Altair Engineering Inc.

Altair Grid Engine Documentation

Grid Engine Release Notes

Author:
Altair Engineering

Version:
2025.1.0 (8.10.0)

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Contents

1 License

Software License Agreement and Maintenance Agreement

Enterprise Computing

1. SOFTWARE LICENSE AND SUPPORT

1.1 License Grant.

(a) "Software" means the Altair computer Software(s) in object code form, not including updates, revisions or the like except as provided by Altair pursuant to the Maintenance Services (as defined below). Altair hereby grants to Licensee a limited, personal, nonexclusive and nontransferable license to install and use the quantity of Software indicated on the applicable quotation on Licensee controlled systems (including Licensee controlled cloud computing environments, only for Licensee's own internal operations by Licensee's Permitted Users (as defined below). Licensee shall be liable for any use or modification of the Software by its Permitted Users. Permitted Users are Licensee's employees and contractors which are (i) engaged in the support of Licensee's business purpose(s), (ii) bound by obligations of confidentiality to Licensee at least as restrictive as the terms hereof and (iii) agree to use the Software in strict compliance with the terms of this Agreement.

(b) Licensee may make a reasonable number of copies of the Software only for archival purposes and only for use as back-ups when the Software are not operational, which copies shall be subject to the provisions of this Agreement, and all proprietary rights notices shall be reproduced in such copies.

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1.3 Maintenance and Technical Support Services. Altair will provide Licensee with maintenance and technical support services for the Software following the date such Software is received by Licensee (the "Installation Date"), in accordance with the terms and conditions set forth in Exhibit A hereto (the "Maintenance Services"). Annual licenses include Maintenance Services for any additional fee. Maintenance Services for perpetual license are available to licensee for an additional fee as set forth on the applicable quote. Altair shall have no obligation to maintain or support (a) altered, damaged or Licensee-modified Software, or any portion of the Software incorporated with or into other software not provided by Altair; (b) any version of the Software other than the current version of the Software or the immediately prior release of the Software; (c) problems caused by Licensee's negligence, abuse, or misapplication of Software or use of the Software in a manner not specified in the Documentation; (d) problems beyond the reasonable control of Altair; (e) any support issue that is not reproducible by Altair; or (f) Software installed on any hardware, operating system version or network environment that is not supported by Altair. Support also excludes con-

figuration of hardware, non- Altair Software, and networking services; consulting services; general solution provider related services; and general computer system maintenance.

2. RESTRICTIONS ON USE

2.1 Restrictions. Notwithstanding the foregoing license grant, Licensee shall not do (or allow others to do) any of the following: (a) sell, transfer, assign, sublicense, lease, lend or rent the Software or use the 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 Software; (c) except for a reasonable number of backup or archival copies pursuant to Section 1.1 (b), copy the Software; (d) create derivative works from the Software or Documentation; or (e) circumvent or otherwise interfere with any authentication or security measures of the Software

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

3. TERM AND TERMINATION

3.1 Term. The term of this Agreement shall commence on the Effective Date and shall continue until terminated as provided herein. Annual licenses shall have a 12-month term of use and perpetual licenses shall have a term of twenty-five years. Maintenance orders for perpetual licenses have a 12-month term. Annual licenses and maintenance for perpetual licenses shall automatically renew unless either party provides notice to the other party in writing of its intent not to renew.

3.2 Termination. Altair may terminate this Agreement for convenience upon thirty (30) days written notice to Licensee. Either party may terminate this Agreement or any license granted under this Agreement for a material breach of this Agreement which is not cured within thirty (30) days (other than Licensee's breach of Sections 1 or 2, or Licensee's failure to pay as specified below) following notice from the non-breaching party to the breaching party specifying such breach. If Licensee (a) violates Sections 1 or 2; or, (b) fails to pay any fee or other amount in full when due, Altair may terminate this Agreement or any license granted under this Agreement effective upon notice. Termination of this Agreement shall be without prejudice to or limitation on any other remedies or any accrued obligations of either party.

3.3 Requirements Upon Termination. If a license granted under this Agreement is terminated or expires, Licensee shall (a) immediately cease using the applicable Software, and (b) certify in writing to Altair within thirty (30) days after such termination that Licensee has either destroyed, permanently erased or returned to Altair the Software, all related Documentation and all copies in all forms, partial and complete, in all types of media and computer memory and storage.

4. INDEMNITY

4.1 Infringement Indemnity. Altair will defend and indemnify, at its expense, any claim made against Licensee by a third party based on an allegation that the Software infringes a patent or copyright ("Claim"); provided, that Licensee (i) has not materially breached the terms of this Agreement, (ii) notifies Altair in writing promptly after Licensee first learns of the Claim; and (iii) reasonably cooperates in the defense of the Claim. Altair shall have sole control over such defense. If a Claim is made, Altair may modify the Software to avoid the alleged

infringement, provided however, that such modifications do not materially diminish the Software's functionality. If such modifications are not commercially reasonable or technically possible, Altair may terminate this Agreement and refund to Licensee the prorated license fee that Licensee paid for the then current term for annual licenses. Perpetual licenses shall be pro-rated over a 36-month term. Altair shall have no indemnification obligation under this Section 4.1, if the alleged infringement arises from: (i) Altair's compliance with specifications or instructions prescribed by Licensee, (ii) modification of the Software by Licensee, (iii) use of the Software in combination with other software not provided by Altair and which use is not specifically described in the Documentation, or (iv) Licensee is not using the most current version of the Software, if such alleged infringement would not have occurred except for such exclusions listed here.

THIS SECTION 4.1 STATES LICENSEE'S EXCLUSIVE REMEDY AND ALTAIR'S ENTIRE LIABILITY FOR ANY PROPRIETARY RIGHTS INFRINGEMENT.

