Moab HPC Suite – Basic Edition 8.1.3 Release Notes

The release notes file contains the following sections:

New Features

The following is a summary of key new features in Moab HPC Suite – Basic Edition.

- General Suite on page 2
- Moab Workload Manager on page 2
- Moab Web Services on page 4
- TORQUE Resource Manager on page 5

General Suite

This section contains information applicable to more than one of the components in the Moab HPC Suite.

8.1.3/5.1.3

None.

8.1.2/5.1.2

None.

8.1.1/5.1.1

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

> ⓘ Support for Red Hat 7-based and SUSE 12-based systems requires the 8.1.1.2/5.1.1.2 maintenance release and after.

8.0.0/5.0.0

None.

Moab Workload Manager

8.1.3

REQUIREDUSERLIST and REQUIREDACCTLIST for SRCFG

SRCFG[] has two new attributes REQUIREDUSERLIST and REQUIREDACCTLIST. Each of these takes a comma delimited list of users and accounts, respectively. When one of these is present any jobs that run in the reservation must match them. If both are present any job that runs inside the reservation must match both. It is recommended that any entries in REQUIREDUSERLIST and REQUIREDACCTLIST be present in the USERLIST and ACCOUNTLIST parameters to handle reservation affinities.

showq Filter for Feature

Enable "showq -w nodefeature=" to filter on node feature strings.

8.1.2

Ignore Hostlist Requirements on Jobs

Added CLASSCFG[] IGNHOSTLIST=TRUE to ignore hostlist requirements on jobs.

Query Details for Jobs that Have Already Terminated

Enabled checkjob ALL --flags=COMPLETE to obtain checkjob information for every job, including completed jobs.

Change the Requested Tasks Per Node for a Job

Enabled "mjobctl -m tpn=X" for modifying tasks per node.

Ability to Specify a Minimum Size Before the Job is Eligible For Priority Reservation

A new MINPRIORITYJOBRSVSIZE server parameter is available to define the minimum total job size (in processors) for jobs that can get a priority reservation. Jobs smaller than the specified value will still be started during normal and backfill scheduling, but will not be eligible for priority reservations. Default is 0.

Node Features Can Be Shared by the Same Class

NODEACCESSPOLICY now supports the SINGLECLASS attribute.

8.1.1

No new features.

8.1.0

Elastic Computing Feature - Ability to Request Dynamic Nodes From an External Service

A new Elastic Computing feature is available to allow the Moab scheduler to utilize systems that can temporarily provide additional nodes (for example, to create new virtual machines or borrow physical nodes from another system) to fulfill increased workload demand so that job backlog is completed in a reasonable time frame. When this feature is enabled and configured, Moab accesses the dynamic nodes, also known as bursting, to handle the increased workload. Accessed nodes are then released once the demand is filled.

> ⓘ Elastic Computing is only available with a Moab HPC Suite - Enterprise Edition license that has Elastic Computing enabled. Please contact your account manager at Adaptive Computing for further details and requirements for this feature.

Moab's Scheduling Cycle No Longer Needs to Wait on the Cluster Query

A new "threadedqueries" resource manager flag is available. When this flag is set for an individual RM (for example, "RMCFG[torque] TYPE=PBS FLAGS=threadedqueries"), the queries that Moab performs to get information from the RM are done in a separate thread from the main Moab process. This allows Moab to remain responsive during the query, and ultimately reduces the time spent in a scheduling cycle. If multiple RMs are being used, the effect can be more significant because all RMs will be queried in parallel.

Moab Web Services

8.1.3

No new features.

8.1.2

No new features.

8.1.1

No new features.

8.1.0

Support for Multi-Line (textarea) Configuration Parameters in Plugins

MWS now supports multi-line (textarea) configuration parameters in plugins. See **Configuration Constraints** in the *Moab Web Services Reference Guide* for more information.

