Lenovo ThinkSystem SR645 and SR665 with AMD EPYC 7003 Series Processors with AMD 3D V-Cache Technology

Article

AMD recently released the world's first data center CPU using 3D die stacking, the 3rd Gen AMD EPYC™ processors with AMD 3D V-Cache™ technology, codenamed "Milan-X". Built on the "Zen 3" core architecture, these processors expand the 3rd Gen EPYC CPU family and can deliver a performance uplift across a variety of targeted technical computing workloads versus comparable, non-stacked 3rd Gen AMD EPYC processors.

These new processors can now be configured with the Lenovo ThinkSystem SR665 and ThinkSystem SR645 servers

Figure 1. Lenovo ThinkSystem SR645 now support "Milan-X" processors

AMD EPYC 7003 Series Processors with AMD 3D V-Cache Technology

These new processors feature the industry's largest L3 cache, delivering the same socket, software compatibility and modern security features as 3rd Gen AMD EPYC CPUs while providing outstanding performance for technical computing workloads such as computational fluid dynamics (CFD), finite element analysis (FEA), electronic design automation (EDA) and structural analysis.

These workloads are critical design tools for companies that must model the complexities of the physical world to create simulations that test and validate engineering designs for some of the world's most innovative products. As technical computing applications iterate on the most challenging design problems, they move a lot of data between the cores and memory; with the large L3 cache in Milan X, more data can be stored closer to the cores enabling performance increases.

Available in four SKUs and ranging from 16 to 64 cores, the new processors feature 768 megabytes of L3 cache. Faster, better CPU cores with ZEN 3 leadership core density per server and the new 3D V cache technology combined to deliver the best performance for technical computing. This performance translates directly to a competitive advantage for advanced digital design companies. Giving them more design iterations per day leads to better quality products and faster market time, delivering a competitive business advantage.

The four EPYC processor models are listed in the following table.

Table 1. AMD EPYC 7003 Series Processors with AMD 3D V-Cache Technology ("Milan-X")

EPYC model	Cores / Threads	Base Frequency	Max Boost Frequency	L3 Cache	Memory channels	Memory bus	TDP
7373X	16 / 32	3.05 GHz	3.8 GHz	768 MB	8	3200 MHz	240 W
7473X	24 / 48	2.8 GHz	3.7 GHz	768 MB	8	3200 MHz	240 W
7573X	32 / 64	2.8 GHz	3.6 GHz	768 MB	8	3200 MHz	280 W
7773X	64 / 128	2.2 GHz	3.5 GHz	768 MB	8	3200 MHz	280 W

By choosing ThinkSystem SR645 or SR665 with one of these new processors, IT leaders can select a server infrastructure that will enable them to shorten design cycles, build better products, save money, and deliver the energy efficiency needed to help meet enterprise sustainability goals.

The SR665 also now supports the AMD EPYC 7003 Series Processors with AMD 3D V-Cache Technology ("Milan-X").

Figure 2. Lenovo ThinkSystem SR665

Performance benchmarks using AMD EPYC 7003 Series Processors with AMD 3D V-Cache

The Lenovo ThinkSystem SR645 has achieved 4 world records configured with the new AMD EPYC 7003 Series Processors with AMD 3D V-Cache technology.

Two performance world records with new 2-socket results of the SPEChpc 2021 Small benchmark, achieving the following scores:

SPEChpc_2021_sml_base = 0.687
SPEChpc_2021_sml_peak = 0.687

Two performance world records with new 2-socket results of the SPEChpc 2021 Tiny benchmark, achieving the following scores:

SPEChpc_2021_tny_base = 6.73
SPEChpc_2021_tny_peak = 6.73

Conclusion

If you are working with technical computing workloads, consider incorporating servers that feature 3rd Gen AMD EPYC processors with AMD 3D V-Cache technology into your computing stack.

Lenovo ThinkSystem SR645 and SR665 servers are great offerings to take advantage of both the reliability and performance of a Lenovo server and the latest technology with AMD's 3rd Gen EPYC processors with AMD 3D V-Cache.

Related product families

Product families related to this document are the following:

- ThinkSystem SR645 Server
- ThinkSystem SR665 Server

Notices

Lenovo may not offer the products, services, or features discussed in this document in all countries. Consult your local Lenovo representative for information on the products and services currently available in your area. Any reference to a Lenovo product, program, or service is not intended to state or imply that only that Lenovo product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any Lenovo intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any other product, program, or service. Lenovo may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to:

Lenovo (United States), Inc.
8001 Development Drive
Morrisville, NC 27560
U.S.A.
Attention: Lenovo Director of Licensing

LENOVO PROVIDES THIS PUBLICATION ”AS IS” WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some jurisdictions do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. Lenovo may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

The products described in this document are not intended for use in implantation or other life support applications where malfunction may result in injury or death to persons. The information contained in this document does not affect or change Lenovo product specifications or warranties. Nothing in this document shall operate as an express or implied license or indemnity under the intellectual property rights of Lenovo or third parties. All information contained in this document was obtained in specific environments and is presented as an illustration. The result obtained in other operating environments may vary. Lenovo may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you.

Any references in this publication to non-Lenovo Web sites are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this Lenovo product, and use of those Web sites is at your own risk. Any performance data contained herein was determined in a controlled environment. Therefore, the result obtained in other operating environments may vary significantly. Some measurements may have been made on development-level systems and there is no guarantee that these measurements will be the same on generally available systems. Furthermore, some measurements may have been estimated through extrapolation. Actual results may vary. Users of this document should verify the applicable data for their specific environment.

This document, LP1593, was created or updated on July 26, 2022.

Send us your comments in one of the following ways:

- Use the online Contact us review form found at:
  https://lenovopress.lenovo.com/LP1593
- Send your comments in an e-mail to:
  comments@lenovopress.com

This document is available online at https://lenovopress.lenovo.com/LP1593.

Trademarks

Lenovo and the Lenovo logo are trademarks or registered trademarks of Lenovo in the United States, other countries, or both. A current list of Lenovo trademarks is available on the Web at https://www.lenovo.com/us/en/legal/copytrade/.

The following terms are trademarks of Lenovo in the United States, other countries, or both:
Lenovo®
ThinkSystem®

The following terms are trademarks of other companies:

SPEChpc™ is a trademark of the Standard Performance Evaluation Corporation (SPEC).

Other company, product, or service names may be trademarks or service marks of others.