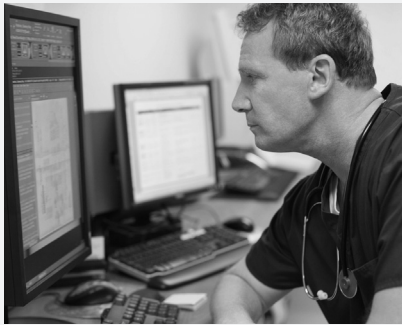


## Healthcare provider gains centralized management control over diverse backup environments



### Challenges

- Rapid data growth increasing backup windows
- Frequent backup failures
- Incompatibility among different tape drives and backup systems

### Solution

- EMC Avamar deduplication backup software and system
- EMC NetWorker solution for centralized management of traditional and deduplicated backup and recovery
- VMware ESX Server virtualization solution

### Key benefits

- 120:1 data deduplication ratio for Epic database
- Daily full backups reduced from 12-14 hours to four hours
- Epic database restores shrunk from days to seven to eight hours
- Lower TCO due to reduced backup storage and streamlined administration

Aspirus is a non-profit network of five hospitals, 35 clinics, and other healthcare facilities with 4,200 employees. The healthcare network provides one of the nation's best cardiovascular programs as well as advanced cancer, trauma, women's health, spine, and neurological care, among other medical services.

Based in Wausau, Wisconsin, Aspirus has rapidly accumulated more data as they've acquired hospitals, opened new clinics, and rolled out an Epic electronic medical records (EMR) solution. Data backup and recovery in particular was becoming a pain point since backup datasets were growing so fast. Aspirus tried several backup and data deduplication solutions, such as ExaGrid, Symantec NetBackup, and CommVault, but none of them satisfied their demanding backup requirements.

Tom Whalen, Aspirus' IT Server and Storage Infrastructure team leader, explains, "When our new EMR system started driving a lot more data into our infrastructure, we began endlessly struggling with growing backup windows and backup failures. In worst cases, our backups were taking 19 hours. We brought in multiple backup and deduplication systems, but they couldn't keep up with our data growth rates."

"We also were dealing with incompatibilities among different tape drives and backup systems, so when our backups did complete, we couldn't trust that they were accurate. With doctors and nurses tapping into our systems all day and night to help take care of patients, the risk of not being able to restore lost or corrupted data wasn't even close to acceptable."

### EMC NETWORKER AND AVAMAR INTEGRATED BACKUP AND RECOVERY SOLUTION TREAT DATA GROWTH PAINS

Aspirus decided it needed to implement a more reliable, efficient, backup and recovery process. After engaging EMC® Global Services to assess its backup and recovery requirements, Aspirus selected an integrated solution with EMC NetWorker® and EMC Avamar®. EMC Global Services also assisted Aspirus with design and implementation of the solution.

Aspirus selected NetWorker due to its ability to centrally manage Avamar as well their other tape, disk-based backup and non-EMC data deduplication solutions, which are used to protect medium-critical applications. See Figure 1.

By using the integrated NetWorker/Avamar client, Aspirus could also leverage deduplication for backup of their most critical applications including Epic, Sectra PACS radiology and cardiology imaging, Microsoft® Exchange® and SQL® Servers across physical and VMware® Servers. NetWorker was able to provide a single screen for managing deduplicated and traditional backups.

Aspirus' application data is stored on a multi-tiered EMC storage infrastructure that includes EMC CLARiiON® CX3 and CX4 networked storage, EMC Celerra® networked-attached storage and EMC Centera® content-addressed storage.

