

Whitepaper

Stop Wasting OpEx

Modernize Your Network Test Strategy

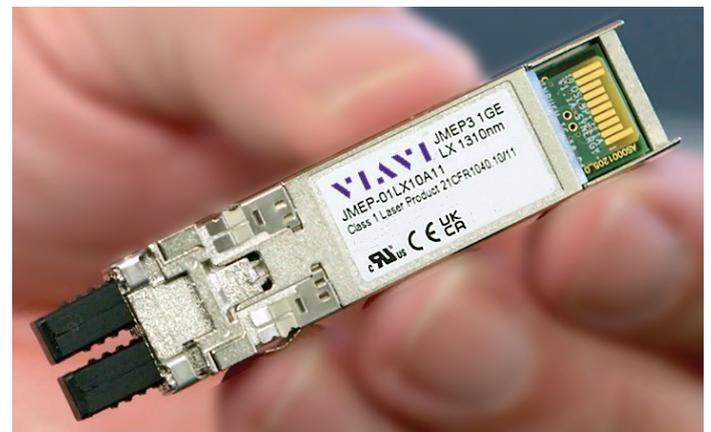
For decades, Network Service Provider (NSP) networks were based on fixed exchanges and physical connections making it impossible to offer more flexible network services that would allow for an easy and flexible reaction to changing customer demands. The shift from circuit-switching to packet-switching was a giant leap in the right direction, providing the first glimpses of the dynamism and network efficiency that was lacking in earlier technology generations.

That breakthrough led to subsequent concepts such as software defined networking (SDN), network function virtualization (NFV), software-defined wide area network (SD-WAN) or network as a service (NaaS). But as promising as these technologies are, they have not taken the industry by storm. Of course, there has been progress and implementation, but thus far, it's been more evolution than revolution. Why?

The Future is Challenging

Part of the reason is that incumbent NSPs are victims of their own recurring revenue model. No service provider will disconnect a circuit to upgrade it if there is a paying customer on the other end. As a result, no networks are ever "forklifted" out at scale and replaced with something better. Rather, the new network technology is simply overlaid on top of previous network technologies, and all remain in service as revenue-generating assets.

In addition to legacy network layers and vendors still in service, the new networking concepts are introducing other problems that make the roll-out still more challenging, like security. In the past, multiple vendors' equipment was simply connected via cables. Now, the integration of a new vendor into a multi-vendor VM environment each accessible via IP addresses, has turned into a full-blown IT integration project, with security an unsolved problem. That complexity combined with the



usual problems of SLA monitoring, bandwidth capacity planning, reducing power consumption, optimizing space utilization, and the need to reduce technician dispatches, the once bright and shiny future has turned out to be a difficult beast that's harder to tame than we realized.

What Now?

Virtualization once promised to address many of today's issues, but its reliance on cost-optimized compute platforms, costly IT integration projects, and its introduction of IT security vulnerabilities have eroded its value. NSPs have therefore begun to re-evaluate hardware (HW) based solutions. Consequently, VIAMI's SFP-based network testing solution, Fusion JMEEP, has become popular with NSPs around the world. The system is based on tiny, dedicated HW test heads which are easy to deploy, and that unlike server-dependent solutions, require no additional power or space. Moreover, JMEEP is not a VM and subsequently does not carry the IT

integration and security burdens. Its MSA-compliant, SFP form factor enables integration with all network elements which in turn allows the deployment of testing capabilities anywhere in the network.

An executive at a Tier 1 NSP recently said of his Fusion JMEP deployment, "There's no additional cabling, power, or building anything separate. That means that the installation process, effectively became as straightforward as an engineer visiting the exchange, locating the right port, plugging (in a JMEP), and walking away."

How JMEP Works

JMEP transceivers are the lynchpin of the VIAVI Fusion Ethernet assurance platform. Deployed throughout a network, JMEPs provide network operators and service providers with remote points of testability that enable performance-assured service delivery without a technician, and as a result increase the value of existing network infrastructure. As described, 1GE or 10GE JMEP transceivers are simply inserted into network devices already in the field. In addition to single stream testing, JMEPs can also simulate multiple, simultaneous loads on the network through Y.1564 traffic generation, and micro-burst monitoring for throughput as a function of time-of-day with msec resolution.

Compared with field technicians in trucks using handheld test devices, Fusion and JMEP provide a more efficient test and troubleshooting process by leveraging Y.1564 test methodology and one-button automated testing with centralized reporting. The solution also supports Y.1731/TWAMP-Light (RFC 5357) continuous performance monitoring.

