Automated Agile Deployment of Cloud-Native Network Functions and Virtualized Network Functions at the Edge with Lenovo and ADVA
Solution Brief

Implement virtualized services and reap the benefits of NFV

ADVA Ensemble Connector delivers the industry's first and most advanced pure-play virtualization platform designed to simplify the deployment and management of universal customer premises equipment (uCPE) and edge computing solutions.

Lenovo has partnered with ADVA to enable a secure, high-performance NFVi platform built around the Intel® Select Solution for uCPE reference design

Ensemble Connector is an open software framework running on standard servers and providing a scalable, high-performance network operating system. It can host any third party virtualized network functions (VNFs) and cloud-native network functions (CNFs), which enable the service provider to offer a wide array of new revenue generating services. Ensemble Connector includes standard network function virtualization (NFV) infrastructure (NFVI) components such as Linux, KVM, Docker, and OpenStack.

Benefits

Lenovo's compact and powerful ThinkSystem SE350 Edge server is verified as an Intel Select Solution for uCPE on ADVA Ensemble Connector. This pre-configured NFVi solution takes the guesswork out of the evaluation and procurement process by meeting pre-defined hardware and software configuration requirements and rigorous system-wide performance benchmarks to speed deployment for Communications Service Providers (CoSPs).

Now service providers can take advantage of the benefits of uCPE: agile, automated delivery of multi-vendor software services.
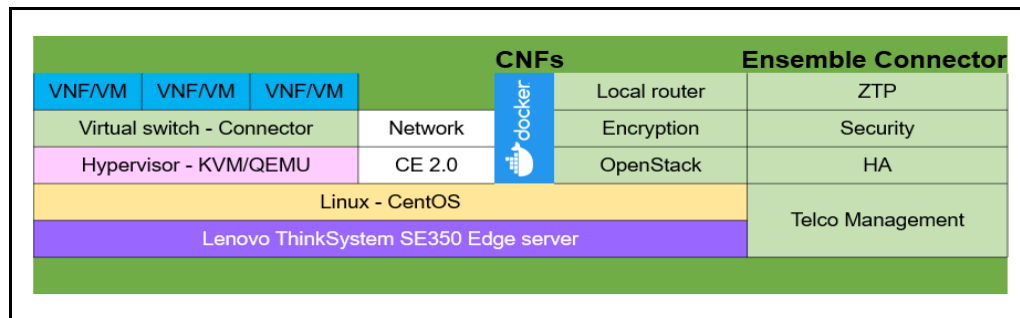

Figure 1. High level block diagram of Ensemble Connector on ThinkSystem SE350

The ThinkSystem SE350 supports a wide range of use cases at the network edge, bringing together high compute power in a compact and ruggedized form factor. Combining this powerful purpose-built edge hardware with ADVA Ensemble saves time and money while lowering risk. This unified all-in-one combination enables organizations to rapidly deploy ADVA Ensemble to new Edge locations.

NFV at the Edge with ThinkSystem SE350

Customers looking for computing solutions at the edge of their networks often have to compromise - to use either standard datacenter servers that are expensive, large and power hungry, or PC based equipment which can't run their enterprise level applications. The ThinkSystem SE350 fits the space between those two extremes.

The Lenovo ThinkSystem SE350 is a compact, powerful, edge server designed for rural edge, smart city, enterprise edge, or IoT edge applications. It has a small footprint measuring 1.75 inches high, 8.1 inches wide, and 14.9 inches deep that can be mounted on a wall, stacked on a shelf, or installed in a rack. The server is hardened in a shock-resistant and dust-resistant case and can handle temperatures from 0 to 55 degrees Celsius. It uses the Intel Xeon D-2100 processors, which feature a data center processor architecture that is optimized for network, storage, and cloud-edge systems. Intel Xeon D-2100 processors have up to 16 cores with a performance per-watt of power that is optimized for edge applications.

Highlights
• Pre-configured NFVi solution with verified high end-performance
• Agile, automated delivery of multi-vendor services
• Rapidly scale and expand to new Edge locations

Figure 2. Lenovo ThinkSystem SE350

The ThinkSystem SE350 also features up to 256 GB of RAM and 16 TB of internal solid-state storage with optional support for additional accelerators. Multiple connectivity options are offered, including wired Ethernet, Wi-Fi, and 4G/LTE. Because it can be deployed in the remotest of locations, security is a key consideration. The server includes encrypted storage and physical security features, such as a locking bezel, along with intrusion and tamper-detection mechanisms.

Intel Select Solution for uCPE on ADVA Ensemble Connector verified configuration

The following table lists the key components of the ADVA Ensemble Connector verified configuration

Table 1. ADVA Ensemble Connector verified configuration

Component	ThinkSystem SE350 WiFi/LTE model
Processor	Intel Xeon D-2166NT, 12C, 85W, 2.0 GHz
Memory	128GB (4x 32GB TruDDR4 2666 MHz RDIMM)
Network controllers	Application: 2 x 10GbE SFP+ Management: 2x 1GbE SFP, 2x 1GbE RJ45
Storage	M.2 128GB (mirrored), 2x 480GB SED SSD, 1TB NVMe
Software	ADVA Ensemble Connector version 19.1.3.x

ThinkSystem SE350 verification with ADVA Ensemble Connector included software installation with automatic hardware configuration discovery (e.g. CPU cores, memory, NICs, disks) for ease of provisioning and performance validation through several scenarios including Data Plane Development Kit (DPDK) and Single Root I/O Virtualization (SR-IOV). The SE350 packet processing performance was validated using the L3 Forward VNF sample application with RFC2544 zero packet loss test case.

Why Lenovo for CoSP

Lenovo infrastructure is built on a global manufacturing, services and support footprint, and is ranked #1 globally in both server reliability and customer support. Our CoSP and partner validated solutions are built on open standards and interfaces to preclude vendor lock-in. Lenovo XClarity Administrator simplifies Physical Infrastructure Management (PIM). Lenovo cloud automation platform offers automation and management of cloud networks across infrastructures.

Lenovo for CoSP solutions are based on Intel Xeon D-2100 based processors and Intel QuickAssist Technology (Intel QAT), which is optimized for packet processing, encryption and compression based NFV workloads.

About ADVA

ADVA Optical Networking SE is a European telecommunications vendor that provides network equipment for data, storage, voice and video services. Their open connectivity solutions enable customers to deliver the cloud and mobile services that are vital to today's society and for imagining new tomorrows.

For more information

To learn more about Lenovo for CoSP solutions and validated partner configurations, contact your Lenovo Business Partner or visit https://www.lenovo.com/cosp.

Intel Select Solutions for Network Transformation are supported by the Intel Network Builders Program: https://networkbuilders.intel.com/

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, LP1518, was created or updated on November 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/LP1518
- Send your comments in an e-mail to:
  comments@lenovopress.com

This document is available online at https://lenovopress.lenovo.com/LP1518.

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®
XClarity®

The following terms are trademarks of other companies:

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

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

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