

Lenovo Intel® Select Solutions for NFVi Forwarding Platform

Lenovo accelerates User Plane (UP) throughput @Edge

Reduce time to value with validated and optimized NFV solutions

Lenovo & Intel® Select Solutions for NFVi Forwarding Platform on Red Hat OSP13

Lenovo's deep technical partnerships with industry leaders ensures that Communications Service Providers (CoSPs) can choose among the highest performance and optimized solutions with confidence. With the latest Intel® Select Solutions for NFVi Forwarding Platform Reference Design, CoSPs can plan their development efforts to achieve a Control and User Plane Separation (CUPS) described in TS 23.214/23.244 which ensures both low network Edge latencies and maximum efficient use of resources.

Benefits

This Lenovo verified solution based on 2nd Generation Intel® Xeon® Scalable processors exceeds the performance benchmarks required to address challenges emerging at the new network Edge. Key benefits include:

- Optimized NFVi Solution for 4G or 5G UPF and broadband use cases like vBNG, vEPC, vCMTS
- Balanced I/O across sockets to ensure CUPS and maximizing data performance
- Enabling CoSPs to capture emergent revenue streams from intelligent transportation, remote healthcare and industrial automation

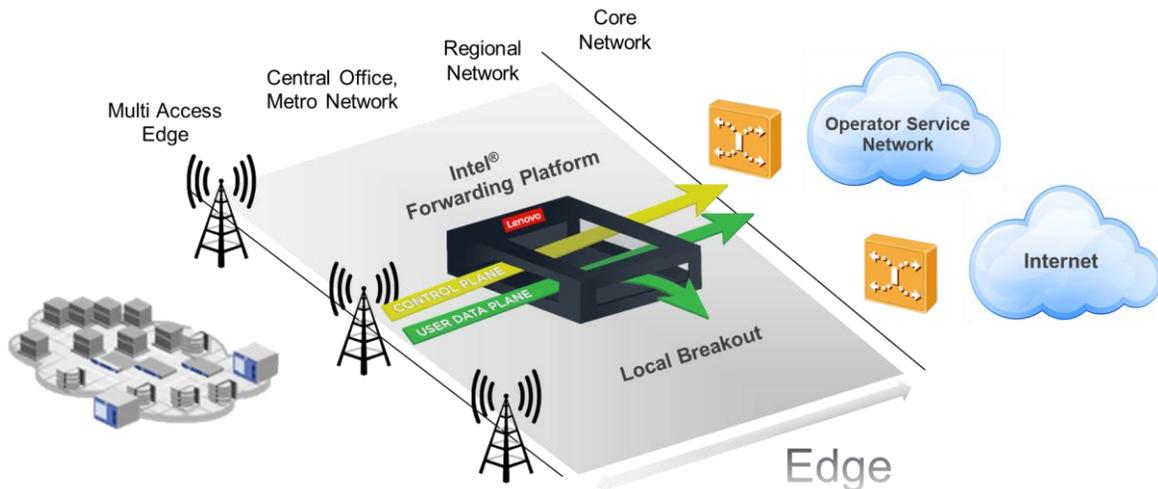


Figure 1: Communications Service Provider Edge Network depicting physical location of a Forwarding Platform





Communications networks have among the highest performance requirement to meet both enterprise and subscriber demands. Lenovo and Intel eliminate hurdles that CoSPs are confronted with to develop regional, Point of Presence (PoP) and Far Edge solutions. The 2nd Generation Intel® Xeon® Scalable processors are ideally suited to drive greater performance from the cloud data center to the network Edge. Lenovo works with key industry players to ensure your NFVi infrastructure is ready for delivery in the most demanding conditions to customers.

ThinkSystem SR650



The ThinkSystem SR650 is Lenovo's most powerful, versatile 2U2P rack server design. With up to 24 drive bays, it offers industry-leading reliability and no-compromise performance to tackle Communications Service Providers (CoSP) user plane workloads.

ThinkSystem SR630



The Lenovo ThinkSystem SR630 features a no-compromise 1U2P rack server design that can handle almost any workload in the software defined data center. For the CoSP control layer, the SR630 offers flexibility and scalability with a wide selection of drive types and capacities.

The Lenovo NFVi foundation reduces CoSP performance uncertainty at the network Edge

Lenovo offers a fast and efficient deployment path to reliable infrastructure with configurations that enable deployment of 4G and 5G-enabled technologies. By verifying virtualization configurations and Reference Design, Lenovo ensures that CoSPs deliver leading customer experiences from their network. In addition, Lenovo also works with 3rd party testing organizations such as EANTC to validate solution performance under real-world conditions. Lenovo's active participation in the ecosystem with partners lifts the pre-testing and verification burden so that CoSPs can focus on growing their business.

