HELIOS

Mac OS X Server migration to a HELIOS server – White Paper

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1.1 Introduction

The Apple Xserve product line was discontinued by Apple as of January 31, 2011. Current and prospective users are now considering future alternatives.

How can they continue to get the benefits of the Xserve, while gaining additional power, efficiency, and features?

Xserve servers offered a convenient 1U server hardware system, running the Mac OS X Server operating system. In this document, we show how to migrate and replicate the server services offered by Mac OS X, to a HELIOS server. Because HELIOS server solutions run on a broad range of server platforms, there is an excellent choice of hardware and OS options to replace the Xserve.

Mac OS X is a UNIX-based operating system. So for compatibility and ease of migration, when switching from a Mac OS X server, it makes sense to switch to another UNIX-based OS such as Solaris, AIX, or Linux, rather than a Windows server. UNIX has been around much longer as a server OS, and the competition between vendors gives rise to a good selection of offerings. Combine that with the multitude of UNIX server hardware options, and there should be good choices for every Xserve migration.

HELIOS Software first developed EtherShare, its Apple compatible file and print server, 20 years ago. Since then, it has been in continuous development and improvement. HELIOS EtherShare sets the standard for Mac client support on UNIX servers in mission-critical environments. EtherShare includes a

range of server services that replicate and are fully compatible with Apple technologies, such as AFP, Spotlight indexing and searches, Time Machine backup server, Bonjour server, etc. Furthermore, HELIOS server solutions bring additional advanced capabilities such as superior cross-platform client support (Mac/Windows/Web), server fail safety, and the HELIOS advanced printing system. All of this is easy to manage via the HELIOS Admin application (see 1.2.13 "Remote management").

HELIOS servers on UNIX offer the most complete, reliable, and easy to administer Xserve replacements, with the easiest transition for administrators, and a transparent change-over for end-users. This guide should help in the replacement selection and migration processes.

1.2   Services to migrate

Below is a list of all "Services" which are available in the Mac OS X Server "Server-Admin" tool, with their counterparts on a HELIOS server. Also listed are the OS services which are simply "switched on" via the Mac OS X Server "Server-Admin". We provide a migration description for these services, too.

1.2.1   AFP server

***Provided by* HELIOS EtherShare**

Migration to HELIOS EtherShare is the solution. EtherShare includes an AFP 3.2+ server which is very compatible with the Apple AFP service. The following need to be considered:

❍ *File system case-sensitivity*
   The Mac OS X HFS file system allows administrators to configure case-sensitivity, which will be honored by EtherShare. The Mac OS X Server

HFS is case-insensitive by default, other UNIX systems are mostly case-sensitive. EtherShare has worked case-sensitive on UNIX platforms for two decades, and we have not seen any problems.

❍ *UNIX permissions and HFS Access Control Lists (ACLs)*
Mac OS X HFS volumes and UNIX volumes support owner, group and mode file system permissions. HFS supports in addition HFS ACLs. These ACLs are not available on most UNIX systems and therefore EtherShare supports the standard UNIX permissions only. However, if the server file system supports additional permissions, e.g. ZFS or UFS ACLs, then these permissions will be honored by all HELIOS products. This means that, if available, ACLs defined on the server will be honored by EtherShare. Modifying ACLs from an AFP client workstation is not supported by EtherShare. More details are available in the EtherShare manual.

❍ *Spotlight Search*
HELIOS Base includes the HELIOS Index Server search system which is compatible with the Apple AFP Spotlight protocol. It indexes file names, text, and metadata, for Spotlight compatible searches for file names and content. More details are available in the HELIOS Index Server manual.

1.2.2   Backup support

Provided by HELIOS EtherShare

HELIOS EtherShare includes Mac OS X Time Machine support. It also adds additional **backup image tools** (see Fig. 1.1) and Time Machine backups observation.