5. WARRANTIES, EXCLUSIVE REMEDIES AND DISCLAIMERS

5.1 Limited Warranty. Altair warrants for 90 days from the Installation Date that such Software, unless modified by Licensee, will perform the functions described in the Documentation provided by Altair under Section 1.2 when operated on the designated hardware and operating system in accordance with the terms hereof. Altair does not warrant that the operation of the Software will be uninterrupted or error-free or that the Software will satisfy Licensee's requirements. For any breach of the above warranties, Licensee's exclusive remedy, and Altair's entire liability, shall be the correction of the non-conforming Software; however, if Altair is unable to correct the non-conforming Software, Licensee shall be entitled to recover the applicable license fees paid to Altair for such non-conforming Software.

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6. LIMITATION OF LIABILITY

With the exception of Claims under Section 4.1, 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, and shall not exceed, in the aggregate, the license and maintenance fees paid under this Agreement by Licensee in the 12 months prior to the claim. ALTAIR SHALL NOT BE LIABLE TO LICENSEE OR ANYONE ELSE FOR INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES ARISING HEREUNDER (INCLUDING LOSS OF PROFITS OR DATA, DEFECTS IN DESIGN OR PRODUCTS CREATED USING THE SOFTWARE, OR ANY INJURY OR DAMAGE RESULTING FROM SUCH DEFECTS, SUFFERED BY LICENSEE OR ANY THIRD PARTY) EVEN IF ALTAIR HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. 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.

7. PAYMENT TERMS
7.1 Payments. Licensee shall pay in full the fee for licensed Software and/or Maintenance Services within thirty (30) days of receipt of the invoice. Past due fees shall bear interest at the rate of one and a half percent (1.5%) per month.

7.2 Taxes. Fees do not include taxes or duties and Licensee is responsible for paying (or for reimbursing Altair if Altair is required to pay) any federal, state or local taxes, or duties imposed on any license acquired under this Agreement or the possession or use by Licensee of the 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 license fees are not paid to it on a timely basis.

Payment Address: Payable in US-dollar currency to:
Altair Engineering Inc.
Dept 771419
P.O. Box 77000
Detroit, MI 48277-1419

8. CONFIDENTIALITY
Licensee acknowledges that the Software and Documentation is confidential and constitutes valuable assets and trade secrets of Altair. Confidential Information shall be defined as the Software and Documentation, information related thereto, and all information clearly marked by either party as confidential. Each party shall use the same degree of care, but no less than a reasonable degree of care, to prevent the unauthorized disclosure of the other party's Confidential Information as it uses to protect its own confidential information of a similar nature. Licensee shall not disclose or make the Software or Documentation available to any person or entity except as expressly provided in this Agreement. Licensee shall promptly notify Altair in the event any unauthorized person obtains access to the Software and Documentation. Each party shall limit dissemination of the other party's Confidential Information to its employees or consultants with a need to know and who agree to observe the restrictions of this Agreement. Confidential Information shall not include information which a) is or becomes part of the public domain through no fault of the receiving party; b) is lawfully received by the receiving party from a third party having the right to disclose such information; c) was known to the receiving party prior to receipt from the disclosing party without an obligation of confidentiality; or e) is independently developed by the receiving party without a breach of this Agreement. If the receiving party is required by a government body or court of law to disclose Confidential Information, the receiving party agrees to promptly notify the disclosing party so that the disclosing party may seek an appropriate protective order or other relief.

9. GOVERNING LAW
This Agreement shall be governed by and construed under the laws of the state of Delaware, without regard to that state's conflict of laws principles except if the state of Delaware adopts the Uniform Computer Information Transactions Act drafted by the National Conference of Commissioners of Uniform State Laws as revised or amended as of June 30, 2002 ("UCITA") which is specifically excluded. This Agreement shall not be governed by the United Nations Convention on Contracts for the International Sale of Goods, the application of which is expressly excluded. Each party waives its right to a jury trial in the event of any dispute arising under or relating to this Agreement. Each party agrees that money damages may not be an adequate remedy for breach of the provisions of this Agreement, and in the

event of such breach, the aggrieved party shall be entitled to seek specific performance and/or injunctive relief (without posting a bond or other security) in order to enforce or prevent any violation of this Agreement.

10. SEVERABILITY AND WAIVER
If any provision of this Agreement is found void and unenforceable, such provision shall be interpreted so as to best accomplish the intent of the parties within the limits of applicable law, and all remaining provisions shall continue to be valid and enforceable. The failure of a party to enforce at any time any of the provisions of this Agreement shall not be construed to be a waiver of the right of the party thereafter to enforce any such provisions.

11. EXPORT ADMINISTRATION AND U.S. GOVERNMENT RIGHTS
Licensee hereby acknowledges that it will not export any of the Software, related documentation or technical data (which includes, among other things, any technical information relating to the Software, in electronic format, written or otherwise), or any product incorporating any Software, related documentation or Altair technical data. This section applies to all acquisitions of Software by or for the United States federal government. By accepting delivery of the Software, the Licensee hereby agrees that the Software qualifies as "commercial computer software" as that term is defined in Federal Acquisition Regulation (FAR) 2.101 and Department of Defense FAR Supplement (DFARS) clause 252.227-7014(a)(1), as applicable, and the Government shall have only the rights in the Software specified in this Agreement in accordance with FAR 12.212 and DFARS 227.7202-3(a), as applicable. This Agreement supersedes any contrary terms or conditions, including, without limitation, any noncommercial computer software FAR, DFARS, or other FAR agency supplemental clauses contained in any purchase order, statement of work, contract, or other document. If any provision of this Agreement is unacceptable to the government, Altair may be contacted at Altair Engineering, Inc., 1820 E. Big Beaver Road, Troy, MI 48083-2031; telephone (248) 614–2400. If any provision of this Agreement violates applicable federal law or does not meet the government's actual, minimum needs, the Licensee agrees to return the Software for a full refund.

