Altair Engineering Inc.

Altair Grid Engine Documentation

Grid Engine Release Notes

Author:
Altair Engineering

Version:
2022.1.1 (8.7.3)

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Contents

1 License

SOFTWARE LICENSE AGREEMENT

This Agreement (defined below) is between the individual or entity agreeing to this Agreement and Altair Engineering Inc. (Altair) with its registered office at 1820 E. Big Beaver Road, Troy MI 48083.

BY ACCEPTING THIS AGREEMENT, EITHER BY CLICKING A BOX INDICATING YOUR ACCEPTANCE OR BY EXECUTING A QUOTATION THAT REFERENCES THIS AGREEMENT, YOU AGREE TO THE TERMS OF THIS AGREEMENT. IF YOU ARE ENTERING INTO THIS AGREEMENT ON BEHALF OF A COMPANY OR OTHER LEGAL ENTITY, YOU REPRESENT THAT YOU HAVE THE AUTHORITY TO BIND SUCH ENTITY TO THESE TERMS AND CONDITIONS, IN WHICH CASE "CUSTOMER" SHALL REFER TO SUCH ENTITY. IF YOU DO NOT HAVE SUCH AUTHORITY, OR IF YOU DO NOT AGREE WITH THESE TERMS AND CONDITIONS, THEN YOU MUST NOT ACCEPT THIS AGREEMENT AND MAY NOT USE THE ALTAIR SOFTWARE.

1. SCOPE. This Agreement governs the licensing of the Altair Software and Support provided to Customer.

- Altair Software means the software described in the quotation referencing this Agreement ("Quotation"), all updates and enhancements provided by Altair, Altair's user documentation for such software, and license keys (Altair Software). This Software is licensed and is not sold to Customer.
- Capacity means the amount of computing resources on which Customer is licensed to use the Altair Software, as described on the applicable Quotation. Attached as Appendix A are definitions of the terms that may be used in a Quotation to define Capacity.

2. LICENSE. Subject to the terms of this Agreement, Altair grants Customer a limited, non-exclusive, non- transferable, non-sub licensable, license, solely during the term of this Agreement and in accordance with (and not to exceed) the Capacity, to install and use the Altair Software on Customer-controlled systems (including Customer-controlled cloud computing environments) for Customer's internal business purposes. If Customer is installing the Altair Software, Altair further grants Customer the right to make a reasonable number of copies of the Altair Software for archival and backup purposes. Customer's contractors and majority owned Affiliates are allowed to use the Altair Software under the terms of this Agreement, provided that such contractors and majority owned Affiliates are bound by obligations of confidentiality to Customer as least as restrictive as the terms hereof and agree to use the Altair Software in accordance with this Agreement. Customer is responsible for compliance with the terms of this Agreement and shall indemnify, defend and hold harmless Altair for the actions of its employees, contractors and majority owned Affiliates. With respect to this Agreement, Affiliate shall be defined as, with respect to a specified entity, an entity that directly or indirectly through one or more intermediaries, that controls, is controlled by or is under common control with Customer as of the Effective Date of this Agreement. For purposes of this definition, "control" shall mean possession, directly or indirectly of at least fifty percent (50%) of the voting equity of another entity (or other comparable interest for an entity other than a corporation), or the power to direct or cause the

direction of the management or policies of an entity whether through ownership of securities, by contract or otherwise

3. RESTRICTIONS. Altair reserves all rights not expressly granted in Section 2 above. Without limiting the preceding sentence, Customer may not, and covenants that it will not, directly or indirectly, and may not authorize any third party to:

(a) Sell, transfer, assign, sublicense, or rent the Altair Software or use the Altair Software for the benefit of third parties (including through as a software service provider or in an outsourcing environment);

(b) reverse engineer, decompile, disassemble, modify, translate, or otherwise attempt to discover the source code of, the Altair Software;

(c) except for a reasonable number of backup or archival copies, copy the Altair Software;

(d) create derivative works from the Altair Software; or

(e) circumvent or otherwise interfere with any authentication or security measures of the Altair Software.

3.1 The Altair Software licensed hereunder may not be used for the design, development, production or use of nuclear, chemical or biological weapons or missiles unless Customer has first obtained all required approvals and export licenses as may be required by the US Government.

4. PROPRIETARY RIGHTS AND CONFIDENTIALITY.

(a) Proprietary Rights. The Altair Software, workflow processes, designs, know-how and other technologies provided by Altair as part of the Altair Software are the proprietary property of Altair and its licensors, and all right, title and interest in and to such items, including all associated intellectual property rights, remain only with Altair. The Altair 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 Altair 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. Recipient agrees to take the same precautions necessary to protect and maintain the confidentiality of the Confidential Information, including but not limited to the Altair Software, as it does to protect its own information of a confidential nature but in any event, no less than a reasonable degree of care, and shall not disclose or make them available to any person or entity except as expressly provided in this Agreement.

(c) Confidential Information means all proprietary or confidential information that is disclosed to one party to this Agreement (Recipient) by the other party to this Agreement (Discloser), and includes, among other things:

- any and all information relating to Altair 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 Altair, the Altair 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; or * is independently developed by or for Recipient without use or access to the Confidential Information.

(d) If Recipient is required by any governmental authority or court of law to disclose Confidential Information, then Recipient shall immediately notify Discloser before making such disclosure so that Discloser may seek a protective order or other appropriate relief.

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

5. PAYMENT. Customer will pay in full all fees due under a Quotation within thirty (30) days of the invoice date. Past due fees shall bear interest at the rate of eighteen percent (18%) per annum. Fees do not include taxes or duties and Customer is responsible for paying (or for reimbursing Altair if Altair is required to pay) any federal, state or local taxes, or duties imposed on the Customer or the possession or use by Customer of the Altair Software excluding, however, all taxes on or measured by Altair's net income. Altair shall be entitled to its reasonable costs of collection (including attorneys fees and interest) if fees are not paid to it on a timely basis.

6. WARRANTY DISCLAIMER. ALTAIR DOES NOT REPRESENT OR WARRANT THAT THE ALTAIR SOFTWARE WILL MEET CUSTOMER'S REQUIREMENTS OR THAT THEIR OPERATION WILL BE UNINTERRUPTED OR ERROR-FREE, OR THAT THE ALTAIR SOFTWARE WILL BE COMPATIBLE WITH ANY PARTICULAR HARDWARE OR SOFTWARE. ALTAIR EXCLUDES AND DISCLAIMS ALL EXPRESS AND IMPLIED WARRANTIES, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF TITLE, NON- INFRINGEMENT, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE ALTAIR SOFTWARE MAY NOT BE ERROR FREE, AND USE MAY BE INTERRUPTED. THE ENTIRE RISK FOR THE PERFORMANCE, NON-PERFORMANCE OR RESULTS OBTAINED FROM USE OF THE PRODUCTS RESTS WITH LICENSEE AND NOT ALTAIR. ALTAIR MAKES NO WARRANTIES WITH RESPECT TO THE ACCURACY, COMPLETENESS, FUNCTIONALITY, SAFETY, PERFORMANCE, OR ANY OTHER ASPECT OF ANY DESIGN, PROTOTYPE OR FINAL PRODUCT DEVELOPED BY LICENSEE USING THE PRODUCTS.

7. TERM AND TERMINATION. This Agreement commences on the date it is accepted by or on behalf of Customer, as applicable, and expires as set forth on the applicable Quotation. This Agreement will be automatically renewed on its expiry for an additional one year period unless a written notification of termination has been received 60 days prior to term expiry. 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. Notwithstanding the foregoing, Altair may terminate this Agreement immediately in the event Customer breaches Sections 2 or 3 of this Agreement. Upon termination of this Agreement or expiration of an order, Customer

must discontinue using the Altair Software, de-install it and destroy or return the Altair Software and all copies, within 5 days. Upon Altair' request, Customer will provide written certification of such compliance. Customer's obligations in Sections 2 and 3 of this Agreement shall survive expiration or termination of this Agreement.

8. SUPPORT INCLUDED. Altair's technical support and maintenance services (Support) is included with the fees paid under an order. Altair may change its Support terms, but Support will not materially degrade during any paid term. Altair supports the most current version of its software and one version prior. More details on Support are located at http://www.Altair.com/resources/files/support.pdf

9. LIMITATION OF LIABILITY AND DISCLAIMER OF DAMAGES. Altair's entire liability for all claims arising under or related in any way to this Agreement (regardless of legal theory), shall be limited to direct damages, and shall not exceed, in the aggregate for all claims, the fees paid under this Agreement by Customer in the 12 months prior to the claim. IN NO EVENT WILL ALTAIR BE LIABLE FOR ANY INDIRECT, SPECIAL, INCIDENTAL, EXEMPLARY, PUNITIVE, TREBLE, OR CONSEQUENTIAL DAMAGES (INCLUDING, WITHOUT LIMITATION, LOSS OF BUSINESS, REVENUE, PROFITS, GOODWILL, DATA, OR ECONOMIC ADVANTAGE, AND COSTS OF SUBSTITUTE GOODS OR SERVICES) ARISING OUT OF OR RELATING TO THIS AGREEMENT, HOWEVER CAUSED, AND BASED ON ANY THEORY OF LIABILITY, WHETHER FOR BREACH OF CONTRACT, BREACH OF WARRANTY, TORT (INCLUDING NEGLIGENCE), PRODUCT LIABILITY, OR OTHERWISE, EVEN IF CUSTOMER IS ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. ALTAIR'S TOTAL LIABILITY (INCLUDING ATTORNEYS' FEES) ARISING OUT OF OR RELATED TO THIS AGREEMENT, SHALL BE LIMITED TO DIRECT DAMAGES, AND WILL NOT EXCEED THE AMOUNT PAID BY CUSTOMER UNDER THE QUOTATION GIVING RISE TO THE CLAIM DURING THE 12-MONTH PERIOD PRIOR TO THE DATE THE CLAIM AROSE. THESE LIMITATIONS WILL APPLY NOTWITHSTANDING ANY FAILURE OF THE ESSENTIAL PURPOSE OF ANY LIMITED OR EXCLUSIVE REMEDY. Customer acknowledges that it is solely responsible for the adequacy and accuracy of the input of data, including the output generated from such data, and agrees to defend, indemnify, and hold harmless Altair and its suppliers from any and all claims, including reasonable attorney's fees, resulting from, or in connection with Customer's use of the Software. No action, regardless of form, arising out of the transactions under this Agreement may be brought by either party against the other more than two (2) years after the cause of action has accrued, except for actions related to unpaid fees.

10. INTELLECTUAL PROPERTY INDEMNITY. If a third party claims that the Altair Software infringes that party's patent, copyright or other intellectual property right, then Altair will defend and indemnify Customer against that claim at Altair' expense and pay all costs, damages, and attorney's fees, that a court finally awards or that are included in a settlement approved by Altair, provided that Customer:

(a) Has not materially breached the terms of this Agreement; and

(b) promptly notifies Altair in writing of the claim; and

(c) allows Altair to have sole control, and cooperates with Altair in, the defense and any related settlement.

10.1 If Altair receives information about an infringement claim related to the Altair Software, then Altair will at its discretion and at no cost to Customer either obtain

a license to enable Customer to continue to use the Altair Software or modify the Altair Software so that it is no longer infringing. If Altair determines that these alternatives are not reasonably available, Altair may terminate the license to the Altair Software and refund to Customer the prorated fees that Customer paid for the then current term. 10.2 Altair's obligations above do not apply if the infringement claim is based on (i) Altair's compliance with specifications or instructions prescribed by the Customer, (ii) modification of the Altair Software by Customer, (iii) Customer's breach of this Agreement, (iv) the use of the Altair Software in combination with products not supplied or approved by Altair in writing, or (v) Customer's failure to use any updates made available by Altair (vi) open source software or third party software included in the Altair Software. 10.3 This section contains Customer's exclusive remedies and Altair' sole liability for infringement claims.

11. GOVERNING LAW AND EXCLUSIVE FORUM. This Agreement is governed by the laws of the State of Delaware, 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 Delaware. 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 attorneys' fees and costs from the other party.

12. MISCELLANEOUS.

(a) Inspection and Usage Reporting. Upon request by Altair, Customer must provide a usage report at least 60 days before the renewal anniversary. Usage in the cloud must be reported on a quarterly basis as defined in Appendix A. Altair, or its representative, may audit Customer's usage of the Altair 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 Altair Software in excess of the license.
(b) Entire Agreement. This agreement, which incorporates by reference Appendix A, and all Quotations referencing this agreement (collectively, the "Agreement"), constitutes 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 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. Altair provides the Altair Software, including related data and technology, for ultimate federal government end use solely in accordance with the following: The government hereby agrees that the software qualifies as "commercial" computer software. Government technical data and software rights related to the software include only those rights customarily provided to the public as defined in this Agreement. This customary commercial license is provided in accordance with FAR 12.211 (Technical Data) and FAR 12.212 (Software) and, for Department of Defense transactions, DFAR 252.227-7015 (Technical Data – Commercial Items) and

DFAR 227.7202-3 (Rights in Commercial Computer Software or Computer Software Documentation). If a government agency has a need for rights not granted under these terms, it must negotiate with Univa to determine if there are acceptable terms for granting those rights, and a mutually acceptable written addendum specifically granting those rights must be included in any applicable agreement.

(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. Altair rejects additional or conflicting terms of a Customer's form-purchasing document.

(j) No CISG. The United Nations Convention on Contracts for the International Sale of Goods does not apply.

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

Rev: Nov 2020

2 Supported Operating Systems, Versions, and Architectures

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

Table 1: Supported Operating Systems, Versions and Architectures

Operating System	Version	Architecture
SLES	12, 15	x86-64
RHEL/CentOS	6, 7 and higher	x86-64, Power8/9
openSUSE Leap	42	x86-64, ARM64
Ubuntu	16.04LTS - 20.04LTS	x86-64
Oracle Linux	6, 7 and higher	x86-64
Oracle Solaris	11	x86-64
Microsoft Windows	Server 2016	64bit
	8 / 8.1 Pro / Enterprise	64bit
	10 Pro / Enterprise	64bit

PLEASE NOTE: If you require Altair Grid Engine support for unlisted Linux distributions and/or OS/architecture combinations please contact our sales or support team.

PLEASE NOTE: If you require Altair Grid Engine support for older versions of the above operating systems please contact our sales or support team. For Linux distributions with libc <v2.13 in particular, the ulx-* platform packages can be provided. Linux with kernel version <v2.4.* and/or libc <v2.5.* is unsupported.

PLEASE NOTE: Altair Grid Engine qmaster is fully supported on Linux only. We can provide binaries of Altair Grid Engine for running the qmaster on other operating systems but they are not supported, and are delivered as a courtesy. If you require qmaster support on other architectures please contact us at age-navops-support@altair.com. Microsoft Windows operating systems cannot be used as master or shadow hosts at all.

3 Supported and Tested Docker Versions

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

Linux Distribution	Docker Versions
RedHat, CentOS, Debian and Ubuntu	1.12.0 to 1.13.0 and 17.03.0-ce to 20.10.13-ce
SLES and openSUSE	1.12.0 to 1.13.0 and 17.03.0-ce to 19.03.1-ce

But in the past some Docker versions did not work properly and were withdrawn later. There were different Docker builds provided under the same version number showing a slightly different behavior, so it is not possible to ensure Altair Grid Engine does work with all Docker versions between 1.12.0 and 19.03.1. 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 were not tested or are too broken to test successfully.

