Flexible Storage Architecture (FSA): A New Storage Architecture for a New Information Age

A Eurologic Systems

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In today's systems environments, there are only two constants: change and growth. Applications are expanding at a dramatic rate, and systems are evolving to keep pace. A key driver behind this constant, rapid change is the explosive impact of the World Wide Web and other media-intensive applications. The Web is emerging as the source of first resort for information, entertainment and even communications, placing tremendous demands on the systems that store and serve up that data to hundreds, thousands or even millions of users. As rich media content-including streaming audio and video-becomes commonplace on the Web, these demands are compounded at an incredible rate.

In the corporate environment, enterprise-wide information access via company intranets and the rise of new "e-business" models is driving a proliferation of media-intensive, server-based applications-from imaging to data warehousing. The deployment of these types of applications is driving companies to increase their demand for storage by 100 percent a year. Leading industry analysts believe that, within the next five years, corporations could be devoting nearly 90 cents of every IT dollar to storage.

The Storage Challenge

While these trends are driving rapid evolution throughout the IT environment, nowhere are they being felt more than in the area of network storage. In some applications, demand for storage capacity is doubling every few months. According to GartnerGroup Dataquest, the global market for storage solutions - including hardware and software -- is forecast to grow to over $65 billion in the next five years. Once a "peripheral" concern, storage is today an issue of strategic importance.

To address this critical issue, many companies are turning to new, network storage topologies, from Storage Area Networks (SANs) to Network Attached Storage (NAS) to storage appliances. They are looking to these topologies to help them reduce the burden on the server network created by the tremendous increase in data volumes, while helping them to access data information faster and more reliably. They are looking for solutions that enable them to expand as their storage requirements grow without affecting the existing systems or application processes. At the same time, companies are looking to centralize the management of their storage network and reduce the overall cost of managing their storage resources.

A New Approach

Regardless of the storage topology they choose, to keep pace with their rapidly changing storage requirements, companies need a new, more flexible storage architecture that addresses scalability in multiple dimensions. They need networked storage solutions that are versatile enough to change rapidly in response to changing business requirements - solutions that drive down the immense cost of managing complex storage infrastructures, while enabling cost-effective growth and expansion. Flexibility is even more critical for OEMs, channel partners, VARs, and other third-party distributors. To compete effectively, they need a common storage solution that can be configured to meet a variety of application requirements, minimizing the number of specialized components required to meet the diverse needs of their customers.

Eurologic has responded to this need with its new Flexible Storage Architecture (FSA). A major advancement over existing storage architectures, FSA provides a modular storage framework that increases flexibility, while reducing cost and technology risk. With FSA, storage solutions are created from flexible, modular "building blocks" based on open standards. This approach is fundamentally different than existing storage architectures, which are based on application-specific designs that limit their flexibility.

The modular FSA architecture enables network storage solutions that are scalable in all four key dimensions: Functionality; Interface; Capacity; and Performance. The result is a highly cost-effective "all in one" solution that meets the full range of storage needs of today-while enabling rapid scaling or reconfiguration to meet the needs of tomorrow.

Functional Flexibility

The modular FSA architecture provides an unprecedented degree of configuration flexibility. Control functionality is provided by hot-swappable modules based on a compact, industry-leading form factor. The FSA platform can be configured for virtually any storage configuration-including JBOD, RAID, SAN, and other network storage topologies-simply by sliding in the appropriate module. This modular design also provides a cost-effective, "single card" migration path to the best-of-breed technologies in the future-including emerging intelligent networking technologies that place application intelligence within the storage platform.

This design offers the tremendous advantage of a single, modular platform able to satisfy virtually any network storage need. This dramatically simplifies stocking and sparing for OEMs-reducing their overall costs, while greatly increasing their responsiveness to customers' needs. For end users, FSA's modular functionality enables companies to reconfigure existing storage platforms as their needs change, without costly "forklift" upgrades. For example, a JBOD platform can be transformed into a RAID platform by swapping a single module. The JBOD module can be retained for use in another platform or as a spare, protecting the entire technology investment. This modular approach also enables cost-effective redundancy with hot-swappable components to meet the availability requirements of demanding enterprise, transaction processing, and Web commerce environments.