12. GENERAL PROVISIONS.
12.1 Entire Agreement. This Agreement together with all Exhibits and the applicable quotation constitute the entire, final, complete and exclusive agreement between the parties and supersedes all previous agreements or representations, written or oral, and all printed provisions or subordinate Licensee documents, including purchase orders, with respect to the Software, the services specified herein, and the licensing and providing of same under this Agreement. In the event of any conflict between the terms of this Agreement and any terms and conditions on a Licensee purchase order, the terms of this Agreement shall prevail. Moreover, each party agrees any additional terms on any purchase order or comparable document other than the transaction items of (a) item(s) ordered; (b) pricing; (c) quantity; (d) delivery instructions and (e) invoicing directions, are not binding on the parties. This Agreement may not be modified or amended except in a writing signed by a duly authorized representative of each party.

12.2 Notices. All notices given by one party to the other under the Agreement shall be sent by certified mail, return receipt requested, or by overnight courier, to the respective addresses set forth in this Agreement or to such other address either party has specified in writing to the other. All notices shall be deemed given upon actual receipt. Notices to either party shall be sent to the address specified on the first page. Notice to Altair shall be sent to the attention of Legal Department, or such other address as a party may specify to the

other in writing.

12.3 Assignment. Neither party shall assign this Agreement without the prior written consent of other party, which shall not be unreasonably withheld. All terms and conditions of this Agreement shall be binding upon and inure to the benefit of the parties hereto and their respective successors and permitted assigns.

12.4 Relationship of Parties. The parties are independent contractors; nothing in this Agreement shall be construed to create a partnership, joint venture or agency relationship between the parties.

12.5 Publicity. Licensee agrees that Altair may use Licensee's name in Altair's Licensee list. Licensee also agrees that Altair may publish information about Licensee's use of Altair Software, products and services in advertisements, news releases and releases to professional and trade publications. Licensee will have the right to approve each such release prior to its placement, but agrees not to unreasonably withhold or delay its approval.

12.6 Language. This Agreement is in the English language only, which language will be controlling in all respects. No translation, if any, of this Agreement into any other language will be of any force or effect in the interpretation of this Agreement or in determination of the interests of either party hereto. Furthermore, the parties agree that all correspondence, notices, orders, claims, suits and other communication between the parties hereto will be written or conducted in English.

12.7 Execution. Either party may request this Agreement to be executed in counterpart. This Agreement may be executed, scanned and transmitted electronically and electronic or digital signatures affixed thereto shall be deemed original signatures for purposes of this Agreement and all matters related thereto, with such scanned and electronic signatures having the same legal effect as original signatures.

EXHIBIT A

1. MAINTENANCE SERVICES

1.1 Altair will provide Maintenance Services to keep the most current release of the Software (licensed to Licensee under this Agreement), in good operating condition. Maintenance Services consist of telephone technical support and the distribution of Software updates, and associated documentation changes. Updates provided to Licensee shall be included in the definition of "Software" and are subject to the terms and conditions of this Agreement. Updates do not include major new releases (Upgrades) or new Software for which a separate license fee is charged.

1.2 Altair will keep available telephone assistance to Licensee between 8:00 am and 5:00 pm, Pacific Time, Monday through Friday (excluding Altair recognized holidays).

1.3 Altair's obligation to provide Maintenance Services pursuant to this Agreement is dependent upon (i) Licensee's continued good repair of the designated equipment; and (ii) the performance by Licensee of all its obligations set forth in this Agreement including the payments of applicable license fees.

2. INSTALLATION

2.1 Software installation is not included as part of this Agreement. If installation service is requested by the Licensee and is not included in any other agreement between the Licensee and Altair, service will be charged to the Licensee at Altair's then current hourly "on-call" maintenance rate in effect on the date such service is performed.

2.2 If installation service is requested by Licensee, Altair personnel shall have access to where the Software is to be installed during normal business hours. Licensee agrees to provide technical expertise on the Licensee's applicable computer equipment, at no cost to Altair, as required to complete the installation. If installation is requested outside of normal business hours, Altair reserves the right to quote and charge accordingly a premium hourly rate.

3. LIMITATION OF COVERAGE

3.1 Software remedies made necessary by the following causes are not a part of this Agreement, and the remedies requested by the Licensee shall be charged at Altair's then current service rates:

- Changes or alterations to Software not specifically authorized or performed by Altair.
- Failure caused by Licensee's use of interconnected devices other than those specified by Altair.
- Failure resulting from catastrophe, accident, neglect, misuse, failure of electrical power or air conditioning, or any causes other than ordinary use and defects in materials and workmanship.
- Software that are not the then current release or the immediately preceding sequential release of the Software.
- Customized Software.

3.2 Altair will submit a description of the work that is required to restore the Software to its original operating specifications and the changes associated therewith. Altair will request written permission in the form of an authorized Licensee purchase order before Altair proceeds to restore the Software to its original operating specifications. If Altair is not granted permission to perform such restoration at Licensee's expense, Altair shall have the right to immediately terminate all of its obligations under this Agreement with respect to such Software.

4. LICENSEE RESPONSIBILITIES

4.1 Licensee shall notify Altair promptly by designated electronic mail or telephone of Software problems and provide follow-up reports in writing. Altair will confirm receipt of any electronic problem report within 24 hours of receipt and, in the absence of such confirmation, Licensee will promptly retransmit such report.

4.2 Licensee shall allow reasonable access to all designated equipment and communication facilities and provide Altair reasonable work space and storage and other normal and customary facilities.

4.3 Licensee will provide reasonable assistance, as requested and ensure that an employee of Licensee is present during all on-site service.

