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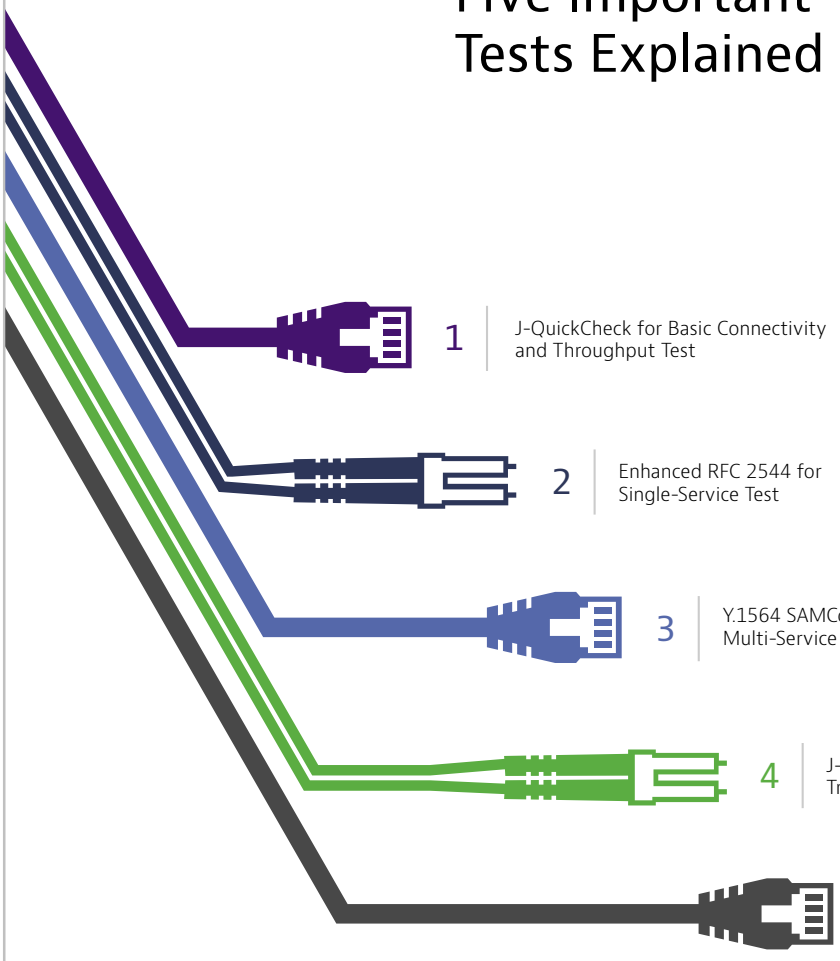
The Essentials of Ethernet Service Activation

Five Important Tests Explained



1 J-QuickCheck for Basic Connectivity and Throughput Test

2 Enhanced RFC 2544 for Single-Service Test

3 Y.1564 SAMComplete for Multi-Service Test

4 J-Proof for Layer 2 Control Plane Transparency Test

5 RFC6349 Test with TrueSpeed™

Solution Brief

01/18 / V01 / IF / viavi/nitro/essentials-ethernet-service-activation

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Global growth in communications and data services is driving increasing demand for Ethernet. As businesses and consumers demand more and more data, the pressure is on service providers (SP) to supply reliable Ethernet with the capacity for growth – and to do it quickly. Customers want easy, well-priced access to reliable high-speed, cloud-based data services such as streaming, Internet of Things, and the comping next-generation networks. At the same time, service providers are keen to supply new services—and benefit from new, growing revenues. To capitalize on demand and manage operational costs, service providers will rely on testing tools that help them turn up and monitor Ethernet connections quickly, safely, and cost-effectively with minimal complications.

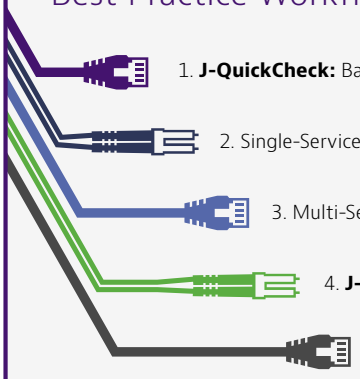
Key Advantage:

The Viavi service activation workflow delivers overall OPEX savings in terms of technician time, additional truck rolls, and customer experience.

Success Starts Here

Viavi Solutions offers the industry's most comprehensive, standards-based suite of service activation tests. Based on our experience in years and clientele, our service activation tests feature one-of-a-kind enhancements that serve to greatly reduce your test time and truck rolls. These tests can be run from a variety of Viavi instruments at rates up to 100 GigE and in some cases, can also be conducted using Virtual Network Functions (VNFs). The following diagram introduces the Viavi service activation test suite and provides the recommended "best practice" work flow:

Best Practice Workflow (Single and Multiple Services):



1. **J-QuickCheck:** Basic Connectivity and Throughput Test
2. Single-Service: **Enhanced RFC 2544**
3. Multi-Service: **Y.1564 SAMComplete** For Ethernet KPI Verification
4. **J-Proof** Layer 2 Control Plane Transparency Test
5. **RFC 6349 TrueSpeed:** Layer 4 TCP Throughput

This test workflow is applicable to Ethernet Business Services and Wireless Backhaul network topologies; a typical Ethernet business service network topology is shown in the following diagram.

