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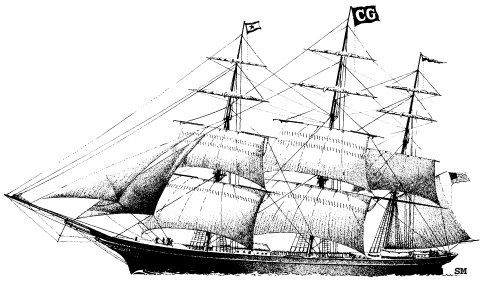

Navigating Information Technology Horizons℠

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EMC NetWorker Evolves into a Unified Platform for Traditional and Next-Gen Backup and Recovery

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Management Summary

Backup and recovery used to be simple and straightforward, like ordering food at a hot dog stand. There was only one item on the menu, and the vendor asked, "You want mustard, relish, and onions with that?" That one item was tape backup and the optional choices included *full or incremental backups* and *onsite or offsite tape storage*. However, times have changed. The hot dog stand of tape backup does not, by itself, meet today's full requirements for enterprise data protection and recovery.

Next-generation technologies – like disk-centric backup, data deduplication, snapshot copies, and server virtualization – have taken hold and created a multiplicity of options, making backup more complex than before. The good news is these technologies dramatically improve availability and recoverability of data. Nevertheless, the situation is now more like a restaurant with an extra-long menu and 30 possible side dishes. They all look good, so which do you choose, and how do you manage it?

EMC's answer to these questions has a couple of parts. The first is to offer a full slate of enterprise backup technologies. Through innovation and acquisition, EMC has built a broad portfolio of technologies related to backup, data protection, and recovery: *NetWorker, RecoverPoint, Avamar, HomeBase, SnapView, TimeFinder, RepliStor, Disk Library, Data Protection Advisor,* and others. Each product satisfies a unique requirement and niche in the data protection spectrum, so EMC provides them all. EMC professional services also are available for enterprises that want help sorting out this long menu of options.

The second part is *EMC NetWorker*, an enterprise backup application with a large customer base, which EMC has evolved to become a unified platform for traditional and next-generation backup and recovery capabilities. NetWorker now offers extensive support for all of these important functions.

- **Backup to disk** – For faster backup and recovery
- **Data deduplication** – To dramatically reduce backup data and enable faster, more comprehensive adoption of disk backup.
- **Snapshot copies, replication, and CDP** – For recovery to previous points in time and backing up without disrupting production applications.
- **Virtualized server environments** – For extending and simplifying backup and recovery in virtual environments
- **Centralized management** – A simplified, single point of management for large, diverse data protection and recovery environments
- **Server recovery –** For recovering server and operating system configurations, even on dissimilar hardware

Read on for details about how NetWorker bridges the old and the new, simplifies management, and brings next-gen data protection to traditional backup customers.

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NetWorker Unified Backup and Recovery

EMC NetWorker has expanded from a traditional enterprise backup solution to one that also embraces next-generation capabilities for data protection. The NetWorker product has a long history and substantial installed base. Today, NetWorker provides centralized backup and recovery for a wide range of heterogeneous environments, both physical and virtual. Its features include support for:

- SAN, NAS, and DAS storage
- *UNIX*, Microsoft *Windows*, *Linux*, *NetWare*, *OpenVMS*, and *Macintosh* operating systems
- Application integration modules for Oracle databases; Microsoft *SQL Server*, *Exchange*, *SharePoint*, and *Active Directory;* IBM *DB2*, *Informix*, and *Lotus Notes/Domino*; SAP *R/3*; Sybase; EMC *Documentum*, and Meditech
- Offhost "hot" backup while applications are in use
- 256-bit AES file encryption and user authentication for data security

Beyond these enterprise backup features, NetWorker extends its scope by integrating with and managing next-generation capabilities for data protection and server virtualization backup. In other words, **NetWorker has become a unified leverage point and access portal for technologies that meet more stringent recovery point objectives (RPO) and recovery time objectives (RTO).** The following EMC technologies are in this category.