Trigger Object includes New Type Field

The Trigger object in MWS has a new field called type. The type of a trigger can be either generic or elastic.

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

See .

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.

General Suite

This section contains information applicable to more than one of the components in the Moab HPC Suite.

8.1.3/5.1.3

None.

8.1.2/5.1.2

None.

8.1.1/5.1.1

Daemon Restart

If your configuration uses systemd to start or stop daemons, also use systemd to restart daemons instead of using the direct restart options.

For example, if you use systemctl start moab.service, use systemctl restart moab.service instead of the mschedctl -R option.

 For example, if you use

- systemctl start moab.service, use systemctl restart moab.service instead of the mschedctl -R option.
- systemctl start goldd.service, use systemctl restart goldd.service instead of the goldd -r option.

> ℹ Support for systemd (Red Hat 7-based and SUSE 12-based systems) requires the 8.1.1.2/5.1.1.2 maintenance release and after.

8.1.0/5.1.0

None.

Moab Workload Manager

<u>8.1.3</u>

Processors Are Listed as Node Attributes

Processors were incorrectly listed as node attributes. This has been corrected.

Added UseRMCompletedJobStats SCHEDCFG Flag

Use RM reported CPUTime when calculating job efficiency with SCHEDCFG[] FLAGS=UseRMCompletedJobStats.

<u>8.1.2</u>

Enhanced showq Sorting Priority for Blocked Jobs

The showq command now sorts blocked jobs in descending priority order.

Condensed Queries Between Moab and Torque Disabled

"RMCFG[] FLAGS=NoCondensedQuery" is now the default setting. Previously, faulty job reservations were applied on nodes not allocated for specific job. These false reservations would occasionally corrupt walltimes and kill jobs prematurely. This change resolves those concerns.

Added 'JSTAT' to 'JOBCFG' Object

To apply this change, enable "JOBCFG[X] JSTAT=X" for collecting template statistics. This allows for ease-of-use in reporting and viewing statistics for the different application types. Statistics from different templates can be shown on the same JSTAT which can be seen by using the command "showstats -j".

Enabled "failure" Scheduler Trigger for Recovering in HA Scenarios

Added an HA trigger mechanism used for handling Moab failures. When Moab fails over, a system trigger is fired on the new active server allowing the user to run scripts and perform services such as changing floating IP addresses, stopping and starting MWS, postgres, and other services.

Added Configuration Option to Attach Environment Variables to All Jobs

To enable Moab job environment variables on all jobs, use the "SCHEDCFG[] FLAGS=EnableMoabJobEnv" setting.

Backfill Disabled Within Reservation When Owner Job is Present

Disable Moab backfill with the "SRCFG[] FLAGS=OwnerExclusiveBF" setting. This setting allows for full utilization of clusters by avoiding backfill-induced starvation. While this setting is not advised for all scenarios (backfill is desired in

certain cases), this feature provides more options for users wishing to disable backfill.

Enhanced Command Support With UIMANAGEMENTPOLICY FORK

User-initialized UIMANAGEMENTPOLICY FORK now support the "mdiag -a|-c|-g|-q|-r|-S|-s|-t|-u|", "showstate", and "showstats" commands.

Set NODEAVAILABILITYPOLICY on a Per-NODECFG Basis

You can now use NODEAVAILABILITYPOLICY with NODECFG at the local level.

> ⓘ The syntax has a different format when using it locally (with NODECFG) instead of setting it globally (using the NODEAVAILABILITYPOLICY server parameter).

Modify a Job's Maximum Memory Limit

Enabled "mjobctl -m MAXMEM=X" to modify a job's maximum memory limit.

Enable NODEAVAILABILITYPOLICY on Reservations and NODECFG

Added ability to set NODEAVAILABILITYPOLICY on a per-NODECFG basis.

SINGLECLASS Feature Request

Enabled NODEACCESSPOLICY SINGLECLASS and SINGLEQOS.

mjobctl Supports Modification of a Job's tpn

Enable "mjobctl -m tpn=X" for modifying tasks per node.

