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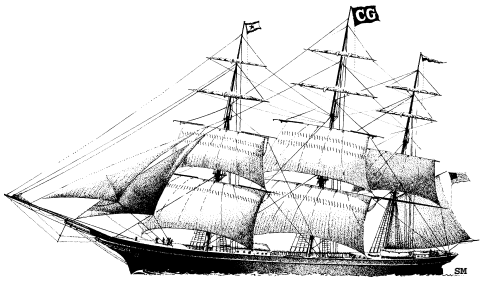

Navigating Information Technology Horizons℠

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EMC NetWorker Becomes Access Portal for 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 options included full vs. incremental backups and onsite vs. offsite tape storage. However, the hot dog stand of tape backup does not, by itself, provide the full spectrum of data protection and recovery that enterprises need today. Many new and innovative technologies have stepped in to fill the gap:

- **Continuous data protection (CDP)** – For recovery to virtually any prior point in time and performing backups without disrupting applications
- **Data de-duplication** – Can reduce the size of daily full backups by up to 500x and cumulative backend storage by up to 50x
- **Snapshot copies** – For recovery to specific previous points in time and non-disruptive backups
- **Backup to disk** – For faster backup and recovery
- **Backup reporting** – To ensure successful backups and recoveries
- **Bare-metal recovery** – For recovering server and operating system configurations, even on dissimilar hardware

These technologies create a multiplicity of options and configuration possibilities, making backup more complex than before. It is now 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 this question has a couple of parts. The first is to offer a full slate of enterprise backup technologies. By means of 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*, *Backup Advisor*, and others. Each product satisfies a unique requirement and niche in the data protection spectrum, so EMC offers 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 solution with a large customer base, which now serves as a centralized management console for both traditional and next-generation capabilities. NetWorker bridges the old and the new, simplifies management, and brings next-gen data protection to traditional backup customers. Read on for the details.

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NetWorker for Central Management

EMC *NetWorker* has expanded from a traditional enterprise backup solution to one that also embraces next-generation capabilities for data protection. NetWorker originated in EMC's acquisition of Legato, and the product has a long history and substantial installed base. NetWorker provides centralized backup and recovery for large, heterogeneous environments. Salient features include support for:

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

Beyond these enterprise backup features, NetWorker differentiates itself by integrating with and managing next-generation capabilities for data protection. In other words, NetWorker is now a central leverage point and access portal for new technologies that can meet more stringent recovery point objectives (RPO) and recovery time objectives (RTO). The following EMC technologies are in this category.

Continuous Data Protection

For block-level continuous data protection (CDP) and remote replication, EMC offers a solution called *RecoverPoint*. What makes it powerful is the ability to recover protected applications to virtually any prior point in time at either the local or remote sites. This means faster and more up-to-date recoveries from disasters, system failures, and data corruption, so business operations can resume.

Via the NetWorker console, administrators can initiate application-consistent snapshots and recoveries from RecoverPoint as well as use the snapshots as source data for long-term backup to tape. Without leaving the NetWorker environment, administrators can leverage this CDP technology to deliver substantially better RPO and RTO objectives to the business.

Data De-duplication

Avamar is backup and recovery software with integrated data de-duplication technology. Enterprise data tends to be redundant in the first place – think of how shared files and e-mails proliferate like rabbits across servers and offices worldwide. In addition, traditional backup solutions move and store lots of redundant data, making it difficult to backup remote offices, *VMware* environments, and LAN attached file servers within short backup windows.

Unlike most other de-duplication solutions on the market, Avamar reduces the size 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 500x and cumulative backend storage can be reduced by up to 50x across sites and servers.

Avamar also enables fast, reliable backup for VMware environments by de-duplicating data within and across virtual machines via agents at the VM guest, ESX Service Console, or VCB proxy server.

Smaller remote offices can deploy just Avamar software agents on the systems to be protected, with no additional local hardware required. Larger offices and datacenters can deploy a local Avamar server, which is available in a number of flexible deployment options. *Avamar Virtual Edition* is the first backup and recovery virtual appliance for VMware, which leverages existing *ESX* server hardware and storage.

EMC fused the NetWorker and Avamar client agents and added Avamar management into the NetWorker console. Administrators can now simultaneously manage traditional and de-duplicated backup streams via a single NetWorker interface.

