

# **AUTOMAID<sup>®</sup>** **TECHNICAL BRIEF**

As IT administrators look to reduce space and power consumption, the storage system is a natural place to find that savings. Nexsan E-Series™ disk arrays with built-in AutoMAID® power management technology offer 60 disks in 4U while saving up to 87% on energy and cooling.

## INTRODUCTION

With ever-increasing volumes of data, IT departments are looking for storage systems that minimize both the rack space required and power and cooling expenses. Buildings with infrastructures designed 10 years ago are now reaching their limits on what they can support with power and cooling ranking among the top concerns of new datacenters.

Nexsan is the industry leader in both of these areas. AutoMAID® power management technology, built in to the E-Series disk arrays, can save up to 87% on power and cooling bills, as explained in this paper.

## BEST USAGE SCENARIOS

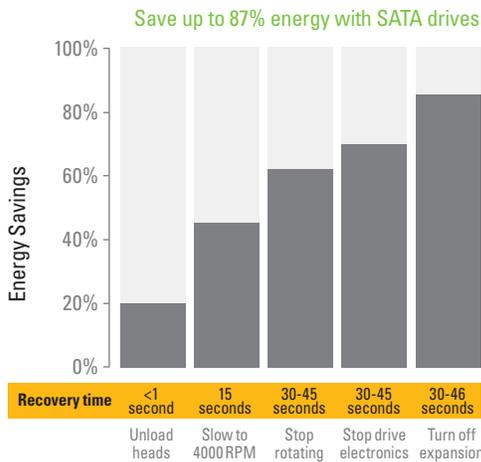
AutoMAID allows the administrator to define policies that place drives into progressively lower power states based on disk activity. In a typical disk array, there may be several RAID disk sets. The AutoMAID power management policy is per RAID set, not necessarily across all of the drives in the storage system. AutoMAID policies are based on the time of day, day of the week, and amount of time elapsed since the last access to the disk set. A true “set and forget” setting, AutoMAID allows the administrator to define the policies that will allow for the least disruption to productivity by users. If a Nexsan storage system is not idle, AutoMAID does not kick in; only when RAID sets hit policy limits on inactivity does AutoMAID begin to progressively transition to lower power usage.

One common use for AutoMAID is for backup to disk. At 10PM the backups start, and all drives are running at full speed to complete the nightly backup as quickly as possible. But at 7AM the backups are done, and that RAID disk set will not be accessed for another 15 hours. So a policy is set that says if none of the disks are accessed for 30 minutes, go into a power savings state. Then at 10PM the first write takes about 30 seconds longer than usual, then the entire disk set runs at full speed while backups are being performed.

Another common use is when large scientific projects are being stored. Perhaps the scientists are working on the Mars data, and the Moon data is sitting idle. This is the ideal time for AutoMAID to spin down the RAID disk set housing the moon data until the Moon it is accessed again. The nice thing about AutoMAID is that the policies are easy to set up and change. Users and applications are unaware of the power efficiencies that are occurring. If a set of disks is being actively accessed, they will stay running at full speed for all users. It couldn't be simpler or more effective.

## IDEAL FOR BACKUP-TO-DISK AND BULK STORAGE APPLICATIONS

### AUTOMAID<sup>®</sup> INDUSTRY-LEADING POWER EFFICIENCY



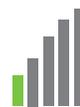
Lastly in video surveillance, the storage system can be configured with 7 RAID disk sets, one for each day of the week. In this configuration only one RAID disk set needs to be powered up at any given time to accept that day's data, resulting in startling power savings. Of course all drives are accessible as needed, should someone wish to view or process the video captured on prior days.

### TECHNICAL DETAILS

There are 5 levels of power savings that AutoMAID supports in the E-Series:



Efficiency



#### Level 1:

Heads parked/unloaded  
Sub-second recovery time  
About 15% to 20% savings



Efficiency



#### Level 2:

Heads unloaded (slows to 4000 RPM)  
15 second recovery time  
About 35% to 45% savings



Efficiency



#### Level 3:

Stops spinning (sleep mode; powered on)  
30 to 45 second recovery time  
About 60% to 65% savings



Efficiency



#### Level 4:

Stops drive electronics  
30 to 45 second recovery time  
About 70% savings



Efficiency



#### Level 5:

Turn off E60X expansion enclosure  
30 to 46 second recovery time  
About 87% savings with SATA  
About 92% savings with 15K SAS



Caltech uses AutoMAID level 1 and level 2 to maximize the performance versus savings tradeoffs.”

**EUGEN HACOPIANS**

SENIOR SYSTEMS ENGINEER  
CALTECH

- One of the largest leading independent storage system companies
- Over 33,000 systems and 11,000 customers worldwide
- A full suite of Unified, Hybrid, SAN, NAS and Cloud storage
- 100% channel model with over 600 resellers worldwide
- 96% customer satisfaction

**CASE STUDY**

California Institute of Technology (Caltech) & NASA's JPL Caltech hosts around 2.5PB of astronomy imaging data for the Jet Propulsion Laboratory for NASA, of which about 99% is on Nexsan's disk arrays according to Eugene Hacopians, a senior systems engineer at Caltech.

To cut energy costs on some 3,000 spinning disks, Hacopians noted, "...Caltech uses AutoMAID level 1 and level 2 to maximize the performance versus savings tradeoffs."

Caltech uses their Nexsan storage systems on AutoMAID level 1 by setting up an AutoMAID policy to retract heads after five minutes of no activity. By doing so, Caltech saves 20% on their energy costs. Caltech also has a policy that after 2 hours of non-activity, AutoMAID level 2 is activated. With AutoMAID level 2, in addition to the heads being retracted, the drive slows the rotation speed of the platters from 7,200 RPM to 4,000 RPM. This results in a 40% savings in energy. Combining the inherently energy efficient disk array with the savings of AutoMAID provides impressive energy consumption and cost savings<sup>1</sup>.

**ABOUT NEXSAN**

Nexsan® is a leading provider of innovative data storage systems with over 11,000 customers worldwide. Nexsan's pioneering Hybrid Storage systems combine solid-state technologies, disk storage and advanced software to deliver radically new levels of performance and capacity at lower cost. The company's advanced technologies enable organizations to optimize traditional, virtual and cloud computing environments for increased productivity and business agility. With more than 33,000 systems deployed since 1999, the company delivers its data storage systems through a worldwide network of cloud service providers, value-added resellers and solution integrators. Nexsan is based in Thousand Oaks, Calif. For more information, visit [www.nexsan.com](http://www.nexsan.com).

<sup>1</sup> Source: Wikibon Peer Incite Webcast entitled, "Petabyte Explosion: How Caltech Manages to Manage Billions of Files"