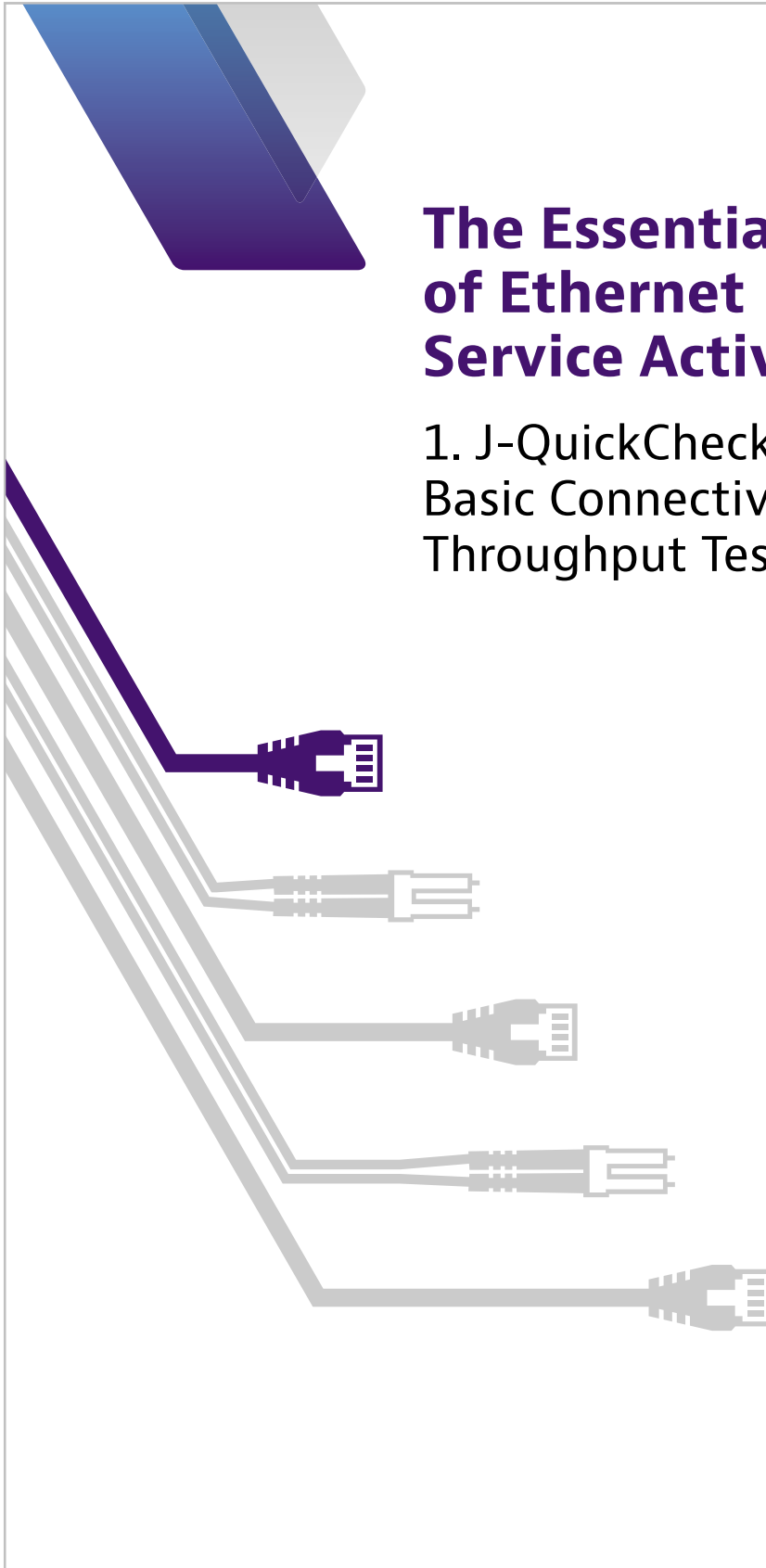


# The Essentials of Ethernet Service Activation

## 1. J-QuickCheck for Basic Connectivity and Throughput Test



Solution Brief

## 1. J-QuickCheck for Basic Connectivity and Throughput Test



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 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:

Viavi Solutions is the only vendor on the market to offer this test. The time savings for service activation can be quite substantial and potentially reduce total test time by 75% or more.

