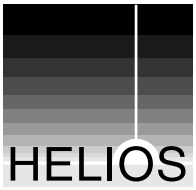

EtherShare G8

(Version 7.0.0)

User manual

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1 About the chapters of this manual

In the following, we give a brief summary of each chapter in this manual. These summaries will help you find the information you are looking for.

Chapter 2 “An introduction to HELIOS EtherShare” gives background information about the components that make up EtherShare.

Chapter 3 “HELIOS Admin” briefly shows how to manage EtherShare related tasks such as configuring AFP volume settings, PAP printer settings, etc. with the HELIOS administration program.

Description of the server software modules

Chapter 4 “TCP/IP configuration” describes how to set up AFP server and volume access lists.

Chapter 5 “The EtherShare file server” describes the function, the configuration, and the operation of the file server. It explains how the administrator can define access privileges for EtherShare Mac OS 8/9 and OS X users.

Chapter 6 “The EtherShare print server” explains the “papsrv” and describes how to configure printers manually.

Chapter 7 “EtherShare utility programs” introduces EtherShare utility programs and describes them in detail.

Chapter 8 “EtherShare client applications” introduces and explains EtherShare client applications such as the HELIOS Meta plug-in or HELIOS LanTest.

Chapter 9 “Preferences” lists the EtherShare preferences and explains what they effect when set.

Additional information

Appendix A “Files in the HELIOS directory” lists the files that belong to the EtherShare installation.

Appendix B “Glossary” explains some product related terminology.

2 An introduction to HELIOS EtherShare

This manual addresses EtherShare environments with OS X clients. If you are using classic Mac OS up to Mac OS 9.x, please refer to the EtherShare 2.6 manual. This is available on the **HELIOS website**.

The software which makes up EtherShare provides file server functions for Mac computers connected together in an AFP network. EtherShare is based on powerful multitasking/multiuser features. With EtherShare, it is very easy to expand the power of your network at a later date, when the amount of work and the number of users increase.

Note: HELIOS EtherShare runs on top of the foundation provided by HELIOS Base. Please read the HELIOS Base manual for installation instructions and other important details.

File server

While maintaining complete compatibility with the AFP specification, the EtherShare file server allows access to documents and applications throughout the whole network.

To network your host system and thus your Mac computers with Windows PC compatible computers use PCShare. To provide real-time remote file access for web clients, use WebShare (see B “Glossary”).

HELIOS Admin server and HELIOS Admin

The cross-platform program HELIOS Admin is an administration tool which can be used to configure EtherShare from any connected client workstation. It

can also be used by regular users to check the configuration. However, they are prevented from making any changes.

HELIOS Admin communicates with EtherShare through the HELIOS Admin server, which runs on the host while HELIOS Admin needs to be installed on the client workstation. The communication between these two programs takes place through a TCP/IP connection which allows managing multiple servers remotely and supporting concurrent TCP/IP connections (see "Logging on to the HELIOS Admin server" in the HELIOS Base manual).

Print server and font server

The EtherShare print server program ("papsrv") is a central spooler for print jobs destined for PostScript devices such as PostScript printers and photo-typesetting machines.

One or more printers can be connected to EtherShare simultaneously either through TCP/IP, or connected directly to the host via a serial interface. Print jobs are received from the network and temporarily stored on the host before being sent to the assigned printer (print spooling). This considerably improves the throughput of the workstations on the network, since they can immediately dispatch their print jobs and do not have to wait for the printer. Other connection types are also supported (see 6 "The EtherShare print server").

EtherShare allows PostScript devices to be directly connected to the print server via a serial interface, so it is not necessary for them to support the Apple PAP (*Printer Access Protocol*). The interface between such printers and networks is implemented in the print server, which allows such printers to be accessed from any workstation as if they were directly connected to the workstation. However, problems may occur with applications that send images as binary bitmap data, since serially connected PostScript printers interpret certain binary codes as control signals. Accordingly, we recommend network connected printers, which are able to handle 8-bit data (see 6.4 "Configure printers manually"). In addition, it is much faster than a serial connection, which is an important factor, e.g. for images.