Backup to Disk

Disk-based backup is the most significant trend in backup and recovery over the last decade. Tape-based backup infrastructure can be too slow and cumbersome to protect fast-growing enterprise data adequately. Backup jobs may not complete or they overlap into production hours. Recovery from tape may too slow or unreliable to meet the uptime requirements of the business. A practical and increasingly popular way to alleviate this problem is to replace tape with disk storage – either as a staging point before backing up to tape or as a complete tape replacement. Disk is much faster for both backups and restores, especially for handling random reads and writes. It is also easier to manage because there is no longer a need for physical tape handling. Tape is still the lowest-cost option for long-term archiving, but more and more enterprises are adopting disk-based backup to overcome limitations in their backup processes.

A small obstacle may stand in the way of disk nirvana – an enterprise's long-established backup configurations and procedures that are designed around a tape environment. It is not trivial to reconfigure. However, a virtual tape library (VTL) offers an easy workaround. It disguises disk storage as a tape library. A VTL appears to a backup system as a tape library, but performs like disk (because it is), so it conveniently slips into a backup infrastructure without hassle.

NetWorker supports VTLs in general and integrates particularly well with the EMC *Disk Library* product line. In fact, a NetWorker component resides on the Disk Library to enable consolidated management of virtual and physical tapes connected to it via the NetWorker console.

For companies that do not have an offsite location or do not want to handle tapes, NetWorker also supports backup to "the cloud" by cloning backups to the EMC *Atmos Online* cloud storage service.[1] This service allows enterprises to procure and consume capacity at an offsite location, as they need it. NetWorker secures data with encryption and conserves WAN bandwidth using compression before sending data to Atmos Online.

Data Deduplication

Another transformative trend in backup is data deduplication, which can reduce backup data by up to 50:1, depending on the nature of the data. After all, *why store the same data multiple times?* Deduplication technology scans for repetitive data segments and replaces subsequent occurrences with pointers to the original. Since backup data is highly repetitive, deduplication is especially effective at reducing storage requirements. Your actual results will vary, based on your backup schedules and data characteristics.

Deduplication paves the way to backing up data to disk. Less data stored means more capacity will be available to store more backup data for longer periods. The business benefits from

[1] For more on Atmos, see **The Clipper Group Navigator** dated June 25, 2009, entitled *EMC Atmos and Atmos OnLine - The Yin and Yang of Unstructured Data Storage*, available at http://www.clipper.com/research/TCG2009027.pdf.

faster and more reliable backups and recoveries. In fact, deduplication has become a major catalyst for the adoption of disk-based backup. NetWorker supports deduplication through integration with EMC *Avamar* and EMC *Data Domain*.

EMC Avamar

Avamar is the industry's leading next-generation deduplication backup software. It reduces the amount of backup data at the source (client) – *before* it is transferred across the network and stored to disk. By sending only new, unique sub-file variable length data segments, Avamar enables fast, daily full backups despite congested networks or infrastructure. As a result, Avamar reduces the required daily network bandwidth by up to 500 times and cumulative backend storage can be reduced by up to 50 times across sites and servers.

EMC fused the NetWorker and Avamar client agents and added Avamar deduplication into the NetWorker workflow. Administrators can set deduplication policies and schedules and view reports in the NetWorker console. They can now manage traditional deduplicated backup streams simultaneously through one interface.

Avamar supports source deduplication of databases related to Microsoft applications, Oracle, DB2, Sybase, SAP, Informix, and Lotus. It is integrated with VMware for backing up virtual machines (more on this later). Additionally, Avamar can automatically back up servers in remote offices and even desktop and laptop PCs over a WAN connection to an enterprise's main data center, thereby consolidating the backup process.

EMC Data Domain

Data Domain is the industry-leading inline deduplication storage system for disk-based backup. A Data Domain appliance slips into an enterprise backup environment by connecting to a backup system as either a file server (CIFS, NFS) over an Ethernet network or as a VTL over a Fibre Channel network. It delivers high-performance throughput and 10 to 30 times data reduction. Data Domain also offers snapshot copies and replication of deduplicated data to a disaster recovery site.

Data Domain is qualified with all major enterprise backup applications, including NetWorker. It offers an easy way to adopt deduplicated disk storage, especially backup existing backup configurations.

Snapshot Copies, Replication, and CDP

NetWorker facilitates centralized management of snapshot copies in EMC *Symmetrix*[2], CLARiiON, *Celerra*, and third-party copy solutions for backup and recovery. From the NetWorker console, administrators can schedule, create, and delete snapshots for recovery to a previous point in time (i.e., logical recovery in the event of data corruption) and as a source for non-disruptive backup to disk or tape. When used in conjunction with application integration, NetWorker can create application-consistent and fully-restartable snapshot copies. For Microsoft platforms and applications, this feature is available via the NetWorker Module for Microsoft applications. For other platforms, this is enabled using the NetWorker PowerSnap Module.