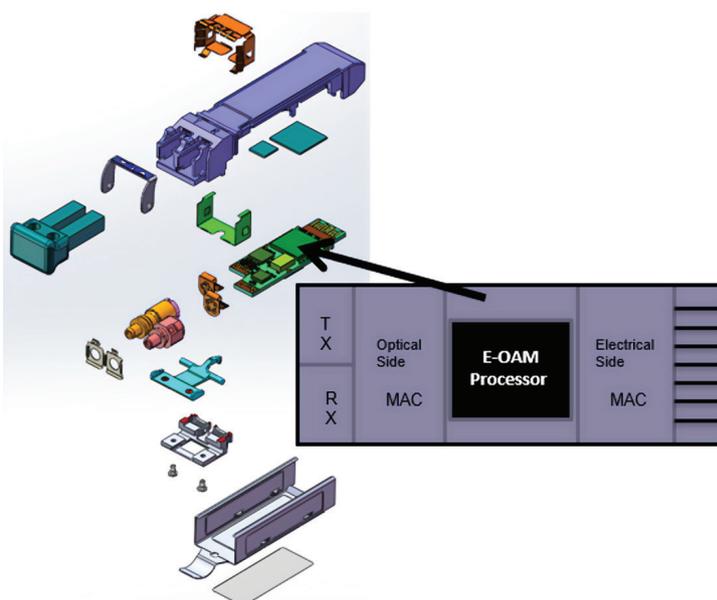
Features

- Fully compatible loopback for RFC 2544 and Y.1564
- Traffic Initiation at full line rate supporting up to 4 DSCP values
- 24/7 Performance Monitoring using Y.1731/TWAMP-Light (RFC 5357)
- Measures throughput, availability, frame loss, frame delay, and delay variation
- Fully integrated with the VIAVI FUSION Ethernet Assurance platform

Benefits

- Easy to deploy in existing network SFP ports
- Simplifies test and troubleshooting
- Reduces truck-rolls
- Shortens mean time to repair (MTTR)
- Leverages existing assets:
 1. Compatible with VIAVI T-BERD®/MTS test portfolio
 2. Turns network ports into service-assurance tools

Logical View of VIAVI JMEP



Top Use Cases

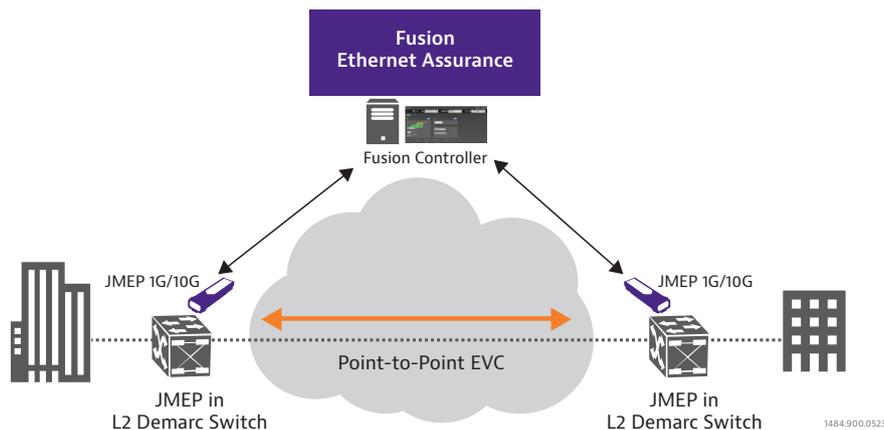
Business Services

Business Services are an important revenue stream for NSPs as residential services have been flat for some years. To justify the higher margins that Business Services circuits generate they must be provisioned and managed with more care than other services. For Business Services testing, JMEPS are deployed either at the end points of the circuit or at (Internet) peering locations, enabling service activation and troubleshooting testing remotely, without a technician.

Use Cases

- Service activation and assurance for Ethernet mobile backhaul 4G, 5G, WLL
- Ethernet business-services SLA verification and assurance
- Micro Test Head for Last-Mile testing in DSL and PON applications

