Contents

1 License 1

2 Supported Operating Systems, Versions and Architectures 6

3 Supported and tested Docker versions 7
   3.1 Known Docker issues that affect Univa Grid Engine ..... 10

4 Fixes and Enhancements 11
   4.1 Summary ......................................................... 11
      4.1.1 8.5.5: Security fixes and enhancements ....................... 11
      4.1.2 8.5.5: Changed resulting “failed” job states in the accounting .... 11
      4.1.3 8.5.0: Logging specific changes ................................ 11
      4.1.4 8.5.1: Changed limit calculation ............................... 12
      4.1.5 8.5.1: Improved rescheduling behaviour ........................ 12
      4.1.6 8.5.1: Possibility to reduce qhost data request sizes at sge_qmaster ... 12
      4.1.7 8.5.1: New environment variables in the job environment ........... 12
      4.1.8 8.5.1: New example script for jsv and core-binding ............... 13
      4.1.9 8.5.1: sgepasswd renewal ..................................... 13
      4.1.10 Performance Improvements and Memory Requirements ............... 14
      4.1.11 Standing Reservations ...................................... 14
      4.1.12 Policy Scheme: Consider Slots Instead of Jobs .................. 14
      4.1.13 RSMAP Enhancements ........................................ 15
      4.1.14 Improved Scheduler Profiling .................................. 16
      4.1.15 Improved Logging ............................................ 16
      4.1.16 Encryption in CSP mode / sgepasswd ............................ 16
      4.1.17 Online usage of running Windows jobs ........................ 16
      4.1.18 Docker Related Enhancements ................................ 18
      4.1.19 Host Aliasing and Resolving .................................. 19
      4.1.20 Intel® Xeon Phi™ x200 (Knights Landing) integration ............ 20
   4.2 Full List of Fixes and Enhancements ............................. 21
      4.2.1 Univa Grid Engine 8.5.0alpha1 (also fixed for a 8.3 or 8.4 patch release) . 21
      4.2.2 Univa Grid Engine 8.5.0alpha1 (also fixed for a 8.4 patch release) .......... 24
## Contents

4.2.3 Univa Grid Engine 8.5.0alpha1 ............................................ 27  
4.2.4 Univa Grid Engine 8.5.0alpha2 ............................................ 29  
4.2.5 Univa Grid Engine 8.5.0beta1 ............................................. 30  
4.2.6 Univa Grid Engine 8.5.0 FCS ................................................. 31  
4.2.7 Univa Grid Engine 8.5.1 ..................................................... 31  
4.2.8 Univa Grid Engine 8.5.2 ..................................................... 33  
4.2.9 Univa Grid Engine 8.5.3 ..................................................... 33  
4.2.10 Univa Grid Engine 8.5.4 .................................................... 34  
4.2.11 Univa Grid Engine 8.5.5 .................................................... 35  

5 Upgrade Notes ................................................................. 36  
5.1 Upgrade Requirements ....................................................... 36  

6 Compatibility Notes .......................................................... 37  
6.1 Changes in Output Format of Commands ................................. 37  
6.2 Changes in Windows execution host sgepasswd file ................. 38  
6.3 Deprecated Functionality ................................................... 39  

7 Known Issues and Limitations .............................................. 40  
7.1 setting halftime to -1 (GE-6497) not supported in qmon .......... 40  
7.2 NOTE: Disabled SYSTEMD support ........................................ 40
1 License

TERM SOFTWARE LICENSE AND SUPPORT AGREEMENT

This agreement is between the individual or entity agreeing to this agreement and Univa Corporation, a Delaware corporation (Univa) with its registered office at 2300 N Barrington Road, Suite 400, Hoffman Estates, IL 60195.

1. SCOPE: This agreement governs the licensing of the Univa Software and Support provided to Customer.
   - Univa Software is defined as the Univa software described in the order, all updates and enhancements provided under Support, its software documentation, and license keys (Univa Software), which are licensed under this agreement. This Univa Software is only licensed and is not sold to Company.
   - Third-Party Software/Open Source Software licensing terms are addressed on the bottom of this agreement.

2. LICENSE. Subject to the other terms of this agreement, Univa grants Customer, under an order, a non-exclusive, non-transferable, renewable term license up to the license capacity purchased to:
   (a) Operate the Univa Software in Customer’s business operations and
   (b) Make a reasonable number of copies of the Univa Software for archival and backup purposes.

Customer’s contractors and majority owned affiliates are allowed to use and access the Univa Software under the terms of this agreement. Customer is responsible for their compliance under the terms of this agreement.

The initial term of this license is for a period of one year from date hereof to be automatically renewed at each anniversary unless a written notification of termination has been received 60 days prior to each anniversary.

3. RESTRICTIONS. Univa reserves all rights not expressly granted. Customer is prohibited from:
   (a) assigning, sublicensing, or renting the Univa Software or using it as any type of software service provider or outsourcing environment or
   (b) causing or permitting the reverse engineering (except to the extent expressly permitted by applicable law despite this limitation), decompiling, disassembly, modification, translation, attempting to discover the source code of the Univa Software or to create derivative works from the Univa Software.

4. PROPRIETARY RIGHTS AND CONFIDENTIALITY.
   (a) Proprietary Rights. The Univa Software, workflow processes, designs, know-how and other technologies provided by Univa as part of the Univa Software are the proprietary property of Univa and its licensors, and all rights, title and interest in and to such items, including all associated intellectual property rights, remain only with Univa.
The Univa Software is protected by applicable copyright, trade secret, and other intellectual property laws. Customer may not remove any product identification, copyright, trademark or other notice from the Univa Software.

(b) Confidentiality. Recipient may not disclose Confidential Information of Discloser to any third party or use the Confidential Information in violation of this agreement.

(c) Confidential Information means all proprietary or confidential information that is disclosed to the recipient (Recipient) by the discloser (Discloser), and includes, among other things:
   • any and all information relating to Univa Software or Support provided by a Discloser, its financial information, software code, flow charts, techniques, specifications, development and marketing plans, strategies, and forecasts
   • as to Univa the Univa Software and the terms of this agreement (including without limitation, pricing information).

(ii) Confidential Information excludes information that:
   • was rightfully in Recipient’s possession without any obligation of confidentiality before receipt from the Discloser
   • is or becomes a matter of public knowledge through no fault of Recipient
   • is rightfully received by Recipient from a third party without violation of a duty of confidentiality
   • is independently developed by or for Recipient without use or access to the Confidential Information or
   • is licensed under an open source license.

Customer acknowledges that any misuse or threatened misuse of the Univa Software may cause immediate irreparable harm to Univa for which there is no adequate remedy at law. Univa may seek immediate injunctive relief in such event.

5. PAYMENT. Customer will pay all fees due under an order within 30 days of the invoice date, plus applicable sales, use and other similar taxes.

6. WARRANTY DISCLAIMER. UNIVA DISCLAIMS ALL EXPRESS AND IMPLIED WARRANTIES, INCLUDING WITHOUT LIMITATION THE IMPLIED WARRANTY OF TITLE, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE UNIVA SOFTWARE MAY NOT BE ERROR FREE, AND USE MAY BE INTERRUPTED.

7. TERMINATION. Either party may terminate this agreement upon a material breach of the other party after a 30 day notice/cure period, if the breach is not cured during such time period. Upon termination of this agreement or expiration of an order, Customer must discontinue using the Univa Software, de-install it and destroy or return the Univa Software and all copies, within 5 days. Upon Univa’s request, Customer will provide written certification of such compliance.

8. SUPPORT INCLUDED. Univa’s technical support and maintenance services (Support) is included with the fees paid under an order. Univa may change its Support terms, but Support will not materially degrade during any paid term. More details on Support are located at www.univa.com/support
9. LIMITATION OF LIABILITY AND DISCLAIMER OF DAMAGES. There may be situations in which, as a result of material breach or other liability, Customer is entitled to make a claim for damages against Univa. In each situation (regardless of the form of the legal action (e.g. contract or tort claims)), Univa is not responsible beyond:

(a) the amount of any direct damages up to the amount paid by Customer to Univa in the prior 12 months under this agreement and

(b) damages for bodily injury (including death), and physical damage to tangible property, to the extent caused by the gross negligence or willful misconduct of Univa employees while at Customer’s facility.

Other than for breach of the Confidentiality section by a party, the infringement indemnity, violation of Univa’s intellectual property rights by Customer, or for breach of Section 2 by Customer, in no circumstances is either party responsible for any (even if it knows of the possibility of such damage or loss):

(a) loss of (including any loss of use), or damage to: data, information or hardware

(b) loss of profits, business, or goodwill or

(c) other special, consequential, or indirect damages

10. INTELLECTUAL PROPERTY INDEMNITY. If a third-party claims that Customer’s use of the Univa Software under the terms of this agreement infringes that party’s patent, copyright or other proprietary right, Univa will defend Customer against that claim at Univa’s expense and pay all costs, damages, and attorney’s fees, that a court finally awards or that are included in a settlement approved by Univa, provided that Customer:

(a) promptly notifies Univa in writing of the claim and

(b) allows Univa to control, and cooperates with Univa in, the defense and any related settlement.

If such a claim is made, Univa could continue to enable Customer to use the Univa Software or to modify it. If Univa determines that these alternatives are not reasonably available, Univa may terminate the license to the Univa Software and refund any unused fees. Univa’s obligations above do not apply if the infringement claim is based on the use of the Univa Software in combination with products not supplied or approved by Univa in writing or in the Univa Software, or Customer’s failure to use any updates within a reasonable time after such updates are made available.

This section contains Customer’s exclusive remedies and Univa sole liability for infringement claims.

11. GOVERNING LAW AND EXCLUSIVE FORUM. This agreement is governed by the laws of the State of Illinois, without regard to conflict of law principles. Any dispute arising out of or related to this agreement may only be brought in the state of Illinois. Customer consents to the personal jurisdiction of such courts and waives any claim that it is an inconvenient forum. The prevailing party in litigation is entitled to recover its attorney’s fees and costs from the other party.

12. MISCELLANEOUS.
(a) Inspection. Univa, or its representative, may audit Customer’s usage of the Univa Software at any Customer facility. Customer will cooperate with such audit. Customer agrees to pay within 30 days of written notification any fees applicable to Customer’s use of the Univa Software in excess of the license.

(b) Entire Agreement. This agreement, and all orders, constitute the entire agreement between the parties, and supersedes all prior or contemporaneous negotiations, representations or agreements, whether oral or written, related to this subject matter.

(c) Modification Only in Writing. No modification or waiver of any term of this agreement is effective unless signed by both parties.

(d) Non-Assignment. Neither party may assign or transfer this agreement to a third party, except that the agreement and all orders may be assigned upon notice as part of a merger, or sale of all or substantially all of the business or assets, of a party.

