

Intel® Select Fast Track Kit for NFVI with Red Hat* Enterprise Linux*

Intel® Select Fast Track Kit for NFVI with Red Hat* Enterprise Linux* gives Intel® Network Builders members an accelerated path to developing NFV applications with performance of the Intel® Xeon® Scalable processors.



Introduction

The Intel® Network Builders ecosystem is made up of network functions virtualization (NFV) solution providers focused on helping communications service providers (CommsPs) in the network transformation journey. Ecosystem members are helping CommsPs evolve from costly, inflexible, fixed-function hardware to a fully virtualized set of network functions residing in scalable, flexible, and cost-effective servers based on Intel® Xeon® processors.

The launch of the new Intel® Xeon® Scalable processors gives Intel Network Builders members access to processors with increased scalability and enhanced performance for NFVI applications. This new processor family is based on an entirely new processor architecture—Intel® Mesh Architecture—that scales to deliver workload-optimized performance in NFV applications. The Intel Xeon Scalable processors integrate a number of performance accelerators. The most important of these for NFV applications is Intel® QuickAssist Technology (Intel® QAT), which accelerates encryption/decryption and data compression operations needed for network security.

Intel® Select Solutions are workload-optimized solution configurations that utilize the Intel Xeon Scalable processors to meet the needs of today's complex compute, storage, and networking workloads. The **Intel® Select Solution for NFVI** reference designs provide a roadmap to building optimized, next-generation NFVI servers powered by the Intel Xeon Scalable processors.

To help Intel Network Builders members develop solutions for these new servers, Intel has launched the **Intel® Select Fast Track Kit for NFVI** to enable Intel Network Builders members to accelerate the development of NFV solutions by leveraging the capabilities of these new processors.

Intel® Select Fast Track Kit for NFVI

The Intel Select Fast Track Kit for NFVI benefits Intel Network Builders members by providing these developers faster access to optimized and stable platform configurations to speed development of optimized NFV solutions (see Figure 1). In addition, CommsPs can utilize these platforms to conduct testing and modeling of solutions that will define next-generation services.

Intel® Select Solution for NFVI

Intel® Select Solutions are optimized, verified solutions **from a broad ecosystem** targeting today's complex network workloads.

- Customers will be able to quickly and efficiently deploy infrastructure achieving reliable, security-enabled, and workload-optimized performance on a balanced platform configuration.
- As a result, customers will be able to spend less time, effort, and expense evaluating hardware and software integrations.

Accelerate Deployment

Intel® Select Fast Track Kit for NFVI

Pre-integrated hardware plus software platforms accelerate market evolution by:

- Providing Intel Network Builders Developers faster access to advanced platform configurations to speed availability of optimized NFV solutions.
- Providing CommSPs with tuned platforms early to pull in test and modeling of solutions that will define next-generation architectures.

Speed Development

Figure 1. Intel Select Solution for NFVI is a blueprint for an optimized NFV server; the Intel Select Fast Track Kit for NFVI is a development platform for this server configuration.

The Intel Select Fast Track Kit for NFVI provides a base configuration that can be used for a broad range of workloads, including:

- Consumer Services: VoLTE, Wi-Fi calling, RCS, WebRTC, vIMS, vTAS, vSBC
- Business Services: Network on demand, virtual managed services, SD-WAN, SD-Transport, SD-VPN, DC-DC, vE-CPE, vPE, vCE, vFW, vRouter, vWAN, vSBC
- Wholesale Services: IoT, MVNO services, vEPC
- Internal Functions: PCRF, DPI, SDN, OCS, OFCS, HSS, DNS, NAT, DHCP, Radius, FW, LB, Orchestration

