COMPETITIVE COMPARISON

NetApp AFF vs. Dell EMC XtremIO

Flash Architecture Comparison

OVERVIEW

Today's businesses depend on speed and agility to generate revenue growth. The IT organization must meet the speed requirements of the business, but it must also provide highly reliable systems that fit within budget guidelines. To satisfy business needs within the operational constraints of IT, all-flash storage is becoming increasingly popular. All-flash systems can be quickly deployed into a traditional infrastructure environment and used to accelerate a variety of enterprise applications.

This document compares two popular all-flash solutions available today: NetApp AFF and the latest iteration of Dell EMC's flash-based XtremIO product line, known as X2. The X2 is built upon clustered storage "bricks," each of which contains a pair of storage controllers and SSD devices. It is available in configurations with up to eight flash storage controllers per cluster, with higher brick counts expected to be supported in the future.

The NetApp AFF is also a clustered, all-flash storage system. Like the X2, AFF storage controllers are grouped in pairs. Today, as many as 12 node pairs can be combined into a single AFF cluster for a maximum of 24 flash storage controllers.

Although the Dell EMC X2 and NetApp AFF are similar in design, many critical points of differentiation exist. This analysis examines five essential criteria to consider when evaluating flash storage products and compares how each of these flash storage systems stands up to the criteria.

COMPARISON SUMMARY

	NetApp AFF	Dell EMC XtremIO
1. Flexible Scalability	✔	◒
2. Quality of Service	✔	◒
3. Application Integration	✔	◒
4. Future-proof Architecture	✔	◒
5. Cloud Integration	✔	◒

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Note that this analysis does not consider performance capabilities or storage efficiency features, such as compression and deduplication. You should always consult published performance benchmarks from third-party organizations, such as the Storage Performance Council, and conduct testing with your own applications and datasets when making performance and efficiency comparisons.

Five Key Differences Between NetApp and XtremIO

1. FLEXIBLE SCALABILITY

Dell EMC XtremIO: The X2 can currently scale capacity within a brick or by adding additional bricks. X2 bricks are available in two models: newer X2-R and X2-S. The two models cannot be mixed within the same X2 cluster. Prior generations of XtremIO bricks cannot be mixed with the X2-R or X2-S bricks within a single cluster.

NetApp AFF: Each AFF node pair can scale up to support a maximum 480 SSDs. An AFF cluster can also scale out to 24 nodes and support up to 5,760 SSDs. AFF node pairs are available at multiple price/performance points and can be mixed and matched within a single cluster in many ways—old and new, big and small, all-flash and hybrid-flash—all within the same cluster.

For example, when additional processing power is needed, high-performance AFF node pairs can be added with minimal storage capacity. Conversely, when additional capacity is desired, mid-range node pairs with high-capacity storage shelves can be added.

Comparison: The requirement for clustered X2 bricks to contain the same generation of hardware and operating system software can result in stranded resources, silos of storage, and costly data migrations.

By comparison, AFF clusters can accommodate multiple generations of controllers with varying levels of performance and capacity. This enables customers to continue using their existing systems while nondisruptively adding new technologies and capabilities to their storage cluster.

In addition, the AFF supports the latest in high-capacity SSDs, which at the time of writing includes 15.3TB SSDs. By contrast, the highest-capacity SSD supported by the X2 is 1.9TB, with a 3.84TB version announced for the future. With 30TB and 60TB SSDs on the horizon, the X2 is in danger of falling even further behind.

2. QUALITY OF SERVICE (QOS)

Dell EMC XtremIO: Dell EMC recently introduced QoS controls for the

FAST FACT

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XtremIO X2 systems—nearly three years after an EMC blog post promised: "Additional things we're working on are rich QoS models … expect to hear more on that soon." The QoS capability that was finally announced features support for maximum and burst settings for IOPS. It is unclear whether this new QoS capability will be backward-compatible with prior generations of XtremIO products.

NetApp AFF: Sophisticated QoS controls have been available in AFF systems since 2013. They enable the delivery of predictable storage performance for business-critical applications in a shared infrastructure environment. By assigning not-to-exceed performance limits on a per-workload basis, resources can be proactively controlled. It is also possible to set minimum performance thresholds for the most business-critical workloads.

