TEST REPORT
Tolly.

#222137
August 2022

Commissioned by
Broadcom Inc.

Symantec Data-Centric SASE
Performance vs. Non-SASE Internet Leveraging Keysight CyPerf Test Tool

EXECUTIVE SUMMARY

Running business communication over the public Internet might be cheap and easy, but communicating over the Internet is certainly not inherently secure and cannot provide optimal performance. Symantec SASE brings security, reliability and optimized performance to endpoints, by minimizing public Internet routes and preferring Google Cloud's private backbone.

Broadcom commissioned Tolly to provide industry-first validation of SASE performance compared to public Internet (Non-SASE) connections. Tolly benchmarked session connections that spanned three continents.
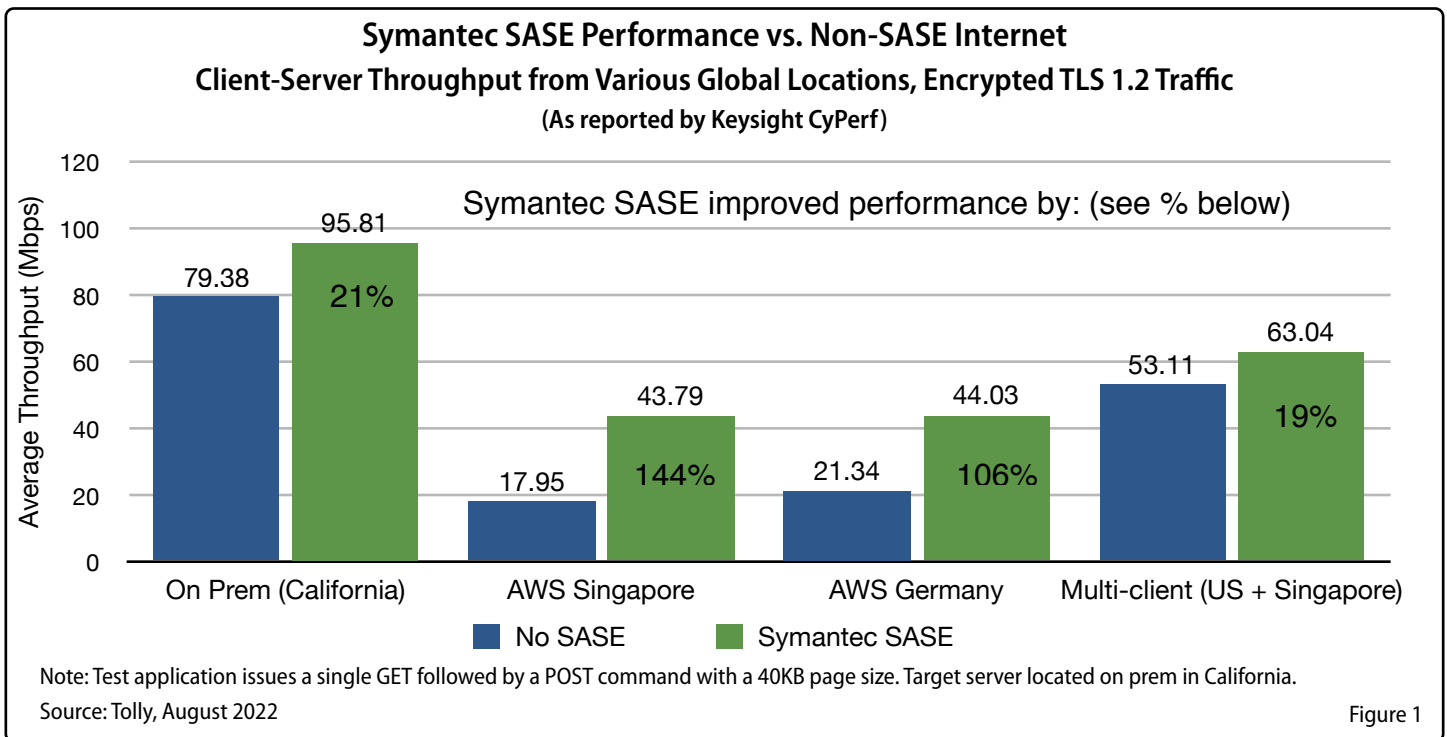
Symantec SASE improved throughput and reduced transaction time for both encrypted and unencrypted traffic in every scenario tested while providing integrated security services. These scenarios included clients based in California, Texas, Ohio, Singapore, and Frankfurt, Germany. Tests included single-client and multi-client distributed scenarios.

