



LIQID

Liquid Launches the
Industry's Fastest,
No-Compromise,
One-Socket Servers,
powered by
Dell Technologies and AMD



— POWERED BY —



Single Socket - Single SSD - Single Server - Unlimited Performance



LIQID AND AMD POWER THE INDUSTRY'S FASTEST NO-COMPROMISE ONE-SOCKET SERVERS

Overview:

IT organizations across the globe face budget and space constraints. These challenges are worsened by poor server utilization. Those same data centers are now demanding high-performance, one-socket servers designed to increase utilization and lower acquisition expenditures and total cost of ownership (TCO).

To meet these needs, Liqid has collaborated with Dell Technologies OEM | Embedded & Edge Solutions to design a solution delivering the fastest single socket storage solution on the market today. Liqid's composable Gen4 fabric technology deployed with the AMD EPYC™ 7002 Series, and designed on the Dell EMC PowerEdge R7515 Rack Server delivers the ideal architecture for next-generation, AI-driven, and HPC application environments.

AMD EPYC™ 7002 Series Processors are the company's next-generation multichip microprocessor architecture designed to help lower TCO and enables organizations to right-size for key application workloads without feature compromise. Since its release, the AMD EPYC™ 7002 Series have set over 140 world records in performance* and have steadily gained market share in the data center.

AMD EPYC™ 7002 Series powered solutions like the Dell EMC PowerEdge R7515 Rack Server provides up to 64 cores and PCIe® 4.0 connectivity unlocking capabilities and unmatched performance previously not available, delivering a powerful out-of-box solution for the most demanding data center environments.

Liqid's composable Gen4 fabric technology designed on Dell Technologies infrastructure with AMD processors empowers users to deploy server systems with the highest compute and storage performance for core data centers as workflows and business needs constantly scale. This solution enables users to dynamically right-size their IT resources by delivering unmatched performance from a single socket server.



AMD EPYC™ Processor World Records, Advanced Micro Devices, Inc. www.amd.com/worldrecords (accessed March 18, 2020)



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Setup:

The Dell EMC PowerEdge R7515 Rack Server is equipped with 2x Gen4 PCIe slots. In order to fully utilize these high-performance Gen4 PCIe slots, it is important to deploy the fastest Gen4 PCIe devices available. Using Gen4 PCIe storage devices like the LQD4500 that enable / deliver 2x-3x the storage performance compared to other NVMe SSDs enables system designers and solutions architects to use the remaining Gen4 PCIe slots for additional high-performance devices.

The performance results outlined below were generated with a single socket AMD CPU, single Liquid NVMe SSD, in a single Dell EMC PowerEdge R7515 Rack Server. Single Socket – Single SSD – Single Server ... Unlimited Performance. The infrastructure leveraged for this benchmarking includes:

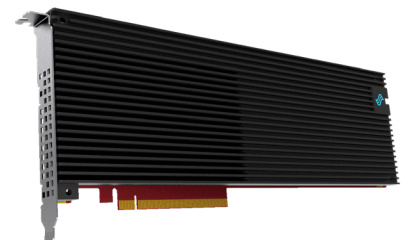
Dell EMC PowerEdge: The Dell EMC PowerEdge R7515 is a single-socket 2U server designed to handle workloads like software-defined storage, virtualization and data analytics. The server is built upon a scalable system architecture and provides choice and flexibility to meet performance demands.



AMD EPYC™ 7002 Series Processors: Utilizing the x86-architecture and built on 7nm technology, the AMD EPYC™ 7002 Series of processors bring together up to 64 cores, 4TB memory capacity, support for 8 channels of DDR4-3200, and 128 lanes of PCIe Gen4 I/O per socket, the AMD EPYC™ 7002 Series has been engineered for data centers that rely on CPU performance. From HPC workloads such as oil and gas exploration, to in-memory databases, to big data analytics to standard data center applications, highly parallel workloads have more cores to work with.



Liquid: The Liquid Element LQD4500 PCIe Add-In-Card (AIC), aka "The Honey Badger," is a full-height-full-length (FHFL), high storage capacity and extreme performance for mission critical and performance-demanding workloads delivering over 24GBs and 3M IOPS of performance. This makes the Element LQD4500 ideal for deployment in high-memory enterprise applications.



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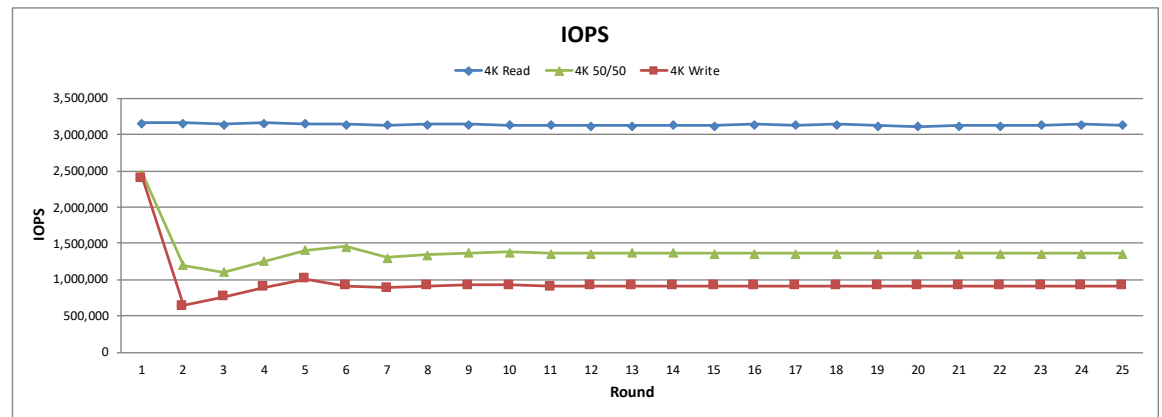
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Performance Summary:

When benchmarking IOPS and for MB/s in sequential reads and writes, the Liquid solution, designed on Dell Technologies infrastructure delivered industry-leading performance results. Below test summary shows the power of Liquid Gen4 NVMe technology deployed on the Dell EMC PowerEdge R7515 Rack Server powered by the AMD EPYC™ 7002 Series.

