

Altair - Breeze Release Notes

Version 2025.2.0



Release 2025.2.0

- Breeze now measures the following additional libc functions: splice and ustat.
- Improved start up performance of Breeze.
- Attempting to read or write with a closed file descriptor is treated as I/O on an invalid mount point. #5813
- Fix bug when following binaries launched with GridEngine qsub. #6028
- Fix bug when following child jobs on GridEngine queues with shell_start_mode set to posix-compatible.
- sendfile now counts as a seek followed by a read and write. #5975
- Don't count fdopen and fdopendir as open calls if the open of the file descriptor has already been counted. #2349
- Reports failed I/O to invalid file descriptors. #5813
- Don't treat fdopen and fdopendir calls as failed just because they set errno. (#6052)
- Fix problem where the Breeze profile could treat a normal file as a symlink.
- Adds ability to disable tracing for su and sudo #5746.
- Adds file locking information to Breeze by way of flock, fcntl, fcntl64, lockf and lockf64 functions. #6011
- Add the ability to import tar files to Breeze. #4176
- Renamed Exec'ed by and Sudo'ed by to remove the apostrophes. #3240
- Worked around bug where U/I failed to load on Ubuntu 24.04. #6081

Release 2025.1.0

Highlights:

- **DEPRECATION NOTICE:** Support for RHEL 5/CentOS 5 is planned to be removed in the next version of Breeze. Please contact support if this will cause you any problems.
- **Switch to Altair Units based licensing.** Breeze will now checkout 30 HPCWorks units whilst running. Set `BREEZE_UNITS=false` to use an old feature license if needed.

Other Changes:

- Added RPM and Debian packages for aarch64 architecture.
- Added documentation surrounding Singularity/Apptainer mounting of `/tmp` and/or `/var/tmp`.
- Fixed bug in monitor causing it to wrongly output an error when dealing with bind mounts.
- Fixed a problem where a multithreaded program could deadlock if the main thread exits without waiting for the other threads to complete.
- Breeze now measures the following additional libc functions: `execveat`, `_Exit`, `fctnl64`, `fstatfs`, `fs-tatfs64`, `fstatvfs`, `fstatvfs64`, `futimens`, `preadv`, `preadv2`, `preadv64`, `preadv64v2`, `pwritev`, `pwritev2`, `pwritev64`, `pwritev64v2`, `quick_exit`, `statfs`, `statfs64`, `statvfs`, `statvfs64`, `utimensat` and `copy_file_range`.
- Record I/O done by glob calls.
- Report the most appropriate mount point when a “bind mount” has been used to mount a device at more than one location.
- Documentation is now available in HTML format as well as PDF #6000.
- Properly handle child jobs launched via `posix_spawn`.
- Remove I/O to unix sockets from Network profiling views.
- Fixed missing sync data in I/O profiling view.
- Calls to `scandir` are treated as reads in much the same way as calls to `readdir`.
- Stop showing profiling data for file systems that are not informative (e.g. `device:0:5`).
- Adds intermediate symlinks to trace instead of needing to traverse them post job.
- Handle seeks larger than 2^{63} bytes.
- Escape backspaces in XML output.
- Fixed bug that could cause a segfault if `src_addr` is NULL in `recvfrom`.
- Avoid a delay at the end of a trace when the trace directory is on NFS.
- `trace-program.sh` will report an error if the permissions on `/tmp/BREEZE` would stop it from working correctly and this can't be automatically corrected.
- If you use “`trace-program.sh -tcsh`” to trace a `tcsh` builtin command, the command will be run within `tcsh` rather than `csh`.
- Fix missing I/O for fork children in program profile and duration views. #6010
- Properly support folding fork children in I/O Summary. #6010
- Fix bug where I/O Summary was under-reporting percentage contributions. #6014
- Improved handling of long file paths in Files View. #5219
- Fix bug that may cause Breeze to output erroneous seek records for `copy_file_range`. #6008

Release 2024.1.1

- Now also intercepts `close_range` when made as an indirect syscall.
- Removed Symlink Chains Count Profiling View.
- Removed File System Trawls Profiling View.
- Removed I/O Sizing profiling views.
- Fixed issue where CPU profile data at the start of the job attributed to the wrong time.

Release 2024.1.0

Highlights:

- Completely reworked directory heirarchy to be more in-line with the FHS /usr heirarchy recommendations.
- Created new RPM and debian packages of breeze, breeze-trace-only, mistral-healthcheck and mistral.