(e) Export Compliance. Customer must comply with all applicable export control laws of the United States, foreign jurisdictions and other applicable laws and regulations.

(f) US Government Restricted Rights. The Univa Software is provided with RESTRICTED RIGHTS. Use, duplication, or disclosure by the U.S. government or any agency thereof is subject to restrictions as set forth in subparagraph (c)(1)(ii) of the Rights in Technical Data and Computer Software clause at DFARS 252.227-7013 or subparagraphs (c)(1) and (2) of the Commercial Computer Software Restricted Rights at 48 C.F.R. 52.227-19, as applicable.

(g) Independent Contractors. The parties are independent contractors with respect to each other.

(h) Enforceability. If any term of this agreement is invalid or unenforceable, the other terms remain in effect.

(i) No PO Terms. Univa rejects additional or conflicting terms of a Customer’s form-purchasing document.


(k) Survival. All terms that by their nature survive termination or expiration of this agreement, will survive.

Additional software specific licensing terms:

Grid Engine incorporates certain third-party software listed at the URL below. These licenses are accepted by use of the software and may represent license grants with restrictions in which Univa is bound to provide. We are hereby notifying you of these licenses.

Unicloud Kits

- Third Party Software is defined as certain third-party software which is provided along with the Univa Software, and such software is licensed under the license terms located at: http://www.univa.com/resources/licenses/

- Open Source Software is defined as certain opens source software which is provided along with the Univa Software, and such software is licensed under the license terms located at: http://www.univa.com/resources/licenses/
Grid Engine

- Third Party Software is defined as certain third-party software which is provided along with the Univa Software, and such software is licensed under the license terms located at: http://www.univa.com/resources/licenses/

- Open Source Software is defined as certain opens source software which is provided along with the Univa Software, and such software is licensed under the license terms located at: http://www.univa.com/resources/licenses/

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:

<table>
<thead>
<tr>
<th>Operating System</th>
<th>Version</th>
<th>Architecture</th>
</tr>
</thead>
<tbody>
<tr>
<td>SLES</td>
<td>10, 11, 12</td>
<td>x86, x86-64</td>
</tr>
<tr>
<td>RHEL</td>
<td>5 or higher, 6 or higher, 7</td>
<td>x86, x86-64</td>
</tr>
<tr>
<td>CentOS</td>
<td>5 or higher, 6 or higher, 7</td>
<td>x86, x86-64</td>
</tr>
<tr>
<td>Oracle Linux</td>
<td>5 or higher, 6 or higher, 7</td>
<td>x86, x86-64</td>
</tr>
<tr>
<td>Ubuntu</td>
<td>10.04 LTS - 16.04 LTS</td>
<td>x86, x86-64</td>
</tr>
<tr>
<td>Oracle Solaris</td>
<td>10, 11</td>
<td>x86_64,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SPARC 64bit</td>
</tr>
<tr>
<td>HP-UX</td>
<td>11.0 or higher</td>
<td>64bit</td>
</tr>
<tr>
<td>IBM AIX</td>
<td>6.1 or later</td>
<td>64bit</td>
</tr>
<tr>
<td>Apple OS X</td>
<td>10.8 (Mountain Lion) or higher</td>
<td>x86, x86-64</td>
</tr>
<tr>
<td>Microsoft Windows</td>
<td>XP Professional (SP3)</td>
<td>32 bit</td>
</tr>
<tr>
<td>Microsoft Windows</td>
<td>Server 2003 / 2003 R2</td>
<td>32 bit</td>
</tr>
<tr>
<td>Microsoft Windows</td>
<td>Vista Enterprise / Ultimate</td>
<td>32 and 64bit</td>
</tr>
<tr>
<td>Microsoft Windows</td>
<td>Server 2008 / 2008 R2</td>
<td>32 and 64bit</td>
</tr>
<tr>
<td>Microsoft Windows</td>
<td>7 Professional / Enterprise / Ultimate</td>
<td>32 and 64bit</td>
</tr>
<tr>
<td>Microsoft Windows</td>
<td>Server 2012 / 2012 R2</td>
<td>32 and 64bit</td>
</tr>
<tr>
<td>Microsoft Windows</td>
<td>8 / 8.1 Pro / Enterprise</td>
<td>32 and 64bit</td>
</tr>
<tr>
<td>Microsoft Windows</td>
<td>10 Pro / Enterprise</td>
<td>32 and 64bit</td>
</tr>
</tbody>
</table>

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 Supported and tested Docker versions

In principle, Univa Grid Engine supports these Docker versions on these Linux distributions:

<table>
<thead>
<tr>
<th>Linux Distribution</th>
<th>Docker versions</th>
</tr>
</thead>
<tbody>
<tr>
<td>RedHat, CentOS, Debian and Ubuntu</td>
<td>1.12.0 to 1.13.0 and 17.03.0-ce to 17.12.0-ce</td>
</tr>
<tr>
<td>SLES and openSUSE</td>
<td>1.12.0 to 1.13.0 and 17.03.0-ce to 17.03.1-ce</td>
</tr>
</tbody>
</table>

But in the past there were not properly working Docker versions available that were withdrawn later and there were different Docker builds provided under the same version number showing a slightly different behaviour, so it is not possible to ensure Univa Grid Engine does work with all Docker versions between 1.12.0 and 17.12.0. The following table shows which Docker versions were tested on which Linux distribution. The table includes the “Git commit” ID of the Docker source code, the Go language version which was used to build Docker, the build date and - for completeness - the version of the Docker RemoteAPI. Other Docker versions either were not tested or are too broken to test successfully on them.

- Red Hat Enterprise Linux 7.4 (Maipo), Kernel 3.10.0-693.11.1.el7.x86_64

<table>
<thead>
<tr>
<th>Docker Version</th>
<th>Git commit</th>
<th>Go Version</th>
<th>Build date</th>
<th>API version</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.12.0</td>
<td>8eab29e</td>
<td>go1.6.3</td>
<td></td>
<td>1.24</td>
</tr>
<tr>
<td>1.12.1</td>
<td>23cf638</td>
<td>go1.6.3</td>
<td></td>
<td>1.24</td>
</tr>
<tr>
<td>1.12.2</td>
<td>bb80604</td>
<td>go1.6.3</td>
<td></td>
<td>1.24</td>
</tr>
<tr>
<td>1.12.3</td>
<td>6b644ec</td>
<td>go1.6.3</td>
<td></td>
<td>1.24</td>
</tr>
<tr>
<td>1.12.4</td>
<td>15640f2</td>
<td>go1.6.4</td>
<td>Mon Dec 12 23:41:49 2016</td>
<td>1.24</td>
</tr>
<tr>
<td>1.12.5</td>
<td>7392e3b</td>
<td>go1.6.4</td>
<td>Fri Dec 16 02:23:59 2016</td>
<td>1.24</td>
</tr>
<tr>
<td>1.12.6</td>
<td>78d1802</td>
<td>go1.6.4</td>
<td>Tue Jan 10 20:20:01 2017</td>
<td>1.24</td>
</tr>
<tr>
<td>1.13.0</td>
<td>49bf474</td>
<td>go1.7.3</td>
<td>Tue Jan 17 09:55:28 2017</td>
<td>1.25</td>
</tr>
<tr>
<td>17.03.0-ce</td>
<td>3a232e8</td>
<td>go1.7.5</td>
<td>Tue Feb 28 08:10:07 2017</td>
<td>1.26</td>
</tr>
<tr>
<td>17.03.1-ce</td>
<td>c6d412e</td>
<td>go1.7.5</td>
<td>Mon Mar 27 17:05:44 2017</td>
<td>1.27</td>
</tr>
<tr>
<td>17.03.2-ce</td>
<td>55c7e52</td>
<td>go1.7.5</td>
<td>Tue Jun 27 02:21:36 2017</td>
<td>1.27</td>
</tr>
<tr>
<td>17.06.2-ce</td>
<td>cec9b72</td>
<td>go1.8.3</td>
<td>Tue Sep 5 20:00:25 2017</td>
<td>1.30</td>
</tr>
<tr>
<td>17.07.0-ce</td>
<td>8784753</td>
<td>go1.8.3</td>
<td>Tue Aug 29 17:43:23 2017</td>
<td>1.31</td>
</tr>
<tr>
<td>17.09.0-ce</td>
<td>af6b6d4</td>
<td>go1.8.3</td>
<td>Tue Sep 26 22:42:49 2017</td>
<td>1.32</td>
</tr>
<tr>
<td>17.09.1-ce</td>
<td>19e2e6f</td>
<td>go1.8.3</td>
<td>Thu Dec 7 22:25:03 2017</td>
<td>1.32</td>
</tr>
</tbody>
</table>
### Supported and tested Docker versions

<table>
<thead>
<tr>
<th>Docker Version</th>
<th>Git commit</th>
<th>Go Version</th>
<th>Build date</th>
<th>API version</th>
</tr>
</thead>
<tbody>
<tr>
<td>17.12.0-ce</td>
<td>c97c6d6</td>
<td>go1.9.2</td>
<td>Wed Dec 27 20:12:46 2017</td>
<td>1.35</td>
</tr>
</tbody>
</table>