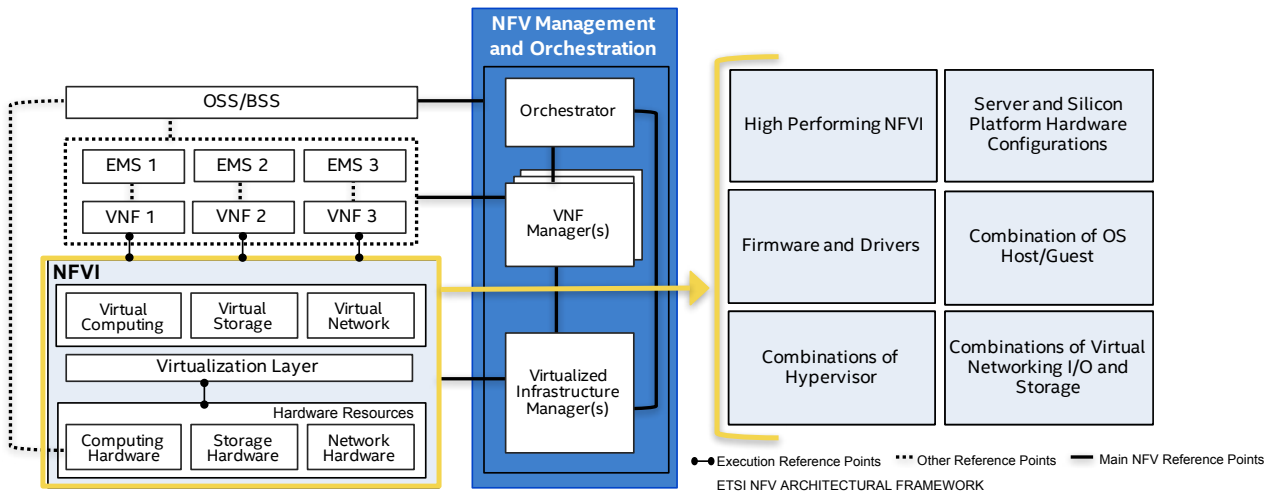


Figure 2. Block diagram of Intel Select Fast Track Kit for NFVI adapted from the ETSI NFV Reference Architecture image. The functions within the yellow line are the elements of the workload-optimized configuration.

<h3>High-Performing NFVI</h3>	<h3>Hardware Configuration</h3> <ul style="list-style-type: none"> • Intel® Xeon® Gold processors • Intel® 628 chipset with Intel® QAT • Intel® Ethernet Converged Network Adapters 	<h3>Drivers</h3> <ul style="list-style-type: none"> • NIC, DPDK, Intel® QAT, etc.
<h3>Combination of OS Host/Guest</h3> <ul style="list-style-type: none"> • Red Hat Enterprise Linux (RHEL) • Ubuntu • CentOS 	<h3>Combinations of Hypervisor</h3> <ul style="list-style-type: none"> • KVM/QEMU 	<h3>Combinations of Virtual Networking I/O</h3> <ul style="list-style-type: none"> • Combinations eliminated through use of "platform I/O services" concept

Figure 3. Intel Select Fast Track Kit for NFVI building blocks.*

Solution Brief | Intel® Select Fast Track Kit for NFVI with Red Hat® Enterprise Linux®

The Intel Select Fast Track Kit for NFVI was configured by analyzing the functional requirements of a wide range of NFVI use cases to arrive at a validated and workload-optimized configuration for VNFs and other NFVI applications.

The Intel Select Fast Track Kit for NFVI is built around the following architectural and deterministic performance features of the Intel Xeon Gold processor-based server board:

- Balanced non-uniform memory access (NUMA) connectivity: I/O is evenly distributed across both CPU sockets. Workloads running on both sockets can benefit from direct access to network, storage (Non-Volatile Memory Express,* or NVMe* drives), and Intel QAT acceleration.
- High throughput versatile network interface cards (NICs): two Intel® Ethernet Network Adapter XXV710-DA2 (dual 25 GbE) NICs per socket, four NICs in total, which gives aggregated theoretical throughput of up to 200 Gbps per server.
- Data-center grade storage using Intel® 3D NAND SSDs that deliver a blend of high performance, storage density, manageability, and reliability at an affordable price. High sequential throughput, high random IOPS, and low/reliable latency characteristics of Intel® SSD Data Center Family for NVMe* help accelerate applications across a wide range of NFVI workloads.
- Intel QuickAssist Technology acceleration built into the Intel® C628 chipset to improve performance and efficiency by offloading compute-intensive encryption and compression operations from server CPUs, including:
 - Bulk cryptography: symmetric encryption and authentication, and cipher operations
 - Public key cryptography: asymmetric encryption, digital signatures, and key exchange
 - Compression: lossless data compression for data in flight and at rest

Table 1 shows the hardware configuration of the Intel Select Fast Track Kit for NFVI:

COMPONENT	PART	PRODUCT CODE
Processor	Intel® Xeon® Gold 6152 processors, 22 Cores, 2.1 GHz, 30.25 LLC (MB), 140 W (TDP)	S-Spec SR3B4
Board + Chassis	Intel® Server Board S2600WFQ Intel® Server Chassis R2208WF – 2U, 8 x 2.5" drives	R2208WFQZS
Power Supply	Redundant 1300 W CRPS - AC, Titanium, Intel	AXX1300TCRPS
Memory	RDIMM 16 GB – DDR4 288-pin, 2666 MHz, Micron*	J26609-002
Storage drives - Boot	2x Intel® SSD Data Center S4500 Series - 240 GB, SATA 3.0	SSDSC2KB240G7
Storage drives - Capacity	4x Intel® SSD Data Center P4500 Series - 1 TB, PCIe 3.0 x 4 Interface	SSDPE2KX010T7
NVMe Switch	4 Port Switch, Intel	AXXP3SWX08040
PCIe Cables	OCuLink Cables for up to 4 NVMe drives, Intel	AXXCBL800CVCR (2), AXXCBL470CVCR (1), AXXCBL530CVCR (1)
Connectivity - NICs	4x dual 25 GbE Intel® Ethernet Network Adapters XXV710-DA2 1 GbE Management Port	XXV710-DA2
Out of Band Network - NICs	Intel® Ethernet Network Connection OCP I357-T4	I357T4OCPG1P5
Cables - Networking	4x Intel® Ethernet SFP28 Twinaxial Cable	XXVDACBL1M

Software Stack

The software stack for the Intel Select Fast Track Kit for NFVI is optimized for NFV applications running on the Intel Xeon Gold processor. The solution stack (see Figure 4) comes with various optimization tools and sample demo applications that showcase the optimal performance levels of the underlying Intel platform ingredients.

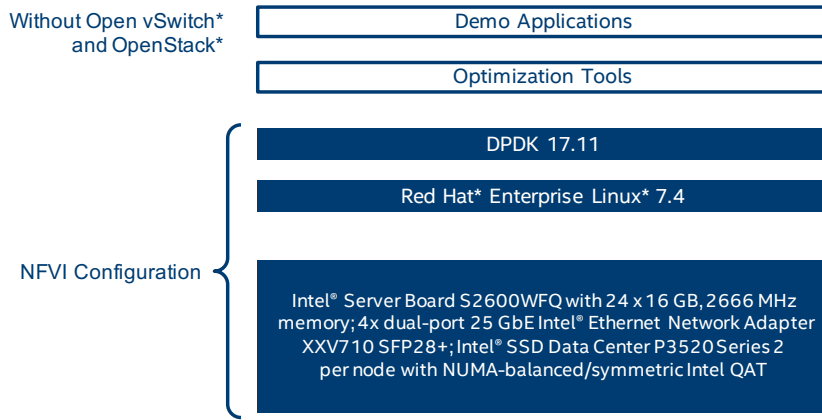


Figure 4. Block diagram of Intel Select Fast Track Kit for NFVI platform including hardware and software. Intel Network Builders members can add OpenStack and Open vSwitch to this configuration if needed for their applications.

Benefits

The Intel Select Fast Track Kit for NFVI comes with the following benefits for the Intel Network Builders members. The platform provides:

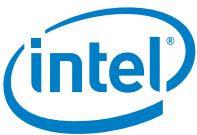
- an NFV infrastructure in a box with a time to market advantage
- a tuned and optimized hardware/firmware/software foundation that is aligned to CommSPs’ requirements
 - one-stop shop for customers to get the latest reference firmware ingredients
 - extensible, which accommodates a growing list of NFV test cases
- NUMA-aware/NUMA-balanced network, data, and crypto for simplified orchestration and provisioning, and deterministic performance
- a common debug platform between Intel and customer for effective debugging and root cause determination in the event of a platform issue
- continuous improvement to the NFVI building blocks, supporting the on-boarded NFV solutions, through Intel’s validation capabilities throughout the lifecycle of product

Conclusion

The Intel Select Fast Track Kit for NFVI was developed to align with communications service providers’ requirements. It provides a development platform for NFV solution providers to assist the CommSPs and enterprises in the network transformation journey. More details are available from the Intel Network Builders account management team or the Intel Select Fast Track Kit for NFVI website at <https://networkbuilders.intel.com/network-technologies/intelselectfasttrackkit>.

About Intel Network Builders

Intel Network Builders is an ecosystem of independent software vendors (ISVs), operating system vendors (OSVs), original equipment manufacturers (OEMs), telecom equipment manufacturers (TEMs), system integrators (SIs), enterprises, and service providers coming together to accelerate the adoption of network functions virtualization (NFV)-based and software-defined networking (SDN)-based solutions in telecom networks and in public, private, and hybrid clouds. The Intel Network Builders program connects service providers and enterprises with the infrastructure, software, and technology vendors that are driving new solutions to the market. Learn more at <http://networkbuilders.intel.com>.



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