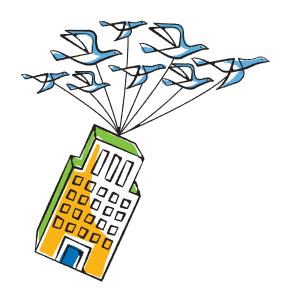# NetApp®

Datasheet

Clustered Data ONTAP Operating System

Respond more quickly to business changes and new opportunities—on premises or in the cloud

KEY BENEFITS

Nondisruptive Operations
- Perform storage maintenance, hardware lifecycle operations, and software upgrades without interrupting your business.
- Eliminate planned and unplanned downtime for continuous business availability.
- Improve service levels by managing storage resources dynamically.

Proven Efficiency
- Reduce storage costs with comprehensive storage efficiency technologies.
- Use a single infrastructure for workloads or tenants with different performance, capacity, and security requirements.
- Increase management efficiency as you scale your storage environment.

Seamless Scalability
- Scale capacity, performance, and operations without disruption.
- Scale SAN and NAS from terabytes to tens of petabytes without affecting running applications.
- Combine different generations of storage hardware for investment protection.

The Challenge

Businesses today struggle with the increasing amount of data that they need to store, manage, and protect. Growing competitive pressure, budget constraints, and 24-hour business cycles require that your mission-critical business processes and data remain accessible around the clock.

As your business continues to evolve and grow, you need a modern approach to data storage. Pressure is on IT to act as a broker of services and to eliminate planned and unplanned downtime. This requires you to improve the agility and efficiency of your IT infrastructure and your IT staff to deliver on service-level expectations. In addition, you need to be able to scale nondisruptively with the pace of your business and capitalize on cloud services.

The Solution

Clustered Data ONTAP addresses the challenges that face your growing and dynamic business by extending the innovation of NetApp Data ONTAP, the world's number one branded storage operating system.[1] Our unified cluster architecture scales and adapts to your changing needs, and reduces risk and cost. It also provides a clear approach to deploy your vision of the cloud, whether

private, public, or a hybrid infrastructure. Clustered Data ONTAP is designed to eliminate downtime, allowing you to service your infrastructure without disrupting access to user data and applications, even during regular business hours.

Simplify your overall storage environment with proven operational efficiency that helps you manage storage infrastructure at scale. Automate important processes to increase productivity. Add capacity as you grow across both SAN and NAS environments without reconfiguring running applications.

Clustered Data ONTAP provides up to 24 storage controllers—or nodes—managed as a single logical pool, so your operations scale more easily. Start small and grow big without the burden of disruptive hardware upgrades, which are common practice with other storage vendors.

Prevent Business Disruptions

With IT integral to your business operations, the impact of downtime goes beyond lost money or productivity. Your company's reputation might also be at stake. Clustered Data ONTAP eliminates sources of downtime and protects your critical data against disaster.

1. IDC Worldwide Quarterly Disk Storage Systems Tracker Q1 2014, June 2014 (Open Networked Disk Storage Systems revenue).

"[Clustered Data ONTAP] lets us move data—for load balancing, for moving less-used or inactive data to lower-cost drives, or for technology updates—without having to stop the application… It used to take 28 days to restore a 100TB Oracle DB—now it takes 15 minutes."

CERN

Nondisruptive operations

NetApp clustered Data ONTAP allows you to perform critical tasks without interrupting your business. You can dynamically assign, promote, and retire storage resources to improve service levels over the lifecycle of an application. Plus, storage controllers and disk shelves can be replaced without disruption.

You can move data between controllers without application interruption when data movement is required to achieve management objectives—for example, as an application transitions from development to production or to adjust service levels.

With clustered Data ONTAP, you can mix models and generations of hardware to extend the life of existing investments or to support leasing decisions as you add new storage systems and retire older ones. All storage maintenance operations and software upgrades can be performed without interrupting your day-to-day business.

