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**HOWLER TECHNOLOGIES**

**HOWLER SCREAMER v1.3.0**

**RELEASE AND INSTALLATION NOTES**

| Version | Date        | Description  | Author            |
|---------|-------------|--|-------------------|
| 1.0     | 18-Nov-2009 | Release and Installation Notes for Howler Screamer v1.2.1                        | N R<br>Horncastle |
| 1.1     | 20-Nov-2009 | Section 4 added to include full instructions on how to install the physical card | N R<br>Horncastle |
| 1.2     | 26-Nov-2009 | Sections 4 and 5 reversed  | N R<br>Horncastle |
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## 1. INTRODUCTION

This document contains the Release and Installation Notes for Release 1.3.0 of the Howler Screamer. This release contains the following codecs:

- Howler G.729A Howlet - optimised G.729 Annex A codec

The Howler Screamer is a PCI-E format accelerator card that offloads the CPU intensive operations associated with audio and video transcoding from the main board CPU to a highly optimised cell processor architecture. For full details of which soft-switches are supported in this release see section Supported soft-switch versions.

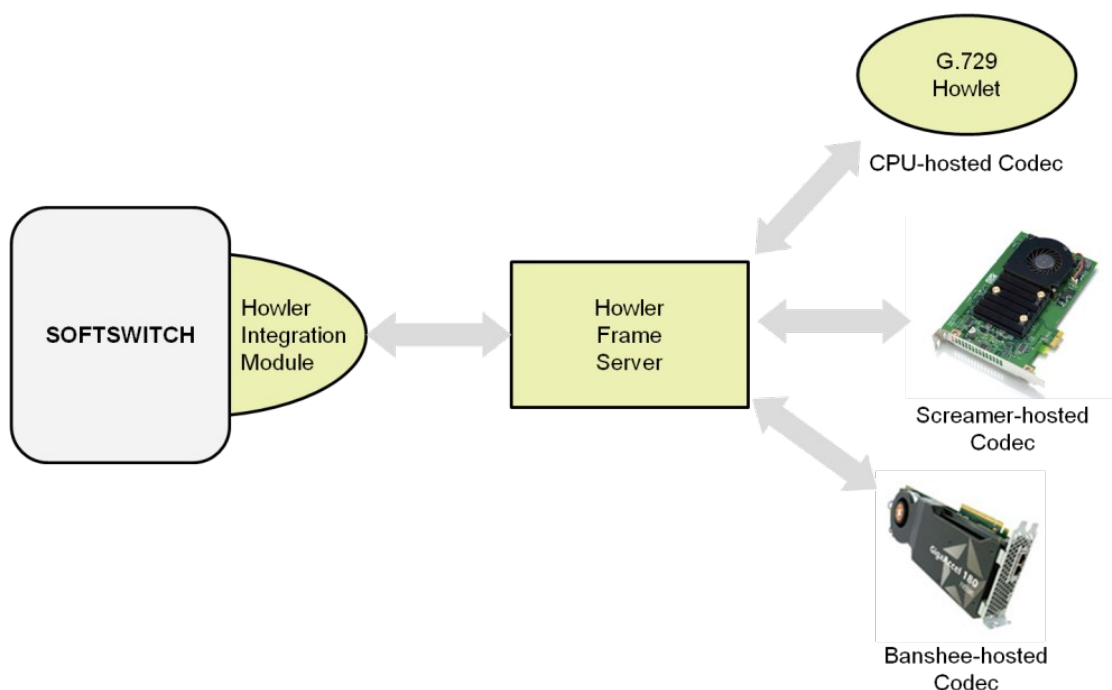
Any feedback (good and bad) relating to our products is gratefully received by us. To ensure the quickest possible response please supply feedback via our on-line Helpdesk. If you are a new user, please register for the Helpdesk and verify yourself as per the instructions in section Enable real-time priority threads. If you are a returning user, log in at <http://support.howlertech.com/login>.

Further details about Howler Technologies' products can be found at <http://www.howlertech.com/>

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## 2. HOWLER PRODUCT ARCHITECTURE



### HOWLETS

'Howlets' refer to the optimised suite of audio and video codecs produced by Howler Technologies, which can run either on your host CPU, or on the Howler Screamer card.

### HOWLER FRAME SERVER

The Howler FrameServer is a separate process which runs on your server and contains the proprietary and patent-indemnified Howlet algorithms, as well as providing support for the Howler Screamer card that off-loads the signal processing from your host CPU.

