NetApp®

Datasheet

SANtricity Dynamic Disk Pools (DDP)

Delivering new levels of performance and protection

In high-performance computing (HPC) and other big-data environments, success depends on the speed at which data is acquired, processed, and distributed. These environments use staggering amounts of data that can cripple most storage systems and break traditional architectures. For these sites, the ability to keep a system up and running at a consistently high level has replaced maximum raw performance as a critical need.

The Challenge
Big-data sites often have thousands of drives supporting a clustered file system; and with that many drives, failures are inevitable. As drive capacities continue to grow, traditional RAID technology struggles to keep up. Rebuild times on large-capacity drives can range from 18 hours for an idle system to multiple days or a week for an active system. Because idle time is rare, a drive failure and subsequent rebuild process can significantly affect a system's performance—in some cases up to 40%.

Dynamic Disk Pools
NetApp® SANtricity Dynamic Disk Pools (DDP) provides enormous value to sites with vast amounts of data supporting high-bandwidth programs and complex application processing. Its next-generation technology minimizes the performance impact of a drive failure and can return the system to optimal condition up to eight times faster than traditional RAID. This powerful combination helps E-Series storage systems deliver consistently high performance for maximum productivity.

Dynamic Disk Pools distributes data, parity information, and spare capacity across a pool of drives. Its intelligent algorithm (seven patents pending) defines which drives are used for segment placement; making sure data is fully protected. And its flexible disk pool sizing provides optimal utilization of any configuration for maximum performance, protection, and efficiency.

Consistent Performance
Large-scale compute clusters demand multiple gigabytes per second of bandwidth. For these sites, a drop in performance means that jobs run long or don't complete in their allotted window. Dynamic Disk Pools delivers and maintains exceptional performance under all conditions, whether optimal or under the stress of a drive failure.
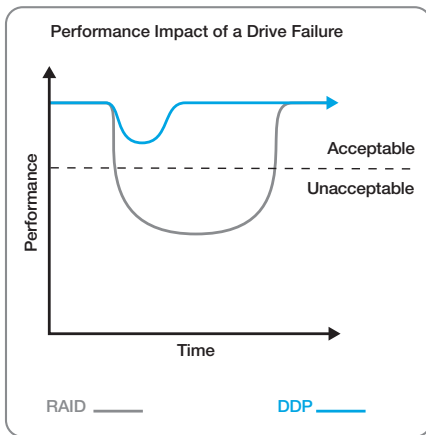
Performance Impact of a Drive Failure

Performance

Acceptable

Unacceptable

Time

RAID ———   DDP ———

Figure 1) Dynamic Disk Pools is designed to maintain high performance even after drive failure.

DDP minimizes the performance impact of a drive failure in multiple dimensions. By distributing parity information and spare capacity throughout the disk pool, DDP is able to use every drive in the pool for the intensive process of rebuilding a failed drive. This dynamic rebuild process is the reason that DDP can return the system to optimal condition up to eight times faster than traditional RAID. What's more, by distributing the rebuild workload across all drives, the overall impact of the process is greatly reduced. Rebuilds take less time and have less impact—a win-win for big-data sites.

Improved Data Protection

Dynamic Disk Pools offers a level of data protection that simply can't be achieved with traditional RAID. Shorter rebuild times significantly reduce exposure to multiple cascading disk failures—a real concern as drive capacities get larger and larger. And thanks to its patented prioritize reconstruction technology, DDP is actually able to increase protection levels as the pool gets larger. Add to this the advanced protection features and extensive diagnostic capabilities that are standard with E-Series and you have a storage system that is optimized for excellent data protection.

Extreme Versatility

Maximum performance is often at odds with efficiency. High-performance applications require an optimized stripe size that typically doesn't align with the number of drives in the storage system. The result is either unused spindles, non-optimized stripe sizes, or the elimination of hot spare drives.

Because of its extreme versatility, Dynamic Disk Pools is able to address wide-ranging application requirements without sacrificing efficiency. Drives can be configured into one large disk pool to maximize simplicity and protection, or into multiple smaller pools to maximize performance for clustered file systems. Different drive types can be used to create storage tiers, such as performance pools and capacity pools. Disk pools can also reside in the same system with traditional RAID groups. And flexible disk pool sizing—ranging from

just 11 drives up to a full configuration—means an optimized fit for any configuration.

Summary

The time is right for a new generation of data protection to support the massive data sets and round-the-clock processing demands of big-data environments. E-Series storage combined with Dynamic Disk Pools technology is the platform of choice for these environments.

About NetApp

NetApp creates innovative storage and data management solutions that deliver outstanding cost efficiency and accelerate business breakthroughs. Discover our passion for helping companies around the world go further, faster at *www.netapp.com*.

Go further, faster®

ATTRIBUTE	E2600	E5400
Minimum drives per disk pool	11	11
Maximum drives per disk pool	192	384
Concurrent drive additions to expand disk pool	1 to 12	1 to 12
Maximum disk pool volume size	64TB	64TB
Maximum volumes per disk pool	512	2,048
Supported drive types	SAS, NL-SAS	SAS, NL-SAS

Table 1) DDP Specifications

NetApp®

www.netapp.com