❍ Archiware Backup is fully compatible with HELIOS servers, additional third-party backup solutions are available.
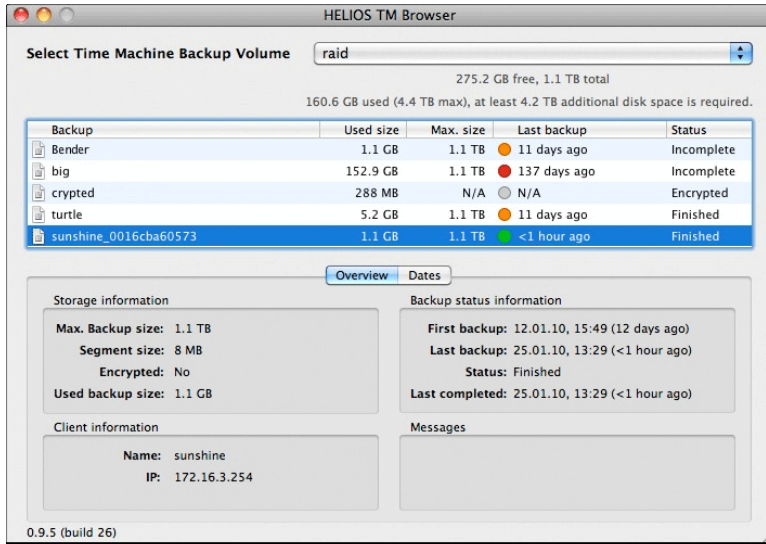
Fig. 1.1: HELIOS TM Browser

1.2.3   Bonjour server

***Provided by* HELIOS Base**

HELIOS Base is included with every HELIOS product, it includes an advanced Bonjour (mDNS) server as well as a Bonjour proxy server. It enables automatic discovery of servers, printers and other devices and services on networks. More details are available in the HELIOS Base manual.

1.2.4   DHCP server

***Provided by* HELIOS Base**

HELIOS Base is included with every HELIOS product, it adds an advanced DHCP server which provides TCP/IP configurations to Windows, Mac, and other network devices. The secondary DHCP server support allows a second HELIOS server to take over the DHCP service and configuration in case the main DHCP server fails. Find more details in the HELIOS Base manual.

1.2.5   DNS server

***Provided by* UNIX built-in services**

A DNS server is included within UNIX. The "named" is the standard DNS server used by most UNIX servers. The configuration must be done manually via its zones files. Please refer to the "named" configuration documentation for details. Additional DNS servers and configuration solutions are available from third parties.

1.2.6   File server data migration

This section describes several options to successfully migrate the OS X file server data to the new HELIOS server. A simple UNIX copy will not work because permissions, resource information, creation date and Finder info, such as color labels and Finder view, may get lost.

❍ *Copy files between the servers using a Mac client*
   The disadvantage is that this takes time and all owner and group system permissions are lost.

❍ *HELIOS Xtar backup into a tar archive*
   HELIOS offers a free enhanced "tar" backup tool which includes Mac

Finder info and resource information as well as UNIX permissions into a backup "tar" container file. Use the HELIOS included "htar" to restore the backup on the HELIOS server. The commands would be:

```
# cd /Volumes/Data/  # on the OS X Server
# xtar cf /Volumes/Backup/backupdata.tar .
#
# cd /Data/ # on the new server
# umask 0
# /usr/local/helios/bin/htar -xf /backup/backupdata.tar
```

HELIOS developed the "Xtar" tool for Mac OS X **with documentation and download information »**

❍ *Use a third-party backup solution*
   For example, Archiware backup is compatible with OS X server as well as with a HELIOS server. Therefore an Archiware backup can be done on a Mac OS X Server and restored into a HELIOS volume.

Note: None of the backup methods mentioned above will backup/restore ACL permissions.

Composite Unicode UTF-8 encoding is used for file names on HELIOS volumes. Additional Finder info and resource information for each file is stored in a subdirectory ".rsrc/<filename>". Windows file streams are stored in ".rsrc/filename:streamname". Documentation on the HELIOS "Resource/Data File Spec" is available **here**.