Howler Frame Server offers an ease to buy licenses once and use them across all the soft-switches supported by Howler Frame Server. With the addition of floating licenses, licenses can be shared even with different soft-switches on the fly, resulting in ultimate scalability and flexibility to the users.

## HOWLER INTEGRATION MODULES

Howler Integration Modules enable codec and CLI support for the Howler FrameServer in your chosen soft-switch or application.

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## 3. RELEASE NOTES

This section contains the pre-installation requisites which must be completed BEFORE starting the Howler Screamer installation as described in section Hardware Installation. There are three steps to carry out:

1. Download the latest version of the Howlets software
2. Check SELINUX settings
3. Register with the Howler Technologies Helpdesk

These steps are detailed below.

### *1.1. DOWNLOAD LATEST VERSION OF HOWLETS*

Please make sure you have the latest Howlets release before starting the installation process. The latest release is available for download at:

<http://www.howlertech.com/support/downloads/>

Supported soft-switch vendors/versions are listed below. If you install Howlets on an unsupported platform, you do so entirely at your own risk.

#### *1.1. SUPPORTED OPERATING SYSTEMS*

This release of the Howler Screamer supports the following Linux distributions:

| Distribution  | Version      | 32-bit support? | 64-bit support? |
|---------------|--------------|-----------------|-----------------|
| RedHat Linux  | 5            | YES             | NO              |
| CentOS5 Linux | 5.2 or above | YES             | NO              |

The Howler Screamer has not been tested on any versions other than those listed above.

Our next release will contain 64-bit support for the Screamer card.

#### *1.2. SUPPORTED SOFT-SWITCH VERSIONS*

Different soft-switches are supported via a Howler Integration Module (HIM). This release supports the following soft-switch versions:

| Vendor     | Version  | 32-bit available? | 64-bit available? | Source code patches? |
|------------|----------|-------------------|-------------------|----------------------|
| Asterisk   | 1.4.26.2 | YES               | NO                | YES                  |
| Asterisk   | 1.6.0.15 | YES               | NO                | YES                  |
| Asterisk   | 1.6.1.6  | YES               | NO                | YES                  |
| FreeSWITCH | 1.0.4    | YES               | NO                | YES                  |

You must have already installed and configured one of the above soft-switch versions prior to installing any Howlets. Additional vendor soft-switches may be supported based on customer feedback and demand.

#### ~~g~~ CHECK SELINUX SETTING

Please check that SELINUX is set to 'disabled' before starting the installation process. Edit the file `/etc/selinux/config` and ensure that it contains the line:

```
SELINUX=disabled
```

#### ~~g~~ ENABLE REAL-TIME PRIORITY THREADS

To fully optimise G.729 transcoding performance make the following additions (shown in red) to `/etc/security/limits.conf`. Replace 'USER\_ACC' with the name of the soft-switch's user account:

```
USER_ACC soft rtprio 10
USER_ACC hard rtprio 10
root soft rtprio 100
root hard rtprio 100
```

#### ~~g~~ HELPDESK REGISTRATION

Howler Technologies has an online Helpdesk system that allows you to log and track requests relating to problems, incidents and questions. If you use the Helpdesk to contact us you will receive priority over all other communication channels. All we need is your name and email address, it only takes a minute to register at:

<http://support.howlertech.com/registration>

Please use your organisational (rather than your personal) email address so we can track all requests that come from individuals in your organisation. This also means you have visibility of all requests your colleagues have logged. You will receive a

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verification email that contains a link to activate your Helpdesk login. Please click on it to activate your account.

Your privacy is important to us. Your details are used ONLY for Helpdesk related activities. For full details please read our privacy policy at

<http://www.howlertech.com/privacy/>.

## 4. SOFTWARE INSTALLATION

This section describes how to install and configure Howlets for your specific soft-switch. There are five steps in the procedure:

1. Unpack the downloaded Howler software
2. Install the Howler Screamer Linux Kernel Module
3. Install the Howler FrameServer
4. Install the appropriate Howlet Integration Module for your soft-switch
5. Activate your licence

These steps are detailed below.

