Virtual Radio Access Network Distributed Unit (vRAN DU) with Lenovo ThinkEdge SE455 V3

Solution Brief

Telco network modernization and 5G is fueling a surge in media-rich content usage by subscribers, which strains cellular networks and impacts telco operators' profitability and growth. To address these challenges, telco operators are embracing new technologies, including transition to virtualization and cloud-native technologies, and many operators are deploying virtualized Radio Access Network (vRAN) for greater agility.

vRAN architectures offer many advantages including enhanced user experience and faster network performance since critical tasks are optimized for performance and completed at the edge, closer to data generation, reducing latency. Operational costs for both CapEx and OpEx are reduced using standards-based infrastructure, improving hardware utilization efficiency, and reduced operating costs through reduced maintenance and power consumption savings.

ThinkEdge SE455 V3 with Edge-optimized AMD EPYC 8004 processors for vRAN

Lenovo expands its Telco portfolio with the launch of the new ThinkEdge SE455 V3 server with AMD EPYC 8004 Series processors. The SE455 V3 is a high performance, power efficient and secure server with rapid automated, remote provisioning and deployment, for expanding Telco workloads, including vRAN, Multi-Access Edge Compute, and Edge Content Delivery workloads.

The ThinkEdge SE455 V3 provides adaptable performance and agile flexibility with CoTs infrastructure decoupled from specific workloads, it can seamlessly adjust to incorporate new network elements and services, enabling dynamic responses to evolving network demands.

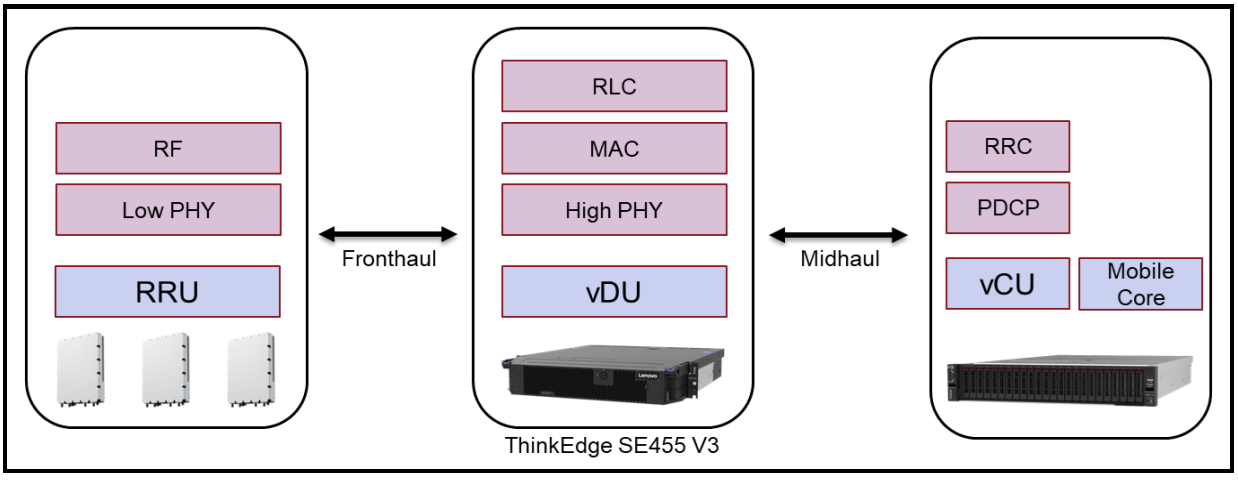

Figure 1. ThinkEdge SE455 V3 for vRAN

Benefits of the SE455 V3 vRAN solution

The benefits of the SE455 V3 Server for Telcos include:

- Handles increased network traffic and subscriber demands with leading system performance, high core count (up to 64) and improved system bandwidth.
- With up to 64 power-efficient processor cores providing 50% improvement in performance per Watt*, this enables operators to lower costs while also meeting subscribers' performance demands.
- A modular platform design can accommodate different RAN accelerator technologies today and, in the future (look aside, inline, SW based) and RAN deployment options (mu-MIMO, mmWave) .
- Zero-touch provisioning using XClarity and Lenovo's LOC-A for rapid, automated deployment and remote system management allows Telco's to simplify large-scale deployments across thousands of locations.
- End-to-end security for systems and data with tamper protection, intrusion detection, system lock down, HW root of trust and encryption.
- Helps Telcos meet sustainability goals with reduced emissions and power consumption.

Built for the Telco edge

The ThinkEdge SE455 V3 is purposely designed to operate outside of the datacenter, close to where the data is created and where the users need it. The short depth form factor of the server allows it to be installed in branch offices and remote locations with no typical IT infrastructure.

For example, the SE455 V3 can be installed in a small cabinet, even mounted on the wall. The server is built to operate in ruggedized conditions, sustaining wider operating temperature as well as shock and vibration.

Figure 2. Lenovo ThinkEdge SE455 V3 Edge Server (optional security bezel removed)

The short depth form factor and ruggedized server does not compromise on performance by supporting Edge-optimized AMD EPYC™ 8004 Series Processors and IO expansion with up to six PCIe slots (two PCIe Gen5, four PCIe Gen4), and one OCP 3.0 Gen5 expansion cards.

Security of data at the edge is crucial, which is why the SE455 includes ThinkShield Activation, Security Bezel, Tamper protection, Encrypted SSD, System Lockdown, Silicon Root of Trust, and TPM 2.0. The new SE455 V3 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.

While the SE455 V3 is deployed in several remote locations, it is easily configured centrally by Lenovo xClarity System management software, with remote deployments, automated installation and management using the Lenovo Open Cloud Automation (LOC-A).