4.4 Licensee will provide sufficient support and test time on Licensee's computer system to duplicate the problem and verify that the problem is due to a Software.

4.5 Licensee will provide sufficient data to reproduce the problem on another computer at Altair's Licensee support center.

5. CONTINGENCIES

Altair shall be excused from performance and shall not be liable for any delay in delivery or for non-delivery, in whole or in part, caused by the occurrence of any contingencies beyond

the control of Altair, including, but not limited to, war (declared or not declared), sabotage, insurrection, riot, or other act of civil disobedience, act of a public enemy, failure or delay of transportation, act of any government or subdivision thereof affecting the terms of the Agreement or otherwise, judicial action, labor dispute, accident, fire, explosion, earthquake, flood, storm, volcanic eruption, or any similar acts.

Revised July 2021

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, ARM64
RHEL/CentOS	7 and higher	x86-64, ARM64
AlmaLinux	8 and higher	x86-64, ARM64
Rocky Linux	8 and higher	x86-64, ARM64
openSUSE Leap	42	x86-64, ARM64
Ubuntu	18.04LTS - 22.04LTS	x86-64, ARM64
Oracle Linux	7 and higher	x86-64, ARM64
Oracle Solaris	10 and higher	x86-64
Microsoft Windows	Server 2016 and higher	x86-64
	8 / 8.1 Pro / Enterprise	x86-64
	10 Pro / Enterprise	x86-64

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 supported on Linux x64 (“lx-amd64”) only. If you require qmaster support on other architectures, please contactus 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/Rocky and Ubuntu	20.10.24 to 27.3.1

Older versions should still work, but are not tested anymore. Other Linux distributions like openSUSE should also work but are also not tested because there are no official packages for them from Docker.

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, build date, Docker RemoteAPI version and the version of the containerd that was used for testing. It is always tried to install the least containerd version which is required by the Docker installation package. If this containerd version is not available, the latest containerd version at the time of testing is used.

- Red Hat Enterprise Linux 7.4 (Maipo), Kernel 3.10.0-693.17.1.el7.x86_64

Docker	Git commit	Go	Build date	API	containerd
20.10.24	5d6db84	go1.19.7	Tue Apr 4 18:21:02 2023	1.41	1.6.33
23.0.6	9dbdbd4	go1.19.9	Fri May 5 21:20:38 2023	1.42	1.6.4
24.0.9	fca702d	go1.20.13	Thu Feb 1 00:50:53 2024	1.43	1.6.4
25.0.5	e63daec	go1.21.8	Tue Mar 19 15:07:09 2024	1.44	1.6.24
26.0.0	8b79278	go1.21.8	Wed Mar 20 15:20:06 2024	1.45	1.6.24
26.0.1	60b9add	go1.21.9	Thu Apr 11 10:55:26 2024	1.45	1.6.24
26.0.2	7cef0d9	go1.21.9	Thu Apr 18 16:28:58 2024	1.45	1.6.24
26.1.0	c8af8eb	go1.21.9	Mon Apr 22 17:08:46 2024	1.45	1.6.24
26.1.1	ac2de55	go1.21.9	Tue Apr 30 11:49:57 2024	1.45	1.6.24
26.1.2	ef1912d	go1.21.10	Wed May 8 13:59:55 2024	1.45	1.6.24
26.1.3	8e96db1	go1.21.10	Thu May 16 08:35:20 2024	1.45	1.6.24
26.1.4	de5c9cf	go1.21.11	Wed Jun 5 11:31:02 2024	1.45	1.6.24

- CentOS 7.9, Kernel 3.10.0-1160.108.1.el7.x86_64

Docker	Git commit	Go	Build date	API	containerd
20.10.24	5d6db84	go1.19.7	Tue Apr 4 18:21:02 2023	1.41	1.6.33
23.0.6	9dbdbd4	go1.19.9	Fri May 5 21:20:38 2023	1.42	1.6.4
24.0.9	fca702d	go1.20.13	Thu Feb 1 00:50:53 2024	1.43	1.6.4
25.0.5	e63daec	go1.21.8	Tue Mar 19 15:07:09 2024	1.44	1.6.24
26.0.0	8b79278	go1.21.8	Wed Mar 20 15:20:06 2024	1.45	1.6.24
26.0.1	60b9add	go1.21.9	Thu Apr 11 10:55:26 2024	1.45	1.6.24
26.0.2	7cef0d9	go1.21.9	Thu Apr 18 16:28:58 2024	1.45	1.6.24

Docker	Git commit	Go	Build date	API	containerd
26.1.0	c8af8eb	go1.21.9	Mon Apr 22 17:08:46 2024	1.45	1.6.24
26.1.1	ac2de55	go1.21.9	Tue Apr 30 11:49:57 2024	1.45	1.6.24
26.1.2	ef1912d	go1.21.10	Wed May 8 13:59:55 2024	1.45	1.6.24
26.1.3	8e96db1	go1.21.10	Thu May 16 08:35:20 2024	1.45	1.6.24
26.1.4	de5c9cf	go1.21.11	Wed Jun 5 11:31:02 2024	1.45	1.6.24