Incorrect mdiag -j Memory output; Displayed Per Task, But Not Total

"mdiag -j -v" now reports total job memory.

Ability to Define Minimum Size of Jobs That Get Priority Reservation

Added MINPRIORITYJOBRSVSIZE to specify minimum job size for a priority reservation.

Flag for checkjob ALL to Include Completed Jobs

Enable "checkjob ALL --flags=COMPLETE" to include completed jobs

Users Discretion in Choosing Where to Save Files

Added ability to specify path with log level using "mschedctl -L".

MIN.TPN and MAX.TPN Do Not Remap Class

Enable CLASSCFG[] MIN.TPN and MAX.TPN for class remapping.

<u>8.1.1</u>

Set Job Flags in Identity Manager

Enabled the JOBFLAGS parameter on accounts through moab.cfg and identity managers.

New PREEMPTIONALGORITHM Parameter

The PREEMPTIONALGORITHM is added to designate how Moab handles preemption scheduling policies. Valid values are PREEMPTORCENTRIC or PREEMPTEECENTRIC. PREEMPTEECENTRIC is the default.

- PREEMPTORCENTRIC specifies Moab uses the normal scheduling policy and obeys all configured policies (such as JOBNODEMATCHPOLICY, NODEALLOCATIONPOLICY, NODEACCESSPOLICY). Previously, Moab did not support those policies for preemption.

- PREEMPTEECENTRIC specified Moab uses the custom scheduling policy that ignores many policies to ensure the fewest and least important (by priority) preemptees are disturbed by the preemptor.

> **ℹ** Preemption now works with JOBMATCHPOLICY EXACTNODE.

Change to ALWAYSEVALUATEALLJOBS Configuration Parameter

The configuration parameter ALWAYSEVALUATEALLJOBS was changed from a boolean to an enumerated value. The possible values are ALWAYS (formerly TRUE), FIRSTRSV (formerly FALSE), and FULLRSV (an intermediate setting).

> **ℹ** No change is required when upgrading from earlier versions. The TRUE value will map to ALWAYS and the FALSE value will map to FIRSTRSV.

RSVSEARCHALGO by partition

Enabled "PARCFG[] FLAGS=WideRsvSearchAlgo" to allow for per-partition specific scheduling rules. See the **RSVSEARCHALGO** parameter in the *Moab Workload Manager Administrator Guide*.

FSSCALINGFACTOR Pre-Partition Setting

Enabled "PARCFG[] FSSCALINGFACTOR" for partition-specific fairshare usage scaling.

msub MOAB_SUBMITDIR Environment Variable

MOAB_SUBMITDIR is populated with the submission directory for jobs submitted with "msub -E".

msub -P

Added '-P' option to msub command to match functionality with 'qsub -P'. This option can only be used by users in the ADMINCFG[1] security level.

Clarify Jobs Submitted with -n

Added log entry when job submitted with '-n' (node_exclusive). 'n' sets the node's access policy as SINGLEJOB.

New Argument for checknode -h

"ALL" is now a valid argument in 'checknode -h'.

Mandatory Queuetimes on Reservation Owners

Added new parameter "SRCFG[] OWNERPREEMPTQT=XX:XX" to configure mandatory queuetimes on reservation owners.

checkjob Change for Node Availability Information on Large Clusters

checkjob will no longer report node availability information on large (>1000 node) clusters unless a '-v' flag is included.

mrsvctl -m Disallows the Modification of a Standing Reservation

mrsvctl -m now disallows the modification of a standing reservation and returns an error to the user if this is attempted.

8.1.0

Set Default Accounts on a Per Partition Basis

Added the ability to define default accounts per partition. Also available in fairshare trees.

Node Collection in the Moab Database in MongoDB

The node collection in the Moab database in MongoDB has an index on the attributes field. This field can grow too large to index.