Integrated data protection

Clustered Data ONTAP provides integrated data protection (IDP) to safeguard your operations and keep them running smoothly. Technologies include near-instant backup and recovery, as well as synchronous and asynchronous replication to satisfy your business continuity and disaster recovery requirements. We also provide superior integration with enterprise backup vendors and

leading applications. Our IDP solutions also include integrated and unified disk-to-disk backup and disaster recovery in a single process for VMware® and Microsoft® virtualization.

Manage Infrastructure at Scale with Proven Efficiency

Clustered Data ONTAP gives you the capabilities and tools you need to make both your storage and your IT staff more productive. You can scale your storage infrastructure without scaling your IT organization. A common set of features and procedures simplifies complex tasks, so your IT staff can be more productive and focus on addressing more important priorities.

Superior storage efficiency

With clustered Data ONTAP, you can reduce costs with one of the most comprehensive storage efficiency offerings in the industry. You get innovative NetApp Snapshot™ copies, replication and cloning technologies, thin provisioning, inline and postprocess data compression, and deduplication. NetApp is the only storage provider delivering proven efficiencies for both SAN and NAS on software-based, converged infrastructure and virtualized third-party arrays for entry-level, midtier, and enterprise systems.

Optimized for flash

Clustered Data ONTAP supports all-flash configurations for those applications that require the highest IOPS with consistent low latency. You can also choose a hybrid

storage option that combines the performance of flash with the capacity of hard disk drives (HDDs). With these systems, hot data is automatically cached in flash to accelerate application performance. You achieve optimal performance with little or no tuning, no time-consuming data migrations, and no ongoing data prioritization and management.

Manage data at scale

Clustered Data ONTAP management processes scale so that when your storage doubles in size, it no longer means that you have twice as much work to manage it. And the NetApp OnCommand® software portfolio extends the value of your clustered Data ONTAP environment. It includes management products for small, mid-size, and large enterprises that need to manage virtualized private and hybrid cloud environments.

With OnCommand, you can set up your new hardware quickly and start managing your clustered environment with a device management tool. For a large or growing environment, you can choose software for centralized monitoring of capacity, availability, performance, and data protection. You can manage at scale, optimize performance, and take advantage of storage service analytics to make better-informed decisions about your storage.
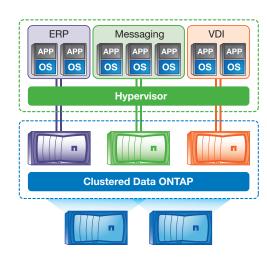
Figure 1) With native multi-tenancy, clustered Data ONTAP appears to each application or tenant as a separate, secure storage system. QoS policies control consumption of cluster performance resources.

You can build on our OnCommand management platform and automate your storage processes, and also integrate storage processes for end-to-end service delivery. Use OnCommand software products to enable IT self-service and to deploy your private and hybrid cloud services.

Maximize Shared Storage Investments

Clustered Data ONTAP lets you save time and money by consolidating and sharing the same infrastructure for workloads or tenants that have different performance, capacity, and security requirements.

Multi-tenancy

A storage cluster can be subdivided into secure partitions governed by rights and permissions. These storage virtual machines (SVMs) can be used to securely isolate individual tenants—for instance, in a service provider environment—or individual applications, workgroups, or business units. Because SVMs aren't tied to particular physical resources, you can move an SVM or adjust the resources available to it without disruption.

Quality of service

Clustered Data ONTAP offers QoS workload management that allows you to control the resources that each workload can consume, so you can better manage performance spikes and improve customer satisfaction. You can consolidate many workloads or tenants on a cluster without fear that the most important workloads will suffer or that activity in one tenant partition will affect another.

Stay Ahead of Business Changes with Seamless Scalability
Start small, grow big

Storage systems that run clustered Data ONTAP can scale SAN and NAS from terabytes to tens of petabytes transparently and without reconfiguring running applications. You can start with a single cluster node or two nodes and seamlessly expand your cluster up to 24 nodes as your business needs grow.

Easily adapt

With clustered Data ONTAP, you can rebalance capacity and workloads as needed. You can improve service levels by redeploying workloads dynamically and you can avoid hot spots by moving volumes to less active disk aggregates or spreading workloads across multiple controllers. Each dataset gets the right technology to meet your performance and cost targets.

