NetApp Solutions for MongoDB

Maximize performance and control costs with NetApp solutions for MongoDB

KEY BENEFITS

Accelerate MongoDB Performance

- Deliver up to 825K IOPS with consistent microsecond latency and sustained throughput up to 12GB/s with E-Series systems.
- Deliver up to 4 million IOPS and 20 times faster response times with All Flash FAS (AFF) systems.

Reduce Operational Costs

- Improve storage utilization by up to 33% and decrease power and cooling use by up to 40% with E-Series systems.
- Slash database licensing costs by 50% and increase usable capacity by almost 20% with All Flash FAS systems.

Achieve the Highest Levels of Availability and Security

- Maximize uptime with >99.999% availability and encrypt data at rest with E-Series systems.
- Provide zero RPO and low to zero RTO for mission-critical workloads and backup to the cloud with All Flash FAS systems.

The Challenge

Keep pace with and maintain control of exponential data growth

Today's IT applications, systems, and technology infrastructure generate data every millisecond of every day. Called machine data, this category is one of the fastest growing and most complex areas of big data. To cope with these vast amounts of ever-growing data, organizations are turning to NoSQL databases. Unlike traditional relational databases, NoSQL databases are designed to address the scalability and agility challenges posed by modern and third platform applications.

The Solution

Deploy MongoDB on NetApp storage

MongoDB is an open-source NoSQL database used by companies of all sizes across all industries and for a wide variety of applications. These applications include business-critical operational applications for which low latency, high throughput, and continuous availability are critical requirements. MongoDB is an agile database that uses a flexible document data model so that schemas can change quickly as applications evolve. This database combines the functionality developers expect from traditional databases, such as secondary indexes, an expressive query language, and strong consistency, with the performance and agility of a NoSQL database.

MongoDB is built for scalability, performance, and high availability, scaling from single-server deployments to large, complex, multisite architectures. By leveraging in-memory computing, MongoDB provides high performance for both reads and writes. MongoDB's native replication and automated failover enable enterprise-grade reliability and operational flexibility.

Deploying MongoDB on NetApp E-Series for consistent microsecond response or on All Flash FAS systems for backup and recovery from the cloud enables you to maintain the highest levels of performance and uptime. This deployment provides advanced fault recovery features and easy in-service growth capabilities to meet ever-changing business requirements. The E-Series and All Flash FAS systems are designed to help you build a high-performance, cost-efficient, and highly available analytics solution.
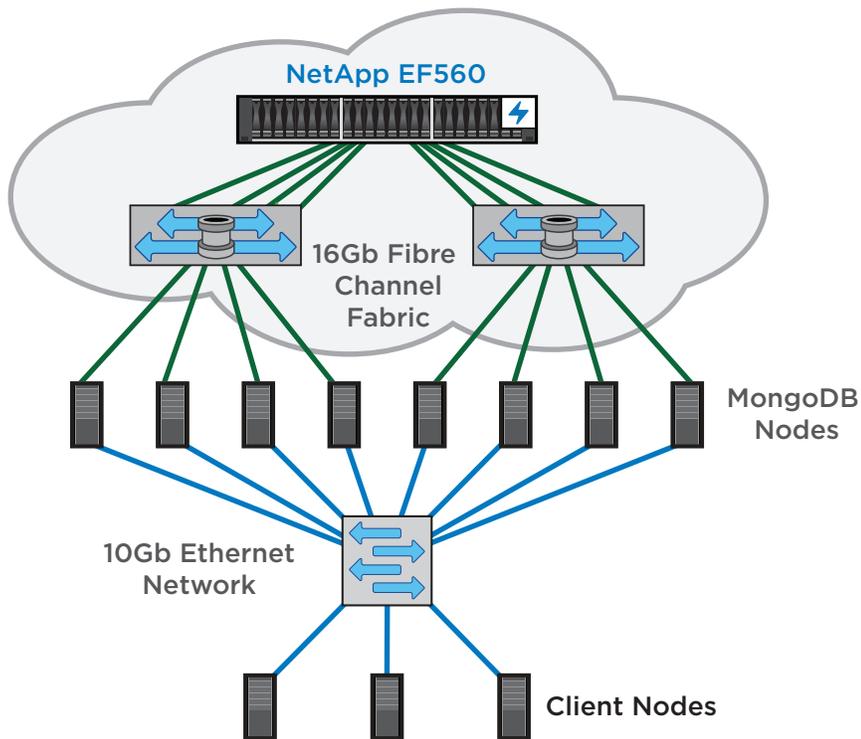
■ NetApp®

mongoDB

NetApp Alliance Partner

Figure 1) EF-Series and MongoDB configuration.

Change how you see and manage your data

MongoDB is scalable enough to work across all of your data centers and it is powerful enough to deliver real-time dashboard views to any level of the organization. Using this data can be a challenge for traditional data analysis, monitoring, and management solutions that are not designed for large-volume, high-velocity diverse data. MongoDB offers a unique way to sift, distill, and understand these immense amounts of machine data, which can change how IT organizations manage, analyze, secure, and audit themselves. MongoDB enables users to develop valuable insights into how to innovate and offer new services as well as visibility into trends and customer behaviors.

"When implemented for high-load MongoDB deployments, NetApp E-Series outranks commodity servers with internal storage against a number of criteria."

