White Paper

Network Evolution – Where Did the Test Instruments Go?
Uncertainty Makes Operators Unhappy

Time is the enemy when you're trying to identify the root cause of a network problem. You urgently need more information. Specifically, you require precise data about the status of nodes and the quality of end-to-end services. With that info, you could easily direct your field services teams and fix the issue at hand. Fortunately, this type of network testing technology exists. Forward thinking service providers are putting it to use, and the system provides everything they need to tackle network failures even before services are affected.

Software-driven networks need new testing technologies

Legacy networks are hardware-centric with network features provided by purpose-built network devices. This is also true for legacy network testing systems. Failure analysis requires service engineers to visit sites with dedicated test equipment. But this is a slow and far from cost-effective process. Service providers want software-driven networking with virtual network functions (VNFs) operated on standard servers. With network functions virtualization (NFV), they can transform their networks into agile and flexible service production factories. They can introduce new services

Virtual testing simplifies operations

- Network services lifecycle assurance with virtualized testers easily deployed at any site

- Minimizing operational cost with central tools connecting to distributed, virtual probes and agents

- Compatibility between virtual probes and agents, legacy equipment and central controllers

- Highest customer satisfaction with self-service portal to real-time service quality information

- Scalable software platform easily aligns with network and services growth

- Open and flexible NFV infrastructure, management and orchestration platform

by activating software appliances, with no installation of hardware or software, and no site visits. Service providers need to have the same approach for network testing, which must align with the speed and agility of software-defined networks. They want to move to an automated and software-centric mode of operation.

Service lifecycle health monitoring with virtualized network testing

Maintaining or enhancing service quality will be critical to winning business customers and paving the way for a successful transition to virtual services. The nature of an open, VNF-based solution requires a different approach to network and service assurance since service quality can no longer be inferred from network and equipment quality metrics alone. By including service assurance VNFs in the service chain, the service orchestrator can automatically test and verify a service (e.g., a service activation test, SAT) before turning it over to the customer and can implement end-to-end service monitoring based on policy or operational needs in a dynamic way. Automating these functions is the only way to address the need for scalability of 5G and IoT services.

Assuring service quality at the virtualized network edge

Automated transport assurance and throughput tests

- Ethernet and IP service activation testing (Y.1564)

- TCP throughput testing (RFC6349) y Ethernet OAM (Y.1731)

- IP performance monitoring (TWAMP)

- Server/application response time

Automated application and service testing

- Firewall

- VoIP

- Video

- DNS response time

Test Technology Leader Goes Virtual

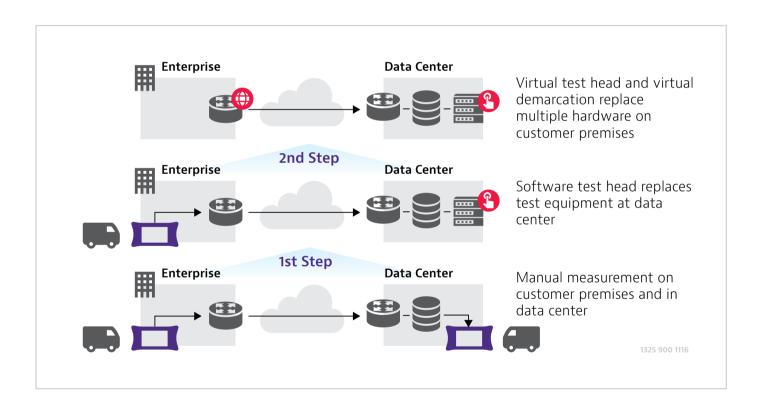VIAVI is enabling service providers to deliver on the promise of this new paradigm with a fully managed, lower-cost, open assurance solution that delivers a better quality of experience than appliance-based solutions. VIAVI Fusion is a software-based, Layer 2-4 network test system that allows service providers to roll out new types of virtual services while at the same time making sure that those services meet the quality and throughput requirements that customers have come to expect. Fusion also features multiple North-South interoperability options. For example, ensured by extensive interop testing, Fusion service assurance and PM agents can be setup and controlled using industry standard SDN controllers leveraging its built in RestCONF and NetCONF capabilities. For years, VIAVI has successfully deployed an automated network assurance solution based on VIAVI NetComplete EtherASSURE deployed at all major Tier 1 mobile operators. Going forward those traditional assurance processes will transition from a static, slow, and reactive model to a much more dynamic approach, enabling proactive monitoring, real-time intelligence and analytics using virtual validation and monitoring systems.

VIAVI Fusion

Performance monitoring at any phase of a service lifecycle service agility and potential cost savings are the primary motivations for an operator turning up a service using virtual rather than physical network functions. When a new managed service is established, the operator will validate it using a service activation test. Doing so ensures the service was properly assembled, configured and deployed (service chain integrity) and that the network can deliver the service with the characteristics such as latency and bandwidth as defined. This makes sure that the important TL 9000 metric can be met with first time-right results. The service may then be continuously monitored to ensure its performance remains within predefined boundaries. As part of the service orchestration function, specific

test or monitoring VNFs can be installed in the service chain and activated to perform the required tests. The resources can be freed up when the VNF gets removed prior to turning the service over to the customer. For ongoing service monitoring or troubleshooting, resource-efficient VNFs can be added.

Even for locations where no compute resources are readily available, Fusion has a solution to offer. Using and deploying Smart SFPs (JMEPs) with built-in test and PM functionality enables service providers to setup networks with integrated test capability right from day one, eliminating the need to dispatch service technician to troubleshoot a problem.

Enterprise — Data Center

Virtual test head and virtual demarcation replace multiple hardware on customer premises

2nd Step

Enterprise — Data Center

Software test head replaces test equipment at data center

1st Step

Enterprise — Data Center

Manual measurement on customer premises and in data center

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