- CentOS 8.5, Kernel 4.18.0-348.7.1.el8_5.x86_64

Docker	Git commit	Go	Build date	API	containerd
20.10.24	5d6db84	go1.19.7	Tue Apr 4 18:18:29 2023	1.41	1.6.32
23.0.6	9dbdbd4	go1.19.9	Fri May 5 21:18:15 2023	1.42	1.6.4
24.0.9	fca702d	go1.20.13	Thu Feb 1 00:48:52 2024	1.43	1.6.4
25.0.5	e63daec	go1.21.8	Tue Mar 19 15:05:24 2024	1.44	1.6.24
26.0.0	8b79278	go1.21.8	Wed Mar 20 15:17:57 2024	1.45	1.6.24
26.0.1	60b9add	go1.21.9	Thu Apr 11 10:53:31 2024	1.45	1.6.24
26.0.2	7cef0d9	go1.21.9	Thu Apr 18 16:27:41 2024	1.45	1.6.24
26.1.0	c8af8eb	go1.21.9	Mon Apr 22 17:06:47 2024	1.45	1.6.24
26.1.1	ac2de55	go1.21.9	Tue Apr 30 11:47:58 2024	1.45	1.6.24
26.1.2	ef1912d	go1.21.10	Wed May 8 13:59:54 2024	1.45	1.6.24
26.1.3	8e96db1	go1.21.10	Thu May 16 08:33:34 2024	1.45	1.6.24

- Rocky Linux 9.5, Kernel 5.14.0-503.14.1.el9_5.x86_64

Docker	Git commit	Go	Build date	API	containerd
20.10.24	5d6db84	go1.19.7	Tue Apr 4 18:18:28 2023	1.41	1.7.23
23.0.6	9dbdbd4	go1.19.9	Fri May 5 21:18:11 2023	1.42	1.6.4
24.0.9	fca702d	go1.20.13	Thu Feb 1 00:48:42 2024	1.43	1.6.4
25.0.5	e63daec	go1.21.8	Tue Mar 19 15:05:16 2024	1.44	1.6.24
26.0.0	8b79278	go1.21.8	Wed Mar 20 15:18:58 2024	1.45	1.6.24
26.0.1	60b9add	go1.21.9	Thu Apr 11 10:53:19 2024	1.45	1.6.24
26.0.2	7cef0d9	go1.21.9	Thu Apr 18 16:27:59 2024	1.45	1.6.24
26.1.0	c8af8eb	go1.21.9	Mon Apr 22 17:06:36 2024	1.45	1.6.24
26.1.1	ac2de55	go1.21.9	Tue Apr 30 11:47:50 2024	1.45	1.6.24
26.1.2	ef1912d	go1.21.10	Wed May 8 13:59:54 2024	1.45	1.6.24
26.1.3	8e96db1	go1.21.10	Thu May 16 08:33:39 2024	1.45	1.6.24
26.1.4	de5c9cf	go1.21.11	Wed Jun 5 11:29:11 2024	1.45	1.6.24
27.0.1	ff1e2c0	go1.21.11	Mon Jun 24 14:58:36 2024	1.46	1.6.24
27.0.2	e953d76	go1.21.11	Wed Jun 26 18:47:31 2024	1.46	1.6.24
27.0.3	662f78c	go1.21.11	Sat Jun 29 00:02:31 2024	1.46	1.6.24
27.1.0	a21b1a2	go1.21.12	Fri Jul 19 17:43:02 2024	1.46	1.6.24
27.1.1	cc13f95	go1.21.12	Tue Jul 23 19:57:11 2024	1.46	1.6.24
27.1.2	f9522e5	go1.21.13	Mon Aug 12 11:50:54 2024	1.46	1.6.24
27.2.0	3ab5c7d	go1.21.13	Tue Aug 27 14:15:14 2024	1.47	1.6.24

Docker	Git commit	Go	Build date	API	containerd
27.2.1	8b539b8	go1.22.7	Fri Sep 6 12:07:57 2024	1.47	1.6.24
27.3.0	41ca978	go1.22.7	Thu Sep 19 14:25:44 2024	1.47	1.6.24
27.3.1	41ca978	go1.22.7	Fri Sep 20 11:41:09 2024	1.47	1.6.24

- Ubuntu 18.04.6 LTS, kernel 4.15.0-213-generic x86_64

Docker	Git commit	Go	Build date	API	containerd
20.10.24	5d6db84	go1.19.7	Tue Apr 4 18:18:49 2023	1.41	1.6.21
23.0.6	9dbdbd4	go1.19.9	Fri May 5 21:17:53 2023	1.42	1.6.4
24.0.2	659604f	go1.20.4	Thu May 25 21:52:13 2023	1.43	1.6.4

- Ubuntu 20.04.6 LTS, kernel 5.4.0-155-generic x86_64

Docker	Git commit	Go	Build date	API	containerd
20.10.24	5d6db84	go1.19.7	Tue Apr 4 18:18:40 2023	1.41	1.7.23
23.0.6	9dbdbd4	go1.19.9	Fri May 5 21:18:22 2023	1.42	1.6.4
24.0.9	fca702d	go1.20.13	Thu Feb 1 00:48:08 2024	1.43	1.6.4
25.0.5	e63daec	go1.21.8	Tue Mar 19 15:05:20 2024	1.44	1.6.24
26.0.0	8b79278	go1.21.8	Wed Mar 20 15:17:51 2024	1.45	1.6.24
26.0.1	60b9add	go1.21.9	Thu Apr 11 10:53:25 2024	1.45	1.6.24
26.0.2	7cef0d9	go1.21.9	Thu Apr 18 16:26:06 2024	1.45	1.6.24
26.1.0	c8af8eb	go1.21.9	Mon Apr 22 17:07:12 2024	1.45	1.6.24
26.1.1	ac2de55	go1.21.9	Tue Apr 30 11:48:20 2024	1.45	1.6.24
26.1.2	ef1912d	go1.21.10	Wed May 8 13:59:58 2024	1.45	1.6.24
26.1.3	8e96db1	go1.21.10	Thu May 16 08:33:49 2024	1.45	1.6.24
26.1.4	de5c9cf	go1.21.11	Wed Jun 5 11:29:19 2024	1.45	1.6.24
27.0.1	ff1e2c0	go1.21.11	Mon Jun 24 14:57:49 2024	1.46	1.6.24
27.0.2	e953d76	go1.21.11	Wed Jun 26 18:47:28 2024	1.46	1.6.24
27.0.3	662f78c	go1.21.11	Sat Jun 29 00:02:29 2024	1.46	1.6.24
27.1.0	a21b1a2	go1.21.12	Fri Jul 19 17:43:11 2024	1.46	1.6.24
27.1.1	cc13f95	go1.21.12	Tue Jul 23 19:56:56 2024	1.46	1.6.24
27.1.2	f9522e5	go1.21.13	Mon Aug 12 11:51:03 2024	1.46	1.6.24
27.2.0	3ab5c7d	go1.21.13	Tue Aug 27 14:15:09 2024	1.47	1.6.24
27.2.1	8b539b8	go1.22.7	Fri Sep 6 12:08:15 2024	1.47	1.6.24
27.3.0	41ca978	go1.22.7	Thu Sep 19 14:26:12 2024	1.47	1.6.24
27.3.1	41ca978	go1.22.7	Fri Sep 20 11:41:03 2024	1.47	1.6.24

