



UNIVA CORPORATION

GRID ENGINE DOCUMENTATION

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# Grid Engine Release Notes

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# Contents

<b>1</b>	<b>License</b>	<b>1</b>
<b>2</b>	<b>Supported Operating Systems, Versions and Architectures</b>	<b>6</b>
<b>3</b>	<b>Fixes and Enhancements</b>	<b>7</b>
3.1	Summary . . . . .	7
3.1.1	Manual Preemption . . . . .	7
3.1.2	Different Resource Requests for Master and Slave Tasks of Parallel Jobs . . . . .	7
3.1.3	Possibility to Change Resource Selection During Runtime of Jobs . . . . .	8
3.1.4	Possibility to use Consumable Resources for Soft Requests . . . . .	8
3.1.5	Possibility to Specify a Range of Consumable Resource for Soft Requests . . . . .	8
3.1.6	Find Used/Available Resources . . . . .	8
3.1.7	Find free-but-still-bound Resources for Preempted Jobs . . . . .	8
3.1.8	Users Can increase POSIX Priority of Own Jobs . . . . .	9
3.1.9	Configurable Timeout for Client Side Suspended qrsh . . . . .	9
3.1.10	Lost job Detection . . . . .	9
3.2	Full List of Fixes and Enhancements . . . . .	10
<b>4</b>	<b>Upgrade Notes</b>	<b>16</b>
4.1	Upgrade Requirements . . . . .	16
4.2	Upgrade Procedure . . . . .	17
<b>5</b>	<b>Compatibility Notes</b>	<b>17</b>
5.1	Reporting of Job Wallclock Time . . . . .	17
5.2	Reporting of Resource Capacities and Resource Quota . . . . .	17
5.2.1	qstat -F / qhost -F . . . . .	18
5.2.2	qquota . . . . .	18
5.2.3	qconf -sp . . . . .	19
<b>6</b>	<b>Known Issues and Limitations</b>	<b>20</b>

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Rev: August 2014



## 2 Supported Operating Systems, Versions and Architectures

Univa Grid Engine supports various platforms, hardware architectures and versions of operating systems. Find the full list in following table:

Operating System	Version	Architecture
SLES	10,11	x86, x86-64
RHEL	5 or higher, 6 or higher, 7	x86, x86-64
CentOS	5 or higher, 6 or higher, 7	x86, x86-64
Oracle Linux	5 or higher, 6 or higher, 7	x86, x86-64
Ubuntu	10.04LTS - 14.04LTS	x86, x86-64
Oracle Solaris	10, 11	x86_64, SPARC 64bit
HP-UX	11.0 or higher	64bit
IBM AIX	6.1 or later	64bit
Apple OS X	10.8 (Mountain Lion) or higher	x86, x86-64
Microsoft Windows	XP Professional (SP3)	32 bit
Microsoft Windows	Server 2003 / 2003 R2	32 bit
Microsoft Windows	Vista Enterprise / Ultimate	32 and 64bit
Microsoft Windows	Server 2008 / 2008 R2	32 and 64bit
Microsoft Windows	7 Professional / Enterprise / Ultimate	32 and 64bit
Microsoft Windows	Server 2012 / 2012 R2	32 and 64bit
Microsoft Windows	8 / 8.1 Pro / Enterprise	32 and 64bit

Table 1: Supported Operating Systems, Versions and Architectures

*PLEASE NOTE:* Hosts running the Microsoft Windows operations system cannot be used as master or shadow hosts.

*PLEASE NOTE:* Univa Grid Engine qmaster is fully supported on Linux and Solaris. We provide binaries in Univa Grid Engine for running the qmaster on other operating systems but they are not supported and delivered as a courtesy. If you require qmaster support on other architectures please contact us at support@univa.com.

*PLEASE NOTE::* if you require Univa Grid Engine support for older versions of the above operating systems please contact our sales or support team.

## 3 Fixes and Enhancements

### 3.1 Summary

#### 3.1.1 Manual Preemption

Univa Grid Engine 8.3 provides the first step of job preemption.

