

TORQUE Resource Manager 5.1.3 Release Notes

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New Features

The following is a summary of key new features in TORQUE Resource Manager.

5.1.3

Added ghost_queue Queue Attribute

If pbs_server restarts and recovers a job but cannot find that job's queue, a new queue with the 'ghost_queue' attribute is created. That job is added and then run on the new queue. Jobs cannot be added to ghost queues. Once an administrator reviews and corrects the queue's settings, the 'ghost_queue' attribute can be removed, allowing the new queue to function normally.

New "email_batch_seconds" Server Parameter

The new server parameter "email_batch_seconds" lets you control at what frequency a batch of emails are sent to each user.

5.1.2

Added Feature to Disable Editing pbsnodes File

The qmgr command "dont_write_nodes_file=true" disables all commands which edit nodes. If set to true, this setting locks all access to the nodes file, thereby ensuring the nodes file is never overwritten unintentionally.

Added Process Adoption Through pbs-track

Added the ability to adopt running processes into a job with pbs_track.

Able to Exclude Compute Nodes from allow_node_submit

A new TORQUE server parameter "node_submit_exceptions" is available to specify nodes that are not allowed to submit jobs. This parameter is set in conjunction with "allow_node_submit".

Ability to Trust Certain Users or Groups from Hosts without Allowing All Users from those Hosts to Submit Jobs

Two new TORQUE server parameters "acl_user_hosts" and "acl_group_hosts" are available to support this new validation.

5.1.1

Support for more OSs

These additional OSs are now supported:

- CentOS 7.x
- RHEL 7.x
- Scientific Linux 7.x
- SUSE Linux Enterprise Server 12

i Support for Red Hat 7-based and SUSE 12-based systems requires the 5.1.1.2 maintenance release or later.

5.1.0

Ability to Provide Condensed qstat Output

A 'qstat -C' option, which specifies that TORQUE will provide only a condensed output (job name, resources used, queue, state, and job owner) for jobs that have not changed recently (as per the job_full_report_time parameter), has been added. Jobs that have recently changed will continue to send a full output.

Performance Enhancements to MOM Clean-up Time

Some minor performance enhancements were made to improve MOM clean-up time.

Differences

This section contains differences in previously existing features that require a change in configuration or routine.

5.1.3

Reduced the Number of Logging Statements

Reduced the number of logging statements when a node isn't up and therefore can't receive the mom hierarchy.

Prohibited Mode Not Allowed for User Jobs

Setting the compute mode of an NVIDIA GPU to prohibited makes it so the GPU cannot be used at all. In previous versions of Torque users were allowed to set a GPU to prohibited mode. But then it could not set the mode to anything else since the GPU was now prohibited. This change went into effect for version 5.1.3, 6.0.2, and later.

5.1.2

down_on_error Server Parameter Now Defaults to TRUE

By default, nodes that report an error from their node health check to pbs_server will be marked down and unavailable to run jobs.

Added a Way to Exclude Compute Nodes From allow_node_submit

Set 'allow_node_submit=true' in qmgr, and then add a remote mom to node_submit_exceptions with 'set server node_submit_exceptions = <nodename>' in qmgr. This setting will disable job submissions on the <nodename> specified by the user. Previously, the process of disallowing compute nodes from submitting jobs would require making a separate entry in qmgr for each individual compute node.

Abnormal Job Exit States Combined Into Single Exit Code

Added parameter "exit_code_canceled_job" to force all canceled jobs to have the same exit code, regardless of exit state. Previously, exit codes would be inconsistent depending on the type of cancellation or abnormal exiting of each job. The "exit_code_canceled_job" gets rid of extraneous exit codes and allows users to set their own exit code. For example, if a user sets "exit_code_canceled_job = 300" in qmgr, the exit code for any job that exits with a non-zero status becomes 300.

Qmgr Support Added for "loglevel" Attribute

The "loglevel" attribute name was not recognized by qmgr, while it was recognized in momctl; the string "loglevel" is now equivalent to "log_level" in qmgr. The user can now use either of these attribute names to check the current value of the loglevel.

Node Health Checks Now Run on Sister Nodes

Previously, node health checks would exclusively run on the mother superior. Node health checks now run on sister nodes as well.

Submission Syntax Added to Prevent Mixing NCPUs and Nodes

When mixing NCPUs and nodes, the checkjob command would show available procs as a negative; this mixing is now prohibited.