By using the Symantec SASE security stack, which includes complete URL and file inspection, customers benefit at two levels: 1) enhanced security, and 2) enhanced performance leveraging GCP and its traffic optimization and peering.

THE BOTTOM LINE

Symantec SASE delivers:

1 Up to 144% greater throughput than Non-SASE for encrypted traffic

2 Up to 62% lower (better) transaction time than Non-SASE for encrypted traffic

3 14% greater throughput than Non-SASE for unencrypted traffic

4 19% lower (better) transaction time than Non-SASE for unencrypted traffic

Symantec SASE Performance vs. Non-SASE Internet
Client-Server Throughput from Various Global Locations, Encrypted TLS 1.2 Traffic
(As reported by Keysight CyPerf)

Symantec SASE improved performance by: (see % below)

Location	No SASE	Symantec SASE	Improvement
On Prem (California)	79.38	95.81	21%
AWS Singapore	17.95	43.79	144%
AWS Germany	21.34	44.03	106%
Multi-client (US + Singapore)	53.11	63.04	19%

Y-axis: Average Throughput (Mbps), scale 0–120

Legend: ■ No SASE ■ Symantec SASE

Note: Test application issues a single GET followed by a POST command with a 40KB page size. Target server located on prem in California.

Source: Tolly, August 2022

Figure 1

Test Results

Environment Overview

All tests were run using Keysight CyPerf, an instantly scalable network test solution for distributed cloud environments.[1] This provides a realistic, cloud-delivered, client/server testing model where one or more simulated clients can be used to benchmark sending and receiving traffic from a simulated server using a vast array of actual application traffic profiles.

Clients were implemented using CyPerf agents. These agents were deployed as virtual or physical instances that can be located anywhere around the globe - in public cloud, private cloud, and/or on-prem locations.

In order to show realistic performance, clients were benchmarked accessing a server instance deployed in California from various points around the globe. Clients were deployed in multiple locations in the US (California, Texas, and Ohio), in Europe (Frankfurt, Germany) and in Asia (Singapore). The test roughly simulates what a typical corporate user would experience accessing an application deployed in a single region as they travel around the globe.

