TEST REPORT

Tolly.

#217112

August 2017

Commissioned by
Cisco Systems, Inc.

Cisco RV340 Dual WAN Gigabit VPN Router

L3, L4 & VPN Performance Evaluation

EXECUTIVE SUMMARY

Small businesses can have big needs when it comes to network throughput. Cisco Systems realizes that and designed its RV340 Dual WAN Gigabit VPN Router to deliver a range of connectivity options and to deliver Gigabit throughput across NAT and IPsec connections.

Cisco Systems commissioned Tolly to evaluate its Cisco RV340 Dual WAN Gigabit VPN Router in both single device and paired router configurations. Tests evaluated the Layer 3 NAT throughput of a single router and the throughput across an IPsec VPN tunnel between a pair of routers. Additionally, tests benchmarked the Layer 4 throughput of the device.

The Cisco RV340 delivered up to 99% of theoretical throughput across Gigabit Ethernet in a NAT configuration, up to 95% across an IPsec VPN tunnel and approximately 975Mbps HTTP download speed in Layer 4 testing.
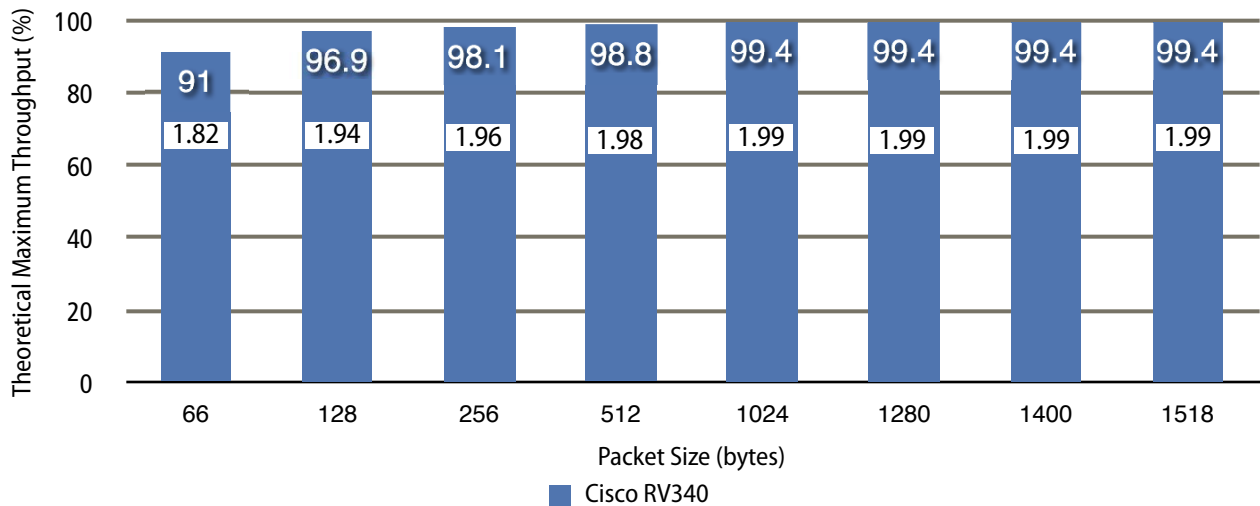...<continued on next page>

THE BOTTOM LINE

The Cisco Systems RV340 delivers:

1 LAN-to-WAN Single-router bi-directional throughput of 1.82Gbps or higher (up to 99.4%) at all packet sizes tested with NAT

2 Up to 1.89Gbps bi-directional application throughput across IPsec VPN

3 Layer 4 unidirectional throughput of ~975Mbps

4 Model RV345 (16 LAN ports), model RV345P (16 LAN and PoE), RV340W (integrated AC WiFi)

Layer 3 NAT Gigabit Ethernet LAN-to-WAN RFC 2544 Throughput
Across a GbE WAN port and a GbE LAN port of One Router
(as reported by Ixia IxNetwork)

Packet Size (bytes)	Throughput (%)	Aggregate (Gbps)
66	91	1.82
128	96.9	1.94
256	98.1	1.96
512	98.8	1.98
1024	99.4	1.99
1280	99.4	1.99
1400	99.4	1.99
1518	99.4	1.99

■ Cisco RV340

Note: Aggregate bi-directional throughput (Gbps) shown in white box in each column.

Source: Tolly, July 2017

Figure 1

The RV34X Family of Routers

Tolly tested the RV340 model which provides 4 LAN and 2 WAN ports (all GbE) as well as 2 USB ports. (See Table 1.)

