ADVANTECH Networks & Communications

Your NFVI Partner for the New IP Infrastructure

Solution Brief

Intel® Select Solution for NFVI
Intel® Xeon® Processor Scalable Family

Remote Evaluation of Intel Select Solutions for NFVI

Overview

Several years after ETSI published its Network Functions Virtualization (NFV) white paper, the communications industry continues to work together to realize the vision of a virtual network where software-based network functions are disaggregated from the hardware below them. The road to full network transformation is not an easy one and strong ecosystem collaboration has been proven to be essential to its success. In an effort to accelerate NFV deployment, Intel launched its Select Solutions initiative for the NFV infrastructure (NFVI). Intel Select Solutions for NFVI are pre-validated configurations optimized to run NFV workloads that help speed up the process of selecting and deploying hardware and software when building next generation networks.

Advantech has been working closely with Intel in two platforms that meet Intel Select Solutions for NFVI criteria. The SKY-8201 carrier-grade server and FWA-6170 network appliance have been validated to support intensive workloads targeting applications such as virtual routers, network gateways and remote access servers. Communication service providers (CoSP) can consider these platforms when re-architecting their network edge with the peace of mind that they have been tested for deployment flexibility, service assurance and carrier-grade security.

As an active member of the NFV community, Advantech is working to take Intel Select Solutions objectives one step further by putting its remote evaluation labs at the service of CoSPs, integrators and ecosystem partners. Advantech verified Intel Select Solutions for NFVI can be remotely validated through Advantech's new online portal iss.testdrive-advantech-nfv.com which offers secure access to dedicated Advantech SKY-8201 and FWA-6170 platforms for evaluating NFV performance and service chaining without incurring the costs and delays of shipping and fine tuning test equipment. The new Advantech Intel Select Solutions for NFVI Test-Drive Portal gives partners and customers a head-start on NFVI and puts them in the fast track to network transformation.

The Advantech FWA-6170 and SKY-8201 are verified Intel Select Solutions for NFVI that provide fast access to workload-optimized configurations with the objective of accelerating deployment of NFV solutions.

Ready to ship as pre-configured platforms, the SKY-8201 and FWA-6170 are now also available for benchmarking in Advantech's Remote Evaluation Service labs. Communications service providers, integrators and ecosystem partners can leverage this platform to conduct early testing and network modeling shortening time and reducing integration risks when rolling-out next-generation services.

Hardware Platforms	***Software Platforms***
• *2U high performance SKY-8201 server and FWA-6170 appliance based on dual Intel® Xeon® Platinum and Gold processors* • *High density I/O with up to 200Gbps throughput per 1RU* • *Advanced packet processing technologies such as DPDK and Intel® QuickAssist* • *Compact design, reduced size and power footprint*	• *Red Hat Enterprise Linux (RHEL) and Red Hat OpenStack* • *Tested with a range of virtual network functions for the provider edge such as vEPC, vBNG, vCMTS, vSecGW and vPE Router*

intel select solution

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Introduction to Advantech Remote Evaluation Service

Advantech Remote Evaluation Service (www.go-res.com) is a testing platform built on Advantech's labs in Taiwan that has been designed to accelerate communication service providers (CoSPs), integrators and ecosystem partners' evaluation process and reduce integration risks when building next-generation networking solutions.

The service puts virtual control of your own test lab at your finger-tips. RES users can load software onto a wide range of platforms to perform functional testing and get an early start on development. The systems we propose are pre-integrated application-ready platforms based on the latest silicon and embedded in a qualified, dedicated, and secure test environment.

Originally conceived to benchmark bare-metal platforms, Advantech Remote Evaluation Service gained a new significance with the arrival of NFV. Breaking out physical network appliances into many different software and hardware pieces that need to perform as if they had been designed to work together generates uncertainties that the communications industry needs to confront. Therefore, the Advantech Remote Evaluation team decided to give RES a second use by opening its **NFV Test-Drive Portals** to help CoSPs, integrators and ecosystem partners address the main challenges of NFV. These portals provide an NFV-ready, open and standard platform with a common execution environment that integrates all the required NFVI hardware and software components to evaluate:

- **Performance and scalability:** benchmark virtual network functions (VNFs) early on to detect and remove bottlenecks that may hit at different levels of the virtual stack. Users can evaluate how multi-threaded, multi-tenancy VNFs scale out across multiple network nodes with several instances running on different containers, optimize VM provisioning and mapping, validate service chaining and prepare for peak traffic. From slim customer premises equipment (CPE) to high-performance blade servers, the wide choice of platforms that can be deployed to implement the virtual customer and provider edge makes Advantech NFV Test-Drive Portals a perfect tool to choose the appropriate configuration with the right price/performance point for specific deployment needs. Users can also evaluate software and hardware acceleration technologies and measure savings when deploying data plane intensive VNFs.