- For existing installations, the following commands on the MongoDB server will fix the problem:

```
$ mongo moab –u moab_user –p secret2
> db.node.dropIndex({"attributes":1})
```

    The username and password for your database are most likely different from the above example. Check with your database administrator.

- For new installations using this and future releases, the index is no longer created and does not need to be dropped.

IDCFG[] Defaults to TRUE

The default value for IDCFG[] CREATECRED has been changed to TRUE. Moab will now create all credentials that it finds in the identity manager.

Moab Web Services

8.1.3

No known differences.

8.1.2

No known differences.

8.1.1

No known differences.

8.1.0

Reservation Statistics Value Changes

MWS reservation statistics (CIPS, CAPS, TAPS, and TIPS) values have been changed from floating decimal points (double) to long integers. This supports reservations now passing the consumption rate as an attribute (instead of an element).

TORQUE Resource Manager

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.

Installation and Upgrade Information

> ⚠ When installing or upgrading, it is *strongly* recommended that administrators configure Moab with mauth authentication with a complex key value. See **Mauth Authentication** in the *Moab Workload Manager Administrator Guide* for more information.

Compatibility Requirements

This section provides information on compatibility between the difference components of the suite.

Moab Workload Manager and TORQUE Resource Manager

Although the recommended configuration is Moab version 8.1.x and TORQUE version 5.1.x, Moab version 8.1.x supports TORQUE version 4.2.9, 4.2.10, 5.0.x, and 5.1.x.

TORQUE 5.1.x requires Moab 8.1.x or 8.0.x.

Installing Moab HPC Suite 8.1.x

Please see **Requirements** and also see **Preparing for Installation** and **Installing Suite RPM** for manual or RPM-based installation instructions, respectively, in the *Moab HPC Suite Installation and Configuration Guide*.

Upgrading to Moab HPC Suite 8.1.x

Please see **Preparing for Upgrade** and **Upgrading from 7.2** *or* **Upgrading from 8.0** for manual or RPM-based installation instructions, respectively, in the *Moab HPC Suite Installation and Configuration Guide*.

Known Issues

The following are known issues in Moab HPC Suite – Basic Edition Moab HPC Suite. 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.

8.1.3/5.1.3

- 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.

8.1.2/5.1.2

No known issues.

8.1.1/5.1.1

- When altering a GRES with 'mjobctl -m' on a job submitted with "-l software=" (instead of with "-l gres="), the change incorrectly reverts after an iteration. As a workaround, use '-l gres=' instead of '-l software='. The 'software' syntax will be deprecated in favor of 'gres'. (MOAB-7631)

- Requesting multiple GRESes with "-l software=" honors only the first license request. Use "-l gres=" instead. The 'software' syntax will be deprecated in favor of 'gres'. (MOAB-7630)

- Job user priority lost after running 'mjobctl -m userprio'. (MOAB-8094)

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

8.1.0/5.1.0

- Jobs submitted with invalid credentials are put in a held state, instead of rejected, until the administrator can respond. The checkjob command gives administrators further information regarding why the job is held. Blindly assuming that all held jobs should in fact be running RIGHT NOW is not only unsafe, but circumvents intentional Moab policies and workflow. An administrator should exercise care when resolving held jobs. (CVE-2014-5375, MOAB-7478, MOAB-7526)

- When installing or upgrading, it is *strongly* recommended that administrators configure Moab with mauth authentication with a complex key value. See **Mauth Authentication** in the *Moab Workload Manager Administrator Guide* for more information. (CVE-2014-5376, MOAB-7525, MOAB-7480)

- BACKFILLPOLICY BESTFIT does not support multi-req jobs. Only FIRSTFIT supports multi-req jobs. (MOAB-6824)

- ~~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 Moab HPC Suite – Basic Edition. 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.

