

SOLUTION BRIEF

Communications Service Providers
Service Assurance



Veryx Launches Virtual Service Assurance Using Intel® Xeon® Scalable Processors

New service assurance test tools are essential to measuring NFV quality of service. vProbes from Veryx® Technologies running on Intel® Xeon® Scalable processors feature scalability, performance, and features to provide visibility for virtualized networks.



Overview

The communication service provider (CommSP) industry is in the process of adopting software defined networking (SDN) and network functions virtualization (NFV) technologies, driven by a need for more automated network control leading to more agile networks. Service assurance is an essential network function that ensures customer satisfaction with services—and it too has evolved to measure and control service quality in the new virtual network era.



Service assurance test probes are deployed throughout the network to monitor network health. NFV is a primary driver in the need for many more test points in a network, which makes using legacy hardware-based test probes expensive and difficult to scale. The need of CommSPs to consistently deliver enhanced quality of service for differentiated customer experiences at ever greater scale requires intelligently virtualizing these test systems.

In order to support the deployment of successful NFV services, Intel® Network Builders ecosystem member Veryx® Technologies has developed a virtualized network test solution designed with the scalability and automated deployment required to comprehensively test these new network services.

The Challenge

With legacy testing and visibility solutions, probes must be manually deployed, which is too time consuming for NFV networks that can remotely instantiate new virtual network functions (VNF) throughout the network. This makes it difficult to provide the required level of visibility when utilizing VNFs. As CommSPs transition to NFV, they face the following service assurance challenges:

Service Chaining: With virtualization, network operators may use service chaining to combine more than one VNF for a particular service. Legacy testing tools will not help in isolating issues in such a virtualized environment.

Dynamic Nature of On-Demand Services: Before NFV, services were manually activated and de-activated based on user request and often were made available for specific time duration. Going forward, there is the need to assure the service performance for dynamic, on-demand service offerings. Service assurance will be essential for dynamic services, such as expanded Internet access services during events or network backups, with durations that can vary widely.

Traffic Generation: Legacy solutions rely on fixed-function network probes to generate traffic at full line rate. But the dynamism of NFV networks can make it a challenge to deploy these probes where the need is and also can result in a

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mismatch between the probe's interface and the speed of the network. These conditions make it expensive to scale hardware probes as new virtual services are deployed.

Lack of Intelligence: Generally, when a service design/activation test is conducted, the testing solution reports a mere pass/fail status, requiring a network engineer to do further onsite investigation to interpret the errors. The costly process is very time consuming, which makes it hard to scale and it can be prone to errors.

The Solution

To help overcome these challenges, Veryx Technologies offers Veryx vProbe, a software-based test probe tool, a component of SAMTEST®, which supports activation, monitoring, and diagnostics for network services based on NFV and SDN capabilities fueled by the Intel Xeon Scalable platform. This includes benchmarking of a virtualized network in the lab or in pre-deployment production network verification. The vProbe can be used for VNF- or VM-based service activation, monitoring, on-demand measurement, and trouble shooting. It provides both active and passive performance management capabilities. Veryx vProbes in the network are managed by a SAMTEST controller, which provides centralized comprehensive test and monitoring capabilities.

Key vProbe features include:

Support for agile and on-demand services: Veryx vProbes are VNFs optimized for Intel Xeon Scalable platform that can be spun-up in seconds and require minimal system resources from the host server. The small processing footprint required for Veryx vProbes facilitates dynamic transfer of vProbes to many different servers across the network when network service needs change.

Traffic generation and analysis up to 10 Gbps¹: Unlike current solutions that rely on legacy test resources with a single, fixed network interface, Veryx vProbe features 100 Mbps, 1 Gbps, and 10 Gbps interfaces along with the flexibility to measure different packet sizes.

Service testing with insights for the test personnel:

Generally, when a service activation or service design test is conducted, legacy test tools merely report a fail/pass status. However, the Veryx vProbe provides an analysis that highlights the root cause of a test failure. This enables the test personnel to quickly escalate the issue to the proper team for rapid resolution. For instance, a developer can be alerted to implementation issues or test personnel can be made aware of configuration issues. Thus, the time and effort associated with fixing such issues and completing service activation and design testing can be drastically reduced.