Scale up and scale out

Scale up individual storage controllers by adding high-capacity HDDs, high-performance HDDs, or low-latency SSDs, or scale out by adding additional storage controllers to a cluster.

Most scale-out storage solutions provide a single large repository. Clustered Data ONTAP takes a different approach that gives you more flexibility and greater control. NetApp Infinite Volume lets you create large, flexible, and easy-to-manage content repositories. You also have the ability to isolate workloads and offer different levels of service by

using different controller technologies, storage tiers, and QoS policies. In addition, you can span multiple controllers for nearly limitless scalability.

Maximize Investment Protection

You can mix storage controllers from various NetApp FAS product lines and virtualize third-party arrays with NetApp FlexArray virtualization. You can grow your cluster with the latest hardware and keep older hardware longer because you can mix different generations of hardware in the same cluster. When it's time to retire a storage system, you can simply upgrade the controllers and keep data in place.

Make the Right Choice for Cloud

Deploy your system on-premises or integrate with public cloud providers to meet ever-changing business expectations. Clustered Data ONTAP allows you to evolve from a private cloud to a hybrid cloud environment without introducing risk or compromising availability, storage efficiency, or scalability.

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

Software/Feature	Function	Benefits
Data compression	Provides transparent inline and postprocess data compression for data reduction	Reduces the amount of storage you need to purchase and maintain
NetApp DataMotion™	Offers nondisruptive data mobility for volumes and LUNs	Granular data mobility allows you to move data nondisruptively while your applications keep running
Deduplication	Performs general-purpose deduplication for removal of redundant data	Reduces the amount of storage you need to purchase and maintain
NetApp Flash Pool™	Creates a mixed-media storage pool by using SSDs and HDDs	Increases the performance and efficiency of HDD pools with flash acceleration, especially for random workloads
NetApp FlexClone®	Instantaneously creates file, LUN, and volume clones without requiring additional storage	Saves you time in testing and development and increases your storage capacity
NetApp FlexVol®	Creates flexibly sized volumes across a large pool of disks and one or more RAID groups	Enables your storage systems to be used at maximum efficiency and reduces your hardware investment
Infinite Volume	Creates a volume that can scale up to 20PB with one file system	Provides a large container for content repositories; a single cluster can contain multiple Infinite Volumes
NetApp MetroCluster™	Combines array-based clustering with synchronous mirroring to deliver continuous availability and zero data loss	Maintains business continuity for critical enterprise applications and workloads in the event of a data center disaster
QoS	Creates a performance limit for a storage workload	Can prevent one workload or tenant from affecting the performance of another in multiworkload and multi-tenant environments
NetApp RAID-DP®	Provides a double-parity RAID 6 implementation that prevents data loss when two drives fail; default RAID option	Protects your data without the performance impact of other RAID 6 implementations
NetApp SnapDrive®	Provides host-based data management of NetApp storage from Microsoft Windows®, UNIX®, and Linux® servers	Lets you automate OS-consistent backup, restore, cloning, and other operations, taking full advantage of NetApp capabilities
NetApp SnapManager®	Provides host-based data management of NetApp storage for databases and business applications	Offers application-aware backup and disaster recovery; automates error-free data restores
NetApp SnapMirror®	Enables automatic, incremental asynchronous data replication between systems	Provides you with flexibility and efficiency when mirroring for data distribution and disaster recovery
NetApp SnapRestore®	Rapidly restores single files, directories, or entire LUNs and volumes from any Snapshot copy backup	Instantaneously recovers files, databases, and complete volumes from your backup
Snapshot	Makes incremental data-in-place, point-in-time copies of a LUN or volume with minimal performance impact	Enables you to create frequent space-efficient backups with no disruption to data traffic
NetApp SnapVault®	Exports space-efficient Snapshot copies, preserving compression and deduplication savings, to another NetApp system, providing an incremental backup solution	Provides you with cost-effective, long-term backups of disk-based data

Table 1) Clustered Data ONTAP offers a robust set of standard and optional features.

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