All printers should be driven through the print server, in order to take advantage of the EtherShare print job spooling feature – please select the corresponding *printer queue* from Apple's "Printers & Scanners" system preferences pane and NOT the *printer* which the queue is connected to.

In addition to printing to the assigned printer and providing spooling functions, the print server automatically interprets messages returned by the printer and forwards them to the appropriate user via e-mail and the "srvmsg" tool. Apart from convenience, this feature allows rapid reaction to situations such as "paper out" or "paper misfed".

The font server is an integral part of the print server. It reduces network loading, increases throughput and allows central administration of printer fonts. See **Font including (Mac OS 9 clients only!)** in 6.2 "The print server in operation" for information on this feature.

2.1 EtherShare on Windows

On Windows platforms, HELIOS EtherShare adds full AFP compatibility for Mac network clients to connect to Windows volumes and printers. HELIOS EtherShare on Windows offers the same user experience as on other HELIOS server platforms, including support for Spotlight search, and Time Machine backups to EtherShare volumes. Administrators will note that the "dt" tools are slightly different on Windows, with the primary difference that "dt sync" is not included. Hence the "Syncs" tab does not appear in HELIOS Admin

Note: Within this manual, "UNIX" is used frequently. Generally, when referring to a server, it can be read as *UNIX or Windows server*. However, the Windows NTFS file system, and the UNIX file systems are different in many respects. So topics related to the UNIX file system, may or may not be applicable to the Windows server.

2.2 EtherShare client applications

There are several HELIOS drivers and applications included for installation or use on Mac network clients utilizing HELIOS server volumes and print queues.

- HELIOS Permissions (described in 8.1 “HELIOS Permissions”)
- HELIOS TCP Printer driver (described in 6.3 “HELIOS TCP Printer”)
- HELIOS Admin application (described in 3 “HELIOS Admin”)
- HELIOS Meta plug-in (described in 8.4 “The HELIOS Meta plug-in”)
- HELIOS LanTest (described in 8.5 “HELIOS LanTest”)
- HELIOS Spotlight search (described in 8.6 “HELIOS Spotlight search”)
- HELIOS WebShare Manager, which facilitates project collaboration, with automatic file synchronization (described in its own manual)

Note: The EtherShare client applications distributed with HELIOS G8 run on OS X 10.11 and later. Users with older Macintosh clients can install an older HELIOS software suite, e.g. CD026, and then do an overinstallation with HELIOS CD027. This enables the “Unsupported” folder in “HELIOS Applications > MacOS” which contains software versions of the EtherShare client applications that will work with client workstations prior to OS X 10.11.

The “Client software installation checklist” (“HELIOS_Install_Checklist.pdf”) lists all the options, and is included in the “Documentation” folder in the “HELIOS Applications” volume.

2.3 New EtherShare features

For new features in the EtherShare software see the HELIOS website:
www.helios.de Go to *HELIOS Product Versions – New Features*

For HELIOS Base, the foundation used by all HELIOS products, see the HELIOS Base product web page:
www.helios.de Go to *Products > Base*

3 HELIOS Admin

This cross-platform based administration service is comprised of two components, the HELIOS Admin server and the HELIOS Admin client.

The HELIOS Admin client is a convenient tool that allows configuring users, groups, volumes, printer queues, etc., and which is supported for various client platforms due to its Java heritage. For details see the chapter “HELIOS Admin” in the HELIOS Base manual.

In this manual we focus on the EtherShare related usage of HELIOS Admin, such as configuring AFP volume settings or PAP printer settings.

Note: EtherShare administration server and EtherShare Admin are being phased out by HELIOS, so it is recommended to use the cross-platform HELIOS Admin instead. For details on EtherShare Admin, refer to the EtherShare 2.6 manual on the HELIOS product CD or in the “HELIOS Applications” volume.

3.1 General remarks

This chapter describes the use of the application HELIOS Admin to perform EtherShare related configuration from any workstation in a convenient and secure way.