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

Docker	Git commit	Go	Build date	API	containerd
1.12.0	8eab29e	go1.6.3		1.24	
1.12.1	23cf638	go1.6.3		1.24	
1.12.2	bb80604	go1.6.3		1.24	
1.12.3	6b644ec	go1.6.3		1.24	
1.12.4	1564f02	go1.6.4	Mon Dec 12 23:41:49 2016	1.24	
1.12.5	7392c3b	go1.6.4	Fri Dec 16 02:23:59 2016	1.24	
1.12.6	78d1802	go1.6.4	Tue Jan 10 20:20:01 2017	1.24	
1.13.0	49bf474	go1.7.3	Tue Jan 17 09:55:28 2017	1.25	
17.03.0-ce	3a232c8	go1.7.5	Tue Feb 28 08:10:07 2017	1.26	
17.03.1-ce	c6d412e	go1.7.5	Mon Mar 27 17:05:44 2017	1.27	
17.03.2-ce	f5ec1e2	go1.7.5	Tue Jun 27 02:21:36 2017	1.27	
17.06.2-ce	cec0b72	go1.8.3	Tue Sep 5 20:00:25 2017	1.30	
17.07.0-ce	8784753	go1.8.3	Tue Aug 29 17:43:23 2017	1.31	
17.09.0-ce	afdb6d4	go1.8.3	Tue Sep 26 22:42:49 2017	1.32	
17.09.1-ce	19e2cf6	go1.8.3	Thu Dec 7 22:25:03 2017	1.32	
17.12.0-ce	c97c6d6	go1.9.2	Wed Dec 27 20:12:46 2017	1.35	
18.03.0-ce	0520e24	go1.9.4	Wed Mar 21 23:13:03 2018	1.37	
18.03.1-ce	9ee9f40	go1.9.5	Thu Apr 26 07:23:58 2018	1.37	
18.06.0-ce	0ffa825	go1.10.3	Wed Jul 18 19:10:42 2018	1.38	
18.06.1-ce	e68fc7a	go1.10.3	Tue Aug 21 17:25:29 2018	1.38	
18.06.2-ce	6d37f41	go1.10.3	Sun Feb 10 03:48:29 2019	1.38	
18.06.3-ce	d7080c1	go1.10.3	Wed Feb 20 02:28:17 2019	1.38	
18.09.0	4d60db4	go1.10.4	Wed Nov 7 00:19:08 2018	1.39	1.2.0

Docker	Git commit	Go	Build date	API	containerd
18.09.1	4c52b90	go1.10.6	Wed Jan 9 19:06:30 2019	1.39	1.2.0
18.09.2	6247962	go1.10.6	Sun Feb 10 03:47:25 2019	1.39	1.2.0
18.09.3	774a1f4	go1.10.8	Thu Feb 28 06:02:24 2019	1.39	1.2.0
19.03.0	aeac9490dc	go1.12.5	Wed Jul 17 18:14:16 2019	1.40	1.2.2
19.03.1	74b1e89	go1.12.5	Thu Jul 25 21:19:36 2019	1.40	1.2.2
19.03.2	6a30dfc	go1.12.8	Thu Aug 29 05:27:34 2019	1.40	1.2.4
19.03.3	a872fc2f86	go1.12.10	Tue Oct 8 00:56:46 2019	1.40	1.2.4
19.03.4	9013bf583a	go1.12.10	Fri Oct 18 15:50:54 2019	1.40	1.2.4
19.03.5	633a0ea	go1.12.12	Wed Nov 13 07:24:18 2019	1.40	1.2.4
19.03.6	369ce74a3c	go1.12.16	Thu Feb 13 01:28:07 2020	1.40	1.2.4
19.03.7	7141c199a2	go1.12.17	Wed Mar 4 01:22:45 2020	1.40	1.2.4
19.03.8	afacb8b	go1.12.17	Wed Mar 11 01:25:42 2020	1.40	1.2.4
19.03.9	9d988398e7	go1.13.10	Fri May 15 00:24:05 2020	1.40	1.2.4
19.03.10	9424aeaee9	go1.13.10	Thu May 28 22:16:43 2020	1.40	1.2.4
19.03.11	42e35e61f3	go1.13.10	Mon Jun 1 09:12:26 2020	1.40	1.2.4
19.03.12	48a66213fe	go1.13.10	Mon Jun 22 15:45:28 2020	1.40	1.2.4
19.03.13	4484c46d9d	go1.13.15	Wed Sep 16 17:02:21 2020	1.40	1.2.4
19.03.14	5eb3275d40	go1.13.15	Tue Dec 1 19:19:17 2020	1.40	1.2.4
19.03.15	99e3ed8919	go1.13.15	Sat Jan 30 03:16:33 2021	1.40	1.2.4
20.10.0	eeddea2	go1.13.15	Tue Dec 8 18:56:55 2020	1.41	1.4.3
20.10.1	f001486	go1.13.15	Tue Dec 15 04:35:42 2020	1.41	1.4.3
20.10.2	8891c58	go1.13.15	Mon Dec 28 16:16:13 2020	1.41	1.4.3
20.10.3	46229ca	go1.13.15	Fri Jan 29 14:32:37 2021	1.41	1.4.3
20.10.4	363e9a8	go1.13.15	Thu Feb 25 07:04:45 2021	1.41	1.4.3
20.10.5	363e9a8	go1.13.15	Tue Mar 2 20:32:17 2021	1.41	1.4.3
20.10.6	8728dd2	go1.13.15	Fri Apr 9 22:43:57 2021	1.41	1.4.3
20.10.7	b0f5bc3	go1.13.15	Wed Jun 2 11:56:35 2021	1.41	1.4.3
20.10.8	75249d8	go1.16.6	Fri Jul 30 19:54:13 2021	1.41	1.4.3
20.10.9	79ea9d3	go1.16.8	Mon Oct 4 16:06:37 2021	1.41	1.4.3
20.10.10	e2f740d	go1.16.9	Mon Oct 25 07:43:13 2021	1.41	1.4.3
20.10.11	847da18	go1.16.9	Thu Nov 18 00:37:17 2021	1.41	1.4.3
20.10.12	459d0df	go1.16.12	Mon Dec 13 11:44:05 2021	1.41	1.4.3
20.10.13	906f57f	go1.16.15	Thu Mar 10 14:08:16 2022	1.41	1.4.3
20.10.14	87a90dc	go1.16.15	Thu Mar 24 01:48:24 2022	1.41	1.4.10
20.10.15	4433bf6	go1.17.9	Thu May 5 13:15:18 2022	1.41	1.4.10
20.10.16	f756502	go1.17.10	Thu May 12 09:18:08 2022	1.41	1.4.10

- CentOS 7, Kernel 3.10.0-693.2.2.el7_x86_64

Docker	Git commit	Go	Build date	API	containerd
1.12.0	8eab29e	go1.6.3		1.24	
1.12.1	23cf638	go1.6.3		1.24	
1.12.2	bb80604	go1.6.3		1.24	
1.12.3	6b644ec	go1.6.3		1.24	
1.12.4	1564f02	go1.6.4	Mon Dec 12 23:41:49 2016	1.24	
1.12.5	7392c3b	go1.6.4	Fri Dec 16 02:23:59 2016	1.24	

Docker	Git commit	Go	Build date	API	containerd
1.12.6	78d1802	go1.6.4	Tue Jan 10 20:20:01 2017	1.24	
1.13.0	49bf474	go1.7.3	Tue Jan 17 09:55:28 2017	1.25	
1.13.1	092cba3	go1.7.5	Web Feb 8 06:38:28 2017	1.26	
17.03.0-ce	3a232c8	go1.7.5	Tue Feb 28 08:10:07 2017	1.26	
17.03.1-ce	c6d412e	go1.7.5	Mon Mar 27 17:05:44 2017	1.27	
17.03.2-ce	f5ec1e2	go1.7.5	Tue Jun 27 02:21:36 2017	1.27	
17.06.2-ce	cec0b72	go1.8.3	Tue Sep 5 20:00:25 2017	1.30	
17.07.0-ce	8784753	go1.8.3	Tue Aug 29 17:43:23 2017	1.31	
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17.09.1-ce	19e2cf6	go1.8.3	Thu Dec 7 22:25:03 2017	1.32	
17.12.0-ce	c97c6d6	go1.9.2	Wed Dec 27 20:12:46 2017	1.35	
18.03.0-ce	0520e24	go1.9.4	Wed Mar 21 23:13:03 2018	1.37	
18.03.1-ce	9ee9f40	go1.9.5	Thu Apr 26 07:23:58 2018	1.37	
18.06.0-ce	0ffa825	go1.10.3	Wed Jul 18 19:10:42 2018	1.38	
18.06.1-ce	e68fc7a	go1.10.3	Tue Aug 21 17:25:29 2018	1.38	
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18.06.3-ce	d7080c1	go1.10.3	Wed Feb 20 02:28:17 2019	1.38	
18.09.0	4d60db4	go1.10.4	Wed Nov 7 00:19:08 2018	1.39	1.2.0
18.09.1	4c52b90	go1.10.6	Wed Jan 9 19:06:30 2019	1.39	1.2.0
18.09.2	6247962	go1.10.6	Sun Feb 10 03:47:25 2019	1.39	1.2.0
18.09.3	774a1f4	go1.10.8	Thu Feb 28 06:02:24 2019	1.39	1.2.0
19.03.0	aeac9490dc	go1.12.5	Wed Jul 17 18:14:16 2019	1.40	1.2.2
19.03.1	74b1e89	go1.12.5	Thu Jul 25 21:19:36 2019	1.40	1.2.2
19.03.2	6a30dfc	go1.12.8	Thu Aug 29 05:27:34 2019	1.40	1.2.4
19.03.3	a872fc2f86	go1.12.10	Tue Oct 8 00:56:46 2019	1.40	1.2.4
19.03.4	9013bf583a	go1.12.10	Fri Oct 18 15:50:54 2019	1.40	1.2.4
19.03.5	633a0ea	go1.12.12	Wed Nov 13 07:24:18 2019	1.40	1.2.4
19.03.6	369ce74a3c	go1.12.16	Thu Feb 13 01:28:07 2020	1.40	1.2.4
19.03.7	7141c199a2	go1.12.17	Wed Mar 4 01:22:45 2020	1.40	1.2.4
19.03.8	afacb8b	go1.12.17	Wed Mar 11 01:25:42 2020	1.40	1.2.4
19.03.9	9d988398e7	go1.13.10	Fri May 15 00:24:05 2020	1.40	1.2.4
19.03.10	9424aeaee9	go1.13.10	Thu May 28 22:16:43 2020	1.40	1.2.4
19.03.11	42e35e61f3	go1.13.10	Mon Jun 1 09:12:26 2020	1.40	1.2.4
19.03.12	48a66213fe	go1.13.10	Mon Jun 22 15:45:28 2020	1.40	1.2.4
19.03.13	4484c46d9d	go1.13.15	Wed Sep 16 17:02:21 2020	1.40	1.2.4
19.03.14	5eb3275d40	go1.13.15	Tue Dec 1 19:19:17 2020	1.40	1.2.4
19.03.15	99e3ed8919	go1.13.15	Sat Jan 30 03:16:33 2021	1.40	1.2.4
20.10.0	eeddea2	go1.13.15	Tue Dec 8 18:56:55 2020	1.41	1.4.3
20.10.1	f001486	go1.13.15	Tue Dec 15 04:35:42 2020	1.41	1.4.3
20.10.2	8891c58	go1.13.15	Mon Dec 28 16:16:13 2020	1.41	1.4.3
20.10.3	46229ca	go1.13.15	Fri Jan 29 14:32:37 2021	1.41	1.4.3
20.10.4	363e9a8	go1.13.15	Thu Feb 25 07:04:45 2021	1.41	1.4.3
20.10.5	363e9a8	go1.13.15	Tue Mar 2 20:32:17 2021	1.41	1.4.3
20.10.6	8728dd2	go1.13.15	Fri Apr 9 22:43:57 2021	1.41	1.4.3
20.10.7	b0f5bc3	go1.13.15	Wed Jun 2 11:56:35 2021	1.41	1.4.3
20.10.8	75249d8	go1.16.6	Fri Jul 30 19:54:13 2021	1.41	1.4.3
20.10.9	79ea9d3	go1.16.8	Mon Oct 4 16:06:37 2021	1.41	1.4.3

Docker	Git commit	Go	Build date	API	containerd
20.10.10	e2f740d	go1.16.9	Mon Oct 25 07:43:13 2021	1.41	1.4.3
20.10.11	847da18	go1.16.9	Thu Nov 18 00:37:17 2021	1.41	1.4.3
20.10.12	459d0df	go1.16.12	Mon Dec 13 11:44:05 2021	1.41	1.4.3
20.10.13	906f57f	go1.16.15	Thu Mar 10 14:08:16 2022	1.41	1.4.3
20.10.14	87a90dc	go1.16.15	Thu Mar 24 01:48:24 2022	1.41	1.4.10
20.10.15	4433bf6	go1.17.9	Thu May 5 13:15:18 2022	1.41	1.4.10
20.10.16	f756502	go1.17.10	Thu May 12 09:18:08 2022	1.41	1.4.10

Note: Docker version 1.13.1 is provided by Docker. Docker version 1.13.1-63 is provided by CentOS, and is broken and NOT supported by Altair Grid Engine!