Once the data is migrated to a HELIOS volume, the HELIOS "dt" utilities offer UNIX compatible file management, e.g. "dt cp", "dt mv", "dt rm". This preserves metadata and file streams, and updates the Desktop database when doing command line based file management. Details on the "dt" utilities are described in the HELIOS Base manual.

1.2.7   Firewall

Provided by **HELIOS & UNIX built-in services**

All UNIX-based systems offer a software firewall. Please read the OS documentation.

OS	Command
AIX	genfilt
Solaris 10	ipf
Linux	iptables

HELIOS also includes a TCP port firewall on a per-service basis. These security settings can be specified in TCP/IP access lists via HELIOS Admin.

1.2.8   FTP server

Provided by **UNIX built-in services**

All UNIX-based platforms include an FTP server by default. More powerful remote file transfer and presentation of data for customers is offered by HELIOS WebShare. For security and ease of use reasons HELIOS recommends to use WebShare instead of FTP.

1.2.9   NetBoot

Provided by **HELIOS – details will follow**

The "Server Admin Tools" **are available from Apple**. They contain the "System Image Utility" which is needed to create the NetBoot disk image from the Mac OS X installation DVD. After the installation of the "Server Admin Tools" they are located in "/Applications/Server/". An updated migration help document will contain information on how to use NetBoot with a HELIOS server. We are working on a detailed description which will follow.

1.2.10   Open Directory

***Provided by* HELIOS Base**

The HELIOS services can use local users as well as network users via NIS, AD/PDC, LDAP, and Open Directory (see **HELIOS Authentication Server LDAP** for details about LDAP and Open Directory usage). It offers no server for these services but allows using them from the HELIOS server.

1.2.11   Print server

***Provided by* HELIOS EtherShare**

HELIOS Base includes a very sophisticated print server which is easy to use and administer via HELIOS Admin (see Fig. 1.2). The queuing system is LPR compatible and allows a variety of output options. More details are available in the HELIOS EtherShare and HELIOS Base manuals.
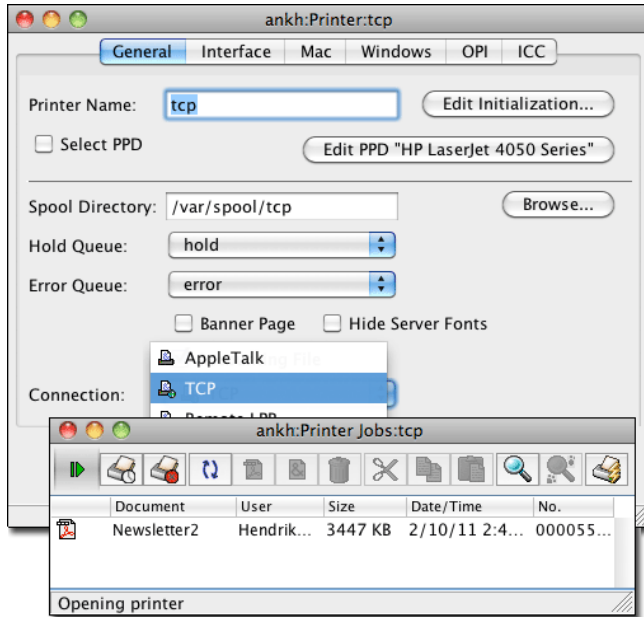
Fig. 1.2: HELIOS Admin printer settings/jobs

1.2.12   Remote login

Provided by **UNIX built-in services**

"rlogin" and "ssh" servers are available for all HELIOS supported UNIX platforms. Please refer to the OS vendor documentation and install the additional "ssh" server packages.

