Acopia ARX Takes File Virtualization Global

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Management Summary

No doubt your enterprise experiences its share of IT pains and challenges. Consider the following list:

- Administration of client mappings for network file systems
- Disruptive data and storage management tasks
- Poor storage utilization and access performance
- Moving data to/from remote sites
- Need to replicate data for resiliency and protection
- Fragmented, inefficient storage management
- Poor and/or unpredictable WAN performance
- Need to implement data (or information) lifecycle management (DLM)

If one or more of these strike a chord, you should have a look at the new Acopia *ARX* platform for file virtualization and data management. This solution actually addresses *all* of the problems, which is impressive considering there are products on the market for doing just one of them.

The ARX platform is an intelligent Gigabit Ethernet switch that resides (logically) between client servers/PCs and an enterprise's file servers and NAS platforms. It virtualizes heterogeneous file servers and presents them to clients as a single, global namespace. Clients mount the namespace and access it via standard CIFS and NFS protocols. The global namespace abstracts changes in the underlying physical storage, shares, and volumes, so clients to not need to be reconfigured. Furthermore, ARX can create an enterprise-wide file virtualization infrastructure by placing platforms in geographically-distributed sites and interconnecting them with WAN links. It can automatically move and replicate data among sites based on policy for purposes such as centralized backup, archiving, data distribution, and data protection. It can also migrate files among different storage tiers (again, based on policy) to perform DLM functions. And the list continues.

Business benefits of this solution include lower storage acquisition and operating costs, enhanced service levels, and broader, easier access to enterprise information. Read on for details about the ARX and the IT challenges it can address.

- **Improving local access performance** – When remote sites access files over a WAN, they must contend with delays and bandwidth limitations that can make it unacceptably slow. A solution is to keep file copies local, so users can access them over the LAN.

ARX can meet the challenge of data movement by interconnecting distributed platforms over a wide-area network (WAN). ARX platforms at each geographical location not only virtualize local file resources, but also connect to each other to form a dynamic, enterprise-wide infrastructure for file access and movement. Administrators can create policies for moving data between locations according to business and IT needs, and the ARX network executes them. The platforms can even monitor performance and usage in real-time and move data around to maintain acceptable access performance.

Need to Replicate Data for Resiliency and Protection

Related to data movement is replication, where data copies are kept in remote locations to protect against local loss, corruption, or disaster. Administrators can set up policies to periodically replicate files and directories, including incremental changes since the last copy. It gives enterprises a higher level of data protection and the accompanying peace of mind. Another purpose is to make point-in-time copies for non-disruptive backup operations, data warehouse loading, and testing, and development.

Fragmented, Inefficient Storage Management

The rule of thumb is that it is easier to manage one big thing than many smaller things. Many enterprises struggle with managing a plethora of file servers, whether collocated in one data center or distributed throughout an enterprise. ARX offers the holy grail of centralized management. Administrators can manage one global namespace and aspects of the underlying storage assets from one console. ARX provides leverage.

Poor and/or Unpredictable WAN Performance

Network congestion and failed connections can get in the way of data movement, replication, and remote access. However, interconnected ARX platforms are actually smart enough to compute alternative routing paths based on factors like throughput, latency, and packet loss. They help get the most out of the network and the data, where it needs to be in a timely fashion.

Data Lifecycle Management (DLM)

Enterprises increasingly want to exploit data lifecycle management (DLM)[2]. Similar to plants and animals, data follows a cradle-to-grave path of existence where its value changes over time. The DLM process seeks to apply the optimal storage service level[3] to data at each point in its lifecycle. There can be multiple tiers of service – think in terms of "low, medium, and high" or "silver, gold, and platinum." DLM strikes the optimal balance between meeting business requirements and minimizing storage costs. It ensures the right data has the right service level at the right time. Reasons to consider these solutions include business and regulatory requirements for data retention, improved performance of databases and file systems, lower storage acquisition costs, and speeding up data management operations like backup and replication.

ARX can enable a tiered storage environment[4] by:

- **Classifying data according to file attributes (e.g., modified date, directory), usage, and access performance.** It can apply user-defined policies to categorize the data based on these characteristics.
- **Virtualizing multiple storage tiers.** Since the ARX can include multiple, heterogeneous file servers in its global namespace, it can deliver multiple storage tiers to users and applications. For example, it might use high-end NAS platforms with Fibre Channel drives for high service levels and Windows-based NAS appliances with ATA drives for a lower and less-costly service level.
- **Moving files to the appropriate storage tier automatically and non-disruptively based on policies and classification.** As values change over time, ARX can dynamically respond and migrate data to ensure it resides in the most appropriate service-level tier.