The preemption of jobs in order to enable other jobs to start running can be triggered manually. Later versions of Univa Grid Engine will provide the means to configure and do automatic job preemption.

Find more information concerning preemption in the man page `sgc_preemption(5)` or in the chapter ‘Advanced Concepts’->‘Manual, Semi-Automatic and Automatic Preemption’ in the Users Guide.

#### 3.1.2 Different Resource Requests for Master and Slave Tasks of Parallel Jobs

Univa Grid Engine 8.3 allows to specify different resource requests for the master task and slave tasks of parallel jobs. Resources for the master task can be specified with the **-masterl** switch of submit commands. A parameter named **masterl** is also available in job classes and job submission verifiers to predefine job templates for parallel jobs or to adjust jobs during the time of job submission.

Find more information concerning **masterl** in the man pages `qsub.1`, `sgc_job_class.5` or `jsv.1`.

*PLEASE NOTE:* The **-masterl** switch affects many different components of Univa Grid Engine for now only the common use cases for **-masterl** have been implemented. Some usage of **-masterl** may conflict with other Univa Grid Engine features.

These are some of the problems that are to be expected when using the **-masterl** switch:

- the **-masterl** switch conflicts with the usage of soft resource requests of the same resource, i.e. if a request like “`-masterl resource=val1 -soft -l resource=val2`” is specified, the soft request should apply to all slave tasks, but is ignored.
- when enforcing limits by the QMaster is enabled by setting the “`qmaster_params ENFORCE_MASTER_LIMIT=true`” configuration value, limits specified by the **-masterl** switch are ignored.
- the resources requested using the **-masterl** switch are not taken into account for urgency calculation.
- backfilling of jobs before jobs using the **-masterl** switch might fail.
- requesting different “`m_mem_free`” limits with **-masterl** und **-l** does not work.

### 3.1.3 Possibility to Change Resource Selection During Runtime of Jobs

It is now possible to change the amount of granted resources during runtime of a job. Granted resource can either be increased or decreased. To do this **qalter -l** can be used in combination with running jobs. Users have also to specify the **-when** switch to express that the change should happen immediately and not when the job is restarted.

The attempt to increase the granted resource set of a job will be rejected with an error message if not enough resources are available during the time **qalter** is executed.

This new functionality is especially helpfull to increase **h\_rt** for running jobs or to decrease the amount consumables (like license requests) when those resources are only required for a certain amount of time but not the full runtime of the job.

Please note that many resource requests such as **h\_vmem** or **h\_cpu** are set by the kernel of the operating system (via the **setrlimit()** function) so that they cannot be modified during runtime.

The modification of resources that were granted based on “-soft” requested consumables is currently not supported.

Find more information concerning resource adjustments in the **-l** and **-when** section of **qsub.1**.

### 3.1.4 Possibility to use Consumable Resources for Soft Requests

It is now possible to request a consumable of type **INT**, **MEMORY**, **RSMAP** or **DOUBLE** in the soft request part (e.g.: **qsub -soft -l cpu=4**). If there are free resources the job will get it. If there are no resources available the request will be ignored and the job will be started. It is also possible to specify hard and soft requests (e.g.: **qsub -soft -l cpu=4 -hard -l cpu=2**). The job will only be started if the hard request is available, but if the soft request is also available the soft request will be granted.

### 3.1.5 Possibility to Specify a Range of Consumable Resource for Soft Requests

It is now also possible to request a range value for consumables in the soft request part (e.g.: **qsub -soft -l cpu=4-6**). The consumable must have type **INT**, **MEMORY**, **RSMAP** or **DOUBLE**. The resulting granted request value is reported by **qstat -j** call. Find more information and examples in the complex (5) man page. The soft consumable range is not supported for the NUMA binding of **m\_mem\_free** consumable.

### 3.1.6 Find Used/Available Resources

Output commands of Univa Grid Engine 8.3 have been enhanced so that they show resources in various states. **qconf -sp pe\_name** will now show the amount of used resources. Previous versions showed only the amount of configured resources.

