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IBM System Storage N series Quick Reference Guide

Overview

This IBM® Redpaper™ publication for the IBM System Storage® N series is a Quick Reference Guide that briefly defines some of the key technologies. It summarizes features and benefits and provides web links to access additional information.

Reference table

Table 1 summarizes N series key features and functions. The table presents this information in the following format:

Feature name <ul style="list-style-type: none">▶ Description▶ Benefit Link to additional information (if available)

Table 1 N series features and benefits

<p>Data ONTAP</p> <ul style="list-style-type: none"> ▶ N series storage operating system, highly optimized, scalable, and flexible, providing full featured and unified data management for both block and file serving environments. ▶ Single architecture and user interface simplify data management and reduce costs for SAN and NAS deployment. <p>http://www.ibm.com/systems/storage/network/software/data_ontap/</p>
<p>Clustered Failover</p> <ul style="list-style-type: none"> ▶ IBM System Storage N series with Clustered Failover is designed to deliver a robust and highly available data service for business-critical environments. ▶ Improves data availability by transferring the data service of an unavailable storage controller to the other one in the cluster. The transfer of data service occurs without impacting users and applications. <p>http://www.ibm.com/systems/storage/network/software/cluster_failover/</p>
<p>Advanced Single Instance Storage (also referred to as Deduplication)</p> <ul style="list-style-type: none"> ▶ Performs block-level data deduplication of primary data and secondary data (backup and archival). ▶ Volume data is automatically scanned and deduplicated, resulting in immediate space savings with minimal affect on operations. <p>http://www.ibm.com/systems/storage/network/software/deduplication/</p>
<p>Data Compression</p> <ul style="list-style-type: none"> ▶ Reduces the physical capacity required to store data on storage systems by compressing data within a flexible volume (FlexVol) on primary, secondary, and archive storage. ▶ Higher efficiency for more workloads, better write performance. Flexibility to use data compression inline or as a post-process based on your capacity requirements and available resources. <p>http://www.redbooks.ibm.com/abstracts/sg248033.html?Open</p>
<p>Disk Sanitization</p> <ul style="list-style-type: none"> ▶ The process of physically obliterating data by overwriting disks with specified byte patterns or random data. ▶ Helps prevents recovery of current data by any known recovery methods. <p>http://www.redbooks.ibm.com/redbooks/pdfs/sg247840.pdf</p>
<p>FlexVol</p> <ul style="list-style-type: none"> ▶ Creates flexibly sized LUNs and volumes across a large pool of disks and one or more RAID groups. ▶ Fast, simple, and flexible storage provisioning and high capacity utilization. <p>http://www.ibm.com/systems/storage/network/software/flexvol/</p>
<p>FlexClone</p> <ul style="list-style-type: none"> ▶ Instantaneously creates LUN and volume clones without requiring additional storage. ▶ Accelerated test and development and storage capacity savings. <p>http://www.ibm.com/systems/storage/network/software/flexvol/features.html</p>
<p>FlexCache</p> <ul style="list-style-type: none"> ▶ Designed to address some of the most difficult data access and data management problems. ▶ Helps the storage infrastructure when frequent read bottlenecks occur, when there is the need to efficiently support remote access, or if there is a need for tiered storage that cannot automatically adjust to changing usage patterns. <p>http://www.ibm.com/systems/storage/network/software/flexcache/</p>
<p>FlexShare</p> <ul style="list-style-type: none"> ▶ Prioritizes storage resource allocation to the highest value workloads on a heavily loaded system. ▶ Ensures that best performance is provided to designated high-priority applications. <p>http://www.ibm.com/systems/storage/network/software/flexshare/</p>

