

TrueSpeed

RFC 6349-compliant TCP test for the VIAVI Fusion Service Activation and Assurance System and the entire Metro Family of test equipment



Experience your network like your customers do—automate verification of TCP throughput in carrier Ethernet and IP field networks per industry best practices

Traditionally, a provider installs Ethernet services using RFC 2544 or other types of Layer 2/3 service activation tests; however, the customer's business applications such as YouTube, Facebook, and file downloads (FTP) are transported on the TCP layer. This gap in testing often shows passing results for traditional Layer 2/3 tests, even though customers continue to complain of poor application performance, leading to customer dissatisfaction and churn. Problems like these significantly increase operating expenses (OpEx) for service providers with additional truck rolls per service activation.

VIAVI solves this problem by introducing the industry's first automated TCP-layer throughput test called TrueSpeed™, which is fully compliant with the new IETF RFC 6349 framework for TCP throughput testing.

This automated RFC 6349 TCP test enables service providers to run traditional RFC 2544 installation tests as well as a quick TCP test during the same truck roll and with the same skill-level technician. Customer case studies have shown that the TrueSpeed test methodology prevents future truck rolls and saves at least 20 percent on overall installation OpEx.

The test can be performed in as little as 3 minutes by novice technicians due to its simple "push button" execution and provides automated reporting that more experienced network engineers can use to verify and implement SLAs.

Intended Audience

- Field groups including backhaul technicians, special services, and central office technicians who install and troubleshoot Ethernet/IP services
- Professional services and managed service engineers who perform maintenance, troubleshooting, and evolution of end customer service level agreements (SLAs)
- Enterprise and government network professionals who install and conduct fault analysis for circuits and networks