### 3.1.7 Find free-but-still-bound Resources for Preempted Jobs

Due to the preemption enhancement resources can be in a state called free-but-still-bound. Resources in such state are in process to be released from jobs that got preempted so that they will be available for preemptor jobs of higher priority.

**qstat -F**, **qhost -F**, **qquota** will show resources in that state additionally to the maximum capacity or available/used resources.

### 3.1.8 Users Can increase POSIX Priority of Own Jobs

In the past users were only allowed to decrease the POSIX priority of own jobs. Univa Grid Engine 8.3 allows also to reincrease the priority up to the value 0 when an administrator allowed this for a cluster by defining the parameter **ALLOW\_INCREASE\_POSIX\_PRIORITY=1** in the **qmaster\_params** of the cluster configuration.

### 3.1.9 Configurable Timeout for Client Side Suspended qrsh

When qrsh is run from a terminal and placed into the background the qrsh is suspended by the terminal session and will remain suspended indefinitely until it is placed back into the foreground by the user. Qrsh provides a command line switch **-bgio** that controls how qrsh behaves when backgrounded, however many users are not aware of this switch or they forget to properly use the switch and backgrounded qrsh tasks can remain backgrounded forever. A new parameter **SGE\_DEFAULT\_MAX\_IJS\_CLIENT\_WAIT\_TIME** controls how long the qrsh will wait before exiting. Please read `sge_conf.5` in the man pages for more details.

### 3.1.10 Lost job Detection

The qmaster parameters “`lost_job_timeout`” and “`enable_lost_job_reschedule`” can be used to enable lost job detection at qmaster. If qmaster worker threads will monitor the jobs reported by the execution daemons. If a task of a job that was started on an execution node is not reported for longer than the defined timeout the job is logged in the qmaster messages file. If “`enable_lost_job_reschedule`” is enabled the jobs for which the timeout was detected are set to error and will be rescheduled.

## 3.2 Full List of Fixes and Enhancements

Univa Grid Engine 8.3.0 alpha (also fixed for a 8.1 and/or 8.2 patch release)

- GE-5020 SGE\_HGR\_ environment variable is not shown in case of host aliasing
- GE-5031 reduce the level of the execd message "master task of pe job\*finished - still\*slave tasks are running" to INFO
- GE-5127 drmaa client failed receiving gdi request response for mid=65535 (got synchron message receive timeout error)
- GE-5151 extensive logging in qmaster messages file
- GE-5154 qdel may crash and cause communication error loggings at qmaster
- GE-5158 massive qdel request stresses qmaster daemon
- GE-5159 event client (e.g. scheduler) may get triggered events delayed if event interval is changed
- GE-5256 qghost, qstat and qquota should disconnect from qmaster before printing out the data

Univa Grid Engine 8.3.0 alpha (also fixed in a 8.2 patch release)

- GE-5088 qmaster is crashing when used in combination with LO
- GE-3177 max\_unheard parameter not working as expected
- GE-3435 potential deadlock in commlib
- GE-4954 Add configurable timeout for client-side suspended qrsh jobs
- GE-5059 update script adding wrong default parameter for cgroups\_params
- GE-5072 stree-edit is not part of the distribution
- GE-5078 RSMAP attribute in complex\_values definition masks following attributes
- GE-5086 if execd gets modified execd load report time the change is not immediately effective
- GE-5108 execd installation fails with error message "./inst\_sge: test: ] missing"
- GE-5112 uninstallation fails with error message  
"./inst\_sge: LO\_ENABLE\_QCONF\_OPTIONS=1: is not an identifier"
- GE-5120 qmaster is crashing due to lothread issue, when a array job is deleted
- GE-5121 scheduler assigns already used resource map value to job
- GE-5122 RSMAP not correctly set if job requests more than one value
- GE-5235 race condition at connection set-up may overwrite MAX\_IJS\_CLIENT\_WAIT\_TIME
- GE-5285 qconf -de nodexxx should not work if nodexxx is reference any where.  
It causes the qmaster to crash
- GE-5038 qstat -j shows job present, but job not available and no shepherd present either
- GE-5280 execd reports memory errors at startup
- GE-5360 the notify switch does not work in combination with qrsh
- GE-2638 advance reservations should support project based access lists
- GE-3610 check for GDI-version mismatch at commlib level
- GE-4207 qrsh -inherit to a cluster of different version dumps core
- GE-4782 the use of binding switch breaks the functionality of -w v/p
- GE-4833 gridengine ignores complex request and puts tasks into wrong queue instance
- GE-4892 shepherd pid is not moved out of cgroup when shepherd\_cmd is set
- GE-4959 on native Windows, if the execd was started manually, it stops when the