## Connectivity and Throughput

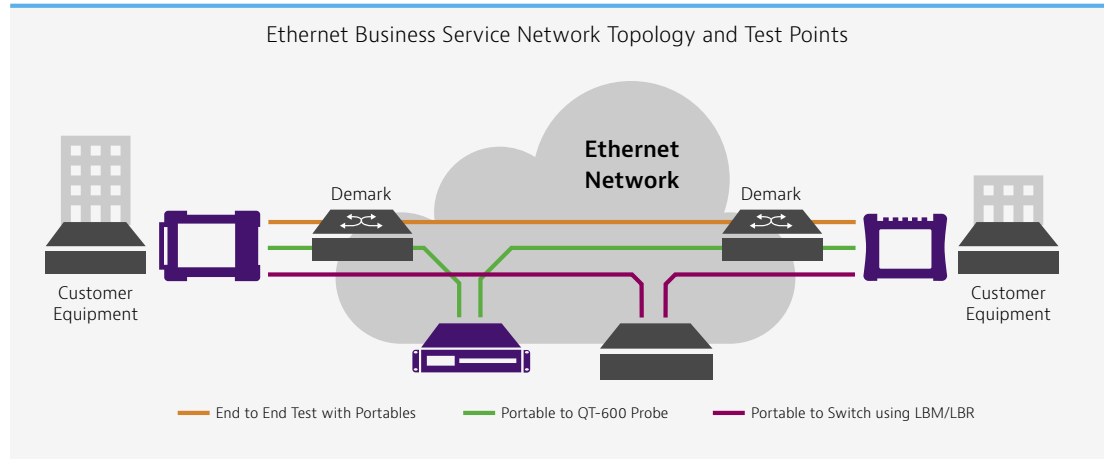
This brief will focus on the first test in Ethernet service activation, J-QuickCheck. The standalone test can be run within 2–3 minutes as a simple connectivity and throughput test, as opposed to a complicated manual test. This brief will concentrate on this standalone test; however, please note that J-QuickCheck can also be run as a “pre-test” in the RFC 2544 / Y.1564 workflow. As an embedded pre-test for the RFC 2544 / Y.1564 workflows, J-QuickCheck verifies basic connectivity and throughput of the network very quickly before significant time is wasted trying to run and the RFC 2544 or Y.1564 service activation test.

### 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.

## 1. J-QuickCheck for Basic Connectivity and Throughput Test



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.

### J-QuickCheck Test Component and Benefits

The following table describes the distinct role of J-QuickCheck as well as the Viavi enhancements that provide unique, valuable advantages:

Table 1

Service Activation Test	Description	Viavi Advantage
<b>J-QuickCheck</b>	<ul style="list-style-type: none"> <li>Standalone test</li> <li>Takes just 2-3 minutes for a simple connectivity and throughput test, as opposed to a complicated, time-consuming, manual test</li> <li>A "pre-test" integrated within RFC 2544 / Y:1564</li> <li>Conducts basic connectivity and throughput tests prior to running the much more extensive, complicated RFC 2544 and/or Y:1564 tests</li> </ul>	<ul style="list-style-type: none"> <li>Viavi is the only provider of this effective test. Our customers use J-QuickCheck save time and effort by quickly verifying network service integrity in just 2-3 minutes.</li> <li>As a pre-test integrated within RFC 2544 / Y:1564, J-QC potentially reduces total test time by 75% or more</li> <li>Immediately locates configuration errors and pitfalls (internal analysis)</li> <li>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)</li> </ul>