8.1.3/5.1.3

- **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)

- **Issues reported groups, users, and accounts with spaces in the name.** Enabled SCHEDCFG[] FLAGS=AllowCredentialsWithSpaces to let Moab ignore POSIX standards and allow groups, users, and accounts with spaces in the name. (MOAB-8399)

- **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 incorrectly ran when requesting logically ANDed QoS tied to default account .** This issue is fixed. (MOAB-8350)

- **CPUTime in accounting usage record was being rendered as a date-time.** This issue is fixed. (WS-2469)

- **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)

- **Jobs with the "AFTER" dependency were not auto-cancelling.** This issue is fixed. (MOAB-8387)

8.1.2/5.1.2

- **Rounding of ConsumptionRate variable caused noticeable charge discrepancies.** MAM now receives an increased precision of the processor consumption rate value. (MOAB-7940)

- **When sending periodic reset calls, Moab got stuck and shut down incorrectly.** Added a 60 second shutdown alarm to avoid getting hung up during shutdown. (MOAB-8011)

- **OMAX* parameters were not recognized in the identity manager.** Enables setting OMAX* parameters in the identity manager. (MOAB-7567)

- **Wrong 'queuestatus' was shown for a blocked job.** Previously, if a job's individual walltime violated the set walltime, the checkjob xml would incorrectly display the job's queuestatus as eligible. Client commands now agree regarding queuestatus. (MOAB-8266)

- **Some job dependencies did not run before a job started.** "DEPEND:before" jobs no longer blocked when "mjobctl -m" parameter used before canceling job. (MOAB-8082)

- **Multiple instances of standing reservation were created when some nodes go down.** This issue is fixed. (MOAB-8042)

- **Under certain conditions a false "cancelfailed" email was sent to the user.** Canceled jobs that are not yet removed from the queue no longer block other jobs. (MOAB-7964)

- **Memory was divided incorrectly per task in array jobs.** Moab would commit too many jobs to a node when initializing an array job, and user specified memory limits would be exceeded. Moab no longer commits excessive memory with array jobs. (MOAB-7959)

- **Jobs were placed in incorrect partitions when one or more partition is down.** This issue is fixed. (MOAB-7103)

- **Moab redundantly pinned on ROLLBACKOFFSET reservations.** This issue is fixed. (MOAB-7942)

- **Moab would silently shut down with a valid license during a network outage.** This issue is fixed. (MOAB-7640)

- **If periodic charging was enabled on the grid head, extraneous charges would occur.** Under certain circumstances, if a job were created with multiple charges, the grid head would notice inconsistencies and show the job as migrated. This issue is fixed. (MOAB-7842)

- **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)

- **Init.d script updated for enhanced start up reliability.** "OS/EL/etc/init.d/moab stop()" function modified to use killproc -t60. (MOAB-8002/MOAB-8231)

- **Request features on class not working.** Enable CLASSCFG[] IGNHOSTLIST=TRUE to ignore hostlist requirments on jobs. (MOAB-8225)

- **Moab was not collecting template statistics correctly.** Enable "JOBCFG[X] JSTAT=X" for collecting template statistics. (MOAB-8068)

- **DEFAULT FSCAP ignored.** FSCAP rules were able to be set, but would not function properly all of the time. This issue is fixed. (MOAB-6684)

8.1.1/5.1.1

- **Moab failed to register GRES update via qalter.** Fix applied to update changes made to job gres via qalter. (MOAB-7559)

- **showhist.moab.pl was missing output file and working directory in the output.** Added ability to display the output file and working directory in the output of showhist.moab.pl. (MOAB-5609)

- **mnodectl -m features with regex only updates one node.** Enabled mnodectl -m *<features>* x:*<node_regex>* for node features. (MOAB-7843)

- **Moab is calling salloc/srun with wrong options.** Changed call for Slurm's srun command from "-n1 -N1" to "-n*<num_tasks>*". (MOAB-6770)

