Micron® SolidScale™ Platform Architecture

Your Innovation Requires High-Performance Infrastructure to Evolve

Your business is driven by data — lots of data. So how do you obtain maximum value from that data in the most efficient way? Today's storage infrastructures cannot keep up with your demands, but what about future technologies? Which future advancements will you take advantage of to continue your innovatation? And what if that future technology was already here today?

The fastest storage solution available today is server-local NVMe solid state devices. The challenge is that these server-local SSDs are hard to manage, with the NVMe benefits locked into individual servers that typically don't utilize the device's full capacity, IOPS or throughput. To remove these limitations, Micron has identified a better, more innovative option that truly unlocks the full potential of NVMe. This solutions allows you to build more responsive, scalable and low-cost solutions to innovate far into the future.

Release the Power of NVMe for Your Next-Generation Data Center

The Micron® SolidScale™ platform architecture is the next-generation intelligent infrastructure platform designed to provide applications with all of the raw performance you can expect from local storage — and all of the flexibility, manageability and scalability typically experienced with traditional storage area network-based solutions. Leveraging the latest NVMe and PCIe standards, the SolidScale platform uses a low-latency, high-bandwidth RDMA over Converged Ethernet (RoCE) fabric infrastructure to connect compute and storage together in a flexible way that will fit almost any application's architecture requirements. Deploy the SolidScale platform in storage-centric, compute-centric or mixed storage and compute configurations, and integrate it with existing data center application servers as desired (see Figure 1).

With the SolidScale platform, you can unlock unused capacity and performance, so you can run the same workload with potentially fewer storage devices because capacity can be shared across applications and servers. The SolidScale platform has the horsepower to host even the most demanding, real-time analytics applications, SQL and NoSQL databases, and virtual infrastructure solutions.

Key Benefits

Performance

- Get the performance of local NVMe in a centralized, networked storage solution.
- Get predictable application performance.

Flexibility

- Deploy SolidScale nodes to fit your application and data center requirements.
- Choose volume creation for performance or protection.
- Meet business requirements and budgets with "right-sized" volumes for hundreds of servers.

Manageability

- Provide consistent deployment and performance across the data center with simple, lightweight storage protocol stack.
- Gain complete control of the storage infrastructure with RESTful APIs and web-based management.

Scalability

- Grow to petabytes or exabytes of ultra-fast NVMe storage.
- Scale to over 1000 nodes thanks to lightweight storage stack.

Micron SOLIDSCALE™

Micron®

Ultimate Flexibility

Regardless of the deployment model, the SolidScale platform provides the flexibility to create and manage a single, centralized pool of storage, create "right-sized" logical volumes, and even share storage resources with non-SolidScale compute resources. This lets you support existing applications currently deployed in your data center. Mix and match SolidScale platform nodes to provide the flexibility and performance you need to support your legacy and next-generation cloud-centric application needs with the extremely low latency and high throughput required by these applications.

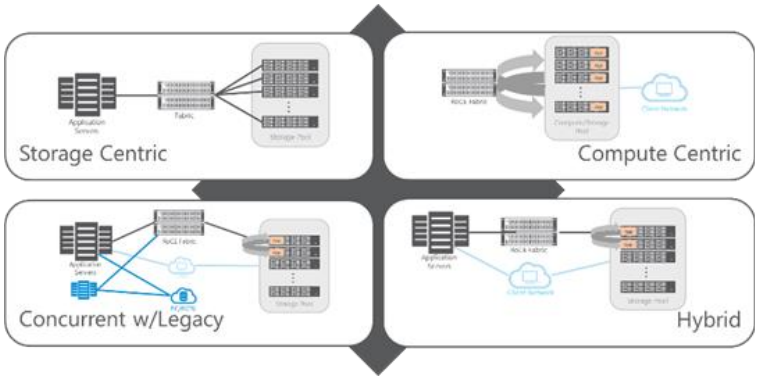

Figure 1: The SolidScale platform provides a flexible, high-performance application infrastructure

Any data center infrastructure is only as useful as its ability to be easily configured and managed. The SolidScale platform provides a complete management interface using a robust RESTful API to allow all functions and features of the platform to be managed using existing management tools. The SolidScale platform also provides a graphical, web-based user interface for an easy and interactive configuration experience. With advanced data center storage features such as RAID, deduplication, replication and snapshots[1], the SolidScale platform ensures your data is safely and efficiently managed.

