools
```

6. Type the heal command:

```
./sw_heal -h <dead adapter>,<dead disk> -n <spare adapter>,<spare disk>
```

For example, in the case of a dead disk at adapter 4, disk 3 with a spare at adapter 5, disk 6, the command should read:

```
./sw_heal -h 4,3 -n 5,6
```

**NOTE:** Wait until the heal is complete. The duration of a heal depends of the size of the framespace and the number of controllers and their bandwidth.

Sample Output:

```
./sw_heal: There is/are 1 partition[s] to be healed
Partition number 0 will take about 58 minutes to heal
Would you like to heal it? (y/n) y
Total Time = 58 Minutes
Defaulting SW_HEAL_NUM_DISK_IO_PROCS to 2
Partition number 0 will take about 58 minutes
Heal In Progress:
0% -----
100%
.....
./heal: Disk heal successful on partition 0
```



**WARNING:** If an error message appears after entering the *sw\_heal* command line, contact Customer Support.

- Restart Stone and Wire. Type:

```
/usr/discreet/sw/sw_start
```

This restarts Stone and Wire and mounts the filesystem. Messages in the Console window indicate that the file system is loaded for each partition.

- Make sure your filesystem is mounted. Type:

```
/usr/discreet/sw/sw_df
```

A report similar to the following appears in the shell:

```
Partition free %use purgeable %use total ifree itotal %iuse
0 10104315 92 53727 0 143283735 3341216 4057840 17
```

Each partition is listed in the report, providing information about the total, free, and used memory and inodes in the partition.

## Verify the Heal Operation

### To verify the heal operation:

1. Open a shell and log in as root.
2. Start `sw_config`. Type:  

```
cd /usr/discreet/sw/sw_config
```
3. Verify that the spare disk is now green.
4. Verify that the dead disk is now white and it is still marked as Dead.
5. Physically locate the spare disk in the array by right-clicking the spare disk in `sw_config` and selecting Ping Disk.
6. Look at the disk array and locate the blinking LED.
7. Place a sticky paper on the spare disk to identify it.
8. Return to the system and stop the `ping` command.
9. Physically locate the dead disk on the array by right-clicking the dead disk in the Configuration utility and selecting Ping Disk.
10. Look at the disk array and locate the blinking LED.
11. Place a different sticky paper on the dead disk to identify it.
12. Return to the system and stop the `ping` command.

**NOTE:** If a disk appears grey in the Configuration utility, ping the disks that come before and after the dead disk. The disk between the two blinking ones will be the bad disk.

## Replace the Dead Disk with a New Spare Disk

If you have a Stone IR Series array, you can leave the array powered on while removing the bad disk.

**NOTE:** For more information about physically replacing a disk, see the appropriate storage configuration guide available in PDF format on the Autodesk Web site at [www.autodesk.com/discreet-documentation](http://www.autodesk.com/discreet-documentation).

### To replace a dead disk:

1. Pull out the dead disk.

**NOTE:** Since the disks are spinning when you pull them out, make sure to pull them out slowly.

2. Move the spare disk into the dead disk location.

## Verify and Configure the Disk Array

To verify and configure the disk array:

1. Open a shell and log in as root.

2. Stop Stone and Wire. Type:

```
/usr/discreet/sw/sw_stop
```

A message appears in the shell indicating that Stone and Wire is stopped.

3. Unmount all Stone filesystems. Type:

```
/usr/discreet/sw/sw_unmount all
```

4. Start *sw\_config*. Type:

```
./sw_config
```

5. In *sw\_config*, verify that the spare disk has been moved to the dead disk location and that there is no longer a disk in the spare location.



**WARNING:** If you cannot confirm that the spare disk is at the new location, contact Customer Support.

6. Click Save.

The following message appears: "Will save configuration for partitions: { 0 } Are you sure you want to do that?"

7. Click OK.

8. Restart Stone and Wire. Type:

```
/usr/discreet/sw/sw_start
```

This restarts Stone and Wire and mounts the filesystem. Messages in the Console window indicate that the file system is loaded for each partition.

9. Start the Effects or Editing application as usual and verify that the images on the disk array appear normal and that the message bar is clear of any errors about the disk array.

## Obtain a New Spare Disk

When the heal procedure is finished, you need to order a replacement for your spare disk. If you have a valid hardware support contract, you can contact the Customer Support centre to exchange your dead disk for a new spare.

Before contacting Customer Support, make sure the following information is available:

- The serial number of your computer
- The model number of your dead disk (usually in the form of STXXXXXX for Seagate disks)

- A valid shipping address

## Apply the Disk Array Configuration to the Spare Disk

After you receive the new spare disk from Customer Support, you must install it in the storage chassis and configure it for later use.

### To apply the disk array configuration to the spare disk:

1. Open a shell and log in as root.

2. Stop Stone and Wire. Type:

```
/usr/discreet/sw/sw_stop
```

A message appears in the shell indicating that Stone and Wire is stopped.

3. Unmount all Stone filesystems. Type:

```
/usr/discreet/sw/sw_unmount all
```

4. Start *sw\_config*. Type:

```
/usr/discreet/sw/sw_config
```

5. Verify that the new spare disk is white at the spare location.

6. Click Save.

7. Click OK.

8. Restart Stone and Wire. Type:

```
/usr/discreet/sw/sw_start
```

This restarts Stone and Wire and mounts the filesystem. Messages in the Console window indicate that the file system is loaded for each partition.

## Verify the Clips and Playback in the Effects or Editing Application

### To verify the clips and playback in the Effects or Editing application:

1. Launch the Effects or Editing application.

2. Play back some clips.


You have now completed the heal procedure.

## Performing a Software RAID Heal with a Cold Spare Disk

Use this procedure if you do not have a spare disk in your configuration. If you do not know if you have a spare disk in the configuration, start with the first heal procedure. See [“Performing a Software RAID Heal with a Hot Spare Disk”](#) on page 67.

**NOTE:** This procedure also works if the bad disk prevents your system from booting and you need to remove the bad disk before starting the heal procedure.

You need a spare disk to run a heal. However, some configurations do not have spares configured in the actual disk array. If this is the case, you will need an external spare (a spare not already installed in your array). If you do not have a spare, contact Customer Support to find out how to obtain one.

 **WARNING:** A parity disk must exist in the configuration. The heal utility cannot work without a parity disk.

### To perform a software RAID heal with a cold spare disk:

1. Locate the SCSI ID of the disks involved in the heal. See [“Identify the Dead and Spare Disks”](#) on page 68.
2. Physically locate the bad disk. See [“Identify the Dead and Spare Disks”](#) on page 68.  
If your bad disk is preventing the system from booting, look at the disk LEDs. If a disk’s LED is constantly ON (or OFF, for Fibre Channel disks) despite the fact that the computer is turned off, the disk may have failed. If you have no physical evidence of a dead disk, then turn on the computer with the disk array turned off and look at `/var/log/messages` (Linux) or `/var/adm/SYSLOG` (IRIX) for error messages that might help you locate a defective disk.
3. Physically remove the bad disk from the array. See [“Replace the Dead Disk with a New Spare Disk”](#) on page 71.
4. Put the spare where the bad disk was located.
5. Open a shell and log in as root.
6. Start `sw_config`. Type:  
**`/usr/discreet/sw/sw_config`**
7. Make sure that a white disk is located where the dead disk used to be. If the dead disk is still there and your white disk is somewhere else, you moved the wrong disks.
8. Stop and unmount Stone and Wire and then run the heal utility. See [“Run the Heal Utility”](#) on page 69. You should use the same address for the dead disk and the spare disk.

Example:

```
./sw_heal -h 4,3 -n 4,3
```

Be sure to restart Stone and Wire after you run the heal.

9. Verify that the heal worked. See [“Verify the Heal Operation”](#) on page 71.





# Troubleshooting Stone and Wire

## Summary

- [Basic Troubleshooting Procedures](#) ..... 77
- [Common Stone Filesystem Problems and Resolution Steps](#) ..... 80
- [Common Wire Network Problems and Solutions](#) ..... 90

## Basic Troubleshooting Procedures

This chapter describes some typical Stone and Wire problems and troubleshooting procedures.

Whether you are troubleshooting Stone filesystem or Wire problems, you should always verify that Stone and Wire processes are running. See [“Verifying that Stone and Wire Processes Are Running”](#) on page 78.

You should also check error logs to see what messages are being generated by Stone and Wire processes. See [“Checking Stone and Wire Error Logs”](#) on page 79.

It is also useful to answer the following questions. The information you gather helps you isolate the cause of your problem and helps Customer Support, should you require their assistance, to resolve the problem.

| Question                                                                                                                                                                             | Answer |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| What version of the Stone filesystem software is running? Type the following in a shell:<br>Linux:<br><b>rpm -qa   grep -i stone</b><br>IRIX:<br><b>versions -bn   grep -i stone</b> |        |
| What application software is running? Type the following in a shell:<br>Linux:<br><b>rpm -qa   grep -i 2007</b><br>IRIX:<br><b>versions -bn   grep -i 2007</b>                       |        |

| Question                                                                                                                | Answer |
|-------------------------------------------------------------------------------------------------------------------------|--------|
| Has any software been recently installed?                                                                               |        |
| Have there been any recent hardware or configuration changes?                                                           |        |
| What is the exact error message or nature of the failure?                                                               |        |
| What information is in the Console window or error logs?                                                                |        |
| When did the problem start happening?                                                                                   |        |
| Is the problem repeatable or persistent? If so, is the problem consistent (does it happen at the same place each time)? |        |
| What type, size, and number of disk arrays are on the system?                                                           |        |
| What was happening at the time of the error, or what are the steps leading to the problem?                              |        |

## Verifying that Stone and Wire Processes Are Running

There are three processes that must be running for Stone and Wire to work:

- *sw\_serverd*.
- *sw\_probed*.
- *iffsWiretapServer*. This process is started by the script *sw\_wiretapd*.

**NOTE:** To transfer frames using Wire, you must have a Wire license. All Stone and Wire processes run without a license, but you cannot transfer frames using Wire without a Wire license.

### To verify that Stone and Wire processes are running:

1. Open a shell and log in as root.
2. Type:

```
ps -ef | grep sw_
```

This command should return several lines similar to the following:

```
root 18612 8:24 0:00:35 /usr/discreet/sw/sw_probed
root 18630 8:24 0:08:11 /usr/discreet/sw/sw_serverd
root 18672 8:24 0:00:00 /bin/sh /usr/discreet/sw/wiretapd
```

To verify that the *iffsWiretapServer* process is running, type:

```
ps -ef | grep Wire
```

If Stone and Wire processes are not running, start them. See [“Starting Stone and Wire Processes”](#) on page 79.

## Starting Stone and Wire Processes

All Stone and Wire processes should start when you restart your system. If they are not running, check that they are configured to run and then restart Stone and Wire.

The procedure for starting Stone and Wire processes depends on your operating system. On Linux, you must modify a text file listing of all processes. On IRIX, you must set the *chkconfig* flag “on” for each process you want running.

### To start Stone and Wire processes on Linux:

1. Open a shell and log in as root.
2. Use a text editor to open the Stone and Wire configuration file */etc/sysconfig/stone+wire*.

The file should include the following:

```
dl_stone=on
dl_wire=on
dl_wiretap=on
dl_vic=on
```

If any of the processes you need are set to “off”, change them to “on” and then restart Stone and Wire.

3. To restart Stone and Wire, type:

```
/usr/discreet/sw/sw_restart
```

If any Stone and Wire process is still not running, check the error logs. See [“Checking Stone and Wire Error Logs”](#) on page 79.

### To start Stone and Wire processes on IRIX:

1. Open a shell and log in as root.
2. Type:

```
chkconfig <process_name> on
```

## Checking Stone and Wire Error Logs

Every Stone and Wire process has a log file. You can find these log files at */usr/discreet/sw/log*.

The current log file is named *<process>.log*, where *<process>* is the name of the Stone and Wire process or daemon. The next time Stone and Wire creates a log file for the process, it renames the previous log file by adding a number to the file name.

For example, the *sw\_served* process log file is named *sw\_served.log*. The next time the process is launched, the first log file is renamed to *sw\_served.log.1*. Each time Stone and Wire creates a new log file, the old log file is renamed by incrementing the number that appears at the end of the filename.

You can also use the shell to list the most recent version of the log files. Type the following in a shell:

```
ls -altr
```

## Enabling Verbose Stone and Wire Driver Error Reporting

Use the *swr\_set\_debug* utility to enable verbose reporting of Stone and Wire driver errors.

When you turn on error reporting, Stone and Wire outputs error messages in the following locations:

- */var/log/messages* (Linux)
- */var/adm/SYSLOG* file (IRIX)
- Console window

**NOTE:** You must disable verbose error reporting after you have finished troubleshooting. The messages generated by this process can fill up the system drive.

### To enable verbose Stone and Wire driver error reporting:

1. Open a shell and log in as root.
2. Run *swr\_set\_debug*. Type:
 

```
/usr/discreet/sw/tools/swr_set_debug <level>
```

 where *<level>* is the number representing the verbosity of the report.
 

Choose from one of the following levels:

  - **1** — turns on error reporting. This is the default level.
  - **2** — provides more detailed error reporting.
  - **0** — disables error reporting.
3. Check the Console window and the log files for error information.

## Common Stone Filesystem Problems and Resolution Steps

This section describes some common filesystem problems and steps you can take to resolve them.

If you suspect there is a defective disk in your array, see [Chapter 6, “Monitoring and Repairing the Filesystem.”](#) on page 61 for instructions on identifying and resolving this type of hardware failure.

### Problem: Hard Disks or Logical Drives Not Displaying in *sw\_config*

Hard disks (software RAID) or logical drives (hardware RAID) may not appear in *sw\_config* if they are not available to the operating system.

| Application or vic Error Messages (If Any):          | Resolution Steps:                                                                           |
|------------------------------------------------------|---------------------------------------------------------------------------------------------|
| VOLUMEMGT: WARNING: The disk array has 1 bad disk(s) | <a href="#">“Verifying that the Disks are Available to the Operating System”</a> on page 83 |

### Problem: Disks Appear Dead

Sometimes disks appear dead in *sw\_config* even if they are not dead. This can happen after a power outage.

| Application or vic Error Messages (If Any):          | Resolution Steps:                                      |
|------------------------------------------------------|--------------------------------------------------------|
| VOLUMEMGT: WARNING: The disk array has 1 bad disk(s) | <a href="#">“Setting “Dead” Disks Well”</a> on page 86 |

### Problem: Cannot Mount the Filesystem

There are a number of reasons why a filesystem cannot mount. After you have eliminated hardware failure as the problem, check error logs to get more insight into the problem.

| Application or vic Error Messages (If Any):         | Resolution Steps:                                                                                   |
|-----------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| Cannot mount partition 0:<br>Framestore Id Mismatch | <a href="#">“Resolving a Framestore ID Mismatch”</a> on page 88                                     |
| Cannot mount partition 0: I/O Error.                | <a href="#">“Evaluating the State of Individual or Logical Disks on your Framestore”</a> on page 82 |

### Problem: Cannot Access a Stone Filesystem Partition

| Application or vic Error Messages (If Any): | Resolution Steps:                                                                                           |
|---------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| VOLUMEMGT: Error Initializing volume.       | Check to see that the filesystem is mounted. See <a href="#">“Mounting the Stone Filesystem”</a> on page 85 |

## Problem: No disk space

| Stone and Wire and Application Error Messages (If Any):                                                                                   | Resolution Steps                                                                                                                                                                                                                                                                                                                 |
|-------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Stone and Wire Error Message:<br>Failed to allocate the frame<br>0x0: No disk space.<br><br>Application Error Message:<br>Framestore Full | Check to see if the filesystem is full. See <a href="#">“Verifying Disk Usage”</a> on page 87. If it is full: <ul style="list-style-type: none"> <li>• Archive some material to make room on the filesystem.</li> <li>• Consider emptying the Undo Buffer. See <a href="#">“Clearing the Undo Buffer”</a> on page 88.</li> </ul> |

## Problem: Failure to Initialize Stone Filesystem

| Application or vic Error Messages (If Any):                                                             | Resolution Steps:                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|---------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| VOLUMEMGT: Error Initializing<br>volume. Locked, perhaps by VIC<br>if you just rebooted. (Press<br>ESC) | <ul style="list-style-type: none"> <li>• If you just rebooted, press <b>ESC</b> and wait to see if VIC completes its check and relaunch the application. You can check if VIC is running by typing the following in a shell:<br/> <code>ps - ef   grep vic</code></li> <li>• If you continue having problems, your framestore may be locked by another application or remote host. See <a href="#">“Handling Lock Files”</a> on page 89.</li> </ul> |

## Problem: Images Appear Striped

If images appear striped even though no disks are marked as dead, there is likely a dead disk in your array. If dead disks are not indicated in `sw_config`, you must locate the dead disk manually.

| Application or vic Error Messages (If Any): | Resolution Steps:                                                              |
|---------------------------------------------|--------------------------------------------------------------------------------|
|                                             | <a href="#">“Locating Dead Disks Manually (Software RAID Only)”</a> on page 86 |

## Evaluating the State of Individual or Logical Disks on your Framestore

When troubleshooting a Stone filesystem, you must determine if the problem is hardware-related. Use `sw_config` to evaluate the state of individual disks or logical disks in your framestore.

**To evaluate the state of the individual disks or logical disks in your framestore:**

1. Open a shell and log in as root.
2. Start `sw_config`. Type:
 

```
/usr/discreet/sw/sw_config
```

3. Look at the disks as they appear in the *sw\_config* interface.

| If:                                                                                                                     | Then:                                                                                                                                                                                 |
|-------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Multiple disks are marked dead and you are running software RAID                                                        | Set each dead disk well without saving. See <a href="#">“Setting “Dead” Disks Well”</a> on page 86. If the error recurs after you re-start the application, contact Customer Support. |
| Multiple disks are greyed out, indicating that your workstation doesn't have access to part or all of your storage unit | Verify that the disks are appearing to the operating system. See <a href="#">“Verifying that the Disks are Available to the Operating System”</a> on page 83.                         |
| All your disks are white, indicating that Stone and Wire could not load its configuration from one or many disks        | Check for evidence of a failed disk. See <a href="#">Chapter 6, “Monitoring and Repairing the Filesystem.”</a> on page 61. Otherwise, contact Customer Support.                       |

## Verifying that the Disks are Available to the Operating System

After you connect the Stone Direct to the host computer and reboot the system, the hard disks or logical drives should be visible in *sw\_config*.

If your disks or logical drives are not appearing in *sw\_config*, you should verify that they are visible to the operating system.

### To verify that the disk/controller is available to the operating system:

1. Open a shell and log in as root.
2. Run the command that will provide you with a list of all the controllers or disks on your system.

On Linux, type:

