

By Renny Shen

# SIMPLIFYING DATA MANAGEMENT AND MOBILITY: F5 ARX FILE VIRTUALIZATION AND DELL STORAGE

Accelerating data growth has increased the pressure on organizations to manage this data efficiently and cost-effectively. F5® ARX® Series intelligent file virtualization devices and Dell™ storage systems help simplify storage management by enabling flexible data mobility, while automated data management policies help to reduce costs, lower IT overhead, and enhance productivity.

**T**he torrid rate of growth in file data is elevating the strategic importance of smart data management in the eyes of IT professionals. Businesses and other organizations are generating data faster and retaining it for longer than ever—but in many environments, the traditional strategy of constantly adding capacity no longer scales well enough to handle this accelerated growth. Bridging the gap between rapid data growth and constrained IT budgets, Dell and F5 Networks have partnered to help organizations build dynamic storage infrastructures that can simplify management and offer breakthrough storage economics.

File virtualization using F5 ARX Series devices provides the foundation for flexible data mobility, while automated management policies intelligently move files based on data value. This combination of nondisruptive file movement and automation can help organizations make the most of their investment in—and leverage the cost and management advantages of—Dell file storage systems.

## UNDERSTANDING THE IMPACT OF DATA GROWTH ON STORAGE

Data growth stresses the storage infrastructure in many ways, but the capacity cost required to sustain that growth is generally paid the greatest attention. Storage is often the largest line item in the IT

budget, and the rate of data growth can exceed that of budget growth, often dramatically. But behind the balance sheet, the lack of data mobility can contribute as much to rising storage costs as data growth. Moving data is a disruptive task, making it difficult to match data to the most cost-effective or efficient location.

One common attribute of many high-growth environments is the high ratio of inactive data to active data. As organizations retain data for extended periods, a growing percentage of it is no longer actively accessed or modified. The logical next step would be to move that inactive data to lower-cost storage, but the operational cost of doing so can be prohibitive. Aside from the IT resources needed to continually identify which files are inactive, the act of physically moving those files can be disruptive: when users and applications are statically mapped to specific storage resources, moving data to a different resource can break those mappings and cause downtime.

Another critical, yet often overlooked, aspect of data growth is its inconsistent nature. Because data sets grow at different rates and those rates typically change over time, it is extremely difficult to predict which storage resources will need additional capacity and which will have excess capacity. Here, once again, a lack of data mobility hampers effective growth

management by making it hard to share capacity across storage resources or to migrate data between resources to balance utilization levels. As a result, organizations are often forced to deploy more capacity than they really need, while existing capacity goes unclaimed.

## ENABLING DATA MOBILITY

F5 ARX Series intelligent file virtualization devices can play a crucial role in addressing these data mobility challenges. File virtualization is designed to abstract the physical storage layer and decouple the physical relationship between clients and storage resources. The key feature that facilitates this decoupling is the global namespace—essentially a collection of virtual Common Internet File System (CIFS) shares and Network File System (NFS) exports presented by the ARX device. With file virtualization, clients mount these logical or virtual shares and exports to access their data, instead of mapping to the physical storage devices directly.

Because user and application clients mount virtual shares and exports, they are no longer exposed to the physical location of their data. This approach enables ARX devices to move data between different physical locations without changing how clients logically access data. In a sense, the device acts like a file router, keeping track of the current location of each file and routing logical access through virtual shares to the appropriate physical location.

The in-line placement of ARX devices between client systems and storage also makes them well suited for providing and enforcing data management policies. The devices provide a rich set of automated policies that govern the movement of individual files customized to how specific organizations intend to deploy and optimize their available storage capacity, including the following:

- **Data migrations:** Migrations occur for a variety of reasons, and can include planned events such as consolidations, upgrades, and technology refreshes as

well as unplanned events such as re-provisioning capacity. Virtualized file storage enables organizations to flexibly move data as needed without affecting user or application access. Data migration policies help reduce the amount of up-front planning, time, and IT overhead required, even when performing complex migrations and restructuring file system layouts.

- **Storage tiering:** Storage tiering helps organizations align the cost of storing data with their limited IT budgets. The basic premise is to match different classes of data with the most appropriate type of storage. Many organizations have already implemented tiering at the block level using storage such as Dell EqualLogic™ PS Series Internet SCSI (iSCSI) storage area network (SAN) arrays, or on a per-application basis. ARX devices provide automated storage tiering policies that take advantage of the inherent business context of each file to help determine the most appropriate place to store it—active or high-value data on high-performance storage, and inactive or low-value files on lower-cost storage. When inactive data represents a large percentage of all data under management, storage tiering can be a huge source of cost savings. In addition, organizations can now apply different backup policies to tiers with active and inactive data to help reduce backup windows and media consumption.
- **Capacity balancing:** Capacity balancing combines multiple file storage resources into a virtual storage pool. Similar to the capabilities of Dell EqualLogic PS Series storage between different arrays at the block level, virtual file systems presented through ARX devices can utilize storage capacity from different back-end file storage resources—allowing organizations to reclaim stranded capacity from underutilized storage and redeploy it where data is growing. Automated policies can balance file placement across multiple storage resources for consistent aggregate utilization.

Although the lack of data mobility hampers the ability of organizations to respond to data growth, enabling data mobility by itself is not enough to do so effectively. Effective data management must be a repetitive process of optimizing how and where storage capacity is most efficiently and cost-effectively deployed.

F5 Data Manager software can help organizations understand their changing data storage requirements by providing customized reporting on file storage and data characteristics. Detailed analysis of scanned data provides crucial information for planning and refining data management policies.