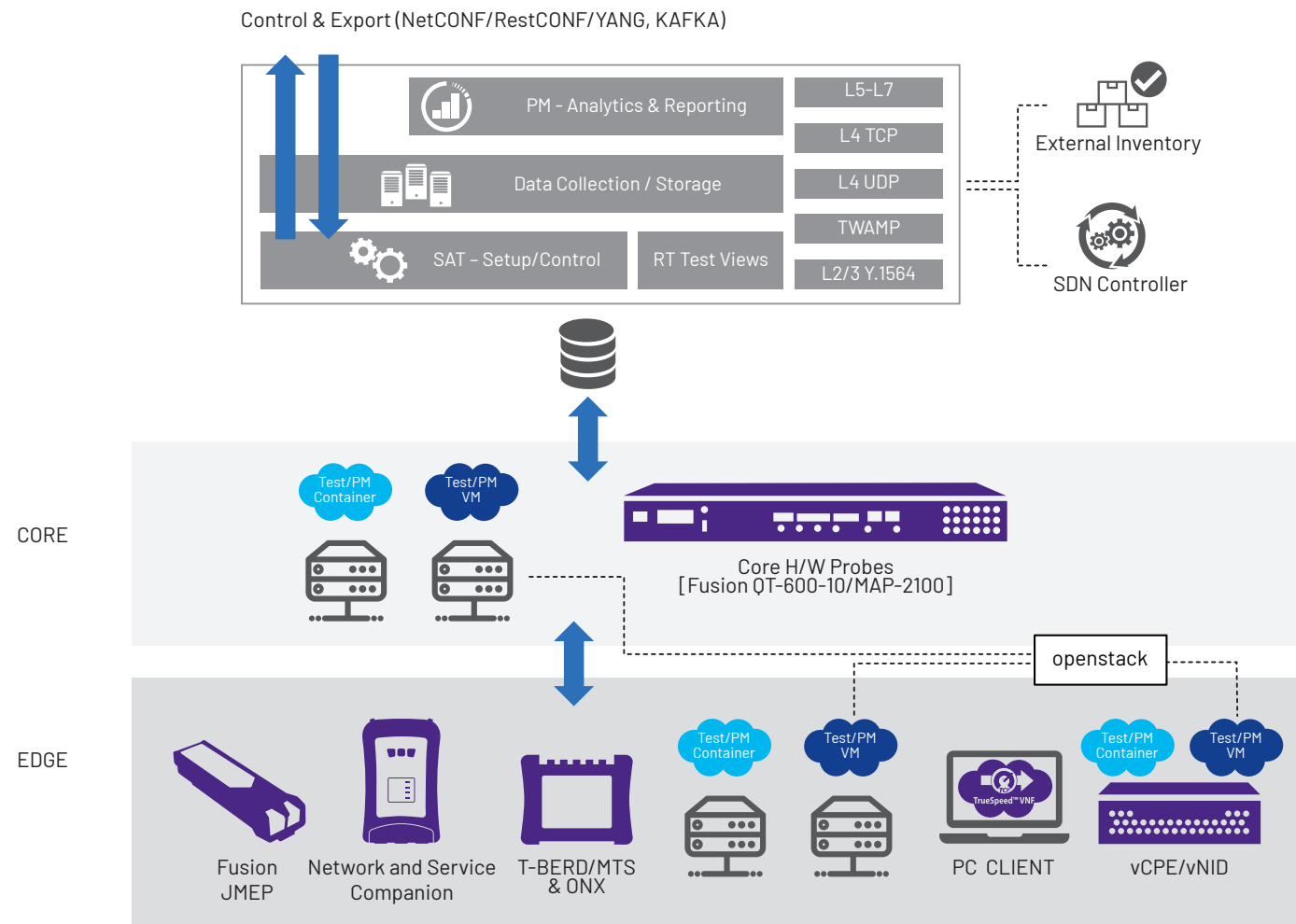


Fusion-capable Test Points

Feature/Benefit Summary

Feature	Description	Advantage	Benefit
TCP throughput testing following IETF best practices	The IETF developed the standards for the TCP protocol and has endorsed RFC 6349 as a framework for proper TCP throughput testing	Adhering to the structured, repeatable approach specified by RFC 6349 enables providers and end-customers to eliminate the variability of the test method and misinterpretation of results that frequently occur with TCP testing without RFC 6349.	Compliant with IETF RFC 6349, framework for TCP throughput testing
10 Mbps to 100GE TCP testing	Emulate up to 64 users/sessions and fill the pipe with real TCP traffic up to 10 GE.	Emulating multiple users/sessions ensures realistic testing of end customer TCP window sizes on networks with high bandwidth and high-latency links.	Ensure end-customer satisfaction before service activation and prevent customer churn.
One-button, automated, IETF-based TCP testing	Conduct an automated, comprehensive TCP test that provides dashboard results for beginners and provides advanced reports for Tier 2/3 engineers.	Enables conducting traditional RFC 2544 installation and TCP testing during the same truck roll with the same skill-level technician.	Save significant turn-up and troubleshooting time with an automated test—without the need for an expert engineer.
Repeatable TCP tests with consistent results	Industry experts defined the automated test method that provides a best practice approach to testing path MTU, round-trip latency, and TCP throughput with special emphasis on rapid diagnosis of network issues that can impact TCP performance.	Both network providers and end users can conduct repeatable tests and compare “apples to apples” results to significantly reduce finger-pointing.	Avoid future truck rolls for troubleshooting and solve the bandwidth discrepancy mystery by applying industry-standard best practices.
Advanced traffic shaping tests	These tests expose potential traffic policing versus shaping problems, which is a key component in optimizing TCP performance over WAN/metro networks.	Simplify a complex network engineering condition with the new one-step push-button TCP automation test.	Network providers can expertly verify and recommend the benefits of traffic shaping to end customers, confidently proving proper network operation.
Compatible with QT-600-10 test heads and TrueSpeed VNF	Test conducted between T-BERD/MTS test instruments and hardware probes or virtual endpoints.	Sectionalize TCP performance issues and reduce coordination costs of testing.	Reduce the time and costs of testing using physical or virtual tools.