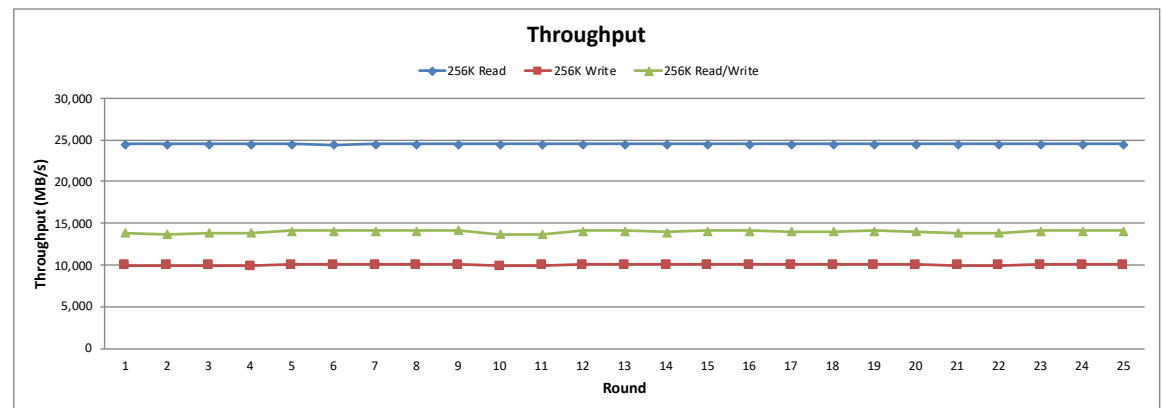
Random IOPS

IOPS			
Block Size	Read / Write Mix%		
	100/0	50/50	0/100
4K	3,138,001	1,390,460	961,663
8K	1,794,673	730,052	479,889



Sequential bandwidth

Throughput (MB/s)			
Block Size	Read / Write Mix%		
	100/0	50/50	0/100
128K	24,471	13,834	10,052
256K	24,481	14,002	10,028



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Conclusions:

The Liqid solution, powered by Dell Technologies enables users to deploy server systems with the highest compute and storage performance on the market. The Dell EMC PowerEdge R7515 Rack Server powered by AMD EPYC™ 7002 Series and Liqid Honey Badger Gen4 NVMe SSD enables users to dynamically right-size their IT resources by delivering unmatched performance from a single socket server. The configuration delivers an industry-leading solution that out-performs other dual socket and multi-processor servers. This leading edge Gen4 PCIe platform is enabling next levels of performance not previously available from a single server let alone a single socket server.

Comparison of AMD Single Socket vs. Intel Single & Dual Socket

Configuration	Single Socket	Single Socket	Dual Socket
Processor	AMD EPYC™	Intel Xeon	Intel Xeon
Model	AMD EPYC™ 7742	Platinum 8280	Platinum 8280
PCIe Bus	Gen4 - 128 Lanes	Gen3 - 48 Lanes	Gen3 - 96 Lanes
Core Count	64	28	56
Thread Count	128	56	112
Max CPU Speed	3.4GHz	3.8GHz	3.8GHz
Power	225W	215W*	430W*
Memory	DDR4-3200	DDR4-2933	DDR4-2933

**Intel Power includes PCH chip-set*



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About Liqid

Liqid provides the world's most-comprehensive software-defined composable infrastructure platform. The Liqid Composable platform empowers users to manage, scale, and configure physical, bare-metal server systems in seconds and then reallocate core data center devices on-demand as workflows and business needs evolve. Liqid Command Center software enables users to dynamically right size their IT resources on the fly. For more information, contact info@liqid.com or visit www.liqid.com. Follow Liqid on [Twitter](#) and [LinkedIn](#).

About Dell Technologies OEM | Embedded & Edge Solutions

Dell Technologies Original Equipment Manufacturer (OEM) | Embedded & Edge Solutions delivers customized infrastructure, services and a secure supply chain designed for our customer's vision and business goals – all from one trusted, sustainable and secure Tier 1 provider. The best of Dell Technologies, engineered and configured for our customer's application. [Learn More](#)

About AMD

For 50 years AMD has driven innovation in high-performance computing, graphics and visualization technologies – the building blocks for gaming, immersive platforms and the data center. Hundreds of millions of consumers, leading Fortune 500 businesses and cutting-edge scientific research facilities around the world rely on AMD technology daily to improve how they live, work and play. AMD employees around the world are focused on building great products that push the boundaries of what is possible. For more information about how AMD is enabling today and inspiring tomorrow, visit the [AMD \(NASDAQ: AMD\) website, blog, and Twitter pages](#).

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