- **Integration and interoperability:** users can streamline the validation phase when testing complex NFV dependencies thanks to Advantech NFV Test-Drive Portals that provide easy access to pre-validated NFVI configurations and commercially-available NFV solutions. The initiative of certifying that particular NFV hardware and software products are interoperable and perform well together is a joint industry effort that minimizes end users' integration risks and shortens their evaluation process. As an active member of the NFV ecosystem, Advantech wants to help partners minimize resources, time and cost efforts of multi-vendor certifications by offering a common test platform where different NFV players can work together towards optimized joint solutions for their customers.

- **Reliability and security:** Advantech platforms available for evaluation are commercial-off-the-shelf (COTS) standard servers and appliances that still have been designed for continuous operation of applications that require zero downtime. They offer significant security enhancements over pure IT platforms such as redundant firmware images with failsafe upgrades and redundant, hot swappable FRUs. Advantech NFV Test-Drive Portal users can remotely test VNFs on these carrier-grade platforms to assess overall system availability and expose their planned network architecture to real-world threats.

There are currently three live NFV Portals accessible through Advantech RES: 6WIND, Wind River and Intel Select Solutions for NFVI. The latter being the latest portal and the subject of this paper.

Advantech verified Intel Select Solutions for NFVI

The Intel Select Solutions for NFVI were defined based on the functional requirements of a wide range of NFV use cases to arrive at a verified and workload-optimized configuration for VNFs that facilitates the process of selecting and deploying NFVI when building next-generation networks.

Two Advantech platforms have passed Intel Select Solutions for NFVI Plus Configuration tests that specify network, storage and integrated platform acceleration to maximize virtual machine density, the FWA-6170 Network Appliance and the SKY-8201 Carrier-Grade Server. Both platforms are based on high-performance Intel® Xeon® processors and provide high throughput with balanced I/O and on-board acceleration thanks to Intel® QuickAssist Technology and DPDK. Both have been integrated to specification and tested to meet the demanding performance and interoperability requirements of complex NFV workloads.

The **FWA-6170** is a high-end network appliance that provides performance, scalability and functionality in a 2U rack mount footprint. The configuration verified to meet Intel's reference benchmark-performance threshold, part number FWA-6170-ISS01, was equipped with dual Intel® Xeon® Platinum 8176 processors (28 cores each, 2.1GHz) that provide the latest architectural enhancements from Intel. With an abundance of PCI Express lanes, the FWA-6170 can support up to 8 Network Mezzanine Cards (NMCs) for modular, configurable networking I/O and acceleration. PCIe Gen3 technology on all NMC slots provides sufficient bandwidth to support multiple 40GbE and quad 10GbE modules as well as double sized NMCs for 100GbE connectivity. Support for two internal low-profile PCIe add-on cards enables further encryption offload in addition to on-chip PCH-based Intel QAT depending on the appliance model.

The **SKY-8201** carrier-grade server also meets the criteria for the Intel Select Solution for NFVI plus configuration. Architected around the Intel® Xeon® Platinum 8160M and Intel® Xeon® Gold 6154 processors in Intel Select Solution for NFVI configurations (part numbers SKY-8201LIS-IS02E and SKY-8201LIS-IS01E respectively), the dual-socket SKY-8201 combines high performance with the ruggedness, reliability, and long system lifecycles required by the industry. The SKY-8201 is a highly configurable, compact server designed to balance server-class processing with up to 200Gbps throughput per RU in a 20" depth chassis that has been designed for NEBS Level 3 carrier-grade environments and where limited rack space is available.

Both platforms come with an enhanced feature set to improve availability, serviceability and usability that includes IPMI 2.0 compliant management, redundant BIOS and remote BMC/BIOS upgrades using industry standard HPM.1 protocol.

For more information on these platforms and full Intel Select Solutions for NFVI specifications please visit http://www.advantech.com/nc/spotlight/NCG/ISS.