```
cat /proc/scsi/scsi
```

On IRIX, type:

```
hinv -c disk
```

A listing of all controllers and hard disks attached to your system appears.

| If:                                                                      | Then:                                                                                                                                                                                                                                                                                                                                                                             |
|--------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Any SCSI controllers or hard disks in your configuration are not visible | <ul style="list-style-type: none"> <li>• Check the connections and cabling to your storage device. See the <i>Autodesk Stone Direct Configuration Guide</i>.</li> <li>• Ensure that your storage hardware is functioning. See the <i>Autodesk XR/XE RAID Solution Maintenance Guide</i> or the <i>Installation and Hardware Reference Guide</i> for IR-series storage.</li> </ul> |
| You must reconnect your storage or tighten any loose connections         | Reload the fibre channel and Stone and Wire drivers. See <a href="#">“Scanning Your Storage Hardware”</a> on page 84.                                                                                                                                                                                                                                                             |

## Scanning Your Storage Hardware

If you must reconnect or tighten connections to your storage hardware, it is a good idea to rescan your hardware to ensure that the operating system is able to communicate with it.

The procedure for scanning your storage hardware depends on your operating system.

### To scan your storage hardware on Linux:

1. Open a shell and log in as root.
2. Unload the Stone and Wire driver. Type:  
**/etc/init.d/stone+wire unload**
3. Unload and reload the fibre channel drivers. Type the following sequence of commands:

```
rmmod qla2300
rmmod qla2400
rmmod qla2xxx
rmmod qla2xxx_conf
modprobe qla2xxx
modprobe qla2300
modprobe qla2400
```

**NOTE:** Depending on the storage you are running, your system might not use all of the drivers listed. If your system does not use a driver listed, the commands to unload or reload the drivers will fail. You can ignore these failures. They just indicate that the driver is not required by your system.

4. Reload the Stone and Wire driver. Type:  

```
/etc/init.d/stone+wire reload
```

Your filesystem should now be mounted.
5. To verify if any partitions are mounted, see [“Mounting the Stone Filesystem”](#) on page 85.

#### To scan your storage hardware on IRIX:

1. Open a shell and log in as root.
2. Type:  

```
scsiha -rp <controllerX>
```
3. Reload the Stone and Wire driver. Type:  

```
/etc/init.d/stone+wire reload
```

Your filesystem should now be mounted.
4. To verify if any partitions are mounted, see [“Mounting the Stone Filesystem”](#) on page 85.

## Mounting the Stone Filesystem

Normally, partitions are mounted automatically whenever you restart your system or Stone and Wire.

If you cannot access your Stone filesystem, check to see if your filesystem is mounted. If it is not mounted, try to mount it.

**NOTE:** As you attempt to mount the filesystem, observe the output of the commands to the shell. The shell reports the log files that are updated while executing the commands.

#### To mount a Stone filesystem:

1. Open a shell and log in as root.
2. To verify if any partitions are mounted, open the Stone and Wire directory and run the *sw\_df* command. Type:

```
cd /usr/discreet/sw  
  
./sw_df
```

This command displays the total, free, and used space of all mounted filesystems.

3. If no partitions are mounted, try *sw\_mount all*. Type:

```
./sw_mount all
```

This command mounts all Stone filesystem partitions.

Use the `sw_df` command to see if the filesystem has mounted. If it has not, check the `sw_mount.log` file for information.

4. If no partitions were mounted again, try restarting Stone and Wire using `sw_restart`. Type:

```
./sw_restart
```

5. Finally, if no partitions are mounted, try restarting the complete Stone and Wire package. Type:

```
/etc/init.d/stone+wire restart
```

If no partitions are mounted after completing this final step, check your hardware. See [“Evaluating the State of Individual or Logical Disks on your Framestore”](#) on page 82 and [“Verifying that the Disks are Available to the Operating System”](#) on page 83.

## Setting “Dead” Disks Well

When `sw_config` marks a disk as “dead”, it is no longer readable or writable. Sometimes disks that are functioning correctly can be marked dead. For example, when a disk array is powered down accidentally while the main Effects or Editing application is running, the system automatically marks all disks as dead. If you suspect that a disk has been marked dead in error, you can mark the disk as “well” to verify its state.

### To mark disks as well:

1. Exit the Effects or Editing application.
2. Open a shell and log in as root.
3. Start `sw_config`. Type:
 

```
/usr/discreet/sw/sw_config
```
4. Right-click a dead disk and choose Set Well.
5. Repeat for all dead disks.



**WARNING:** Clicking Save while the Create option is set to Create will destroy all data in the current partition.

6. Click Quit.

## Locating Dead Disks Manually (Software RAID Only)

If images appear striped (stripe of noise is visible on all frames in the framestore), it is likely that a disk has failed, but that the system was not able to detect the problem. If the system cannot detect a failed disk, you must attempt to do so manually and heal the disk.

**To locate a defective disk manually:**

1. Exit the Effects or Editing application.
2. Open a shell and log in as root.
3. Start *sw\_config*. Type:  
**`/usr/discreet/sw/sw_config`**
4. Select the appropriate partition.
5. Right-click a disk (of the same colour as the current partition) and choose Set Dead.



**WARNING:** Clicking Save while the Create option is set to Create will destroy all data in the current partition.

6. Click Quit.
7. Start the Effects or Editing application.

If the dead disk is truly defective, the parity drive will be enabled and the image will appear as it should (no stripe in the image). If the image does not appear normal, return to *sw\_config*, mark the dead disk as “well” using the Set Well command, and mark the next disk as “dead”. Repeat this procedure until the defective disk is identified.

8. Replace the dead disk and rebuild the replacement disk using *sw\_heal*, as described in [Chapter 6, “Monitoring and Repairing the Filesystem.”](#) on page 61.

**Verifying Disk Usage**

You cannot write to Stone filesystem partitions that are completely full. Use the *sw\_df* command to check disk usage.

If your filesystem is full or almost full, consider deleting or archiving older material from clip libraries to free disk space.

**NOTE:** VTR archiving in Effects or Editing applications requires free space on the framestore to generate slates, test patterns, headers, and audio encoding.

You can also clear the UndoBuffer to free up space. See [“Clearing the Undo Buffer”](#) on page 88.

**To use the *sw\_df* command to see if the Stone filesystem is full:**

1. Open a shell and log in as root.
2. Open the Stone and Wire directory. Type:  
**`cd /usr/discreet/sw`**
3. Run the *sw\_df* command. Type:

`./sw_df`

This command returns the amount of free or used space on your filesystem.

## Clearing the Undo Buffer

The Undo Buffer takes up space on your filesystem. Consider clearing it if your filesystem is full or almost full to liberate disk space.



**WARNING:** Clearing the Undo Buffer cancels any undoable operation. Consider what operations might be stored in the Undo Buffer before you clear it.

### To clear the Undo Buffer:

- ▶ Click the Clear Undo Buffer button in the Preferences menu.  
In the Effects applications, the Clear Undo Buffer button is located in the Desktop menu.  
In the Editing applications, the Clear Undo Buffer button is located in the Undo & Save area.

## Resolving a Framestore ID Mismatch

The framestore ID must match the filesystem ID to mount your filesystem.

If you must change your framestore ID to ensure that all hosts on your Wire network have a unique ID, see [“Changing the Framestore ID”](#) on page 101.

### To resolve a Framestore ID mismatch error:

1. Open a shell and log in as root.
2. Check the Framestore ID value of your storage using the `sw_backupfs` command. Type:

```
/usr/discreet/sw/tools/sw_backupfs testfile
```

The output that appears in the shell will include a line similar to the following:

```
File system id 73
```

3. Note the value of the Filesystem ID. In the previous example, the ID was 73. This value must be the same as the Framestore ID that appears in the `sw_framestore_map` file.
4. Open the `/usr/discreet/sw/cfg/sw_framestore_map` file in a text editor.

The `sw_framestore_map` file includes a section similar to the following:

```
[ FRAMESTORES ]
```

```
FRAMESTORE=london HADDR=172.16.129.32 ID=32
```

The Framestore ID value in the `sw_framestore_map` file must match the Filesystem ID value reported by the `sw_backupfs` command.

Notice that the Framestore ID in the *sw\_framestore\_map* file (32) does not match the Filesystem ID reported by *sw\_backupfs* (73).

5. Change the Framestore ID value in the *sw\_framestore\_map* file to match the Filesystem ID reported by the *sw\_backupfs* command.

**NOTE:** The last sequence of numbers in the IP address defined by the HADDR keyword in the *sw\_framestore\_map* file does not have to match the Framestore ID. These values are often the same by default, but it is not a requirement for Stone and Wire operation.

6. Save and close the file.
7. Restart Stone and Wire. Type:
 