5.1.1

\$prologalarm is Always Honored

\$prologalarm was ignored on the prologue for a job. Also when the epilogue was run the \$prologalarm value was ignored if it was more the 300. Now the \$prologalarm value is always honored regardless of how large it is for both prologue and epilogue scripts. The default timeout is still 300 seconds.

Disable the Automatic Requeuing of Jobs

Added the ability to disable the automatic requeuing of jobs due to transient failures.

pbs_mom now sets environment variable for NVIDIA GPUs

A new mom config parameter, \$cuda_visible_devices, was added to specify whether pbs_mom sets the CUDA_VISIBLE_DEVICES environment variable when it starts a job. The default is TRUE.

Log Milliseconds

Added milliseconds in TORQUE's log files.

pbs_server Enhancement for Very Large Number of Jobs

pbs_server has been enhanced to better handle a very large number of jobs (several hundred thousand or more) by enabling an alternate way for it to store job-related files in the directories \$PBS_HOME/server_priv/jobs and \$PBS_HOME/server_priv/arrays.

A new boolean server attribute, use_jobs_subdirs, lets an administrator direct the way pbs_server will store its job-related files. When use_jobs_subdirs is unset (or set to false), job and job array files will be stored directly under \$PBS_HOME/server_priv/jobs and \$PBS_HOME/server_priv/arrays. This is the default behavior and the way the server has stored these files in the past.

When `use_job_subdirs` is set to true, job and job array files will be distributed over 10 subdirectories under their respective parent directories. This method helps to keep a smaller number of files in a given directory.

If an administrator wishes to change the `use_jobs_subdirs` attribute from its previous value (or when setting it to true when it has not previously been set), it is highly recommended that TORQUE be drained of all jobs. Failing to take this action may result in the loss of existing jobs.

5.1.0

CLIENTRETRY Configuration Option Support for qdel

The `qdel` parameter now includes the `-b` option and `CLIENTRETRY` configuration option support. This feature functions similar to `-b` option for `qsub`. Specifically:

- `-b <num>` command line argument support
- `CLIENTRETRY` configuration option support
- `PBS_CLIENTRETRY` environment variable support

Jobs Deleted When the Dependency Can No Longer Be Satisfied

When a job is deleted because its dependency can no longer be satisfied, that job will follow the `keep_completed` parameter set (if any) for `pbs_server`. Previously, jobs were purged immediately.

pbs_server -t No Longer Supports hot|warm|cold Options

The `pbs_server -t` option no longer supports the `hot|warm|cold` options. Other options are still supported.

Known Issues

The following are known issues in TORQUE Resource Manager. Following each issue description is an associated issue number in parentheses. Known issues are aggregated and grouped by the release version for which they first occurred or were reported.

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- `qsub -X` may incorrectly look for `xauth` in `/usr/X11R6/bin/` instead of `/usr/bin/`.

As a workaround, you can set `XAUTHPATH /usr/bin/xauth` in `TORQUE_HOME/torque.cfg` on client machines, and `$xauthpath /usr/bin/xauth` in `TORQUE_HOME/mom_priv/config` on the compute nodes. Alternatively, you may be able to work around the issue by simply creating a symlink from `/usr/X11R6/bin/xauth` to `/usr/bin/xauth` on `pbs_mom` hosts.

5.1.2

No known issues.

5.1.1

- Jobs do not exit the routing queue if the job is submitted with a hold (e.g. `qsub -h`). (TRQ-2788)

5.1.0

- ~~DNS caches are not purged of removed nodes when Elastic Computing is enabled. SLES 11 SP1 has an issue with giving the old IP address to TORQUE even after updating `/etc/hosts`. Do not use SLES SP1 if you are using this method to manage the IP addresses for `pbs_server`. The mom's OSs are irrelevant. (TRQ-2765)~~ This issue is resolved in 5.1.1.
- Some limitations exist in the way that `pbsdsh` can be used. Please note the following situations are not currently supported:
 - Running multiple instances of `pbsdsh` concurrently within a single job. (TRQ-2851)
 - Using the `-o` and `-s` options concurrently; although requesting these options together is permitted, only the output from the first node is displayed rather than output from every node in the chain. (TRQ-2690)

Resolved Issues

The following is a list of some key bugs fixed in TORQUE Resource Manager. Following each issue description is an associated issue number in parentheses.