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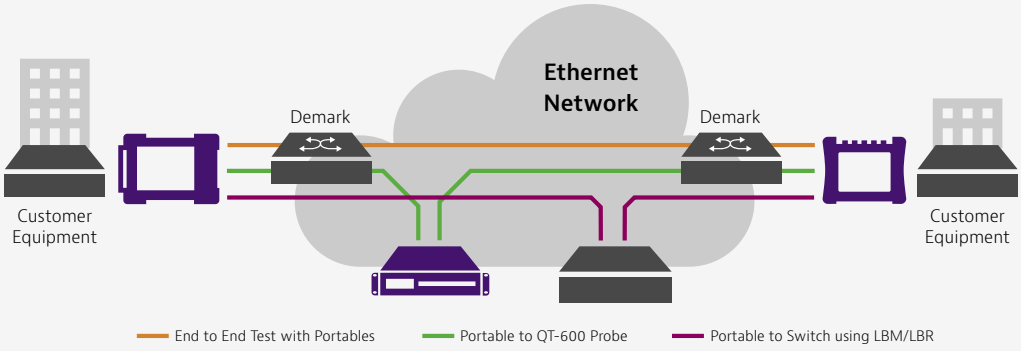
Five Important Tests Explained

Ethernet Business Service Network Topology and Test Points



This Ethernet topology system diagram shows that Viavi's service activation solution can test between physical instruments (portables), installed network probes (Viavi QT-600), JMEP (Viavi SFP-based technology), and even network devices which support Loop Back Messages and Replies (LBM/LBR). In the case of RFC 6349 TrueSpeed, the TCP test can be run between portables, instruments, and software clients to accurately measure end-user experience at the TCP application layer.

The Five Tests of Service Activation

The following table describes the distinct role of each test as well as the Viavi enhancements that provide unique, valuable advantages:

Service Activation Test	Description	Viavi Advantage
J-QuickCheck	· Standalone test · Takes just 2-3 minutes for a simple connectivity and throughput test, as opposed to a complicated, time-consuming, manual test · A "pre-test" integrated within RFC 2544 / Y.1564 · Conducts basic connectivity and throughput tests prior to running the much more extensive, complicated RFC 2544 and/or Y.1564 tests	· Viavi is the only provider of this effective test. Our customers use J-QuickChek save time and effort by quickly verifying network service integrity in just 2-3 minutes. · As a pre-test integrated within RFC 2544 / Y.1564, J-QC potentially reduces total test time by 75% or more* · Immediately locates configuration errors and pitfalls (internal analysis) · Automatically detects and configures auto-negotiation settings (mismatches, and resultant half-duplex ports, are one of the most common causes of failed tests and poor network performance)

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Five Important Tests Explained

Service Activation Test	Description	Viavi Advantage
Enhanced RFC 2544	· Industry-standard service activation test for single-service Ethernet and IP (i.e. "pipe" test) · Measures key performance indicators and bandwidth profile such as: throughput, latency, packet Jitter, frame loss, and committed burst size (CBS)	· Viavi's enhanced RFC 2544 runs tests concurrently which reduces test time by ~66%. · A standard RFC 2544 would take approximately 10 minutes with this enhanced technique versus 30 minutes. · Wide variety of loop backs including OAM and JMEP (Viavi SFP-based technology) · Committed burst size (CBS) testing to ensure proper network policer and shaper configuration, as well as the MEF 34 policer test · Wizard-like UI and test profiles simplify test configuration and results interpretation · Long-term test, a.k.a "soak test," lasting up to 24 hours (differentiator) · Concurrent end-to-end, bi-directional testing which reduces test time by 50% and can reveal hidden issues in a sequential "up then down" test · "Zeroing in" throughput algorithm can dramatically reduce troubleshooting time (e.g., over ten minutes for a standard RFC 2544, just seven seconds for Viavi enhanced)

Y.1564 SAMComplete	· The industry standard service activation test for multi-service Ethernet and IP ("Triple Play")
	· Measures KPIs and bandwidth profile such as:
	  · CIR, EIR (Throughput)
	  · Frame Delay (FD), Latency
	  · Frame Delay Variation (FDV), Jitter
	  · Frame Loss Rate (FLR)
	  · Committed Burst Size (CBS), Policing
		· The only solution available that runs Y.1564 and RFC 6349 tests concurrently.
		· Data service is tested using real TCP stateful traffic and is the only way to accurately test multi-service quality of service (QoS) including queues, prioritization, policers, shapers, etc.
		· Faster Y.1564 configuration test by starting at 100% bandwidth to save time (versus starting from lowest bandwidth value)
		· Wide variety of loop backs such as OAM and JMEP, etc.
		· Committed burst size (CBS) testing to ensure proper network policer shaper configuration as well as MEF 34 policer test
		· Wizard-like UI and test profiles simplify test configuration and results interpretation

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Service Activation Test	Description	Viavi Advantage
J-Proof	· Verifies that Ethernet control plane traffic (ARP, STP, CDP, etc.) flows transparently from end to end. · For example: enterprise Cisco switch protocols flow through service provider network and are not altered	· Ethernet control plane issues can be difficult to identify and troubleshoot. · J-Proof is a customizable, reliable way to guarantee that an end-customer's control traffic will not be altered · Test execution lasts just 10 seconds and saves potential hours spent trying to isolate hidden problems caused by transparency errors · Many of your customers are unaware of this test and its quick results. If you are on site, you can run this test in just ten seconds to ensure control plane traffic.
RFC 6349 TrueSpeed	· Automated and repeatable TCP-throughput test per IETF RFC 6349 standards, including key performance metrics of TCP efficiency and Buffer delay	· TrueSpeed is a "one button" implementation of RFC 6349 that runs on physical instruments or VNFs and includes differentiating features such as: · Interoperable between Viavi TBERD/ MTS, ONX, QT-600, software clients, and integrated network-element VNFs · "TCP Doctor" provides expert diagnosis of test results that can identify root cause of poor TCP performance · Integrated traffic shaper is easy to use and demonstrates TCP performance with and without a shaper · Centralized server reporting, accessible via Web interface (VNF only)

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