## TAKING ADVANTAGE OF DELL FILE STORAGE

F5 ARX Series devices and F5 Data Manager software can help organizations realize the cost and management advantages of Dell file storage systems. Organizations looking to migrate their storage infrastructure to Dell systems can do so without disruption or downtime, while those looking to augment their existing environment can take advantage of ARX automated tiering and load balancing policies to seamlessly integrate these systems:

- **Seamless integration of Dell storage:** ARX devices are designed to simplify management of heterogeneous file storage environments and allow organizations to deploy Dell file storage systems seamlessly alongside existing systems. File virtualization masks the physical differences between different storage types from user and application clients, enabling organizations to utilize available storage capacity efficiently and effectively regardless of type, platform, or vendor.
- **Simplified migration to Dell storage:** ARX devices help simplify and accelerate data migration projects from legacy infrastructures to Dell file storage systems. One of the biggest hurdles when replacing legacy file storage is the potential disruption from migrating data. ARX devices support online migration without

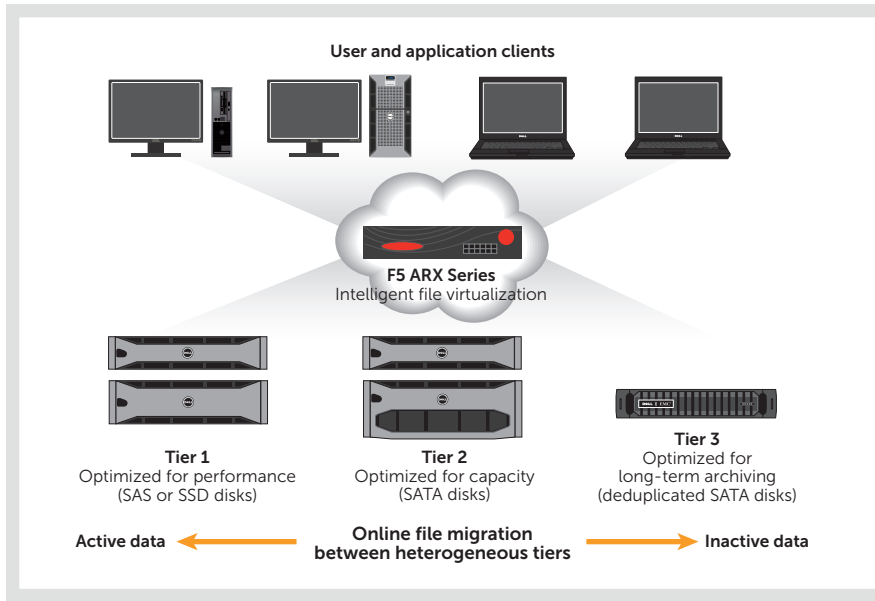


Figure 1. Automated storage tiering with F5 ARX Series intelligent file virtualization and Dell storage

downtime or client reconfiguration, helping to reduce planning, migration time, and IT overhead requirements.

- Consolidation with Dell NX4 systems:** ARX devices can perform nondisruptive consolidation of legacy file servers onto Dell NX4 systems for mixed Microsoft® Windows®, Linux®, and UNIX® environments. File virtualization allows nondisruptive file migration, enabling even complex consolidations with reduced planning, migration time, and IT overhead requirements.
- Storage tiering with Dell EqualLogic and Dell PowerVault™ systems:** Storage tiering with ARX devices can provide performance and cost-savings benefits for file data similar to those provided by EqualLogic arrays for block data. Within a virtual file system, ARX devices can migrate individual files between physical CIFS shares or NFS exports presented by multiple PowerVault systems and provisioned from Serial ATA (SATA), Serial Attached SCSI (SAS), and solid-state drive (SSD) capacity on EqualLogic arrays. File-level tiering complements block-level tiering by adding dimensions or criteria used to determine what data to move and when to move it. Organizations can configure automated policies

based on the inherent context of each file, using a combination of file attributes such as the latest modification or access date, type, name, location, and size.

- Storage tiering with Dell/EMC DD Series systems:** ARX devices can also be used to take advantage of the data deduplication capabilities of Dell/EMC DD Series systems in a long-term file archive tier. Because of the performance impact that can be associated with accessing deduplicated data, organizations may choose to deploy deduplicated storage capacity only for data that is rarely accessed or modified. Automated tiering policies can move individual files as they age to a deduplicated storage tier, allowing organizations to seamlessly combine primary storage capacity from Dell NX4 or EqualLogic systems for active data with deduplicated storage capacity from Dell/EMC DD Series systems for inactive data (see Figure 1).
- Load balancing across Dell storage:** ARX devices can combine Dell file storage systems—including Dell NX4, Dell EqualLogic, Dell PowerVault, and Dell/EMC DD Series systems—into a single virtual storage pool. Organizations with applications needing large workspaces can create virtual file systems

that exceed the physical limitations of individual devices while automated policies distribute files across multiple heterogeneous storage resources for consistent and predictable utilization.

- Simplified provisioning of Dell storage:** ARX devices help make it easy to add capacity from Dell file storage devices into existing virtual shares, on demand and transparently to clients. By avoiding the disruption of re-provisioning storage, ARX devices provide organizations with the operational flexibility to run highly efficient storage environments that are responsive to unpredictable growth.

**BUILDING A DYNAMIC STORAGE INFRASTRUCTURE**

F5 ARX Series intelligent file virtualization devices and Dell file storage systems can help organizations build dynamic storage infrastructures that can respond to unpredictable and inconsistent data growth. With F5 ARX Series devices, the combination of data mobility and automated policies helps dramatically simplify the processes of deploying and managing a comprehensive range of Dell file storage systems while helping maximize operational and cost savings.

Renny Shen is a product marketing manager with F5 Networks.

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