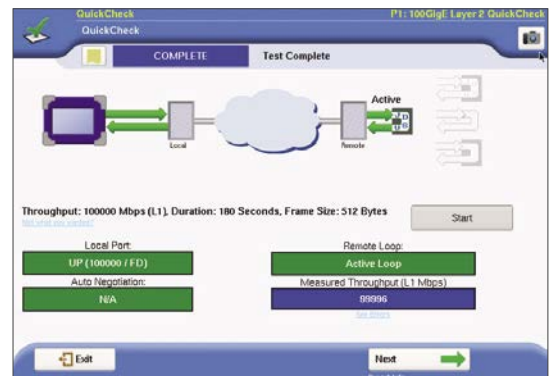
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Service Activation Test	Description	Viavi Advantage
<b>Identify auto-negotiation settings</b>	<ul style="list-style-type: none"> <li>Automatically configures auto-negotiation settings to match the network</li> </ul>	<ul style="list-style-type: none"> <li>This is common user error which can lead to false and very poor RFC 2544 / Y.1564 results. This step eliminates auto-negotiation misconfiguration.</li> </ul>
<b>Automatically Discover VLAN of remote loop-back device</b>	<ul style="list-style-type: none"> <li>A "VLAN loop scan" is conducted by the local TBERD/MTS to determine the VLAN of the remote loopback device</li> </ul>	<ul style="list-style-type: none"> <li>Misconfiguration of the remote device VLAN is very common. Significant time is wasted when the technician must manually enter correct VLANs. Automatically detecting the VLAN provides enormous time savings which can eliminate hours of wasted time.</li> </ul>
<b>Verify connectivity to the remote loop-back device</b>	<ul style="list-style-type: none"> <li>The local TBERD/MTS can verify connectivity (both Layer 2 and 3) and activate a Viavi loop, soft loop, and hard loop</li> </ul>	<ul style="list-style-type: none"> <li>This feature eliminates the need for the user to configure detailed set-ups for a test or to activate the loop back mode.</li> </ul>
<b>Quick throughput test</b>	<ul style="list-style-type: none"> <li>This is a rapid throughput test, to verify that the network is active and fundamentally "sound"</li> </ul>	<ul style="list-style-type: none"> <li>Viavi is currently the only vendor on the market to offer this option. As a standalone test, it can be run as a simple connectivity and throughput test (2-3 minutes) as opposed to a more time-consuming manual test. Some providers use this as the sole test to verify network service integrity in a very rapid manner.</li> </ul>

## Easy Set-up and Testing

The following is a screenshot of the J-QuickCheck configuration screen on the local TBERD/MTS. For a Layer 2 test, no remote device configuration is required. For Layer 3 tests, the user must only enter the management IP address of the remote loopback device, press Start and the TBERD automatically cycles through each step detailed in Table 1.



J-QuickCheck User Interface

## 1. J-QuickCheck for Basic Connectivity and Throughput Test



### Time-Saving Factors with the J-QuickCheck

#### Auto-negotiation Issues

When a local test unit is connected to the network, the test unit and network equipment (e.g. Ethernet switch), must negotiate to the proper full-duplex link speed or the interface will default to half-duplex. If the interface cannot negotiate properly and enters half-duplex state, then an RFC 2544 / Y.1564 test will falsely report a very low throughput for a given CIR. As an example, a CIR of 100 Mbps may only achieve 10 Mbps (or less) if the link is set for half-duplex.

In the example screen shown here, a switch port failed to auto-negotiate. The negotiation process fell back to half duplex (HD) mode and the J-QuickCheck test immediately identified the condition.

The J-QuickCheck test detects the settings of the connected test port and automatically ensures that maximum full duplex speed is configured before running the much longer RFC 2544 / Y.1564 test. This can save hours of technician test time and eliminates the need for the technician to contact advanced field support (which saves even more service provider time).



#### Mis-configured VLAN

Traditionally, the technician must enter the correct VLAN on the local test set. Many times, this VLAN is incorrect or the technician is not even aware that the network is using VLAN tags. An example would be when the network is configured to use VLAN 202 between the local and remote test device. If the technician does not enter a VLAN or enters the incorrect VLAN, the remote device will never see the loopback commands. This can waste significant amounts of time since the technician must contact advanced engineering or the Network Operations Center (NOC). The situation can be even more problematic when the network is not well documented.

The J-QuickCheck VLAN scan test (due early 2017) automatically sends loop "hello" commands to all 4096 VLANs and provides a list of remote devices which reply on a VLAN (with the Viavi device ID). This scan takes about ten seconds to complete. The time-savings is significant, as VLAN misconfiguration is one of the most common test configuration errors.