Non-SASE traffic used default Internet connections from client location to target server. Symantec SASE sent traffic over Symantec's secure SASE network. See Test Setup and Methodology section for more details.
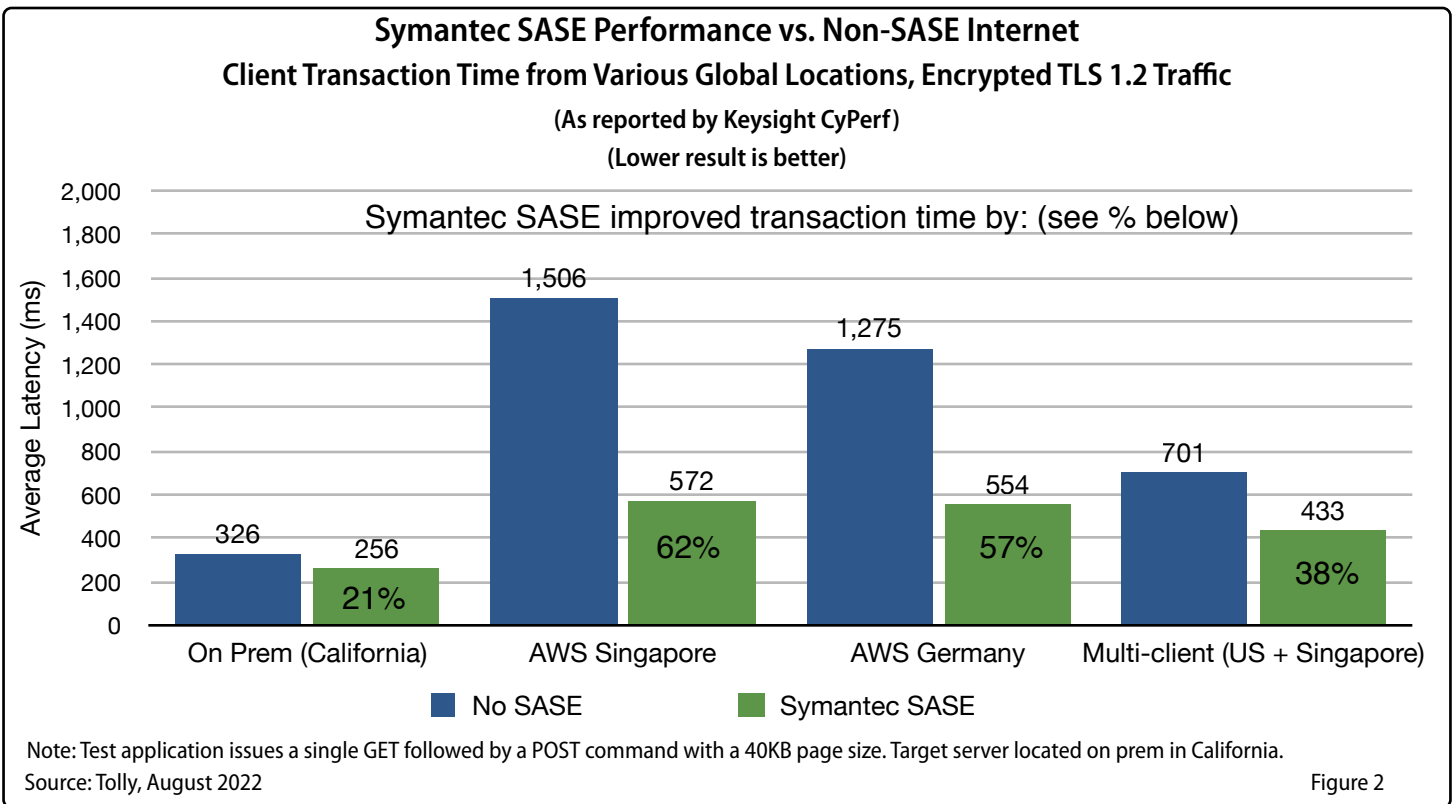
Performance with Encrypted Traffic

The same test traffic scenario was run via a single client from locations in the US, Europe and Asia and, then again using four clients simultaneously that were distributed around the globe.

Throughput

While providing a secure network for each of the sessions, Symantec SASE improved the throughput, as measured in average Mbps, in every test. See Figure 1.

For the most distant client, in Singapore, throughput improved by 144%. For the client in Germany, the improvement was 106% over the non-SASE Internet. Even for

Symantec SASE Performance vs. Non-SASE Internet
Client Transaction Time from Various Global Locations, Encrypted TLS 1.2 Traffic
(As reported by Keysight CyPerf)
(Lower result is better)

Note: Test application issues a single GET followed by a POST command with a 40KB page size. Target server located on prem in California.
Source: Tolly, August 2022   Figure 2

[1] While Broadcom has an advanced Digital Experience Monitoring solution through the acquisition of AppNeta, Tolly selected a third party tool to eliminate any perception of vendor bias.

an on-prem client located in the same city as the server, Symantec SASE improved throughput by 21%.

In the multi-client test, with one client in the US and the other in Singapore, aggregate throughput was improved by 19%.

The more distant the client, the more impressive the throughput improvement.

Transaction Time

The transaction time measures both the network and, in the case of SASE, the SASE infrastructure end-to-end from client to server. This measurement is shown as latency in the chart axis. Latency is not an academic consideration. Even adding 250ms of latency can be perceived by many users and degrade the user experience. As with the throughput measurements, transaction time (or delay) measured by the client was improved by SASE in every scenario. See Figure 2.