```
/usr/discreet/sw/sw_restart
```
8. If you continue to get error messages, contact Customer Support.

## Handling Lock Files

When a process accesses a file, it attempts to get a lock on the file so that it can have Write, as well as Read, access. (A process can be your Editing or Effects application or a remote application transferring media over Wire.) When a file is locked by one process, no other process can write to that file, which ensures that files do not get corrupted or accidentally overwritten by multiple users.

When a process finishes working on a file, it releases the lock so that other processes can get Write access. However, if the process is unable to release the file because of a problem, that lock file will remain and will prohibit other processes from getting a lock, even if the process is not using the file.

If you can't get Write access to a file, use the following procedure to locate the lock file and check to see if the file is legitimately locked. If the file is not locked by an active process, you can delete the lock file so that another process can get Write access.

### To evaluate lock files:

1. Open a shell and log in as root.
2. Open the clip directory. Type:
 

```
cd /usr/discreet/clip
```
3. Locate the lock files. Type:
 

```
find . -name '*-lock'
```

The command returns results similar to the following example:

```
./burnBat/SNA.clip-lock
```

```
./wiretap/Default.clib-lock
```

This example indicates that there are two lock files.

4. Determine what processes have locked the files. Type:

```
ls -l ./burnBat/SNA.clib-lock
```

This command returns results similar to the following:

```
lrwxrwxrwx 1 root users 19 Jun 15 09:14 ./burnBat/SNA.clib-  
lock -> 172.16.129.53:16488
```

In this example, the IP address of the machine that is running the process and the ID of the process are provided at the end of the line. In this example, the IP address is 172.16.129.53 and the process ID is 16488.

5. To determine if that process is still running, log in to the machine where the process was running. Then use the ID to determine if the process is running. Type:

```
ps -e | grep <process_ID>
```

Using the process ID from the previous example, this command would look like:

```
ps -e | grep 16488
```

This command has two possible results:

- If the command returns nothing, it indicates that the process is not running and the lock file is not necessary.

After you have determined that no process has locked a file, you can delete the lock file.

- If the command returns a process name, you know that a process is running and has locked the file. You can't delete the lock file without jeopardizing someone else's work.

## Common Wire Network Problems and Solutions

This section describes some common Wire problems and steps you can take to resolve them.

## Problem: Cannot Access a Framestore

| Application or vic Error Messages (If Any):                                                                                                                                      | Resolution Steps:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <pre> Framestore unreachable Error reading source frame Error reading source proxy frames Error writing destination frame Error writing destination proxy frame           </pre> | <ul style="list-style-type: none"> <li>• Make sure all Stone and Wire processes are running. <a href="#">“Verifying that Stone and Wire Processes Are Running”</a> on page 78.</li> <li>• Make sure that Wire is licensed. See <a href="#">“Validating the Wire License”</a> on page 91.</li> <li>• Identify any Wire network configuration errors. See <a href="#">“Testing Wire Using sw_framestore_dump”</a> on page 92, <a href="#">“Using sw_ping to Test Wire Communication”</a> on page 93, and <a href="#">“Using sw_ping to Test Network Performance”</a> on page 94.</li> <li>• Identify any basic network configuration errors. See <a href="#">“Verifying Remote Clip Library Access and Permissions”</a> on page 94, <a href="#">“Verifying that NFS and Automounting Daemons are Running”</a> on page 95, <a href="#">“Using Ping to Test Network Communication”</a> on page 96, and <a href="#">“Checking the Status of Network Interfaces”</a> on page 97.</li> </ul> |

## Validating the Wire License

You must have a valid Wire license to share files over Wire. During the start-up of Stone and Wire, messages appear in the shell indicating if a Wire license is valid.

### To validate a Wire license:

1. Open a shell and log in as root.
2. Open the Stone and Wire directory. Type:

```
cd /usr/discreet/sw
```

3. Restart Stone and Wire. Type:

```
./sw_restart
```

The system shuts down and restarts all Stone and Wire processes. Information is printed to the shell during this process.

If your Wire server is not licensed, a message similar to the following will appear:

```

Starting Stone+Wire Network Server...
(Unlicensed: will run without Wire)
Using SmartHeap version 7.1.0
Output log to: '/usr/discreet/sw/log/sw_serverd.log'.
          
```

Stone+Wire Network Server started successfully.

| If:                  | Then:                                                                            |
|----------------------|----------------------------------------------------------------------------------|
| Wire is not licensed | Get and install a Wire license. See <a href="#">“Licensing Wire”</a> on page 40. |

## Testing Wire Using `sw_framestore_dump`

Use `sw_framestore_dump` to identify the Wire hosts that are reachable from one workstation. You should do this if you are having any problems with Wire or after you configure Wire for the first time.

**NOTE:** You must have at least two Wire hosts set up to test Wire connectivity.

### To verify that you can access the framestores on other Wire hosts:

1. Open a shell and log in as root.
2. Type:

```
/usr/discreet/sw/tools/sw_framestore_dump
```

A list of all the available framestores appears in the shell. Review the output and verify that all the framestores on your Wire network appear in the list.

You can also verify that each framestore on your network is using a unique framestore ID.

| If:                                                             | Then:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| You are unable to see other Wire hosts on your network          | Check: <ul style="list-style-type: none"> <li>• The filesystem and networking configurations in the <code>sw_framestore_map</code> file. See <a href="#">“Understanding the sw_framestore_map File”</a> on page 99.</li> <li>• The <code>sw_probed.cfg</code> port number. See <a href="#">“Configuring probed to Automate Connections between Wire Hosts”</a> on page 42.</li> <li>• You may also have problems with your Wire network. Use <code>sw_ping</code> to test that you can connect to other Wire hosts. <a href="#">“Using sw_ping to Test Wire Communication”</a> on page 93.</li> </ul> |
| You see only some of the Wire hosts (as opposed to all or none) | check that each framestore has a unique Framestore ID. See <a href="#">“Understanding the sw_framestore_map File”</a> on page 99.                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

3. Repeat this procedure on each Wire host.

## Using *sw\_ping* to Test Wire Communication

If you are unable to connect to a Wire host, use *sw\_ping* to determine if you can connect to the other Wire host over the Wire network.

### To use *sw\_ping* to test Wire communication:

1. Open a shell and log in as root.
2. Change to the Stone and Wire directory. Type:

```
cd /usr/discreet/sw
```

3. Start *sw\_ping*. Type:

```
./sw_ping -host <host_name> -loop <count> -size <packetsize>  
-r -w
```

| Where:       | Is:                                           |
|--------------|-----------------------------------------------|
| <host_name>  | The name of the host to ping.                 |
| <count>      | The number of times to execute this test.     |
| <packetsize> | The size of the read/write buffer (in bytes). |

For example, type:

```
./sw_ping -framestore tunisia -loop 4 -size 9000000 -r -w
```

Results similar to the following are reported to the shell:

```
Using Stone+Wire API 2007 [ProductSW30]
Pinging framestore tunisia, filesystem id 186 (host: tunisia)
Buffer size = 9043968
Sending data to tunisia, filesystem id 186
MB/sec: 0.460127
Success!
Buffer size = 9043968
Sending data to tunisia, filesystem id 186
MB/sec: 0.509057
Success!
Buffer size = 9043968
Sending data to tunisia, filesystem id 186
MB/sec: 0.500577
Success!
Buffer size = 9043968
Sending data to tunisia, filesystem id 186
MB/sec: 0.516597
Success!
Minimum MB/sec: 0.460127
Maximum MB/sec: 0.516597
Average MB/sec: 0.496590
```

| If:                                                                                                                                                       | Then:                                                                                                                                                                                                                                                                                                                                                      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| An <i>sw_ping</i> from machine 1 to machine 2 is successful and you still cannot access the remote framestore through your Editing or Effects application | Check that the remote system has exported its folders so that the local system has read/write access. See <a href="#">“Verifying Remote Clip Library Access and Permissions”</a> on page 94.                                                                                                                                                               |
| An <i>sw_ping</i> from machine 1 to machine 2 is unsuccessful                                                                                             | <ul style="list-style-type: none"> <li>• Validate the <i>sw_framestore_map</i> file on both machines. See <a href="#">“Understanding the sw_framestore_map File”</a> on page 99.</li> <li>• Check that <i>sw_probed</i> and <i>sw_serverd</i> are running on both machines. See <a href="#">“Starting Stone and Wire Processes”</a> on page 79.</li> </ul> |

## Using *sw\_ping* to Test Network Performance

Use the *sw\_ping* command to test network performance. For more significant results, run the test 100 times.

### To test network performance:

1. Open a shell and log in as root.
2. Start *sw\_ping*. Type:

```
/usr/discreet/sw/sw_ping -framestore <framestore_name> -r  
-w -size <packetsize> -loop <n>
```

| Option:                                 | Description:                                                |
|-----------------------------------------|-------------------------------------------------------------|
| <b>-framestore</b><br><framestore_name> | Is the name of the framestore to ping.                      |
| <b>-r</b>                               | Reads a buffer from the remote framestore.                  |
| <b>-w</b>                               | Writes a buffer to the remote framestore (non destructive). |
| <b>-size</b> <packetsize>               | Reads/writes a buffer of packetsize bytes.                  |
| <b>-loop</b> <n>                        | Executes this test n times.                                 |

The following is an example for an NTSC (720 x 486 x 3) frame format, sent 100 times in read and write mode to framestore *my\_framestore*:

```
/usr/discreet/sw/sw_ping -framestore my_framestore -read -  
write -size 1049760 -l 100
```

## Verifying Remote Clip Library Access and Permissions

Verify that the local host has write permissions to the clip library directory of the remote host.

**To verify remote clip library access and permissions:**

1. Open a shell and log in as root.
2. Try to access the clip library directory of the remote host. Type:  
**cd /hosts/<remote\_machine>/usr/discreet/clip**
3. If an error message appears on the client machine, check to see that the required network daemons are on.
4. If you have access to */hosts/<remote\_machine>/usr/discreet/clip*, make sure you have root privileges to read and write to this directory.

For Linux, type:

```
touch /hosts/<remote_machine>/usr/discreet/clip/deleteme
```

For IRIX, type:

```
mkfile 2k /hosts/<remote_machine>/usr/discreet/clip/  
deleteme
```

If error messages appear, verify the permissions in the */etc/exports* file on the server machine. Read and write permission must be given to the hosts. The appropriate line should look similar to one of the following:

Linux:

```
/usr/discreet/clip *(rw,synch,no_root_squash
```

IRIX:

```
/usr/discreet/clip -rw,anon=0
```

**Verifying that NFS and Automounting Daemons are Running**

Network File System (NFS) and automounting daemons (AMD on Linux or AutoFS on IRIX) must be running for Wire transfers to work.

These daemons are installed and running by default. Use the following procedures to verify that these daemons are running.

**To start NFS and AMD on Linux:**

1. Open a shell and log in as root.
2. Type:  
**chkconfig --list | grep nfs**  
**chkconfig --list | grep amd**

3. Verify that NFS and AMD are set to “on” for run levels 3,4, and 5.
4. If NFS or AMD is off on any of those run levels, type:
 

```
chkconfig nfs on
chkconfig amd on
```
5. Restart your network. Type:
 

```
/etc/init.d/network restart
```

You might also consider rebooting your workstation.

#### To start NFS and AutoFS on IRIX:

1. Open a shell and log in as root.
2. Type:
 

```
chkconfig | grep nfs
chkconfig | grep auto
```
3. Verify that NFS and AutoFS are set to “on”.
4. If NFS or AutoFS is set to off, type:
 

```
chkconfig nfs on
chkconfig autofs on
```
5. Restart your network. Type:
 

```
/etc/init.d/network restart
```

You might also consider rebooting your workstation.

## Using Ping to Test Network Communication

Try to ping your local host from a client machine. If this works, ping all other machines that should be accessible through Wire.

#### To use ping to test network communication:

1. Open a shell and log in as root.
2. At the prompt, type:
 

```
ping <host_name>
```
3. If ping fails, try using the machine’s IP address (for example, 172.16.100.23) instead of its name. Type:
 

```
ping <IP_address>
```

If this is successful, verify how the machine resolves host names on the network. You should set the order of host name resolution to first look at the local setup file, then validate on the network. The `/etc/nsswitch.conf` file should include a “hosts” line that has the name validation process in the following order:

```
hosts: files nis dns
```

## Checking the Status of Network Interfaces

If you continue to have problems with your network, you should verify that your network interfaces are up and running.

### To check the status of your network interfaces:

1. Open a shell and log in as root.
2. Check the status of your network interfaces.

On Linux, type:

```
ifconfig
```

On IRIX, type:

```
ifconfig -a
```

- If your network interface is up and running, an “up” appears in the broadcast report for the interface.

On Linux, the report includes a line similar to the following:

```
UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
```

On IRIX, the report includes a line similar to the following:

```
flags=8715c43<UP, BROADCAST, RUNNING, FILTMULTI, MULTICAST, CKS  
UM, DRVRLOCK, LINK0, L2IPFRAG, L2TCPSEG, IPALIAS, IPV6>
```

- If your network interface is not up and running, check the connections on your network card. A green light appears when there is a good connection between your network card and its destination.

If you must reconnect cables on Linux, you must restart the network interface.

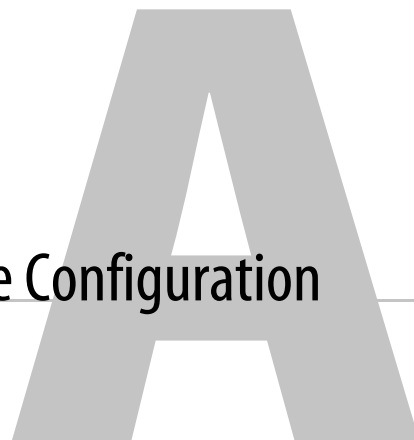
### To restart a network interface:

1. Open a shell and log in as root.
2. Type:

```
ifconfig <interface_name> up
```



# Advanced Stone and Wire Configuration



## Summary

|                                                                             |     |
|-----------------------------------------------------------------------------|-----|
| <a href="#">Understanding the <code>sw_framestore_map</code> File</a> ..... | 99  |
| <a href="#">Changing the Framestore ID</a> .....                            | 101 |
| <a href="#">Extending Wire Over Multiple Networks</a> .....                 | 102 |

## Understanding the `sw_framestore_map` File

The `sw_framestore_map` file is a text file that contains Stone and Wire filesystem and networking configurations. It is located in `/usr/discreet/sw/cfg`. You can edit it with any text editor.

The following is an example of the `sw_framestore_map` file:

```
[ FRAMESTORES ]
FRAMESTORE=newcastle  HADDR=172.16.131.38  ID=38

[ INTERFACES ]
FRAMESTORE=newcastle
PROT=IB_SDP  IADDR=192.168.100.104  DEV=1
PROT=TCP  IADDR=172.16.131.38  DEV=1
```

From the example, you notice that the `sw_framestore_map` is divided into two sections:

- FRAMESTORES
- INTERFACES

### FRAMESTORES

The [FRAMESTORES] section of the `sw_framestore_map` file includes configuration keywords for the framestore name, network address, and framestore ID (also known as the filesystem ID).

See the following table for a description of the keywords in this section and their values.

| Keyword    | Description                                                                                                                                                                                                                                                                                                                                                                                              |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| FRAMESTORE | The name of the framestore.                                                                                                                                                                                                                                                                                                                                                                              |
| HADDR      | TCP/IP address of the system connected to the framestore.                                                                                                                                                                                                                                                                                                                                                |
| ID         | A numeric ID for the framestore (also known as the filesystem ID). By default, the last octet of the IP address is used to generate the framestore ID. However, it is not necessary that they match. On a Wire network with multiple hosts, the framestore ID for each host must be unique. For information on changing the framestore ID, see <a href="#">“Changing the Framestore ID”</a> on page 101. |

In the following example, the name of the framestore is `newcastle`, its IP address is `172.16.131.38`, and its framestore ID is `38`.

```
[FRAMESTORES]
FRAMESTORE=newcastle    HADDR=172.16.131.38    ID=38
```

## INTERFACES

The [INTERFACES] section of the `sw_framestore_map` file includes configuration keywords that define the network interfaces on the system that are available for Wire transfers, the network address of those interfaces, and the order that they should be used. Wire uses the first interface in the list to attempt transfers. If the destination system does not have an interface that uses the same protocol, Wire tries the next interface on its list.


See the following table for a description of the keywords in this section and their values.

| Keyword    | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| FRAMESTORE | The name of the framestore. This is the name that appears when remote hosts attempt to connect to this framestore. This name must match the framestore name in the [FRAMESTORES] section of the file.                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| PROT       | Network protocol used to communicate with the framestore. <ul style="list-style-type: none"> <li>• Use TCP for TCP/IP.</li> <li>• Use IB_SDP for InfiniBand interfaces.</li> <li>• Use HIPPI for Hippi interfaces.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                           |
| IADDR      | The IP or HIPPI address of the network card. <ul style="list-style-type: none"> <li>• If you selected the TCP/IP protocol (PROT=TCP), the interface address is the IP address of the TCP/IP network card.</li> <li>• If you selected the InfiniBand protocol (PROT=IB_SDP), the interface address is the IP address of the InfiniBand card.</li> <li>• If you selected the HIPPI protocol (PROT=HIPPI), the interface address is the I-Field address for the HIPPI interface such as <code>0x03000001</code>. Refer to your HIPPI network configuration document for more information on how to determine the I-Field value.</li> </ul> |
| DEV        | Set the DEV keyword to 1 in all cases.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

In the following example, there are two network interfaces. This system uses the first interface in the list to attempt Wire transfers. If the destination system cannot use the same protocol for Wire transfers, the source system uses the next interface in the list to attempt a Wire transfer.