- CentOS 8, Kernel 4.18.0-305.17.1.el8_4.x86_64

Docker	Git commit	Go	Build date	API	containerd
19.03.13	4484c46d9d	go1.13.15	Wed Sep 16 17:01:11 2020	1.40	1.3.7
19.03.14	5eb3275d40	go1.13.15	Tue Dec 1 19:18:24 2020	1.40	1.3.7
19.03.15	99e3ed8919	go1.13.15	Sat Jan 30 03:15:19 2021	1.40	1.3.7
20.10.0	eeddea2	go1.13.15	Tue Dec 8 18:57:25 2020	1.41	1.4.3
20.10.1	f001486	go1.13.15	Tue Dec 15 04:32:21 2020	1.41	1.6.4
20.10.2	8891c58	go1.13.15	Mon Dec 28 16:15:09 2020	1.41	1.6.4
20.10.3	46229ca	go1.13.15	Fri Jan 29 14:31:25 2021	1.41	1.4.3
20.10.4	363e9a8	go1.13.15	Thu Feb 25 07:02:50 2021	1.41	1.3.7
20.10.5	363e9a8	go1.13.15	Tue Mar 2 20:15:27 2021	1.41	1.3.7
20.10.6	8728dd2	go1.13.15	Fri Apr 9 22:43:02 2021	1.41	1.3.7
20.10.7	b0f5bc3	go1.13.15	Wed Jun 2 11:54:48 2021	1.41	1.3.7
20.10.8	75249d8	go1.16.6	Fri Jul 30 19:52:00 2021	1.41	1.3.7
20.10.9	79ea9d3	go1.16.8	Mon Oct 4 16:06:48 2021	1.41	1.3.7
20.10.10	e2f740d	go1.16.9	Mon Oct 25 07:41:17 2021	1.41	1.3.7
20.10.11	847da18	go1.16.9	Thu Nov 18 00:35:20 2021	1.41	1.3.7
20.10.12	459d0df	go1.16.12	Mon Dec 13 11:43:44 2021	1.41	1.3.7
20.10.13	906f57f	go1.16.15	Thu Mar 10 14:05:59 2022	1.41	1.3.7
20.10.14	87a90dc	go1.16.15	Thu Mar 24 01:46:10 2022	1.41	1.3.7
20.10.15	4433bf6	go1.17.9	Thu May 5 13:14:10 2022	1.41	1.3.7
20.10.16	f756502	go1.17.10	Thu May 12 09:15:41 2022	1.41	1.3.7

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

Docker	Git commit	Go	Build date	API	containerd
1.12.0	8eab29e	go1.6.3	Thu Jul 28 22:11:10 2016	1.24	
1.12.1	23cf638	go1.6.3	Thu Aug 18 05:33:38 2016	1.24	
1.12.2	bb80604	go1.6.3	Tue Oct 11 18:29:41 2016	1.24	
1.12.3	6b644ec	go1.6.3	Wed Oct 26 22:01:48 2016	1.24	
1.12.4	1564f02	go1.6.4	Tue Dec 13 00:08:34 2016	1.24	

Docker	Git commit	Go	Build date	API	containerd
1.12.5	7392c3b	go1.6.4	Fri Dec 16 02:42:17 2016	1.24	
1.12.6	78d1802	go1.6.4	Tue Jan 10 20:38:45 2017	1.24	
1.13.0	49bf474	go1.7.3	Tue Jan 17 09:58:26 2017	1.25	
17.03.0-ce	3a232c8	go1.7.5	Tue Feb 28 08:01:32 2017	1.26	
17.03.1-ce	c6d412e	go1.7.5	Mon Mar 27 17:14:09 2017	1.27	
17.03.2-ce	f5ec1e2	go1.7.5	Tue Jun 27 03:35:14 2017	1.27	
17.06.2-ce	cec0b72	go1.8.3	Tue Sep 5 19:59:11 2017	1.30	
17.09.0-ce	afdb6d4	go1.8.3	Tue Sep 26 22:40:56 2017	1.32	
17.09.1-ce	19e2cf6	go1.8.3	Thu Dec 7 22:23:00 2017	1.32	
17.12.0-ce	c97c6d6	go1.9.2	Wed Dec 27 20:09:53 2017	1.35	
18.03.0-ce	0520e24	go1.9.4	Wed Mar 21 23:08:31 2018	1.37	
18.03.1-ce	9ee9f40	go1.9.5	Thu Apr 26 07:15:30 2018	1.37	
18.06.0-ce	0ffa825	go1.10.3	Wed Jul 18 19:09:05 2018	1.38	
18.06.1-ce	e68fc7a	go1.10.3	Tue Aug 21 17:23:21 2018	1.38	
18.06.2-ce	6d37f41	go1.10.3	Sun Feb 10 03:46:30 2019	1.38	
18.06.3-ce	d7080c1	go1.10.3	Wed Feb 20 02:26:20 2019	1.38	
18.09.0	4d60db4	go1.10.4	Wed Nov 7 00:16:44 2018	1.39	1.2.0
18.09.1	4c52b90	go1.10.6	Wed Jan 9 19:02:44 2019	1.39	1.2.0
18.09.2	6247962	go1.10.6	Sun Feb 10 03:42:13 2019	1.39	1.2.2
18.09.3	774a1f4	go1.10.8	Thu Feb 28 05:59:55 2019	1.39	1.2.2
19.03.0	aeac949	go1.12.5	Wed Jul 17 18:14:42 2019	1.40	1.2.2
19.03.1	74b1e89e8a	go1.12.5	Thu Jul 25 21:20:09 2019	1.40	1.2.2
19.03.2	6a30dfc	go1.12.8	Thu Aug 29 05:26:54 2019	1.40	1.2.2
19.03.3	a872fc2	go1.12.10	Tue Oct 8 00:58:28 2019	1.40	1.2.2
19.03.4	9013bf583a	go1.12.10	Fri Oct 18 15:52:23 2019	1.40	1.2.2
19.03.5	633a0ea838	go1.12.12	Wed Nov 13 07:48:43 2019	1.40	1.2.2
19.03.6	369ce74a3c	go1.12.16	Thu Feb 13 01:26:38 2020	1.40	1.2.2
19.03.7	7141c199a2	go1.12.17	Wed Mar 4 01:21:22 2020	1.40	1.2.2
19.03.8	afacb8b7f0	go1.12.17	Wed Mar 11 01:24:30 2020	1.40	1.2.2
19.03.9	9d988398e7	go1.13.10	Fri May 15 00:24:07 2020	1.40	1.2.2
19.03.10	9424aeaee9	go1.13.10	Thu May 28 22:15:37 2020	1.40	1.2.2
19.03.11	42e35e61f3	go1.13.10	Mon Jun 1 09:11:15 2020	1.40	1.2.2
19.03.12	48a66213fe	go1.13.10	Mon Jun 22 15:44:20 2020	1.40	1.2.2
19.03.13	4484c46d9d	go1.13.15	Wed Sep 16 17:01:30 2020	1.40	1.2.2
19.03.14	5eb3275d40	go1.13.15	Tue Dec 1 19:18:49 2020	1.40	1.2.2
19.03.15	99e3ed8919	go1.13.15	Sat Jan 30 03:15:33 2021	1.40	1.2.2
20.10.0	eeddea2	go1.13.15	Tue Dec 8 18:57:46 2020	1.41	1.4.3
20.10.1	f001486	go1.13.15	Tue Dec 15 04:32:57 2020	1.41	1.4.3
20.10.2	8891c58	go1.13.15	Mon Dec 28 16:15:23 2020	1.41	1.4.3
20.10.3	46229ca	go1.13.15	Fri Jan 29 14:31:47 2021	1.41	1.4.3
20.10.4	363e9a8	go1.13.15	Thu Feb 25 07:03:05 2021	1.41	1.4.3
20.10.5	363e9a8	go1.13.15	Tue Mar 2 20:16:12 2021	1.41	1.4.3
20.10.6	8728dd2	go1.13.15	Fri Apr 9 22:45:24 2021	1.41	1.4.6
20.10.7	b0f5bc3	go1.13.15	Wed Jun 2 11:54:58 2021	1.41	1.4.6

- Uuntu 16.10, kernel 4.8.0-59-generic x86_64

Docker	Git commit	Go	Build date	API	containerd
1.13.0	49bf474	go1.7.3	Tue Jan 17 10:05:19 2017	1.25	
17.03.0-ce	3a232c8	go1.7.5	Tue Feb 28 08:05:01 2017	1.26	
17.03.1-ce	c6d412e	go1.7.5	Mon Mar 27 17:17:43 2017	1.27	
17.03.2-ce	f5ec1e2	go1.7.5	Tue Jun 27 03:59:22 2017	1.27	

- Ubuntu 17.04, kernel 4.10.0-42-generic x86_64

Docker	Git commit	Go	Build date	API	containerd
17.09.0-ce	afdb6d4	go1.8.3	Tue Sep 26 22:41:24 2017	1.32	
17.12.0-ce	c97c6d6	go1.9.2	Wed Dec 27 20:09:19 2017	1.35	

- Ubuntu 17.10, kernel 4.13.0-19-generic x86_64

Docker	Git commit	Go	Build date	API	containerd
17.06.2-ce	cec0b72	go1.8.3	Tue Sep 5 19:57:44 2017	1.30	
17.09.0-ce	afdb6d4	go1.8.3	Tue Sep 26 22:41:24 2017	1.32	
17.09.1-ce	19e2cf6	go1.8.3	Thu Dec 7 22:23:07 2017	1.32	
17.12.0-ce	c97c6d6	go1.9.2	Wed Dec 27 20:09:47 2017	1.35	

- Ubuntu 18.04, kernel 4.15.0-24-generic x86_64

Docker	Git commit	Go	Build date	API	containerd
17.12.0-ce	c97c6d6	go1.9.2	Wed Dec 27 20:09:47 2017	1.35	
18.03.0-ce	0520e24	go1.9.4	Wed Mar 21 23:08:36 2018	1.37	
18.03.1-ce	9ee9f40	go1.9.5	Thu Apr 26 07:15:45 2018	1.37	
18.06.1-ce	e68fc7a	go1.10.3	Tue Aug 21 17:23:15 2018	1.38	
18.06.2-ce	6d37f41	go1.10.3	Sun Feb 10 03:46:20 2019	1.38	
18.06.3-ce	d7080c1	go1.10.3	Wed Feb 20 02:26:34 2019	1.38	
18.09.0	4d60db4	go1.10.4	Wed Nov 7 00:16:44 2018	1.39	1.6.4
18.09.1	4c52b90	go1.10.6	Wed Jan 9 19:02:44 2019	1.39	1.6.4
18.09.2	6247962	go1.10.6	Sun Feb 10 03:42:13 2019	1.39	1.2.2
18.09.3	774a1f4	go1.10.8	Thu Feb 28 05:59:55 2019	1.39	1.2.2
19.03.0	aeac949	go1.12.5	Wed Jul 17 18:13:43 2019	1.40	1.2.2
19.03.1	74b1e89	go1.12.5	Thu Jul 25 21:19:41 2019	1.40	1.2.2
19.03.2	6a30dfc	go1.12.8	Thu Aug 29 05:27:45 2019	1.40	1.2.2
19.03.3	a872fc2f86	go1.12.10	Tue Oct 8 00:58:31 2019	1.40	1.2.2
19.03.4	9013bf583a	go1.12.10	Fri Oct 18 15:52:40 2019	1.40	1.2.2
19.03.5	633a0ea838	go1.12.12	Wed Nov 13 07:28:22 2019	1.40	1.2.2
19.03.6	369ce74a3c	go1.12.16	Thu Feb 13 01:26:21 2020	1.40	1.2.2
19.03.7	7141c199a2	go1.12.17	Wed Mar 4 01:21:08 2020	1.40	1.2.2
19.03.8	afacb8b7f0	go1.12.17	Wed Mar 11 01:24:19 2020	1.40	1.2.2

Docker	Git commit	Go	Build date	API	containerd
19.03.9	9d988398e7	go1.13.10	Fri May 15 00:23:50 2020	1.40	1.2.2
19.03.10	9424aeaee9	go1.13.10	Thu May 28 22:15:20 2020	1.40	1.2.2
19.03.11	42e35e61f3	go1.13.10	Mon Jun 1 09:10:54 2020	1.40	1.2.2
19.03.12	48a66213fe	go1.13.10	Mon Jun 22 15:44:07 2020	1.40	1.2.2
19.03.13	4484c46d9d	go1.13.15	Wed Sep 16 17:01:06 2020	1.40	1.2.2
19.03.14	5eb3275d40	go1.13.15	Tue Dec 1 19:18:45 2020	1.40	1.2.2
19.03.15	99e3ed8919	go1.13.15	Sat Jan 30 03:15:20 2021	1.40	1.2.2
20.10.0	eeddea2	go1.13.15	Tue Dec 8 18:57:44 2020	1.41	1.6.4
20.10.1	f001486	go1.13.15	Tue Dec 15 04:32:40 2020	1.41	1.6.4
20.10.2	8891c58	go1.13.15	Mon Dec 28 16:15:09 2020	1.41	1.6.4
20.10.3	46229ca	go1.13.15	Fri Jan 29 14:31:25 2021	1.41	1.6.4
20.10.4	363e9a8	go1.13.15	Thu Feb 25 07:03:17 2021	1.41	1.6.4
20.10.5	363e9a8	go1.13.15	Tue Mar 2 20:16:00 2021	1.41	1.6.4
20.10.6	8728dd2	go1.13.15	Fri Apr 9 22:44:13 2021	1.41	1.6.4
20.10.7	b0f5bc3	go1.13.15	Wed Jun 2 11:54:48 2021	1.41	1.6.4
20.10.8	75249d8	go1.16.6	Fri Jul 30 19:52:16 2021	1.41	1.6.4
20.10.9	79ea9d3	go1.16.8	Mon Oct 4 16:06:34 2021	1.41	1.6.4
20.10.10	e2f740d	go1.16.9	Mon Oct 25 07:41:06 2021	1.41	1.6.4
20.10.11	847da18	go1.16.9	Thu Nov 18 00:35:16 2021	1.41	1.6.4
20.10.12	459d0df	go1.16.12	Mon Dec 13 11:43:36 2021	1.41	1.6.4
20.10.13	906f57f	go1.16.15	Thu Mar 10 14:05:41 2022	1.41	1.4.10
20.10.14	87a90dc	go1.16.15	Thu Mar 24 01:45:46 2022	1.41	1.4.10
20.10.15	4433bf6	go1.17.9	Thu May 5 13:17:24 2022	1.41	1.4.10
20.10.16	f756502	go1.17.10	Thu May 12 09:15:33 2022	1.41	1.4.10

- Ubuntu 18.10, kernel 4.18.0-15-generic x86_64

Docker	Git commit	Go	Build date	API	containerd
18.06.0-ce	0ffa825	go1.10.3	Wed Jul 18 19:07:56 2018	1.38	
18.06.1-ce	e68fc7a	go1.10.3	Tue Aug 21 17:23:15 2018	1.38	
18.06.2-ce	6d37f41	go1.10.3	Sun Feb 10 03:46:20 2019	1.38	
18.06.3-ce	d7080c1	go1.10.3	Wed Feb 20 02:26:34 2019	1.38	
18.09.0	4d60db4	go1.10.4	Wed Nov 7 00:16:44 2018	1.39	1.2.0
18.09.1	4c52b90	go1.10.6	Wed Jan 9 19:02:44 2019	1.39	1.2.2
18.09.2	6247962	go1.10.6	Sun Feb 10 03:42:13 2019	1.39	1.2.2
18.09.3	774a1f4	go1.10.8	Thu Feb 28 05:59:55 2019	1.39	1.2.2
19.03.0	aeac9490dc	go1.12.5	Wed Jul 17 18:13:27 2019	1.40	1.2.2
19.03.1	74b1e89	go1.12.5	Thu Jul 25 21:19:53 2019	1.40	1.2.2