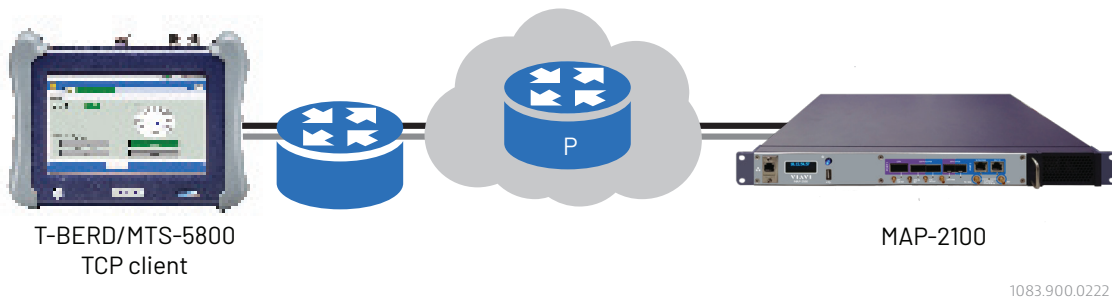
Fusion Architecture



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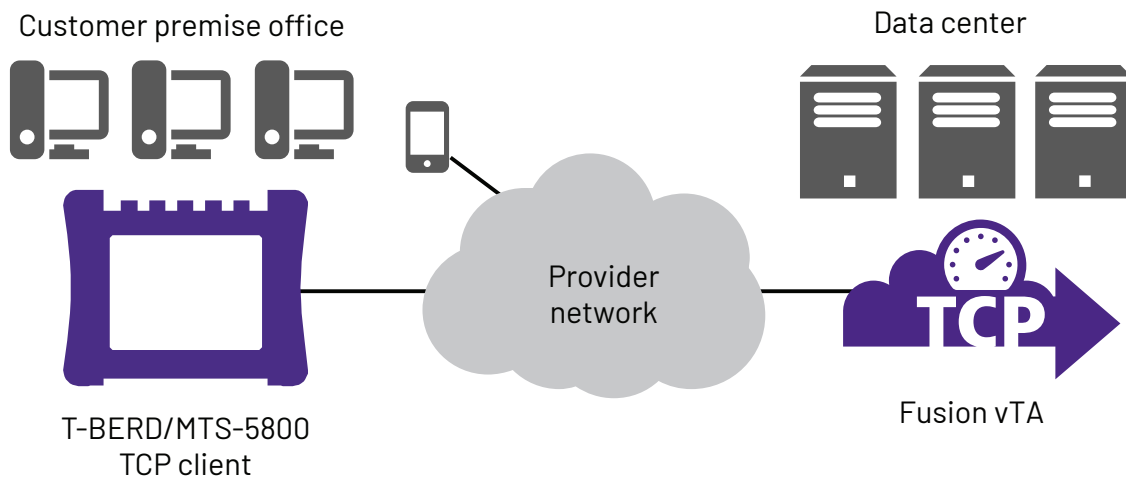
Use Case: Verify TCP Layer Throughput within Network Provider Network

This use case uses the T-BERD/MTS-5800 as a TCP client and the T-BERD/MTS-6000A as a TCP server to verify proper TCP throughput within the network provider's network. VIAVI experts recommend running the automated TCP throughput test after the traditional Layer 2/3 RFC 2544 test.



Use Case: Verify TCP Layer Throughput "End to End" (from CPE to CPE)

After verifying the network provider's network, use the T-BERD/MTS-5800 to verify TCP layer throughput in an end-to-end manner. This test often provides final evidence that the TCP performance issue resides in the configuration of equipment, such as servers, firewalls, or similar equipment, on the customer premises.