NetWorker also integrates with EMC *RecoverPoint*[3], a versatile network-based platform for data replication and disaster recovery. RecoverPoint combines continuous data protection (CDP) for recovery to any previous point in time with synchronous and asynchronous local and remote replication for operational and disaster recovery. It is a data protection solution suitable for a variety of applications and environments.

Via the NetWorker console, administrators can initiate application-consistent snapshots and recoveries from RecoverPoint at local and remote sites as well as use the snapshots as source data for backup to tape. Without leaving the NetWorker environment, administrators can leverage RecoverPoint's CDP snapshot and replication technologies.

Virtualized Server Environments

The growth of server virtualization continues unabated in enterprise data centers. This popular technology provides significant benefits in physical server consolidation, cost reductions and ease and flexibility of virtual machine deployment. In response to this trend, EMC has built into NetWorker additional capabilities for supporting virtual server environments, including

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[2] For more on Symmetrix, see **The Clipper Group Navigator** dated December 8, 2009, entitled *EMC Rolls Out Fully Automated Storage Tiering and Other Storage Enhancements*, which is available at http://www.clipper.com/research/TCG2009051.pdf.

[3] For more on RecoverPoint, see **The Clipper Group Navigator** dated February 27, 2010, entitled *EMC RecoverPoint and VMware — Managing Data Replication and Recovery the Easy Way*, which is available at http://www.clipper.com/research/TCG2010005.pdf.

VMware and Microsoft *Hyper-V*. NetWorker can to span the physical and virtual world as enterprises transition their server resources.

NetWorker support for VMware is especially strong. It accesses VMware *vCenter Server* to discover virtual machines automatically, note their protection status, track when they are moved by *vMotion* or *DRS*, and help ensure virtual machines are adequately protected. It supports in-guest backup and VMware *Consolidated Backup* for off-host backups. NetWorker Management Console generates a graphical view of the virtual backup environment to help administrators understand the relationships between *ESX* Servers, clusters, virtual machines, and backup configurations.

NetWorker also supports server virtualization via its integration with Avamar, which is particularly well suited for backing up virtual environments. Virtualized servers run multiple virtual machines and are more highly utilized than are dedicated physical servers, so there tends to be fewer processor, memory, and I/O resources available for backup. By deduplicating data within and across virtual machines, Avamar minimizes the impact of backup on virtualized servers. Backups are faster and more reliable. Enterprises can maintain high utilization rates on virtualized servers without being constrained by the backup process.

Centralized Management

EMC has invested significant development resources into simplifying and enhancing the NetWorker Management Console. As a unified platform and management framework for backup and recovery, it spans multiple NetWorker servers and interfaces with data protection technologies on other platforms. As mentioned above, it manages EMC and third-party snapshot copy solutions as well as Avamar deduplication backup software. The NetWorker console includes easy-to-use wizards to set up devices and to configure file system and application backups. It is the central launch point for restore operations. Administrators can customize their screen views to track what is most relevant to them. NetWorker reports backup and recovery statistics and user activity auditing. Customers who have deployed EMC *Data Protection Advisor* can also launch this advanced backup analysis tool directly from the NetWorker console.

Server Recovery

For recovering servers at the level of the hardware and operating system, also called "bare metal" recovery, EMC offers a solution called *HomeBase*. It periodically records configuration profiles of server hardware and operating systems, so when a full recovery is needed, it can quickly load the most recent profile to ensure a successful server restart, even on dissimilar hardware and in VMware virtualized environments.

As with Avamar, NetWorker has combined its client agent with HomeBase to streamline backup and recovery deployments. Since data and bare-metal recovery are complementary processes, using NetWorker and HomeBase together makes it simple for administrators to protect their complex production environments.

Conclusion

EMC has evolved NetWorker beyond a traditional enterprise backup solution to embrace next-gen data protection and recovery. It now does – or it manages – both. It offers traditional, even risk-averse customers easy access to new, innovative capabilities without discarding their existing and familiar backup processes. If you are looking for more features working together, take a close look at EMC NetWorker.

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