- Ubuntu 20.04, kernel 5.4.0-104-generic x86_64

Docker	Git commit	Go	Build date	API	containerd
19.03.9	9d988398e7	go1.13.10	Fri May 15 00:23:53 2020	1.40	1.3.7
19.03.10	9424aeaee9	go1.13.10	Thu May 28 22:15:24 2020	1.40	1.3.7
19.03.11	42e35e61f3	go1.13.10	Mon Jun 1 09:11:07 2020	1.40	1.3.7
19.03.12	48a66213fe	go1.13.10	Mon Jun 22 15:44:15 2020	1.40	1.3.7
19.03.13	4484c46d9d	go1.13.15	Wed Sep 16 17:01:20 2020	1.40	1.3.7
19.03.14	5eb3275d40	go1.13.15	Tue Dec 1 19:18:53 2020	1.40	1.3.7
19.03.15	99e3ed8919	go1.13.15	Sat Jan 30 03:15:30 2021	1.40	1.3.7
20.10.0	eeddea2	go1.13.15	Tue Dec 8 18:57:45 2020	1.41	1.4.3
20.10.1	f001486	go1.13.15	Tue Dec 15 04:32:52 2020	1.41	1.4.3
20.10.2	8891c58	go1.13.15	Mon Dec 28 16:15:19 2020	1.41	1.4.3
20.10.3	46229ca	go1.13.15	Fri Jan 29 14:31:32 2021	1.41	1.4.3
20.10.4	363e9a8	go1.13.15	Thu Feb 25 07:03:23 2021	1.41	1.4.3
20.10.5	363e9a8	go1.13.15	Tue Mar 2 20:16:15 2021	1.41	1.4.3
20.10.6	8728dd2	go1.13.15	Fri Apr 9 22:45:28 2021	1.41	1.4.3
20.10.7	b0f5bc3	go1.13.15	Wed Jun 2 11:54:50 2021	1.41	1.4.3
20.10.8	75249d8	go1.16.6	Fri Jul 30 19:52:33 2021	1.41	1.4.3
20.10.9	79ea9d3	go1.16.8	Mon Oct 4 16:06:37 2021	1.41	1.4.3
20.10.10	e2f740d	go1.16.9	Mon Oct 25 07:41:08 2021	1.41	1.4.3
20.10.11	847da18	go1.16.9	Thu Nov 18 00:35:15 2021	1.41	1.4.3
20.10.12	459d0df	go1.16.12	Mon Dec 13 11:43:42 2021	1.41	1.4.3
20.10.13	906f57f	go1.16.15	Thu Mar 10 14:05:44 2022	1.41	1.4.3
20.10.14	87a90dc	go1.16.15	Thu Mar 24 01:45:53 2022	1.41	1.6.4
20.10.15	4433bf6	go1.17.9	Thu May 5 13:17:28 2022	1.41	1.6.4
20.10.16	f756502	go1.17.10	Thu May 12 09:15:28 2022	1.41	1.6.4

- Ubuntu 21.10

Docker	Git commit	Go	Build date	API	containerd
20.10.10	e2f740d	go1.16.9	Mon Oct 25 07:42:04 2021	1.41	1.4.11
20.10.11	847da18	go1.16.9	Thu Nov 18 00:35:27 2021	1.41	1.4.11
20.10.12	459d0df	go1.16.12	Mon Dec 13 11:43:41 2021	1.41	1.4.11
20.10.13	906f57f	go1.16.15	Thu Mar 10 14:05:51 2022	1.41	1.4.11
20.10.14	87a90dc	go1.16.15	Thu Mar 24 01:45:56 2022	1.41	1.4.11
20.10.15	4433bf6	go1.17.9	Thu May 5 13:17:13 2022	1.41	1.4.11
20.10.16	f756502	go1.17.10	Thu May 12 09:15:33 2022	1.41	1.4.11

- Ubuntu 22.04

Docker	Git commit	Go	Build date	API	containerd
20.10.13	906f57f	go1.16.15	Thu Mar 10 14:05:38 2022	1.41	1.5.10
20.10.14	87a90dc	go1.16.15	Thu Mar 24 01:45:38 2022	1.41	1.5.10
20.10.15	4433bf6	go1.17.9	Thu May 5 13:19:15 2022	1.41	1.5.10
20.10.16	f756502	go1.17.10	Thu May 12 09:16:22 2022	1.41	1.5.10

- openSUSE Leap 42.3, kernel 4.4.92-31-default x86_64

Docker	Git commit	Go	Build date	API	containerd
1.12.0	8eab29e	go1.6.3		1.24	
1.12.1	23cf638	go1.6.3		1.24	
1.12.2	bb80604	go1.6.3		1.24	
1.12.3	6b644ec	go1.6.3		1.24	
1.12.4	1564f02	go1.6.4	Mon Dec 12 23:41:28 2016	1.24	
1.12.5	7392c3b	go1.6.4	Fri Dec 16 02:24:38 2016	1.24	
1.12.6	78d1802	go1.6.4	Tue Jan 10 20:20:13 2017	1.24	
1.13.0	49bf474	go1.7.3	Tue Jan 17 10:00:08 2017	1.25	
17.03.0-ce	60ccb22	go1.7.5	Thu Feb 23 10:55:03 2017	1.26	
17.03.1-ce	c6d412e	go1.7.5	Fri Mar 24 00:53:12 2017	1.27	
17.09.1-ce	f4ffd25	go1.8.7	Tue Jun 12 12:05:08 2018	1.32	

3.1 Known Docker Issues that Affect Altair Grid Engine

- With Docker 17.09.0-ce and Docker 17.12.0-ce, specifying the **–oom-kill-disable** switch has no effect when using the **docker** command-line client, and also has no effect when using the **-xd "–oom-kill-disable"** switch of the Altair Grid Engine submit clients.

4 Supported and Tested DCGM Versions

Altair Grid Engine 8.7.0 supports the following versions of NVIDIA's Data Center GPU Manager (DCGM):

Altair Grid Engine Version	Supported DCGM Version
8.6.0 to 8.6.14	1.3.3 to 1.7.2
8.6.15 to 8.6.18	1.5.6 to 2.2.9
8.6.19	1.5.6 to 2.4.5
8.7.0 or higher	1.5.6 to 2.4.5

Newer DCGM versions may work with Altair Grid Engine without any problems, but they have not been tested and are not officially supported.

Please note: Due to an issue in libdcgm.so, DCGM versions 2.0.13, 2.0.15 and 2.1.4 might cause sge_execd to crash when DCGM_PORT is set. The issue has been fixed in DCGM version 2.1.7.

5 Unisight

Unisight 4.7.0, compatible with Altair Grid Engine 8.7.0 and higher is now available for customers who use Unisight with Univa Grid Engine. Please contact

age-navops-support@altair.com

for more information on downloading the software.

6 Fixes and Enhancements

6.1 Major Enhancements

6.1.1 Re-scheduling of Advance and Standing Reservations

With the introduction of the qralter command in Altair Grid Engine 8.6.0, it became possible to modify all attributes of an advance or standing reservation. Modifying resource requests or the calendar for advance or standing reservations requires re-scheduling of the AR/SR. In Altair Grid Engine 8.6.x re-scheduling is only possible if there are no jobs running in the AR/SR.

Beginning with Altair Grid Engine 8.7.0 it is possible to configure detaching of jobs from advance/standing reservations to allow re-scheduling; see the sge_conf(5) man page, in the section about qmaster_param AR_DETACH_JOBS_ON_RESCHEDULE.

6.1.2 Support for NVIDIA Multi Instance GPUs (MIG)

Altair Grid Engine 8.7.0 adds support for NVIDIA Multi Instance GPUs (MIG). MIG devices must be configured with the tools provided by NVIDIA (e.g. `nvidia-smi`) and can then be used in Altair Grid Engine like physical GPUs. For more information on how to configure and use MIG devices in see the `sge_nvidia(5)` man page.

Note: The load value `m_gpu` shows only the number of physical GPUs and does not include MIG devices.

6.1.3 GPU Load Values via NVIDIA Management Library (NVML)

Altair Grid Engine 8.7.0 uses the NVIDIA Management Library (NVML) to query and report GPU -specific load values. The integration of NVML is enabled by default and replaces the cuda_load_sensor that was shipped with previous versions of Altair Grid Engine. The use of NVML in Altair Grid Engine can be disabled by setting the execd_param `NVML_LIBRARY_PATH` to `none` (see `sge_conf(5)`).

For a list of available load values see `sge_nvidia(5)`.

6.1.4 cgroups Memory Usage Values

Altair Grid Engine 8.7.0 is able to collect memory usage values via cgroups. When cgroups are enabled and the cgroups param `m_mem_free_hard` or `m_mem_free_soft` is set to `true`, Altair Grid Engine will collect usage values for jobs with `m_mem_free` request. The following usage values are shown in in `qstat -j <job_id>` and `qacct -j <job_id>`:

value	qstat -j	qacct -j	description
failcnt	X	X	Number of memory limit hits
memsw.failcnt	X	X	Number of memory and swap limit hits
usage_in_bytes	X		Current usage of memory

value	qstat -j	qacct -j	description
memsw.usage_in_bytes	X		Current usage of memory and swap
max_usage_in_bytes		X	Maximum recorded memory usage
memsw.max_usage_in_bytes		X	Maximum recorded memory and swap usage

In Altair Grid Engine 8.7.2 two additional memory usage values have been added:

value	qstat -j	qacct -j	description
cgroups_memory	X		cgroups memory value calculated from memory.stat as total_active_anon + total_inactive_anon + total_unevictable
max_cgroups_memory	X	X	The maximum of of cgroups_memory

The collection of cgroups usage values is enabled by default and can be disabled by setting the execd_param `ENABLE_CGROUPS_USAGE_VALUES` to `false`.

On some systems the `memsw.*` load values are not available by default and swap accounting has to be enabled. On Ubuntu this can be done by changing `GRUB_CMDLINE_LINUX_DEFAULT` in `/etc/default/grub`:

```
GRUB_CMDLINE_LINUX_DEFAULT="cgroup_enable=memory swapaccount=1"
```

The `memsw.*` load values should be visible after `sudo update-grub` and rebooting the host.

6.1.5 Reporting of rss and maxrss Job Usage Values

To have the job usage values rss and maxrss reported the execd_param ENABLE_MEM_DETAILS=TRUE had to be specified in earlier Altair Grid Engine versions.

Beginning with Altair Grid Engine 8.7.2 rss and maxrss are reported by default (if the underlying OS supports these usage values).

6.1.6 GPU Usage Reporting and Accounting

Altair Grid Engine 8.7.0 allows collection of GPU usage values via NVIDIA Data Center GPU Manager (DCGM). When DCGM is installed on a host and support for DCGM is enabled in the execution daemon, GPU usage values of jobs running on that host are automatically collected. The usage values can be displayed in qstat (see sge_conf(5), `gpu_job_usage`) and they can be written to the accounting record of the job (see sge_conf(5), `gpu_job_accounting`).

For a list of available usage values and possible configurations see sge_nvidia(5).

Please note that due to limitations in DCGM, GPU usage is currently not reported for jobs using a NVIDIA Multi-Instance GPU (MIG). This feature will be added to Altair Grid Engine as soon as it is available in DCGM. For further information contact age-navops-support@altair.com or the NVIDIA Support and mention NVIDIA Bug ID 3690884.

6.1.7 Parallel Task-specific Queue and Resource Requests

With Altair Grid Engine 8.7.0 it is now possible to define separate resource and queue requests for ranges of parallel tasks (PE tasks) of a parallel job. For this, the submit command line option `-petask` was introduced; this specifies that all queue or resource requests following this option shall be applied for the ranges of parallel tasks which are specified with this option. It is still possible to define resource and queue requests for the whole job or for all parallel tasks without separate resource and queue requests. See the `submit(1)` man page for details.

This option extends the functionality of the old `-masterl` and `-masterq` options to all tasks of a parallel job. The old `-masterl` and `-masterq` options are still available, but are now mere synonyms to `-petask 0 -l` and `-petask 0 -q`.
The behaviour was changed a bit, however:
In previous Altair Grid Engine versions, the Scheduler tried hard to find a host and queue for the controller task that did not obstruct scheduling the agent tasks. Because this would be too much effort now, the controller task is simply sent to the first suitable host and queue, and from there on in sort order, the agent tasks are sent to the following hosts and queues.

If the requests for controller and agent tasks are disjoint but the allocation rule forces agent tasks onto the same host as the controller task, the job cannot be scheduled. To allow the job to be still scheduled, previous Altair Grid Engine versions automatically added one task to the number of requested tasks for which the allocation rule was ignored, and used this as a controller task. The automatic adding was confusing and has now been disabled. Instead a means was introduced to explicitely specify that the controller task should not be scheduled according to the allocation rule of the parallel environment of the job; instead it should be scheduled to a separate host. This can be enforced using the option combination `-petask 0 -par 1` which specifies that the allocation rule of the parallel environment should be overwritten by the allocation rule "1" for the controller task only.
Normally, the `-par` option can be applied for the whole task only; this is the only exception from that rule. The rule can be applied only for the controller task and only with allocation rule "1".

Scheduling to parallel environments defining **job_is_first_task=FALSE** was also changed. When **job_is_first_task** is set to **FALSE** in the parallel environment granted to the job, the job script (and its child processes) are considered only to start the parallel program, are not part of the parallel program itself, are not considered to consume a significant amount of CPU time, and therefore no slot is granted to the job script. Because of this the job gets one task more than requested while the number of slots occupied by the job is equal to the number of requested tasks. Even so, it is possible to define separate resource requests for each individual task, so with **job_is_first_task** set to **FALSE**, the ID of the last PE task is equal to the number of requested PE tasks for this job. When **job_is_first_task** is set to TRUE, the ID of the last PE task is one less than the number of requested PE tasks for this job.
In many cases it should not be necessary to use **job_is_first_task=FALSE** any more; it is recommended to identify these cases and switch to **job_is_first_task=TRUE** for them! See `sge_pe(5)` for more details.

See the man pages `ar_submit(1)`, `sge_types(1)`, `submit(1)`, `sge_job_class(5)`, `sge_jsv(5)` and `sge_pe(5)` for more details.

See section "Known Issues" for a list of known issues with parallel task-specific queue and resource requests.

6.1.8 Integration of the Altair License Management System with Altair Grid Engine

Altair Grid Engine 8.7.0 introduces a licensing mechanism that is linked to the Altair license services; this mechanism allows fine-grained resource usage reporting. License consumption information is available for the the main cluster component (sge_qmaster) for the current point in time and for the past, beginning when Altair Grid Engine 8.7.0 was installed or when an upgrade to that version was made.

The new license consumption reporting allows Altair Grid Engine to check out Altair network licenses; these licenses are maintained by the Altair license server. Altair Grid Engine consumes a certain amount of feature licenses dependent on the number of CPUs and GPUs available in the cluster.

Altair Grid Engine checks for license violations at regular time intervals (every 90 seconds); the system sends notifications when license violations occur, and provides actions to solve those violations.

For details see the Altair Grid Engine Administrator's Guide->Special Activities->Integrating Altair Grid Engine with a License Management System.

6.1.9 Upgrade to Portable Hardware Locality (hwloc) 2.3

Altair Grid Engine 8.7.0 uses Portable Hardware Locality (hwloc) version 2.3 instead of 1.11.10. The upgrade has been done due to increased performance and stability of hwloc 2.X. No changes to the cluster or its hosts are required to use the new version of the library.

6.1.10 New qmaster_params parameter ENABLE_SUBMIT_LIB_WARNING

With Altair Grid Engine 8.7.1 a new *qmaster_params* parameter was introduced. The ENABLE_SUBMIT_LIB_WARNING parameter can be used to define if the removal of potentially harmful environment variables like e.g. LD_LIBRARY_PATH specified with the "-v" or "-V" flags at job submission should result in a warning message in the submit client output. The default behavior to print out the warning has been removed and can be enabled again when using this parameter.

6.1.11 Builtin support for I/O profiling using Breeze and Mistral

Altair Grid Engine 8.7.2 introduces an option to enable collection of I/O performance measurements for AGE jobs using Altair's I/O profiling products, Breeze and Mistral. This can be enabled using execd_params, "AGE_BREEZE_MODE" and "AGE_MISTRAL_MODE" and other respective params for Breeze and Mistral installation and license paths. Please refer to man pages `sge_conf(5)` and `submit(1)` for detailed list of configuration parameters.