<p>FlexScale</p> <ul style="list-style-type: none"> ▶ Enables Predictive Cache Statistics (PCS) on your N series Storage System to simulate the addition of Performance Acceleration Modules (PAM cards). ▶ Gives the customer the power to answer a question that he could only guess at in the past. Provides the objective data needed to rationalize a hardware purchase (for example, adding cache). <p>http://www.ibm.com/systems/storage/network/software/pam/</p>
<p>MultiStore</p> <ul style="list-style-type: none"> ▶ Securely partitions a storage system into multiple virtual storage appliances. MultiStore is the foundation for a Shared Storage Infrastructure. ▶ Enables secure consolidation of multiple domains and file servers. Delivers an enhanced, secured multi-tenancy solution for virtualized environments. <p>http://www.ibm.com/systems/storage/network/software/multistore/</p>
<p>MetroCluster</p> <ul style="list-style-type: none"> ▶ An integrated high availability and disaster recovery solution for campus and metro area deployments. ▶ Ensures high data availability when a site failure occurs. It is the solution for RPO 0 and RTO 0 requirements. <p>http://www.ibm.com/systems/storage/network/software/metrocluster/</p>
<p>NearStore (near-line storage)</p> <ul style="list-style-type: none"> ▶ Increases the maximum number of concurrent data streams (per storage controller). ▶ Enhances backup, data protection and disaster preparedness by increasing the number of concurrent data streams between two N series systems. <p>http://www.ibm.com/systems/storage/network/solutions/nearline/</p>
<p>Raid-DP</p> <ul style="list-style-type: none"> ▶ Double parity bit, RAID protection. (N series RAID 6 implementation.) ▶ Protects against data loss due to double disk failures, and media bit errors occurring during drive rebuild processes. Provides identical resiliency as RAID 10 protection without the same cost. <p>http://www.redbooks.ibm.com/abstracts/redp4169.html?Open</p>
<p>Raid 4</p> <ul style="list-style-type: none"> ▶ Single parity bit, RAID protection (same level of protection as Raid 5). ▶ Protects against data loss due to single disk failure. It allows the administrator to add data drives to RAID groups without having to touch any of the data or having to recalculate parity.
<p>SyncMirror (Raid 1)</p> <ul style="list-style-type: none"> ▶ Maintains two online copies of data with RAID-DP protection on each side of the mirror. ▶ Protects against all types of hardware outages, including triple disk failure. <p>http://www.ibm.com/systems/storage/network/software/syncmirror/</p>
<p>Snapshot</p> <ul style="list-style-type: none"> ▶ Makes incremental, data-in-place, point-in-time copies of a LUN or volume with minimal performance impact. ▶ Enables frequent, non-disruptive, space-efficient, and quickly restorable backups. <p>http://www.ibm.com/systems/storage/network/software/snapshot/</p>
<p>SnapRestore</p> <ul style="list-style-type: none"> ▶ Rapidly restores single files, directories, or entire LUNs and volumes from any Snapshot backup. ▶ Enables near-instantaneous recovery of files, databases, and complete volumes. <p>http://www.ibm.com/systems/storage/network/software/snaprestore/</p>
<p>SnapVault</p> <ul style="list-style-type: none"> ▶ Exports Snapshot copies to another N series system, providing an incremental block-level backup or archival solution. ▶ Enables cost-effective, long-term retention of rapidly restorable disk-based backups. <p>http://www.ibm.com/systems/storage/network/software/snapvault/</p>

Open Systems SnapVault - OSSV

- ▶ Provides the advantages of NetApp SnapVault advanced backup and recovery technology to heterogeneous storage environments (UNIX, Linux, and Windows).
- ▶ OSSV enables automated backups, rapid snapshots, low bandwidth utilization, and reduced storage requirements, making it particularly useful for remote office environments as well as for environments where the primary data resides on non-N series gear.

<http://www.ibm.com/systems/storage/network/software/ossv/>

SnapMirror

- ▶ Enables automatic, block-level incremental data replication between systems: synchronous or asynchronous
- ▶ Provides flexible, space and network efficient, site-to-site mirroring for disaster recovery and data distribution

<http://www.ibm.com/systems/storage/network/software/snapmirror/>

SnapManager Suite

- ▶ Provides host-based data management of N series storage for databases, messaging, and business applications.
- ▶ Simplifies application-consistent Snapshot copies, automates error-free data restores, and enables application-aware disaster recovery.

SnapManager for Microsoft Exchange

- ▶ Streamlines storage management and simplifies configuration, backup, and restore operations for Microsoft Exchange Server databases.
- ▶ Simplifies application data management. You can automate complex, manual, and time-consuming processes associated with the backup, recovery, and verification of Exchange Server databases.

<http://www.ibm.com/systems/storage/network/software/snapmanager/exchange/>

SnapManager for Microsoft SQL Server

- ▶ Tightly integrated with Microsoft technology to help you streamline database storage management while simplifying storage layout planning, backup, and restore operations for SQL Server databases.
- ▶ With SnapManager, you can reduce SQL Server data recovery times to minutes. You can also automate backup, recovery, and database cloning. Furthermore, you can simplify data protection administration of SQL Server applications and streamline data management and routine tasks to increase DBA productivity.