- CentOS 7, Kernel 3.10.0-693.2.2.el7_x86_64

<table>
<thead>
<tr>
<th>Docker Version</th>
<th>Git commit</th>
<th>Go Version</th>
<th>Build date</th>
<th>API version</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.12.0</td>
<td>8eab29e</td>
<td>go1.6.3</td>
<td>Thu Jul 28 22:11:10 2016</td>
<td>1.24</td>
</tr>
<tr>
<td>1.12.1</td>
<td>23cf638</td>
<td>go1.6.3</td>
<td>Thu Aug 18 05:33:38 2016</td>
<td>1.24</td>
</tr>
<tr>
<td>1.12.2</td>
<td>bb80604</td>
<td>go1.6.3</td>
<td>Tue Oct 11 18:29:41 2016</td>
<td>1.24</td>
</tr>
<tr>
<td>1.12.3</td>
<td>6b644ec</td>
<td>go1.6.3</td>
<td>Wed Oct 26 22:01:48 2016</td>
<td>1.24</td>
</tr>
<tr>
<td>1.12.4</td>
<td>15640f2</td>
<td>go1.6.4</td>
<td>Mon Dec 12 23:41:49 2016</td>
<td>1.24</td>
</tr>
<tr>
<td>1.12.5</td>
<td>7392e3b</td>
<td>go1.6.4</td>
<td>Fri Dec 16 02:23:59 2016</td>
<td>1.24</td>
</tr>
<tr>
<td>1.12.6</td>
<td>78d1802</td>
<td>go1.6.4</td>
<td>Tue Jan 10 20:20:01 2017</td>
<td>1.24</td>
</tr>
<tr>
<td>1.13.0</td>
<td>49bf474</td>
<td>go1.7.3</td>
<td>Tue Jan 17 09:55:28 2017</td>
<td>1.25</td>
</tr>
<tr>
<td>17.03.0-ce</td>
<td>3a232c8</td>
<td>go1.7.5</td>
<td>Tue Feb 28 08:10:07 2017</td>
<td>1.26</td>
</tr>
<tr>
<td>17.03.1-ce</td>
<td>c6d412e</td>
<td>go1.7.5</td>
<td>Mon Mar 27 17:05:44 2017</td>
<td>1.27</td>
</tr>
<tr>
<td>17.03.2-ce</td>
<td>f5ec1e2</td>
<td>go1.7.5</td>
<td>Tue Jun 27 02:21:36 2017</td>
<td>1.27</td>
</tr>
<tr>
<td>17.06.2-ce</td>
<td>cec0b72</td>
<td>go1.8.3</td>
<td>Tue Sep 5 20:00:25 2017</td>
<td>1.30</td>
</tr>
<tr>
<td>17.07.0-ce</td>
<td>8784753</td>
<td>go1.8.3</td>
<td>Tue Aug 29 17:43:23 2017</td>
<td>1.31</td>
</tr>
<tr>
<td>17.09.0-ce</td>
<td>afdb6d4</td>
<td>go1.8.3</td>
<td>Tue Sep 26 22:42:49 2017</td>
<td>1.32</td>
</tr>
<tr>
<td>17.09.1-ce</td>
<td>19e2ef6</td>
<td>go1.8.3</td>
<td>Thu Dec 7 22:25:03 2017</td>
<td>1.32</td>
</tr>
<tr>
<td>17.12.0-ce</td>
<td>c97c6d6</td>
<td>go1.9.2</td>
<td>Wed Dec 27 20:12:46 2017</td>
<td>1.35</td>
</tr>
</tbody>
</table>

- Ubuntu 16.04.3 LTS, Kernel 4.4.0-103-generic x86_64

<table>
<thead>
<tr>
<th>Docker Version</th>
<th>Git commit</th>
<th>Go Version</th>
<th>Build date</th>
<th>API version</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.12.0</td>
<td>8eab29e</td>
<td>go1.6.3</td>
<td>Thu Jul 28 22:11:10 2016</td>
<td>1.24</td>
</tr>
<tr>
<td>1.12.1</td>
<td>23cf638</td>
<td>go1.6.3</td>
<td>Thu Aug 18 05:33:38 2016</td>
<td>1.24</td>
</tr>
<tr>
<td>1.12.2</td>
<td>bb80604</td>
<td>go1.6.3</td>
<td>Tue Oct 11 18:29:41 2016</td>
<td>1.24</td>
</tr>
<tr>
<td>1.12.3</td>
<td>6b644ec</td>
<td>go1.6.3</td>
<td>Wed Oct 26 22:01:48 2016</td>
<td>1.24</td>
</tr>
<tr>
<td>1.12.4</td>
<td>15640f2</td>
<td>go1.6.4</td>
<td>Tue Dec 13 00:08:34 2016</td>
<td>1.24</td>
</tr>
<tr>
<td>1.12.5</td>
<td>7392e3b</td>
<td>go1.6.4</td>
<td>Fri Dec 16 02:42:17 2016</td>
<td>1.24</td>
</tr>
<tr>
<td>1.12.6</td>
<td>78d1802</td>
<td>go1.6.4</td>
<td>Tue Jan 10 20:38:45 2017</td>
<td>1.24</td>
</tr>
</tbody>
</table>
3 Supported and tested Docker versions

<table>
<thead>
<tr>
<th>Docker Version</th>
<th>Git commit</th>
<th>Go Version</th>
<th>Build date</th>
<th>API version</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.13.0</td>
<td>49bf474</td>
<td>go1.7.3</td>
<td>Tue Jan 17 09:58:26 2017</td>
<td>1.25</td>
</tr>
<tr>
<td>17.03.0-ce</td>
<td>3a232c8</td>
<td>go1.7.5</td>
<td>Tue Feb 28 08:01:32 2017</td>
<td>1.26</td>
</tr>
<tr>
<td>17.03.1-ce</td>
<td>c6d412e</td>
<td>go1.7.5</td>
<td>Mon Mar 27 17:14:09 2017</td>
<td>1.27</td>
</tr>
<tr>
<td>17.03.2-ce</td>
<td>f5ec1e2</td>
<td>go1.7.5</td>
<td>Tue Jun 27 03:55:14 2017</td>
<td>1.27</td>
</tr>
<tr>
<td>17.06.2-ce</td>
<td>cec0b72</td>
<td>go1.8.3</td>
<td>Tue Sep 5 19:59:11 2017</td>
<td>1.30</td>
</tr>
<tr>
<td>17.09.0-ce</td>
<td>afd6b6d4</td>
<td>go1.8.3</td>
<td>Tue Sep 26 22:40:56 2017</td>
<td>1.32</td>
</tr>
<tr>
<td>17.09.1-ce</td>
<td>19e2c6f6</td>
<td>go1.8.3</td>
<td>Thu Dec 7 22:23:00 2017</td>
<td>1.32</td>
</tr>
<tr>
<td>17.12.0-ce</td>
<td>c97c6d6</td>
<td>go1.9.2</td>
<td>Wed Dec 27 20:09:53 2017</td>
<td>1.35</td>
</tr>
</tbody>
</table>

• Ubuntu 16.10, Kernel 4.8.0-59-generic x86_64

<table>
<thead>
<tr>
<th>Docker Version</th>
<th>Git commit</th>
<th>Go Version</th>
<th>Build date</th>
<th>API version</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.13.0</td>
<td>49bf474</td>
<td>go1.7.3</td>
<td>Tue Jan 17 10:05:19 2017</td>
<td>1.25</td>
</tr>
<tr>
<td>17.03.0-ce</td>
<td>3a232c8</td>
<td>go1.7.5</td>
<td>Tue Feb 28 08:05:01 2017</td>
<td>1.26</td>
</tr>
<tr>
<td>17.03.1-ce</td>
<td>c6d412e</td>
<td>go1.7.5</td>
<td>Mon Mar 27 17:17:43 2017</td>
<td>1.27</td>
</tr>
<tr>
<td>17.03.2-ce</td>
<td>f5ec1e2</td>
<td>go1.7.5</td>
<td>Tue Jun 27 03:59:22 2017</td>
<td>1.27</td>
</tr>
</tbody>
</table>

• Ubuntu 17.04, Kernel 4.10.0-42-generic x86_64

<table>
<thead>
<tr>
<th>Docker Version</th>
<th>Git commit</th>
<th>Go Version</th>
<th>Build date</th>
<th>API version</th>
</tr>
</thead>
<tbody>
<tr>
<td>17.06.2-ce</td>
<td>cec0b72</td>
<td>go1.8.3</td>
<td>Tue Sep 5 19:57:44 2017</td>
<td>1.30</td>
</tr>
<tr>
<td>17.09.0-ce</td>
<td>afd6b6d4</td>
<td>go1.8.3</td>
<td>Tue Sep 26 22:41:24 2017</td>
<td>1.32</td>
</tr>
<tr>
<td>17.09.1-ce</td>
<td>19e2c6f6</td>
<td>go1.8.3</td>
<td>Thu Dec 7 22:23:07 2017</td>
<td>1.32</td>
</tr>
<tr>
<td>17.12.0-ce</td>
<td>c97c6d6</td>
<td>go1.9.2</td>
<td>Wed Dec 27 20:09:19 2017</td>
<td>1.35</td>
</tr>
</tbody>
</table>

• Ubuntu 17.10, Kernel 4.13.0-19-generic x86_64
3 Supported and tested Docker versions

<table>
<thead>
<tr>
<th>Docker Version</th>
<th>Git commit</th>
<th>Go Version</th>
<th>Build date</th>
<th>API version</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.12.0</td>
<td>8eab29e</td>
<td>go1.6.3</td>
<td></td>
<td>1.24</td>
</tr>
<tr>
<td>1.12.1</td>
<td>23cf638</td>
<td>go1.6.3</td>
<td></td>
<td>1.24</td>
</tr>
<tr>
<td>1.12.2</td>
<td>bb80604</td>
<td>go1.6.3</td>
<td></td>
<td>1.24</td>
</tr>
<tr>
<td>1.12.3</td>
<td>6b644ec</td>
<td>go1.6.3</td>
<td></td>
<td>1.24</td>
</tr>
<tr>
<td>1.12.4</td>
<td>1564f02</td>
<td>go1.6.4</td>
<td>Mon Dec 12 23:41:28 2016</td>
<td>1.24</td>
</tr>
<tr>
<td>1.12.5</td>
<td>7392c3b</td>
<td>go1.6.4</td>
<td>Fri Dec 16 02:24:38 2016</td>
<td>1.24</td>
</tr>
<tr>
<td>1.12.6</td>
<td>78d1802</td>
<td>go1.6.4</td>
<td>Tue Jan 10 20:20:13 2017</td>
<td>1.24</td>
</tr>
<tr>
<td>1.13.0</td>
<td>496f474</td>
<td>go1.7.3</td>
<td>Tue Jan 17 10:00:08 2017</td>
<td>1.25</td>
</tr>
<tr>
<td>17.03.0-ce</td>
<td>60ccb22</td>
<td>go1.7.5</td>
<td>Thu Feb 23 10:55:03 2017</td>
<td>1.26</td>
</tr>
<tr>
<td>17.03.1-ce</td>
<td>c6d412e</td>
<td>go1.7.5</td>
<td>Fri Mar 24 00:53:12 2017</td>
<td>1.27</td>
</tr>
</tbody>
</table>

3.1 Known Docker issues that affect Univa Grid Engine

- With Docker 17.09.0-ce and Docker 17.12.0-ce, specifying the `--oom-kill-disable` switch has no effect, neither using the `docker` command line client nor the `-xd "--oom-kill-disable"` switch of the Univa Grid Engine submit clients.
4 Fixes and Enhancements

4.1 Summary

4.1.1 8.5.5: Security fixes and enhancements

Univa Grid Engine contains security fixes GE-6972, GE-6973 and GE-6974. These fixes ensure that the vulnerabilities CVE-2012-0523 and CVE-2012-0208 which were reported for Oracle Gridengine are also fully integrated into Univa Grid Engine. The description of the vulnerabilities can be found at: https://nvd.nist.gov/

One result of this enhancements is a tighter filtering for unsave environment variables. A new qconf parameter was introduced that influences the filter behaviour (see also man sge_conf(5), parameter ENABLE_SUBMIT_LIB_ENV_PREFIX).