For the most distant client, in Singapore, transaction time improved by 62%. For the client in Germany, the improvement was 57% over the non-SASE Internet. Even for an on-prem client located in the same city as the server, Symantec SASE improved transaction time by 21%.

In the multi-client test, with one client in the US and the other in Singapore, aggregate transaction time was improved by 38%.

Again, the more distant the client, the more impressive the transaction time improvement.

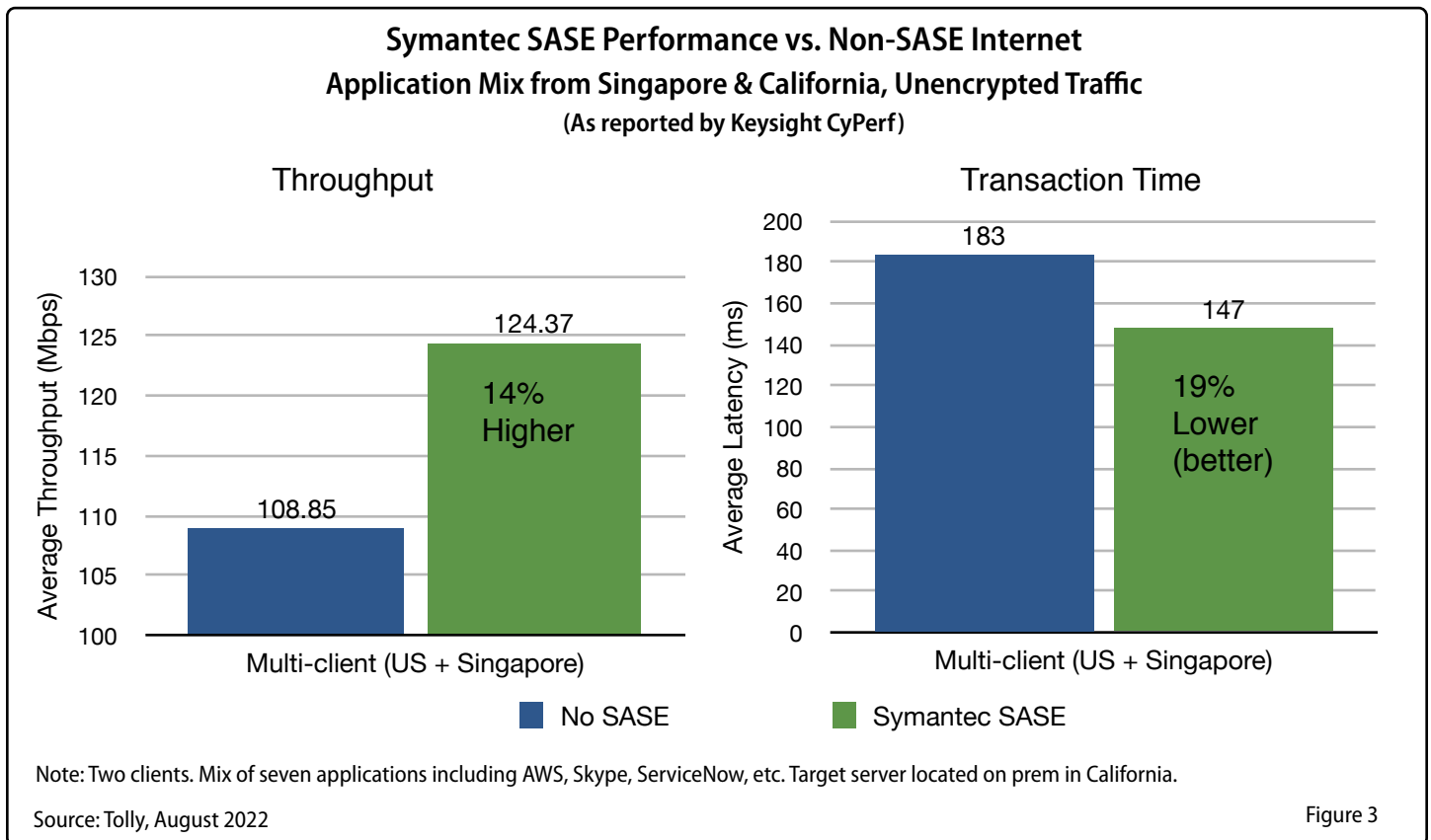**Broadcom Inc.**

Symantec Data-Centric SASE

SASE Performance

Tested August 2022

Performance with Unencrypted Traffic

This test used a mix of seven applications without using encryption.