```
[ INTERFACES ]
FRAMESTORE=newcastle
PROT=IB_SDP IADDR=192.168.100.104 DEV=1
PROT=TCP IADDR=172.16.131.38 DEV=1
```

## Changing the Framestore ID

 **WARNING:** Changing the framestore ID destroys any data on the framestore. You must archive all data you want to keep before you change the framestore ID.


To use Wire, every system on the Wire network must use a unique framestore ID (also known as the filesystem ID). You can change the framestore ID of a system to ensure that all systems are using a unique ID.

Before you change the framestore ID, you must archive any data that you want to save from the framestore. You must also delete all soft imported clips in your clip libraries.

**NOTE:** You do not have to change the framestore ID if you change the IP address of a system.

### To change the framestore ID:

1. Archive all data that you want to save from the framestore. See your application user's guide for instructions.
2. Open a shell and log in as root.
3. Stop Stone and Wire. Type:  
**`/usr/discreet/sw/sw_stop`**  
A message appears in the shell indicating that Stone and Wire is stopped.
4. Unmount all Stone filesystems. Type:  
**`/usr/discreet/sw/sw_unmount all`**
5. Open the `/usr/discreet/sw/cfg/sw_framestore_map` file in a text editor.
6. Locate the ID keyword in the [FRAMESTORES] section and change it to the value you want.
7. Save and exit the file.

 **WARNING:** The following steps will destroy any data you have on the framestore. You must archive your data before you continue this procedure.

8. Create a new filesystem using *sw\_config*. Select the Create filesystem option and use the same value you entered in the *sw\_framestore\_map* file for the framestore ID in the Filesystem ID field of *sw\_config*. Save the filesystem and restart Stone and Wire. See [Chapter 3, “Creating the Stone Filesystem.”](#) on page 19 for detailed instructions on creating a filesystem.

## Extending Wire Over Multiple Networks

The *sw\_probed* broadcast cannot extend over network routers. To enable Wire transfer over routers, you must add the names of the Wire hosts you want to contact on other networks to the *sw\_framestore\_map* file.

### To extend Wire over multiple networks:

1. Open a shell and log in as root.
2. Open the framestore configuration file in a text editor. The framestore configuration file is located in the following path: `/usr/discreet/sw/cfg/sw_framestore_map`
3. Add all the Wire hosts that are not the same network as your local host to the [FRAMESTORES] section of the file.

The following example of the [FRAMESTORES] section of the *sw\_framestore\_map* file for a framestore named london. This system has two additional Wire hosts listed in the [FRAMESTORES] section, mora and suddan.

```
[FRAMESTORES]
FRAMESTORE=london HADDR=172.16.129.32 ID=30
FRAMESTORE=mora HADDR=172.16.129.68 ID=32
FRAMESTORE=suddan HADDR=172.16.129.13 ID=13
```

For details on the *sw\_framestore\_map* file, see [“Understanding the sw\\_framestore\\_map File”](#) on page 99.

**NOTE:** Transfers across routers will not work if the IP address or the framestore ID is not accurate.

4. Save and close the file.
5. Restart Stone and Wire. Type the following in a shell:
 

```
/etc/init.d/stone+wire start
```

# Management Utilities



## Summary

|                                                |     |
|------------------------------------------------|-----|
| <a href="#">Stone and Wire Utilities</a> ..... | 103 |
| <a href="#">Application Utilities</a> .....    | 114 |

## Stone and Wire Utilities

There are a number of command line utilities you can use to test and manage Stone and Wire. Man pages are available for most of the utilities. Refer to the Man pages for the options and the most up-to-date information.

### To view the man pages for a Stone and Wire utility:

► In a shell, type:

```
man <command_name>
```

where <command\_name> is the name of the command as it appears in the Stone and Wire directory.

### *disk\_summary*

This utility lists information about all disk drives on the system. It displays extensive information about the drives installed on a machine. Use it to ensure that all drives are of the same type and are labelled “AUTODESK”, “STON+WIR”, or “DISCREET”.

The *disk\_summary* utility provides the following information:

- Adapter number
- Target number
- Logical Disk Number (LUN)
- Disk label
- Disk model number

- Revision number
- Serial number

**Location** —

*/usr/discreet/sw*

***sw\_backupfs***

Use the *sw\_backupfs* utility to back up super block information written to each partition in the Stone filesystem. The super block describes the configuration of each partition in the filesystem. You can use the backup to restore the filesystem (using *sw\_restorefs*) or to analyze the filesystem. This command does not back up actual frames or data stored on the filesystem.

**NOTE:** If you are backing up the mounted filesystem, use the *sw\_sync\_fs* utility. See [“sw\\_sync\\_fs”](#) on page 113. You can also analyze the backup using *sw\_analfs*. See [“sw\\_analfs”](#) on page 111.

**Location** —

*/usr/discreet/sw/tools*

***sw\_df***

Use *sw\_df* to verify that filesystems have been mounted or are unmounted. This utility displays the total, free, and used space of all mounted filesystems. It can also return space values relevant to the number of frames stored in a specific resolution.

**Location** —

*/usr/discreet/sw*

***sw\_diskserials***

This utility is only used when installing Stone and Wire.

**Location** —

*/usr/discreet/sw/tools*

***sw\_frag***

This tool assesses the fragmentation of the Stone filesystem.

**Location** —

*/usr/discreet/sw/tools*

***sw\_framestore\_dump***

This utility displays information about the local and remote framestores available to the host. It also displays whether *sw\_probed* has detected a framestore on the system and the OS of the system. Use this utility to test access to remote framestores over the Wire network. See [“Testing Wire Using \*sw\\_framestore\\_dump\*”](#) on page 92.

This command returns the following information:

- Framestore name
- Filesystem (Framestore?) ID
- Ping results (not used)
- Hardware or IP address of the system (as reported by the *sw\_framestore\_map* file)
- Hostname of the hardware address (if available)
- Creator (*network* indicates the framestore was detected by *sw\_probed*; *file* indicates the framestore was listed in *sw\_framestore\_map*.)
- Network protocol used for communicating with the framestore
- Interface address
- Device Number (as reported in the DEV section of the *sw\_framestore\_map* file)

**Location —**

*/usr/discreet/sw/tools*


***sw\_get\_config***

This utility is used to acquire the *swr2cfg* file, the Stone configuration file, from the specified disk.


**Location —**

*/usr/discreet/sw/tools*

***sw\_heal***

 **WARNING:** This utility can destroy your filesystem and data if improperly used. Please contact Customer Support before running this utility. See [“Contacting Customer Support”](#) on page 6.


On a software RAID enabled Stone filesystem, this utility restores parity after a failed disk has been replaced. See [Chapter 6, “Monitoring and Repairing the Filesystem.”](#) on page 61.

 **WARNING:** Never stop *sw\_heal* when it is running.

**Location —**

*/usr/discreet/sw/tools*

### ***sw\_makeframestoremap***

 **WARNING:** If your framestore ID changes after running this utility, you will not be able to access any frames on the filesystem.

This script creates a very simple *sw\_framestore\_map* configuration based on the local framestore. Use this script when re-installing the Stone filesystem without parameters.

**NOTE:** You can redirect the output of this script to a file. The program uses the last number sequence of the machine's IP address (205.236.124.143) as a default Filesystem ID.

#### **Location —**

*/usr/discreet/sw/tools*

### ***sw\_markdisk***

Use this command to set drive status from the command line. Alternately, you can set drive status using *sw\_config*.

#### **Location —**

*/usr/discreet/sw/tools*

### ***sw\_mount***

Use *sw\_mount* to manually mount Stone filesystems. To start an Autodesk Effects or Editing application, the Stone filesystem must be mounted. Stone filesystems are usually mounted automatically during system startup by the *sw\_start* script.

#### **Location —**

*/usr/discreet/sw*

### ***sw\_ping***

Use *sw\_ping* to test communication with a remote framestore.

#### **Location —**

*/usr/discreet/sw*

***sw\_print\_config***

Use *sw\_print\_config* to display information about the current configuration of the disk array. It provides the following information for each disk.


| <b>Entry:</b> | <b>Description:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| serial        | Serial number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| a             | Adapter number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| t             | Target number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| l             | LUN number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| status        | Bitwise status where:<br>bit 1 - If set, the disk has been found in the inventory at the boot time<br>bit 2 - If set, the disk has the proper Stone+Wire label<br>bit 3 - If set, the disk supports tag queuing for faster I/O processing<br>bit 4 - If set, the disk is unreadable (if bit 4 is set and bit 5 is <i>not</i> set, the disk is SICK)<br>bit 5 - If set, the disk is unwriteable (if bits 4 and 5 are set, the disk is DEAD)<br>bit 6 - Not used<br>bit 7 - Not used<br>bit 8 - Not used |
| recovered     | The number of errors from which the Stone and Wire driver has recovered. This counter resets when you reboot the system.                                                                                                                                                                                                                                                                                                                                                                               |
| unrecovered   | The number of errors from which the Stone and Wire driver could not recover. This counter resets when you reboot the system.                                                                                                                                                                                                                                                                                                                                                                           |
| partitions    | The number of partitions and the settings of each partition.                                                                                                                                                                                                                                                                                                                                                                                                                                           |

**Location —**

*/usr/discreet/sw/tools*

***sw\_purge***

This utility cleans up filesystem holders for frames that have been deleted. After they are purged, these frames are returned to the free frame pool where they are ready to be used.

 **WARNING:** Purged frames cannot be recovered.

**Location —**

*/usr/discreet/sw*

***sw\_restart***

This utility stops and starts the Stone filesystem using *sw\_stop* and *sw\_start*. Before you launch this utility, you must check that your coworkers are not connected to your machine using Wire. This utility stops the *sw\_serverd* daemon, which will interrupt any connections to this host over the Wire network.

**NOTE:** The Stone filesystem is not unmounted by this utility.

**Location** —

*/usr/discreet/sw*

***sw\_start***

This utility starts the Stone and Wire daemons you have turned on, including the Stone filesystem, the Wire server, and the Wiretap server.

On Linux systems, you must open the */etc/sysconfig/stone+wire* file change the setting of the following servers to on or off.

- *dl\_stone* on or off. If set to on, *sw\_start* mounts the Stone filesystem. If set to off, *sw\_start* starts the other servers without mounting the filesystem.
- *dl\_wire* on or off. If it is set to on, *sw\_start* starts the Wire server.
- *dl\_wiretap* on or off. If it is set to on, *sw\_start* starts the Wiretap server.

On Irix systems, you can use *chkconfig* to set the following Stone and Wire servers on or off.

**Location** —

*/usr/discreet/sw*

***sw\_stop***

*This utility stops the Stone and Wire daemons.*

**NOTE:** *sw\_stop* does not unmount the Stone filesystem. If required, use *sw\_unmount* to unmount the Stone filesystem before using *sw\_stop*.

**Location** —

*/usr/discreet/sw*

***sw\_unmount***

*This utility disables a Stone filesystem. Typically, you unmount a filesystem to accomplish tasks such as modifying the disk configuration.*

Before you unmount a filesystem, you must verify that all products accessing the Stone filesystem are stopped, including Wire. See [“sw\\_stop”](#) on page 108.

**Location** —

*/usr/discreet/sw*

***sw\_wiretap\_client\_tool***

This utility allows you to perform many of the common operations available through the Wiretap API, including copying and reading clips.

For all the options of this command, type the following in a shell:

```
sw_wiretap_client_tool --help
```

**Location —**

*/usr/discreet/sw/tools*

***sw\_wiretap\_dump\_translations***

This utility lists all path translations created in the */usr/discreet/cfg/sw\_wiretap\_path\_translation\_db.xml* file. You can use this to validate your configurations for path translation.

For information on Wiretap path translation, see [“Configuring Wiretap”](#) on page 45.

**Location —**

*/usr/discreet/sw/tools*

***sw\_wiretap\_ping***

Use this utility to ping a Wiretap server.

For all the options of this command, type the following in a shell:

```
sw_wiretap_ping --help
```

**Location —**

*/usr/discreet/sw*

***sw\_wiretap\_print\_tree***

This utility lists all of the Wiretap metadata available from the specified host.

For all the options of this command, type the following in a shell:

```
sw_wiretap_print_tree --help
```

**Location —**

*/usr/discreet/sw/tools*

***sw\_wiretap\_server\_dump***

Lists all of the Wiretap servers accessible from the current host. You can use this to test your Wiretap configuration. See [“Configuring Wiretap”](#) on page 45.

For all the options of this command, type the following in a shell:

```
sw_wiretap_server_dump --help
```

**Location —**

*/usr/discreet/sw/tools*

***sw\_wiretap\_translate\_path***

Converts a path mounted on one filesystem to the path that is mounted on another filesystem using the rules you created in the */usr/discreet/cfg/sw\_wiretap\_path\_translation\_db.xml* file.

This is a way of testing your path translation database. For information on setting up Wiretap, see [“Configuring Wiretap”](#) on page 45.

For all the options of this command, type the following in a shell:

```
sw_wiretap_translate --help
```

**Location —**

*/usr/discreet/sw/tools*

**Risky Utilities and Utilities Reserved for Engineers**

The following tools can either cause damage when used or are reserved for use by Autodesk engineers.

***dvhtool***


**WARNING:** This utility can destroy your filesystem and data if improperly used. Please contact Customer Support before running this utility. See [“Contacting Customer Support”](#) on page 6.

This is a disk volume header management tool. You can use it to delete the licenses or volume header on your disks.

**Location —**

*/usr/discreet/sw/tools*

***stone\_test***

 **WARNING:** Be sure you use the `-r` option in this command. Do not use the `-w` option; this will erase the contents of your filesystem.

This utility measures the performance of your Stone filesystem.

You can use this utility to determine how much bandwidth you have available on your system. For more information, see [“Bandwidth”](#) on page 25.

**Location —**

*/usr/discreet/sw/tools*

***sw\_analfs***


This utility displays the number of fields in a superblock for each frame descriptor (in tabular form).

Before you run this utility, you must create a file to analyze using `sw_backups`. See [“sw\\_backups”](#) on page 104.

**Location —**

*/usr/discreet/sw/tools*

***sw\_fdisk***

 **WARNING:** This utility can destroy your filesystem and data if improperly used. Please contact Customer Support before running this utility. See [“Contacting Customer Support”](#) on page 6.

This utility reformats your disks. You can use it to initialize all disks from the command line.

You can also use `sw_config` to initialize your disks. See [Chapter 3, “Creating the Stone Filesystem.”](#) on page 19.

**Location —**

*/usr/discreet/sw/tools*

***sw\_fid***

This utility displays information about frame IDs generated by Stone and Wire. Frame IDs are presented in a readable format.

**Location —**

*/usr/discreet/sw/tools*

***sw\_fsck***

This utility audits a Stone filesystem and reports any inconsistencies or errors similar to the UNIX *fsck* utility. *sw\_fsck* automatically tests all partitions but will not repair the filesystem.

**Location —**

*/usr/discreet/sw/tools*

***sw\_killall***

This utility will stop Stone and Wire processes you identified. It is used by *sw\_stop*.

**Location —**

*/usr/discreet/sw*

***sw\_lcheck***


This utility checks for a valid Wire license. You must run this command from a script that prints the error code to the shell to see the results of the command.

To check for a valid license, you can also restart Stone and Wire and check the messages in the shell. See [“Validating the Wire License”](#) on page 91.

**Location —**

*/usr/discreet/sw*

***sw\_restore\_vh***


 **WARNING:** This utility can destroy your filesystem and data if improperly used. Please contact Customer Support before running this utility. See [“Contacting Customer Support”](#) on page 6.

When the *sw\_heal* utility is interrupted, the original system configuration should be restored automatically. However, there are cases where the *sw\_heal* utility will not recover from an interruption, and you will need to use *sw\_restore\_vh* to restore the original configuration file from memory.

**Location —**

*/usr/discreet/sw/tools*

***sw\_restorefs***

 **WARNING:** This utility can destroy your filesystem and data if improperly used. Please contact Customer Support before running this utility See [“Contacting Customer Support”](#) on page 6.


This utility restores the Stone filesystem superblock information of a partition. The superblock information is stored in a backup file using *sw\_backupfs*. *sw\_restorefs* only restores the superblock information; it does not restore actual frames.

**NOTE:** You should stop Stone and Wire and unmount your framestore before using this command See [“sw\\_stop”](#) on page 108 and [“sw\\_unmount”](#) on page 108.

**Location —**

*/usr/discreet/sw/tools*

***sw\_set\_config***

 **WARNING:** This utility can destroy your filesystem and data if improperly used. Please contact Customer Support before running this utility See [“Contacting Customer Support”](#) on page 6.

This utility writes the *swr2cfg* file to the specified disk.

**Location —**

*/usr/discreet/sw/tools*

***sw\_set\_license***

This utility installs a license onto selected drives.

Disks are shipped with a valid Stone and Wire license. There should be no reason to re-license your disk with this utility.

**Location —**

*/usr/discreet/sw/tools*

***sw\_sync\_fs***

*This utility* synchronizes a mounted filesystem with the disks. By default, this is done automatically every 2000 operations.

To make sure your backup contains the latest information, run this utility before running *sw\_backupfs* on a mounted filesystem.

**Location —**

*/usr/discreet/sw*

***swf\_tweak***

*This utility* configures your local framestore settings from the command line. Your changes will be reset to the default values upon rebooting your system.

**NOTE:** Your configuration should be tuned for optimal performance. Autodesk does not recommend changing any values using *swf\_tweak*.

**Location —**

*/usr/discreet/sw/tools*

***swr\_set\_debug***

*This utility* allows you to set the debug level of the Stone filesystem kernel driver. The default value is restored when the system is rebooted.

**Location —**

*/usr/discreet/sw/tools*

## Application Utilities

There are a number of application utilities that you can also use to manage the contents of your framestore.

These utilities include the following:

- volume integrity check (*vic*) corrects media referencing errors on the framestore.
- *cmtool* is a suite of tools for working with the contents of your volumes. You can use *cmtool* to perform tasks such as adding and deleting clips, libraries, and projects.

These utilities can be useful when you are troubleshooting your system. See the “Utilities” chapter of your Autodesk Editing or Effects User’s Guide for information on these utilities.

# index

## Index

### A

- AMD
  - starting daemon 95
- audience requirements 4
- Autodesk storage
  - overview 1
- AutoFS
  - starting daemon 95

### B

- Bandwidth
  - partition configuration 25
- block size
  - standardizing across disks 66

### C

- cmtools 114
- compatibility 57
- configuring Wiretap
  - workflow 45
- creating Stone filesystem
  - workflow 19
- cron job
  - disk failure notification 63
- customer support
  - contacting 6

### D

- disk array
  - configuring 72
  - healing a bad disk 67
- disk failure
  - disk status 82

- email notification, IR-series hardware RAID
  - 62
- email notification, software RAID 62
- email notification, XR-series hardware RAID
  - 64
- Heal utility 69
- locating dead disks (software RAID) 86
- locating drives 64
- operating system access 83
- setting disks "well" 86
- software RAID heal 67

- disk space
  - troubleshooting Stone filesystem 82
- disk usage 87
  - clearing undo buffer 88
- disk\_summary 103
- disks
  - bad disk error message 66
  - dead disks, identifying 68
  - healing 67
  - replacing dead disk with spare 71
  - resizing 67
  - spares, identifying 68
  - standardizing block sizes across disks 66
- documentation
  - set of guides 4
- dsm\_rebuild\_check
  - disk failure notification 63
- dvhtool 110

### E

- error logs 79
- error message, bad disks 66
- exports file

Wire 43

## F

fault-tolerance 2

filesystem

  ID 27

  problems 80

FRAMESTORE

  sw\_framestore\_map 99

framestore ID

  changing 101

  mismatch, resolving 88

framestores

  access, Wire 91

  filesystem ID 27

  locating on the network 42

## G

group rule

  Wiretap path translation 50

guide

  audience 4

  conventions 4

  organization 3

## H

hard disk status

  sw\_config 35

heal 67

  verify 71, 73

  without spare disk 74

Hippi

  configuring on IRIX 18

host/path rule

  Wiretap path translation 49

hosts file

  network load balancing 15

## I

InfiniBand

  configuring, Linux 17

  sw\_framestore\_map 100

init.d scripts

  stopping all Stone and Wire daemons 40

INTERFACES

  sw\_framestore\_map 100

IP address

  changing 11

  sw\_framestore\_map 99

IR-series storage 2

## J

jumbo frames

  IRIX 14

## K

KB/inode ratio

  Stone filesystem 26

## L

Length

  sw\_config 25

licensing

  Wire 40

  Wire troubleshooting 91

load balancing

  configuring hosts file 15

  configuring netif.options file 15

  installing NLBS 14

  IRIX 14

  starting NLBS 16

lock files 89

loopback host name

  Linux 12

## M

man pages

  Stone and Wire utilities 103

monitoring Stone filesystem

  workflow 61

mounting

  Stone filesystem 31, 85

multicasting

  Linux 13

multi-OS networks

  Wiretap path translation 48

## N

netif.options file

  network load balancing 15

network interfaces

  status 97

- Wire 41
- Wiretap 47
- network performance
  - sw\_ping 94
- network tests
  - ping 96
- networking
  - changing IP address 11
  - Hippi, IRIX 18
  - InfiniBand, Linux 17
  - jumbo frames, IRIX 14
  - load balancing, IRIX 14
  - loopback hostname, Linux 12
  - multicasting, Linux 13
  - Wire 2
- NFS
  - starting daemon 95
- NLBS
  - installing 14
  - starting 16
- O**
- Offset
  - sw\_config 25
- operating system rule
  - Wiretap path translation 52
- P**
- partitions
  - clearing 22
  - configuring 24
  - partitioning modes 34
  - Stone filesystem 27
- path translation database
  - XML syntax 49
- ping 96
- probed
  - Wire 42
- problems
  - filesystem 80
  - Wire 90
- R**
- RAID 2
  - parity disk 27
- repairing Stone filesystem
  - workflow 61
- resizing a disk 67
- routers
  - Wire networking 102
- S**
- scanning storage hardware 84
- self discovery
  - probed 42
  - Wire hosts 42
- Set Dead 36
- Set Sick 36
- Set Well 36
- setting up Wire
  - workflow 39
- software RAID
  - heal failed disk 69
  - heal without spare 74
  - Stone filesystem 27
  - verify heal 71, 73
- spare disks
  - apply configuration 73
  - identifying 68
  - obtaining 72
  - obtaining a new disk 72
- status
  - network interfaces 97
- Stone and Wire
  - compatibility 57
  - restarting 31
  - restarting daemons 44
  - stopping 20
  - stopping all daemons 40
  - upgrading 58
  - versions 58
- Stone and Wire daemons
  - See Stone and Wire processes 40
- Stone and Wire processes
  - displaying 78
  - restarting 44
  - starting 79
- Stone and Wire utilities
  - disk\_summary 103
  - dvhtool 110
  - overview 103
  - stone\_test 111
  - sw\_analfs 111

- sw\_backups 104
- sw\_df 104
- sw\_diskserials 104
- sw\_fdisk 111
- sw\_fid 111
- sw\_frag 104
- sw\_framestore\_dump 105
- sw\_fsck 112
- sw\_get\_config 105
- sw\_heal 105
- sw\_killall 112
- sw\_lcheck 112
- sw\_makeframestoremap 106
- sw\_markdisk 106
- sw\_mount 106
- sw\_ping 106
- sw\_print\_config 80, 107
- sw\_purge 107
- sw\_restart 107
- sw\_restore\_vh 112
- sw\_restorefs 113
- sw\_set\_config 113
- sw\_set\_debug 114
- sw\_set\_license 113
- sw\_start 108
- sw\_stop 108
- sw\_sync\_fs 113
- sw\_unmount 108
- sw\_wiretap\_client\_tool 109
- sw\_wiretap\_dump\_translations 109
- sw\_wiretap\_ping 109
- sw\_wiretap\_print\_tree 109
- sw\_wiretap\_server\_dump 110
- sw\_wiretap\_translate\_path 110
- swf\_tweak 114
- swr\_set\_debug 114
- Stone Direct
  - overview 2
- Stone filesystem
  - bandwidth 25
  - basic troubleshooting 77
  - clearing partitions 22
  - configuring partitions 24
  - disk usage 87
  - filesystem ID 27
  - KB/inode ratio 26
  - mounting 31, 85
  - overview 1
  - partition offset and length 25
  - partitions 27
  - saving configuration 30
  - software RAID 27
  - spare disks 27
  - unmounting 20
- stone\_test 111
- storage
  - scanning hardware 84
- striped images
  - troubleshooting 82
- support
  - contacting 6
- sw\_analfs 111
- sw\_backups 104
- sw\_config
  - Bandwidth 25
  - button descriptions 37
  - Disk menu 36
  - disk partition information 36
  - filesystem creation options 34
  - hard disk area 35
  - interface description 32
  - KB/Inode ratio 26
  - Offset and Length 25
  - partition configuration parameters 35
  - partition summary 35
  - partitioning buttons 35
  - partitioning modes 34
  - starting 21
  - zoom arrows 38
- sw\_df 104
- sw\_diskserials 104
- sw\_fdisk 111
- sw\_fid 111
- sw\_frag 104
- sw\_framestore\_dump 105
  - testing Wire 92
- sw\_framestore\_map
  - FRAMESTORES section 99
  - INTERFACES section 100
  - network interfaces 41
  - overview 99
- sw\_fsck 112
- sw\_get\_config 105
- sw\_heal 105

- healing a dead disk 67
  - sw\_killall 112
  - sw\_lcheck 112
  - sw\_makeframestoremap 106
  - sw\_markdisk 106
  - sw\_mount 106
  - sw\_ping 106
    - network performance 94
    - testing Wire 93
  - sw\_print\_config 80, 107
  - sw\_purge 107
  - sw\_restart 107
  - sw\_restore\_vh 112
  - sw\_restorefs 113
  - sw\_set\_config 113
  - sw\_set\_license 113
  - sw\_start 108
  - sw\_stop 108
  - sw\_sync\_fs 113
  - sw\_unmount 108
  - sw\_wiretap\_client\_tool 109
  - sw\_wiretap\_dump\_translations 109
  - sw\_wiretap\_ping 109
  - sw\_wiretap\_print\_tree 109
  - sw\_wiretap\_server\_dump 110
  - sw\_wiretap\_translate\_path 110
  - swf\_tweak 114
  - swr\_set\_debug 114
- T**
- testing
    - Wiretap path translation 53
  - testing Wire
    - sw\_framestore\_dump 92
    - sw\_ping 93
  - troubleshooting
    - common filesystem problems 80
    - common Wire problems 90
  - troubleshooting Stone filesystem
    - basic troubleshooting 77
    - cannot access partition 81
    - cannot mount filesystem 81
    - disks appear dead 81
    - disks not displaying 81
    - evaluating disk status 82
    - failure to initialize 82
    - no disk space 82
    - operating system access 83
    - striped images 82
- U**
- undo buffer
    - clearing 88
  - unmounting
    - Stone filesystem 20
  - upgrading 58
    - workflow 57
- V**
- verbose error reporting 80
  - versions
    - Stone and Wire 58
  - VIC 114
- W**
- well
    - changing state of possible failed disks 86
  - Wire
    - clip library access, verifying 94
    - exporting shares 43
    - licensing 40
    - overview 2
    - probed and self discovery 42
    - problems 90
    - setting up network interfaces 41
  - Wire networking
    - extending over routers 102
  - Wire troubleshooting
    - cannot access framestore 91
    - licensing 91
    - network interface status 97
  - Wiretap 45
    - configuring network interfaces 47
    - configuring path translation 48
    - overview 3
    - path translation 48
  - Wiretap path translation
    - configuring 48
    - group rule 50
    - host/path rule 49
    - operating system rule 52
    - sharing the database 53
    - testing 53

Wiretap server  
starting 46

## X

XML syntax  
path translation database 49  
XR-series storage 2

## Z

zoom arrows  
sw\_config 38