Jaryba® SmartSuspend™

Release Notes

Version 2.1.1

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2.0 Contents

Preface

The *SmartSuspend Release Notes* provide:

- Description of the product packaging
- Detailed system installation requirements
- Notes on issues and limitations you need to be aware of when using the Jaryba SmartSuspend software

Prerequisites

To install and use Jaryba SmartSuspend software, you should have working knowledge of the operating system and shell for the machine on which you are installing the software.

In addition, you should have in-depth knowledge of any third-party applications you are using in conjunction with the SmartSuspend software.

Conventions Used in This Guide

Commands, URLs, and any text that you enter appear in **`this bold font`**.

Computer output, file names, and locations appear in `this font`.

Elements on the user interface appear in **bold like this**

Important new terms appear in *italics like this*.

Variables, where you need to substitute site- or installation-specific details, appear in brackets and italics <*`like_this`*>.

Contacting Jaryba

For product operation and support inquiries, send email to:
`support@jaryba.com`

The following information is needed when you contact Jaryba, Inc. for support:

- Company name, contact name, email address, and phone number
- Software version number: execute the software library name to obtain the version number, for example: `/lib/libssr.so` or `/lib64/libssr.so`

- Platform details: hardware, operating system type, and version
- Problem background information: describe the problem in as much detail as possible and any actions you have attempted to resolve the problem. In addition, be sure to include available log files and error message text.

You can also visit our support Web site at:
https://support.jaryba.com

For general inquiries, send email to:
`info@jaryba.com`

For sales inquiries, send email to:
`sales@jaryba.com`

For general information about Jaryba or Jaryba SmartSuspend, visit our Web site at:
http://www.jaryba.com/

1 Introducing SmartSuspend 2.1.1

These *SmartSuspend Release Notes* provide important information you should read before installing or using the SmartSuspend software.

Software Packaging

The Jaryba SmartSuspend software is installed using a tarball package that contains:

- SmartSuspend dynamic library (`libssr`)
- SmartSuspend command line utility (`ssrcmd`)
- LSF Integration script (`ssrlsf.sh`)
- Oracle Grid Engine Integration script (`ssroge.sh`)
- Altair PBS Pro Integration script (`ssrpbs.sh`)
- Documentation in the form of man pages for the installed components

The following documentation is also available for download from the customer Web site, along with the installers:

- *SmartSuspend Release Notes* (`relnotes.pdf`)—this document
- *Using SmartSuspend* (`using_ss.pdf`)
- *SmartSuspend: Integration with 3rd-Party Schedulers LSF* (`SmartSuspend_LSF_Integration.pdf`)
- *SmartSuspend: Integration with 3rd-Party Schedulers OGE* (`SmartSuspend_OGE_Integration.pdf`)

See *Using SmartSuspend* for details on how to install, configure, and use the SmartSuspend software.

Minimum System Requirements

The Jaryba SmartSuspend software is thoroughly tested in specific configurations to ensure product interoperability and maximum performance. Installing Jaryba SmartSuspend software on unsupported operating systems or hardware configurations violates the terms of your support agreement with Jaryba.

The SmartSuspend command line utility can be used interchangeably with both 32- and 64-bit serial applications, such as EDA applications, as well as CAE, CFD, and other MPI-based parallel applications. SmartSuspend can be run from anywhere on the network as long as `ssh` access is available.

Operating System

- Red Hat Enterprise Linux 4 and 5

Inter-Process Communication Support

The following are supported over Ethernet ch_p4:

- MPICH 1.2.7p1
- HP-MPI, version 2.2.5.1 or higher
- Open MPI, version 1.2.2 or higher

The following are supported over InfiniBand:

- HP-MPI, version 2.2.5.1 or higher
- Open MPI, version 1.2.2 or higher

Interconnect Support

- Gigabit Ethernet (GigE)
- InfiniBand (IB)

Third-Party Integration Support

Jaryba SmartSuspend supports flexible integration with most commercial and popular open source resource managers and job schedulers. Official support has been confirmed with the following schedulers:

- Platform LSF
- Oracle Grid Engine.

SmartSuspend License Management Support

The SmartSuspend license management feature that relinquishes licenses when an application is suspended and re-obtains licenses when jobs are resumed, currently works only for applications that use FLEXnet licensing.

2 New and Enhanced Features

Version 2.1.1

Fixes

- Fix slave job submission from master job.
- :Fix for thread stack allocation in low memory environments.

Version 2.1

- Add support for Altair PBS Pro scheduler.
- Add support for LM-X based licenses.

Version 2.0.2

Fixes

- Fix signal issue.

Version 2.0.1

Fixes

- Fix for Cadence Encounter.
- Fixed segmentation fault when executing libc immediately after launching a new shell.

Version 2.0

- Add support for Oracle Grid Engine integration.

Fixes

- Many stability fixes.

Version 1.1.9

The items below were included in prior SmartSuspend version 1.1.x releases:

Fixes

- Fixed issue with parsing FlexNET license files.
- Fixed issue where we were failing to preserve other preloaded libraries before executing another binary.

Version 1.1.8

- The `ssr_data` file in the status directory has a new entry for license tracking.

  If the job is currently tracking and releasing licenses it has checked out during a suspension operation, this is listed in the file as follows:

  ```
  License Tracking: ENABLED
  ```

- SmartSuspend now releases heap memory along with other memory mapped regions. This significantly reduces the suspended memory footprint of applications that perform a very large amount of small allocations.