This flexibility extends to connectivity. FSA enables any subsystem to interface with popular network storage topologies, simply by inserting the appropriate interface module. FSA provides interface modules for RAID and JBOD, fibre or SCSI, and copper and optical. These modules were designed with support for the latest interface technology, such as Ultra 320 SCSI and 2 gigabit-per-second (Gbps) Fibre Channel, as well as enabling support for new standards, such as Infiniband, as they emerge. This flexible connectivity is essential in today's heterogeneous, evolving network environments. Companies can configure their storage solution for today's technologies and, as those technologies evolve, upgrade their FSA platforms by swapping a single card.

Scaling Flexibility

A difficult challenge for companies today is that of cost-effectively managing storage capacity. They must balance their need to keep pace with growing storage requirements with their need to preserve their budget. FSA's modular design provides the ideal solution, enabling companies to start small and add capacity as it is required-quickly and inexpensively.

This "pay as you grow" approach not only reduces initial costs; it reduces costs at every stage of the network storage lifecycle, enabling companies to buy only the capacity and functionality they need. With FSA, companies can begin with as little as 9GB, adding capacity simply by sliding in additional disk modules. This provides a solution to the problem of scaling that is easy and cost-effective, with exceptional density. Up to 8 subsystems can be daisy-chained to provide up to 8TB of capacity with 72GB drives-while taking up less than 5 square feet.

Performance Flexibility

FSA also enables companies to tailor the performance of each storage platform to meet their needs. Companies can modify the bandwidth and transaction performance to "tune" the platform to its intended application. If more bandwidth is required, such as for streaming media or seismic analysis applications, the ratio of RAID controllers to drives can be easily expanded. If higher transaction performance is required, for file serving or OLTP applications, the ratio of drives to controllers can be increased. The grouping and configuration of drives can also be optimized for specific applications via a centralized management facility. As needs change, the platform can be "retuned" accordingly.

FSA is based on open standards and supports a full range of operating systems, including major Unix implementations, Windows NT and Windows 2000. It also supports the latest hardware technologies-including 15,000 RPM drives-enabling storage solutions with leading-edge performance.

Management Flexibility

As storage networks expand in size and complexity, system administrators need effective solutions for storage management. FSA provides this, with centralized management of the entire FSA storage network. From a single browser-based GUI management console, administrators can configure, monitor and tune disk arrays across the storage network.

FSA also enables capacity and security management, through its support for controller-based mapping. This is a server-to-logical-disk mapping mechanism that allows system managers to easily define and enforce storage access policies across a SAN. Managers can quickly create SAN maps that define the logical disks that each SAN node is allowed to access; all other logical disks are rendered transparent, so the OS will not attempt to mount them. As new SAN nodes and applications are added, the SAN maps can be easily modified to allow new access patterns. In addition to preventing servers from corrupting each other's data, mapping can be used to partition storage pools by application or user group to enhance the security of sensitive data.

The Architecture for Tomorrow

In developing FSA, Eurologic worked closely with its customers and partners, including major OEMs, to learn their network storage requirements for the new era. FSA addresses their expressed needs for true "future proof" flexibility. The innovative, modular design of FSA enables companies and OEMs to:

- Dramatically reduce their cost for network storage, while increasing performance and availability
- Cost-effectively scale their capacity as their needs grow
- Tailor their network storage devices to meet their specific application needs
- Increase storage capacity, while minimizing the space requirements
- Manage their entire storage network from a single, easy-to-use console
- Leverage new, best-of-breed technologies, while protecting their investment

Eurologic's FSA provides a versatile alternative to the large, monolithic storage solutions that have dominated the marketplace until now. More than just a cosmetic enhancement of existing architectures, FSA represents a new direction in networked storage technology-a direction pointing to an even more data-intensive future.

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