2nd Generation Intel® Xeon® Scalable processors:

- Offer high scalability that is cost-efficient and flexible, from the multicloud to the intelligent edge
- Establish a seamless performance foundation to help accelerate data's transformative impact
- Support breakthrough Intel® Optane™ DC persistent memory technology
- Accelerate AI performance and help deliver AI readiness across the data center
- Provide hardware-enhanced platform protection and threat monitoring

Configuration Item	Lenovo Cloud Node (Base Configuration)	Lenovo Controller Node Configuration
Processors	Intel® Xeon® Gold 6252 24C 2.1GHz processor	Intel® Xeon® Gold 5218 16C 2.3GHz processor
Memory	384 GB DDR4-2666 memory	192 GB DDR4-2666 memory
Intel® Optane™ DC Persistent Memory	N/A	
Discrete Network Adapters	4x Intel® Ethernet Network Adapter XXV710 dual-port @ 25 Gbps	2x Intel® Ethernet Network Adapter XXV710 dual-port @ 25 Gbps
Local Storage	2x ThinkSystem 2.5" Intel S4510 480GB Hot Swap SSD	
LAN on Motherboard	ThinkSystem 10Gb 4-port SFP+ LOM (uses Intel X722 1/10 GbE) 1/10 Gbps port for management	
NFV Infrastructure	Red Hat OpenStack 13	

Table 1: Intel® Select Solutions for NFVi Forwarding Platform Cloud (Base) and Controller Configurations

Key business challenges drive the value of the forwarding plane

The Intel® Select Solutions for NFVi Forwarding Platform based on the 2nd Generation of Intel® Xeon® scalable processors is a reference architecture. The Intel Reference Design includes a set of validation qualifications to ensure that CoSPs benefit from the forwarding plane characteristics which satisfy the emerging customer demands at the network Edge.

Lenovo for CoSPs has demonstrated compliance to these requirements and presents an NFVi platform that meets the high demands of a mobile service provider network that is evolving to include multi-access technologies including 4G and 5G.

5G is driving a new use case focus

According to the International Telecommunication Union (ITU), 5G wireless networks are addressing aspects of wireless networks that have not been fully addressed by prior generations. In combination with a Control and User Plane Separation (CUPS) strategy, the benefit of 5G is aligned to the following use case categories.

Ultra-reliable and low-latency communication (URLLC)

URLLC applications require low end-end latencies to achieve positive customer experiences. Highly visible voice & video performance sets a baseline for customers' expectation, but the expanded list of services includes mission-critical services such as autonomous driving, remote medical, industrial automation. URLLC services must be not only highly secure, but also reliable.

enhanced mobile broadband (eMBB)

Mobile networks that deliver some data connectivity have become so ubiquitous that basic services are highly competitive. eMBB is an advancement to basic broadband service that enables Augmented and Virtual Reality features that often require high up and down link performance. 360 video is an example of multimedia service that demands high performance from the network.

Massive machine type communications (mMTC)

IoT spans enterprise and individual devices which is exponentially increasing the number of connections. With expansion of the types and numbers of applications is also a steady rise in the amount of data and information transferred between connected devices and networks. 5G networks facilitate not only up and downlink communications, but also a high degree of information sharing among devices at the network Edge.

Table 2: Carrier-grade Edge applications

Edge Location	Use Case
Regional Office	Application load balancing
	vCGNAT - virtual Carrier Grade Network Address Translation
	vCDN - virtual Content Delivery Network
	vFW - virtual Firewall
Central Office (CO) / Point of Presence (PoP)	vBNG - virtual Breakout Network Gateway
	vDPI - virtual Deep Packet Inspection
	MEC - Multi-access Edge Compute
	O-RAN - virtual Open Radio Access Network
	vSecGW - virtual Secure Gateway
	Virtual Central Office (VCO)
Access Network	MEC - Multi-access Edge Compute
	O-RAN - virtual Open Radio Access Network

Lenovo and Intel are working on behalf of Communications Service Providers to advance mobile network solutions. This cooperation ensures that mobile subscriber and enterprise customers have optimized digital experiences.



Accelerate the evolution to NFV with Lenovo

Lenovo is well known for delivering servers to industry with the #1 uptime and exceptional customer satisfaction. However, in addition to servers, Lenovo delivers software solutions for Communications Service Providers (CoSPs) which dramatically improve operational systems to deploy virtualized infrastructure in communications networks.

Lenovo Open Cloud Automation (LOC Automation) creates an automated platform to deploy, optimize and manage high performance cloud infrastructure. LOC Automation accelerates cloud deployment by up to 3X with respect to manual deployment. Customers can benefit from:

- Accelerated deployment and cloud readiness
- Rapid time to incremental revenue
- Edge friendly solution to efficiently extend the network
- Built in benchmarking to observe, manage and reduce costs.

Lenovo is not only your hardware provider, but also your infrastructure deployment partner to make sure that your network deployment, expansions and maintenance perform beyond your expectations.

Why Lenovo for CoSPs

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).

For More Information

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

Highlights of Lenovo Intel® Select Solutions for NFVI, Optimized and Pre-Tested

- Simplified evaluation. VNF validation and the transition to virtualized infrastructure are two areas where Communications Service Providers (CoSPs) spend more time and money to find optimal solutions. Intel® Select Solutions through Lenovo are tightly specified to eliminate guesswork and accelerate decision-making.
- Fast and easy deployment. With predefined settings and rigorous system-wide tuning, solutions deployed on Lenovo infrastructure are designed to increase efficiency in carriers testing process, speed time to service delivery, and increase confidence in performance.
- Workload-optimized performance. Lenovo configurations meet or exceed Intel® Select Solutions design goals to deliver a guaranteed performance threshold for the workload and are built on the latest Intel architecture.

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