4.1.2 8.5.5: Changed resulting “failed” job states in the accounting

The enhancements done with GE-6983 and GE-6508 have an influence on to the Univa Grid Engine job accounting:

<table>
<thead>
<tr>
<th>Old failed state</th>
<th>New failed state</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>44</td>
<td>enforced by execd process if h_rt limit was hit</td>
</tr>
<tr>
<td>100</td>
<td>45</td>
<td>enforced by execd process if h_cpu limit was hit (see “Restrictions” below)</td>
</tr>
<tr>
<td>100</td>
<td>46</td>
<td>enforced by execd process if h_vmem limit was hit (see “Restrictions” below)</td>
</tr>
<tr>
<td>100</td>
<td>47</td>
<td>enforced by execd process if h_rss limit was hit (see “Restrictions” below)</td>
</tr>
<tr>
<td>37</td>
<td>48</td>
<td>forced job deletion (qdel -f)</td>
</tr>
</tbody>
</table>

Restrictions: The states 45-47 (h_cpu, h_vmem and h_rss limit reached) will only be set if the execd is configured to observe the limits. This can be configured by setting the ENFORCE_LIMITS execd parameter in the configuration to “EXECD”. All other settings or other limit related job termination (shell limit, cgroups) will not trigger this new failed states. In such cases the previous state 100 will be reported.

A list of all failed states can be found in the sge_diagnostics man page.

4.1.3 8.5.0: Logging specific changes

If there are temporary permission problems for the configured execd spool directory the sge_execd daemon tries to open a different file for logging messages in the spooling directory area. The filename should be “messages.” where nr is some unique increasing number. Once the execd is restarted the correct file name “messages” is used again.
4.1.4 8.5.1: Changed limit calculation

The limit calculation for jobs was improved for Univa Grid Engine 8.5.1 and changed compared to previous versions of Univa Grid Engine. The most important changes are:

- The configured consumable type (NO, YES, JOB, HOST) will not influence any resulting limit for tight integrated parallel jobs
- Previous Univa Grid Engine version calculated limits that were too high (depending on pe and consumable settings)
- This also affects the cgroups h_vmem observation

Univa Grid Engine versions prior to 8.5.1 had limit values that were set too high for limits like “h_vmem”. As a result jobs were not terminated although they exceeded one of their limits. The limit calculation is now corrected. A detailed overview of the limit observation and how it works is described in the sge_diagnostics(1) man page (JOB LIMITS).

ATTENTION: If you are updating to 8.5.1 from a previous version please verify the used limit requests of your jobs. It may be necessary to change the requested limit value. If the limit is set too low or adjusted to fit the old limit calculation, jobs which were running fine may fail after installing this version.

4.1.5 8.5.1: Improved rescheduling behaviour

The new execd_params parameter RESCHEDULE_ON_MISSING_EPILOG is introduced. The default value is true, which causes the old behaviour. If set to false, the job is not rescheduled and the queue not set to error state if the configured epilog script cannot be found. Instead, Univa Grid Engine behaves as if no epilog script was configured. This parameter also applies to the stop_proc_args scripts of a parallel environment (also called pe_stop script).

4.1.6 8.5.1: Possibility to reduce qhost data request sizes at sge_qmaster

By setting the environment variable SGE_GDI_REQUEST_REDUCE_LEVEL it is possible to reduce the amount of data transferred from sge_qmaster to qhost clients. A detailed description can be found in the qhost(1) man page (ENVIRONMENTAL VARIABLES).

4.1.7 8.5.1: New environment variables in the job environment

Univa Grid Engine sets two new environment variables in the environment of the job, the prolog, pe_start, pe_stop and epilog scripts:

SGE_RERUN_REQUESTED=<0|1|2>

A value of 0 means there was no -r y|n request on the submit command line of the job, 1 means -r y was requested and 2 means -r n was requested.

SGE_RERUN_JOB=<0|1>

A value of 1 means the job will be rescheduled on error. The value is determined from the SGE_RERUN_REQUESTED value and the configuration value rerun of the queue the job runs in.
Additionally, Univa Grid Engine sets this new environment variable in the environment of the `pe_stop` and `epilog` scripts:

SGE_JOB_EXIT_STATUS

This variable is set to the exit status of the job. This is the same value that is written to the accounting to the `exit_status` field.

### 4.1.8 8.5.1: New example script for jsv and core-binding

A new example script that demonstrates core-binding using JSV can be found at “$SGE_ROOT/util/resources/jsv/core_binding_jsv.sh”

### 4.1.9 8.5.1: sgepasswd renewal

The upgrade and installation scripts have been updated to ensure that CSP/sgepasswd key store is backed up and is restored correctly in a clone upgrade. If you are currently using CSP or sgepasswd you need to save your configuration as user root with:

```
# $SGE_ROOT/util/upgrade_modules/save_sge_config.sh <backupdir>
```

then replace the original script in your existing installation with the new Univa Grid Engine 8.5.1 one to also ensure backup of existing sgeCA infrastructure. Now an upgrade with `inst_sge -upd -csp` will restore your backed up key store. If you create new key store by creating a new sgeCA infrastructure you will have to reencrypt an existing sgepasswd file manually with the following command as root:

```
# $SGE_ROOT/bin/<sge_arch>/sgepasswd -n \
   /var/sgeCA/<old port number>/<old sge_cell>.backup/private/key.pem
```

The original sgepasswd file is stored as

```
# ls $SGE_ROOT/$SGE_CELL/common/sgepasswd.oldcert_backup
```

and the reencrypted file is available as

```
# ls $SGE_ROOT/$SGE_CELL/common/sgepasswd
```

Please do not repeat this process without first saving the original files otherwise you might lose your original information and need to recreate the sgepasswd file from scratch.

Please be aware that the encryption algorithm has changed in version 8.5.0. If you are upgrading from an older installation than 8.5.0 you have to first follow the steps under section: Changes in Windows execution host sgepasswd file
4.1.10 Performance Improvements and Memory Requirements

We invested quite some time to improve the performance of various Univa Grid Engine components and libraries.

As a consequence the following metrics of the cluster have been improved compared to Univa Grid Engine 8.4.4 versions of Univa Grid Engine:

- Submit rate (increased by 5-15% depending on the jobs types and requested functionality)
- Scheduling times (reduced by 5-30% depending on the used policies)
- Faster delivery of dispatched jobs to sge_execd esp. for interactive jobs
- Memory requirements for request handling (reduced by 5-10%) especially for read-only requests like qstat, qhost, ... (reduced by 5-30%)
- Processing and response time of requests send by execution hosts (certain requests will now be handled in parallel within qmaster)
- Processing of clients requests like qstat/qhost (which results in about 30% more requests that can be handled in the same amount of time with the same memory requirements)
- Job turnaround times

This improves the overall cluster throughput as well as interactions with the Univa Grid Engine cluster.

The speedup in your cluster depends on the details of the cluster setup and on the features of Univa Grid Engine that are enabled or disabled.

4.1.11 Standing Reservations

In Univa Grid Engine the Advance Reservation feature has been extended to allow for Standing Reservations.

A Standing Reservation is a recurring Advance Reservation. Start and end times of the individual Advance Reservations are specified via a calendar, additional command line options allow for the specification of the number of reservations at a time and the behaviour in case a reservation cannot be granted.

All options available for Advance Reservations such as resource requests are also available for Standing Reservations.

See User Guide -> Reservations for details.

4.1.12 Policy Scheme: Consider Slots Instead of Jobs

Univa Grid Engine provides a configuration option where the scheduler will consider the number of slots used by running jobs and by pending jobs when calculating users and projects contribution toward their sharing goals as defined by the share tree. That is, a parallel job using 4 slots will be considered equal in terms of resource usage to 4 serial jobs. The previous share tree algorithm did not take into account slot use which meant that if a mix of parallel and serial jobs were running or queued, the number of tickets granted to pending jobs did not result in the correct run-time sharing ratios and the share tree targets were not met. For example, if two projects “a”
and “b” are configured at the same level in the share tree with equal shares, the scheduler should try to schedule jobs so that the projects get equal usage. However, if project “a” has mostly parallel jobs, it will tend to get more usage because the previous share tree algorithm treats all jobs equally. In fact, with the old algorithm, if we look at the prioritized order of pending 4-slot jobs for project “a” and pending 1-slot jobs for project “b” for a share tree with no usage, we would see the pending jobs interleaved (a b a b a b a b ...). With the new algorithm, we would see the pending jobs ordered based on their slot usage (a b b b a b b b b ...), which is more likely to lead to the proper runtime sharing ratios.

The urgency_slots PE attribute will be used to determine the assumed number of slots used by a pending job with a slot range. See urgency_slots in the sge_pe(5) man page for additional information.

The old behavior (sharing based on jobs) can be configured by setting SHARE_BASED_ON_SLOTS=false (default) in the sched_conf(5) params attribute. The new behavior (sharing based on slots) can be configured by setting SHARE_BASED_ON_SLOTS=true in the sched_conf(5) params attribute. See the sched_conf(5) man page for more details.

```
$ qconf -msconf
...  
params SHARE_BASED_ON_SLOTS=true
...
```

Please note that beginning with version 8.6.0 of Univa Grid Engine the default for SHARE_BASED_ON_SLOTS will be changed from false to true.

### 4.1.13 RSMAP Enhancements

In Univa Grid Engine it is possible to request specific Ids of a Resource Map Complex (RSMAP) via command line with the syntax used for RESTRING (see complex(5) man page for details). The following example submits a job that requests four Ids of the complex “GPU”, three Ids with the name “gpu1” or “gpu2” and one Id with the name “gpu3”.

```
qsub -l GPU=3(gpu1|gpu2)&1(gpu3) $SGE_ROOT/examples/jobs/sleeper.sh 3600
```

Depending on the host configuration and the available Ids, one possible combination of assigned Ids for this job is `gpu1 gpu1 gpu2 gpu3`.

A job cannot be scheduled if the scheduler cannot find enough free Ids with the requested names, even if there are enough free Ids with different names available.

It is still possible to use the RSMAP complex without the syntax enhancements introduced in Univa Grid Engine. The scheduler will then behave like in previous versions and use any free id.

Please be aware that very complicated requests may slow down the scheduler.

To make the configuration of RSMAPs easier, a shortcut has been added.