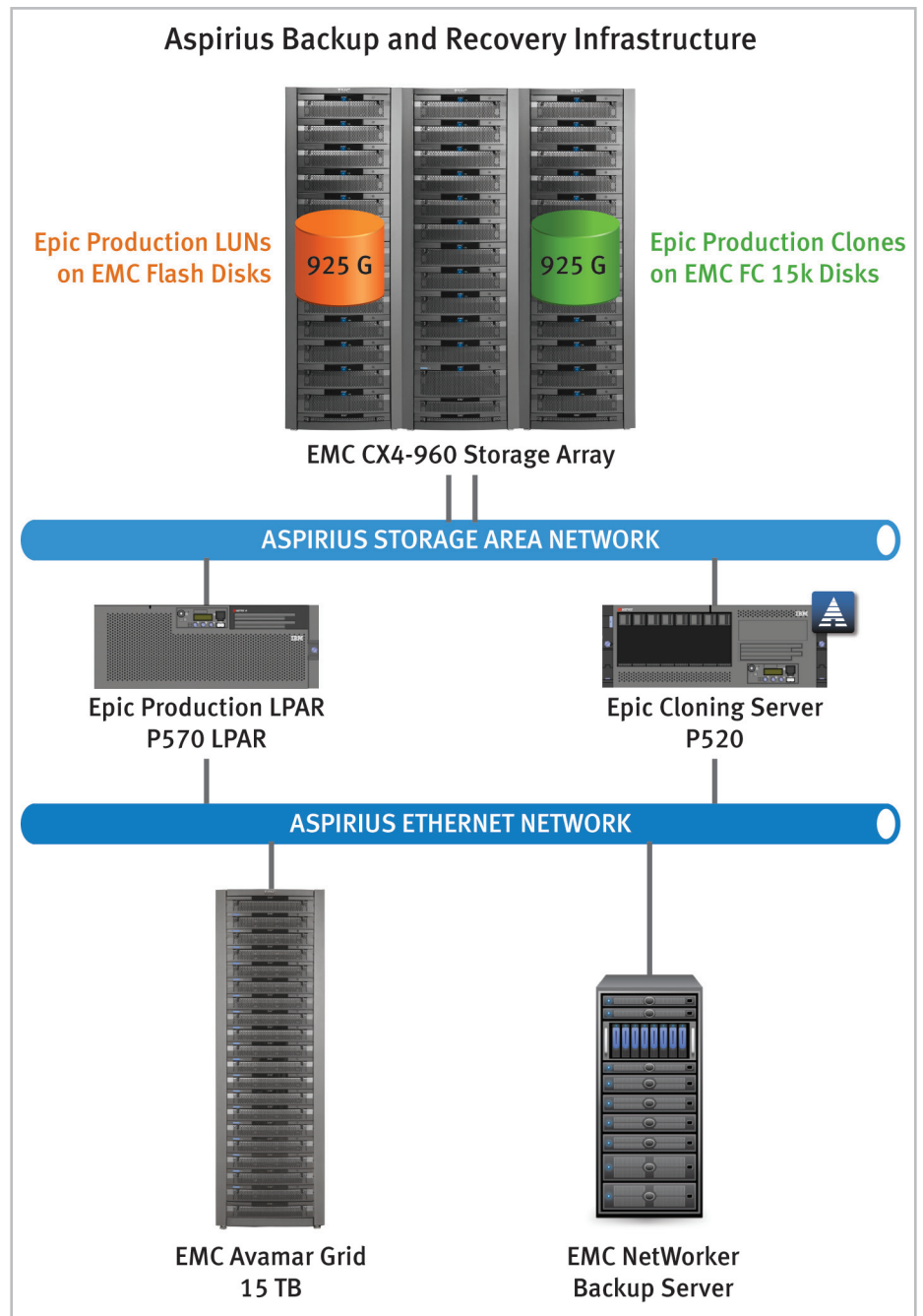


Figure 1. Aspirus Backup and Recovery Infrastructure

## REGAINING CONTROL OVER GROWING BACKUP WINDOWS

After deploying the EMC backup and recovery solution, Aspirus noticed immediate improvements in backup performance, reliability, and management.

Previously, Aspirus used ExaGrid to deduplicate backup data after it has been transmitted to a storage grid. With Exagrid, Aspirus was sending nearly a terabyte of data over the network nightly, which was degrading performance of other applications.

By using NetWorker with Avamar, Aspirus can deduplicate data at the client before it is backed up. Aspirus now transmits only sub-file, changed data across the network to Avamar Data Stores. Since implementing this solution, Aspirus has achieved a deduplication ratio of 120:1 based on nightly full backups of its one-terabyte Epic environment, compared to traditional approaches.

“On our first backup with Avamar, our backup windows went from typically 12-14 hours to six hours—a window we hadn’t seen for years. We were shocked,” says Whalen.

“As Avamar’s data deduplication kicked in over several days,” explains Whalen, “our backup windows shrunk to just four hours. In some cases, our backups are completing in minutes versus one to two hours. Avamar and NetWorker by far provide the finest backup process we’ve ever seen.” See Figure 2.