- **mjobctl 'command-line arg info not available' is logged.** Added "starttime" to the event logged when either the 'showstart' or 'mjobctl -q starttime' command is run. (MOAB-7230)

- **Group missing from showq -b.** Added GROUP to output of "showq -b" and "showq -b -v". (MOAB-6762)

- **Unable to disable a RM that is down.** Added ability to set state of down RM to disabled. (MOAB-7481)

- **Unable to clear failures for ID in mdiag -R output.** Added an ID option to mrmctl -f to clear the ID failure messages in mdiag -R. (MOAB-7259)

- **Moab was reading in old job information and using it.** Added log warning if job id from RM is already found in the completed job table. (MOAB-7196)

- **mysql error code was missing in the list of ignored SQL error codes.** This issue is fixed. (MOAB-7758)

- **runjob ignores policies.** Added the enforcing of partition limits to runjob (mjobctl -x). (MOAB-6132)

- **Job submission rejected for insufficient resources yet still created template jobs.** Cleaned up job workflows that could not be submitted. (MOAB-7919)

- **Moab peer to peer grid with LOCALWORKLOADEXPORT results in livelock.** Enabled "RMCFG[] TYPE=MOAB FLAGS=asyncdelete" for more responsive grids. (MOAB-7415)

- **GPU usage did not show up in workload trace.** This issue is fixed. (MOAB-7498)

- **Potential race condition when node idle purge time exceeded.** Enabled automatic node draining when NODEIDLEPURGETIME is reached. (MOAB-7663)

- **Moab not escaping properly when sending XML to MAM.** Enabled sanitizing of credential names. (MOAB-7419)

- **Erroneous message reported about classes when nodes are down.** This issue is fixed. (MOAB-7770)

- **Moab log is incorrect.** Fixed log message about nodes located for job. (MOAB-7788)

- **"could not get user info" message displays for job triggers with flag "user".** Set job trigger exec user to default user of job if not explicitly set. (MOAB-7907)

- **Checkjob reporting misleading error.** Suppressed non-essential error output when unable to connect to the CLIENTUIPORT. (MOAB-7539)

- **Jobs not taking all procs when "flags=allprocs" is requested on the job and "set queue batch resources_default.ncpus = 1" is set in TORQUE.** This issue is fixed. (MOAB-7748)

- **Moab was scheduling jobs before setting up the rsv event table.** This issue is fixed. (MOAB-7953)

- **MPBSWorkloadQuery failure caused problems with jobs.** Enabled RMCFG[] FLAGS=NoCondensedQueries to disable Torque's condensed qstat queries. (MOAB-7958)

- **Problems reported with credential REST queries.** Changed max_idle_jobs, max_jobs, max_nodes, max_processors, and max_processor_seconds from integer to string. (WS-2388)

- **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_queuable issues.** Fixed some bugs causing incorrect max_user_queuable 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)

8.1.0/5.1.0

- **mrmctl -f {messages|stats} failed to work for AM.** Fixed bug so that messages and statistics can be cleared for AM as described in the documentation.

- **Several mrmctl options ignored the option argument or did not honor them properly.** These issues are fixed.

- **Role permission updates were incorrectly applied to user permissions.** This issue is fixed. (WS-2340)

- **multireq jobs take hours to start.** Fix bug where multi-req jobs were slow to start in certain cases. (MOAB-6824)

- **Unauthorized error does not tell you what permission you are lacking.** Improved error messages related to accessing resources without sufficient permissions. (WS-2301)

- **Submitting remote job scripts (that is, including the script as part of the JSON payload) is not currently supported.** Job scripts can now be included in the POST body when submitting jobs via MWS. The new field is called commandScript. (WS-2112)

- **MWS could send phony node name to Moab.** MWS is now more robust when parsing the nodesRequested field during a job PUT. (WS-2352)

- **Reservation trigger parser is broken.** The rest/reservations resource now correctly returns trigger IDs (if any) on reservations. (WS-2342)

- **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)