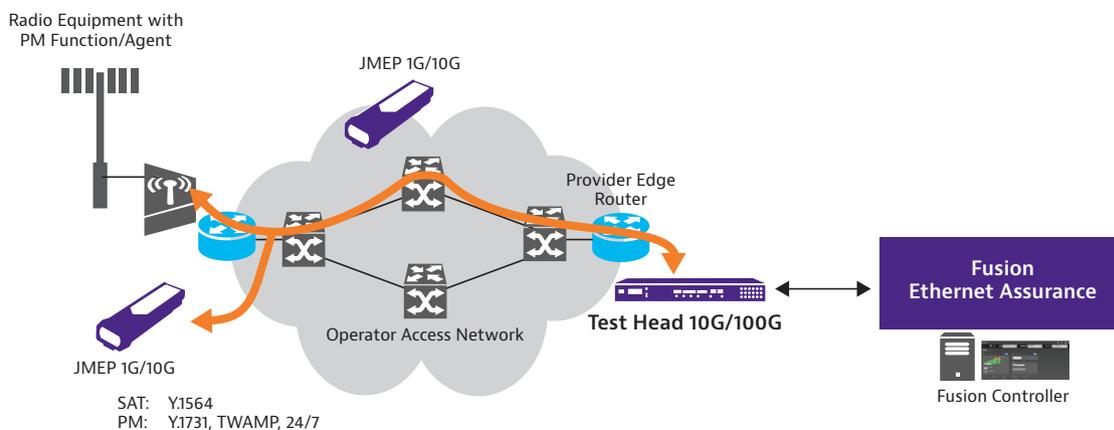
Site-to-Site Testing Using smart SFPs



Mobile Backhaul

The customer impact, and therefore economic consequences of backhaul degradation can be devastating. In mobility-centric environment, ongoing performance management and key performance indicator (KPI) trending for all backhaul links is no longer a luxury. JMEPs are used initially for service activation testing of backhaul connections using their Y:1564 loopback or traffic initiation capabilities. Once the backhaul link is operational, JMEPs are used as TWAMP devices that provide 24x7 performance monitoring, and transmission degradation warnings or alarms.

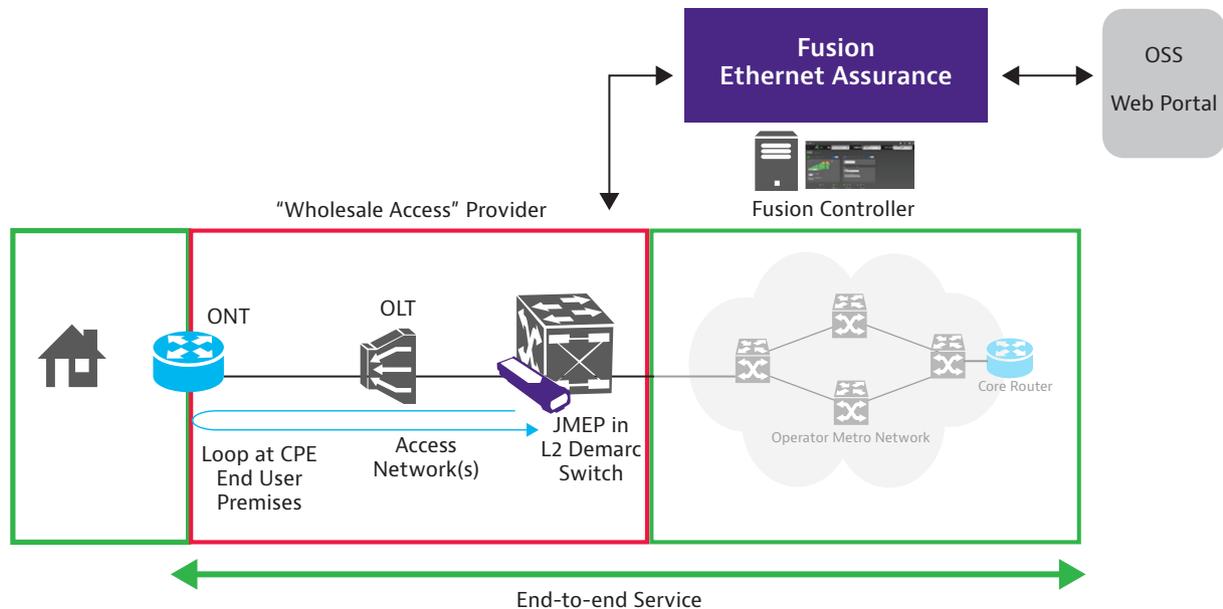
24/7 PM in Mobile Backhaul Networks



Last Mile

In scenarios where NSPs simply want to test and troubleshoot their last mile connections, JMEPs are perfectly suited to serve as micro test heads. With the smart SFP sitting in the aggregation points, they have the capability to test to any of their last mile demarcation devices.

Real World Applications: Testing GPON Access Links



JMEP Service Activation Test Features

- Support of Layer 2 and Layer 3 loopbacks on any port
- Support of per-port or per-EVC loopbacks
- Automatically discovered from the T-BERD/MTS
- Generation of Y.1564 test traffic at full line rate with up to 4 streams/DSCP values
- interoperability with any VIAVI test instrument (T-BERD/MTS, NSC, ONX) and test head (QT600-10, MAP2100) Ethernet test portfolio and the QT-600 test head

Performance Monitoring Features

- Supports a TWAMP-Light reflector (RFC 5357) on multiple services/QoS concurrently.
- Support for Y.1731 reflector and initiator modes on up to 10 Ethernet virtual connections (EVCs)
- Throughput monitoring with ms resolution allowing for Microburst detection