Performance Is the Name of the Game With SolidScale Platform[2]

One goal of the SolidScale platform is to provide near server-local performance in a linear scale-out remote NVMe solution. In early platform testing, a series of five test runs showed impressive performance: We achieved average IOPS levels within 4% of an equivalent server-local deployment (Figure 2) without adding more than an average of 10µs to the overall IO in 100% random reads in 4K blocks. And in early scalability testing using three 2U SolidScale nodes, we achieved over 10.9 million IOPS[3] over a single 100Gb link. As our SolidScale infrastructure technology matures, we expect these performance metrics even closer to server-local performance levels.

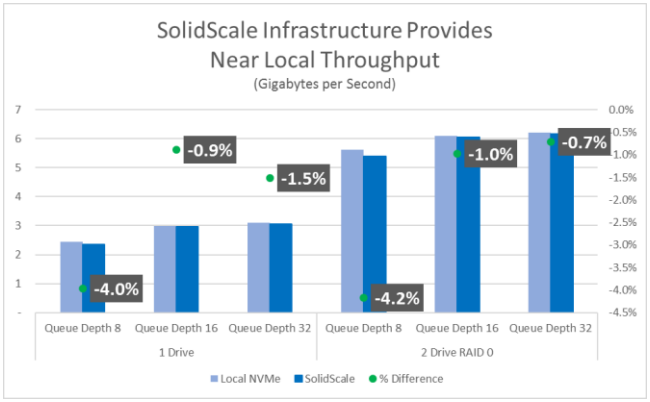

Figure 2: SolidScale provides linear scale throughput levels close to those of server-local NVMe

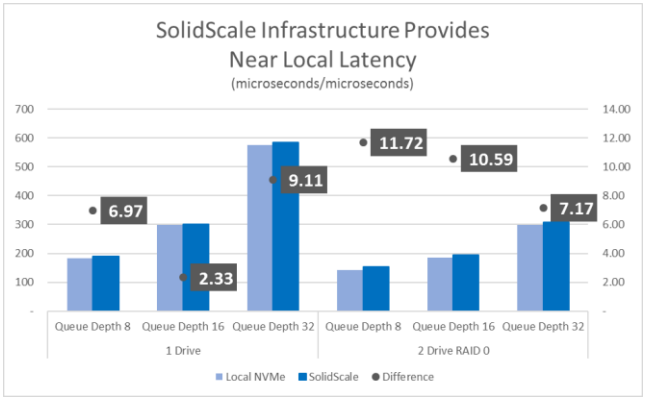

Figure 3: SolidScale provides latency levels close to those of server-local NVMe

Want to Learn More?

Interested in participating in the Micron SolidScale platform early access program? Or are you an OEM company interested in partnering with Micron to extend the SolidScale architecture across your hardware platforms? Visit micron.com/solidscale or send an email to solidscale@micron.com.

micron.com/solidscale

1. Deduplication, replication, and snapshots are future features not currently supported as of the publishing of this solution brief.
2. All testing was completed on early beta releases of all SolidScale hardware and software. Actual product performance has yet to be finalized and will be communicated at a later date. Results reflect FIO 4K random reads using a single Micron 2.4TB 9100MAX installed in a server versus installed in a remote SolidScale node. All network connections were 100Gb RoCE interfaces.
3. 3X SolidScale nodes with 12X Micron 2.4TB 9100MAX SSDs per node running FIO over dual 100Gb RoCE ports.

Mellanox TECHNOLOGIES Excelero Micron