Comparison: The most critical applications often require a minimum level of predictable performance, especially in virtualized, multitenant environments. AFF systems meet this need by enabling an administrator to specify a minimum performance level. The lack of a minimum QoS setting for X2 systems can result in unpredictable performance, despite maximum and burst QoS capabilities. In addition, Dell EMC customers must consider whether QoS controls will ever be available on older XtremIO systems.

3. APPLICATION INTEGRATION

Dell EMC XtremIO: Dell EMC provides application integration using an optional software add-on called AppSync. According to the datasheet, the software simplifies, orchestrates, and automates the process of generating and consuming copies of production data. Support is listed for Oracle, Microsoft SQL Server, Microsoft Exchange, and VMware, along with the capability to support other environments using custom scripts.

NetApp AFF: NetApp offers SnapCenter® software as an add-on option for its AFF systems. SnapCenter software provides simple, centralized, scalable, end-to-end data protection and an in-place copy data management solution for enterprise data, both on-premises or in a hybrid cloud. Application integration is available for Oracle, Microsoft SQL Server, SAP HANA, MySQL, and IBM DB2 as well as VMware, Windows, and NAS environments.

Comparison: Both the X2 and AFF provide customers with the application integration for commonly used enterprise applications and use cases. Perhaps the biggest difference between the two is the cloud integration offered by NetApp SnapCenter software. For example, SnapCenter software supports the creation of data protection copies on cloud-integrated appliances (AltaVault®), cloud-connected storage systems (NetApp Private Storage), and cloud-native software targets (ONTAP® Cloud for AWS or Azure). In addition, SnapCenter software takes full advantage of ONTAP data services to provide space-efficient, application-consistent, disk-based backups; rapid, granular restore and application-consistent recovery; and quick, space-efficient cloning.

4. FUTURE-PROOF ARCHITECTURE

Dell EMC XtremIO: Dell EMC XtremIO X2 utilizes traditional SAN (FC and iSCSI) controllers in an active/active dual-controller design. This design is packaged into an X2 brick, which includes two controllers and up to 72 SSDs. Storage clusters are created by deploying up to eight X2 bricks (16 controllers) in a networked fashion using a 40Gb back-end InfiniBand interconnect.

NetApp AFF: NetApp AFF deploys unified SAN/NAS (FC, iSCSI, FCoE, SMB and NFS) in dual, active/active controller configurations. Each controller pair can contain hundreds of SSDs. Up to 24 storage nodes can be combined into a single cluster, using 40Gb Ethernet for node-to-node communications.

In addition, flash-based AFF systems and traditional HDD-based FAS systems can be combined as part of a single, flexible, storage cluster. In this manner, high-performance storage nodes can be combined with high-capacity nodes to support a diverse range of enterprise applications, including applications with high-capacity needs (e.g., data warehousing) and those with extreme performance requirements (e.g., enterprise databases).

Comparison: The limited flash capacity and block-only protocols of the X2 place it in a niche with other hardware-centric, SAN-based flash solutions. By comparison, the software-defined approach of the AFF, with multiprotocol support and flexible clustering, can support a wide array of enterprise applications, both on-premises and within hybrid cloud environments.

AFF clusters can be deployed as part of a converged infrastructure design, as part of a software-defined storage gateway in front of third-party systems, or integrated with cloud storage. Flexible deployment models enable a future-proof infrastructure design that can take full advantage of the NetApp Data Fabric architecture.

5. CLOUD INTEGRATION

Dell EMC XtremIO: With investments in Pivotal, Virtustream, and VMware, Dell EMC has placed several large bets on the cloud. However, it remains unclear which cloud integration options will be available for X2 systems and which add-on products will be required to enable cloud integration. The Dell EMC cloud roadmap for its storage portfolio remains unclear, as is the company's commitment to providing data portability across industry-leading cloud services such as AWS, Azure, Google Cloud Platform, and IBM Bluemix.

NetApp AFF: AFF is Data Fabric ready with proven cloud connectivity. For

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SnapCenter software supports the creation of data protection copies on cloud-integrated appliances, cloud-connected storage systems, and cloud-native software targets.