This version of integration is only supported on Linux 64 and 32 bit execution hosts (and Breeze profiling, only for binary batch jobs).

When both Breeze and Mistral are enabled, profiling only happens using Breeze.

More information can be found in the section "Upgrade Notes".

6.1.12 Plugin for RStudio Workbench

The RStudio AGE Launcher (rstudio-AGE-launcher) plugin is introduced from Altair Grid Engine 2022.1.0 (8.7.2). This plugin supports the backward compatiblity to work with the earlier versions of Altair Grid Engine. This plugin is a glue to interconnect the Grid Engine cluster with the RStudio Workbench. This allows the developers to connect with Grid Engine cluster for running RStudio sessions and launcher jobs from the web interface of RStudio Workbench. The details of configuration and administration of the plugin is available in the seperate document of AdminsGuideRStudioAGE. The details of running RStudio sessions and launcher jobs is available in the seperate document of UsersGuideRStudioAGE.

6.1.13 GPU Auto-Configuration

A new script `setup_gpu.sh` was added to the `util` directory in Altair Grid Engine 8.7.2. This script helps configuring GPUs in the Altair Grid Engine cluster by analysing the output of `qconf -se` of each host and creating example/default configurations for hosts with GPUs. More information on configuring GPUs in Altair Grid Engine and on using the script can be found in the sge_nvidia(5) man page and in the output of `setup_gpu.sh -help`.

Please note that the cluster must be running when the script is executed and that currently only NVIDIA GPUs are supported.

6.1.14 GraphQL Web API

A new experimental Web API has been added to the Altair Grid Engine `sge_qmaster` which supports GraphQL based queries and mutations.

It can be enabled at installation time, see Install Guide -> Installing with the Command-Line Installation Script.

For enabling it in an existing installation, see Admin Guide -> Enabling GraphQL Web API.

Documentation on how to use is in the new GraphQL Guide.

6.1.15 New execd_params parameter LOG_PDC_TIME

With Altair Grid Engine 8.7.3 a new *execd_params* parameter was introduced. The LOG_PDC_TIME parameter can be used to profile the time needed for parsing memory usage values from the /proc file system on the execution daemon hosts. (See sge_conf(5) man page).

6.2 Full List of Fixes and Enhancements

6.2.1 8.7.0

```
GE-2209  more than one -b not always accepted
GE-2218  Add new option -name to uidgid binary to return username
GE-3271  use syslog during the time where components would normally log
```

```
         into log files located in /tmp
GE-3838  add "how to configure the Windows host" to the "Preparing
         Windows Hosts" section of the installation guide
GE-3867  "-pty no" in $SGE_ROOT/$SGE_CELL/common/sge_request file is
         ignored by qlogin
GE-3894  cleaning up job runtime files, using linux namespaces
GE-3938  Man page sge_priority needs prio/pprio clarity
GE-3942  qmon man page refers to schedd_conf(5)
GE-3946  Explain priority normalization and fix issues with sge_priority
         man page
GE-4020  getservbyname segfaults when called with wrong amount of arguments
GE-4257  In man page for sge_conf and sge_execd, correct/add
         load_report_time references
GE-4258  define the units of variables in sge_conf man page
GE-4340  enable -V switch for qrsh (without command) and qlogin command
GE-4378  Respect better parsing for admin user in bootstrap file
GE-4381  Enhance error message logging for flat file spooling
GE-4391  add more information about the importance of the gid range to
         the install guide
GE-4399  scheduler should skip hosts which cores are all occupied by
         core-bound jobs for non-core bound jobs
GE-4402  SGE_DRMAA_ENABLE_ERROR_STATE variable is not documented
GE-4454  The sge_priority man page has a typo regarding prior calculation
GE-4457  log hostname, IP and PORT of qmaster and execd in message files
GE-4458  allow specification of terabytes and petabytes for memory values
GE-4469  Need clear description how to handle certificates within AGE CSP
         installations
GE-4495  load_values can be added for complex resources that do not exist
GE-4504  Upon deletion of Complexes that have load_values present, clear
         out the associated load_values
GE-4575  deleting array tasks can block qmaster for a significant time
GE-4796  Make it possible to declare that a loadsensor attribute is
         static in the same way as *arch* and a few others.
GE-5125  Add addition information in man page for qsub
GE-5257  Customer would like back the -binding option for qlogin
GE-5305  jsv does not recognize -now switch
GE-5306  jsv(1) man page should document complete stdin/stdout protocol
GE-5319  Zero RSMAP consumable request exports SGE_HGR env variable with
         next free element from RSMAP
GE-5346  qdel <jobid> -t <taskid> deletes complete job
GE-5364  RQS wrongly prevents a job from being scheduled
GE-5513  "The filename or extension is too long" error when creating
         job process on native Windows (win-x86)
GE-5688  Clarify description in queue_conf man page section about
         RESOURCE LIMITS
GE-5698  enable native Windows (win-x86) to use CSP mode
GE-5713  Need to have specific reasons for the failure of job be stated
         in the accounting.
GE-5730  support AGE on IBM Power 9 architecture on Linux (lx-ppc64le)
```

```
GE-5790  Implement a means to change the requested resources of AR, even
         if the AR is already submitted
GE-5791  add new cgroups based memory reporting to the accounting file
GE-5801  Windows (win-x86) qloadsensor.exe doesn't recognize if execd is
         killed or crashed
GE-5805  Provide limit to 'exit 99' re-scheduling attempts
GE-5809  wrong error messages if RSMAP complexes are defined for queues
GE-5826  port RESTRING matching to native Windows (win-x86)
GE-5837  Create complete documentation for JAVA and C DRMAAv2.0 APIs
GE-5839  Provide a method for REGEX matching on strings longer than 2048
         characters
GE-5891  incorrect values in inst_execd.sh file
GE-5900  qmaster rejects job without message on client side when jc now
         TRUE is set
GE-5912  comma-separated userset-lists are not accepted
GE-5942  qstat (-r) -ext and qstat (-r) -ext -xml do not show any
         information about start / submit time
GE-5996  "qstat -s z" displays confusing output when finished_jobs !=0
GE-6019  Improve error logging of native win-x86 RedirectStdHandles()
         function
GE-6041  When adding a message (-msg "") and disabling all queue instances
         on a host only one instance shows the message
GE-6053  for docker jobs need to create additional binds
GE-6078  Messages stored for queue instances (qmod -msg) are not deleted
         when host is removed from queue
GE-6091  qsub to use advance reservation by name instead of id
GE-6151  job error mail not helpful because error message is cut off
GE-6199  commlib should log in the messages files any resolving change
         of a used host
GE-6207  qstat -j<multiple_job_ids> prints all reservation times of all
         jobs for every job
GE-6222  Starter Service of native Windows (win-x86) fails to start
         second execd if the first cannot be started
GE-6223  add check to native Windows (win-x86) installer if an execd is
         already installed to the same $SGE_CELL or uses the same port
GE-6224  Document: adding job shares (-js) moves job ahead of all other
         jobs in functional policy
GE-6226  the native Windows (win-x86) execution daemon doesn't report
         m_cores, m_sockets and m_threads
GE-6235  Provide a way to change execd startup behaviour -> infinite
         connection retries
GE-6263  Job hold state cannot be changed through JSV
GE-6377  Move libdrmaa.so to own separate lib directory
GE-6451  sge_do_log() function doesn't try to write a panic file if
         logging to the messages file is not possible
GE-6457  log full communication between shepherd and Docker daemon to
         the shepherd trace file
GE-6473  sge_share_mon issues
GE-6486  UC: make granted resource requests available in accounting and
```

```
         reporting file
GE-6512  implement a way to suppress the user switch inside docker images
         for docker jobs
GE-6525  document exit status (of intermediate accounting records) and
         failed field in reporting(5)  and accounting(5)
GE-6584  mem_free should be allowed to increase even for running jobs
GE-6592  add per thread monitoring to commlib
GE-6593  sge_execd hangs,  jobs stay in t state
GE-6645  add -a <execution_time> time stamp to accounting/reporting record
GE-6650  Make GPU affinity manually configurable
GE-6651  Add support for DCGM configuration changes
GE-6652  Implement DCGM callbacks in case of GPU failures
GE-6653  Use DCGM to provide additional information about GPU usage of jobs
GE-6654  Perform health checks of GPUs before assigning them
GE-6672  execd_params S_DESCRIPTORS cannot be increased to values > 65535
GE-6700  low m_mem_free load values prevent job dispatching
GE-6717  argument of "-hold_jid" to be added to accounting file
GE-6723  qstat -explain m -xml does not show Administrator message
GE-6730  pe scheduling: accept first possible assignment
GE-6731  pe scheduling: accept up to n soft violations
GE-6732  pe scheduling: accept suboptimal assignment if dispatching
         already took a configurable amount of time
GE-6733  pe scheduling: additional algorithm for PE_SORT_ORDER
GE-6740  the configuration parser cannot handle white spaces before and
         after configuration values
GE-6745  UC: add a way to allow user to specify resource requests on pe
         task basis
GE-6749  "qstat -s r" is broken for array jobs with suspended tasks
GE-6750  "qdel -s r" is broken for array jobs with suspended tasks
GE-6751  qalter -clearp and -clears doesn't delete "hold_jid" attributes
GE-6760  document that additional group ids (ENABLE_SUP_GRP_EVAL=1) cannot
         be used to determine department membership
GE-6769  qstat -flt project <projectID> also shows job in qw without
         filtering the projectID
GE-6789  qstat -q filter broken for project jobs if queue has projects
         list set to NONE
GE-6801  accounting man page field description is wrong for "wallclock"
GE-6802  job are handled as still running, even if all processes are
         already stopped
GE-6805  incorrect booking of consumables results in scheduling errors
         and massive error logging
GE-6809  Could not edit non reserved complex when advance reservation
         with pe is running
GE-6830  enable RSMAP placeholders to be resolved for -masterl requests
GE-6844  analyze logging '"context" of "all.q" is empty -
         Adding new element(s).'
GE-6848  qconf -sds should also show cluster queues that have no queue
         instances
GE-6863  job with -pty yes failed if output was directed to folder with
```

```
         permission 754
GE-6865  queue instances in alarm state are not considered for resource
         reservation
GE-6890  for Docker jobs and execd spooling on root_squash too many files
         have write permissions for others
GE-6896  qconf -me parser allows to define a RSMAP twice which cause
         sequential errors
GE-6950  A Docker job requesting duplicate mount points sets the host in
         error state
GE-6958  execd should also cleanup dockers cgroups dir inside cgroups uge
         jobs dir if not done by docker
GE-6962  Put all remaining array job tasks into hold state instead of
         queue into E state
GE-6963  disallow built-in share-tree usage values as complex attributes
GE-6978  cgroup leaves orphan processes after qdel if the job is submitted
         within an tightly integrated openmpi
GE-6984  config-api package is unusable and its doc is not clear about
         install/build
GE-6986  Jobs which request binding that can be fulfilled by fewer RSMAP
         ids do net get any Ids assigned
GE-6990  DRMAA2 Python binding to support customer workflow
GE-7011  reserve resources regardless of complex definition of an AR
GE-7023  add cgroup memory values to online usage
GE-7028  Completed job remains in dr state and is not cleaned up at execd
GE-7030  XOR RSMAP request syntax rejected in JCs
GE-7033  qrstat should show the submission commandline
GE-7034  add the -par submit option also to the AR submission
GE-7036  more info on qmaster message log when -tcon yes for non array job
GE-7055  Support docker run --env option by qsub -xd for docker job
GE-7059  qsub job verification "-w e" is executed before server side JSV
GE-7087  quota keeps the limit of complex although qalter release resources
GE-7088  add a CLIENT_COMMAND parameter to JSV
GE-7089  support bulk changes for exec host and project objects
GE-7096  support for nvidia-docker 2.0
GE-7137  qstat -q filter seems to be broken, when job requests RSMAP
GE-7142  qstat -j shows env=NONE for jobs submitted with variable
         without value (-v var=)
GE-7174  support bulk changes for all configuration objects
GE-7209  named pipe execd-shepherd file descriptor leak
GE-7212  upgrade to hwloc 2.x
GE-7236  The fields noted in the reporting man page do not match up with
         the colon separated fields in the reporting file
GE-7238  display granted RSMAP ids and granted devices in qacct
GE-7243  man page qsub -P description incorrect
GE-7253  errors with consumable capacity management after "qalter -when now"
         or after reduction of capacity
GE-7266  update openssl library to most current version for Windows
GE-7268  projects & xprojects fields in execution host configuration,
         not allowing comma separated values
```

```
GE-7271  support to set "loglevel" in local cluster configuration
GE-7276  JOB consumable on global host level prevents regular job
         dispatching for those resources
GE-7285  Make python-JSV work with version 2 and 3
GE-7287  event handler callback functions fail after QMaster restart
GE-7290  qconf -sconf requires manager privileges
GE-7310  ensure compatibility with  DCGM versions up to 1.4.6
GE-7323  sgepasswd tool enhancement or change of behaviour
GE-7325  output of memory information is broken on lx-amd64
GE-7328  qstat -r is showing wrong values for requsted resources
GE-7332  pending job with "-tcon y" and "-t" prevents other jobs from
         running
GE-7335  execd crash due to expand_path ~ instead of ~/
GE-7336  typos in AdminsGuideGE, chapter 3.9.5, Tuning the sge_shadowd
GE-7337  -xd --shm-size doesn't work correctly
GE-7343  add a commlib parameter not to do hostname resolving but parse
         the ip address out of the hostname
GE-7345  lothread should wait for lodail to be ready before sending
         state changes
GE-7348  optimize commlib nameservice lookup cache
GE-7351  sge_shepherd stays running if Docker job is deleted
GE-7352  qalter -rdi y prints wrong message if schedd_job_info is
         turned off
GE-7359  More information in qmaster message log when job requests an
         invalid host
GE-7362  Document RSMAPs in man-pages and Usersguide, including their
         request-syntax
GE-7365  RSMAP-request with XOR does not work when RSMAP is defined
         with a range
GE-7367  gdi_request_limits doesn't work as documented for qmod requests
GE-7370  support Docker up to version 18.06
GE-7373  formatting issues with some man pages
GE-7383  put all queue instances on host in error state on cgroups
         related errors
GE-7388  "commlib returns can't find connection" errors for "qsub -sync"
         jobs
GE-7390  qselect with RSMAPs returns no queues or strtok errors
GE-7391  PE slave tasks should be handled in own cgroups
GE-7395  SGE_HGR_TASK variable should also be exported for non PE jobs
GE-7401  Delete or modify operations might have failed although command
         line client returned success.
GE-7404  cgroups based devices blocking does not block all devices
GE-7407  timer for job cleanup of tightly integrated job not setup on
         qmaster restart
GE-7408  timeout handler for cleanup of tightly integrated job must
         request global lock
GE-7409  no setup of queued signal handler for jobs at qmaster restart
GE-7410  no error message if qselect is used with -l without a value
GE-7412  qmaster is not accepting new RW requests
```