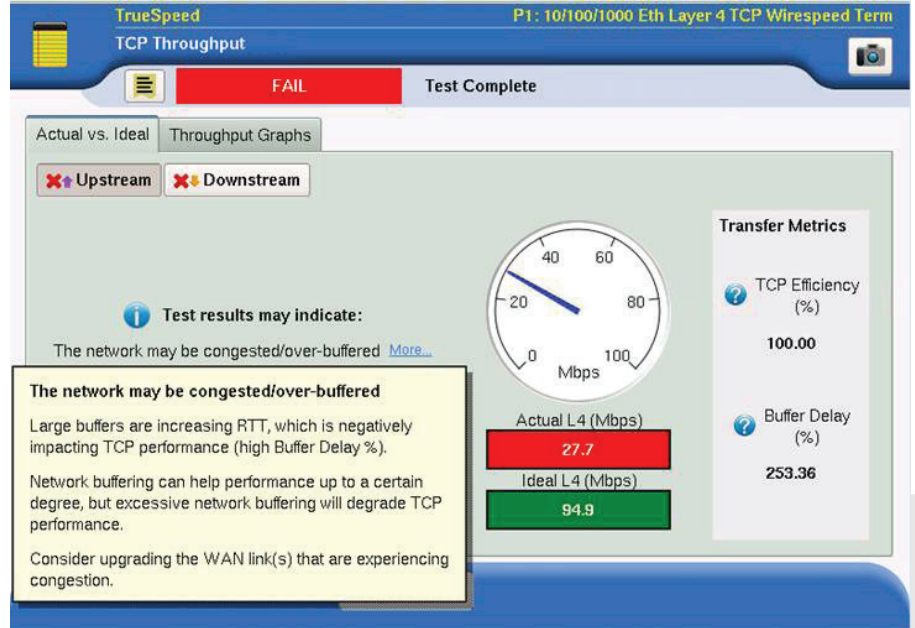


Dashboard Results for Beginners

While simplifying the test configuration is the first step to automating TCP testing, simple results interpretation and guided problem diagnosis is essential for proper service verification. TrueSpeed provides an intuitive TCP dashboard results screen with pass/fail results, provides two RFC 6349 metrics to diagnose loss- versus delay-related TCP performance degradation, and provides automated expert analysis to diagnose potential causes of poor performance.

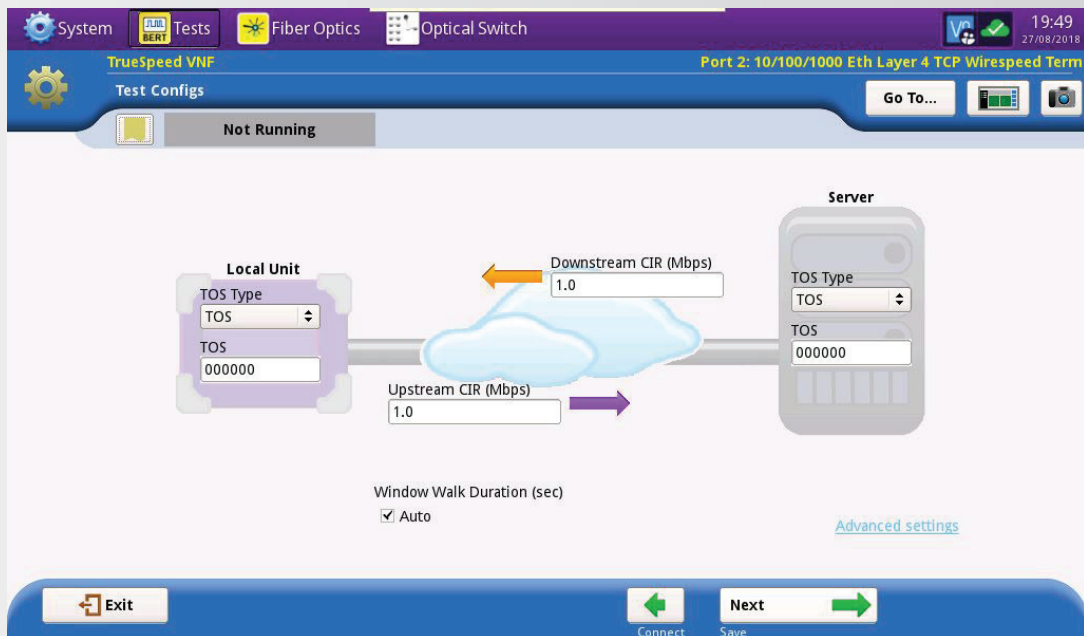
The network may be congested/over-buffered

Large buffers are increasing RTT, which is negatively impacting TCP performance (high Buffer Delay %).