Line Rate Performance on Servers with Intel® Xeon® Scalable Processors

The Veryx vProbe has been engineered to transmit and receive at full line rate for all packet sizes on a 10 Gbps Ethernet interface. For bi-directional data flows, full line rate is achieved for 128 byte and larger packets. It also has capability to transmit and receive full line rate traffic with mixed packet sizes. The table below shows the values measured with two high-performance servers utilizing Intel® Xeon® Scalable processors in Intel's lab. The servers

Veryx vProbe Benefits for CommSPs

- vProbe can be linked in a service chain with other VNFs to measure performance of a complete service.
- Built-in programmable traffic generation means no additional investment is required for hardware traffic generators for custom testing.
- Dynamic migration of vProbes is rapid across the network and can be spun-up in seconds for reduced staff time and effort.
- Veryx vProbe's small footprint requires few server resources, which contributes to a reduction in total cost of ownership.

were connected back-to-back using 10 GbE adapters and performance was measured with packets in different sizes. Configuration details are summarized below.

The Intel Xeon Scalable Processors

Servers based on the Intel Xeon Scalable processors are the infrastructure platform for agile digital services. This processor family offers:

- High scalability for cloud-optimized and 5G-capable communications networks
- Exceptional processing of data-protecting encryption algorithms and acceleration for compression and other key workloads
- Performance and efficiency to allow convergence of key communications workloads such as applications and services, control plane, packet, and signal processing

Hardware Configuration

- 2x 26-Core Intel® Xeon® Platinum 8170 processor @ 2.10 GHz
- 384 GB quad-channel DDR4 RAM @ 2666 MHz
- Intel® Ethernet Connection X722 10 Gbps
- Ubuntu* 16.04.3 LTS / 4.4.0-87-generic x86_64 GNU/Linux*
- DPDK 16.07.2

Veryx vProbe Configuration

- Logical CPU cores allocated: 4
- Huge page memory allocated: 256 MB per port
- Memory allocated: 2 GB
- Disk space allocated: 4 GB

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The table below summarizes the test result when unidirectional traffic was transmitted between vProbes for 15 minutes during four test iterations.

UNIDIRECTIONAL TX (VPROBE -> VPROBE)		
PACKET SIZE (BYTES)	RATE %	MBPS
64	100.00	7,619
80	100.00	8,000
128	100.00	8,648
256	100.00	9,275
512	100.00	9,624
1024	100.00	9,808
1500	100.00	9,868
2000	100.00	9,900
EMIX (7:4:1)	100.00	9,433

Table 1. Performance with unidirectional traffic¹

The table below summarizes the test result when bi-directional traffic was transmitted between vProbes for 15 minutes during four test iterations.

BI-DIRECTIONAL TX (VPROBE -> VPROBE)		
PACKET SIZE (BYTES)	RATE %	MBPS
64	71.00	5,464
80	74.00	5,922
128	100.00	8,648
256	100.00	9,275
512	100.00	9,624
1024	100.00	9,808
1500	100.00	9,868
2000	100.00	9,900
EMIX (7:4:1)	100.00	9,433

Table 2. Performance with bi-directional traffic¹

Conclusion

The overall results of the validation demonstrate that Veryx vProbe is capable of delivering line-rate performance on 10 GbE networks. The performance was better than expected given that it was achieved using open source virtualization (KVM) and no special bare metal OS customizations. These results showed that the Veryx vProbe is NFV-ready and can be integrated into open source cloud management stacks at scale and with the necessary performance.

In addition, the test demonstrated the suitability of Veryx vProbe for meeting the needs of emerging VNF testing functions in NFV deployments.

The Veryx vProbe has many features, including the ability to scale elastically for carrier cloud deployments. Another advantage is the ease with which virtual instances and compute nodes can be added on demand.

Taking advantage of the latest Intel Xeon Scalable processors, the Veryx vProbe offers a software-based test probe that can deliver the visibility required for NFV networks.

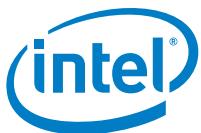
About Veryx

Veryx Technologies is a provider of innovative testing, automation, and monitoring solutions for network service providers, cloud service providers, data centers, enterprises, and network equipment vendors. Veryx offers solutions for network testing, visibility, performance monitoring, and equipment testing applications for technologies such as Carrier Ethernet, IP, Cloud, IoT, NFV, and SDN.

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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¹ Test conducted by Veryx in the Intel® Builders Construction Zone Lab. Hardware configurations: 2x 26-Core Intel® Xeon® Platinum 8170 processor @ 2.10GHz, 384 GB quad-channel DDR4 RAM @2666 MHz, Intel® Ethernet Connection X722 10 Gbps, Ubuntu® 16.04.3 LTS / 4.4.0-87-generic x86_64 GNU/Linux*, DPDK 16.07.2. Veryx vProbe configuration: logical CPU cores allocated: 4; huge page memory allocated: 256 MB per port; memory allocated: 2 GB; disk space allocated: 4 GB.

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