



## RainStorage – A Catalyst For Fast, Non-Disruptive Data Migration

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### Management Summary

**Anyone who has moved to a new home knows how tiring and difficult it is.** Even if the move is for a positive reason, such as upgrading to a house from an apartment, it is still a disruptive event. Taking time off work, packing and unpacking boxes, loading and unloading, switching utilities, meeting new neighbors – all of it takes a toll on a person. If not for the benefit at the other end, who would sign up for it?

But what if there was a product that did it for you? Just drop it into your current residence, go to bed, and wake up in the new location. **Everything is moved and everything is in place – no disruption to your life!** Unfortunately, there is no such product for moving one's home. But a company called Rainfinity has developed something like this for moving data.

**The product is called *RainStorage*, and it is designed to move data quickly and non-disruptively in heterogeneous file server and NAS environments.** It uses the standard NFS (Unix) and CIFS (Windows) protocols to moves files between devices while maintaining data access. The RainStorage appliance is only in-band during the copy process; otherwise, it sits on the sidelines and has no affect on network performance or availability. Data integrity is maintained during the copy process, even if the transaction fails.

Furthermore, both installation and de-installation are fairly easy. The appliance attaches to the LAN and uses temporary VLANs to perform data migrations. It does not require configuration changes on clients, servers, or storage devices. **RainStorage is a targeted solution that enhances, not replaces, existing infrastructure.**

This product is useful for a number of functions, including storage consolidating, performance tuning/load balancing, and data re-purposing. It benefits enterprises by performing these tasks in a non-intrusive way that does not disrupt data availability. **This eliminates downtime for applications and users and, therefore, helps improve productivity.**

The status quo for data migration is complex, stressful, and disruptive. **Rainfinity offers a solution that can make data migration a normal, useful, and non-disruptive part of storage management.** Read on for details.

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## Drivers of Data Migration

The phrase *data migration* can make IT administrators wince. “It’s a dirty job, but somebody has to do it,” they might say. The process of moving data from one storage device to another can involve many hours of careful planning, many hours of application downtime, and many hours of stress knowing that a wrong move could put mission-critical data at risk. **It is disruptive and user-unfriendly, which conflicts with the needs of our 24 x 7 business world.** It is also no coincidence that so many vendors and system integrators offer data migration services – many IT administrators would just assume pay an expert to tackle this tricky task.

So, why do it? Why not just leave the data where it is? In fact, there are a number of good reasons for data migration/movement:

- **Storage consolidation** – Consolidating data onto fewer storage systems improves resource utilization, simplifies management, and lowers storage costs. Runaway procurement policies, mergers and acquisitions, or a general effort to streamline operations can drive consolidation.
- **Performance tuning** – Application- and user-response times are optimized when the data is load-balanced across storage systems. If one is overburdened and another is underutilized, targeted data movement can correct the situation.
- **Re-purposing data** – Testing a new application or loading a data warehouse requires re-purposing production data without comprising its integrity and availability. Copying data to other devices may be a part of this process.
- **Data protection** – Replication and remoteness are two important ingredients for protecting data. Backup, recovery, mirroring, electronic vaulting, and so forth involve data movement.
- **Lifecycle data management** – Migrating data between different price/performance tiers of storage as its value changes over time is the essence of lifecycle data

management. This helps minimize storage costs while keeping data accessible for business and regulatory purposes.<sup>1</sup>

- **Remote caching** – Copying and caching enterprise data at remote locations can improve user-response times and manage network loads in a geographically-dispersed organization.

These functions have at least three things in common: (1) They help improve storage service levels while minimizing costs, (2) they are growing trends, and (3) data movement underpins them. The implication is that data movement will become more necessary and common – as these trends play out and as the technologies to implement them mature. **If the storage industry will realize its vision of a brighter future, data movement must be less painful and disruptive than it often is today.** It must be easier and more transparent.

## RainStorage – The Data Migration Catalyst

In response to this need, Rainfinity has developed **the RainStorage appliance, a solution for fast, non-disruptive data migration among file servers and network-attached storage (NAS) appliances.** It supports any file server that uses the standard NFS (Unix) and CIFS (Windows) protocols, even heterogeneous devices. It is designed for fast installation and de-installation in existing environments and does not require configuration changes or software uploads to clients, servers, or storage devices. So it is virtually plug-and-play.