The family also includes models with additional options. The RV345 provides 16 LAN ports. The RV345P provides 16 LAN ports and power over Ethernet (PoE) support. Finally, the RV340W adds integrated 802.11ac WiFi to the RV340 model configuration.

Testing Overview

Three separate test scenarios were run to illustrate the RV340's performance in important router connectivity scenarios. The first test evaluated the single router GbE performance between a LAN and WAN port. The second test used an identical pair of RV340 routers to benchmark the application throughput across a GbE IPsec VPN tunnel between the routers. Finally, L4 performance was benchmarked.

Single-Router NAT RFC 2544 Throughput

Industry-standard RFC 2544 Throughput tests of multiple frame sizes illustrated that the Cisco RV340 could deliver near line-rate throughput (98% or higher) from 256-byte packets on up through 1518-byte packets. Tests were run bidirectionally illustrating throughput of nearly 2Gbps. Tests were run with network address translation (NAT) used for all test traffic. See Figure 1.

Two-Router IPsec VPN Throughput

Industry-standard RFC 2544 Throughput tests of multiple frame sizes illustrated that the Cisco RV340 could deliver over 90% of line-rate application throughput across an (encrypted) IPsec VPN tunnel with packet sizes of 1024-bytes and higher. With those larger packet sizes, the bidirectional throughput achieved was about 1.9Gbps aggregated. See Figure 2.

Cisco Systems, Inc.

RV340 Dual WAN Gigabit VPN Router

L3, IPsec Tunnel & L4 Performance

Tested July 2017

Layer 4 Throughput

This test benchmarked the throughput of router for use with cloud applications and typical web services. The test simulated the download of a 100MB file from a web server across the router. The test illustrated the the RV340 could sustain a unidirectional transfer rate of approximately 975Mbps between a WAN port and a LAN port. See Figure 3.

Layer 3 IPsec VPN Gigabit Ethernet Throughput
Across One Gigabit Ethernet WAN link Between Two Routers
**(as reported by Ixia IxNetwork)**
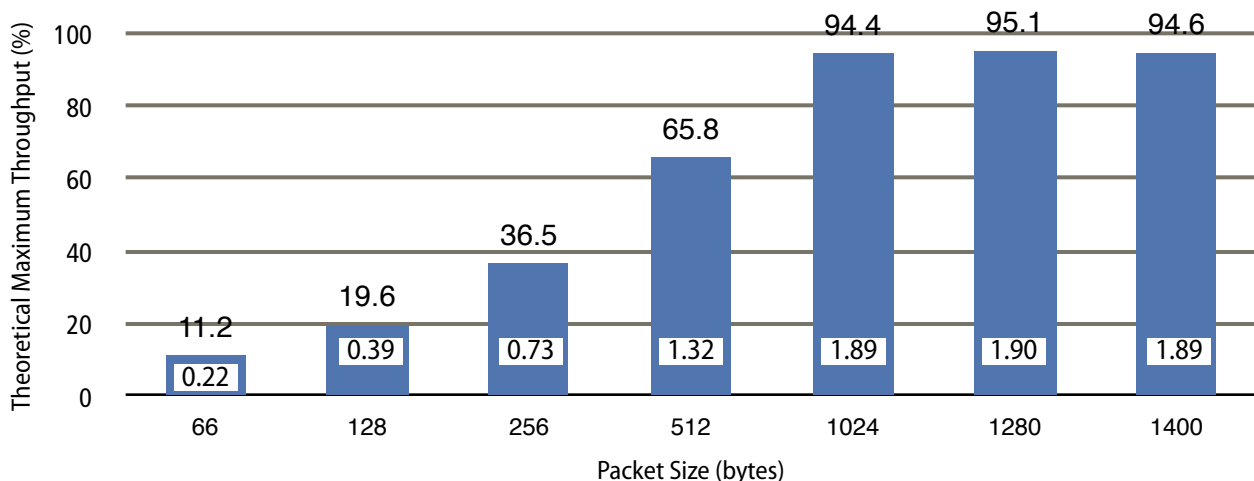
Note: Aggregate bi-directional throughput (Gbps) shown in white box in each column. Throughput does not include IPsec VPN overhead.