The syntax is:

```
complex_values   complex_name=amount(complex_id:amount)
```
The following example defines a complex named “GPU” with ten available IDs, five with the name “gpu1” and five with the name “gpu2”:

```
qconf -me exechost1
...
complex_values GPU=10(gpu1:5 gpu2:5)
...
```

### 4.1.14 Improved Scheduler Profiling

In previous versions of Univa Grid Engine the scheduler profiling did not completely cover the scheduling main loop. This led to some wrong or missing profiling data. Univa Grid Engine has additional diagnostics to cover the main loop. Please read the updated `sge_diagnostics(1)` man page where the scheduler profiling is described in detail.

### 4.1.15 Improved Logging

The `sge_diagnostics(1)` man page was introduced to provide an overview on available logging and diagnostic options. The most important changes and new options are:

- show statistics about request types in worker and reader request queues (see “MONITOR_REQUEST_QUEUES”, man page “sge_conf(5)”)  
- log spooling exceeding a certain threshold (see “LOG_SPOOLING_TIME”, man page “sge_conf(5)”)  
- communication errors at first startup not logged into /tmp/execd_messages file  
- communication specific enhancements for profiling and startup behavior (see “PROF_COMMLIB_TIME”, man page “sge_conf(5)”)  
- log job verification time exceeding a certain threshold (see “LOG_JOB_VERIFICATION_TIME”, man page “sge_conf(5)”)  
- log request processing exceeding a certain threshold (see “LOG_REQUEST_PROCESSING_TIME”, man page “sge_conf(5)”)  

### 4.1.16 Encryption in CSP mode / sgepasswd

The encryption algorithm has been changed from RC4 to AES256_CBC. This affects CSP encryption and the encryption of the Windows `execd sgepasswd` file. There are no additional upgrade steps necessary for CSP mode and the steps for Windows are described below in section: Changes in Windows execution host sgepasswd file

### 4.1.17 Online usage of running Windows jobs

For Univa Grid Engine jobs running on Microsoft Windows, some usage values are now reported while the jobs are running. The usage values that are reported are: `wallclock, cpu, mem, io, ioops, vmem, maxvmem`  
The online usage value `iow` is not reported on Microsoft Windows.
Not all Windows usage values exactly match the corresponding UNIX usage values; this list shows what Windows system value is retrieved to report the corresponding usage value:
4 Fixes and Enhancements

<table>
<thead>
<tr>
<th>Online usage</th>
<th>Corresponding Windows system value</th>
</tr>
</thead>
<tbody>
<tr>
<td>wallclock</td>
<td>(current wallclock time - start wallclock time) of the job.</td>
</tr>
<tr>
<td>cpu</td>
<td>(kernel time + user time) of all processes in the job.</td>
</tr>
<tr>
<td>mem</td>
<td>integral of vmem over time.</td>
</tr>
<tr>
<td>io</td>
<td>(read bytes + write bytes + other bytes) of all processes in the job.</td>
</tr>
<tr>
<td>ioops</td>
<td>(read operations + write operations + other operations) of all processes in the job.</td>
</tr>
<tr>
<td>vmem</td>
<td>private usage of all processes in the job. The private usage is documented to be the “commit charge for this process”, which is nearly the same as the virtual memory of UNIX.</td>
</tr>
<tr>
<td>maxvmem</td>
<td>maximum of all measured vmem values of the whole job.</td>
</tr>
</tbody>
</table>

These online usage values are printed e.g. using the command:

```bash
> qstat -j <job_id>
```

Additionally, for finished jobs that ran on Microsoft Windows, these usage values are accounted:

`ru_wallclock, ru_utime, ru_stime, wallclock, cpu, mem, io, ioops, maxvmem`

<table>
<thead>
<tr>
<th>Accounting usage</th>
<th>Corresponding Windows system value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ru_wallclock</td>
<td>the wallclock of the whole job measured by Windows.</td>
</tr>
<tr>
<td>ru_utime</td>
<td>user time of the whole Windows Job object that contains all processes of the job.</td>
</tr>
<tr>
<td>ru_stime</td>
<td>kernel time of the whole Windows Job object that contains all processes of the job.</td>
</tr>
</tbody>
</table>

`wallclock, cpu, mem, io, ioops, maxvmem` are identical to the online usage values.

The accounting values for finished jobs are printed e.g. using the command:

```bash
> qacct -j <job_id>
```

4.1.18 Docker Related Enhancements

With Univa Grid Engine, variable placeholders are allowed in sub-options of the “-xd” option on the submit command line, sge_request files, job scripts, job classes and job submission verifier. These variable placeholders are resolved by corresponding elements of specific RSMAP complexes the Scheduler selects for the tasks of a job.

The format of these placeholders is:
where complex_name is the name of the corresponding RSMAP complex and index is the index of the element the scheduler selects from the RSMAP for this job, starting with 0.

E.g.: If a resource map defines these values on a host: gpu_map=4(0 1 2 3)
this qsub command line is used:

```bash
# qsub -l docker,docker_images="*some_image*",gpu_map=2
    -xd "--device=/dev/gpu$gpu_map(0):/dev/gpu0,
        --device=/dev/gpu$gpu_map(1):/dev/gpu1"
```

and the scheduler selects the elements “1” and “3” from the resource map, the command line is resolved to

```bash
# qsub -l docker,docker_images="*some_image*",gpu_map=2
    -xd "--device=/dev/gpu1:/dev/gpu0,
        --device=/dev/gpu3:/dev/gpu1"
```

which means the physical GPUs “gpu1” and “gpu3” are mapped to the virtual GPUs “gpu0” and “gpu1” inside the container and at the same time are exclusively reserved for the current job among all Univa Grid Engine jobs.

### 4.1.19 Host Aliasing and Resolving

Univa Grid Engine now better supports changes to the host_aliases file while Univa Grid Engine is running.

Periodically naming services like DNS or NIS may be updated which may result in changed hostnames, additionally administrators may update the host_aliases file. Both of these situations result in changes to the host name resolution in Univa Grid Engine. Univa Grid Engine has been enhanced to handle the following situations:

**Adding host_aliases while Univa Grid Engine is running:** Adding new entries to the host_aliases file is supported while Univa Grid Engine is running if the resulting name and none of the mapped hostnames is referenced in any Univa Grid Engine configuration. Host names that are changed or added which are referenced in any Univa Grid Engine configuration object will be ignored and a message will be logged in the qmaster messages file.

**Update of internal name resolution database on daemon startup:** At startup of the qmaster daemon any change of a hostname in the configuration will be detected and the name resolution database will be adjusted to reflect this change. If the name resolution change affects the execution daemon nodes they must be restarted by the Administrator.

**Additional Improvements:** Improved several places (e.g. plain hostnames used in regular expressions, hostnames reported by loadsensors) where hostnames are entering the system. This resulted in not scheduleable jobs and other problems in the past. The final Univa Grid Engine version will get an updated host_aliases man page and an updated admin guide (GE-6013).
4.1.20 Intel® Xeon Phi™ x200 (Knights Landing) integration

Univa Grid Engine provides an integration for Intel® Xeon Phi™ x200 (Knights Landing) Processors. The pre-compiled load-sensor automatically detects the current Cluster and also the current Memory Mode of the x200 machine. Furthermore, the current MCDRAM distribution gets reported.

Please see “Configure and Install Intel Xeon Phi x200 (Knights Landing) Processors support” in the AdminsGuideGE for details.
4.2 Full List of Fixes and Enhancements