In this way, ARX enables DLM for an enterprise-wide, virtualized file infrastructure.

A Workhorse

As you can see, the Acopia ARX is a workhouse that can simultaneously solve many IT and business challenges. If you require multiple capabilities listed above, and/or if you need them on a broad scale, then you are in the ARX's sweet spot. The ARX can accomplish a lot in one fell swoop. But if the scope of requirements is limited, such as

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[2] See *Top 10 Things You Should Know About Information Lifecycle Management* in **The Clipper Group Explorer** dated May 11, 2004, available at http://www.clipper.com/research/TCG2004041R.pdf.

[3] Service levels describe the particular performance, availability, recoverability, and cost characteristics applied to a data set.

[4] See *Tiered Storage Classes Save Money – Getting The Most Out Of Your Storage Infrastructure* in **The Clipper Group Explorer** dated August 29, 2002, at http://www.clipper.com/research/TCG2002030.pdf.

Acopia ARX Series Specifications

	ARX6000	*ARX1000*
Size	13U modular chassis	2U fixed configuration
Network connectivity	24 x 1Gbps Ethernet	6 x 1Gbps Ethernet
File system support	NFS v2 & v3, CIFS	NFS v2 & v3, CIFS
Data object capacity	500 million	100 million
Throughput	10 Gbps read/write	3 Gbps read/write
Simultaneous sessions	20,000	5,000
File placement rate	60 million/hr	10 million/hr
Average list price	$150,000	$45,000

replicating data between two servers, the ARX could be more than you need. There are products on the market that can address any one of the above capabilities – the uniqueness of the ARX is that it can do all of them on a global-enterprise scale.

The Acopia ARX Platform

The ARX platform is an intelligent, purpose-built switch. It subsumes multiple, heterogeneous file servers and NAS platforms, and then presents them to clients within a global namespace. It supports the standard NFS and CIFS protocols and the *Solaris*, *Linux*, and *Windows* operating systems on clients. It comes in a large and a small version: The ARX6000 is a modular chassis with up to 24 Gigabit Ethernet ports, support for 20,000 simultaneous sessions, and has been tested up to 500M objects. The ARX1000 is a fixed configuration with 6 Gigabit Ethernet ports, 5,000 simultaneous sessions, and tested to 100M objects[5]. *See the sidebar above for technical specifications.*

The platform is *in-band*, meaning that all I/Os pass through the ARX platform. This central position in the network confers several advantages:

- Encompasses conceivably all clients and file servers,
- No agents or changes on clients,
- Able to monitor and deliver intelligent data and network management in real-time, and
- Facilitates centralized management.

The network is the common ground between clients and file servers. Thus, it is a sensible place to put intelligence, especially for a solution of broad scope.[6] The downside is potentially being a single point of failure, but the ARX can be configured in clustered pairs for high availability.

The ARX ties together an existing storage

infrastructure and adds a layer of intelligence.[7] There is no need to sweep the floor of existing assets or to perform a major upgrade. The kind of incremental investment that ARX offers can be less disruptive and easier to justify financially to executives.

Conclusion

While the Acopia ARX's set of capabilities is quite broad, its business benefits fall into four categories:

- **Lower storage acquisition costs** – Thanks to higher utilization and the use of tiered storage, enterprises can spend less on acquiring storage.
- **Lower operating costs** – Management is greatly simplified by a global namespace, centralized management, and policy-based automation. Simplicity saves time, and time is money. Operating costs are by far the largest component of storage total cost of ownership.
- **Enhanced service levels** – The capabilities of the ARX can improve performance, availability, recoverability, and cost.
- **Better information access** – The global namespace and wide-area connectivity of ARX help get the right information to the right people for getting the right work done. It breaks down information silos and improves accessibility. Even a file search is easier and more comprehensive. As a result, the business itself can be more productive and competitive.

If the ARX might address one or two (or more) of your enterprise's particular problems, take a closer look. You may find that it can solve those problems as well as provide advantages that you had not yet considered. **It is like getting many birds with one stone!**

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[5] Both models could scale beyond the rated number of objects, but this has not been tested.

[6] See *Intelligent Storage Networking – Poised for Broad Adoption* in **The Clipper Group Explorer** dated October 16, 2003, available at http://www.clipper.com/research/TCG2003054.pdf.

[7] It also has an API (application programming interface) that can allow third-party software and policy managers to make inquiries and initiate tasks.

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