

Case Study Open-E NAS



Bar Ilan University

Only an hour's drive away from Jerusalem is the fully networked **Bar Ilan University**. The Open-E NAS Enterprise software offers both students and professors as well as other staff online access to data managed centrally via Active Directory Services.



Open-E NAS – the economic alternative

With almost 32,000 members, approximately 17,000 of them students, the **Bar Ilan University** is by far the largest educational institution in Israel. Under its motto "*The beginning of wisdom is the fear of the lord*" it strives to combine tradition with modernity. Therefore it offers its members not only profound spiritual teaching, but also state-of-the-art research facilities and an IT infrastructure that is unparalleled in higher education worldwide. The **Bar Ilan University** handles its steadily increasing storage requirements - 1,500 new students enrol at the university each year – with the help of storage servers based on Open-E NAS Enterprise Software.



The Hebrew equivalents of the initials B and I in the logo of the **Bar Ilan University** form the shape of a microscope. This logo also serves as a symbol for the Faculty of Life Sciences, which led the way in developing the university's IT infrastructure.

Rule-based Utilisation of Resources

- The **Bar Ilan University** organises all network resources for its 32,000 employees and students using the Active Directory Services of a Microsoft Server 2000 system. The network, which covers the entire campus, consists of a Fast Ethernet backbone with switches in all buildings, and in some instances on their individual floors.
- While the university network is managed by a central data centre, responsibility for the IT infrastructure of the individual faculties lies with independent „Organisational Units“ (OUs)– this also applies to the Faculty of Life Sciences, which is equipped with, among other things, state-of-the-art Zeiss laser microscopes that can produce enormous amounts of data.
- The data centre of this Life Sciences department is managed by Daniel Tuchinsky, who grew up in Staten Island, New York, and worked as a professional scroll writer in Israel for 15 years before training as a Microsoft Certified Systems Engineer to join the **Bar Ilan University** after his graduation in 2001.

The **Bar Ilan University** celebrated its 50th birthday in 2005.



Case Study Open-E NAS

The microscope department was the first OU to use a Windows 2000 domain for networking. *"We had to organise students' access to the microscope very precisely", explains Tuchinsky, "and clearly logging students' activities was of great importance to us. To save us doing the same work twice, we wanted to use the group policies of the university-wide network's Active Directory Services for that purpose too."*



Daniel Tuchinsky manages the data centre of the Faculty of Life Sciences at the **Bar Ilan University** in Tel Aviv, Israel. He relies on Open-E NAS Enterprise as the most economic option for Network Attached Storage.



The microscopy unit of the Faculty of Life Sciences has been leading the way in the development of a NAS-supported storage network.

In a first step, ten workstations in the microscopy department of the Faculty of Life Sciences were networked in a Windows 2000 domain; then four lecture theatres for 1st and 2nd degree Bachelor students and for doctoral candidates, one of them combined with a laboratory, followed. *"We also plan to include the library in the domain, and will be adhering to the idea of group policies throughout",* says Tuchinsky.

Wanted: NAS without Windows or NetApp

The 120 gigabytes of storage space that the Windows 2000 server of the Life Sciences domain offered users for file sharing was soon nowhere near sufficient to meet the various requirements of the students. *"We needed a NAS",* explains Daniel Tuchinsky.

After extensively investigating the various options, Tuchinsky had considered purchasing another IBM SCSI solution based on a Windows 2000 server, but the disadvantages soon became apparent:

- The overhead of the many Windows services running in the background.
- The amount of special software needed for maintenance and for security options such as virus protection, which requires a huge effort but nonetheless does not eliminate the danger of attacks by hackers.

"So why should I buy a Windows server when all I need is a storage server!" says Tuchinsky. *"As the Active Directory Services were already set up, all we needed was a storage device that could be operated with minimal administrative effort."*

A storage solution by Network Appliance would also have met Tuchinsky's requirements, *"but at a cost of approximately 35,000 US\$ for five to seven terabytes we felt that NetApp was far too expensive."*

"Take the Open-E from Germany!"

In his quest for a better solution, Tuchinsky sought advice from a MIS colleague who was evaluating Open-E NAS Enterprise for use at a large insurance company at the time. His recommendation: *"Go for Open-E NAS from Germany!"* It was, he claimed, the most extraordinary NAS solution he had ever come across.



The university's IT administrators are briefed on the possibilities and advantages of using Open-E NAS software.

Open-E NAS Enterprise

- The university's requirements regarding capacity, performance and inherent security were met by a NAS machine with hard drives, organised as a RAID 5 array with a hot spare. The aim was an available storage capacity of between seven and ten terabytes. Due to the high fluctuation in students' home accounts, performance considerations meant that only an SCSI solution was feasible for this requirements profile.
- So in November 2004 the Bar Ilan University ordered an accordingly equipped NAS machine from the largest Israeli distributor, for which Arda, the Open-E importer in Israel, supplied the network operating system and server software in the form of an Open-E NAS Enterprise Module.



EastLogic supplied the hardware platform, in which an Open-E NAS Enterprise Module inserted into the primary IDE slot of the motherboard connects two RAID controllers and 12 hard drives of 146 gigabytes each to create a high-performance, secure and affordable storage server.