Source: Tolly, July 2017   Figure 2

Layer 4 TCP Gigabit Ethernet LAN-to-WAN Throughput
Across a GbE WAN Port and a GbE LAN Port of One Router
(as reported by Spirent Avalanche)

~957Mbps throughput reported by Spirent Avalanche
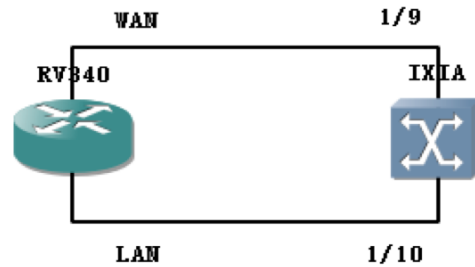
Scenario: HTTP "GET" of 100Mbyte object.
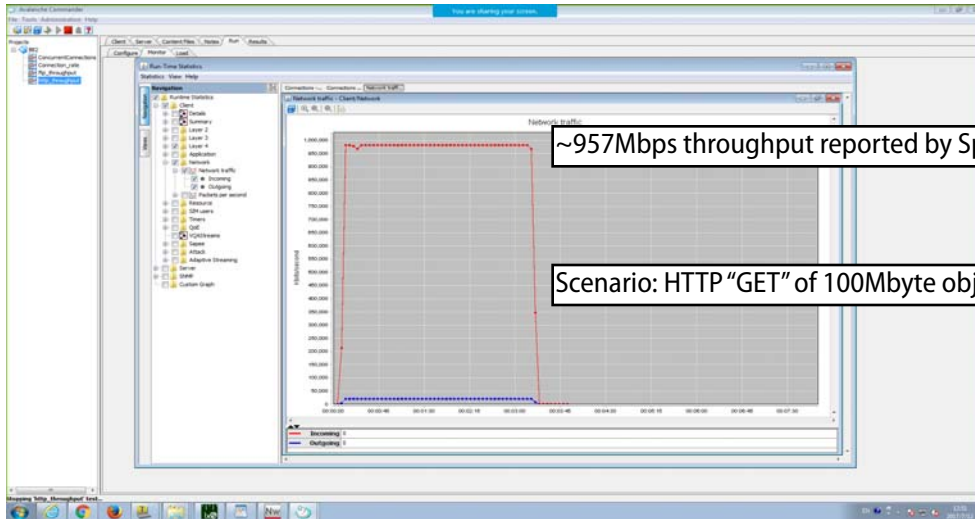
Note: Unidirectional traffic from WAN port to LAN port.
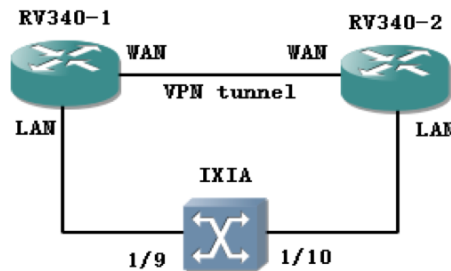
Source: Tolly, July 2017

Figure 3

Test Environment

Test #1 - Single Router UDP Throughput
&
Test #3 - TCP Throughput

Test #2 - Dual-Router WAN Throughput

Note: For test 3, the Ixia test tool was replaced by the Spirent Avalanche.

Source: Tolly, July 2017

Figure 4

System Under Test

Vendor	Product	Description	Vendor SKU	WAN Ports (GbE)	LAN Ports (GbE	Firmware	Notes
Cisco Systems	RV340	Dual WAN Gigabit VPN Router	RV340-K9 V01	2 (RJ-45)	4	1.0.01.17	Also has 2 USB ports to support a 3G/4G modem or flash drive

Note: Two identical routers used for IPsec VPN tunnel test.

Source: Tolly, July 2017   Table 1

Test Setup & Methodology

All tests were run using commercial class test tools from Ixia and Spirent Communications. For specifics of the router under test see Table 1. All testing used LAN and/or WAN GbE ports on the router and GbE ports on the test equipment.

L3 NAT and IPsec Tunnel Throughput Tests

Tests were run using Ixia IxNetwork with two GbE ports. Tests used the RFC 2544 Template.

The Cisco RV340 was configured in NAT mode for Test #1 and IPsec VPN mode (paired with another RV340) for Test #2.

For VPN tests, the maximum packet size was 1400-bytes as the required IPsec headers do not allow for 1518-byte packets.

L4 Throughput Tests

The L4 throughput was benchmarked using Spirent Avalanche test tool.

The test tool was configured to generate TCP traffic: HTTP Get, Get http://100.1.1.200/index.html, Response Properties, Size: 100,000,000 Bytes

The Cisco RV340 was configured in NAT mode for the L4 test.

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You can reach the company by E-mail at sales@tolly.com, or by telephone at +1 561.391.5610.

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Learn more about the Cisco RV340

A small business is constantly exposed to online threats. The RV340 security routers give you firewall protection along with high-speed Internet access.

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