4.2.1 Univa Grid Engine 8.5.0alpha1 (also fixed for a 8.3 or 8.4 patch release)

GE-2716 interactive jobs (qlogin, qrsh without command) don't set the TZ environment variable correctly
GE-3392 Job reservation with wildcards in PE names doesn't work correctly
GE-4229 Reduce executable sizes by removing extra symbols
GE-4288 Confusing message on h_rt or s_rt limit
GE-4296 the unit of the io usage value is missing in qstat -j <job_id> output and not explained in the man page
GE-4384 User lists do not handle space separated user names correctly
GE-4404 Rounding error, when memory values are reported by execd
GE-4641 jobs with high job_id may starve when job_id roll over happens when wait_time is not recognized in job priority calculation
GE-4739 print unique thread names in messages file
GE-4943 shepherd closes FDs, needed by AD authentication
GE-5033 setting ENABLE_SUBMIT_LIB_PATH in qmaster_params has no effect for LD_PRELOAD env variable
GE-5045 qlogin and qrsh without command does not inherit expected variables (e.g. TERM)
GE-5074 sessionusers ACL not present after installation
GE-5081 wrong reference to "MONITOR_TIME" in admin guide
GE-5156 Non-existing paths for input and error files should be implicitly created
GE-5289 add a note about the msvc redist dll to the installation guide
GE-5332 DRMAA2 job template needs to support a native specification replacement
GE-5340 hard coded timeout for PE ...._proc_args, prolog, epilog of 120 s not documented and changeable
GE-5401 h_vmem kill done by execd even when cgroups is setup to handle this limit
GE-5486 introduce per job profiling
GE-5487 introduce performance improvement for -masterq switch
GE-5536 requesting more than one tmpdir per job
GE-5557 Add functionality to search primary and secondary groups when '0' used to specify group in Grid Engine
GE-5587 allow the Cray XC load sensor to update the slots counter in the queue
GE-5588 communication errors at first startup not logged into /tmp/execd_messages.<pid> file
GE-5595 GetAdminUser() fails and is setting ADMINUSER to 'default'
GE-5597 with accounting_summary=true, "wallclock" usage of PE jobs is wrong
GE-5605 test and release qping.exe for win-x86
GE-5624 Unix group entries in predefined userlist as well as manager or operator list are ignored
GE-5625 CUDA and XEON PHI complex attribute installation fails
GE-5637 jsv task job related params are not transferred for 1 task arrays
GE-5638 Windows (win-x86) does not forward or collect the job exit code
GE-5639 gid range observation not always un-blocking additional group ids
GE-5641 user list man page should mention all predefined lists or list with a special meaning
GE-5643 qalter -when now does not work for PE jobs with exclusive consumables
GE-5647 qconf -mu, -au, -du triggers crashes when RQS'es are configured
GE-5649 add an automated TS test for the error scenario
GE-5653 ulx-amd64 packages seem not to be built with HWLOC library
GE-5654 execd crashes on win-x86 when sending a job related admin mail
GE-5655 Qmaster get unresponsive after error "invalid task number 0"
GE-5656 qconf -ke does not completely cleanup execd information
GE-5663 setting host to unheard might block qmaster under certain conditions
GE-5664 array jobs can oversubscribe consumables with qalter -when now
GE-5672 develop library to communicate with the Docker Remote API
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.
GE-5678 implement load sensor that reports docker version and available images
GE-5679 add a "-xdv" switch to the submit clients to allow the user to specify directories to mount into a Docker container
GE-5680 forward information about the selected Docker image and the paths to mount to the shepherd
GE-5682 use Docker API to get online usage of a job
GE-5684 cleanup finished Docker containers after job ended
GE-5685 implement a coshepherd that is started in a Docker container to keep it alive and to run methods and the job
GE-5687 use Docker Remote API to run methods and job and signal container
GE-5689 fix support for foreign filedescriptors in commlib
GE-5690 quota "limit" value rendered as -2^31 for large limits
GE-5693 fix container stats acquisition via docker communication library
GE-5694 Designation of events in logs - many events are labeled as 'Errors', where perhaps they should be 'Warnings'.
GE-5703 non-admin user cannot trigger preemption of own jobs
GE-5718 lothread needs to send reservation information to License Orchestrator
GE-5722 preempted LO job stays in "dr" state after qdel
GE-5723 qalter -p not transferred to LO
GE-5726 licence_constraints in UGE clusters are not updated
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
GE-5734 execd dumps core when a large tightly integrated parallel job is submitted to that host
GE-5737 for Docker jobs, adjust paths in environment variables set by the container_coshepherd
GE-5740 fix libnuma dependency of shepherd to allow starting the coshepherd in the container
GE-5741 rework container start mechanism in shepherd
GE-5745 Add a man page containing all kind of error codes
GE-5746 give the docker containers meaningful names
GE-5750  cleanup container creation struct
GE-5756  make the 'docker' and 'docker_images' complexes builtins
GE-5759  show statistics about request types in worker and reader request queues
GE-5760  add information about start and end (duration) of requests to the DEBUG log_level
GE-5763  improve per thread profiling
GE-5764  create a man page sge_diagnostics that summarizes and explains output of profiling/monitoring/logging/debug functionalities of UGE and L0
GE-5767  Add a means to limit the job script size
GE-5768  keep_active sends all files of a job regardless of the file size
GE-5770  add a means to switch on and off debug logging (DPRINTF) of sge_qmaster during runtime
GE-5775  improve logging in all Docker related components
GE-5779  improve error handling in communication with docker daemon
GE-5796  qmaster crashes with MONITOR_REQUEST_QUEUES=1
GE-5798  performance regression with RQS rules
GE-5803  enhance error logging of Windows (win-x86) qloadsensor.exe
GE-5807  enhance scheduler profiling to show information for RQS calculation
GE-5813  On Windows (win-x86), the execd cannot send the first CR to the loadsensor.exe, causing it to never send load
GE-5814  On Windows (win-x86), the execd logs a misleading warning about load sensors at startup time
GE-5816  commlib external file descriptor support not thread save
GE-5817  Docker jobs fail if the mount points of the binds are not unique
GE-5818  resource quota cleanup for profiling
GE-5825  improve qdel performance for bulk job deletions
GE-5829  Docker jobs fail to start on some Linuxes because MemorySwappiness cannot be set
GE-5845  possible race condition in event master at event client registration or total update
GE-5858  job_load_adjustments may prevent any job dispatching in scheduler run after parallel job was scheduled
GE-5860  communication specific enhancements for profiling and startup behavior
GE-5865  keep_active option does not copy all job related files into faulty job directory
GE-5870  confirm Windows 10 Pro/Enterprise support and add it to list of supported OS
GE-5876  where and what data structures are not used to prepare data for event clients
GE-5878  inplace upgrade with postgres spooling breaks the upgrade script (inst_sge -upd)
GE-5880  profiling shows zero value for utilization in some scheduler profiling lines
GE-5892  RQS limits with Job Classes do not work when max_reservation > 0
GE-5894  cluster queues are rejected due to missing project even if job has a project request
GE-5895  hosts or qinstances are skipped by dispatch algorithm in
Fixes and Enhancements

4 Fixes and Enhancements

GE-5902 a pe job requesting a per slot memory resource is not scheduled despite sufficient resources available

GE-5907 shepherd aborts after a tightly integrated job was killed

GE-5915 locale of qmaster process gets distorted by JVM_thread

GE-5925 wrong qdel message when a job is already in deletion

GE-5933 PE jobs with start/stop procedure or jobs with prolog/epilog requesting a pty change ownership of /dev/null to job user

GE-5978 performance regression when using DRMAA2 monitoring session

GE-5981 add memory usage values as extensions in DRMAA2 job info

GE-5993 qmaster segfaults when deleting jobs with non-existing L0 licenses

GE-6030 possibility to switch off commlib's internal hostname cache

GE-6031 on native Windows (win-x86), the shepherd of running jobs can produce huge trace files if the UGE job starter service ends the connection unexpectedly

GE-6097 log request processing exceeding a certain threshold

GE-6111 sge_qmaster crashes when deleting an advance reservation with a partially finished array job

GE-6152 log spoiling exceeding a certain threshold

GE-6172 jdrama2 openJobSession implementation is missing

GE-6174 qmaster crashes with: -->|C|!!!!!!!!!!!! QU_qname not found in element !!!!!!!!!!!!, host is removed from queue

GE-6176 qdel -f prints unexpected messages, e.g. debug information

GE-6221 sge_qmaster might crash with specific logging settings

GE-6230 Null DRMAA2 Native Specifications Fields Can Cause Segfaults

UWSA-164 advanced reservations does not contain the start time

UWSA-165 creation of an AR results in a wrong duration error

UWSA-175 support CUDA load_sensor values in resourceNumericValues

4.2.2 Univa Grid Engine 8.5.0alpha1 (also fixed for a 8.4 patch release)

GE-3146 resource reservation is broken with SGE calendar

GE-3227 AR shouldn't be scheduled to already disabled queues at time of submission

GE-4158 Some of the job class attributes are incorrect in man page and users guide

GE-4293 qsub -w e -l exclusive=true rejects job, even if the request is valid

GE-4425 SGE_LONG_QNAMES=-1 lead to qstat segfault

GE-4497 PE job is not scheduled when a non-requestable consumable is setup in global host

GE-4603 Job <jid> cannot run in PE <pe_name> because it only offers 0 slots

GE-4672 default_jc and enforce_jc are not documented in the man page

GE-4908 native Windows (win-x86) UGE binaries can't find the SGE_ROOT directory if it is the root directory of a share

GE-5129 regular "ckpt_command" in CKPT interface not executed
GE-5135 user has to login at least one time on each native Windows (win-x86) exec host to get the PROFILE created
GE-5345 UGE to auto resolve host_aliases
GE-5492 cuda loadsensor bash script compatibility issue
GE-5509 host_aliases not working for resource hostname OR request
GE-5510 hostAliases not working for qconf -purge request
GE-5524 newline in job submission breaks reporting/accounting lines and qstat -j
GE-5528 hostname resolving changes should trigger update of all affected data objects at qmaster/execd daemon startup
GE-5547 The install_cuda_complexes.sh doesn't handle 'n' correctly
GE-5577 Server side JSV parameters l_hard, l_soft and masterl contains job class access specifier
GE-5579 Cray XC integration needs to support multiple Crays in a cluster out-of-the box
GE-5589 changes to host_aliases file should be updated when hosts are re-resolved
GE-5604 install_cuda_complexes.sh produces invalid complex
GE-5635 multiple occurrences of same resource in RSMAP is not working
GE-5667 describe in win-x86 installer and documentation that the UGE Starter Service doesn't work with mounted network directories
GE-5671 integration of Docker into UGE
GE-5675 Fully integrate Univa Grid Engine with systemd
GE-5692 enhance sge_container_shepherd to handle stdin/stdout/stderr stream to allow interactive and parallel jobs
GE-5710 changed host aliases can trigger qmaster abort() at startup
GE-5712 need concurrent array jobs where either all tasks run concurrently or no task at all
GE-5714 unbelievable high ru_wallclock values in accounting
GE-5717 basic environment check during startup of Grid Engine daemons
GE-5739 qmaster installation script does not add admin host if its hostname cannot be resolved (error message unclear)
GE-5747 sharetree might be wrong if host clock changes
GE-5758 possible segmentation fault in commlib when static clients try do reconnect
GE-5774 enable execution of tasks of parallel jobs in Docker containers
GE-5776 bind lists of UGE directories properly into the Docker container
GE-5780 update openssl library to current version 1.0.2
GE-5781 exec host goes into unknown (u) state when the system time is set to an earlier time
GE-5787 reported wallclock time is too low when the system time is set to an earlier time
GE-5792 docker jobs are reported as failed on execd restart
GE-5795 exit dispatching loop immediately when shutdown of scheduler thread is triggered
GE-5821 remove basic Docker integration that uses load sensor and starter_method when real Docker integration works
GE-5834 bad performance of RQS rules on host groups
GE-5849 new masterl switch s_rss limit setting is enforced for slave
Fixes and Enhancements

tasks

GE-5877 max_aj_instances and -tc submit option are not respected with enrolled tasks

GE-5879 when max_aj_instances is set to 0 (unlimited) the submit option -tc does no longer have effect

GE-5901 allow Docker containers to automatically start the application configured in the Docker image

GE-5913 On native Windows (win-x86), improve error logging of wl_connect_to_service() function and subfunctions

GE-5920 not all functions retrieving passwd information do resize used buffer if it turns out that it is too small

GE-5935 header of HTTP response from Docker daemon > 1.9 not handled properly

GE-5955 host_aliases not working for sge_shadowd

GE-5962 the Docker daemon doesn't download an image when its not available locally

GE-5989 jobs are not started in Docker containers if the job user has insufficient permissions to write docker specific files

GE-5991 host names used for host_aliases should be handled case insensitive

GE-5994 sge_qmaster startup fails with critical "setup failed" logging message

GE-5995 job is executed even if prolog fails

GE-6022 native Windows (win-x86) execution daemon installer unnecessarily needs sgepasswd file

GE-6023 native Windows (win-x86) submit clients need private keys of sgepasswd file

GE-6028 User/group management done via Windows Active Domain might break UGE

GE-6036 job loss on exed restart after host_aliases changes

GE-6039 clients report "failed to extract authentication information" error

GE-6042 Scheduling run might take longer than with previous versions of UGE

GE-6045 on native Windows (win-x86), the win_getpwnam_r() always tries to load the user profile, even if called with insufficient permissions

GE-6046 infinite loop writing to trace file in docker container

GE-6049 default job class is not used correctly

GE-6056 Cray XC integration needs to set unlimited timeout for epilog for newer UGE version

GE-6059 job gets rescheduled when epilog gets a SIGABRT signal

GE-6064 on native Windows (win-x86), error handling of (Un)LoadUserProfile() overwrites real error message

GE-6067 adding a queue with calendar generates error messages and no jobs will be scheduled into this queue

GE-6068 Interactive Docker jobs fail because sge_container_shepherd doesn't have the permission to "write the shepherd_about_to_exit" file

