SOLUTION BRIEF

Communications Service Providers
Network Security

Clavister* Optimizes Its Security VNF for Performance Advantage

Clavister Security VNF delivers performance that meets needs of growing MNO networks.

Security threats are pervasive, escalating, and continually morphing, and the pressure is mounting on mobile network operators (MNOs) to secure their networks and protect their consumers. At the same time, mobile data adoption continues to skyrocket, with over 11 billion mobile-connected devices predicted to be in use by 2020 (exceeding the world's projected population at that time).[1] That means the burden on MNOs to protect their networks requires an infinite ability to scale their security measures to keep pace with this growth explosion.

To support and manage mobile device growth, the virtualization of mobile and telecom networks will be a monumental shift from fixed and costly hardware-dependent legacy infrastructure towards flexible and scalable virtual network functions (VNFs). This new virtualized network will not only focus on cost efficiencies but also provide functionality and protection that scales to meet growth predictions.[2] Indeed, some of the new security challenges facing MNOs, such as large-scale distributed denial of service (DDOS) attacks, and even the move to high-speed 5G networks, make future-proofing the network with virtualized security infrastructure essential.

However, making the leap to rely on virtual firewall protection via a software defined network (SDN) has not been an easy transition. There is a persistent belief that traditional appliances and legacy hardware are more secure, reliable, and scalable than virtual network functions (VNFs). Key security challenges for virtual firewalls include the following:

- Intra-virtual machine (VM) security: keeping a clear separation between the VNFs and customers.
- Continuity: ensuring the same functions and configurations that were installed as traditional appliances are available as VNFs.
- Service assurance and automation: deploying the ability to react to threats in real-time, from virus detection to wrongly configured applications.
- Multitenancy and performance: building the capacity to scale the network alongside growth in the number of customers and capacity per customer.
- Flexibility: provisioning security gateway functions during operations.
- Elasticity: scaling security VNFs both up and down; and turning them on and off.

With ultimate flexibility and infinite scalability in mind, Clavister* has developed a telco-ready, carrier-grade virtual next generation firewall (vNGFW) that not only achieves flexibility and efficiencies expected from VNFs, but when paired with servers running Intel® Xeon® processors and Intel® Atom® processors, has very high throughput and excellent scalability, flexibility, and reliability for applications that depend on traditional hardware appliances.

The Solution

Knowing that growing mobile adoption paired with exponentially increasing security risks would lead to massive performance demands, the Clavister Security VNF was designed specifically for MNOs with scalability as its goal. The Clavister Security VNF provides carrier-grade performance much like traditional appliances but with the added flexibility of dynamic scale-up and scale-down. Thanks to a unique multi-core architecture with configurable utilization of data-plane and user-plane processes, the Clavister Security VNF scales intelligently and almost linearly based on the number of vCPUs available per software instance. The Clavister Security VNF can reach extremely high capacity due to its unique data plane design that allows for code-blocks within the software to be internally chained in an efficient way according to traffic needs.

This internal software architecture, combined with support for service chaining controllers (see Figure 1), enables MNOs to build customized services by dynamically steering IP edge traffic to virtual services based on variables including service levels, content, location, and congestion. Service chaining avoids sending all traffic through all service functions, thereby supporting more dynamic scalability.