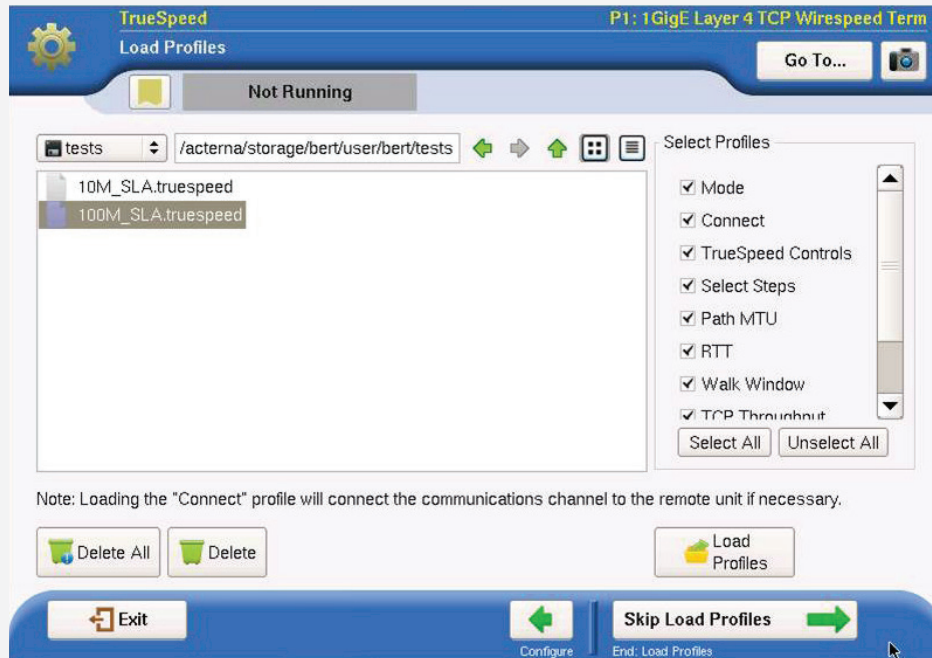
Advanced Graphical Results and Reports for Experts

Even though the intent is for less-experienced field technicians to perform the TrueSpeed test, there are multiple VIAVI test sets that also provide deep analysis (normally provided by lab test equipment). Tier 2/3 network engineers can use these graphs and corresponding reports to diagnose complex performance issues throughout the duration of the TCP test.



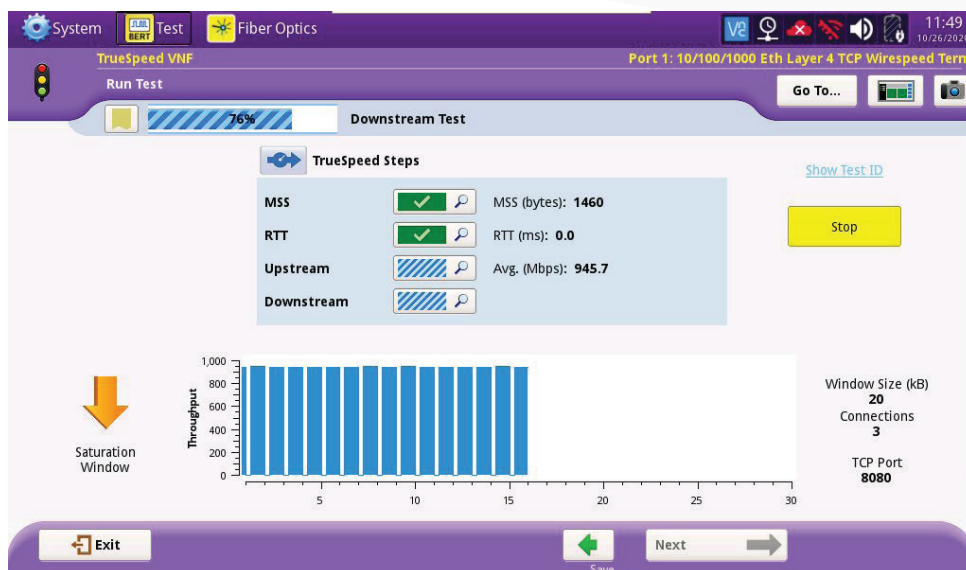
Intuitive User Interface and the Ability to Load Standard Test Configurations