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example, FabricPool enables you to automatically tier data between an AFF and cloud storage so you can maximize performance and reduce overall storage cost. With ONTAP Cloud, you can rapidly deploy cloud-native storage as a target for AFF backups or for disaster recovery. ONTAP Cloud can also be used as a platform for software development, with application environments quickly and easily replicated from a cloud instance to an on-premises AFF system to run production applications. CloudSync can be used to seamlessly synchronize NFS data from a production AFF system to the AWS cloud, enabling pay-as-you-go access to powerful, cloud-based analytics software.

Comparison: If you're looking to extend on-premises systems as part of a hybrid cloud architecture, you'll want to be sure that you can seamlessly and securely move data into and out of leading hyperscale cloud services. This will let you take advantage of best-in-class cloud offerings and provide you with the flexibility to respond quickly to changes in business demands.

The EMC track record of offering purpose-built storage systems with incompatible features and management software suggests that you should carefully consider the Dell EMC approach to data portability in the cloud. The potential for becoming locked into a single cloud service is real, and getting your data back out can be costly.

With one of the industry's largest ecosystems of cloud partnerships, NetApp provides its customers with maximum freedom and flexibility when choosing cloud service providers.

Summary

With industry-leading performance and density, AFF systems can dramatically improve you data center economics by reducing power consumption and rack space to a fraction of what traditional HDD-based systems require. They also significantly simplify storage management and cut support costs by eliminating performance tuning.

AFF is excellent for performance-demanding applications such as Oracle, Microsoft SQL Server, and MongoDB, and it is also a great choice for shared environments that need to support a variety of enterprise workloads, running on virtual desktops, virtual servers, and containers.

Built on years of flash innovation and experience, NetApp AFF achieves high I/O at consistent low latency. And it does so without compromising on core enterprise requirements, such as robust data management, efficient data protection, and flexibility, to respond to changing needs.

Discover how NetApp Flash can meet your needs.

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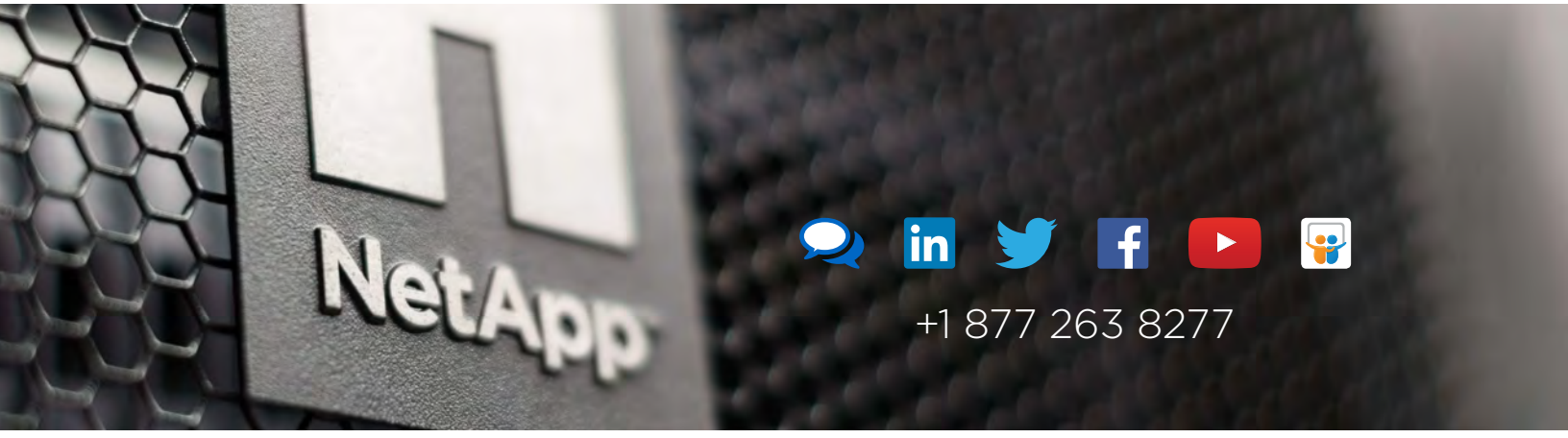

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