1.2.13   Remote management

***Provided by* HELIOS Base**

HELIOS Admin (Fig. 1.3) is a client application which allows easy adminis-
tration of the HELIOS software. Due to its Java-based design it can be used
cross-platform on Windows, Mac OS X, Linux and UNIX clients. Its GUI
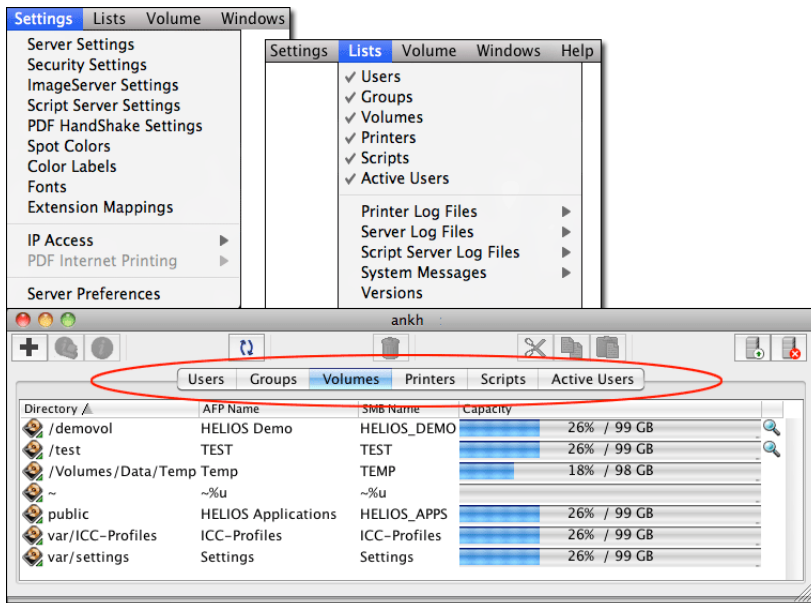supports four languages: English, French, German, and Japanese.

Fig. 1.3: HELIOS Admin

1.2.14   SMB/CIFS server

***Provided by* HELIOS PCShare**

HELIOS PCShare includes an SMB/CIFS server which is compatible with EtherShare volumes. It also supports Windows file streams and UNIX permissions, including a Windows Shell extension to view/change UNIX permissions. Spotlight searches are also supported on Windows clients using HELIOS PCShare.

1.2.15   Spotlight server

***Provided by* HELIOS Base**

The HELIOS UB2 release includes a Spotlight compatible Index Server service which can be enabled per volume (see Fig. 1.4). It is fully compatible with the Apple Spotlight properties and query language. Mac clients use it automatically via their mounted AFP volumes. Windows and Web clients can also perform Spotlight searches via PCShare and WebShare. Scripting solutions can use Spotlight searches via the HELIOS "dt" tools. The content indexing includes file names, text files, IPTC, XMP, and other image metadata information. PDF full-text indexing can be added via HELIOS PDF HandShake.

Note: Search results depend on the different metadata being indexed, some formats (Keynote, video, audio, etc.) are not supported by HELIOS Index Server. However, some properties such as XMP or PDF form fields are only supported by HELIOS Index Server. Additional indexing plug-ins can be developed by third parties.
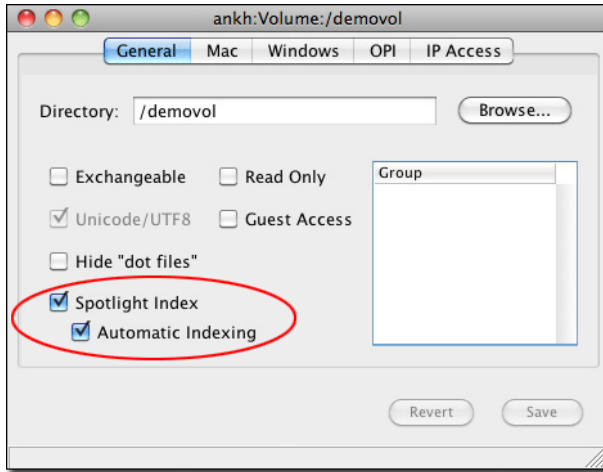
Fig. 1.4: HELIOS Admin Spotlight settings

1.2.16   Users & groups

***Provided by* HELIOS Base**

With HELIOS Admin the migration of users and groups from one server to another is a cinch:

➢ Install HELIOS Base on the Mac OS X Server.

➢ Use HELIOS Admin to log in on both the Mac OS X Server and the new HELIOS server.

➢ Drag & drop the local users and groups to the new HELIOS machine.