Fixes

- Fixed issue with preloading and executing the `glibc` library.
- Various smaller bug fixes.

Version 1.1.7

The following bugs were fixed as a part of the SmartSuspend 1.1.7 release:

- A bug related to a program that defines its own versions of pthread_mutex_* system calls.
- Allowing applications that change their UID or GID to remain under control of SmartSuspend.
- Allowing more flexibility to programs that require their own alternate signal stack.

Version 1.1.6

- Added the ability to disable all SmartSuspend-enabled applications by listing "`DISABLE_ALL`" in the `/etc/smart-suspend/disable.conf` file.
- Added the `--terminate/-t option` to `ssrcmd` to terminate a job with the `SIGTERM` signal.

Fixes

- Integration script fix to support a single job composed of multiple commands.
- Fixes related to memory allocation.

Version 1.1.5

- Added support for applications that contain internal memory allocators.

Version 1.1.4

- Added the ability to terminate a job by setting a timeout interval for suspend and resume operations. An additional option allows for the execution of a user-defined script upon timeout, for example to collect additional information for system administrators. A sample timeout script is included in the distribution in `/usr/share/smart-suspend/ssrcmd_timeout.sh`.

  See the *Using SmartSuspend* documentation for details.
- Simplified the instructions for installing SmartSuspend in a centralized repository.
- This version contains bug fixes related to improper exit behavior in a few applications.

Version 1.1.3

This version contains only bug fixes relating to running SmartSuspend with two specific applications.

Version 1.1.1, 1.1.2

Expanded MPI Support

SmartSuspend now supports applications that launch mpirun internally, for example in a wrapper script, in addition to the existing direct command line support.

In the example below, `mpi_wrapper_script` is launched with `ssrcmd`. If `mpi_wrapper_script` or any process spawned from it calls `mpirun`, SmartSuspend propagates its environment variables.

```
$ ssrcmd -n /nfs/share/ssr_jobinfo -a 61 -b 62 --openmpi --
mpi_wrapper_script -machinefile hostfile -np 4 lammps -in in.crack
```

Disable Feature

A system administrator may now prevent specified applications from being SmartSuspend

enabled. This is accomplished by listing the application(s) in the `/etc/smart-suspend/disable.conf` file.

Permissions for this file are set to 644 so that it can be modified only by the system administrator, but read by any user on the system. In the disable file, include specific program names, one per line, that SmartSuspend will consult at runtime. If the current running program matches a name in the file, then it will disable all SmartSuspend capabilities (ability to suspend/resume, release resources). Comment lines can begin with "#".

Although all capabilities will be disabled for the listed processes, a process that is forked and executed from a disabled process *will* be enabled unless it also is specifically named in the `disabled.conf` file.

Interconnect and MPI Support

- HP-MPI (2.2.5.1 or higher), MPICH (1.2.7p1), and Open MPI (1.2.2 or higher) over Ethernet ch_p4
- HP-MPI (2.2.5.1 or higher) and Open MPI (1.2.2 or higher) over InfiniBand fabric

New ssrcmd Options

The way SmartSuspend supports MPI jobs has been changed. The old `--ssh` (or `-e`) option that was specified to propagate SmartSuspend environment variables to all MPI processes has been replaced by the three options below:

Option	Description
`-H, --hpmpi`	Enables HP-MPI support.
`-M, --mpich`	Enables MPICH MPI support.
`-O, --openmpi`	Enables OpenMPI support.

With the addition of these options, the environment variable `SSR_SSH_SUPPORT` is no longer needed, and has been removed.

Examples

To submit an HP-MPI job:

```
$ ssrcmd -n <job_dir> --hpmpi -- mpirun <application_name> <application options>
```

When the job you are submitting will run on multiple hosts or be controlled from another location, ***<job_dir>*** is the path to a shared location.

Here is an example of submitting an OpenMPI job running a parallel version of the LAMMPS application on multiple hosts:

```
$ ssrcmd -n /nfs/share/ssr_jobinfo --openmpi -- mpirun -machinefile hostfile
-np 4 lammps -in in.crack
```

For HP-MPI or MPICH jobs, replace `--openmpi` with `--hpmpi` or `--mpich`, respectively.

Option	Description
`-s, --stats`	view SmartSuspend job statistics
`-l, --log`	view the SmartSuspend log
`-d, --data`	view SmartSuspend environment data
`-h, --help`	display `ssrstat` help
`-v, --version`	display `ssrstat` version information

Other Enhancements and Fixes

- SmartSuspend now supports Ansoft HFSS (simulation software), properly suspending and resuming jobs.
- The `ssr_data` file that is generated for each SmartSuspend-enabled job now includes the software version number and values for additional environment variables. This information can be useful for troubleshooting.

3 Known Issues and Limitations

This chapter describes known limitations and issues with the Jaryba SmartSuspend software.

Using a Centralized Installation

If you move the SmartSuspend libraries from their standard installed locations, for example, putting them in a shared location to make them accessible across a network, be aware that some SUID (Set User ID) enabled applications cannot preload the SmartSuspend library.

To work around this, manually create symlinks in these directories on each node which point to the libraries located on the network filesystem. The SmartSuspend libraries are installed in `/lib` and `/lib64` so symlinks should be created as follows:

```
/lib/libssr.so -> /path/to/shared/32-bit/library/libssr.so
/lib64/libssr.so -> /path/to/shared/64-bit/library/libssr.so
```

Full instructions for moving the installation to a centralized repository are in the *Using SmartSuspend* documentation.