Resolved issues are aggregated and grouped by the release version in which they were resolved.

5.1.3

- **Array templates can be reported as jobs.** Fixed a problem where array templates were being reported as jobs. (TRQ-3405)
- **Problem with pbsnodes field.** Resolved issues with clearing a node note. Removed length restriction on a node note. (TRQ-3439)
- **Node recovery feature requested.** pbs_server now detects when a node is failing too frequently and mark it down temporarily if this happens. Once a node is marked down, it will be marked up again if either two consecutive communications from pbs_server to the node receive successful replies, or after five minutes of staying offline (whichever comes first). A node is considered to be failing too frequently if it has three failures to reply to a server request without have two consecutive successes in between. (TRQ-2517)
- **Torque was not able to release holds on job arrays.** qrls on an array subjob allows pbs_server to correct slot limit holds for the array to which it belongs. (TRQ-3088)
- **Interactive jobs fail to run from all nodes but the head node.** This issue is fixed. (TRQ-3475)
- **Fixed memory leak when jobs are being started asynchronously.** This issue is fixed. (TRQ-3326)
- **Job holds were not updated when the slot limit is changed for a job array.** This issue is fixed. (TRQ-2360)
- **Jobs that never ran were receiving end records.** This issue is fixed. (TRQ-3432)
- **Resources_used.walltime changed to seconds from HH:MM:SS in accounting logs.** This issue is fixed. (TRQ-3385)
- **Error condition where the mom's port would be inserted into the .JB file name.** This issue is fixed. (TRQ-3090)
- **A deadlock occurred when handling job dependencies.** This issue is fixed. (TRQ-3519)

- **Jobs started even if mother superior could not resolve the hostname for a sister node.** This issue is fixed. (TRQ-3134)
- **libtorque.so was not being created.** This issue is fixed. (TRQ-3374)
- **Compatibility issue with Tcl 8.6+.** This issue is fixed. (TRQ-3389)
- **Compilation error with --enable-mic configured.** This issue is fixed. (TRQ-3418)
- **Jobs were stuck in exiting for 5 minutes.** This issue is fixed. (TRQ-3518)
- **Issue reported with alps login nodes.** Updated cpusets for alps login nodes so that all of the cpus are in the job's cpuset. (TRQ-3568)
- **Job dependencies were not being cleared with High Availability server.** This issue is fixed. (TRQ-3477)
- **Interactive jobs skipped submit filter directives if the first line was not #PBS.** This issue is fixed. (TRQ-3585)
- **Epilogue not showing up in momctl -d3 output.** (TRQ-3495)

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- **pbs_server times out connection to pbs_mom.** Added load balancing to login nodes when they start to get busy. (TRQ-3367)
- **Numbered directories in server_priv/jobs (and arrays) were missing when the server attribute "use_jobs_subdirs" was set to TRUE.** This issue is fixed. (TRQ-3185)
- **Random group names displayed for users that did not belong in the group.** A race condition was fixed by changing to thread safe calls to get group and user ids. (TRQ-3190)
- **Read timeouts were retried indefinitely by pbs_server.** This issue is fixed. (TRQ-3306)
- **End-of-job times were not consistent.** End-of-job times are now recorded closer to when nodes are free for use. (TRQ-2840)
- **Torque init scripts were not LSB compatible.** The pbs_mom service was not returning exit code 3 when exiting, which is an LSB requirement. As a result, the builder was failing to properly initialize pbs_mom, causing nose tests to fail. Init script return codes are now altered to correct values for LSB compatibility. (TRQ-3254)
- **Reporter MOM was unable to handle ALPS UNKNOWN role.** This issue is fixed. (TRQ-3245)
- **Jobs were stuck in EXITING state on mother superior.** This issue is fixed. (TRQ-3165)