<http://www.ibm.com/systems/storage/network/software/snapmanager/sql/>

SnapManager for Microsoft SharePoint Server

- ▶ Helps you reduce storage costs and manage your growing SharePoint environment more efficiently. You can greatly simplify SharePoint data management and easily monitor the status and growth of your SharePoint Server farms across your entire enterprise.
- ▶ Improve scalability of SharePoint deployments by storing and managing large data files on networked-attached storage. Reduce storage costs with space-efficient backup and data deduplication. Simplify SharePoint data management and automate routine tasks.

<http://www.ibm.com/systems/hk/storage/network/software/snapmanager/sharepoint/index.html>

SnapManager for Microsoft Hyper-V

- ▶ An extensive data management technology designed to simplify storage management, backup, restore, and disaster recovery processes in a Microsoft Hyper-V environment.
- ▶ Can help you deal with virtualization challenges through specific management policies. These policies enable you to obtain an outstanding mixture of availability, scalability, performance, and reliability for Microsoft Hyper-V environments.

<http://www.ibm.com/systems/storage/network/software/snapmanager/hyperv/>

SnapManager for Oracle

- ▶ Automates and simplifies the complex, manual, and time-consuming processes associated with the backup, restoration, recovery, and cloning of your Oracle databases.
- ▶ Supports tight integration with Oracle Database to automate critical tasks such as backup, restore, database recovery, and cloning. SnapManager management of the underlying data layout simplifies routine data management tasks, allowing administrators to recover and restore a failed database to full production in minutes.

<http://www.ibm.com/systems/storage/network/software/snapmanager/oracle/>

SnapManager for SAP

- ▶ Integrates closely with SAP BRTools to help automate and streamline SAP data management and provide fast, space-efficient, disk-based backup, rapid restore and recovery, and flexible cloning.
- ▶ Designed to automate complex and time-consuming tasks such as backup, recovery, and cloning, helping free IT personnel to focus more effort on value-added tasks.

<http://www.ibm.com/systems/storage/network/software/snapmanager/sap/>

SnapLock

- ▶ Write-protects structured application data files within a volume to provide WORM disk storage.
- ▶ Enables you to meet both external and internal requirements for retaining, protecting, and accessing regulated and reference data.
- ▶ <http://www.ibm.com/systems/storage/network/software/snaplock/>

LockVault

- ▶ Creates WORM-protected archives for unstructured files by combining SnapLock and SnapVault capabilities.
- ▶ Regulatory compliance solution for spreadsheets, presentations, and other unstructured application data.

SnapMover

- ▶ Enables rapid reassignment of disks between controllers within a system without disruption.
- ▶ Enables fast, non-disruptive load balancing within an active-active controller system.

SnapValidator

- ▶ Maximizes data integrity for Oracle Databases.
- ▶ Enhances Oracle Database resiliency in compliance with Oracle HARD initiative.

SnapDrive

- ▶ Integrates N series data protection technologies into a single interface for multiple applications.
- ▶ Eases management of a variety of applications, and reduces data management complexity.

<http://www.ibm.com/systems/storage/network/software/snapdrive/>

SnapCreator Framework

- ▶ A backup and recovery software solution that enables you to integrate Snapshot technology with any application on any platform that is not supported by SnapManager products.
- ▶ Provides application integration through plug-ins that enable it to support any application on N series storage systems.

<http://www.ibm.com/support/docview.wss?crawler=1&uid=ssg1S7004140>

Virtual File Manager (VFM)

- ▶ Virtualizes multiple Windows, UNIX, and Linux file servers into a single logical pool of storage (Global Namespace).
- ▶ Provides automated, non-disruptive capacity expansion, data replication, and data management across heterogeneous file server environments.

SecureAdmin

- ▶ Authenticates both the administrative user and the N series system, creating a secure, direct communication link to the N series system.
- ▶ Helps protect administrative logins, passwords, and session commands from “cleartext” snooping by replacing rsh and telnet with the strongly encrypted SSH protocol.

<http://www.ibm.com/systems/storage/network/software/secureadmin/>

Single Mailbox Recovery for Exchange (SMBR)

- ▶ Enables the recovery of a single mailbox from a Microsoft Exchange Information Store.
- ▶ SMBR can extract a single mailbox or email directly in minutes compared to hours with traditional methods. Helps eliminate the need for IT staff-intensive, complex, and time-consuming Exchange server and mailbox/objects recovery.

<http://www.ibm.com/systems/storage/network/software/smbr/>

System Manager (or OnCommand System Manager)

- ▶ Provides setup, provisioning, and configuration management of a Data ONTAP storage system.
- ▶ Simplifies out-of-box setup and device management using an intuitive Windows based interface.