GE-7414 SGE_HGR_TASK_ variable is exported for jobs that request RSMAPs as soft request, but do not get any
GE-7415 need changes in spooling format for correct cleanup of tightly integrated job on qmaster restart
GE-7418 added more logging information for job report handling
GE-7421 prevent win-x86 job processes from running away by working around the Windows Job Object race condition
GE-7423 reaching reschedule limit for job crashes qmaster
GE-7426 Limiting m_mem_free with cgroups wrong with masterl-request
GE-7429 qmaster crash in commlib
GE-7434 Use OOM Notification API in Cgroups implementation to notify when jobs exceed memory
GE-7438 frequent logging of "deletion of one or more tasks skipped for job..." in qmaster messages file
GE-7440 add support for -umask switch to qrsh
GE-7442 jobs get RSMAP id assigned if -l rsmap=0 is requested
GE-7443 'sgeexecd stop' fails if corresponding host is no admin host
GE-7447 rpm package ugerest openjdk dependency fails
GE-7450 qmon does not show qinstances anymore
GE-7454 Allow a job to identify how often the job was executed in the past
GE-7455 rescheduling: rerun_limit does not work with "exit 99"
GE-7458 Docker jobs are not rescheduled on exit 99
GE-7462 qconf -Ae <directory> failed with internal error messages
GE-7468 RQS report value double than what actual usage
GE-7469 Unable to edit queue slots configuration using qconf -dattr
GE-7475 enhance monitoring information of reader thread that does event processing
GE-7476 sge_get_config_version_for_host() does hostname resolving which can be avoided
GE-7480 remove hadoop package from the distribution
GE-7481 Combine processor reports and exec host load reports
GE-7482 handle permission check GDI requests in listener thread.
GE-7483 add a possibility to give manager requests higher priority
GE-7484 RSMAP on global host breaks all RSMAPs
GE-7486 optimize performance of exec host deletion
GE-7487 use sge_mutex_lock instead of pthread_mutex_lock in all modules used by sge_qmaster
GE-7489 improve performance for qmod -rq
GE-7490 new added execution hosts not handling reschedule_unknown setting
GE-7492 bad dispatching rate with many big array jobs in a huge cluster
GE-7495 rescheduling of sequential jobs unnecessarily creates timer events
GE-7496 enable cgroups based killing for PE tasks
GE-7497 improve scheduling time for clusters having slots defined on exec host level
GE-7499 shepherd should not be part of the memory Cgroup
GE-7501 Job classes do not allow to specify umask for output and error files
GE-7502 add scheduler param to supress sending of running job tickets

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GE-7503  improve general rescheduling performance
GE-7504  improve reschedule_unkown triggered rescheduling behavior on
         massive execution host lost
GE-7505  add additional worker pool that allows to handle priority requests
GE-7506  improve performance of adding large number of execution hosts
GE-7509  queue initial_state=disabled should not disable queue after
         qmaster restart/migration
GE-7511  newline in jsv_add_env function let qsub crash
GE-7513  unexpected logging: invalid task number 0 for job ... in
         "ORT_ptickets" order
GE-7517  queue is set in error state if Docker daemon is overloaded
GE-7519  execd might not always send a load report within configured
         load_report_time
GE-7520  unexpected connection renewal of execution daemons
GE-7528  qconf -si sid is ignored if not used as first switch
GE-7537  Implement general way to deactivate reporting of load-values
GE-7540  jobs do not get the correct binding if affinity is requested and
         the affinity mask is overwritten with a topology mask
GE-7541  Docker: automatically add user's supplementary groups to
         -xd --group-add
GE-7546  job cleanup problem for PE jobs at execution daemon
GE-7550  do not report m_mem_free_nX/m_mem_used_nX as load values
GE-7553  SR in error state because past SR instance is in "E" state
GE-7556  implement deadlock detection for sge_qmaster daemon
GE-7558  sub-cgroup feature
GE-7565  JSV: Need general solution for newline input by user
GE-7572  Docker background process doesn't allow to exit a interactive job
GE-7573  qstat shows device id twice if two RSMAPs are mapped to the
         same device
GE-7574  concurrent array jobs (-tcon yes) get partially started when
         the number of running tasks exceeds maxujobs
GE-7580  cgroup directory of docker job remains although job finished
GE-7581  PE job with consumable HOST request doesn't get correct resources
         if max_reservation is greater than 0
GE-7586  qmaster becomes unresponsive and needs 100% CPU after qralter
GE-7587  Fix spelling errors in AdminGuide
GE-7592  ensure compatibility with DCGM versions up to 1.5.6
GE-7593  Enable monitoring and deadlock detection for all platforms
GE-7595  standing reservation id restarts at 0 after modifying resource
         requests with qralter
GE-7596  docker -xd command can't export multiple values
GE-7597  resources held by a standing reservations are not properly freed
         when the complex_values of the queue are modified
GE-7598  Docker jobs set queue instance in error because permission to
         write pe_hostfile is denied
GE-7606  ./inst_sge -copycerts <hostlist> command line parsing not correct
GE-7621  qmod message is cleared when any change is made to queue.
GE-7623  wrong debiting of consumables with consumable type HOST
GE-7624  support Docker up to version 18.09
```

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GE-7626  consumable records in the reporting file end with a delimiter
GE-7631  Docker -xd doesn't work for --sysctl option
GE-7639  qmaster crashes in scheduler thread in scheduler_method()
GE-7640  queue instance stays in orphaned state forever after non-admin
         user forced job deletion
GE-7641  newlines in qmaster messages file after hold modifications breaks
         file format
GE-7642  improve 'denied: host "host" is no admin host' qmaster message
GE-7643  improve 'denied: "user" must be manager for this operation'
         qmaster message
GE-7645  job killed by cgroups limit results in  zero values for  ru_*
         usage fields
GE-7646  job killed by cgroup OOM notification is pending in "E" state
GE-7648  provide job "failed" reason in DRMAAv1 and DMRAAv2
GE-7656  need parameter to enable qmaster abort() when a deadlock was
         detected
GE-7657  improve deadlock detection reliability
GE-7664  qloadsensor exe reports wrong core counts
GE-7667  starting Windows (win-x86) GUI jobs without letting them show
         the GUI on the visible desktop does not work
GE-7673  RQS computes double usage for RSMAPs of type HOST for PE jobs
GE-7674  placeholder '$' character can't work with double quote("") unlike
         described in the manual
GE-7693  re-schedule standing reservations without allocation or being in
         error state
GE-7697  it is possible to remove a host exclusive consumable from a host
         which is referenced in an AR
GE-7698  rqs: wildcard projects with at least two different limits crashed
         qmaster
GE-7702  even if it is already installed, native Windows installer always
         asks for SGE admin user password to install the windows starter
         service
GE-7704  make sure libxml2.dll exists on native Windows exec host
GE-7705  port work binary to native Windows (win-x86)
GE-7707  SGE_BINDING env variable can be overwritten by shell
GE-7710  leak in Job Starter Service causes start failures of some jobs
GE-7720  active SR stays in "E" state after qmaster restart even after
         all execds reconnect
GE-7724  not all markdown man pages are part of the packages
GE-7726  "context" in queue instance remains when queue message gets
         deleted or host removed from queue
GE-7728  qstat -j fails when no scheduler thread is running
GE-7737  qalter -when now might break EXCLusive consumable functionality
GE-7748  formatting issue makes subordinate example impossible to read
GE-7750  synchronize execd signaler thread with execd main thread
GE-7759  drmaa2 error: smallest event number n is greater than number 1
         I'm waiting for
GE-7763  allow system to work with unsupported new Docker versions
GE-7766  jobs with topology/affinity mask and -binding request may not
```

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         be scheduled correctly
GE-7767  wrong accounting exit_status=52 if failed=52 due to cgroups
         killing API support
GE-7769  provide transactional trigger to update host_aliases file
GE-7770  ensure RHEL 8 support for AGE
GE-7778  start interactive jobs in a way that exported $PATH gets not
         overwritten
GE-7783  remote automatic execd uninstallation starts itself infinitely
         on remote hosts
GE-7787  force use of lower case hostnames
GE-7790  drmaa2 python crash qmaster
GE-7791  $PATH set twice in environment prohibits qrsh jobs with (t)csh
         as login shell to find commands
GE-7793  pattern matching for hostnames in qsub is broken
GE-7797  drmaaV2-python JobSession example job submission crashes qmaster
GE-7799  provide work/example binary for jobs that use GPUs
GE-7801  update info about cuda loadsensor in documentation
GE-7802  tasks of pe job running under allocation rule $pe_slots are
         scheduled to two different hosts
GE-7815  Change AGE pdf documents to standard Altair font and some typos
         found during review.
GE-7816  XOR RSMAP request issues cause jobs staying pending
GE-7820  add information about multiplier/shortcut to RSMAP man pages
         and documentation
GE-7821  add man page for NVIDIA related features
GE-7822  sge_shepherd is burning 100% cpu when running an IJS job
GE-7824  drmaa2-python pypi package support
GE-7828  remove usermappings.5 man page from distribution
GE-7829  shortened command header and version string in man pages lost
GE-7830  rename section 5 man pages consistently
GE-7831  remove qtcsh.1 and qtask.5 man page from distribution
GE-7832  installation fails when service names are used for qmaster and
         execd ports
GE-7837  Job Category causes scheduler to ignore scheduling an eligible job
GE-7838  if "schedd_job_info = if_requested" "qstat -j" should not print
         global scheduling messages
GE-7840  document syntax of RSMAP XOR in sge_resource_map(5) and sge_types(1)
GE-7842  inst_sge -bup does not backup Windows specific files
GE-7847  Unable to stop the SGE Exec Daemon using 'sgeexecd stop'
GE-7848  qconf accepts invalid values for boolean parameters
GE-7849  add additional GPU usage values per job to accounting
GE-7851  Man page names are incorrectly referenced and need to be aligned
GE-7852  duplicate ids in CUDA_VISIBLE_DEVICES
GE-7853  allow native Windows (win-x86) work.exe binary to fork itself
GE-7854  the names of cuda load values delivered via dcgm shouldn't contain
         the host name
GE-7855  useless profiling output in qmaster messages file
GE-7856  -tc doesn't limit the number of tasks with MIN_PENDING_ENROLLED_TASKS
GE-7858  Introduce new config parameter "max_aj_[q|t]fail_hold" and job
```

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         fields for job error counter
GE-7859  Docker interactive job creates infinite shepherd logging and
         huge trace file
GE-7860  ALLOW_ANY_SUBMITHOSTS=TRUE as qmaster_param should allow
         submission from any host independent of the defined submit hosts
GE-7865  drmaa v1 example code showing wrong include path
GE-7866  commandline and build instructions for drmaa v1 c code is wrong
GE-7867  man page shows default value for finished_jobs setting of 100
GE-7868  sge_qmaster crashes when qalter -w p is used
GE-7870  support SLES 15
GE-7872  qalter and qmod job changes are not logged in reporting file
GE-7874  m_mem_free memory limit might not work if hostname resolving
         differs on execd hosts
GE-7876  scheduling information in qstat refers to RQS limit rules
         although job does not at all fit that rule
GE-7896  Greedy Resource Reservation is reserving nodes that are not
         available
GE-7899  provide profiling about jemalloc memory allocation and heap size
GE-7905  qmaster got stalled four minutes after reinitialization of
         the scheduler
GE-7911  qstat for ulx-x86 dumps core if used gcc is < 4.4.7
GE-7915  Create packages that contain the used open source code
GE-7917  timeouts due to small buffer causes getgrgid_r() errors with
         failing clients and job starts
GE-7920  no or misleading error message when SGE_ROOT is not set
GE-7921  execd for arch=sol-x86 cannot connect in csp mode
GE-7922  Legacy queue Sequence Number is not working using the Admin doc
         suggested config
GE-7924  qconf -Ace/-ace might fail if the attributes are in the wrong
         order
GE-7926  Config API does not support setting 'affinity' on complex
         resources
GE-7927  PE AR does not reserve the correct amount of HOST consumables
GE-7930  qalter / qconf segmentation fault at client setup errors
GE-7932  ability to suppress resolving/sending of additional group ids
         by client commands
GE-7933  make config-api compatible with python3
GE-7935  loadcheck truncates m_topology after 100 characters
GE-7941  loadcheck binary does not show the same DCGM load values as
         qconf -se
GE-7943  update jemalloc to current version 5.2.1
GE-7948  update documentation about consumables in usage_weight_list
GE-7949  upgrade openssl-1.1.0h to openssl-1.1.1d for current product
         releases
GE-7957  Removing queue entries with "qconf -purge" not working for not
         resolveable hosts
GE-7958  add support for Docker 19.03
GE-7960  qrsh_starter might crash because it does not init thread local
         monitoring setup
```