Symantec SASE Performance vs. Non-SASE Internet
Application Mix from Singapore & California, Unencrypted Traffic
(As reported by Keysight CyPerf)

Throughput

Average Throughput (Mbps)

- 124.37 — 14% Higher
- 108.85

Multi-client (US + Singapore)

Transaction Time

Average Latency (ms)

- 183
- 147 — 19% Lower (better)

Multi-client (US + Singapore)

■ No SASE   ■ Symantec SASE

Note: Two clients. Mix of seven applications including AWS, Skype, ServiceNow, etc. Target server located on prem in California.

Source: Tolly, August 2022

Figure 3

This test traffic scenario was run using two clients, one deployed in the US and the other in Singapore. Again, the Symantec SASE environment delivered both improved throughput and transaction time for the clients.

App Mix: Throughput & Transaction Time

The aggregate throughput was improved by 14% over the non-SASE test. The transaction time was improved by 19%. See Figure 3 for both results.

Test Setup & Methodology

Test Tool - Keysight CyPerf

All testing was run using CyPerf 1.6. All test configuration was done in the CyPerf Console application. See Figure 4 for an example test configuration screen.

Cyperf generates real-time statistics, downloadable detailed reports, and CSV files that contain detailed results records generated during the test runs.

Network Test Environments

Non-SASE Internet

For these tests, the client used the default Internet connection path from its location to the target server.

Symantec SASE Internet

For these tests, the client was configured to use the Broadcom Symantec SASE gateway and, thus, the Symantec SASE network to

reach the target server. As noted previously, this means that all traffic is sent through the full Symantec security stack.

Encrypted Traffic Test

The focus of this test was to illustrate maximum throughput of encrypted traffic using TLS 1.2.[2] To do this, a single simple application was used. This application used a 40KB page size (to generate large packets). The client issued a GET command to generate traffic from the server to the client followed by a POST command to generate traffic from the client to the server.

In all cases, the target server was located at an on-prem location in Santa Clara, CA. Tests showed the effective throughput to that server from various locations across the US, Europe and Asia.

Initial tests were run with a single client communicating with the server. Later tests were run with multiple clients in different locations simultaneously communicating with the server.

Tests measured throughput and transaction time.

Unencrypted Traffic Test

The focus of this test was to illustrate application throughput without encryption.

This test used a mix of simulated client applications. CyPerf allows testers to both choose from a large library of applications and specify the percentage of traffic from each application.

For this test, equal amounts of traffic were generated for using the following

application profiles (which specify application, browser environment, and app profile number): ADP Chrome 2, AWS S3 Chrome 4, Baidu Chrome 5, Commvault Chrome 6, Reddit Chrome 10, ServiceNow Chrome 11, and Skype 8 Chrome 12.

In all cases, the target server was located at an on-prem location in Santa Clara, CA. Tests showed the effective throughput to that server from two locations in the US, and Asia.

Tests were run with two clients in different locations (California and Singapore) simultaneously communicating with the server.

Tests measured throughput and transaction time.

Test Results and Metrics

Each test run was approximately two minutes in length. To calculate the results, Tolly analyzed the detailed log files generated by the tests. These provided current throughput and transaction time (average latency) every three seconds.

In order to exclude any ramp-up/ramp-down time, Tolly evaluated a one-minute period beginning approximately 30 seconds after the start of the test.

For transaction time, multiple measurements were provided by CyPerf. Tolly reported the average time to last byte.

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[2] Broadcom notes that both TLS 1.2 and TLS 1.3 are supported by Symantec SASE.

## Symantec Secure Access Service Edge (SASE) Portfolio Comparison
to Gartner SASE Framework
Tolly Report #222122

In this related report, Tolly examines the portfolio of Symantec web security solutions and documents how they encompass the SASE elements as defined by Gartner. Broadcom's security components can work with any SD-WAN solution.