Vladimir Starostenkov, R&D Engineer
Altoros

Accelerate MongoDB Performance

Industry-leading NetApp® E-Series storage systems deliver up to 825,000 input/output operations per second (IOPS) and microsecond latency to help you complete operations more quickly. E-Series systems also offer bandwidth—12GB per second sustained to disk—to support the demanding performance and capacity needs of a MongoDB environment. Balanced performance features help support the requirements of different workloads. Dynamic Disk Pools (DDPs) dynamically rebalance data across all drives in the pool when new drives are added or old drives are removed, eliminating hot spots. The whole process is transparent to users, who experience little to no impact on performance. If a drive fails, DDPs help ensure that high performance within the MongoDB environment is maintained.

NetApp All Flash FAS systems with NetApp ONTAP® FlashEssentials enables up to 4 million IOPS with 24 nodes and meets the demands of MongoDB on the Data Fabric enabled by NetApp. FlashEssentials is what is behind the performance and efficiency of All Flash FAS. It encapsulates flash innovations and optimization technologies in ONTAP software. And with the ONTAP 9 release, performance can be further increased by up to 60%.
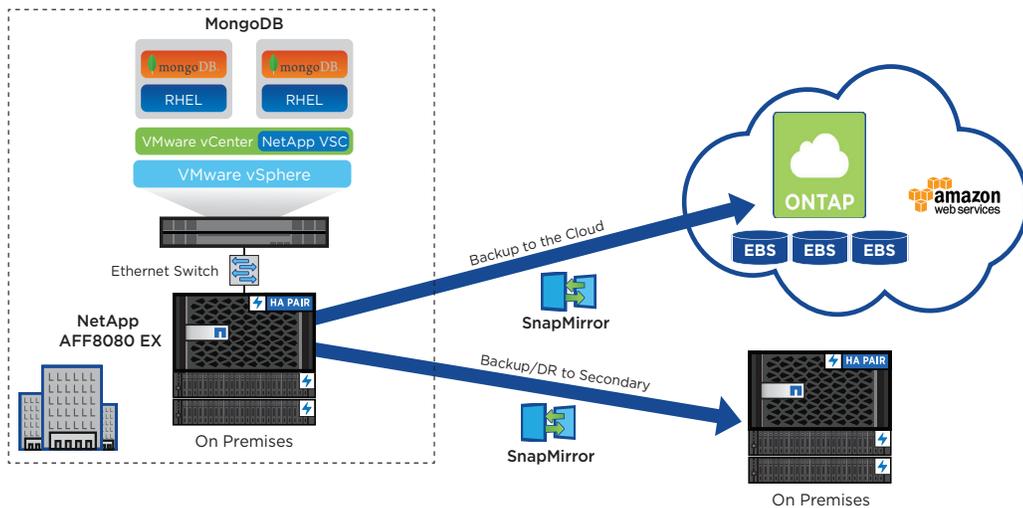
Figure 2) All Flash FAS and MongoDB Backup/DR to the cloud configuration.

Reduce Operational Costs

E-Series storage systems are purpose-built for capacity-intensive environments that require optimal space utilization and reduced power and cooling requirements. The system's ultradense 60-drive 4U disk shelf provides industry-leading performance and space efficiency that reduces rack space by up to 60%. Its high-efficiency power supplies and intelligent design can lower power use by up to 40% and cooling requirements by up to 39%. Thin provisioning capabilities allow you to improve storage utilization by up to 33% while lowering the total cost of ownership by reducing initial acquisition costs and deferring storage purchases.

All Flash FAS systems are built with innovative inline data reduction technologies, including inline adaptive compression, inline deduplication, and inline data compaction introduced in the latest ONTAP 9 release. These technologies provide space savings of 5 to 10 times, on average, for a typical use case. When these capabilities are combined with space-efficient NetApp Snapshot® and FlexClone® technologies, a data reduction ratio as high as 933:1 has been observed.

Achieve the Highest Levels of Availability and Security

E-Series storage systems leverage the latest solid-state disk (SSD) and SAS drive technologies to deliver high-speed, continuous access to your MongoDB application and data. These systems are built on a long heritage of serving diverse workloads to provide enterprise-class reliability. NetApp SANtricity® full disk encryption[1] combines local key management with drive-level encryption for comprehensive security for data at rest that doesn't sacrifice performance or ease of use. Because all drives eventually leave the data center through redeployment, retirement, or service, you can rest assured that your sensitive data is not leaving with them. SANtricity also supports FIPS-certified hard drives for security-sensitive customers.

With AFF, you can leverage the Data Fabric to move data securely across your choice of clouds—enabled by the NetApp ONTAP® Cloud software and NetApp Private Storage for the cloud. Plus, you get the industry's most efficient and comprehensive Integrated Data Protection suite, on the premises or in the cloud. AFF comes with a full suite of acclaimed NetApp Integrated Data Protection software. You get features and capabilities such as NetApp Snapshot copies, cloning, encryption, and both synchronous and asynchronous replication for backup and disaster recovery—all with near-zero performance impact. Synchronous replication with NetApp MetroCluster™ software delivers zero recovery point objective (RPO) and low to zero recovery time objective (RTO) for mission-critical workloads. Support for at-rest data encryption and an onboard key manager helps secure your data.

About MongoDB

By offering the best of traditional databases as well as the flexibility, scale and performance today's applications require, MongoDB lets innovators deploy applications as big as they can possibly dream. From startups to enterprises, for the modern and the mission-critical, MongoDB is the database for giant ideas. For more information, visit www.mongodb.com.

About NetApp

Leading organizations worldwide count on NetApp for software, systems and services to manage and store their data. Customers value our teamwork, expertise and passion for helping them succeed now and into the future.
www.netapp.com

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1. Hardware and software for at-rest data encryption are not available in certain countries, including Russia, Belarus, Kazakhstan, and other Eurasian Customs Union countries.