Maintaining the same user interface as the VIAVI Expert RFC 2544 automated test, the TrueSpeed test lets users customize test configurations, providing key push-button operation of the TCP throughput test. Tier 3 engineers can develop standard test configurations that field technicians can load to populate all test parameters, including IP addresses, TCP window size, TCP MSS, and test duration, among others.



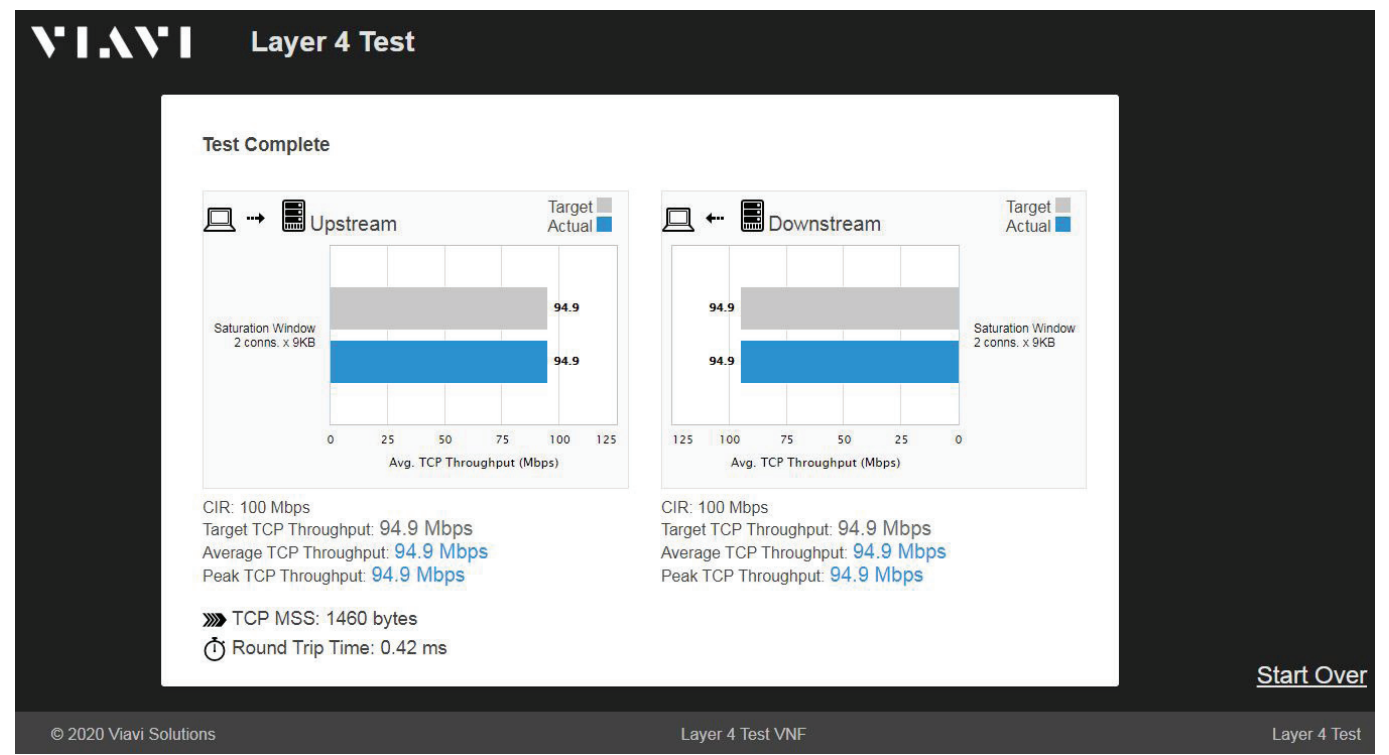
Integrated Traffic Shaper Function

Network technicians can now coach their customers to configure proper traffic shaper settings on customer equipment such as customer edge routers (CERs). The integrated traffic shaper emulates the shaping function on customer equipment to show the effect of proper traffic shaping on end-to-end throughput.



Centralized TrueSpeed Software Agent for “One Man Out” Workflow

Deploying a centralized TrueSpeed SW Test Agent as part of the VIAVI Fusion System makes service activation easier by eliminating the need to dispatch two technicians, one at each end of the circuit. Now a single tech can initiate the TrueSpeed test from their instrument to a central location. Making a two-person test a one-person test speeds the testing process frees up one technician to do other work. The system also allows for TrueSpeed testing from PC-Clients and provides final test reports on a central server.



Frequently Asked Questions

Q: What is RFC 6349?

A: RFC 6349 is the new IETF TCP throughput test methodology that VIAVI, Bell Canada, and Deutsche Telekom co-authored. It provides a repeatable test method for TCP throughput testing with a step-by-step process, metrics, and guidelines to optimize TCP performance. RFC 6349 is squarely targeted as the next logical step after conducting a traditional RFC 2544 test.

Q: Is TrueSpeed different from RFC 6349?

A: TrueSpeed is the VIAVI-branded implementation of RFC 6349 that we co-authored; therefore, we are widely considered to be the definitive experts of its implementation. One other traffic-shaping test that we added to TrueSpeed provides extra value to RFC 6349.