- Ubuntu 22.04.5 LTS, Kernel 5.15.0-78-generic x86_64

Docker	Git commit	Go	Build date	API	containerd
20.10.24	5d6db84	go1.19.7	Tue Apr 4 18:18:48 2023	1.41	1.7.23
23.0.6	9dbdbd4	go1.19.9	Fri May 5 21:18:13 2023	1.42	1.6.4
24.0.9	fca702d	go1.20.13	Thu Feb 1 00:48:39 2024	1.43	1.6.4
25.0.5	e63daec	go1.21.8	Tue Mar 19 15:05:10 2024	1.44	1.6.24
26.0.0	8b79278	go1.21.8	Wed Mar 20 15:17:48 2024	1.45	1.6.24
26.0.1	60b9add	go1.21.9	Thu Apr 11 10:53:21 2024	1.45	1.6.24
26.0.2	7cef0d9	go1.21.9	Thu Apr 18 16:27:07 2024	1.45	1.6.24
26.1.0	c8af8eb	go1.21.9	Mon Apr 22 17:06:41 2024	1.45	1.6.24
26.1.1	ac2de55	go1.21.9	Tue Apr 30 11:47:53 2024	1.45	1.6.24
26.1.2	ef1912d	go1.21.10	Wed May 8 13:59:59 2024	1.45	1.6.24
26.1.3	8e96db1	go1.21.10	Thu May 16 08:33:29 2024	1.45	1.6.24
26.1.4	de5c9cf	go1.21.11	Wed Jun 5 11:28:57 2024	1.45	1.6.24
27.0.1	ff1e2c0	go1.21.11	Mon Jun 24 14:57:52 2024	1.46	1.6.24
27.0.2	e953d76	go1.21.11	Wed Jun 26 18:47:16 2024	1.46	1.6.24
27.0.3	662f78c	go1.21.11	Sat Jun 29 00:02:33 2024	1.46	1.6.24
27.1.0	a21b1a2	go1.21.12	Fri Jul 19 17:42:53 2024	1.46	1.6.24
27.1.1	cc13f95	go1.21.12	Tue Jul 23 19:57:01 2024	1.46	1.6.24
27.1.2	f9522e5	go1.21.13	Mon Aug 12 11:50:12 2024	1.46	1.6.24
27.2.0	3ab5c7d	go1.21.13	Tue Aug 27 14:15:13 2024	1.47	1.6.24
27.2.1	8b539b8	go1.22.7	Fri Sep 6 12:08:10 2024	1.47	1.6.24
27.3.0	41ca978	go1.22.7	Thu Sep 19 14:25:59 2024	1.47	1.6.24
27.3.1	41ca978	go1.22.7	Fri Sep 20 11:41:00 2024	1.47	1.6.24

- Ubuntu 24.04.1 LTS, Kernel 6.8.0-48-generic x86_64

Docker	Git commit	Go	Build date	API	containerd
26.0.0	8b79278	go1.21.8	Wed Mar 20 15:17:48 2024	1.45	1.7.23
26.0.1	60b9add	go1.21.9	Thu Apr 11 10:53:42 2024	1.45	1.7.23
26.0.2	7cef0d9	go1.21.9	Thu Apr 18 16:27:39 2024	1.45	1.7.23
26.1.0	c8af8eb	go1.21.9	Mon Apr 22 17:06:54 2024	1.45	1.7.23
26.1.1	ac2de55	go1.21.9	Tue Apr 30 11:47:54 2024	1.45	1.7.23
26.1.2	ef1912d	go1.21.10	Wed May 8 14:00:00 2024	1.45	1.7.23
26.1.3	8e96db1	go1.21.10	Thu May 16 08:33:35 2024	1.45	1.7.23
26.1.4	de5c9cf	go1.21.11	Wed Jun 5 11:28:57 2024	1.45	1.7.23
27.0.1	ff1e2c0	go1.21.11	Mon Jun 24 14:58:03 2024	1.46	1.7.23
27.0.2	e953d76	go1.21.11	Wed Jun 26 18:47:25 2024	1.46	1.7.23
27.0.3	662f78c	go1.21.11	Sat Jun 29 00:02:23 2024	1.46	1.7.23
27.1.0	a21b1a2	go1.21.12	Fri Jul 19 17:42:42 2024	1.46	1.7.23
27.1.1	cc13f95	go1.21.12	Tue Jul 23 19:57:14 2024	1.46	1.7.23
27.1.2	f9522e5	go1.21.13	Mon Aug 12 11:50:54 2024	1.46	1.7.23
27.2.0	3ab5c7d	go1.21.13	Tue Aug 27 14:15:15 2024	1.47	1.7.23
27.2.1	8b539b8	go1.22.7	Fri Sep 6 12:08:02 2024	1.47	1.7.23
27.3.0	41ca978	go1.22.7	Thu Sep 19 14:25:51 2024	1.47	1.7.23
27.3.1	41ca978	go1.22.7	Fri Sep 20 11:40:59 2024	1.47	1.7.23

