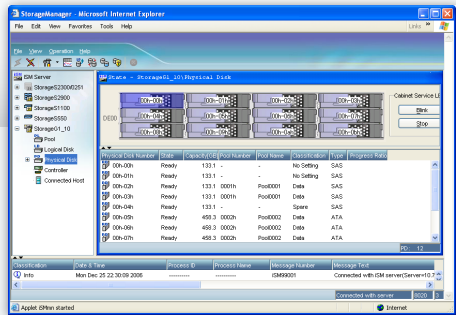


SAN Storage D-Series Software



At a Glance

- Intuitive Ease of Use
- Manage Large Amounts of Storage with Minimal Administration
- Highly Automated Operation
- Integrated Function

Overview

The NEC D-Series SAN Storage Software delivers enterprise-class features that reduce administration cost, enable operational flexibility and speed response to issues and opportunities. A comprehensive

tool set maximizes the potential for continuous data availability, high performance, saving energy, and simplifying storage management.

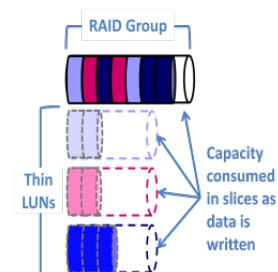
Solution

Simple Management

All D-Series arrays can be controlled through iSM, a browser-based GUI Storage Manager. iSM lets administrators view, set, and modify RAID groups and LUNs. It provides monitoring alerts via SNMP and email. There are two components to iSM: a server component (Windows® or Linux) and a Windows browser-based client with three different security permission levels. Each server installation can manage up to 32 arrays and support up to 32 clients.

Thin Provisioning

Thin Provisioning provides efficient use of capacity while reducing storage capital cost. Thin Provisioning allows capacity over-provisioning/over-subscription policy to be implemented. Capacity is not consumed until actual data is written to the storage. When data is written, capacity is consumed in slices or increments. With other thin provisioning systems, if you delete files managed by the Windows file system, the associated capacity is not released. The D-series has a feature to detected unused NTFS blocks and release them.



Data Protection

D-Series arrays offer mirroring, replication, and snapshot capabilities. DynamicDataReplication (DDR) maintains volume replicas within the same physical array. RemoteDataReplication (RDR) maintains volume replicas between different D-Series arrays via Fibre Channel. DDR and RDR support parallel or cascade mode to implement required recovery configurations and policies. DDR supports synchronous or asynchronous/delta-only operation. RDR supports synchronous, semi-synchronous/all-data and asynchronous/delta-only operations. Synchronous is for short-distance applications while asynchronous modes is designed for longer-distance replication.

DynamicSnapVolume (DSV) allows creation of up to 16 snapshots of up to 64 logical disk volumes for a total of 1,024 snapshots system-wide. Snapshots create volume images at known points in time. The Link Volume feature is a virtual volume (or pointer) that can be directly mounted by a backup server so that direct volume restoration can be performed with a minimum of configuration changes.

DSV snapshots are stored in a RAID-6-protected Snapshot Reserve Area (SRA) so they are protected in the event of two simultaneous disk failures.

To protect Microsoft SQL Server in a transaction-consistent manner, ReplicationControl SQL Option automatically prepares the SQL Server for a snapshot. It also coordinates with DSV and DDR, and RDR so transaction-consistent snapshots and snapshot replication is performed with minimal performance impact.

Software

Objective	NEC Storage Software	Function	D3	D3i	D4
Simple operation	StorageManager (ISM)	Core storage management functionality	Y	Y	Y
	ThinProvisioning	Allows over-provisioning of capacity	-	-	Y
High Availability	PathManager	Multi-pathing for failover and load balancing	Y	Y	Y
Data Protection	DynamicDataReplication (DDR)	Data replication within same array	Y*1	Y*1	Y
	RemoteDataReplication (RDR)	Replication between arrays - synchronous, asynchronous, & semi-synch	Y*1	-	Y*2
	RemoteDataReplication Asynchronous	Replication between arrays - asynchronous only	Y*1	-	Y*2
	DynamicSnapVolume (DSV)	On-demand snapshots	Y*1	Y*1	Y
	ReplicationControl SQL Option	Transaction-consistent protection for MS SQL Server	Y*1	Y*1	Y
Performance Management	PerformanceMonitor	Performance monitoring & alerts	Y	Y	Y
	PerformanceNavigator	Analysis of performance data over time	Y	Y	Y
	PerformanceOptimizer	Automates performance tuning	Y	Y	Y
Energy Conservation	PowerConserver	Turn off HDDs when not needed	Y	Y	Y
Compliance	VolumeProtector	Prevent unauthorized modification of data	Y	Y	Y

*1: Single Controller model does not support
*2: iSCSI option does not support

Performance Management Suite

Performance Monitor

- Real-time monitoring and reporting
- Gather performance data for later analysis
- Threshold set/detect for overloads

Performance Navigator

- Graphical comparative analysis over time

Performance Optimizer

- Automates data movement to avoid hot spots

Energy Conservation

D-Series offers an energy conservation mode called PowerConserver, which allows hosts to power down disks when they are not actively needed. This feature provides significant power and cooling savings in secondary storage applications. Disks are started and stopped via the command line interface (CLI) from the application host. These energy-savings operational modes can be embedded in scripts controlling backup operations. The feature can also be used to power-down spare and unbound hard drives.

High Availability

NEC's PathManager software provides a convenient combination of path failover and load balancing across. It can support up to 64 Fibre Channel paths between the host and the array. Should one path fail, all data traffic is rerouted over alternate paths to continue operation uninterrupted. PathManager provides both static load balancing and dynamic load balancing (based on user-selectable algorithms). PathManager also includes PathPatrol, which monitors the health of active paths and periodically check for restoration of failed paths.

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