- console is closed
- GE-4964 on native Windows, the job environment does not contain SGE\_ and -V/-v variables
- GE-4973 finished jobs are not stored at all, even if the global config param finished\_jobs is greater than zero
- GE-4995 Fix scripts/nonreentrant.sh script that fails to find non-thread-safe functions used in the source code
- GE-5018 cgroup setting "killing=true" causes shepherd to terminate incorrectly
- GE-5032 jsv jc parameter is not reset in server JSV (bourne shell, TCL) if it was set during previous job verification
- GE-5036 native Windows clients crash if the sgepasswd file is corrupted
- GE-5041 "sharelog" record timestamp in "reporting" file not in milliseconds
- GE-5042 man page UGE\_Starter\_Service.exe(8) contains wrong version
- GE-5046 aix platform needs libxml2.a to be available in LIBPATH
- GE-5047 sge\_qmaster segmentation fault
- GE-5051 util/setfilperm.sh does not set ownership of install\_execd.bat
- GE-5055 sge\_qmaster daemon accepts requests from clients using older GDI version
- GE-5058 make the auto installer create certificates even if WIN\_DOMAIN\_ACCESS is false
- GE-5065 garbled error output of "save\_sge\_config.sh"
- GE-5066 GUI installer refers to UGE 8.2.0beta1
- GE-5068 upgrade procedure does not check for existence of "bc" command
- GE-5071 libdrmaa is missing in sol-sparc packages
- GE-5075 define a single point to set the Grid Engine version and GDI version
- GE-5080 invalid "gdi\_request\_limits" accepted by cluster config change although error message is printed
- GE-5091 automatic session cleanup does not work in root user systems
- GE-5092 cwd entry in accounting might break the accounting file format when ":" are used in dir or filenames.
- GE-5093 accounting does not filter "\n" in submission command line
- GE-5094 negative performance impact on qmaster due to logging into message file: "session <session\_id>: processed all available events till unique ID <event\_id>"
- GE-5097 new PE parameter daemon\_forks\_slave / master\_forks\_slave needs to be compatible with cgroups main memory limitation
- GE-5114 host is not set to error state if sgepasswd file cannot be read or is broken
- GE-5115 sge\_execd and sge\_shepherd depend on libgcc on sol-amd64
- GE-5116 sge\_execd on hp11-ia64 does not start (/usr/lib/hpux64/dld.so: Unable to find library libxml2.so.11)
- GE-5117 jobs are not started on hp11-ia64 (failed 137 : invalid execution state)
- GE-5132 create dl script for native Windows
- GE-5139 on native Windows, execd crashes if a load sensor reports too much load at a time
- GE-5144 aimk -uge-version broken
- GE-5146 port qping to native Windows (win-x86)
- GE-5150 misleading error message for classic spooling qmaster installation
- GE-5215 on native Windows, the PATH environment variable contains UNIX style parts
- GE-5238 on native Windows, it is not possible to specify more than one load sensor
- GE-5243 upgrade script fails to upgrade accounting file to 8.2.x format

