Intel Select Solutions for Virtual Radio Access Network (vRAN) with Lenovo ThinkEdge SE450

Solution Brief

Reduce time to value with validated and optimized vRAN solutions

5G is fueling a rapid transition to virtualization and cloud-native technologies and many operators are embracing a shift to virtualized RAN (vRAN) for greater agility. vRAN architectures offer many advantages including the following:

- Enhanced user experience and faster network performance: critical real-time tasks are optimized for performance and completed at the edge, closer to where the data is being generated and used for reduced latency. Reduced costs including both CapEx and OpEx: using standards-based infrastructure improves hardware utilization efficiency and reduces operating costs through reduced maintenance and power savings
- Flexible performance and agile adaptability: as general-purpose infrastructure decoupled from specific workloads can transparently adapt when the new network elements and services are added and can respond dynamically to changing network requirements.

Intel Select Solutions for vRAN provide pre-validated reference designs that help accelerate 5G deployments.

The foundation of the Intel Select Solutions for vRAN is a robust set of Intel architecture components that include the 3rd Gen Intel Xeon Scalable processor, the Intel vRAN Accelerator ACC100, Intel Ethernet 800 Series Network Adapters and Intel QuickAssist Technology (Intel QAT).

The new Lenovo ThinkEdge SE450 has been verified by Intel as an Intel Select Solution for vRAN and can be configured to meet either the Base or the Plus Configuration requirements for best-in-class solutions. The SE450, built on the flexible performance of the 3rd Gen Intel Xeon Scalable processor, is complemented by a software stack based on Red Hat Enterprise Linux.

Built for the Edge

The ThinkEdge SE450 is purposely designed to operate outside of the datacenter, where the data is created and where the users need it. The small form factor of the server allows it to be installed in remote locations with no typical IT infrastructure. For example, the SE450 can be installed in a small cabinet, mounted on the wall or self-standing with a floor stand. The server is also built to operate in ruggedized conditions, sustaining wider operating temperature as well as shock and vibration.

Figure 1. Lenovo ThinkEdge SE450

The small form factor and ruggedized server does not compromise on performance by supporting Intel's 3rd Gen Xeon Scalable processors and up to four (4) PCI expansion cards.

Security at the edge is crucial, which is why the SE450 includes the later TPM 2.0 technology and various secure technologies protecting the device and data it contains.

The new SE450 is designed to process a huge amount of data, directly at edge sites and deliver the insights needed for edge AI use cases to become a reality. It is created to deliver the promise of AI at the edge by using the latest Intel technologies and several AI acceleration cards.

While the SE450 is deployed in several remote locations, it is easily configured centrally by xClarity Orchestrator and the Cloud infrastructure is automatically installed and managed with Lenovo Open Cloud Automation (LOC-a). Remote access to the server via a completely out-of-band wireless access avoids any unnecessary trip to the edge locations.

Specifications

The following table lists the specifications for the Lenovo ThinkEdge SE450

Table 1. Specifications for ThinkEdge SE450

Form Factor	2U rack server 300mm (11.8in) depth with 4x FHHL adapters; or 2U rack server 360mm (14.2in) depth with 4x FHFL adapters
Processor	1x 3rd Gen Intel® Xeon® Platinum processor, up to 36 cores, up to 225W TDP
Drive Bays	Up to 6x 2.5-inch 7mm drives; Up to 6x NVMe drives supported; 2x M.2 boot drives (RAID 1)
Memory	10x DDR4 memory slots; Maximum 1TB using 8x 128GB 3DS RDIMMs; Supports up to 2x Intel® Optane™ Persistent Memory 200 Series modules (PMem)
Expansion Slots	Up to 4x PCIe 4.0 slots, 1x OCP 3.0 slot
GPUs	Up to 4x single-width GPUs or 2x double-width GPUs
Network Interface	LOM adapter installed in the OCP 3.0 slot; PCIe adapters
Ports	Front: 1x Power Button, 1x system locator, health with LED, 1x VGA, 2x USB 3.1, 1x Serial Port (optional), 1x RJ-45 1Gb for dedicated management, 1x system locator LED; Optional Wi-Fi (management)
HBA/RAID Support	SW RAID standard; optional HW RAID with or without cache, or SAS HBAs
Power	Dual redundant power supplies AC (up to 1100W Platinum) or Dual redundant power supplies -48V DC 1100W
Systems Management	Lenovo XClarity Controller
OS Support	Microsoft, Red Hat,Ubuntu, CentOS, VMware.
Limited Warranty	3-year customer replaceable unit and onsite service, next business day 9x5; optional service upgrades

You can learn more about SE450 downloading the datasheet for this server.

The SE450 exceeds the performance benchmarks required to address challenges emerging at the network Edge.

The following table lists the ThinkSystem servers that are compatible.

Table 2. Intel Select Solutions for vRAN requirements

Ingredient	Intel Select Solutions for vRAN Base Configuration Hardware	Intel Select Solutions for vRAN Plus Configuration Hardware
CPU	3rd Generation Intel Xeon Gold 5318N processor (one socket, 20 cores) or higher SKU	3rd Generation Intel Xeon Gold 6338N processor (one socket, 32 cores) or higher SKU
Memory	128 GB (16 GB DIMM/Channel recommeneded)	
Intel Ethernet Controller	1x E810-CAM2 or CAM1 based NIC for 100GB/s throughput e.g. 1x E810-XXVDA4 or 1x E810-CQDA2	2x E810-CAM2 or CAM1 based NIC for 200 GB/s throughput e.g. 2x E810-XXVDA4 or 1x E810-2CQDA2
Acceleration	1x Intel vRAN Dedicated Accelerator ACC100 Intel QAT (optional)	
Storage (SSD/NVMe)	At least 2x480GB for boot (Intel SSD, Intel Optane SSD or M.2 equivalent)	

Together with the SE450, Intel Select Solutions for vRAN offer operators a streamlined path to deployment with validated software stacks built in conjunction with other industry leaders for flexible performance and enhanced security. The verification of the SE450 together with the software helps reduce time, effort and expense associated with developing vRAN solutions.

Conclusion

Lenovo's deep technical partnerships with industry leaders ensures that network operators, service providers, cloud service providers or enterprise infrastructure companies can choose among the highest performance and optimized solutions with confidence. With the latest ThinkEdge SE450 server verified as an IntelSelect Solution for vRAN, customers should be able to quickly and efficiently deploy various 5G vRAN and MEC solutions more securely and easily than ever before.

Customers will spend less time, effort, and expense evaluating hardware and software options with the the SE450 because Intel Select Solutions for vRAN helps simplify design choices by tightly specifying hardware and software ingredients to ensure interoperability and predictable performance.

Related product families

Product families related to this document are the following:

- Edge Servers
- ThinkEdge SE450 Edge 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, LP1544, was created or updated on December 8, 2021.

Send us your comments in one of the following ways:

- Use the online Contact us review form found at:
  https://lenovopress.lenovo.com/LP1544
- Send your comments in an e-mail to:
  comments@lenovopress.com

This document is available online at https://lenovopress.lenovo.com/LP1544.

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®
ThinkEdge®
ThinkSystem®
XClarity®

The following terms are trademarks of other companies:

Intel®, Intel Optane®, and Xeon® are trademarks of Intel Corporation or its subsidiaries.

Linux® is the trademark of Linus Torvalds in the U.S. and other countries.

Microsoft® is a trademark of Microsoft Corporation in the United States, other countries, or both.

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