Snapshot Copies

For snapshot and point-in-time copies, the EMC *Symmetrix DMX* and *CLARiiON* storage systems offer *TimeFinder* and *SnapView* software, respectively. They can create both clone and differential (i.e., space saving) copies, which applications may use for recovering to previous points in time if data becomes

corrupted or accidentally deleted. When integrated with application APIs or Microsoft *Volume Shadow Copy Services (VSS)*, the copies are fully restartable and non-disruptive to the applications.

NetWorker integrates with *TimeFinder*, *SnapView*, and third-party copy solutions to use them for backup purposes. From the NetWorker console, administrators can schedule point-in-time copies and use them for recovery or as a source for backing up to disk or tape.

Backup to Disk

More and more, enterprises are adopting disk-based backup to overcome limitations in their backup processes, and a virtual tape library (VTL) is the easiest way to do it. Tape-based backup infrastructure is often too slow and cumbersome to keep up with fast-growing enterprise data. As a result, some backup jobs do not complete or the jobs overlap into production hours. Restores can also be too slow to meet the uptime requirements of the business. A practical and popular way to alleviate this problem is to replace tape with disk storage – either completely or as a staging point before tape. Disk is much faster for both backups and restores, and it is easier to manage because there is no longer a need for physical tape handling. However, 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, but a VTL offers an easy workaround – it disguises disk storage as a tape library. In other words, a VTL appears to a backup system just like a tape library but performs like disk (because it is), so it conveniently slips into a backup infrastructure without hassle.

The EMC *Disk Library* series of VTLs ranges from the entry *DL210* with 24 TB usable and 1.4 TB/hour of uncompressed performance, to the high-end *DL6300* with 584 TB and 11.4 TB/hour. Its performance means up to 300% faster backups and 200% faster restores, according to EMC. The Disk Library leverages the high-end Symmetrix DMX or midrange CLARiiON storage platforms, depending on the level of protection and functionality a customer wants. It has low-cost SATA drives and optional 3:1 compression to lower the cost of capacity. For high availability, it supports RAID 6, dual engines with active failover, and remote replication.

NetWorker supports EMC Disk Library for backup to disk. In fact, a NetWorker component resides on the Disk Library that enables the consolidated management of virtual and physical tapes connected to it via the NetWorker console.

Backup Reporting

As a reporting and analysis tool for backup and recovery operations, EMC offers *Backup Advisor*. Backup systems are by nature complex because they involve many interdependent components: client servers, operating systems, applications, data sets, backup servers, networks, and tape and disk storage. A simple yes-or-no confirmation about backup job completion is really not enough to effectively manage it. Backup Advisor collects and correlates information about these various components to answer the all-important question, "Is data being protected properly and if not, why not?" More specifically, it analyzes and reports on:

- Backup performance
- Event correlation and root cause of problems
- Recovery points and estimated restore times
- Projected storage utilization for capacity planning
- Customizable, real-time alerts

Backup Advisor supports NetWorker and Avamar environments, as well as several other mainstream third-party backup applications. It reports on NetWorker staging and cloning activities, restores, performance, and load balancing. Furthermore, Backup Advisor can be launched from the NetWorker console. A "lite" version of this tool targeted at smaller, less complex installations is also available for NetWorker.

Bare-Metal Recovery

For bare metal recovery, or recovering servers at the level of the hardware and operating system, EMC offers a solution called *HomeBase*. It periodically records configuration profiles of server hardware and operating systems, so when a full or "bare metal" 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.

While NetWorker and HomeBase are currently separate products, they are complementary and, for sake of consolidation, could be configured to use the same recovery server hardware and backup storage platforms.

Retrospect and Mozy

In addition to NetWorker, EMC offers other backup solutions that fill different niches – namely *Retrospect* and *Mozy*.

Retrospect is a software backup solution for homes and small and midsized businesses. It supports Windows and Macintosh and is designed especially for ease of use and lower cost. Retrospect does not support large, heterogeneous environments like NetWorker does, nor does it integrate with next-gen data protection capabilities.

Mozy is an online backup service, which falls into the category of software-as-a-service (SAAS). Like Retrospect, the Mozy service targets at homes, smaller businesses, and branch offices.

Conclusion

EMC has evolved NetWorker beyond a traditional enterprise backup solution to embrace next-gen data protection and recovery. It now does – or at manages – both. It offers traditional, even risk-averse NetWorker customers easy access to new, innovative capabilities without discarding their existing and familiar backup processes.

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