Univa Grid Engine 8.3.0 beta1

- GE-921 Jobs blocked by `-a <time>` shall also be considered by resource reservation
- GE-5157 colon in resource request breaks accounting file format
- GE-5260 describe how to setup `sgepasswd` if `$SGE_ROOT` is mounted with `nosetuid`
- GE-5265 describe how to write and configure native Windows load sensors
- GE-5269 using job info as filter for jobs can cause segmentation fault of DRMAA2 app
- GE-5270 update all information about UGE on Windows in doc and man pages
- GE-5274 possible delayed configuration update for execution hosts
- GE-5275 race condition can brake `reschedule_unknown` functionality
- GE-5309 DRMAA2 C API lacks of a function for reaping single jobs from internal lists
- GE-3256 `qsub -p` accepts anything as priority value
- GE-3601 add a way that consumables can also be requested as `soft-request`
- GE-4115 enable `qalter` to modify resource requests of running jobs
- GE-4309 Allow for the active `-increasing-` of a resource request
- GE-4936 If `licenses` is not in use it should be possible to release it before job ends
- GE-5195 Visualisation of preempted jobs
- GE-5213 users should be able to increase Posix priority up to 0 even when lowered before
- GE-5217 `qstat -help` does not contain `-explain m`
- GE-5227 `JB_priority` field has wrong value for negative Posix priorities in XML Output
- GE-5228 users should be allowed to manually preempt their own jobs with `qmod -p`
- GE-5247 Formatting in `sge_conf` man page partially incorrect
- GE-5272 need command to show used slots of a PE
- GE-5273 demo doc package contains user and admin manual
- GE-5307 DRMAA2 enums do not contain UNSET values which causes issues for some compilers
- GE-5318 DRMAA2 extensible data structures needs to contain additional pointers (OGF issue 160)
- GE-5328 `qalter` prints error and success message when consumables in hard resource lists should be changed for pending jobs
- GE-5334 `qstat -j` should show granted resources for running jobs
- GE-5343 `qstat -xml` with and without `-j` shows different values for `JB_priority`
- GE-5353 `qacct` gets broken when accounting line is too long
- GE-5375 `qselect` option `-si` is broken
- GE-5376 `sgeexecd` stop fails on Solaris with running jobs
- GE-5166 enhancements to tag resources that get available through preemption (`preemptable-resources`)
- GE-5175 Client side of manual preemption
- GE-5219 ability to change Posix priority and job share against JC access specifiers
- GE-5288 inconsistent/wrong OS support matrices in UGE documentation set
- GE-5322 Improve performance of DRMAA2 list implementation
- GE-5323 DRMAA2 C job template methods needs to be renamed to `jtemplate`

#### Univa Grid Engine 8.3.0 beta2

- GE-3295 Too many users in a group causes GE commands to fail
- GE-3778 reservation could not be enabled in certain cases.
- GE-5245 Reservation is made way too far in the future.
- GE-5324 `dbwriter` creates additional entry in `sge_job` for array jobs
- GE-5383 limit enforcement in the `execd` is broken
- GE-5396 Due to changes of limit calculation `qalter -when` now is broken
- GE-5405 submitting or modifying parallel jobs with `'-mbind nlocal'` but

- without '-masterl m\_mem\_free' is broken
- GE-5406 scheduling of parallel jobs that request different architectures for master and slave tasks is broken
- GE-5410 Reservation in UGE scheduler fails when available resources are reported by a loadsens
- GE-5413 qstat crashes, when /etc/groups entry exceeds a certain length
- GE-5419 manual preemption is not triggered although requested
- GE-5420 UGE scheduler does not reserve resources for the preemptor that are freed due to preemption
- GE-5424 Now-reservation causes qstat -j to print incorrect end time of a job
- GE-5425 default preemption action missing when not specified with qmod -p
- GE-5426 multi line preemption\_msg is not indented
- GE-5431 Exit status 4294967295 in acct records in reporting file
- GE-5432 UGE jobs might stuck in pending state when it requested reservation and when licenses are managed with LO.
- GE-5435 qalter -clears l\_hard does not support complex attribute shortcuts
- GE-5447 soft range algorithm might add granted resources to pe slave jobs running on hosts where the consumable is not available
- GE-5459 qmaster crashes if -l or -masterl requests of a running job are altered
- GE-5461 job limit enforcement uses wrong values if -masterl is specified
- GE-5463 usage value wallclock time is wrongly multiplied by the number of slots a parallel job reserves on the execution host
- GE-5466 qconf -Matr fails although the request is valid
- GE-5467 execd crashes from time to time when executing a new job