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GE-7962  uge_js_service.exe password failure behavior
GE-7969  sol-amd64 support on AMD Opteron Sun hardware broken
GE-7970  DCGM affinity/binding does not work if the qmaster is running
         on a host that is not lx-amd64
GE-7974  show in monitoring how long the global lock was held
GE-7975  improve profiling of worker threads
GE-7977  make warning time for host name resolving configurable
GE-7978  LOG_SPOOLING_TIME/LOG_REQUEST_PROCESSING time should always
         log as WARNING
GE-7979  Put all remaining array job tasks into hold state on job error
GE-7983  user share tree gives no tickets to jobs submitted in a project
GE-7989  deletion of jobs running on native Windows (win-x86) can take
         minutes
GE-7991  Message applied to a group of qinstances during a state change
         is only assigned to qinstances of one cqueue
GE-7995  man page formatting issues
GE-7997  soft requests are ignored for jobs requesting wildcard pes
GE-7998  GPU affinity is broken by server side JSV resource addition
GE-8006  have a means to limit the size of the submit_cmd written to
         accounting/reporting
GE-8008  segv of qconf when SGE_ROOT is not set
GE-8010  wrong scheduling decisions with -masterl switch and load values
GE-8015  openmpi.template has wrong defaults
GE-8018  Allow to disable qinstance access checks when jobs are submitted
GE-8020  Flexible PE Task Requests
GE-8031  qstat -flt accepts a list of projects/pes, but applies filter
         only with the first name in that list.
GE-8032  -masterl requests are taken into account host task times
         instead of one time
GE-8036  RQS "hosts" quotas not updated when hostgroups in a hostgroup
         are changed
GE-8037  enable schedd_runlog and debug tracing in Scheduler for a
         specific job only
GE-8043  "qconf -*attr" should deny to make operations on "context"
         attribute
GE-8044  do not resolve in clients AGE's additional group id's and
         definable ranges
GE-8045  improve profiling of qmaster threads and execd
GE-8050  automated backup creates files with ":", overwrites default
         and causes issues on Windows
GE-8051  qsub nested argument behavior changes
GE-8056  RSMAPs on global host are not assignment correctly if a job
         requests binding
GE-8058  disable topology masks for RSMAPs on global host
GE-8059  analyse sge_shepherd problems with static linked openssl libary
GE-8061  SGE_HGR_TASK_ is not set correctly for RSMAPs on global host
GE-8064  AdminsGuideGE.pdf 3.4.2 "Utilizing Queue Subordination" contains
         incorrect description
GE-8066  SHELL environment variable not set to login shell of user for
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         qrsh without command
GE-8070  pending array job with -hold_jid_ad dependency cannot be deleted
GE-8071  wrong or no reservation if all hosts/queues are blocked by an
         EXCL complex
GE-8073  missing usage and start/end time for docker jobs with h_rt limit
GE-8078  Optimize limit rule handling using ACLs
GE-8081  Split RQS events into RQS and RQS-Rule events in order to optimize
         memory requirements
GE-8086  UC: apply PE job master task limits for first slave task when
         job_is_first_task=false
GE-8087  incorrect scheduling/debiting of JOB consumables on global host
GE-8089  sge_shadowd is restarted by SMF service on term signal
GE-8091  cleanup SMF module
GE-8096  qacct -j <jobid> crashes on native Windows (win-x86)
GE-8103  requested resources are not freed after deleting a suspended job
GE-8116  do resource selection for PE jobs according to task specific
         resource requests
GE-8118  Show task specific requests in qstat
GE-8119  Show task assigned resources in qstat
GE-8121  Show task assigned resources in qrstat
GE-8122  Allow individual task specific requests in qmon
GE-8123  Export task specific resource assigment into the job environment
GE-8128  Export task related resource requests into the context of JSV
GE-8132  Enhance DRMAA2 to support task specific requests
GE-8134  Allow to access task requests via REST
GE-8135  Allow to access assigned resource information for task ranges
         via REST
GE-8136  Allow AR submission with task specific request via REST
GE-8137  Allow to access task requests in AR via REST
GE-8138  Allow to access AR assigned resource information for task
         ranges via REST
GE-8139  Make JC changes for petasks available in the configuration API
GE-8142  Handle upgrade for ARs
GE-8143  Handle upgrade for JCs
GE-8145  Do EC2 test run and scheduler tests
GE-8146  Optimize code according to performance tests for PE task
         specific requests
GE-8148  manual page changes for petask
GE-8149  Create VTH presentation for PE task requests
GE-8150  remove QLICSERVER howto from AdminsGuide because it is no
         longer supported
GE-8151  qstat -j does not show information about granted RSMAP parameter
GE-8152  forked processes (mailer, JSV, LS, License sensor) run by gid 0
GE-8154  add bulkops for all config objects to config-api
GE-8158  incorrect resource assignment with -masterl
GE-8162  resource debiting issues cause poor cluster utilization
GE-8163  update admin guide to document all qconf bulkops option changes
         and additions
GE-8166  PE job with -masterl request may not be scheduled if a complex
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         with consumable YES is requested
GE-8167  "qconf  -purge" not working on "context" attribute
GE-8168  complexes with consumable HOST are debited multiple times if
         a job runs in multiple queues on the same host
GE-8170  ensure compatibility with DCGM versions up to 1.7.2
GE-8171  resource diagram should also contain the current state of all
         RSMAP ids
GE-8187  remove info logging about CUDA runtime library
GE-8191  job deletion in qmaster ignores MAX_JOB_DELETION_TIME for not
         enrolled array task jobs
GE-8192  improve job array task deletion performance
GE-8194  pseudo environment variables replacement not working for qsub -e/-o
GE-8199  install script problems on solaris 10 hosts
GE-8200  RSMAP requests in job classes are not correctly displayed/spooled
GE-8202  task range compression improvement
GE-8203  Windows jobs show wrong error behaviour when sgepasswd entry
         is wrong
GE-8206  used_slots in PE may go up quickly and prevent job dispatching
GE-8209  unexpected logging of "commlib info: got read error (closing qmaster)"
         in qmaster messages file
GE-8218  wrong logging of job states in messages files
GE-8219  Indent implementation in sge_rmon_macros does not work correctly
GE-8220  warnings in responses from the Docker daemon to shepherd
         requests should be forwarded to the execd messages file
GE-8222  lothread restart or uge qmaster restart can result in jobs
         hanging in "l" state
GE-8229  in documentation fix formatting of tables listing complex
         variables
GE-8235  incorrect booking of resources in SRs
GE-8237  Support for kernel version 5
GE-8239  lothread does not cleanup license request under certain
         circumstances
GE-8241  global JOB consumable is ignored when a job with -masterl
         and -l request is submitted into an AR
GE-8242  resource diagram improvements
GE-8243  (implicit) -cal_jmp 0 ignored for SR creations
GE-8245  qrstat output issues
GE-8246  wrong timed_event thread error logging on AR rescheduling
GE-8247  qacct -q without -l request might report unexpected error
         logging
GE-8248  shepherd error on hosts with no suitable devices if cgroups
         parameter "devices" is defined
GE-8253  modifying the end time of a standing reservation can lead
         to unavailable resources
GE-8259  Submit man page refers to not existing UMASK parameter in
         configuration
GE-8260  umask specified during submission is neither visible in
         qstat -j nor in corresponding XML output.
GE-8263  qmaster does not ignore case in domain names - prevents
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         qmaster startup
GE-8264  problems with reporting "m_topology_inuse" via external
         load sensor
GE-8266  resource quotas are applied to jobs running in advance
         reservations
GE-8267  drmaa2-python library_manager.py popen
GE-8268  changes to local cluster configuration not sent to execd
GE-8269  per JOB consumable RSMAPs may cause dispatching and job
         execution issues
GE-8277  examples of qrstat output in documentation is incomplete
GE-8279  execd consumes much CPU if qmaster is not running
GE-8280  wrong behaviour for pending jobs if the consumable attribute
         of a RSMAP is changed
GE-8288  Add support for LMDB in AGE and LO
GE-8289  DB transaction errors with large read operations
GE-8290  incorrect spooling of qinstance on signalling of queue
GE-8292  qstat data transfer and qmaster size increasing
GE-8294  submit_cmd=NONE for DRMAAv2 Python jobs
GE-8298  add support for the Docker --gpus parameter
GE-8302  parsing issues with floating point numbers as RSMAP ids
GE-8305  make automatic adding of one task for the master task on
         disjoint requests configurable
GE-8308  add migrate_spooling.sh to common package
GE-8313  potential deadlock in LMDB
GE-8315  load value ignored when scheduling jobs
GE-8316  erratic performance of LMDB spooling when submitting huge
         numbers of jobs with big job script
GE-8318  add INFO logging when LMDB memory map is resized
GE-8322  at qmaster startup show info messages generated when
         initializing the spooling framework
GE-8328  qstat should show granted cuda ids
GE-8329  JSON output for qstat and qhost
GE-8330  native Windows (win-x86) shepherd crashes at the end of an
         qrsh job
GE-8333  "qconf -sep" and "qconf -sobjl exechost processors" not working
         due to missing load values
GE-8334  memory leaks in sge_execd with Docker installed
GE-8339  bound cpu info only spooled for classic spooling method
GE-8340  execd assumes exit of shepherd to already exited job - job
         stays forever "r"
GE-8347  compress objects before spooling
GE-8350  wrong DCGM job usage values for PE jobs
GE-8353  ensure compatibility with DCGM versions up to 2.0.10
GE-8354  introduce config modification time stamp
GE-8356  Quoting of command lines causes job start errors in (t)csh
GE-8357  qmaster segmentation fault
GE-8360  add support for Nvidia Multi-Instance GPUs
GE-8362  resource diagram doesn't show full queues
GE-8364  qhost -F shows wrong number of GPUs when MIG mode is enabled
```

GE-8365 Nvidia MIG instances cannot be created/changed when sge_execd is running
GE-8368 speed up parsing of large host_aliases file to improve client behavior
GE-8369 use cuda_id parameter to resolve GPU-RSMAPs for Docker jobs
GE-8372 Support Ubuntu 20.04 in Altair Grid Engine
GE-8379 modifying hostgroup objects used in queue configuration object can create unexpected queue instances
GE-8380 allow to configure a GPU UUID as RSMAP cuda_id
GE-8382 add Docker version as requestable load value
GE-8385 wrong RSMAP booking prevents job dispatching to available resources
GE-8387 installation with inst_sge failing on Ubuntu 20.04 hosts
GE-8389 Drop KNL and PHI support
GE-8404 execds need 5 minutes to reconnect after being suspended/clock changed
GE-8405 gpu job usage does not work with DCGM versions lower than 2.0.10
GE-8407 qrsh job is not scheduled immediately
GE-8409 errors in qmaster messages file with server-side JSV rejecting all jobs
GE-8414 install_qmaster with csp fails with permission denied errors while copying certificates
GE-8418 Add the ability to load configurations from directory for qconf -Mconf calls
GE-8424 wrong/misleading error message when cgroups devices can't be set correctly
GE-8427 qrsh -hold_jid returns error
GE-8436 Remove default rdescr element if there is no request
GE-8437 qrsh and qlogin reject "-dl" switch
GE-8444 support Docker 20.x and add logging about detected version
GE-8448 support multiple devices in RSMAP configuration
GE-8457 loadcheck binary should report the number of GPUs (m_gpu)
GE-8470 Fix wrong job state and status flag checking
GE-8472 ugerest sdk AttributeError: 'ClusterQueue' object has no attribute 'putTmpdir'
GE-8484 wrong m_mem_used and m_mem_free values on lx-arm64 hosts
GE-8490 improve thread startup performance
GE-8496 use NVML instead of DCGM to query static GPU load values
GE-8497 remove cuda_load_sensor from distribution
GE-8502 resource requests from different sources (sge_request file, job script, command line) are not combined
GE-8511 Python JSVs log files contain only one line
GE-8517 Implement "-petask 0 -par 1" to replace automatic task adding on disjoint requests
GE-8518 adapt job_is_first_task=false handling to per PE task request scheduler
GE-8519 adjust output of Resource Maps to new data structures
GE-8523 h_rt limit enforcement in Qmaster uses slave h_rt limits if there are master requests without h_rt request

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GE-8554  Python JSV log files will only contain information about the
         end time of JSV script instances
GE-8570  quotes not handled correctly for qrsh -inherit
GE-8604  Rest installation of Scenario 2 documentation should be checked
         fully if this works
GE-8616  own attribute for DCGM job usage in qstat -j
GE-8638  Show resource shortage within grace periods as well
GE-8640  update LMDB to current version 0.9.29
GE-8642  slow qmaster restart and RSMAP related error logging
GE-8645  duplicate hostgroups with > 100 characters in combination with
         changes to host aliases at qmaster startup
GE-8648  improve qconf -uha functionality
GE-8659  Tag in XML output for pe task specific ranges might be incorrect
GE-8660  Incorrect resource requests for specific PE tasks when ranges
         for different resource request types overlap within JCs
GE-8666  rename UGE_DCGM_PORT to DCGM_PORT
GE-8686  rqs_debit_rule_usage() does not handle dynamic rqs limit
         settings when just_verify is set
GE-8696  make "requestable" and "do_report" by default "yes" when creating
         new complex attribute
GE-8713  licensing emails go to admin user account, not administrator_mail
GE-8714  change subject of licensing emails
GE-8716  licensing expiry days do not go down, too frequent license
         logging
GE-8732  AGE/UGE system connected to LO might set execds to unknown
         state after network outage
UWSA-157 Job State can be stale until full job refresh
UWSA-176 clusterqueuesummary contains null entry when hostlist is NONE
         in queue
UWSA-198 Rest dies with segmentation fault
UWSA-204 ugerest startup script fails with ResourceBundle exception
UWSA-206 ugerest api is failing with TLS memory allocation error
UWSA-208 ugerest configuration is partially destroyed when running
         distinst
UWSA-209 add version functionality in the help menu
UWSA-210 libjgdi.so reports undefined symbol: rsmap_request_to_string
UWSA-211 load_values do not show up in uge rest api call exechosts/global
UWSA-216 Cannot view tasks in Rerun Queue (Rq) State
UWSA-219 Rest Stops Receiving Event Updates
UWSA-221 Rest start may not fail on existing "ugerest.pid" file if no
         running Java process
UWSA-222 Rest connection and shutdown issues
UWSA-223 Rest should not truncate /tmp/UGERestService0.0.log at startup
UWSA-224 Rest does not log its version information at startup
UWSA-230 Restarting Qmaster Breaks Synchronization With Rest
UWSA-231 Rest does not show job stat of PE job which run in multiple
         nodes
UWSA-233 Rest seems to crash regularly in a Navops Launch demo
         installation
```

```
UWSA-234 Restart issues when ugerest runs on non master host
UWSA-237 hostsummary doesn't show gc, hc values
UWSA-238 Documentation shows wrong URI path for exechosts endpoint
UWSA-239 Jobs in Eqw state are not returned in jobsummary rest call
UWSA-240 install_ugerest reports success even ugerest cannot start due
         to binding error
UWSA-243 Add Python 3 REST API endpoints
UWSA-249 Job Array Concurrency Value Not Available
UWSA-250 Provide the amount of pending tasks of an array job
UWSA-253 ugerest cannot convert events fast enough
UWSA-254 Automatic display of standard complex resource types in Rest
UWSA-257 Add support for Execution Time to Job Info
UWSA-258 Submission timestamp used as Execution timestamp
UWSA-259 Improve Rest memory usage
```

6.2.2 8.7.1

```
GE-7923  ulx case not included in the creation of settings
GE-8027  ability to suppress warning message when LD_PRELOAD/LD_LIBRARY_PATH
         is stripped at job submit
GE-8153  add uge_diag.sh to Grid Engine distribution
GE-8212  soft-requested non-existent Docker image puts queue and not job
         in errror state
GE-8262  qmake turns SGE_RREQ soft resource request into hard request and
         changes order
GE-8338  qsub -w e falsely rejects jobs submitted with "-binding" option
GE-8521  remove Greedy RR support
GE-8701  ensure AGE compatibility with DCGM versions up to 2.3.4
GE-8709  improve performance and memory usage of qstat -F, qstat -explain a
         and qhost -F
GE-8710  GPU jobs with -binding request are not scheduled
GE-8715  configurable LICENSE_MAIL qmaster_params
GE-8720  need error logging when not all required licenses could be checked
         out, need logging when shortage is over
GE-8737  wrong scheduling of RSMAPs and binding when allocation rule
         $fill_up is used
GE-8741  external usage of resources is not considered for resource
         reservation
GE-8744  SGE_HGR_TASK_ is not exported correctly when master_forks_slaves
         or daemon_forks_slaves is set to true
GE-8747  qconf -sconfld aborts
GE-8751  qconf -sconfld might not show all host configurations
GE-8753  fix EXCL requested per PE task
GE-8779  wrong device capabilities when --gpus is used
GE-8786  SGE_HGR_  exported value of RSMAPs is  limited to 1024 characters
GE-8789  qsub -w e does not work correctly when CONSIDER_LOAD_DURING_VERIFY
         is set
GE-8797  qmaster dumps core, when user list is changed
```

```
GE-8804  job submission with ambigous -petask range specification is not
         rejected
GE-8810  qconf -at / -kt exit 0 on error
GE-8814  reader thread pool will no longer get updated after qconf -kec 3
GE-8829  Docker placeholder resolving does not work for PE jobs
GE-8830  array task deletion leads to misleading "Invalid sge_strtok_r call,
         last is NULL" error logging
GE-8845  qstat -j does not show soft ranges correctly
GE-8846  Upgrade openssl-1.1.1* with latest openssl-1.1.1n
GE-8851  resource reservation for parallel jobs using allocation rule
         $fill_up or $pe_slots is broken
GE-8856  AR with project disappears after qmaster restart
UWSA-262 resource_descriptors entries get overwritten by last entry
UWSA-263 remove unused log4j configuration file from ugerest distribution
```