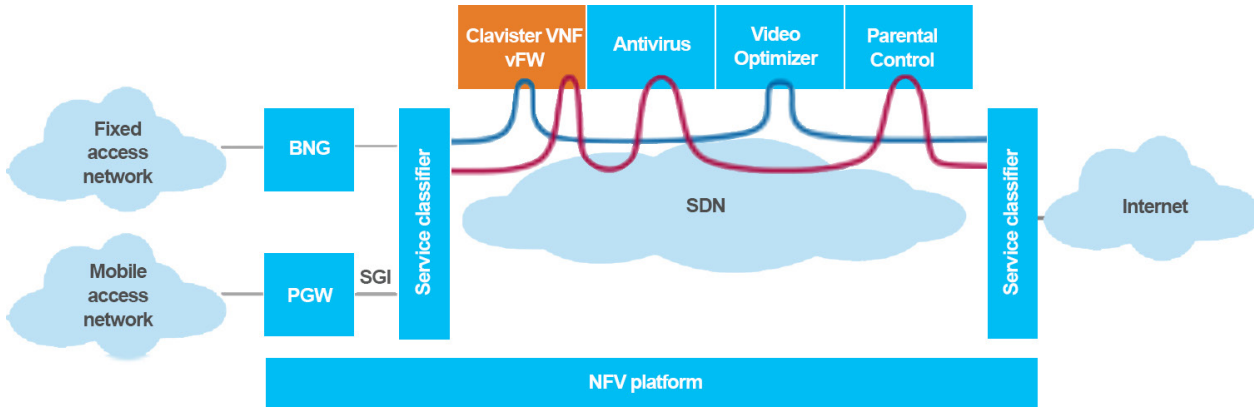

Figure 1. Clavister Security VNF in a service chaining scenario

The Intel® Advantage

The Clavister Security VNF is optimized to run on modern Intel CPUs, and scalable from high-end Intel® Xeon® CPUs down to embedded Intel® Atom® processors. An integral part of the product is the close integration with open source Data Plane Development Kit (DPDK) for a virtualized platform that achieves higher throughput than traditional appliances. With the integrated DPDK running on the Intel CPUs, the combined solution increased throughput and total number of connections. These performance results are shown in Figure 2:

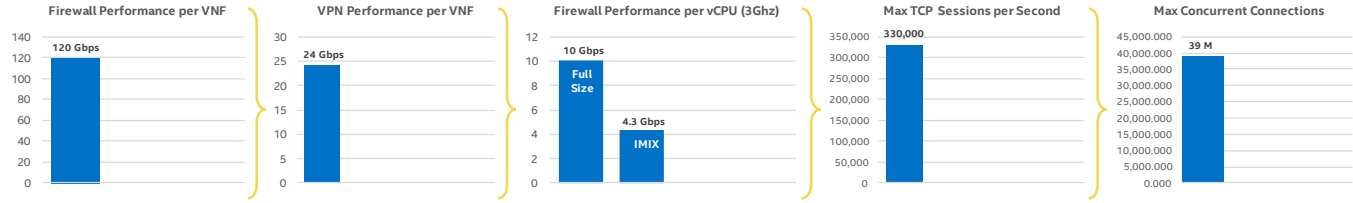

Figure 2. Clavister Security VNF performance results leveraging Intel CPU[3]

The Clavister Security VNF running on Intel CPUs delivers virtual security that enables true elastic scalability using multi-core, multi-threading technology, providing SDN/NFV-ready environments that provide carrier-grade performance.

Summary

The Clavister Security VNF paired with the power of Intel delivers a highly secure, elastic, and nimble NFV solution for communications service providers:

- Dynamic scale-up and scale-down across multiple vCPUs at run-time, for efficiency and performance.
- Purpose-built software designed for telecom readiness.
- Carrier-grade performance using multi-core and multi-threading architecture.
- SDN/NFV-ready environment for reduced costs and improved service agility when making large-scale roll-outs and network expansions.

About Clavister

Clavister is a security provider for fixed, mobile, and virtual network environments. Its award-winning solutions give enterprises, cloud service providers and telecoms operators the highest levels of protection against current and new threats, with unmatched reliability. Clavister joined the Intel Network Builders program in 2014. The company was founded in Sweden in 1997, with its solutions available globally through its network of channel partners. To learn more, visit www.clavister.com.

About Intel

Intel (NASDAQ: INTC) is a world leader in computing innovation. The company designs and builds the essential technologies that serve as the foundation for the world's computing devices. As a leader in corporate responsibility and sustainability, Intel also manufactures the world's first commercially available "conflict-free" microprocessors.[4] Additional information about Intel is available at newsroom.intel.com and blogs.intel.com and about Intel's conflict-free efforts at conflictfree.intel.com.

[1] Cisco VNI Mobile Forecast (2015-2020) http://www.cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/mobile-white-paper-c11-520862.html

[2] Research from Gartner: Virtualized Security – The End of Big Irons https://www.gartner.com/technology/media-products/newsletters/clavister/1-3K4BQ0F/gartner.html

[3] Tests performed by Clavister. Configurations: software: Clavister cOS Stream 3.00 / 2.90; hardware: Intel® Server System R2208WTTYS with dual Intel Xeon processors E5-2687W v4; KVM Host: CentOS 7.0*; I/O: Intel® Ethernet Converged Network Adapter XL710 40 GbE. Performance and capacity tests were performed in accordance to RFC standards such as RFC2544. All performance numbers for VPN capacity are measured on traffic with 512 bytes packet size.

[4] "Conflict-free" refers to products, suppliers, supply chains, smelters, and refiners that, based on our due diligence, do not contain or source tantalum, tin, tungsten or gold (referred to as "conflict minerals" by the U.S. Securities and Exchange Commission) that directly or indirectly finance or benefit armed groups in the Democratic Republic of the Congo or adjoining countries.

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