**Think of RainStorage as a data migration catalyst.** By definition, a catalyst is an agent that accelerates a process without being consumed by it. For instance,

<sup>1</sup> For an in-depth discussion, see *Tiered Storage Classes Save Money – Getting The Most Out Of Your Storage Infrastructure* in **The Clipper Group Explorer** dated August 29, 2002, at [www.clipper.com/research/TCG2002030.pdf](http://www.clipper.com/research/TCG2002030.pdf).

catalysts make car engines burn more efficiently and detergents clean clothes more fully. They engage in the process, work their magic, and then become available for reuse. This is similar to how RainStorage works. The appliance attaches to the LAN and only steps into the data path for as long as it takes to perform a copy and remap/remount clients to point to the destination file server. Meanwhile, clients can still access files during the process. Once complete, the appliance returns out of band and does not affect network traffic. (See box at right for details.)

**RainStorage is useful for storage consolidation, performance tuning, and re-purposing data, as mentioned above.** It can also be used for data protection, lifecycle data management, and remote caching, though realistically Rainfinity would have to add intelligence and/or interoperability with third-party software to perform these functions in an automated fashion (look for such enhancements in the future).

The appliance itself consists of the RainStorage software running on a hardened Linux server with Intel processors, 4 Gigabit Ethernet ports, 2 Fast Ethernet ports, dual power supplies, dual disk drives, and battery-backed write cache. It can also be configured in two-node clusters for higher availability. For device management, it offers a Web-based graphical user interface (GUI) as well as a command line interface (CLI). The list price is \$80,000 per appliance.

### Benefits to the Business

The benefits this product offers fall into two categories:

- **Things you would do anyway, though at greater cost or amount of downtime, and**
- **Things you would not otherwise do, which the appliance enables.**

It is important to differentiate between them because the return on investment (ROI) calculation is different. In the first case,

### RainStorage Migration Process

**The RainStorage appliance temporarily inserts itself in-band to perform data migration.** The administrator establishes a private VLAN, or Virtual LAN, that includes the appliance and the source and destination file servers. (Alternatively, one can physically disconnect file servers from the LAN and attach them directly to the appliance.) The appliance then copies the specified volume, qtree, or directory from the source to the destination using standard NFS or CIFS commands.

**When clients access files during this time, the appliance intercepts the traffic and directs it toward one or both file servers, depending on whether it has been copied yet.** In this way, RainStorage maintains data integrity across both file servers while providing non-disruptive client access. Even if the copy transaction fails partway through, no data is lost and clients can access files as they did originally from the source file server.

**After the copy is complete, the RainStorage appliance directs access to the destination file server while the administrator updates the mount points or network shares on clients.** (Unix *automount* or Windows *DFS* can help automate this task.) Once complete, the administrator or an automated process can reconfigure the VLAN and remove the appliance from the data path. Clients access files directly on the destination file server, and the source is freed up for other purposes.

**From a client perspective, data access is seamless up until updating the mount points or shares.** Rainfinity touts “multi-gigabit throughput” during the copy process, which translates to higher-than-normal latency but probably acceptable for most applications, especially in light of the alternative – no access. Total throughput per appliance is in the range of 20,000 IOPS.

compare the cost of RainStorage versus the cost of the alternative plus the amount of application downtime associated with it. The ROI, to a large degree, may depend on the value to your enterprise of the downtime avoided. Savings on professional services or the time of IT administrators may also be significant.

The second case involves a comparison between the value of the activity enabled versus the cost of RainStorage. For instance, you may want to use the appliance to periodically consolidate data in order to increase utilization of NAS appliances and defer additional storage purchases. To get the ROI, take the value of incrementally-utilized storage (over time) and subtract the cost of acquiring and operating the RainStorage appliance. If the appliance will serve multiple purposes, be sure to spread its cost over all benefit areas.

The point here is not to get lost in the math but to show how the product can have a tangible, quantifiable benefit. **Targeted, discrete solutions like RainStorage are easier to justify to management, especially in these economically uncertain times.** In contrast to major infrastructure upgrades that involve large investments in time, money, and risk, **the RainStorage solution:**

- **Solves a specific, perceived problem,**
- **Enhances existing infrastructure instead of replacing it, and**
- **Offers fast deployment and more immediate ROI.**

**It is less risky, less disruptive, and more palatable decision for executives focused on near-term cost cuts to achieve profitability, though it can still deliver long-term benefits.**

## Conclusion

**Ideally, data migration should be uneventful, not an *event*.** It should be simple and straightforward, not a big hassle. It should also be commonplace because data movement enables many advanced storage functions that improve service levels while

keeping down costs.

Rainfinity takes a big step in the right direction with its RainStorage appliance. **If you want a do-it-yourself solution for non-disruptive file movement, consider RainStorage. Though a specific migration problem may prompt the initial interest, think broadly about how you might use the appliance to better manage storage in your data center.**



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