Remote Evaluation of Intel Select Solutions for NFVI

The new Advantech Intel Select Solutions for NFVI Test-Drive Portal combines Advantech Remote Evaluation Service and Intel Select Solutions initiatives in a natural match that helps users minimize integration risks and time to roll-out when selecting and deploying new NFV infrastructure. Service providers and integrators can tap into Advantech portal to easily test pre-integrated FWA-6170 and SKY-8201 Intel Select Solutions for NFVI

Figure 1. FWA-6170 Network Appliance & SKY-8201 Carrier-Grade Server

and validate their NFV-based network architectures on workload-optimized NFVI configurations.

The Advantech Intel Select Solutions for NFVI Test-Drive Portal is accessible at http://iss.testdrive-advantech-nfv.com/ and puts a special focus on **the virtual provider edge**. The need for lower latency, higher bandwidth and increased storage closer to subscribers makes the network edge of strategical importance when planning for the upcoming virtual and software-centric network transformation. Portal users will be able to evaluate NFVI configurations that have been designed to build high performing, fully programmable and highly available local aggregation points intended to be the foundation of the 5G smart and converged edge.

The Advantech Intel Select Solutions for NFVI Test-Drive Portal recognizes the need to accelerate the development of network edge applications and helps the community openly collaborate together towards this objective. The portal is ready to evaluate service assurance capabilities, deployment flexibility, and cost benefits of innovative edge architectures on pre-integrated NFVI configurations optimized to run virtual provider edge network functions:

- **Quality of service:** Advantech's verified Intel Select Solutions for NFVI have been validated with commercially-available vBNG, vEPC, vCMTS, vSecGW and vPE routers able to provide service to tens of thousands of subscribers. Portal users will be able to measure the power needed to meet their specific edge traffic throughput needs at different network locations and select the right ingredients that can support it in an efficient way.
- **Provisioning flexibility:** the NFVI available for testing leverages Intel architecture in an open and software-agnostic configurations that ensure true hardware-software decoupling and full network programmability. Portal users will be able to validate network automation capabilities in scenarios such as simulating weekdays and evening switchovers by dynamically shutting down enterprise services and moving the load to residential services that kick in at the end of the day on the same NFVI.
- **Cost optimization:** Advantech and Intel have work together to bring to market commercially-available NFVI configurations that address NFV performance and integration concerns without losing sight of CAPEX and OPEX reduction objectives. Portal users will be able to plan for an optimized network infrastructure with better use of hardware resources, more efficient redundancy schemes and compact, short-depth platforms with reduced size and power footprint per 10Gbps. In addition, the use of open and standard NFVI avoids vendor lock-in, allows for new network functions-as-a-service concepts and opens the network edge to third parties and OTT vendors creating new opportunities for CoSPs. These potential revenue generators can also be remotely evaluated to early