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```
GE-2359  -version switch for clients
GE-2786  Clients return unpredictable error message if qmaster is not
         available
GE-4239  Hosts disqualified for missing resources are not displayed in
         qalter -w p with PE job's
GE-7331  do not strip schedd_job_info output after 100 characters
GE-7884  New plugin for RStudio Workbench
GE-8550  adjust scheduler messages to -petask requests
GE-8588  bundle resource bookings to the same resource to a single operation
GE-8607  determine RSS from /proc/<pid>/stat on Linux by default
GE-8656  jsv_log_info does not log anymore
GE-8662  Suspending a job generates additional events
GE-8682  ensure "debited_resources" list is built correctly for parallel
         jobs with PE task specific requests
GE-8748  add CGROUPS based memory usage record to qstat and accounting
GE-8817  Allow shepherd to create cgroups even when memory subsystem is not
         mounted
GE-8828  qstat -s r -q all.q@notexistenthost returns all running jobs
GE-8842  Change GDI Session related Documentation (duration INFINITE)
GE-8843  scheduling info contains multiple lines for the same exceeded
         RQS limit
GE-8848  Make sure that sge_master binary is shipped only for architectures
         where Altair licensing is supported.
GE-8850  admin guide should mention new qconf options for complex variables -?ce
GE-8865  execution daemons crashing in path_alias_list_get_path
GE-8870  Remove duplicate entries for keys with unique hash
GE-8872  entry "NONE" in user group list
GE-8900  notify_tasker() rereads the job environment.
GE-8906  Upgrade openssl-1.1.1n with latest openssl-1.1.1o
GE-8923  shepherd trace file does not show which devices were added
         to the cgroup
```

```
GE-8925  Grid Engine shows a problem with -petask range with a step size set.
GE-8926  create RPM packages for Linux on ARM and PPC64LE
GE-8928  Review/rework the new user/admin guide for the RStudio/AGE integration
GE-8929  Add documentation for the AGE-Mistral/Breeze integration
GE-8934  Disable trace file output in shepherd in case of keep_active=false
GE-8935  Implement fixes for incorrect CULL_UNIQUE LISTDEF definitions for LO
GE-8937  preemption is broken and triggers wrong resource calculation
GE-8942  missing undebiting of temporary debiting causes resources to be
         overbooked which keeps PE jobs from being scheduled
GE-8948  ARCo: installation fails with "%" in DB password
GE-8949  ARCo: version string "UGE 8.7.0" printed "for AGE 8.7.1"
GE-8950  ARCo: GROUP BY SQL statement causes issues with current
         mySQL versions
GE-8952  ARCo: unsupported but still documented "log_consumables" parameter
GE-8953  ARCo: foreign key constraint error causes data loss and reporting
         file processing issues
GE-8954  ARCo: deprecated JDBC driver class loading causes warning messages
         at dbwriter startup
GE-8956  show GPU device path in loadcheck
GE-8963  add script to configure GPUs in AGE
GE-8964  Add the existing GraphQL Interface Documentation to AGE
GE-8969  qstat shows jobs staying unexpected long in "t" state
GE-8970  submit/start time is incorrect in qstat -ext
GE-8974  placeholder are broken for qrsh requesting gpus in a docker job
GE-8978  GPU affinity is not reported correctly on NVIDIA DGX hosts
GE-8983  jobs in t state for several minutes
GE-8989  dbwriter startup script does not work on shared file system
         installation due to missing $remote_fs dependency
GE-8995  Scheduler internal overbooking in case of resource reservation,
         $fill_up and PE task specific requests
GE-8997  inst_ugerest permission problem in /tmp
GE-8999  execd not sending load reports after restart of sge_qmaster daemon
GE-9001  Scheduler internal overbooking in case of resource quotas and
         global limits
GE-9003  Upgrade openssl-1.1.1o with latest openssl-1.1.1q
GE-9011  jobs requesting a resource map do not start despite enough
         resources being reported free
GE-9013  qstat -F <non existing complex> shows the values of *all*
         complex variables
GE-9018  qmaster messages file contains critical error logging
         "used=* > total=* of "*" on object "*" (job *)"
GE-9029  Clean up Introductory Guide
GE-9033  qalter -mods fails, crashes or returns unrelated qmaster internal strings
```

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```
GE-9059  hwloc reports wrong NUMA node which leads to incorrect cgroups binding
GE-9066  enabling GPU usage on a host without DCGM will cause the execd to crash
```

```
GE-9086  implement profiling for execd PDC/PTF
GE-9094  memory leak in sge_execd running jobs requesting core binding
GE-9079  api thread always shows http://... as URL even if https was configured
GE-9118  only one array task of PE job requesting core binding sent to host
```

7 Known Issues and Limitations

- GE-8839 “fix EXCL defined on queue level and requested per PE task”
  If an complex that uses the EXCL operattor is defined on queue level, it is not applied correctly if only specific PE tasks of a job request it.
- GE-8930 Improve Scheduler Messages Functionality Scheduler-created messages in the Qmaster messages file, in the scheduling info for a job in `qstat -j <jobid>` output, and in the output of `qalter -w p <jobid>` or `qalter -w e <jobid>` can contain unrelated entries and sometimes entries are missing.
- When a license is expired, the logging in Gridengine will contain an ambigous error message showing error code 9 and error description “Feature not found” along with the license path. The logging message will not contain a license expired message, currently. This is caused by a bug in the Altair License Manager toolkit and will be fixed in the next release of the toolkit.

8 Upgrade Notes

8.1 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 or Altair Grid Engine 8.X.X to Altair Grid Engine 8.7 when you are currently using classic or database spooling (PostgreSQL). 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 Altair Grid Engine in the Installation Guide.

Table 19: Upgrading from SGE, OGE, or Altair Grid Engine 8.X.X to Altair Grid Engine 8.6.X

Version	Upgrade Method
Altair Grid Engine 8.X.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

8.2 Changes for “ENABLE_SUBMIT_*” qmaster_params

The default behavior of showing warning messages that potentially harmful environment variables such as LD_LIBRARY_PATH or LD_PRELOAD was removed in the submit clients is disabled
with Altair Grid Engine 8.7.1 version. The potentially harmful environment variables are still removed but there will be no warning message anymore. In order to enable the warning message the *qmaster_params* parameter ENABLE_SUBMIT_LIB_WARNING was introduced. More information can be found in the sge_conf(5) man page for the parameter *ENABLE_SUBMIT_LIB_WARNING*.

8.3 Changes in the CSP Hashing Algorithms

Due to changes in the OpenSSL library, in version 1.1.0, hashing algorithms MD5 and SHA1 have been marked as weak. This breaks the backwards compatibility with certificates generated by older versions. Because of this, the situation may arise in a Altair Grid Engine cluster with CSP mode enabled where the daemons do not start and the following message is presented in the panic file (located in /tmp):

```
main|master01|E|commlib error: ssl error ([ID=336245134] in module "SSL routines": "ca md too
```

In order to get rid of this problem, the certificates used by CSP mode need to be renewed using appropriate hashing algorithms. This can be achieved using the script $SGE_ROOT/util/sgeCA/renew_all_certs.csh. When upgrading from a Altair Grid Engine release version prior to 8.6.X, it is recommended to run the $SGE_ROOT/util/sgeCA/renew_all_certs.csh script before starting the upgrade procedure.

9 Compatibility Notes

9.1 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 the current version of Altair Grid Engine, you need to convert your existing sgepasswd file during the upgrade procedure.

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

```
# sgepasswd -c
```

This will create a backup of your original 'sgepasswd' file named 'sgepasswd.old_algorithm_backup', and create the new compatible sgepasswd file. Otherwise encryption-related error messages may show up.

If you create a new sgepasswd file from scratch, no additional steps are required beyond those in previous versions.

9.2 Scheduler Log File

In previous versions of Altair Grid Engine, if both the master and some slave tasks of a parallel job were scheduled to the same queue instance, one line was written to the scheduler log file containing the number of slots that was granted to the job on the queue instance of the master task. Such a line looked like this:
249:1:STARTING:1522328357:2772638938:Q:B@host1:slots:3.00000

From Altair Grid Engine 8.6.0 on, two lines are written, one for the master task, and one for the slave tasks: 249:1:STARTING:1522328357:2772638938:Q:B@host1:slots:1.00000
249:1:STARTING:1522328357:2772638938:Q:B@host1:slots:2.00000

This is because of changed handling of the master task, which was necessary to fix GE-5888; see the "Fixes and Enhancements" section for details.

9.3 Removed Scheduler Parameter `queue_sort_method`

With the newly implemented affinity feature, the scheduler parameter `queue_sort_method` has been replaced with the new parameters `weight_host_sort`, `weight_queue_host_sort`, and `weight_queue_seqno`. Using these, it is possible not only to configure a queue sorting based solely on `seq_no` or on the `host_load_formula` as it was with `queue_sort_method`, but it is now also possible to configure a mixed sorting strategy where the amount of the weight-parameters decide the ratio in which they influence the sorting.

To configure what used to be `queue_sort_method = load`, one now has to set `weight_queue_seqno` to a significantly smaller number than `weight_queue_host_sort`. For `queue_sort_method = seq_no`, simply set `weight_queue_seqno` to a significantly higher value than `weight_queue_host_sort`.

9.4 Changes for qconf Exit States

The qconf command will no longer report an error when showing the content of empty configuration objects. If a configuration object contains no elements, the exit status of qconf will be 0 and there will be no error message. The change affects the following qconf command-line options:

- qconf -scall show a list of all calendar names
- qconf -sckptl show all ckpt interface definitions
- qconf -sconfl show a list of all local configurations
- qconf -sel show a list of all exec servers
- qconf -sh show a list of all administrative hosts
- qconf -shgrpl show host group list
- qconf -sjcl show job class list
- qconf -sm show a list of all managers
- qconf -so show a list of all operators
- qconf -spl show all parallel environments
- qconf -sprjl show a list of all projects
- qconf -sql show a list of all queues
- qconf -srqsl show resource quota set list
- qconf -ss show a list of all submit hosts
- qconf -sul show a list of all userset lists
- qconf -suserl show a list of all users

9.5 Changes for Scheduler Profiling

The scheduler profiling option is revised and cleaned up. The most important changes are:

- Enhanced sge_diagnostics man page with info about scheduler profiling
- The scheduler profiling table shows new profiling levels: “ticket calculation”, “scheduler thread”, “ssos init”, “config update”, “wait for order completion”, “mirror events” and “set event client params”.
- The scheduler profiling level “pending ticket calculation” was renamed to “priority calculation”.
- The scheduler profiling level “copy lists” was renamed to “data preparation”.
- The scheduler profiling level “scheduler” was renamed to “scheduling”.
- The scheduler profiling level “wait” was renamed to “waiting for events”.

9.6 Changed Limit Calculations

The resulting limit calculation is revised and fixed. The most important changes are:

- The configured consumable type (NO, YES, JOB, HOST) will have no influence on any resulting limit for tightly-integrated parallel jobs.
- The previous version calculated the resulting limits to be far to high (depending on PE and consumable settings)
- This also affects the cgroups `h_vmem` observation

Altair Grid Engine versions prior to 8.5.1 showed a limit value for limits such as `h_vmem` that was far too high. The limit adjustments are now adapted. A detailed overview of limit observation and how it works is described in the sge_diagnostics(1) man page (JOB LIMITS).

ATTENTION: When updating to 8.6.0 from a previous version, it is recommended to verify the used limit requests of your jobs. It might be necessary to change the request value. If the limit is set too low or adjusted to fit the old limit adjustment, jobs which were running fine might fail after installing this version.

9.7 New Default for Job Verification of DRMAA Submitted Jobs

In the past a job verification (-w e) was triggered for all jobs submitted via DRMAA. This had a negative performance impact on qmaster for all DRMAA-submitted jobs, which may also have had a negative impact on the cluster throughput. The verification default for DRMAA jobs has now been disabled (-w n) for Altair Grid Engine 8.6.0. Users who nevertheless want to have jobs verified can still enable this through the DRMAA native specification.

9.8 Default for Integer Complexes

Older Altair Grid Engine installations allowed requesting an integer complex resource during job submission without a requirement to specify the amount. Implicitly 1 was used when the amount of requested resources was omitted. This is not possible any longer beginning with 8.6.0.

9.9 Additional Configuration Options for Complexes

Beginning with Altair Grid Engine 8.7.0 there are two additional attributes for complex variables:

do_report allows configuring whether a load value is actually reported by Altair Grid Engine execd. This allows disabling the reporting of load values which are not actually required. When load sensors are used the resources reported by the load sensor must be defined as complex variables and do_report must be set to YES.

is_static specifies whether a load value is static (never or seldom changes, e.g. arch) or non-static (dynamically changes, e.g. np_load_avg). Static load values are spooled and are visible in qstat -F or qconf -se hostname even when an execd is down.

9.10 Deprecated Functionality

Greedy Resource Reservation is deprecated. Use regular Resource Reservation instead.

'qalter -w p' is deprecated. Use scheduler job information instead.

Support for TCL and Java JSVs is deprecated and will be removed in a future release.

9.11 Removed Functionality

The following components/features were removed with version 8.6.0 of Altair Grid Engine:

- Graphical Installer
- qtcsh

The following components/features were removed with version 8.7.0 of Altair Grid Engine:

- qmaster_params ENABLE_REDUCE_MEM_FREE (mem_free can now be increased and decreased without setting any qmaster-parameter)
- The counters for the qmaster_params MAX_AJ_QFAIL_HOLD and MAX_AJ_TFAIL_HOLD are no longer stored in the job environment. The undocumented job environment variables SGE_AJ_QFAIL_HOLD_COUNTER_VALUE and SGE_AJ_TFAIL_HOLD_COUNTER_VALUE are no longer available in the job environment setting.
- Support for Intel® Xeon Phi™ Co-Processors has been removed. The following packages are no longer delivered with Altair Grid Engine:
  - ge-8.x.y-knl-lx-amd64.tar.gz
  - ge-8.x.y-phi-lx-amd64.tar.gz
  - ge-knl-8.x.y-0.x86_64.rpm
  - ge-phi-8.x.y-0.x86_64.rpm
- Support for macOS has been removed. The following package is no longer delivered with Altair Grid Engine:
  - ge-8.x.y-bin-darwin-x64.tar.gz
- Support for 32 bit has been removed for various platforms. The following packages are no longer delivered with Altair Grid Engine:
  - ge-8.x.y-bin-lx-x86.tar.gz
  - ge-8.x.y-bin-ulx-x86.tar.gz
  - ge-8.x.y-bin-sol-x86.tar.gz
- The rlogin, rsh and rshd binaries have been removed.

9.12 Changed REST Configuration Location

Beginning with REST 8.6.4 and 8.7.x, the configuration files are installed in $SGE_ROOT/$SGE_CELL/common/uge
This is done automatically when using the ./install_ugerest script for installation. The reason for this change was to avoid accidental overwriting of configuration files when unpacking a patch into an existing installation. If you still need your old configuration files in order to examine existing settings, back up the $SGE_ROOT/ugerest/conf directory before installing a new ugerest package file.

9.13 Disabled PVM support

Beginning with 8.7.2, the PVM support on execution nodes is disabled. In can be enabled with the execd_param ENABLE_PVM_NOTIFY.

9.14 Writing of trace files

If KEEP_ACTIVE parameter in the execd_params is set to false then the output in the shepherd trace files is reduced beginning with version 8.7.2. To get the full output again KEEP_ACTIVE can be set to any other allowed configuration value.