Specifications

The following table lists the specifications for the Lenovo ThinkEdge SE455 V3

Table 1. Specifications

Feature	SE455 V3 capability
Form Factor	2U rack server 440mm depth
Processor	1x AMD Zen 4 SP6 processor, up to 64 cores, up to 200W TDP
Drive Bays	Up to 4x 2.5-inch Front Hot Swap 15 mm drives Up to 4x 2.5-inch Internal 15 mm drives (optional) 2x M.2 boot drives: non-RAID or Adapter RAID at GA, Hardware M.2 RAID post GA
Memory	6x DDR5 memory slots, up to 576GB using 96GB RDIMMs
Expansion Slots	2x PCIe Gen5 x16 4x PCIe Gen4 x8 1x OCP 3.0 Gen5 x16
GPUs	Up to 2x double-width GPUs (300W) Or up to 4x single-width GPUs (150W) Or up to 6x single width GPUs (75W)
GPU	NVIDIA L4, L40, AMD V70, Qualcomm AI 100
Network Interface	LOM adapter installed in the OCP 3.0 slot; Gen5 x16
Ports, Buttons	Front: 1x Power Button (with green LED), 1x System Locator (with blue LED), 1x NMI button, 1x USB-C, 2x USB 3.0, 1x USB 2.0 for XCC2, 1x RJ45 for XCC2 , 1x Diagnostic handset, COM port via PCI slot
HBA/RAID Support	HW RAID with/without cache or SAS HBAs 4350-8i, 5350-8i, 440-8i, 540-8i, 940-8i with supercap
Power	Dual redundant Gen2 (CFFv4) AC (1100W Titanium, 1100W/1800W Platinum Dual redundant Gen2 (CFFv4) -48V DC 1100W
Security	ThinkShield Activation, Security Bezel, Tamper protection, Encrypted SSD, System Lockdown, Silicon Root of Trust, TPM 2.0
Environmental	AC power: 5°C to 45°C plus up to 55°C under testing DC power: NEBS3 -5°C to 55°C (< 96 hours) Acoustic Mode: 40dbA at 25°C Non-GPU, 45dbA at 25°C with 2x NVIDIA L4
Limited Warranty	3-year customer replaceable unit and onsite service, next business day 9x5; optional service upgrades

You can learn more about server with the SE455 V3 datasheet:
https://lenovopress.lenovo.com/ds0168-se455-v3-datasheet

Lenovo ThinkEdge SE455 V3 provides a modular platform design that can accommodate multiple RAN accelerator technologies. The following table lists the SE455 component options that are compatible to support vRAN.

Table 2. vRAN components

Component type	Supported options
Network Interface Cards	ThinkSystem Broadcom 57416 10GBASE-T 2-Port PCIe Ethernet Adapter ThinkSystem Broadcom 57454 10GBASE-T 4-port PCIe Ethernet Adapter ThinkSystem Broadcom 57454 10GBASE-T 4-port PCIe Ethernet Adapter ThinkSystem Intel X710-T4L 10GBASE-T 4-Port PCIe Ethernet Adapter ThinkSystem Broadcom 57414 10/25GbE SFP28 2-port PCIe Ethernet Adapter v2 ThinkSystem Broadcom 57504 10/25GbE SFP28 4-port PCIe Ethernet Adapter ThinkSystem Intel E810-DA2 10/25GbE SFP28 2-port PCIe Ethernet Adapter ThinkSystem Intel E810-DA4 10/25GbE SFP28 4-port PCIe Ethernet Adapter ThinkSystem Mellanox ConnectX-6 Lx 10/25GbE SFP28 2-port PCIe Ethernet Adapter ThinkSystem Broadcom 57508 100GbE QSFP56 2-port PCIe 4 Ethernet Adapter v2 ThinkSystem Mellanox ConnectX-6 Dx 100GbE QSFP56 2-port PCIe Ethernet Adapter
Telco Accelerators	Intel ACC100, Xilinx T2 (Special bid only)

Summary

The ThinkEdge SE455 V3 with AMD EPYC™ 8004 Series Processors delivers top CPU power efficiency, low TDP, rugged design, and enhanced security that is optimized for vRAN deployments. SE455 V3 also enables effortless deployment to numerous sites, achieves 50% better performance per watt*, and up to 64 processor cores for multitasking efficiency, enhancing data routing and traffic optimization.

Lenovo's deep technical partnerships with industry leaders ensures that network operators and service providers can choose among the best performance and optimized solutions with confidence. With the ThinkEdge SE455 V3 server, customers should be able to quickly and efficiently deploy various 5G vRAN DU and MEC solutions securely and easily.

For more information, see the following pages:

- Lenovo-AMD alliance page:
  https://www.lenovo.com/us/en/servers-storage/alliance/amd/
- ThinkEdge SE455 V3 product page:
  https://www.lenovo.com/us/en/p/servers-storage/servers/edge/thinkedge-se455-v3/len21te0003

* Based on 3rd party testing, compared to previous-generation product.

Author

Hapsara Sukasdadi is a seasoned IT and telecommunications industry expert. Serving as a Solutions architect, Hapsara currently drives Lenovo's AI and Telco technical engagements, focusing on architecting solutions in AI and Telco infrastructures. In this role, Hapsara collaborates closely with partners and ecosystem providers. Hapsara's primary mission is to deliver comprehensive solutions, encompassing design, planning, and integration across a spectrum of critical areas, including AI and Telecommunications infrastructure solutions.

Related product families

Product families related to this document are the following:

- Edge Servers
- ThinkEdge SE455 V3 Server

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This document, LP1823, was created or updated on September 18, 2023.

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