The management of large-scale, rapidly growing infrastructures is a constant challenge for many data center operation teams and it is not surprising that data storage is at the heart of these challenges. The traditional dedicated SAN and dedicated workloads cannot always provide the scale and flexibility needed. A storage array can’t borrow capacity from another SAN if demand increases and can lead to data bottlenecks and a single point of failure. When delivering Infrastructure-as-a-Service (IaaS) or high performance applications, delays in response are simply not acceptable to customers or users.

EMC® ScaleIO® is software that creates a server-based SAN from local application server storage to deliver flexible and scalable performance and capacity on demand. It converges storage and compute resources of commodity hardware into a single-layer architecture, aggregating capacity and performance, simplifying management, and scaling to thousands of nodes. As an alternative to a traditional SAN infrastructure, ScaleIO combines HDDs, SSDs, and PCIe flash cards to create a virtual pool of block storage with varying performance tiers. In addition, it provides enterprise-grade data protection, multi-tenant capabilities, and add-on enterprise features such as QoS, thin provisioning, and snapshots. ScaleIO is hardware-agnostic, supports physical and/or virtual application servers, and has been proven to deliver significant TCO savings vs. traditional SAN.

MASSIVE SCALABILITY

ScaleIO is designed to massively scale from three to thousands of nodes. Unlike most traditional storage systems, as the number of storage devices grows, so do throughput and IOPS. The scalability of performance is linear with regard to the growth of the deployment. Whenever the need arises, additional storage and compute resources (i.e., additional servers and/or drives) can be added modularly so that resources can grow individually or together to maintain balance. Storage growth is therefore always automatically aligned with application needs.

EXTREME PERFORMANCE

Every server in the ScaleIO cluster is used in the processing of I/O operations, making all I/O and throughput accessible to any application within the cluster. Such massive I/O parallelism eliminates bottlenecks. Throughput and IOPS scale in direct proportion to the number of servers and local storage devices added to the system, improving cost/performance rates with growth. Performance optimization is automatic; whenever rebuilds and rebalances are needed, they occur in the background with minimal or no impact to applications and users. The ScaleIO system autonomously manages performance hot spots and data layout. EMC lab testing results demonstrate:

<table>
<thead>
<tr>
<th>Workload</th>
<th>IOPS (3 Nodes)</th>
<th>IOPS (128 Nodes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>100% Read</td>
<td>~875,000</td>
<td>~31,000,000</td>
</tr>
<tr>
<td>70% Read / 30% Write</td>
<td>~650,000</td>
<td>~23,750,000</td>
</tr>
<tr>
<td>100% Write</td>
<td>~375,000</td>
<td>~12,500,000</td>
</tr>
</tbody>
</table>

ESSENTIALS
- Software-defined block storage
- Scales to thousands of nodes
- Tens of millions of IOPS
- Performance and capacity on demand
- Multiple deployment options
- Infrastructure agnostic
- Elastic architecture
- Low TCO
- Features essential for Enterprises and Service Providers
- Integrations with VMware® vSphere®, EMC RecoverPoint™, EMC XtremCache™, and OpenStack®
- Try it for free! Download the F&R version today!
UNPARALLELED FLEXIBILITY

ScaleIO provides flexible deployment options. With ScaleIO, you are provided with two deployment options. The first option is called “two-layer” and is when the application and storage are installed in separate servers in the ScaleIO cluster. This provides efficient parallelism and no single points of failure. The second option is called “hyper-converged” and is when the application and storage are installed on the same servers in the ScaleIO cluster. This creates a single-layer architecture and provides the lowest footprint and cost profile.

ScaleIO provides unmatched choice for these deployments options. ScaleIO is infrastructure agnostic making it a true software-defined storage product. It can be used with mixed server brands, operating systems (physical and virtual), and storage media types (HDDs, SSDs, and PCIe flash cards). In addition, customers can also use OpenStack commodity hardware for storage and compute nodes.

SUPREME ELASTICITY

With ScaleIO, storage and compute resources can be increased or decreased whenever the need arises. The system automatically rebalances data “on the fly” with no downtime. Additions and removals can be done in small or large increments. No capacity planning or complex reconfiguration due to interoperability constraints is required, which reduces complexity and cost. The ScaleIO system reconfigures itself as the underlying resources change; data is rearranged and spread evenly on the servers to optimize performance and enhance resilience. All of this happens automatically without operator intervention and therefore eliminates the need for costly and disruptive data migrations.

COMPPELLING ECONOMICS

There are obvious cost benefits to ScaleIO that have been proven to deliver greater than 60 percent TCO savings vs. traditional SAN. First, the software-only system utilizes commodity hardware to create a server-based SAN; therefore there are no dedicated storage components like fabric and HBAs. This allows for reduced power, cooling, and space, which has tremendous cost savings. And because there is no large storage system with ScaleIO, there are no “forklift” upgrades for end-of-life hardware. You simply remove failed disks or outdated servers from the cluster. ScaleIO enables your IT administrators to individually manage the entire data center stack, using the CLI, active GUI, REST API, and/or VMware vSphere (for VMware ESX™ environments) which improves operational effectiveness and lowers operational costs; drastically reducing administrative overhead. Finally, the software is licensed per TB; customers simply “pay as you grow” so you never have to buy more storage than is needed.

ESSENTIAL FEATURES FOR ENTERPRISES AND SERVICE PROVIDERS

ScaleIO offers a set of features that gives you complete control over performance, capacity and data location. For both private cloud data centers and service providers, these features enhance system control and manageability—ensuring that quality of service (QoS) is met. With ScaleIO, you can limit the amount of performance—IOps or bandwidth—that selected customers can consume. The limiter allows for resource distribution to be imposed and regulated, preventing application “hogging” scenarios. Data masking can be used to provide added security for sensitive customer data. ScaleIO offers instantaneous, writeable snapshots for data backups.

For improved read performance, DRAM caching enables you to improve read access by using SDS server RAM. Fault sets – a group of SDS that are likely to go down together – can be defined to ensure data mirroring occurs outside the group, improving business continuity. You can create volumes with thin provisioning, providing on-demand storage as well as faster setup and startup times.

ScaleIO also provides multi-tenant capabilities via protection domains and storage pools. Protection domains allow you to isolate specific servers and data sets. This can be done at the granularity of a single customer so that each customer can be under a different SLA. Storage pools can be used for further data segmentation, tiering, and performance management. For example, data that is accessed very frequently can be stored in a flash-only storage pool for the lowest latency, while less frequently accessed data can be stored in a low-cost, high-capacity pool of spinning disks.

Finally, tight integrations with other EMC products are available. You can use ScaleIO in conjunction with EMC XtremCache for flash cache auto tiering to further accelerate application performance. Last but not least, you can use ScaleIO with EMC RecoverPoint to provide replication and disaster recovery protection for ScaleIO environments.