- **Jobs with square brackets "[" in their name were aborted on restart if they were not array subjobs.** Torque now allows all jobs that have "[" in their name. (TRQ-3214)
- **Improperly escaped xml caused job files and dependencies to fail upon reload attempt.** This issue is fixed. (TRQ-3284)
- **Jobs were not created properly if the path had one or more spaces in the name.** Added multiple spacing options for job file path name. (TRQ-3235)
- **Completed jobs were not cleaned up properly.** Fixed various issues relating to restarting dependency jobs. (TRQ-3175)/(TRQ-3044)
- **Job files were never deleted when "\$thread_unlink_calls" value was set to TRUE.** Fixed issue where the threadpool in pbs_mom was not started properly causing job files to be left behind. (TRQ-3232)
- **Some threads would cause Torque to hang and become completely unresponsive.** Count_proc() now returns 0 on a NULL argument. (TRQ-3196)
- **Jobs were run in the wrong order and canceled prematurely.** Running jobs are no longer deleted due to dependencies. (TRQ-3189)
- **Server entered deadlock around completed jobs map.** This issue is fixed. (TRQ-3226)
- **Flooding server with client commands disabled some functionality.** Resolved issue where server gets stuck due to large volume of client requests. (TRQ-3296)
- **Kill_delay sent multiple signals.** Signals sent to job pids are now tracked to eliminate redundant sending. (TRQ-3239)
- **Qsub -W stage-in displayed incorrect user grouping.** The log was showing users belonging to groups that the users were not a part of. This issue is fixed. (TRQ-3312)
- **pbs_submit() method changed for stable job submissions.** The qsub command currently utilizes the pbs_submit_hash() method to submit jobs and is stable. Submitting jobs via the pbs_submit() method would occasionally render pbs_server unresponsive. Now pbs_submit() is functioning properly. (TRQ-3314)
- **Moab crashes in Torque API.** This issue is fixed. (TRQ-3368)
- **Job was created incorrectly if path contained a space.** Fixed problem when path to error, output or execution environment contains one or more spaces. This fixes issues with spaces in paths specified by the following qsub options: \-d, \-e, \-o, \-w. And, also fixes a problem when

jobs are submitted from within a directory containing one or more spaces in its path. (TRQ-3347)

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- **Queue default resources were being modified.** Corrected an issue where the all memory values were converted to bytes after a restart. (TRQ-3139)
- **Some completed jobs were taking quite a while to clear out.** Hardened the removal of completed jobs from pbs_server. (TRQ-3044)
- **Ability to have the procct values displayed on the queues where it was set was lost.** This issue is fixed. (TRQ-3135)
- **max_user_queueable issues.** Fixed some bugs causing incorrect max_user_queueable values. (TRQ-2841)
- **PBS_NUM_NODES on multi-req job wrong when using specific hostnames.** This issue is fixed. (TRQ-1949)
- **Dependency jobs fail to start during HA fail over.** Dependencies now display in the format of depend=type:jobid instead of depend=type:jobid@server. (TRQ-2332)

```
# Was
depend=afterok:12.napali@napali

# Now
depend=afterok:12.napali
```

- **Bug reported that caused jobs to not start when ALPS incorrectly returns a permanent confirmation failure.** This issue is fixed. (TRQ-3023)
- **Problem reported that caused MOM restarts to intermittently fail.** This issue is fixed. (TRQ-2307)
- **TORQUE will not compile with --enable-debug on configure.** This issue is fixed. (TRQ-2969)
- **pbs_server would count completed jobs against queue limits when pbs_server was restarted.** This issue is fixed. (TRQ-3087)
- **Compute node offline state doesn't persist across server restarts.** This issue is fixed. (TRQ-2790)
- **With kill_delay and \$exec_with_exec set, a job would be set to a completed state after running qrerun instead of getting set back to queued.** This issue is fixed. (TRQ-2993)
- **qmgr refuses numerical node ids.** This issue is fixed. (TRQ-2946)

- **X11 very slow with qsub -I -X.** The port forwarding buffer size has been increased to improve performance when enabling X11 forwarding from qsub (-X switch). (TRQ-2740)
- **Problem reported with interactive jobs not staying on the node from which they were submitted.** This issue is fixed. (TRQ-3122)
- **Jobs were getting stuck in a running state when an asynchronous run failed.** This issue is fixed. (TRQ-3114)
- **Array slot limits were not getting decremented when a job is preempted or rerun.** This issue is fixed. (TRQ-3110)

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- **HOST_NAME_SUFFIX was no longer adding suffix to job names.** This issue is fixed. (TRQ-2956)
- **pbs_mom filling up the logs in a HA environment.** Reduced verbosity in error logging in HA environments. (TRQ-2863)
- **Delays reported with Preemption.** Speed up process data collection to help diminish time to rerun a job, including correctly sum job memory and cpu time resources for processes created under setsid() calls within a job, and avoid an infinite loop in pbs_mom when running under a Linux Container (lxc). (TRQ-3026)