GE-6073 qsub does not support multiple use of "-binding" or "-t" parameters

GE-6076 on native Windows (win-x86), all job spool directories are deleted when the first job on an execution host finishes

GE-6087 error message complains about missing Qmaster port when Execd port is missing

GE-6095 log job verification time exceeding a certain threshold

GE-6098 RC script fails to install when the OS is using LSB

GE-6099 RC script not being uninstalled when update-rc.d is used as RCFILE

GE-6100 the name of the named pipe between UGE Job Starter Service and
4.2.3 Univa Grid Engine 8.5.0alpha1

GE-575 Parallel jobs exceeding wall clock time are not killed
GE-3909 job submitted with user not on every execd node is stuck in zombie state
GE-4991 loading dynamic libraries fails if uid != euid
GE-5317 remove "verify_suitable_queues" from qstat -j output
GE-5505  Job that is restarted and that was in certain error states previously stays in t-state
GE-5540  GE-5949 drmaa does not provide the submit_cmd line
GE-5560  Java Binding for DRMAA2
GE-5583  enhance RSMAP so that necessity of OR requests in command line can be avoided
GE-5600  Windows (win-x86) queue instance is set to error state if job can't be executed
GE-5608  Atomically Delete Jobs by State
GE-5648  cleanup and speed-up execd job start when using additional group ids
GE-5651  Unified behavior of UGE calls that trigger library functions depending on directory services (NIS, LDAP, Active Directory, ...)
GE-5657  Enhance RSMAP so that only elements / instances with the same name within a RSMAP are chosen.
GE-5658  Enhance RSMAP so that instances can be requested via REGEX
GE-5659  Allowing to configure RSMAP that the above OR is restricted only to one type.
GE-5660  Allow shortcut for RSMAP definition
GE-5661  Allow load sensor to restrict RSMAP
GE-5668  Posix priority 0 not anymore scaled to 0.5
GE-5696  add xd switch to job classes
GE-5721  improve and reduce qhold/qrls messages and logging
GE-5855  skip pending read-only requests where clients are already gone
GE-5856  replace 'old' execd reports in the list of pending worker requests
GE-5875  functionality missing that allows to filter thread specific debug output of components
GE-5899  AR accepts jobs after cleanup of running jobs before end of AR
GE-5957  jobs submitted with qsub -sync are not killed when Ctrl+C is pressed
GE-5985  sharetree algorithm should consider slots, not jobs
GE-6015  It takes 2 load_reports_intervals to get load_values when a new load_sensor is setup
GE-6054  docker jobs started with qrsh have incorrect environment (SGE_ROOT, ...)
GE-6075  Improved scheduler performance due to CULL performance improvement of all lGet/lSet functions
GE-6088  make sure AR and SR are correctly written to the reporting file
GE-6096  improve and reduce qdel messages/logging
GE-6110  Reduce communication overhead by optimizing communication layer
GE-6120  sge_execd reports "can't resolve hostname ",_sge_pseudo_host" in messages file
GE-6128  update openssl to 1.0.2j
GE-6134  qmaster receives empty report lists that qmaster tries to process.
GE-6136  Lock handling done in qmaster for reports send by execd might cause slowdown of qmaster
GE-6138  Reports from execd's are always send in groups. Qmaster uses the same lock for all.
GE-6139  Introduce possibility to set job report flush time @ execd
4.2.4 Univa Grid Engine 8.5.0alpha2

GE-3060 in order to connect through a firewall, qrsh/qlogin should use only specified port numbers
GE-3341 pe_min value is not correct in JSV if multiple slots ranges are requested
GE-3928 Document and/or change default shell for qsub '-b y'
GE-5631 -mods/-clears does not work for master1
GE-5632 -adds/-mods/-clears for "master1" not described in qsub man page
GE-5906 possible endless loop in test_drm22 -> test_job_wait_all
GE-5980 getInfo() does always return a null
GE-5997 allow to specify placeholders for Scheduler selected values in the argument list to the -xd option
GE-6000 Have UGE documentation available in HTML format.
GE-6026 Documentation for job name starting with a digit needs to be corrected
GE-6027 scheduler thread repeats logging of cluster configuration
GE-6131 update postgres library to version 9.6
GE-6145 qsub client crashes with specific sge_request file
GE-6153 use stronger cipher for CSP mode communication and sgepasswd file encryption
GE-6154 Configuration API needs to be part of the regular package build
GE-6164 qmaster, execd and scheduler params should be in upper case letters in man page and documentation
GE-6165 log a warning when qmaster reads unknown cluster config parameters
GE-6166 log a warning when qmaster and execd read unknown *_params
GE-6168 sgepasswd issues
GE-6170 qsub_time is set to a time at year 1970, in case of job error
GE-6192 reduce spooling operations for a job lifecycle
GE-6251 Rest and Config API should also support 'port_range' parameter
GE-6283 switch and argument in xd attribute of job classes cannot be delimited by space although this is possible at command line in qsub
GE-6289 load sensor script triggered endlessly (independent from the configured load report interval)
4 Fixes and Enhancements

GE-6291 scheduler profiling does not show time spend for updating event master settings
GE-6314 JC variant output for xd attribute missing
GE-6317 resource bookkeeping is broken, scheduler stops dispatching large parallel jobs, qmaster getting overloaded
GE-6323 Scheduler tries to find a master_queue for not schedulable job even if there is no master queue request
GE-6329 changing a resource with qalter -mods fails if mem_free is part of the requested resources in the qsub command
GE-6331 docker autostart jobs run through but exit_status is 1 and start/end time missing
GE-6336 incorrect hostname resolving for qsub -q parameter
GE-6337 transient builtin load values are spooled
GE-6358 sge_execd might crash on AIX
GE-6341 Config API should also support new job class ‘xd’ parameter
GE-6345 build sol-sparc64 packages on Solaris 10 instead of Solaris 9
GE-6352 qalter displays success message even if modification is not allowed due to job class
GE-6353 shepherd crashes on MacOS and possibly other OS after job finishes
GE-6357 FQDN Hostnames are limited to 63 Characters
GE-6359 remove obsolete load sensor scripts
UWSA-177 automatic installation is broken -> missing SGE_CELL setting
UWSA-179 Document should mention exact file name for adjusting logging
UWSA-183 UGERest Api crashes when masterl switch is used

4.2.5 Univa Grid Engine 8.5.0beta1

GE-4876 make the native Windows PDC report IO and memory values
GE-4956 qmon about box contains incorrect copyright information
GE-4967 general documentation and man pages typos and issues
GE-5567 Only cpu, mem and io are used in calculations of share tree usage
GE-5721 improve and reduce qhold/qrls messages and logging
GE-5999 Preempted jobs stay in P-state
GE-6107 add information about not properly started Docker daemon to AdminGuide
GE-6316 rework parts of the UGE documentation
GE-6332 docker containers are not always removed after job end
GE-6354 Improve qalter message logging
GE-6372 possible execd crash in Docker job handling
GE-6374 job start fails with Docker 1.13.0
GE-6375 job lost detection might cause severe problems in qmaster
GE-6376 for Docker jobs, a wrong mem online and accounting usage value is reported
GE-6381 possible handshake problems with external load sensors
GE-6382 AAPRE cplx column is not set correctly in qmon complex dialog
GE-6383 qmon crash when job is suspended
GE-6387 qtcsh does not provide an error message when command should be executed on remote host but SGE_ROOT is not set
4.2.6 Univa Grid Engine 8.5.0 FCS

GE-4170 -help for ./inst_sge -upd
GE-4514 Spooledit can create strange 'CONFIG:CONFIG:global' entry
GE-4699 one cannot create CSP credentials for a user 'a', if a user 'ab' already exists
GE-5502 modularize install and upgrade scripts
GE-5804 far too much usage data spooled in user objects
GE-6013 Enhance host_aliases man page and admin guide
GE-6026 Documentation for job name starting with a digit needs to be corrected
GE-6216 fix memory leaks in native Windows (win-x86) execution daemon
GE-6289 load sensor script triggered endlessly (independent from the configured load report interval)
GE-6291 scheduler profiling does not show time spend for updating event master settings
GE-6336 incorrect hostname resolving for qsub -q parameter
GE-6341 Config API should also support new job class 'xd' parameter
GE-6357 FQDN Hostnames are limited to 63 Characters
GE-6362 fix memory leaks and access issues in 8.5.0
GE-6384 ARs oversubscribe queue slots
GE-6397 shutdown of execd in early startup phase might take long
GE-6398 jobs running in Docker containers write files with wrong group ownership
GE-6399 if the version comparison in the upgrade script doesn't find the given version, upgrading should be stopped
GE-6400 invalid load and memory usage reported by execd during install
GE-6401 qmon Modify queue dialog fails with 'no default value for slots'
GE-6405 qmon Clone queue dialog fails with "Multiple values for one queue domain/host..."
GE-6409 autostarting Docker job cause the shepherd to use 100% CPU for many seconds at job end
GE-6411 Jobs sometimes don't get a reservation when using RQS
UWSA-184 Expose the 'qmod -p' preemption functionality in the REST API

4.2.7 Univa Grid Engine 8.5.1

GE-4305 Better documentation for basic share tree use case
GE-4389 enhance qsub man page with JSV modification examples for core binding
GE-5650 with allocation rule $fill_up, slave resource requests are not obeyed when master resource and queue requests are provided
GE-5806 parallel jobs might not startup due to wrong RQS calculations
4 Fixes and Enhancements

GE-5941 renewing certificates makes sgepasswd file unreadable
GE-6020 allow native Windows (win-x86) functions to retry to logon users several times
GE-6103 jobs are bound to cores even if no binding is requested
GE-6183 sge_shepherd sets limits too high for master task
GE-6237 jobs are being restarted even if the '-r no' was specified during submission
GE-6402 Scheduler might not respect RQS limits during the time RQS rules are changed
GE-6407 add documentation for config-api
GE-6413 shepherd does not handle all error responses to a pull Docker image request
GE-6434 incomplete binding requests shown in qstat for long lists of binding requests
GE-6462 on native Windows (win-x86), environment variable values containing an equal sign are truncated
GE-6467 installer fails to restart qmaster when upgrading and using SYSTEMD
GE-6478 Very long load value of loadsensor causes segfault of execd
GE-6480 wrong/missing error messages and wrong exit status when initializing invalid RSMAP ranges
GE-6489 using of external loadsensors might deadlock execution daemon
GE-6490 load sensor specific errors are not logged into execd messages file
GE-6493 RSMAP map entry selection request does not work
GE-6510 Core binding: striding-strategy counts needed cores wrong and rejects viable hosts
GE-6511 gdi_request_limits does not behave as documented
GE-6521 Qmaster crashes with LO enabled and job dependencies
GE-6534 sge_execd crash with core dump with GPGPU jobs
GE-6537 Submitting RSMAP-range jobs via -adds is broken
GE-6553 RQS limits incorrectly applied when PE job submitted with "-l h=<host>"
GE-6573 reduce resulting qhost client requested data sizes transferred via network
GE-6575 stree-edit utility broken
GE-6583 scheduler is wrongly skipping hosts or queue instances for parallel jobs that are using master task specific requests
GE-6587 abort of sge_qmaster if a JC where V is set to yes is used to create a job
UWSA-81 Add support for listening only on localhost
UWSA-186 requested jobEnvironment is not shown in jobs
UWSA-188 jobEnvironment ugerestsdk contains error in json converter
UWSA-189 ugerest is showing same scheduler conf twice
UWSA-190 upgrade of restlet-jse-2.3.6 to restlet-jse-2.3.10
4.2.8 Univa Grid Engine 8.5.2