Other Changes:

- Add support for Apptainer. Renamed BREEZE_SINGULARITY_BIND_PATH to BREEZE_CONTAINER_BIND_PATH.
- No longer hides monitor PID in logging messages.
- Changed pwrite to no longer count as a seek when writing to a file that was opened in append mode to match Linux kernel behaviour.
- Fixed bug where hiding may not work as intended.
- Many binary names have been changed to include {breeze} to make them more identifiable.
- The monitor doesn't take so long to exit at the end of a job.
- Fixed the default path used by some exec functions to match that found in the running version of glibc.
- Correct the handling of zero length monitor status files.
- Fixed a problem where the monitor could be killed during startup. This resulted in directories being left that would normally have been removed when the monitor exits.
- Fix a problem where a multi-threaded application which runs qrsh could modify the environment in an unsafe way.
- Fixed race condition that could cause some networking applications to seg fault.
- Hide anonymous inodes from the files view and related output.
- Fixed pread/pwrite calls always reporting seeks from the beginning of a file.
- Stop marking moved files as automatically read.
- Added I/O Summary and programs to v3 output.
- Fixed bug where directories could cause double counting in I/O Summary.
- Fixed bug where library loads were not counted as file use in I/O Summary.
- Fixed bug when clicking "Select and zoom to fit in Timeline".
- Fixed bug where network I/O is misclassified in I/O Summary.
- Removed text output for programs in BreezeAP.
- Fixed bug where host cpu measurements were missing from the trace.
- Fixed problem where processes started by sudo were not attached to their parent.

Release 2023.1.2

Release 2023.1.1

- Renamed ELLEXUS_DO_NOT_BACKTRACE to ELLEXUS_BACKTRACE and inverted related logic.
- Made backtrace output less confusing, removing libbreeze.so backtrace handler.
- Fixed usage messages from C shell scripts having wrong file extension when referring to self.
- Fixed bug where popen and system calls could have the incorrect child process.
- Fixed bug where operations on network sockets could be assigned to the incorrect port.
- Fixed bug where singularity child traces may not be in a subdirectory of the parent trace directory.
- Changed fflush(NULL) to report each individual stream that was flushed.
- Added call name and better event name for posix_spawn calls.

Release 2023.1.0

Highlights:

- Renamed shared object library from “libdryrun.so” to “libbreeze.so”. “libdryrun.so” is now a sym-link to “libbreeze.so”.
- Removed Light mode from BreezeAP.
- Moved Breeze license settings to their own file `/breeze-license.properties` this file will need to be configured whenever you update Breeze.

Other Changes:

- Now lazily loads libc functions.
- Reduced the amount of stack space used in programs being traced or metered.
- Changed handling of `-child` argument, now defaults to all on and command that launch child jobs can be removed from the list with - e.g. `-child=-qrsh,-qsub`.
- Fix problem where a process within Singularity could send information to the wrong monitor process.
- Fixes `-relocate` option archiving all traces, not just the most recent.
- Sending `SIGUSR1` to the monitor process will now cause it to send status output to the error log.
- Removed the MPI implementation specific versions of `libdryrun.so`.
- Now supports `pbsdsh` and `pbs_tmrsh` jobs.
- Added wrappers for `sendmmsg` and `recvmsg` Linux system calls.
- Add singularity-bind program to simplify setting the `SINGULARITY_BIND` environment variable.
- `Mistral_start_reference.sh` now describes the additional steps needed when Singularity is run directly, rather than as part of a script.
- Ensure shell builtins, e.g. `echo` are traced correctly if they are top level commands.
- Fixed bug when tracing `csch` commands on remote hosts.
- Fixed bug where top level-command could be interpreted by a shell.
- Fixed bug where user names could be truncated in trace directory names.
- Fixed bug for `system(3)` and `popen(3)` that could crash some applications which make use of RDMA devices.
- Fixed bug for `closedir(2)` that caused a segfault when passed `NULL`.
- Added wrapper for `statx(2)` Linux system call.
- Fixed bug where `stderr` was unintentionally open in the monitor, which could alter the behaviour of the Python subprocess module.
- Fixed problem where signal masking within `libbreeze.so` could fail if a signal handler had been installed before `libbreeze.so` was active.
- Fixed bug when tracing `sudo` that could cause a binary in the current working directory to be run.
- Fixed bug when tracing `sudo` that could prevent a shell from being used to interpret shebang scripts.
- Removed internal IDs from all BreezeAP output.
- Renamed “Shared Library” to “Library” in BreezeAP output.
- Removed `Read:Seek` ratio from Files view.
- Re-ordered fields in files XML output.
- Stopped outputting `0s` in XML output to reduce size.
- Fix bug where directories are marked as temporary files.
- Fixed no such file or directory error when using `-packages` option with `trace-program.sh`.
- Change files, dependencies and events output to use new import when they are the only options selected.
- Fixed bug where symlinks could be reported as being on the mountpoint of the target rather than where the link resides.
- Fixed bug where some connect calls were missing from trace.