The Tolly analysis shows that the Symantec web security portfolio provides solutions within each of Gartner's SASE categories and provides services beyond the Gartner main components.
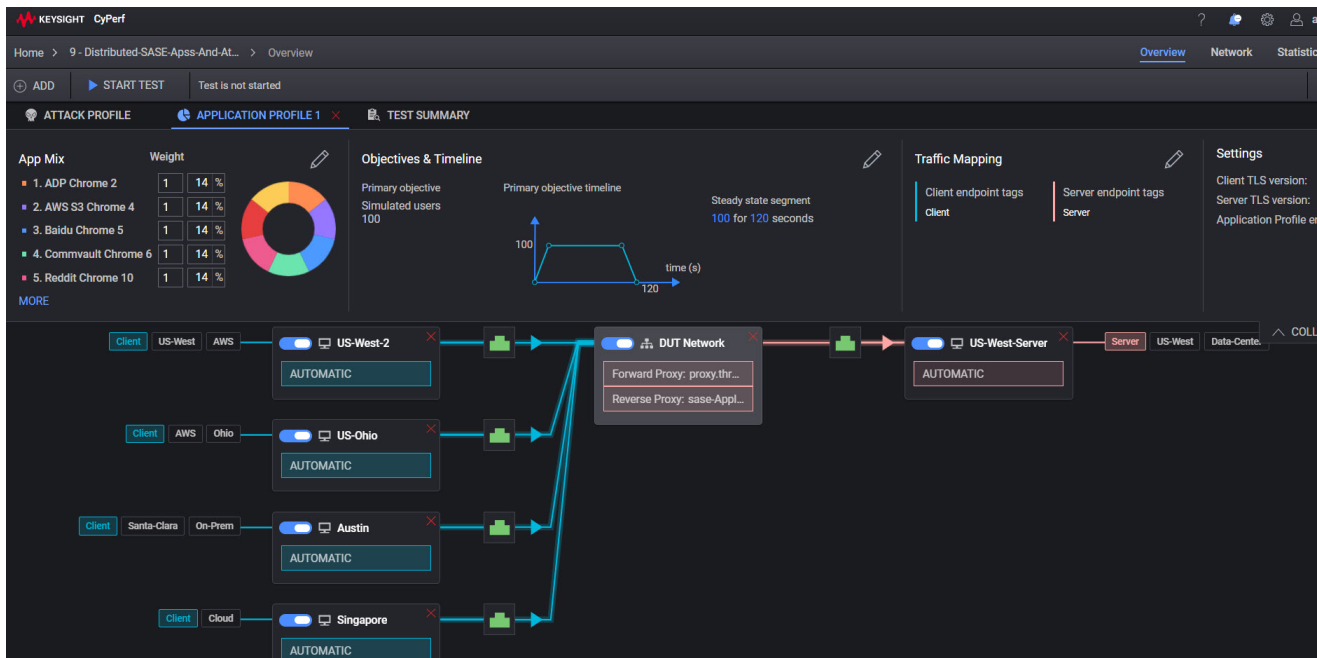
For the full report, visit:
https://reports.tolly.com/DocDetail.aspx?DocNumber=222122
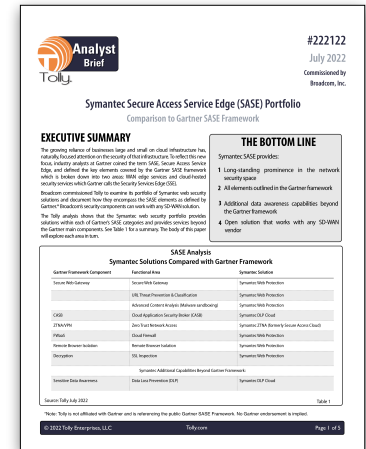
Keysight CyPerf
Example Test Configuration: Distributed SASE Test

Source: Tolly, August 2022

Figure 4

About Tolly

The Tolly Group companies have been delivering world-class IT services for more than 30 years. Tolly is a leading global provider of third-party validation services for vendors of IT products, components and services.

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