Q: Does a TrueSpeed test take more time than an RFC 2544 test?

A: TCP testing can take more time without TrueSpeed. TCP-layer-related issues are actually quite common, and they can be very complex to isolate. Industry best practices and consistent metrics in a push-button test can take less time than an RFC 2544 test.

Q: Will conducting a TCP layer test add significant testing time?

A: No, technicians can complete the TrueSpeed test in less than 5 minutes with minimal additional cost to a field installation. VIAVI recommends first conducting an RFC 2544 test to verify the network at Layer 2/3 and then completing the TrueSpeed test.

Q: Service providers do not manage customer applications. Why is TCP layer testing compelling for network operators?

A: Traditional Layer 2/3 RFC-based testing does not completely verify whether the network can carry application traffic. Specifically, network devices such as routers, switches, and the like employ traffic-policing techniques that drop packets. This may be acceptable in Layers 2/3, but it can seriously degrade performance at Layer 4 (TCP). Network operators can reduce bandwidth discrepancies by providing TCP layer results to their customers and prove that the network is not causing poor application performance.

Q: What is Iperf?

A: The Iperf network testing tool is a commonly used to create TCP sessions when measuring network throughput. The Iperf tool runs on Windows and Linux computers and both customers and advanced network engineers commonly use it to verify TCP throughput performance. A key limitation is that Iperf is software-based and cannot be used to test higher speed networks (200 Mbps upper limit is a good rule of thumb).

Q: Is TrueSpeed a software or hardware upgrade to existing units in the field and which platforms support it?

A: TrueSpeed is included with the TCP Wirespeed option, which is a software upgrade for the T-BERD/MTS-5800, T-BERD/MTS-5800-100G, MAP-2100, OneAdvisor 1000, OneAdvisor 800 and SmartClass-4800.



viavisolutions.com

Contact Us +1 844 GO VIAVI | (+1 844 468 4284)

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