- Now traces calls made to the PSCHED TM API function `tm_spawn`.
- Fixed issue where network profiling data was not properly reported.
- Added double-click to open Program Information dialog to I/O Summary.
- Fixed issue with missing network I/O counts in profiling view.
- The time taken by a traced function is now referred to as a “duration” rather than a “latency”. Two configuration environment variables have been renamed accordingly. (`BREEZE_MONITOR_LATENCY_MAX_IO` becomes `BREEZE_MONITOR_DURATION_MAX_IO` and `BREEZE_MONITOR_LATENCY_SAMPLE` becomes `BREEZE_MONITOR_DURATION_SAMPLE`.)
- Added search box for process environment.
- Failed reads/writes and execs are no longer counted as dependencies.
- Directories are now more consistently marked as directories rather than just files.
- Fixed bug whereby if a shebang script on the path was wrapped with `trace-program.sh`, then its full path was not being reported in the trace.
- Improve the accuracy of symlink counts and filesystem trawls.
- Consolidated file types - files are no longer marked as source files/log/configuration etc but just as Files, Directories, Symlinks etc.
- Added network hostnames to network view, network profiling data and events view.
- Hidden and Temporary are no longer file types, but an attribute of a file. This allows all files, directories and symlinks to be represented as hidden/temporary as necessary.
- Only show views relevant to current selection.
- Fix incorrect column headings in Program I/O Summary.
- Show program library information in tables to make each line easier to read.
- Fix bug in Program Files view where the totals were for the whole job, not the selected process.
- Fixed bug in Program Profile where the tooltip was not for the correct data point.
- Fixed bugs in Program Profile where right click menu didn't work or disappear.

Release 2022.2.1

- Reduced the amount of stack space used in programs being traced or metered.
- Fix bug setting strace output directory with remote traces.
- Removed incorrect headings in network CSV output.

Release 2022.2.0

- The latency of I/O on unix domain sockets is no longer counted as file system latency.
- Fix problems seen on Fedora 35 and glibc 2.34.
- The error log command line option has been changed from `-log` to `-errlog`.
- Fix a problem which caused I/O on a pipe, or a file descriptor which is not associated with an inode, to be counted as I/O to a file in the current working directory.
- The start-monitor utility can now be run without setting `LD_PRELOAD`.
- Fix problem if Breeze is run with the path name of a command which creates a child job.
- Make the `-child-job` option work correctly when Breeze is used with Singularity.
- Fix problem when Breeze is used with an MPI job running on Altair Grid Engine.
- Fix problem where child jobs over-wrote user child job (`ELLEXUS_CHILD`) setting.
- Correctly identify mount points when running in a Singularity container.
- Fix problems shown by compiling with gcc version 12.1.
- Fix bug in path resolution triggered by flush in some circumstances.
- Fix bug where strace option wasn't preserved in child jobs.
- `ELLEXUS_OUTPUT_DIRECTORY` renamed `BREEZE_OUTPUT_DIRECTORY` and is no longer changed whilst being used.
- Fix problem where a program calls `close_range` or `closefrom`.
- Add documentation of the integration with Altair Grid Engine 2022.2.
- Removed obsolete option `BREEZE_PROFILE_BUCKETS` (same functionality available with `BREEZE_VOLUMES`).
- Removed option `BREEZE_PROFILE_FS_TRAWL` (rawl detection is now always on).
- Removed little-used configuration options `BREEZE_PROFILE_TIME_RANGES` and `BREEZE_PROFILE_TRAWL_LENGTH` - the previous default values are now hard-wired (powers-of-ten time ranges and trawl length threshold 4).
- Improved reporting of mountpoints in the Breeze trace.
- Added option to export symlinks data.
- Changed branding and improved structure of Healthcheck report.
- The environment variable which represents the name of the error log has been changed to `BREEZE_ERR_LOG`, though `ELLEXUS_ERR_LOG` is still supported for backward compatibility.
- Fix problem where `trace-program.sh` could exit before the trace was complete.
- Fixed problem where the number of read/write/seek calls could be under-reported in the files and network views. Errors were not always counted in # Calls.
- Fixed problem with long paths preventing horizontal scrolling in Files view, when column auto-expanded.

Release 2022.1.3

- Fixed bug in path resolution triggered by flush in some circumstances.
- Fixed bug in argmangling where ELLEXUS_CHILD was not respected in child jobs.
- Fix problem when Breeze is used with an MPI job running on Altair Grid Engine.