A new password must be assigned to each user. Migrate only real user accounts this way and omit all system accounts e.g. *sys*, *wheel*, *root*, *www*.

Network users (AD/PDC, NIS, OD) can be used from the HELIOS server, without the need to create them anew.

1.3 Services provided by the OS or via third-party solutions

1.3.1 Address Book/iCal

***Provided by* third-party solutions**

This service synchronizes contacts and calendars across the network, based on the CardDAV/CalDAV standard. There are several other implementations available, e.g. the Open Source **Calendar and Contacts server »**.

1.3.2 iChat

***Provided by* third-party solutions**

The iChat server is based on XMPP (also known as *Jabber*), the industry standard IM protocol. This enables support for Mac computers using iChat, as well as for other Jabber clients running on Windows PCs and iPhone.

1.3.3 Mail server

***Provided by* UNIX built-in services**

Every UNIX OS includes mail servers to accept and deliver e-mails (MTA, e.g. *Sendmail* or *Postfix*) as well as server programs to fetch e-mail from the server via POP3 or IMAP (MRA, e.g. *Cyrus IMAP*, *Courier Mail* or *Dovecot*). Configuration of the e-mail server can be a very complex task. Therefore, we recommend use of one of the commercial e-mail servers as an alternate solution.

1.3.4   Mobile Access

***Provided by* Internet access routers**

A service to provide secure access to Address Book, iCal, Mail, and Web services. The Internet access router normally provides a proxy for these services.

1.3.5   MySQL

***Provided by* third-party solutions**

MySQL Community Edition is a freely downloadable version of the world's most popular open source database that is supported by an active community of open source developers and enthusiasts. **MySQL download link »**

1.3.6   NAT (*Network Address Translation*)

***Provided by* OS or routers**

The NAT setup is a special case where only one network interface goes directly to the Internet, via a "public" IP address. All intranet nodes have "private" IP addresses. All network communications from the intranet to the Internet are routed to the NAT IP address, and the NAT server then forwards these requests to the Internet. Some UNIX OS's (Linux and OS X) offer NAT services. Most networks have dedicated DSL routers to do this job.

1.3.7   Network time server

***Provided by* UNIX built-in services**

A network time server is included in all UNIX-based operating systems. On AIX and Solaris it is called *xntpd*, on Linux *ntpd*. Please read the documentation for the setup.

1.3.8   NFS server

***Provided by* UNIX built-in services**

NFS services are included on all UNIX systems, read the documentation for setup details.

1.3.9   QuickTime streaming

***Provided by* third-party solutions**

QuickTime X streams audio and video. Alternatives include a free Darwin streaming server (see **dss.macosforge.org**) and the commercial Wowza Media server (see **www.wowzamedia.com**).

1.3.10   RADIUS (*Remote Authentication Dial-In User Service*)

***Provided by* third-party solutions**

RADIUS is an Internet Engineering Task Force (*IETF*) standard for centralized Authentication, Authorization, and Accounting (*AAA*) management for computers to connect to and use a network service. **List of RADIUS servers »**.

1.3.11   VPN

***Provided by* UNIX built-in services/third-party solutions**

VPN is usually done via external router devices. Some UNIX OS's offer a VPN solution, or a third-party solution can be used.

OS	Command
AIX	ikedb
Solaris 10	openconnect (third party)
Linux	vpnc, openconnect

1.3.12   Web server

Provided by **UNIX built-in services**

The Apache web server is included on Mac OS X Server, the same Apache web server is included with the UNIX complementary installation packages. Please read the vendor documentation for details. For Windows a separate download is needed. The main configuration file ("httpd.conf" or "apache2.conf") is compatible between OS X Server and other UNIX platforms running Apache.

Note: Verify that any additional Apache modules in use (e.g. Perl, PHP, Tomcat) are already included with the new Apache server. All modules are available or can be easily downloaded.

1.3.13   Wiki

Provided by **third-party solutions**

A Wiki-based intranet website where users can work in parallel on different pages. There are many different **Wiki packages available »**

1.4   Unavailable Services

1.4.1   Podcast Producer

Podcast Producer is a complete solution for encoding, publishing, and distributing podcasts.