4 Supported and Tested DCGM Versions

Altair Grid Engine 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 to 8.7.3	1.5.6 to 2.4.5
8.7.4	1.5.6 to 3.1.3
2023.1.0 (8.8.0) and higher	1.5.6 to 3.3.5
2024.1.0 (8.9.0) and higher	1.5.6 to 3.3.5
2025.1.0 (8.10.0) and higher	1.5.6 to 3.3.8

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 Supported and Tested XPUM Versions

Altair Grid Engine supports the following versions of Intel's XPU Manager (XPUM):

Altair Grid Engine Version	Supported XPUM Version
2023.1.0 (8.8.0)	1.1 to 1.2.39
2024.1.0 (8.9.0)	1.1 to 1.2.39
2025.1.0 (8.10.0)	1.1 to 1.2.39

6 Supported and Tested ROCm/AMD-SMI Versions

Altair Grid Engine supports the following versions of AMD's ROCm/AMD-SMI:

Altair Grid Engine Version	Supported ROCm/AMD-SMI Version
2025.1.0 (8.10.0)	5.7 to 6.2.4

7 Unisight

Unisight is no longer available or supported.

A new reporting and monitoring tool Altair InsightPro is now available.

Please contact your Altair account manager for more information how to download and how get an evaluation license key for Altair InsightPro.

8 Fixes and Enhancements

8.1 Major Enhancements

8.1.1 New support for AMD ROCm/AMD-SMI

Altair Grid Engine 2025.1.0 adds support for AMD Instinct accelerators via ROCm and AMD-SMI (see https://www.amd.com/en/products/software/rocm.html). For a list of supported ROCm/AMD-SMI versions see Supported and Tested ROCm/AMD-SMI Versions.

If ROCm or AMD-SMI are installed on a host, Altair Grid Engine will show load values for all supported GPUs in `qconf -se <hostname>`:

If both ROCm and AMD-SMI are installed on a host, Altair Grid Engine will prioritize the AMD-SMI library and will use ROCm only if loading AMD-SMI fails.

The script `util/setup_gpu.sh` can be used to install an example configuration for AMD Instinct accelerators.

For more information, see sge_amd.5 man page.

8.1.2 Support for Altair Units Licensing

Altair Grid Engine adds support for Altair Units licensing whilst continuing support for the existing Grid Engine Feature licensing.

A new *qmaster_params* is introduced for **LICENSE_TYPE**, setting to either **ALTAIR_UNITS** or **GRID_ENGINE_FEATURE**.

When this parameter is not set, Altair Grid Engine 2025.1.x continues to checkout GridEngineFeature licenses to provide backward compatibility when upgrading. For new installations the installer asks which method should be used.

Altair Grid Engine now requires a recent Altair License Manager (ALM). See Required Altair License Management System version for ALM version requirements.

Contact your Altair account manager or the Altair Grid Engine support team (age-navops-support@altair.com) for more information about Altair Units licensing.

For more information, see also sge_licensing.5 and sge_conf.5 man pages.

8.1.3 Support for New Breeze And Mistral Installations

Altair Grid Engine uses *execd_params* parameters **AGE_BREEZE_INSTALL_PATH** and **AGE_MISTRAL_INSTALL_PATH** to define the installation locations for Altair *Breeze* and *Mistral*. New 2024.1.0 versions of *Breeze* and *Mistral* change their layout below these installation locations. Altair Grid Engine now determines whether old or new layouts are available and will use the appropriate installations.

For more information, see the sge_conf.5 man page, and the Admin Guide.

8.1.4 Cgroups Systemd Service

Altair Grid Engine 2025.1.0 uses a systemd service to prevent systemd from changing or resetting the cgroups limits of jobs. The service is automatically started and managed by the Altair Grid Engine execution daemon, if systemd is available on a host.

All cgroups for jobs will be created in:

```
<cgroup_path>/<subdir_name>.service/jobs/<job_id>.<task_id>
```

For example:

```
/sys/fs/cgroup/age.service/jobs/1.1
```

If cgroups are enabled and cgroups version 2 is used, Docker has to be configured with `cgroupfs` as cgroups driver, otherwise Docker jobs in Altair Grid Engine will fail. For details about how to change the cgroups driver in Docker, see “Setting Docker Cgroups Driver”.

9 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.
- GE-9428 upgrade procedure for ARs does not handle per petask requests When an advanced reservation is submitted into an AGE 2022.1.x cluster and the submission contains per petask requests, then the upgraded AR will be incorrect: It does not contain per petask request but all resource and queue requests are done as global requests.

10 Upgrade Notes

10.1 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 14: 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

10.2 Required Altair License Management System version

Altair Grid Engine Version	Required ALM version
2024.1.0 (8.9.0)	15.2 or higher
2025.1.0 (8.10.0)	15.5 or higher

10.3 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*.

