# Throughput Performance for Release 21.1.3

This article provides throughput performance numbers for Versa Operating System$^{TM}$ (VOS$^{TM}$) Release 21.1.3.

All throughput performance testing was done under the following conditions:

- Routing, forwarding, and Layer 7 application-aware traffic steering were activated.
- Testing was done with UDP traffic, as specified in RFC 2544, with a 0.1 percent acceptable loss rate, using 1024 sessions with application offloading and with CPU isolation enabled.
- The session timeout was set to high value (3600 seconds).
- The encryption was AES128-GCM, which is the default encryption.
- A Spirent tester was used for testing SD-WAN traffic (refer to Layer 1 traffic statistics).
- Performance is the amount of traffic processed by the CPU; that is, it is an aggregate of WAN-to-LAN and LAN-to-WAN traffic.
- Performance numbers were captured at 100 percent of the service load under ideal test conditions, so all numbers should be considered as maximum values.

For all testing, the following internet mix (IMIX) distribution was used:

| Frame Size (Bytes) | Percentage | Weight |
|---|---|---|
| 66 | 45 | 45 |
| 78 | 8 | 8 |
| 218 | 8 | 8 |
| 594 | 2 | 2 |
| 1354 | 16 | 16 |
| 1418 | 21 | 21 |

# Versa Cloud Services Gateways (CSGs)

For items in the table marked with a plus (+), numbers are limited by number of ports used.

| Model | Packet Size | UDP Throughput | |
| --- | --- | --- | --- |
| | | Direct Internet Access (DIA) | SD-WAN Branch to Branch |
| CSG350 | 1400 | 2 Gbps | 800 Mbps |
| | Internet mix | 1.5 Gbps | 350 Mbps |
| | 100 | 275 Mbps | 70 Mbps |
| CSG355 | 1400 | 3.5 Gbps | 800 Mbps |
| | Internet mix | 1.5 Gbps | 350 Mbps |
| | 100 | 275 Mbps | 70 Mbps |
| CSG365 | 1400 | 4 Gbps+ | 1.2 Gbps |
| | Internet mix | 2 Gbps | 550 Mbps |
| | 100 | 425 Mbps | 100 Mbps |
| CSG730 | 1400 | 2.5 Gbps | 800 Mbps |
| | Internet mix | 1 Gbps | 350 Mbps |
| | 100 | 210 Mbps | 70 Mbps |
| CSG750 | 1400 | 4 Gbps+ | 2 Gbps |
| | Internet mix | 3 Gbps | 900 Mbps |
| | 100 | 600 Mbps | 185 Mbps |
| CSG770 | 1400 | 4 Gbps+ | 3.5 Gbps |
| | Internet mix | 4 Gbps+ | 1.7 Gbps |
| | 100 | 825 Mbps | 420 Mbps |
| CSG1300 | 1400 | 19.5 Gbps | 8 Gbps |
| | Internet mix | 8 Gbps | 3.7 Gbps |
| | 100 | 1.5 Gbps | 850 Mbps |
| CSG1500 | 1400 | 40 Gbps+ | 27.5 Gbps |
| | Internet mix | 25 Gbps | 12.5 Gbps |

| Model | Packet Size | UDP Throughput | |
| --- | --- | --- | --- |
| | | Direct Internet Access (DIA) | SD-WAN Branch to Branch |
| | 100 | 4.5 Gbps | 2.5 Gbps |

## Versa White Boxes

For items in the table marked with a plus (+), numbers are limited by number of ports used.

| Model | Packet Size | UDP Throughput | |
| --- | --- | --- | --- |
| | | Direct Internet Access (DIA) | SD-WAN Branch to Branch |
| Versa 110/510 | 1400 | 4 Gbps+ | 1.2 Gbps |
| | Internet mix | 2 Gbps | 550 Mbps |
| | 100 | 425 Mbps | 100 Mbps |
| Versa 120/520 | 1400 | 4 Gbps+ | 2.8 Gbps |
| | Internet mix | 3.2 Gbps | 1.3 Gbps |
| | 100 | 700 Mbps | 310 Mbps |
| Versa 200 | 1400 | 2.5 Gbps | 800 Mbps |
| | Internet mix | 1 Gbps | 350 Mbps |
| | 100 | 210 Mbps | 70 Mbps |
| Versa 210 | 1400 | 4 Gbps+ | 2 Gbps |
| | Internet mix | 3 Gbps | 900 Mbps |
| | 100 | 600 Mbps | 185 Mbps |
| Versa 220 | 1400 | 15 Gbps | 5.5 Gbps |
| | Internet mix | 7.5 Gbps | 2.4 Gbps |
| | 100 | 1.6 Gbps | 500 Mbps |
| Versa 240 | 1400 | 19.5 Gbps | 8 Gbps |