1.4.2   Push notification

An iCal server addition which offers push notifications, for calendar changes.

1.4.3   Software update server

***Provided by* third-party solutions**

There is no software update server available from HELIOS. However, there are free solutions available, e.g. Reposado (see **https://github.com/wdas/reposado**).

1.4.4   Xgrid

Xgrid is a proprietary software program and distributed computing protocol from Apple.

1.5   HELIOS supported server platforms

❍ Linux 32-bit or 64-bit based on SUSE, Red Hat or compatible

❍ Oracle Solaris

- SPARC-based servers under Solaris 8/9/10/11
- x86-based servers under Solaris 10/11
- Solaris UFS and ZFS is supported, ZFS offers flexible file system/disk management including multiple snapshot features

❍ IBM Power AIX-based servers

❍ Apple with Mac OS X 10.4, 10.5 or 10.6 (works on Mac OS X workstation and server)

❍ Virtual server deployment is supported under the following platforms

- VMware ESX Server running Linux or Solaris x86
- Microsoft Hyper-V Server running Linux or Solaris x86
- IBM PowerVM (IVM) under AIX

A detailed list of the **Supported Platforms** is available on the HELIOS website.

1.6   HELIOS maintenance options

HELIOS offers a range of maintenance options to ensure that customers receive help in case of performance and compatibility problems, as well as for product updates and upgrades. The following is available:

❍ Free Tech Infos
Provide compatibility advice, available on the HELIOS website.

❍ Software Upgrade Service Agreement
To receive all updates as well as all future upgrades with CD and manuals. This is an annually renewing agreement.

❍ Cold spare option
The cold spare agreement allows receiving product keys for a second server to allow deployment of the second server in case the main server fails.

❍ Authentication server support agreement
This covers advanced NIS, LDAP, AD/PDC planning and support directly provided by HELIOS software engineers to end users.

❍ Software Subscription Agreements
Instead of purchasing a product, this includes the product license with updates/upgrades to deploy the HELIOS product for a duration of a year.

The first level support is done by the HELIOS reseller, the second level support is provided by the local HELIOS distributor in the country. HELIOS supports

these partners to ensure customers get professional help. Most customers deploying HELIOS products use the "Software Upgrade Service Agreement" because it is the most economical solution which ensures that the installation is always up to date.

1.7   Products to replace Mac OS X Server

The Mac OS X Server is best replaced by the HELIOS File Server Bundle which includes Mac, Windows and remote web services as well as an advanced networking and printing system which is easy to install, administer and use.

Additional HELIOS product add-ons offer workflow automation, PDF production, image processing, HD color and proofing solutions. Detailed information can be found on the HELIOS website.

1.8   Summary

Transitioning from an Xserve server can initially appear to be a daunting proposition. But by changing to an OS with a similar UNIX heritage, such as AIX, Solaris, or Linux, and adding the Mac compatible services and server admin provided by HELIOS EtherShare, replication of most services can be achieved. Any remaining services, if needed, can be maintained on a dedicated Mac system. The new freedom to select server hardware opens up many great options, to optimize systems for each site's specific needs. The additional HELIOS server features such as superior cross-platform compatibility, server fail safety, and the advanced printing system, will take the new server beyond the Xserve, to be a more productive server for Mac, Windows, and Web clients.

So layer a solid UNIX OS on a modern server system, and add the HELIOS Server Solutions Suite of EtherShare, PCShare, and WebShare, to get a superb Xserve replacement.

1.9   Other web resources

- **Apple's Xserve Transition Guide »**
- **HELIOS UB+ file server offers record performance (600MB/s) »**
- **Sun Solaris 10 ZFS offers blazing filesystem performance »**
- **Notes on HELIOS Server Virtualization »**
- **HELIOS test drive quick start video guide** or list of all **videos »**
- **HELIOS Software Manuals (HTML) »**
- **HELIOS Backup Image Tools »**