### ~~4.1~~ UNPACK DOWNLOADED SOFTWARE

Unpack the downloaded `hfs-1.3.0.tar.gz` file and `cd` into the build directory using the following commands:

```
$ cd /tmp
$ tar xvzf hfs-1.3.0.tar.gz
$ cd hfs-1.3.0
```

### ~~4.2~~ INSTALL HOWLER SCREAMER LINUX KERNEL MODULE

Prior to building this module you will need to install at least minimal Linux kernel source (e.g. the kernel-devel package) in order to build the Howler Screamer module against your current kernel.

```
# yum install kernel-devel
```

Once installed, compile and install the Howler Screamer against your current Linux kernel by issuing:

```
# make screamer KDIR=path to kernel headers/source
```

Example:

```
# make screamer KDIR=/usr/src/kernels/2.6.18-164.6.1.el5-
i686.
```

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## ~~2.7~~ INSTALL HOWLER FRAME SERVER

Build and install the Howler FrameServer via the following command:

```
# make hfs
```

Howler Frame Server creates its PID file `/var/run/` directory with the name of `HFS.pid`. This PID file can be used to monitor Howler Frame Server using daemon monitoring applications like `monit`. Howler Frame Server will be installed in `/usr/local/sbin/hfs` and the start-up entry is added to the appropriate `/etc/init.d/rc.d` directories so that it starts automatically at boot-time. It stores its configuration files in `/usr/local/lib/hfs/` and a log file in `/var/log/hfs.log`.

## ~~4.7~~ INSTALL HOWLET INTEGRATION MODULE

Before running the appropriate Howlet Integration Module `make` command check to see if your Asterisk or FreeSWITCH installation is deployed in a non-default location. If it is, you need to set the environment variable `AST_MOD` or `FS_MOD` respectively to point directly to the module path before running the `make` command. You need to install the specific Howlet Integration Module for your chosen soft-switch by issuing ONE of the following `make` commands:

| Vendor     | Version  | Command                             |
|------------|----------|-------------------------------------|
| Asterisk   | 1.4.26.2 | <code>make asterisk-1.4.26.2</code> |
| Asterisk   | 1.6.0.15 | <code>make asterisk-1.6.0.15</code> |
| Asterisk   | 1.6.1.6  | <code>make asterisk-1.6.1.6</code>  |
| FreeSWITCH | 1.0.4    | <code>make freeswitch-1.0.4</code>  |

These are the ONLY soft-switch vendor/version combinations supported in this release. Please note: if your particular soft-switch version is not listed above, try installing the closest match. We cannot guarantee that this will work in all instances and it will not be officially supported, but we will try and get you up and running. Please log any problems via the Helpdesk as described in section Enable real-time

priority threads. Our open source soft-switch integration modules are available on request, these allow you to build Howlets directly against your soft-switch source.

## ~~5.1~~ CONFIGURE YOUR SOFT-SWITCH

To allow your soft-switch to accept G.729 calls, you must configure it to do so. The sections below will show you how to do this, with the relevant modifications shown in red.

### 5.1. *ASTERISK*

Asterisk users must edit `/etc/asterisk/sip.conf`:

```
[general]
...
disallow=all
allow=g729
allow=ulaw
allow=alaw
```

You must also disable any existing non-Howlet G729 codec modules by editing `/etc/asterisk/modules.conf`:

```
[modules]
...
noload => codec_g729.so
```

### 5.2. *FREESWITCH*

FreeSWITCH users must edit `/usr/local/freeswitch/conf/vars.xml`:

```
<X-PRE-PROCESS cmd="set"
data="global_codec_prefs=G729,G7221@32000h,G7221@16000h,G722,P
CMU,PCMA,GSM"/>
<X-PRE-PROCESS cmd="set"
data="outbound_codec_prefs=G729,PCMU,PCMA,GSM"/>
```

You must also disable the existing `mod_g729` by editing

`/usr/local/freeswitch/conf/autoload_configs/modules.conf.xml` and making the following changes:

```
<!-- <load module="mod_g729"/> -->
<load module="mod_howlets"/>
```

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## INSTALL HOWLER SCREAMER

You can now shutdown the server in preparation for installing the Howler Screamer card.

## 5. HARDWARE INSTALLATION

The Howler Screamer box includes the following components:

- 1x Howler Screamer card (requires 1x PCI-Express 1.0a/1.1 slot)
- 1x Molex to floppy power adapter lead
- 1x low profile bracket (optional)

To install the card carry out the following instructions:

1. Shut down the server, unplug all cables and electrical cords and open the chassis cover
2. Locate an available PCI-Express x1 slot (blue/black) and remove the blanking plate on the rear panel
3. If you are installing the card in a half-height low profile slot, use a screwdriver to carefully swap the attached Full Profile bracket for the included Low profile bracket
4. Position the Howler Screamer card over the PCI-E slot
5. Insert the card bus connector into the slot, and gently push down until it is fully seated. Use the screw removed from the blanking plate to fasten the card to the chassis

**WARNING: Inserting the Screamer card into the wrong type of slot can damage your card, your server, or both. The card will not need to be forced into the slot. If in doubt, please contact Howler Support.**

6. Connect a floppy power cable to the mini 4-pin power connector on the rear of the card (a Molex-to-Floppy adapter is included for your convenience)
7. Close the chassis, plug in all cables and power cords and turn on the server

Once the server has powered up and your soft-switch is operational proceed to section Licence Activation to license the Howlets software.