| Model | Packet Size | UDP Throughput | |
| --- | --- | --- | --- |
| | | Direct Internet Access (DIA) | SD-WAN Branch to Branch |
| | Internet mix | 8 Gbps | 3.7 Gbps |
| | 100 | 1.5 Gbps | 850 Mbps |
| Versa 810 | 1400 | 36 Gbps | 12 Gbps |
| | Internet mix | 16 Gbps | 5.6 Gbps |
| | 100 | 3 Gbps | 1.1 Gbps |
| Versa 1000 | 1400 | 40 Gbps+ | 25 Gbps |
| | Internet mix | 28 Gbps | 12 Gbps |
| | 100 | 5.7 Gbps | 2.5 Gbps |
| Versa 1800 | 1400 | 40 Gbps+ | 37 Gbps |
| | Internet mix | 39 Gbps+ | 24 Gbps |
| | 100 | 10 Gbps | 4.5 Gbps |

## Versa Dell Appliances

For items in the table marked with a plus (+), numbers are limited by number of ports used.

| Model | Packet Size | UDP Throughput | |
| --- | --- | --- | --- |
| | | Direct Internet Access (DIA) | SD-WAN Branch to Branch |
| VEP-1425 | 1400 | 4 Gbps+ | 2 Gbps |
| | Internet mix | 3 Gbps | 900 Mbps |
| | 100 | 600 Mbps | 185 Mbps |
| VEP-1445 | 1400 | 15 Gbps | 5.5 Gbps |
| | Internet mix | 7.5 Gbps | 2.4 Gbps |

| Model | Packet Size | UDP Throughput | |
| --- | --- | --- | --- |
| | | Direct Internet Access (DIA) | SD-WAN Branch to Branch |
| | 100 | 1.6 Gbps | 500 Mbps |
| VEP-1485 | 1400 | 19.5 Gbps | 8 Gbps |
| | Internet mix | 8 Gbps | 3.7 Gbps |
| | 100 | 1.5 Gbps | 850 Mbps |
| VEP-4600-V910 | 1400 | 38 Gbps | 12 Gbps |
| | Internet mix | 16 Gbps | 5.3 Gbps |
| | 100 | 3 Gbps | 1.2 Gbps |
| VEP-4600-V930 | 1400 | 40 Gbps+ | 27.5 Gbps |
| | Internet mix | 25 Gbps | 12.5 Gbps |
| | 100 | 4.5 Gbps | 2.5 Gbps |

# Versa CPE on AWS Instance

By default, AWS interfaces are SR-IOV capable. It is recommended that you use only SR-IOV capable interfaces.

AWS instances use a network I/O credit mechanism to allocate network bandwidth to instances based on average bandwidth utilization. They accrue credits when their bandwidth is below their baseline bandwidth, and they can use these credits when they perform network data transfers. For more information, open an AWS support case and ask about baseline bandwidth for the specific instance types that you are interested in.

VOS and traffic generator instances are in single virtual private cloud and AWS region.

All numbers need to be considered the maximum as claimed by AWS instance limits.

For items in the table marked with an asterisk (*), testing was limited by the AWS infrastructure or the VOS software.

| AWS Instance | Packet Size | UDP Throughput | |
| --- | --- | --- | --- |
| | | Direct Internet Access (DIA) | SD-WAN Branch to Branch |
| c5. xlarge | 1400 | 6.9 Gbps* | 4 Gbps* |

| AWS Instance | Packet Size | UDP Throughput | |
| --- | --- | --- | --- |
| | | Direct Internet Access (DIA) | SD-WAN Branch to Branch |
| | Internet mix | 3 Gbps* | 2.2 Gbps* |
| | 100 | 500 Mbps | 450 Mbps |
| c5.2xlarge | 1400 | 7.7 Gbps* | 7.5 Gbps* |
| | Internet mix | 3.3 Gbps* | 3 Gbps* |
| | 100 | 550 Mbps* | 650 Mbps |
| c5.4xlarge | 1400 | 9 Gbps* | 7.7 Gbps* |
| | Internet mix | 3 Gbps* | 3 Gbps* |
| | 100 | 550 Mbps* | 650 Mbps* |

## Additional Information

Hardware and Software Requirements for Headend
Versa Analytics Scaling Recommendations
Versa Solution Scalability