The Open-E NAS Enterprise Module includes all the necessary software for a high-performance, secure, affordable and scaleable NAS system for heterogeneous network environments with Windows, Linux, UNIX and Apple clients.

- The core of the machine is an Open-E NAS Enterprise Module. The hardware platform consists of
 - a GHI-480SCSI casing by Guanshing,
 - an SE7210TP1-E motherboard by Intel,
 - two RAID controllers by LSI Logic and
 - twelve SCSI hard drives by Hitachi, of which four are defined as hot spare or data backup drives.
 - At approximately 9,000 US\$, the machine costs a fraction of the price of a comparable NetApp product.
- The data backup mechanism is configured as a manual snapshot; both an internal drive and an external drive connected via USB 2 can be used.

NAS Requirements Profile

Quota and security group policy inheritance is the most urgent requirement for Tuchinsky. *"Storage without quotas is useless! Quotas and security group policies prevent abuse of network resources and disk storage space."* So he drew up a NAS requirements profile that contained the following points:

- Integration with ADS, particularly important: inheriting quotas and security group policies from the Active Directory! Reason: This functionality is not available in Windows 2003 Storage Server! So all that work would have to be done manually for every single user account.
- A file system based on NFS permissions and CFS/SMB (SAMBA).
- The ability to establish secure external SFTP connections to the NAS using SSL clients, in order to allow lecturers and students to access their files from outside the university.
- An affordable price.
- An integrated mechanism for data replication.

Data backup requirements profile

With regard to data replication, Daniel Tuchinsky was adamant that he wanted an internal solution directly on the NAS machine so that no additional external servers would be necessary:

- We don't need a history (for replication).
- We didn't want tapes (for data backup).
- We only have to back up the current data.
- We wanted as little downtime as possible (during backup and restore).
- We wanted to perform the backup within the NAS machine with removable hard drives.
- We need a full, incremental backup (where the files are basically open).
- We needed a simple recovery mechanism.

Professional ADS Integration

- After starting up the brand-new Open-E NAS machine, which took less than an hour including mounting it into the 19-inch rack, Daniel Tuchinsky, master of group policies, got down to the important part - integrating it into the Active Directory Services of the Windows 2000 domain.
- He had to enable controlled access to the resources of the Open-E NAS machine not only for the approximately 3,000 clients of the Organisational Unit (OU) of the Faculty of Life Sciences, but basically for all university employees and students. But the Active Directory of 32,000 clients, printers and other network resources is a pretty extensive database. Therefore it took quite a while to replicate its substantial amount of data into the Open-E NAS module – a design issue caused by the low write speed of flash storage.
- “We needed a customer-specific customisation of the Open-E software to our situation”, remembers Daniel Tuchinsky – and he was to receive it promptly. Open-E sent engineers to Tel Aviv to meet Daniel Tuchinsky’s challenge: “The solution we wanted had to be able to search the entire ADS database of the Bar Ilan University.”*



The Open-E NAS is connected to the campus-wide network of the Bar Ilan University by Fast Ethernet.

- Considering the substantial advantages of the Flash solution, Daniel Tuchinsky didn’t mind that reading in the Active Directory data for the first time took a while, but the delays in group policy management in everyday use were unacceptable. *“It simply took the Open-E GUI too long to display the groups.”*

Open-E NAS Case Study

Conclusion: The Open-E NAS Enterprise software is the most economic alternative the storage market has to offer for Network Attached Storage. It covers the filing requirements of even large companies with thousands of employees; in addition it integrates seamlessly into their organisational structures thanks to its integrative abilities and scalability, and thus saves additional administrative costs on a large scale.

Open-E Edit – an integral component of version 1.7

- So in only a few weeks Open-E developed a caching mechanism that dramatically speeded up access to the data in the Active Directory, and implemented it, with support from EastLogic Field Application Engineers and distributor Arda, on the NAS of the Bar Ilan University in Tel Aviv.
- “In the end, Open-E gave us a search bar”, says Tuchinsky happily. “The three months from November to January seemed like an on-site beta test to me. But in the end I was very impressed that Open-E was able to provide a solution to the problem in such a short time.”*
- “The newly developed features are critical to all medium and large businesses”, states Tuchinsky, who has since had no problems adapting „his“ Open-E NAS to the organisational requirements of daily university operation, although the Bar Ilan University’s Active Directory grows by more than 1,500 objects a year.*
- And his example is catching on: He has already ordered the next Open-E NAS machine for another OU – this time based on SATA disks, because there are no students to cause high fluctuations in the data inventory there. *“When it comes to assigning the costs of procuring and operating IT resources in a large organisation such as our university with its many cost centres, it’s often better to use a second machine than to share one between several OUs”, reasons Tuchinsky. Low procurement and especially operating costs are however a prerequisite for this philosophy to work. “I can see myself purchasing several more of them.”*

open-e

Open-E GmbH
Lindberghstraße 5
D-82178 Puchheim, Germany

Tel.: +49 (89) 800777-0
Fax: +49 (89) 800777-17
<http://www.open-e.com>