## Univa Grid Engine 8.3.0rc1

- GE-5354 shepherd creates panic file because it does not get the current working directory
- GE-5394 qmod -p should print out warnings if preemption is not configured properly
- GE-5397 execd crashes on modification of running job
- GE-5460 Implement a policy to limit permission for altering resource requests.
- GE-5468 'qlogin -N name' using ssh causes shepherd to continuously log POLLHUP messages
- GE-5474 if consumables are specified in '-masterl' request, load\_thresholds are not obeyed
- GE-5477 qquota prints incorrect usage (slots=11844674407370)
- GE-5485 upgrade procedure fails upgrading exechost objects
- GE-5490 parallel jobs requesting a consumable resource are not scheduled when capacity / request > 1
- GE-5494 add a means to indent debug trace output depending on the call tree level
- GE-5499 client job spools unexpectedly removed while execd\_params KEEP\_ACTIVE=true is set
- GE-5500 sgeexecd startup script may hang on shutdown (stop call)
- GE-5512 sgemaster -shadowd start/stop might not work because of hostname matching problem

## Univa Grid Engine 8.3.0rc2

- GE-5453 add section to users guide that explains how to use preemption
- GE-5456 multiple intermediate accounting records are written between 00:00 and 00:10 per job
- GE-5506 on native Windows, qacct crashes immediately
- GE-5507 on native Windows, qquota dumps an assertion if a job is running a an RQS is defined
- GE-5514 setting gdi\_request\_limits to NONE is ignored by master when some limits where previous
- GE-5516 SSOS functionality broken



## Univa Grid Engine 8.3.1beta1

- GE-3989 add execution host and start time to qstat -j output of jobs
- GE-4218 scheduler profiling can not be switched off, it just is kind of disabled, logging does not stop
- GE-4488 interactive job with ssh setup (not the builtin method) does not handle SIGHUP signal
- GE-4745 Extra ^H characters in trace file causes problems with email from epilog scripts
- GE-4757 Specifying -t 2-2 with -sync leads to a hang in qsub
- GE-4861 qsh and old interactive job support change owner of /dev/null on execution host
- GE-4862 job doing a self reschedule using qmod -rj <own\_job\_id> are not rescheduled
- GE-5060 print out the IP address for not resolvable hosts
- GE-5107 resource quotas are running out of sync, limits are overcommitted
- GE-5131 all array job tasks get same tickets in functional, sharetree (and override) policy
- GE-5294 enhanced observation of processes and their used group id in the PDC module
- GE-5414 Reconnection of execd to qmaster takes for ever.
- GE-5438 qrsh does not show the LD\_LIBRARY\_PATH removal message
- GE-5484 GE-5465 deny the combination of m\_mem\_free soft request and -mbind
- GE-5517 UGE 8.3.0 cannot submit jobs to LO prior to 1.1
- GE-5518 decreasing of m\_mem\_free in combination with mbind is broken
- GE-5520 Support for Linux 4.x Kernels
- GE-5522 execd updates wallclock usage of running jobs far too often
- GE-5523 jobs with h\_rt=INFINITY get killed immediately after start because they exceeded h\_rt
- GE-5525 building fails on Windows (win-x86) if a directory defined in aimk.site.bat is not located on the current drive
- GE-5526 array tasks are not sorted by priority in qstat output
- GE-5527 bdb spooling error: error deleting record with key CONFIG:<HOSTNAME>
- GE-5532 Queue instances lost after qmaster restart
- GE-5534 qalter h\_rt can not be altered in combination with exclusive flag
- GE-5538 qstat shows pending job priority only after 2 scheduling runs
- GE-5544 DRMAA2 C lib crashed when processing jobs in hold state
- GE-5549 maxpss and maxrss values falling down to current pss and rss value
- GE-5551 do basic integration of docker into UGE using load sensor and starter\_method

## Univa Grid Engine 8.3.1

- GE-5591 qsh jobs hang at start on OpenIndiana
- GE-5572 qmaster crashes when qalter -when now is used