Additionally, the J-QuickCheck can detect and activate the appropriate loop for the following cases:

- Viavi loop: a device that responds to Viavi Loop Up command
- Soft loop: a device such as a network interface device (NID) or switch that is already in local loopback and swaps MAC addresses
- Hard Loop: a "cable loopback" in which a device does not swap MACs

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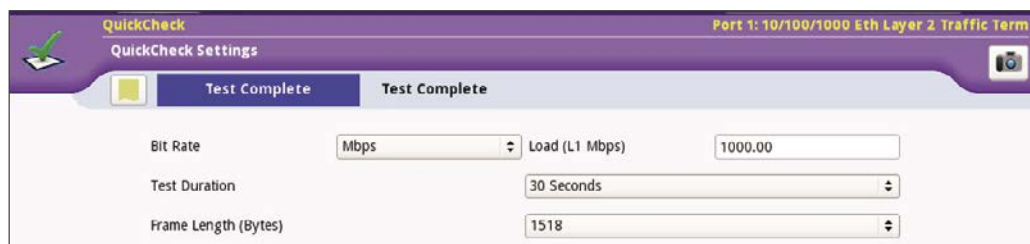


### Quick Throughput Test

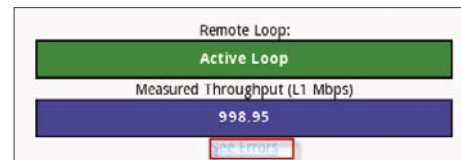
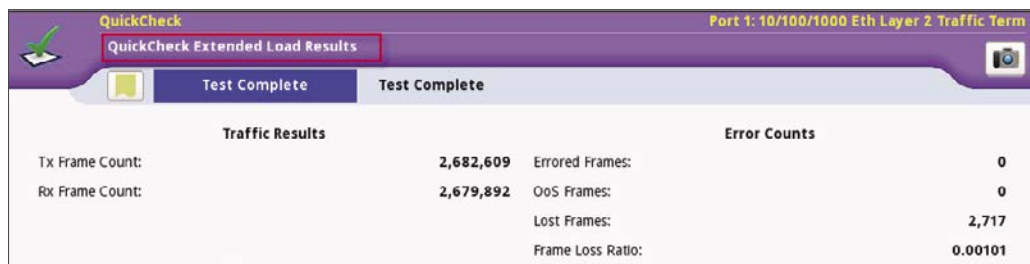
As a standalone test, J-QuickCheck can be run as a simple 2-3 minute throughput test, as opposed to a more complicated manual test (where time is quite variable). For a manual throughput test, the process can be quite tedious and requires the verification of auto-negotiation, correct VLAN, etc. followed by the proper configuration or loopback of the remote device.

J-QuickCheck eliminates these configuration errors and conducts a very simple throughput test that is easy to run no matter the experience level of the user. Some network providers use this as the sole test to verify network service integrity in a very rapid manner.

The following figure illustrates the simple set-up options for the test including Load, Test Duration, and Frame Length.



After the test has completed the user can see the basic result of Measured Throughput (at right) and then drill into to see some more detailed errors such as Errored, Out of Sequence (OOS), and Lost Frame counts (below).

Traffic Results		Error Counts	
Tx Frame Count:	2,682,609	Errored Frames:	0
Rx Frame Count:	2,679,892	OoS Frames:	0
		Lost Frames:	2,717
		Frame Loss Ratio:	0.00101

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As a pre-test integrated within RFC 2544 / Y.1564, J-QuickCheck eliminates these misconfiguration problems altogether by running a very short throughput test that provides immediate feedback (within seconds) to the user about whether a configuration error is causing a wide discrepancy in results. By determining that a policer (etc.) is in the network in seconds versus many minutes or hours, J-QuickCheck can dramatically reduce the time it takes for the overall RFC 2544 / Y.1564 test.

### Conclusion

Ethernet service activation is your first step to ensure customer satisfaction. Service providers need to conduct service activation set-up in a cost-effective manner. Viavi's solution for the J-QuickCheck test provides an advantage in time, efficiency and accuracy to make your service activation workflow as smooth and easy as possible.

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