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## 6. LICENCE ACTIVATION

Howlets can run in 'Trial' or 'Live' modes. In Trial mode you can evaluate the Howlets in two different modes: 'Quality' or 'Performance'. In Live mode, you need a software key to activate the software for the number of (bi-directional) channels you have purchased.

### OBTAINING SOFTWARE LICENSE KEYS

You can purchase Howlet software licenses at:

<http://www.howlertech.com/products/howlets/pricing/>

Licenses are available in both fixed and floating versions. A fixed license is bound to a specified single soft-switch server. A floating license is shared across several connected soft-switch servers and utilised as needed according to the individual soft-switch server transcoding channel requirements.

Note that from version 1.3.0 forward, in response to popular demand, only floating licenses are available for sales from our website. Of course, should you require fixed licenses, or wish to increase the number of fixed licenses you already have, we will be happy to do so. Please contact us at [support@howlertech.com](mailto:support@howlertech.com). Please see the website for more information on licensing options.

### FLOATING LICENSES DEMYSTIFIED

Floating licenses allow you to share purchased licenses across machines on the same subnet. Licenses are allocated between machines on-the-fly, according to the dynamically changing requirements at each server. This allows more cost-efficient usage of licenses, as opposed to fixing a number of licenses to each server. If one or more of the servers on the subnet becomes unavailable, the remaining servers can continue to use the entire license pool, giving a transparent failsafe capability.

Support for floating licenses is present in Howlets v.1.3.0(License server version v.3.0.0).

As of this release of Howlets (v.1.3.0), Howler Frame Server will start in floating-license mode by default. If there is another server on the subnet already running in

floating-license mode, the new server will be visible to it and the existing licenses will get shared with the new server. Once a server has received some valid licenses, you cannot switch back to the trial modes. To test the standalone trial modes, i.e. trial quality and trial performance, do the following:

- Remove all license keys by issuing 'howlets remove license <license key>' command via CLI of soft-switch. Then issue 'howlets g729a trial <quality or performance>' to enter the desired trial mode.
- Or try using some other subnet than the one on which floating servers are running.
- Or stop all servers, delete the file /usr/local/lib/hfs/licenses.txt, start HFS, and then via the soft-switch 's CLI, issue 'howlets g729a trial <quality or performance>' to enter the desired trial mode.

The licensing system selects one machine on the subnet to act as a master server for license requests. Currently, this is the machine with the lowest IP address.

The licensing system slightly complicates stats gathering.

- To view subnet wide total number of calls, issue 'howlets licenses' via CLI of the soft-switch on the licensing master. On other machines, this command only reports the number of local calls.
- To view number of local calls on each server, issue soft-switch specific command to view calls, e.g. issue 'show calls' via CLI on FreeSWITCH and issue 'module show like codec\_howlets' via CLI of Asterisk.

This interface will be improved in a future version.

If one of the servers disappears from the subnet (crashes or goes down for maintenance), any of the license keys bound specifically to its MAC address (and not to some other machine's MAC as well) will remain active for 7 days (168 hours).

These licenses remain in the pool and can be used by other servers in the meantime. After 7 days, the license becomes invalid and is removed from the pool.

On any server machine, HFS acquires the first IP address of the first "enabled" Ethernet card. So if a machine hosts multiple Ethernet cards, cards must be configured with this consideration. To keep network overhead minimal, UDP is used for communications at port 4950 and 4951.

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Note that floating licenses can be shared across any server running Howler Frame Server, regardless of hardware configuration (Screamer card vs non-Screamer) and soft-switch.

Howler Technologies does not offer a trial mode for floating licenses on the website. For time-limited evaluation licenses, please send a request to [support@howlertech.com](mailto:support@howlertech.com).