Univa Grid Engine 8.3.1p1

GE-5597 with accounting\_summary=true, "wallclock" usage of PE jobs is wrong  
GE-5639 gid range observation not always un-blocking additional group ids  
GE-5647 qconf -mu, -au, -du triggers crashes when RQS'es are configured  
GE-5653 ulx-amd64 packages seem not to be built with HWLOC library

Univa Grid Engine 8.3.1p2

GE-5638 Windows (win-x86) does not forward or collect the job exit code  
GE-5643 qalter -when now does not work for PE jobs with exclusive consumables  
GE-5654 execd crashes on win-x86 when sending a job related admin mail  
GE-5663 setting host to unheard might block qmaster under certain conditions

Univa Grid Engine 8.3.1p3

GE-5655 Qmaster gets unresponsive after error 'invalid task number 0'  
GE-5664 array jobs can oversubscribe consumables with qalter -when now  
GE-5673 job lost detection is logging strange error regarding granted resource list  
GE-5674 qmaster crash can be trigger with qconf -mattr on an execd object

Univa Grid Engine 8.3.1p4

GE-5718 lothread needs to send reservation information to License Orchestrator

Univa Grid Engine 8.3.1p5

GE-5722 preempted L0 job stays in "dr" state after qdel  
GE-5723 qalter -p not transfered to L0

Univa Grid Engine 8.3.1p6

GE-5703 non-admin user cannot trigger preemption of own jobs  
GE-5728 suspend/unsuspend endless loop for Preemption of jobs with the same priority  
GE-5731 qmod -p is only allowed on admin-hosts  
GE-5732 User should get a warning when preempting a higher prio job

## 4 Upgrade Notes

### 4.1 Upgrade Requirements

This is a summary of the Upgrade Matrix that describes how you can carry out the transition from Sun or Oracle Grid Engine 6.2uX, Univa Grid Engine 8.0.X, 8.1.X, 8.2.X to Univa Grid Engine 8.3 when you are currently using classic, BDB local spooling or PostgreSQL spooling. If the current version of Grid Engine you are using is missing in the overview, then please look at the full Upgrade Matrix located in the section Updating Univa Grid Engine in the Installation Guide.

Version	Upgrade Method
Univa Grid Engine 8.2.X	Backup/Restore
Univa Grid Engine 8.1.X	Backup/Restore
Univa Grid Engine 8.0.X	Backup/Restore
Oracle Grid Engine 6.2u6-6.2u8	Backup/Restore
Sun Grid Engine 6.2u5	Backup/Restore
Sun Grid Engine 6.2u1-6.2u4	Upgrade to SGE 6.2u5 and then Backup/Restore
Sun Grid Engine 6.2 FCS	Upgrade to SGE 6.2u5 and then Backup/Restore

Table 2: Upgrading from SGE, OGE, UGE 8.1.X, UGE 8.2.X to Univa Grid Engine 8.3.X

## 4.2 Upgrade Procedure

When you upgrade from a previous version of Univa Grid Engine to Univa Grid Engine 8.3.0 then the upgrade procedure will automatically adjust the existing complex configuration of the cluster. An additional attribute will be added to each complex. The attribute is named *aapre* (available after preemption) and it specifies that a resource bound by a job will be automatically reported as available within the Univa Grid Engine system when the corresponding job gets preempted.

As default after an upgrade the *aapre* attribute will be set to *YES* for all consumable resources that exist in the cluster. If you do not want such resources to be reported as available when a job is preempted then you can change this value to *NO* after the upgrade process.

Please note that the *aapre* value for the slots complex has always to be set to *YES* whereas all non-consumables can only have the value *NO*.

Find more information concerning complexes in the man page `complex(5)` or in the Univa Grid Engine administration guide.

## 5 Compatibility Notes

### 5.1 Reporting of Job Wallclock Time

For every job, wallclock time is reported as online usage and in accounting and reporting. Wallclock time is the time a job is *running*, time periods during which a job was suspended are excluded from wallclock time reporting.