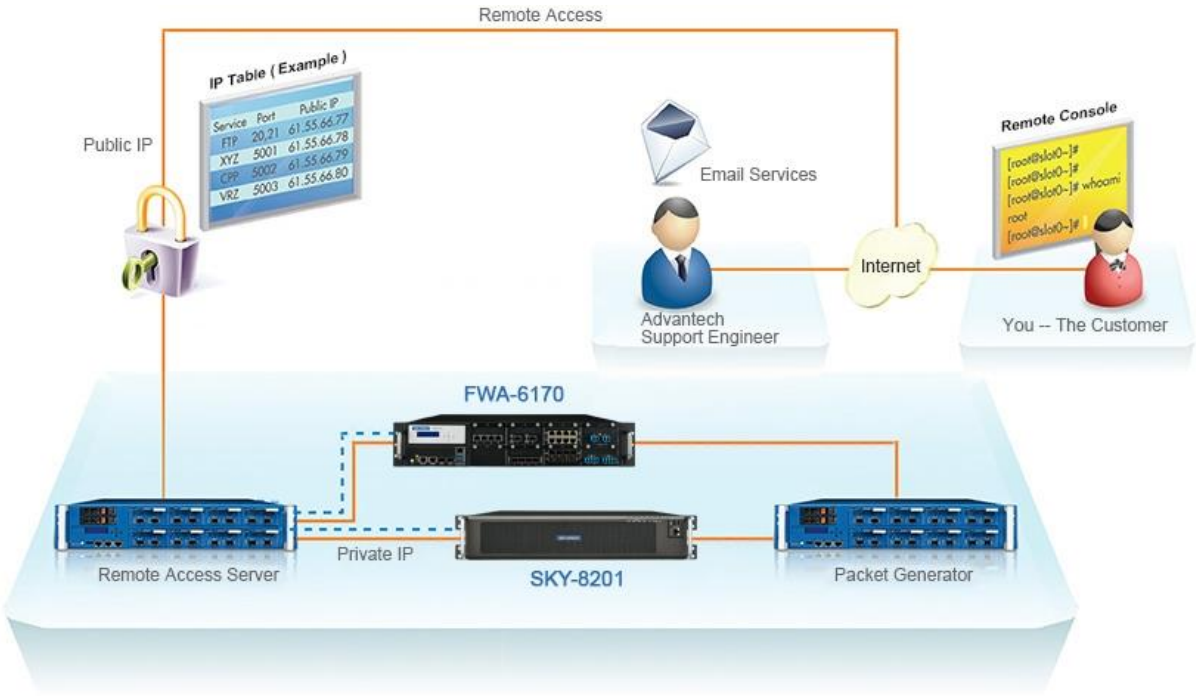

Figure 2. Intel Select Solutions for NFVI Test-Drive Portal Environment

validate new business models.

Test Environment

The Advantech Remote Evaluation Service network is depicted in Figure 2 and includes the following elements:

- *Remote Access Server:* Advantech RES is available through a Remote Access Server that secures access to the evaluation units. Each portal user will log in to the service using an assigned public IP, special port number and credentials. The Remote Access Server connects to the Evaluation Unit through Ethernet and serial console ports.

- *Evaluation Units*: users can remotely test both Advantech platforms verified as Intel Select Solutions for NFVI, the FWA-6170 network appliance and the SKY-8201 carrier-grade server. The verified configurations available for evaluation run Red Hat Enterprise Linux (RHEL) and are compatible with Red Hat OpenStack.

- *Packet Generator:* in order to test performance of the networking gear, RES also integrates a Packet Generator which can generate traffic as well as receive traffic from the Evaluation Units. The Packet Generator is optional and supports 10/25/40/100Gbps traffic.

Access to the Advantech Intel Select Solutions for NFVI Test-Drive Portal can be requested at http://iss.testdrive-advantech-nfv.com/ by clicking on the tab marked “Register” and filling out the simple form. Access can also be requested by sending an email to ncg@advantech.com. One of our representatives will get back to you promptly to discuss your requirements and set up a test drive session. From that point we will take you for a full test-drive and walk you through the online set-up. Once we agree on your needs and evaluation period we’ll send you your login details so you can get started on your own.

Ecosystem Partners

In the new NFV scenario, Advantech recognizes the importance of a strong ecosystem and works together with partners through different industry initiatives to fuel NFV adoption and unlock new business opportunities for traditional and emerging players. This is the vision behind Advantech Remote Evaluation Service conceived as a simple yet powerful tool focused on accelerating transition to the new IP infrastructure.

The new test-drive portal for Intel Select Solutions for NFVI is a step forward in this direction and as such it is open to NFV solution providers that share our philosophy about the telecom cloud architecture, the key role of the network edge and the need for greater NFV elasticity. We currently work with different network builders partners such as netElastic to put together commercially-available end-to-end solutions that customers can remotely test for performance and functionality. If you are part of the NFV community and want to contribute to our objective of putting customers in the fast track to NFV and 5G, you are welcome to contact us to discuss how we can join efforts.

Conclusion

Communication service providers are planning for the upcoming network transformation and starting to build the infrastructure that will run their next-generation virtual and software-centric services. With the broad choice of components that can be used to implement the new network infrastructure, performance, interoperability and reliability arise as the three main concerns resulting from the disaggregation of previously tightly assembled networking software and hardware.

Advantech and Intel have picked up on the inevitable request for pre-integrated NFVI configurations that ensure service quality and minimize integration risks and work together on two sister initiatives that streamline service providers’ evaluation and validation phases when re-architecting the network edge. On one hand, Advantech has joined the Intel Select Solutions for NFVI program with two verified configurations based on Advantech’s FWA-6170 network appliance and SKY-8201 server. On the other hand, Advantech has made these Intel Select Solutions for NFVI available for remote evaluation through an online test-drive portal that reduces testing time and costs.

These two joint initiatives alleviate the difficulties of selecting, benchmarking and integrating multi-vendor NFVI hardware and software configurations with easy access to pre-validated, application-ready platforms that have been tested for optimized performance and functionality running intensive virtual provider edge network functions. Advantech Intel Select Solutions for NFVI Test-Drive Portal gives service providers and integrators a head-start on deployment, reducing time-to-rollout and risk when building next-generation network services.

For more information on Advantech Intel Select Solutions for NFVI Test-Drive Portal or to book a demo please contact us at

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Or visit

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