10.4 Changes in the CSP Hashing Algorithms

Beginning with Altair Grid Engine 8.6.0 and due to changes in the OpenSSL library, in version greater or equal 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 weak")
```

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 following script before starting the upgrade procedure:

```
$SGE_ROOT/util/sgeCA/renew_all_certs.csh
```

11 Compatibility Notes

11.1 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.

11.2 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.

11.3 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`.

11.4 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

11.5 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”.

11.6 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.

11.7 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.

11.8 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.

11.9 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.

11.10 Deprecated Functionality

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

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

11.11 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.

The following components/features were removed with version 2023.1.0 (8.8.0) of Altair Grid Engine:

- TCL/Java support for JSV has been removed

11.12 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/ugerest_conf`

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.

11.13 Disabled PVM support

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

11.14 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.

11.15 Changed ALM lock file base directory

Beginning with Altair Grid Engine 8.9.0 the ALM lock file base directory has been changed from

`/tmp/$SGE_CLUSTER_NAME`

to

`/tmp/age-lmx-$SGE_QMASTER_PORT`

to avoid accidental race conditions or hangs of sge_qmaster.

In addition the permissions have been restricted to 700.

The directory `/tmp/$SGE_CLUSTER_NAME` should be deleted after the upgrade.

11.16 Disabled default reporting/accounting of specific granted resources

Beginning with Altair Grid Engine 2025.1.0 (8.10.0) the creation of reporting and accounting data for granted binding (55), granted rsmap (56), granted devices (57) and granted req. (73) has been turned off. In order to re-enable the creation of data for this parameters the qmaster_params ENABLE_BINDING_RECORDS was introduced.

11.17 Setting Docker Cgroups Driver

The default cgroups driver for Docker on systems with cgroups v2 is `systemd`. If cgroups are enabled in Altair Grid Engine, the cgroups driver in Docker must be changed to `cgroupfs` in order to submit Docker jobs.

The cgroups driver can be changed by modifying `/etc/docker/daemon.json` and setting `native.cgroupdriver` to `cgroupfs`:

```
{
    "exec-opts": ["native.cgroupdriver=cgroupfs"]
}
```

The new driver setting will be active after a restart of the Docker daemon. `docker info` can be used to check the current/active cgroups driver:

```
$ docker info | grep -i cgroup
 Cgroup Driver: cgroupfs
```

12 Full List of Fixes and Enhancements

12.1 2025.1.0 (8.10.0)

HPCGE-5959	Docker jobs don't end properly if container is killed
HPCGE-7241	docker interactive job hangs to exit with ENABLE_ADDGRP_KILL=TRUE
HPCGE-8299	docker interactive job doesn't get killed when job terminated by closing the terminal
HPCGE-8421	B state is not documented
HPCGE-8780	RSMAPs are not freed correctly when jobs are rescheduled using qmod -f -rj
HPCGE-8849	overwriting loglevel for individual logging operations is not thread safe resulting in message loss
HPCGE-8976	ARCO: view_accounting does not contain all accounting attributes
HPCGE-9128	sge_diagnostics document update
HPCGE-9456	Grace period for license expiration is incorrect in admin guide
HPCGE-9509	Standalone shadow host installation does not install rc scripts
HPCGE-9516	docker error message "error sending docker_version request..." is logged every second
HPCGE-9517	Text is cutoff in the middle on AGE docs
HPCGE-9518	create https certificate at qmaster installation when GQL gets enabled
HPCGE-9520	UWA-CLONE - totalCount value does not relate to jobs which match an associated filter
HPCGE-9522	UWA-CLONE - Filtering for queued elements of an expanded job array returns running elements of the array
HPCGE-9524	native Windows (win-x86) sge_execd.exe crashes at startup if a job is running on that execution host
HPCGE-9527	on native Windows (win-x86) sge_mkdir unnecessarily queries the users ID which sometimes fails and prevents creation of that directory
HPCGE-9529	RQS memory limits broken for PE jobs requesting >= 2G
HPCGE-9530	ARCO: dbwriter sge_job table is missing values for submit_host and submit_cmd
HPCGE-9531	RQS memory or double limit might be exceed for parallel jobs if limit is > 2G
HPCGE-9533	support for AMD GPUs
HPCGE-9534	preemption fails because of wrong scheduler decisions and because of a race condition between scheduler and worker
HPCGE-9536	load_sge_config does not restore qtask file at upgrade
HPCGE-9538	qrsh into docker container might not get exit state and show incomplete stderr/stdout messages
HPCGE-9539	very long accounting file fields cause qacct errors and create huge accounting files
HPCGE-9540	qrsh help and man page mentions -@ option file -> does not work
HPCGE-9542	Rocky and Alma Linux are missing in list of supported operating systems
HPCGE-9543	implement solution for cgroups v2 "swappiness"

```
HPCGE-9547   add information about duration of the AGE CA und user certs to
             documentation, extend default duration
HPCGE-9548   support new Breeze and Mistral 2024.1.0 paths in cluster
             configuration
HPCGE-9549   shepherd fails to write job PID to cgroups tasks file
HPCGE-9550   use "current" files to calculate the maximum memory usage if
             "peak" files are missing (cgroups v2)
HPCGE-9551   systemd might reset cgroups limits while jobs are running
HPCGE-9553   Scheduler stops scheduling jobs for hours - worked again after
             restart of sge_qmaster daemon
HPCGE-9566   settings.sh gives error on Rocky 8 because
             $SGE_ROOT/util/arch has error
HPCGE-9567   upgrade restlet framework to latest version 2.4.4
HPCGE-9578   Scheduler stops scheduling - requires to
             restart sge_qmaster daemon
HPCGE-9579   Scheduler stops scheduling until qmaster is restarted
HPCGE-9581   support Altair Units licensing
HPCGE-9582   one license too less checked out
HPCGE-9586   DISABLE_QINSTANCE_CHECK does not work when a queue is specified
HPCGE-9587   interactive job does not always get killed when job terminated
             by closing the terminal
HPCGE-9589   memory leak in qmaster when querying GraphQL
HPCGE-9590   rescheduling of large array jobs lead to sge_qmaster overload
             or outage
HPCGE-9595   qstat -json broken for parallel jobs
HPCGE-9601   some qmaster_params are not set to their default values when
             removed
HPCGE-9604   add sge_amd.5 man page to describe AMD GPU related features
HPCGE-9612   log version of AGML during execd startup
HPCGE-9615   shepherd does not kill suspended Docker jobs correctly
HPCGE-9618   Mistral agent started by shepherd as AGE admin user not job
             user - two agents running
```