This obsoletes the following attributes of the `execd_params` in the cluster configuration (see man page `sge_conf.5`):

- *ACCT\_RESERVED\_USAGE*
- *SHARETREE\_RESERVED\_USAGE*
- *ENABLE\_REAL\_CP*
- *ENABLE\_REAL\_MEM*

The `usage_weight_list` configured in the scheduler configuration (see man page `sched_conf.5`) has been extended by the attribute `wallclock`. The setting of `SHARETREE_RESERVED_USAGE` is replaced by adding `wallclock=1` to the `usage_weight_list`.

*PLEASE NOTE:* In Univa Grid Engine 8.3.0 and Univa Grid Engine 8.3.1, the calculation of the `wallclock` time usage is broken for parallel jobs running in a parallel environment that use the `accounting_summary` feature!

### 5.2 Reporting of Resource Capacities and Resource Quota

With the addition of manual job preemption an additional state of resources has been added: When a job gets preempted the resources which will get preempted will first enter a state “free but still bound”. They will stay in the state “free but still bound” until the job is actually preempted (`sge_execd` acknowledged receipt of the corresponding suspend signal).

The output of commands printing resource capacities show such “free but still bound” resources:

### 5.2.1 qstat -F / qhost -F

Example: A sequential job requests 100M of a memory resource having a capacity of 1G and consumes 1 of 10 job slots.

qstat -F shows:

```

gc:mem_pre=924.000M
qc:slots=9
3000000003 0.55476 sleep      joga      r      04/02/2015 11:07:53      1

```

When the job gets preempted, the preemptable resources will show up as free but still bound for a short time:

```

gc:mem_pre=924.000M+100.000M
qc:slots=9+1
3000000003 0.55476 sleep      joga      P      04/02/2015 11:07:53      1

```

Once the preemption action has been finished, the resources will be reported as free:

```

gc:mem_pre=1.000G
qc:slots=10
3000000003 0.55476 sleep      joga      P      04/02/2015 11:07:53      1

```

### 5.2.2 qquota

Example: We have a resource quota set on slots:

```

{
  name      slots
  description NONE
  enabled   TRUE
  limit     to slots=5
}

```

When a sequential job is running it consumes 1 slot, qquota output shows:

```

resource quota rule limit      filter
-----
slots/1          slots=1/5      -

```

When the job gets preempted, qquota shows that one slot less is booked from the resource quota (but not yet fully free):

```

resource quota rule limit      filter
-----
slots/1          slots=1-1/5    -

```

### 5.2.3 `qconf -sp`

`qconf -sp` shows two additional lines, “used slots” and “bound slots”.

Example: A parallel environment “test.pe” provides 5 slots, `qconf -sp test.pe` shows:

```
pe_name          test.pe
slots            5
used_slots       0
bound_slots      0
...
```

A 4 times parallel job changes the output to:

```
...
used_slots       4
bound_slots      0
...
```

When the job gets preempted the 4 slots consumed by the job will show up as `bound_slots` for a short time period:

```
...
used_slots       4
bound_slots      4
...
```

Once the preemption action has finished no slots of the PE will be reported as in use:

```
...
used_slots       0
bound_slots      0
...
```

## 6 Known Issues and Limitations

Following list shows the known limitations of the “-masterl” switch in Univa Grid Engine 8.3.1p1:

- GE-5380 If a resource is requested both in "-soft -l resource=value1" and "-masterl resource=value2", the soft request is ignored.
  
- GE-5381 qmaster doesn't enforce -masterl limits  
  
If enforcing limits by the QMaster is enabled using the "qmaster\_params ENABLE\_ENFORCE\_MASTER\_LIMIT=true" configuration value, the QMaster still does not enforce limits defined by the "-masterl" switch.
  
- GE-5382 backfilling doesn't work properly for jobs that use the -masterl switch
  
- GE-5384 Resource Quota Sets (RQS) do not take the limits requested by the "-masterl" switch into account
  
- GE-5385 advance reservation does not take -masterl requests into account
  
- GE-5348 The "-masterl" switch cannot be used in combination with the Univa License Orchestrator
  
- GE-5386 qmon does not support the -masterl switch