NetApp's Integrated Data Management Balances Efficiency and Flexibility

Analyst: Michael Fisch

Management Summary

Integrated Data Management **(IDM) is NetApp's multi-layered approach to storage and data management.** The IDM software suites target four layers of the IT stack:

- **Storage** – Management of storage infrastructure, file resources, and SANs.
- **Data** – Management of business continuance and data protection, data migration, and file virtualization.
- **Servers** – Data and storage management from within *Unix* and *Windows* environments, plus plug-ins for third-party management frameworks.
- **Applications** – Data and storage management from within *SQL Server*, *Oracle* database, and *Exchange* environments.

IDM provides centralized management of a consolidated storage environment and, with it, the benefits of cost-effectiveness and efficiency. This capability is important and even expected from a major networked storage vendor. However, IDM goes further by providing multiple integration points with application and host servers, which add significantly to the relevance and flexibility of NetApp's management suite.

In fact, integration *is* an increasingly important aspect of enterprise storage. It is also a fuzzy concept whose value is not always appreciated or understood. As an analogy, picture a water purification plant in a metropolitan area. The plant generates large volumes of clean water that homes and businesses need. No one could go a day without this valuable resource. However, it is of little use without an easy way for people to access it. The water needs to be pumped through a distribution system to individual buildings, and then through internal plumbing to faucets and spigots – where it eventually flows out.

A networked storage platform is like the water purification plant (shared, valuable resource), and integration is like the distribution system. Integration makes a central reservoir of storage and data management available to the applications and servers that consume it. **Moreover, NetApp is using integration as a point of differentiation through its IDM software suite – and to raise the level of discourse about what storage and data management ought to be.** Read on for the details.

A Brief History of Storage Management

Storage management is a balancing act between two apparently contradictory objectives: *efficiency* and *flexibility*. Efficiency is about minimizing costs by getting the most out of storage resources – equipment and administrative personnel. It values centralization, commonality, and control. Trends/ capabilities like "single pane of glass for management" and "consolidated infrastructure" denote movement toward greater efficiency. Efficiency is worthwhile because it saves money on storage, a significant budgetary item.

Flexibility is about adapting storage to meet changing and variable business requirements. It values decentralization, diverse capabilities, and easy, transparent reallocation of resources. Flexibility recognizes that:

- *Business growth and new directions prompt changes in IT, including storage.*
- *An enterprise's competitiveness in a dynamic, global marketplace depends on the ability to adapt continually.*
- *Different data sets require different storage service levels, in terms of performance, availability, recoverability, and cost.* For example, compliance and archiving data have different needs than production data. These requirements also change with time, which has given rise to the practice of information lifecycle management (ILM).
- *System administrators have the best sense of storage requirements for each application, database, and host server.* They also have the primary responsibility for delivering these services to the business.

Trends/capabilities like "tiered storage", "role-based administration", and even "virtualization" denote movement toward greater flexibility. These capabilities tend to add cost, at least upfront, beyond what an enterprise would incur with a strict focus on efficiency. However, the payback is in meeting and managing different service level requirements and more easily reallocating resources as business requirements evolve. If efficiency saves costs, flexibility gains revenue by making a business more nimble and opportunistic.

The previous era of IT was characterized by open systems, distributed computing. Departments and business units ran their own applications with dedicated server and storage stacks. It allowed much flexibility, but at the expense of low utilization and inefficiency.

More recently, enterprises have pursued server and storage consolidation for greater efficiency. This means bigger boxes managed as shared resources for multiple applications and departments. Consoli-dation delivers better economics through classic techniques of centralization and control, but it lacks some flexibility that many businesses now want.

What is the next evolutionary step in storage management? As pendulums tend to swing from side to side, the next approach will likely offer more flexibility without sacrificing efficiency gains of consolidation. The ultimate goal – out on the horizon – is for the pendulum to stop swinging between extremes and to find a balance that fully embraces both efficiency and flexibility.

Integrated Data Management

NetApp has defined its next evolutionary step in storage management: *Integrated Data Management* (*IDM*). **IDM provides centralized management of consolidated infrastructure, but goes further with integration points at the application and host server levels.** This integration implements Net-App's data and storage management capabilities more easily for specific applications and servers. It also distributes management access to system administrators without sacrificing the storage administrator's centralized control. The IDM approach offers a better balance of efficiency and flexibility.

The IDM software suites target four layers of the IT stack.

- **Storage Suite** – Manages and monitors storage infrastructure, file resources, and SANs. Capabilities include configuration, alerting, chargeback, trend analysis, health and performance reporting, monitoring *MultiStore* logical partitions, data classification, and setting thresholds and quotas.
- **Data Suite** – Manages business continuance and data protection, data migration, and file virtualization (i.e., global namespace).
- **Server Suite** – Manages data and storage resources from within *Unix* and *Windows* environments, plus plug-ins for third-party management frameworks.
- **Application Suite** – Manages data and storage resources from within *SQL Server*, *Oracle* database, and *Exchange* environments.

The first two software suites address centralized management of storage infrastructure and the data itself. They are specifically focused for a storage administrator. The Server and Application Suites address aspects of advanced functional and management integration at the host server and application levels.

Advanced Functional Integration

NetApp has multiple software capabilities for data protection and management for its fabric-attached (FAS) platforms, such as *Snapshot*, *Snap-Vault*, *SnapRestore*, *SnapMover*, and *SnapMirror*.

Advanced functional integration allows particular applications and host servers to take advantage of them.