GE-5569 native Windows (win-x86) sge_execd exits if it cannot access the act_qmaster file
GE-6454 improve documentation of Docker integration
GE-6236 accounting file broken on Solaris if accounting line has 1023 characters
GE-6615 enhance error logging if load sensor cannot be started
GE-6618 native Windows (win-x86) execution daemon crashes if qloadsensor does not work
GE-6620 error messages from qloadsensor.exe (win-x86) are not forwarded to the execd messages file
GE-6623 add the UGE admin user to the Performance Monitor Users group on native Windows 10 (win-x86)
GE-6629 qhost NSOC and NCOR incorrect on lx-arm64
GE-6637 using hostgroups in rqs limit definition can trigger short qmaster hang at startup or rqs modify request
GE-6640 qloadsensor.exe report "no error" if an error occurs while initializing the PDH service
GE-6644 any epilog SIGSEGVs and sets queue in error state with execed_params INHERIT_ENV=false
GE-6660 Requesting a RSMAP without ID can crash qmaster

4.2.9 Univa Grid Engine 8.5.3

GE-3721 qstat -j "*" -u "user1" is not working
GE-5290 qstat (-xml) does not accept filter switches when -j "*" is specified
GE-6432 qdel -u "*" is only allowed to managers, not to operators
GE-6483 document placeholders in Docker requests in the UserGuide and man pages
GE-6497 support halftime -1 setting in scheduler config to disable past usage for sharetree
GE-6568 Allow for forced job deletion through UGE REST
GE-6578 Duplicate calendar entries associated with host_aliases
GE-6595 Docker interactive job can’t be deleted by qdel
GE-6617 provide workaround in native Windows (win-x86) sgeexecd.bat script for start /b bug on Windows 10, version 10.0.15063
GE-6644 When host aliases are configured qsub -sync y reports "commlib info: successfully updated host aliases (add: 0, del: 0)"
GE-6670 The global configuration parameter "gdi_request_limits" not working for aliased hostnames
GE-6671 sudo requests for same user as ugerest service user are rejected
GE-6678 Improve accept() handling in commlib
GE-6682 exec host cannot startup if no admin or submit host
GE-6687 RSMAP-topology-masks jobs and -binding jobs result in wrong scheduling decisions
GE-6695 qrstat does not output cal_depth and cal_jmp information for
GE-6696 save_sge_config.sh needs to dump advance/standing reservations for upgrade to newer versions
GE-6697 qstat -j "*" does not support "$user" placeholder set in sge_qstat request file
GE-6706 unexpected logging and possibly incorrect accounting if multiple array tasks of a job are running on a host

4.2.10 Univa Grid Engine 8.5.4

GE-5835 long scheduling times with wildcard PEs and resource reservation
GE-5848 allow to use UGE cgroups in Docker jobs
GE-6356 drmaa2_j_get_info does not provide full job information -> not all fields are filled
GE-6709 huge virtual memory requirements with test DRMAA1 application
GE-6713 shadowd on Solaris cannot start sge_qmaster
GE-6728 sched_conf.5 man page is inaccurate regarding the PREFER_SOFT_REQUESTS scheduler param
GE-6734 wrong scheduler info messages shown for jobs
GE-6739 Parallel job requesting pe range not scheduled even if resources available
GE-6741 jobs submitted into AR with RSMAP resources are not scheduled
GE-6744 qrstat does not output queue request (-q) and immediate request (-now y)
GE-6754 Adding new session (qconf -asi) not working on admin only host
GE-6755 save_sge_config.sh does not dump all advance/standing reservations
GE-6764 very long dispatching time due to RQS rule result in scheduler timeout
GE-6771 qsub -sync stops immediately on native Windows (win-x86)
GE-6777 huge erroneous reader thread logging at calendar state transition
GE-6782 qstat -njd is not working as documented in the man page
GE-6785 Supplementary groups in manager and operator lists are ignored during access validation for job deletions.
GE-6786 false logging for 'qmaster_params': 'gdi_timeout', 'gdi_retries' and 'gdi_ping'
GE-6787 qmaster and execd logging "invalid value (33026) for ar->op"
GE-6788 qmaster logging about receiving older load report
GE-6796 Calendar modification/state transition might cause repeated timed calendar events for up to one second.
GE-6799 unexpected logging messages in sge_qmaster messages file
GE-6812 started docker job at execd may result in sge_shepherd process eating up all memory
GE-6814 removing non "lo_*" complex entry triggers error logging of lothread
GE-6818 error logging: getgrgid(...) failed: Numerical result out of range
UWSA-193 additional job usage values for execd_params ENABLE_MEM_DETAILS=1 are missing
4.2.11 Univa Grid Engine 8.5.5

GE-6508 Accounting shows wrong fail and exit states for 'qdel -f jobID'
GE-6835 update host configurations for changed hostnames not working if a changed hostname is matching as substring of another host
GE-6836 improve execd reconnect behavior after qmaster shutdown and restart
GE-6841 allow to configure the Docker daemon communication timeout
GE-6843 Integration with latest Docker CE version(17.09)
GE-6852 interactive Docker jobs take very long to finish if the qrsh client is killed and an epilog is configured
GE-6853 Sometimes not able to delete pending job if docker device-mapping is used
GE-6855 sge_qmaster abort() with critical logging "got NULL element for RUE_utilized_now"
GE-6869 Release notes contain 'current version' also for features that were introduced with FCS
GE-6874 normal docker job required no_root_quash if execd spooling directory shared via nfs
GE-6901 "messages" file can have the name ".\<digit>\" instead of "messages" in case of file creation issues
GE-6913 expose scheduler thread ID in the qping output
GE-6916 sge_ca script does not show output for skip install question if CA directories are already existing
GE-6939 very long ticket calculation times for parallel array tasks
GE-6946 Delete an array task will break the -tc <number> condition
GE-6948 parse error message from Docker response and provide it as job error reason
GE-6972 Problem with gridengine/kernel
GE-6973 Problem with gridengine/kernel
GE-6974 Problem with gridengine/kernel
GE-6983 if job is killed by execd enforced limit the job failed state in accounting file should reflect this
GE-6997 the native Windows (win-x86) execd should log that it cannot find or start the qloadsensor.exe
GE-7002 test Docker integration with Docker versions up to 17.12
GE-7008 Jobs requesting RSMAP complexes that are defined without Ids are not scheduled
5 Upgrade Notes

5.1 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.X.X to Univa Grid Engine 8.5 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.

<table>
<thead>
<tr>
<th>Version</th>
<th>Upgrade Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Univa Grid Engine 8.X.X</td>
<td>Backup/Restore</td>
</tr>
<tr>
<td>Oracle Grid Engine 6.2u6-6.2u8</td>
<td>Backup/Restore</td>
</tr>
<tr>
<td>Sun Grid Engine 6.2u5</td>
<td>Backup/Restore</td>
</tr>
<tr>
<td>Sun Grid Engine 6.2u1-6.2u4</td>
<td>Upgrade to SGE 6.2u5 and then Backup/Restore</td>
</tr>
<tr>
<td>Sun Grid Engine 6.2 FCS</td>
<td>Upgrade to SGE 6.2u5 and then Backup/Restore</td>
</tr>
</tbody>
</table>

Table 13: Upgrading from SGE, OGE, UGE 8.X.X to Univa Grid Engine 8.5.X
6 Compatibility Notes

6.1 Changes in Output Format of Commands

The output format of some commands has been changed:

- ‘qstat -xml’ output for jobs did sometimes show the mail recipient in the XML node “JB_mail_list/element/MR_user” or “JB_mail_list/mail_list/MR_user” of jobs depending on the used submit interface or submit client. Now it will always be: “JB_mail_list/element/MR_user”. (see GE-6269)

- ‘qstat -j’ output showed an Univa Grid Engine internally used parameter with the name ‘verify_suitable_queues’. This line of output is not shown anymore. (see GE-5317)

- ‘qstat -j’ might show additional online usage values compared to previous versions of UGE. Depending on the architecture of the underlying execution node of a job following values might be reported additionally in the ‘usage’ line: ioops (number of io operations), iow (io waiting time). (see GE-4296)

- If resource requests of jobs contained newline-characters then they were also shown in the ‘qstat -j’ output. This issue has been resolved. (see GE-5524)
6.2 Changes in Windows execution host sgepasswd file

The encryption algorithm for the “$SGE_ROOT/$SGE_CELL/common/sgepasswd” file passwords has been changed from RC4 to AES-256-CBC:

If you upgrade to current the version of Univa Grid Engine you need to convert your existing sgepasswd file during the upgrade procedure.

Become superuser and execute the following command on the master machine:

```
# sgepasswd -c
```

This will create a backup of your original ‘sgepasswd’ file as ‘sgepasswd.old_algorithm_backup’ and create the new compatible sgepasswd file. Otherwise encryption related error messages might show up.

If you create a new sgepasswd file from scratch no additional steps compared to previous versions are required.
6.3 Deprecated Functionality

Following components/features are deprecated and will be removed with version 8.6.0 of Univa Grid Engine:

- Graphical Installer
- qtesh
7 Known Issues and Limitations

7.1 setting halftime to -1 (GE-6497) not supported in qmon

It is recommended to use the qconf command line client.

7.2 NOTE: Disabled SYSTEMD support

Due to an issue with our SYSTEMD integration, we have decided to disable the integration. This means, that currently no SYSTEMD scripts will be created and installed. The legacy init scripts are still available. The related issue ID is: GE-7018

When you plan to upgrade to version 8.5.5 of Univa Grid Engine, please read this post on the Univa Support Portal:

https://support.univa.com/hc/en-us/articles/360000264394

It will contain detailed information about the issue, which workarounds are available and how an upgrade can be done, without issues.

In case of questions or you feel unsure on how to proceed, do not hesitate to open a support ticket or contact us via:

support@univa.com