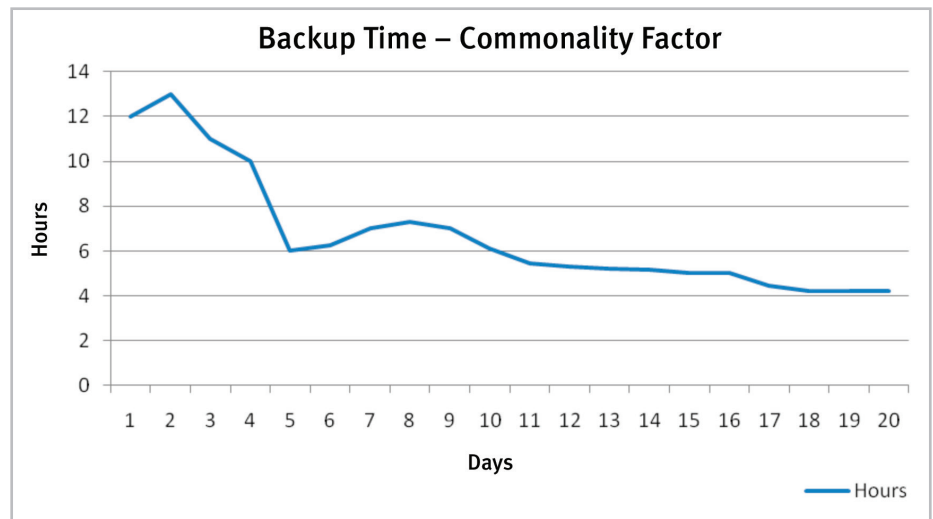


Figure 2. Backup Time – Avamar Deduplication

## SLASHING RESTORE TIMEFRAMES

Because each Epic cache database instance is typically based on multiple file systems, single-threaded restore was taking too long to complete. To decrease restore timeframes, Aspirus used NetWorker to launch multiple restore processes against each file system.

“By simulating multi-threaded restores with NetWorker,” says Whalen, “we leveraged the full horsepower of our Avamar and network infrastructure. Our Epic database RTO (recovery time objective) was cut from 24-48 hours in a tape environment to as little as seven to eight hours. Plus, every restore has passed Epic integrity tests, which is critical in our clinical environment.”

Aspirus also has determined that rebalancing its Epic file systems so they are similar in size will contribute to faster restores. Aspirus projects it will be able to reduce time to restore Epic database instances to six to six and a half hours—even with 10-20 percent growth of its file systems.

## LOW TCO WITH BETTER BACKUP EFFICIENCY

Aspirus credits NetWorker and Avamar with lowering total cost of ownership (TCO) due to reduced backup storage requirements and streamlined backup administration.

Whalen notes, “Because we’ve reduced our backup windows by nearly 90 percent, we’re spending less on backup capacity and leveraging our storage investments for longer periods of time. Avamar’s client-based data deduplication has also meant there’s less data moving across our network, so we maintain high performance without purchasing additional bandwidth.”

Without Avamar deduplication, Aspirus estimates it would need 21 tapes to store nearly five terabytes. Instead, Aspirus uses just 900 GB of backup storage for longer retention of daily (logical) full backups.

“Avamar does an incredible job deduplicating data from our largest and most critical backups,” says Whalen. So, we gain the ability to realistically preserve mission-critical data for longer periods of time without the high costs and reliability issues with maintaining that same data on tape.”

## STREAMLINED BACKUP ADMINISTRATION

Aspirus' IT staff spends significantly less time administering backups," says Whalen. "With NetWorker as our bridge," we centrally manage all of our backups across UNIX, Microsoft® Windows®, Oracle, cache, Exchange, or unstructured file systems and no longer have to deal with incompatibility or integration issues. We also can leverage our prior investments in other backup systems until we're ready to migrate them over to our Avamar Data Store."

Dramatic improvements in backup reliability have also streamlined backup administration. Since deploying the EMC solution, Aspirus hasn't missed a single backup and restore request.

Whalen says, "Our server administrator used to spend four to six hours daily watching over backups, restarting them, and fixing problems. Now that our backups are stable, he's gotten his real job back and focuses on more meaningful activities, such as care and feeding of our infrastructure. The great thing is that we're managing backups with NetWorker and Avamar instead of the backups managing us."

## POISED FOR CONTINUED DATA GROWTH

Even with data deduplication, Aspirus is still preparing for ongoing data growth. Aspirus knows that they can scale their EMC solution through both NetWorker and Avamar. NetWorker is designed to be highly scalable and the Avamar RAIN (redundant array of independent nodes) architecture enables Aspirus to easily absorb greater backup datasets while continuing to keep backup windows under control.

"Our data growth rate is very unpredictable with peaks and valleys," notes Whalen. "Once, we added 10 new clinics in a short of period time and our datasets increased exponentially. Our EMC backup solutions react very well to sudden data growth and without any performance or reliability issues. It's a level of confidence and flexibility a clinical environment like ours must have.

"After trying so many solutions, I had asked EMC to recommend the last backup solution I would ever need. I've finally found a solution for today and well into our future with Avamar and NetWorker."

### TAKE THE NEXT STEP

To learn how EMC products, services, and solutions help solve your business and IT challenges, contact your local representative or authorized reseller—or visit us at [www.EMC.com](http://www.EMC.com).

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