NetApp's capabilities include:
- Online volume expansion for high availability;
- Remote replication and snapshots for data protection and disaster recovery;
- Data migration;
- Synchronization of hot backup mode, snapshots, and database verification for virtually non-disruptive backup and data consistency for fast recovery;
- Multiple, redundant data paths to improve availability and performance;
- Clustered storage platforms integrated with server clustering for high availability; and
- Granular restore of databases or mailboxes for faster recovery and to avoid disruption of non-affected users.

Management Integration

System administrators are the skilled personnel who manage applications, databases, and host servers. Some also manage the storage associated with their application or, in the world of shared networked storage, at least specify requirements. After all, they are the ones primarily responsible for delivering applications as a service to the business.

NetApp's integration at the management layer lets system administrators perform tasks like add and expand volumes, create snapshots, restore data from disk, migrate data, and perform integrity checks at the storage subsystem. Through products like *SnapDrive* and *SnapManager* (*see below*), user interfaces are embedded in standard management tools and/ or are graphical and wizard-driven, so their use is intuitive and the learning curve is minimized. This integration lets system administrators handle the storage aspects of their applications and servers expeditiously and with a measure of independence. It also liberates storage administrators to manage the central resource strategically, setting policies and limits without becoming a bottleneck in day-to-day tasks. Application integration promotes a healthy division of labor and overall ease of administration.

NetApp Integration Products

NetApp has several products for integration of applications and host servers.

SnapDrive

SnapDrive integrates with host operating systems, including Windows, *Solaris*, *Linux*, *AIX*, and *HP-UX*, and adds virtualization and volume management capabilities. SnapDrive makes the virtual

disks on NetApp network storage systems look and feel like local disks on a server, albeit with more functionality. Disks can be expanded online. It can create, delete, and manage snapshots and perform restores (if SnapRestore software is deployed). Fibre Channel and iSCSI (IP) connectivity are supported, as is Microsoft *Cluster Server* (MSCS) on the Windows edition.

SnapManager

SnapManager integrates with specific applications environments, including Oracle, Exchange, and SQL Server, and provides data migration, data verification, data cloning, online backup, and restore. It operates in conjunction with SnapDrive on the host and Snapshot, SnapRestore, and *FlexClone* on the storage system. For instance, it can restore a full Exchange server, storage group, database, virtual disk, or an individual mailbox (with the *Single Mailbox Recovery for Exchange* option). In Windows environments, it supports *VSS* for non-disruptive backup and *MPIO* for high availability and performance through redundant paths to storage.

ApplianceWatch

ApplianceWatch enables third-party frameworks to monitor and manage NetApp solutions. These include HP *OpenView*, IBM *Tivoli*, and Microsoft *Operations Manager*.

Conclusion

The storage industry has been preaching centralized management for years, so NetApp's concept of Integrated Data Management might at first sound counter-intuitive. If centralization is good, why then redistribute some management functions to system administrators? **In fact, the IDM approach offers a balance of efficiency and flexibility that is beneficial to the business.** It gives system administrators empowerment within their areas of responsibility, while preserving centralized, policy-based control by storage experts. It also makes NetApp's data and storage management capabilities more readily applicable and adaptable to changing business requirements.

So, consider IDM as a differentiator for NetApp storage systems, especially its smart application and server integration tools. These will have a significant impact on application service levels, storage adaptability, ease of use, and long-run management costs.

About The Clipper Group, Inc.

The Clipper Group, Inc., is an independent consulting firm specializing in acquisition decisions and strategic advice regarding complex, enterprise-class information technologies. Our team of industry professionals averages more than 25 years of real-world experience. A team of staff consultants augments our capabilities, with significant experience across a broad spectrum of applications and environments.

➢ *The Clipper Group can be reached at 781-235-0085 and found on the web at www.clipper.com.*

About the Author

Michael Fisch is Director of Storage and Networking for The Clipper Group. He brings over ten years of experience in the computer industry working in sales, market analysis and positioning, and engineering. Mr. Fisch worked at EMC Corporation as a marketing program manager focused on service providers and as a competitive market analyst. Before that, he worked in international channel development, manufacturing, and technical support at Extended Systems, Inc. Mr. Fisch earned an MBA from Babson College and a Bachelor's degree in electrical engineering from the University of Idaho.

➢ *Reach Michael Fisch via e-mail at mike.fisch@clipper.com or at 781-235-0085 Ext. 211. (Please dial "211" when you hear the automated attendant.)*

Regarding Trademarks and Service Marks

The Clipper Group Navigator, The Clipper Group Explorer, The Clipper Group Observer, The Clipper Group *Captain's log*, The Clipper Group Voyager, and *"clipper.com"* are trademarks of The Clipper Group, Inc., and the clipper ship drawings, *"Navigating Information Technology Horizons"*, and *"teraproductivity"* are service marks of The Clipper Group, Inc. The Clipper Group, Inc., reserves all rights regarding its trademarks and service marks. All other trademarks, etc., belong to their respective owners.

Disclosure

Officers and/or employees of The Clipper Group may own as individuals, directly or indirectly, shares in one or more companies discussed in this bulletin. Company policy prohibits any officer or employee from holding more than one percent of the outstanding shares of any company covered by The Clipper Group. The Clipper Group, Inc., has no such equity holdings.

Regarding the Information in this Issue

The Clipper Group believes the information included in this report to be accurate. Data has been received from a variety of sources, which we believe to be reliable, including manufacturers, distributors, or users of the products discussed herein. The Clipper Group, Inc., cannot be held responsible for any consequential damages resulting from the application of information or opinions contained in this report.