## LIVE LICENSE INSTALL

If you have purchased a Live licence, you need to add the licence to the Howler Frame Server. Login to your soft-switch console and enter the following command to activate your license key:

```
$$> howlets add license <license key>
```

This command can be issued on any machine which is connected to the license pool.

To confirm the licenses have installed correctly type the following command:

```
$$> howlets licenses
```

Information similar to the following will be displayed:

The following licenses are installed:

| ID             | Max | Expires     | Status |
|----------------|-----|-------------|--------|
| 014 (Floating) | 2   | (Perpetual) | Active |

Maximum number of available calls(G729): 2

Total number of active calls(G729): 0

Number of available calls(G729): 2

## ~~Howler~~ TRIAL LICENSE INSTALL

Howler Technologies allow you to trial the various components of the Howlet Pack prior to purchasing a Live license. Some components offer different trial modes; please review the list below. We acknowledge that customers want to assess both quality and performance of our Howlets. To allow for this the G.729A component can run in one of two trial modes with the following constraints:

### **Quality mode:**

- Call Concurrency: 1
- Call Quality: Excellent
- Maximum Call Length: 2 minutes

### **Performance mode:**

- Call Concurrency: Unlimited
- Call Quality: Low
- Maximum Call Length: 10 minutes

Log in to your soft-switch console and enter **ONE** of the following commands to activate the required trial mode:

To evaluate Quality mode:

```
$$> howlets g729a trial quality
      WARNING: G.729A Howlet is in 'quality' trial mode.
      One concurrent call allowed at maximum quality, call
      duration limited to 2 minutes.
```

**OR** to evaluate Performance mode:

```
$$> howlets g729a trial performance
      WARNING: G.729A Howlet is in 'performance' trial
      mode. Call quality will be artificially lowered. This is
      not indicative of fully licensed call quality. Call
      duration limited to 10 minutes.
```

## ~~Howler~~ UPGRADE FROM TRIAL TO LIVE LICENSE

If you want to upgrade to a Live license you need to disable the trial mode first:

```
$$> howlets g729a trial disable
      G.729A Howlet is no longer in trial mode.
```

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You then need to install your Live License as described in section Live license install.

## 7. HOWLER TECHNOLOGIES OVERVIEW

Howler Technologies has an innovative range of products designed to meet the ever increasing audio and video transcoding demands of end users and Internet Telephony Service Providers.

Headquartered in London, Howler Technologies was founded with one guiding principle in mind: "make it faster, cheaper, better". We strongly believe that IP-based telecommunications solutions make redundant many of the hardware and software based products currently sold by legacy gateway vendors. Racks of power-hungry, air-conditioning-dependent, traditional DSP servers are fast becoming obsolete in 21st Century communications solutions.

Highly-optimised, software-based transcoding solutions, running on a parallel-processing platform, require less space, power and cooling, whilst at the same time providing more simultaneous channels. That is what our product set is all about!

Howler Technologies is the first company to leverage the IBM Cell Broadband Engine Architecture (CBEA) for telecommunications applications. The Cell is a radical, parallel-processing microprocessor sometimes called "the supercomputer on a chip". It has a market-proven track record, being a key element in Sony's PS3 gaming platform and IBM's RoadRunner, the world's fastest supercomputer.

Our products provide a high-speed, low-cost platform for compute-intensive media processing such as transcoding, encryption and signal analysis. The affordability and dramatic scalability of the Cell allows us to deliver packet-processing solutions in different form factors for both large and small deployments, replacing the multiple blades needed to host traditional DSP-based solutions.

Howler Screamer is the first product in our Cell range and will be joined by the higher capacity 1U Howler Banshee and 6U Howler Caraya in 2010.

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## 8. APPENDIX A SUPPORTED CLI COMMANDS

Howlets support the following commands which can be entered via your soft-switch command line interface (CLI):

```
> howlets add license <key>
```

Permanently adds the license <key> to the license pool. Can be run on any machine connected to the license pool.

```
> howlets remove license <key>
```

Permanently removes the license <key> from the license pool. Can be run on any machine connected to the license pool.

```
> howlets licenses
```

Shows the status of all license keys installed in the license pool.

```
> howlets g729a trial performance
```

```
> howlets g729a trial quality
```

```
> howlets g729a trial disable
```

Configures the connected HFS instance into the required trial mode. Please see section Trial license install for more information.

```
> howlets version
```

Displays the current version of the installed Howler Integration Module and connected Howler FrameServer.

```
> howlets help
```

```
> help howlets
```

Depending upon your soft-switch, use any one of the above two commands to display the list of supported commands.