<http://www.ibm.com/developerworks/forums/thread.jspa?threadID=265826>

Operations Manager (for example, DataFabric Manager or “DFM”)

- ▶ Manages multiple N series systems from a single administrative console.
- ▶ Faster deployment and consolidated management of multiple N series systems.

<http://www.ibm.com/systems/storage/network/software/datafabric/>

Protection Manager

- ▶ Intuitive backup and replication management software application for IBM N series unified storage disk-based data protection environments.
- ▶ Designed to allow administrators to apply consistent data protection policies across the enterprise, automate complex data protection processes, and pool backup and replication resources to help improve utilization.

http://www.ibm.com/systems/th/resources/storage_network_software_protectionmanager_TSD03026USEN.pdf

Provisioning Manager

- ▶ Provides operational efficiency by streamlining the provisioning process across enterprise-wide data sets.
- ▶ Policy-based automation to simplify storage provisioning and mitigate the risk of data loss due to storage configuration errors. Task-based workflows with automated processes can help reduce the time, resources, and expertise required to provision SAN and NAS storage protocols.

<http://www.ibm.com/systems/storage/network/software/provisioning/index.html>

Performance Advisor

- ▶ Collects performance information from your N series storage systems and organizes it in groups of performance metrics called performance counter groups.
- ▶ Included with Operations Manager, Performance Advisor has the capability to successfully analyze and troubleshoot performance of your N series storage infrastructure.

OnCommand Unified Manager (includes Core and Host packages)

- ▶ Delivers a unified experience to manage physical and virtual storage environments by using integrated workflows and policy-driven automation.
- ▶ OnCommand manages your shared IT infrastructure as one or more pools of storage by using policy-based automation for provisioning and data protection, resulting in up to 50% savings in storage costs.

OnCommand Core package

- ▶ OnCommand core package 5.0 is an upgrade from DataFabric Manager 4.0. It includes operations management, protection management, and provisioning management.
- ▶ Simplifies and standardizes storage operations, which improves the productivity of storage administrators and enables teams to scale capacity and performance without additional personnel.

<http://www.ibm.com/support/docview.wss?crawler=1&uid=ssg1S7004076>

OnCommand Host package

- ▶ Allows you to view physical-to-virtual relationships as well as manage backup and recovery in virtual environments.
- ▶ You can manage the physical storage and the virtual storage objects on primary and secondary storage by installing OnCommand Core Package.

<http://www.ibm.com/support/docview.wss?crawler=1&uid=ssg1S7004077>

DataMotion for Volumes

- ▶ DataMotion for Volumes can help move data nondisruptively; that is, without any application downtime. It can be used to move a 7-Mode volume containing LUNs to another aggregate within the controller, providing nondisruptive volume movement for N series systems.
- ▶ DataMotion for Volumes is completely nondisruptive, which means that applications accessing LUNs in the migrating volume are not required to be shut down.

<http://www.redbooks.ibm.com/abstracts/sg247900.html>

Virtual Storage Console (VSC) for VMware vSphere

- ▶ A vSphere client plug-in that fully integrates with vCenter and enables central administration of VMware vSphere environments (server and desktop) running on IBM N series System Storage.
- ▶ The Virtual Storage Console (VSC) software is a single vCenter Server plug-in. It provides end-to-end virtual machine lifecycle management for VMware environments running N series storage. The plug-in provides these features:
 - Storage configuration and monitoring, using the Monitoring and Host Configuration capability (previously called the Virtual Storage Console capability).
 - Datastore provisioning and virtual machine cloning, using the Provisioning and Cloning capability.
 - Backup and recovery of virtual machines and datastores, using the Backup and Recovery capability.

<http://www.redbooks.com/abstracts/sg247636.html?Open>

Virtual Storage Tier

- ▶ A self-managing data-driven service layer for storage infrastructure. It provides real-time assessment of workload-based priorities and enables I/O data requests to be optimized for cost and performance without requiring complex data classification.
- ▶ Provides fully automated use and optimization of Flash technology, both controller-based PCI-e-based Flash and solid-state disk (SSD). Works with your existing data volumes and LUNs. It requires no complicated or disruptive changes to your existing storage.

N series features reference table

More details about N series software features can be found in the book *IBM System Storage N series Software Guide*, SG24-7129. This IBM Redbooks® publication is located at:

<http://www.redbooks.ibm.com/abstracts/sg247129.html?Open>

More details about N series hardware features can be found in the book *IBM System Storage N series Hardware Guide*, SG24-7840. This IBM Redbooks publication is located at:

<http://www.redbooks.ibm.com/abstracts/sg247840.html?Open>

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