In order to use HELIOS Admin, the HELIOS Admin server must already be running on the host you want to configure. The HELIOS Service Controller is configured to start this service automatically when the system is booted.

Other chapters in this manual describe how administrative work, which is required to configure and maintain the EtherShare system, can be done directly on the host, e.g. by using “prefvalue” (see “HELIOS utility programs” in the HELIOS Base manual). However, most of these tasks can be carried out much easier using HELIOS Admin from one of the workstations.

HELIOS Admin offers a high degree of convenience to the system administrator. The application allows the host configuration to be represented graphically with lists and windows. Using HELIOS Admin from any workstation, server users, groups, volumes, and printers can be installed, configured and deleted. You can also interrogate each PostScript printer for available resident fonts and install downloadable fonts to the print server.

HELIOS Admin accesses and modifies the “Preferences” configuration file. HELIOS Admin and the HELIOS Admin server have built-in safety checks to avoid conflicting or invalid configuration settings.

HELIOS Admin has the additional advantage that almost all changes are immediately effective, without having to restart the affected service.

Benefits:

- Any new suffix mappings or changes to existing ones will be available immediately.
- Any new HELIOS volume or printer will be available immediately.
- Any changes to HELIOS volumes, e.g. setting groups membership, will be available immediately.

Potential drawbacks:

- Any changes to HELIOS volumes, e.g. removing or changing mount points, switching characteristics to read-only or changes in groups membership may result in side effects for EtherShare clients, in case the volume is still mounted. This may range from write errors to volumes getting dismounted(!).

❍ Especially important – Removing access rights to volumes for clients that still have documents open on that volume might cause damaged or only partially saved documents.

Make it a habit to check the `Active Users` list prior to making any changes that might affect connected users. In this list you can check which users have certain volumes in access.

3.2 Server settings

In the `Settings > Server Settings` window (Fig. 3.1), in the `Mac` tab, you can specify the `Server Name` (if no server name is specified here, the system uses the host name) and select the `Default Client Charset`. From the `IP Access` pop-up menu choose the desired IP access list for the server. The chapter "HELIOS Admin" in the HELIOS Base manual describes in detail how to edit the default IP access list according to your needs.

Note: If you wish to share HELIOS server volumes on a OS X server platform running native AFP file sharing, the HELIOS server should be assigned a Mac server name (`Server Name` in Fig. 3.1) that is different from the OS X server name.

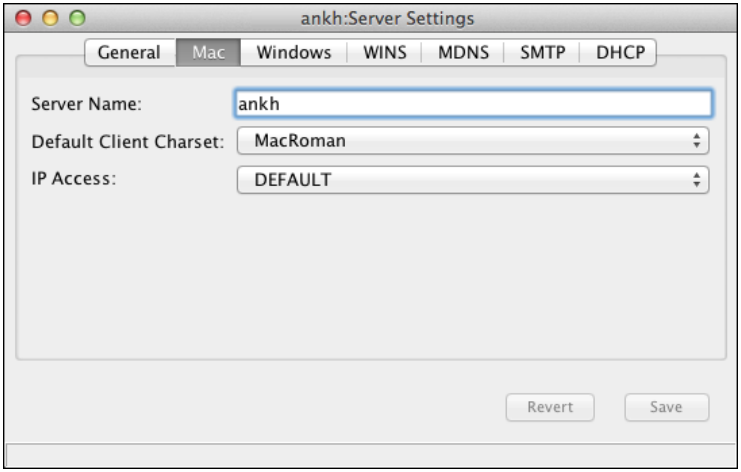

Fig. 3.1: “Server Settings” window

3.3 Volume AFP settings

This chapter refers to AFP related volume settings only. For general information on volume settings and instructions on how to change them see “Volume settings” in the “HELIOS Admin” chapter of the HELIOS Base manual.

The `Volumes` list shows all HELIOS volumes on the host (Fig. 3.2). The HELIOS Admin server automatically creates this list by inspecting volume-related entries in the “Preferences” file (see “Volume preference keys” in the HELIOS Base manual).

➢ Choose the `Volumes` tab. If it is not available, activate it in the `Lists` menu.

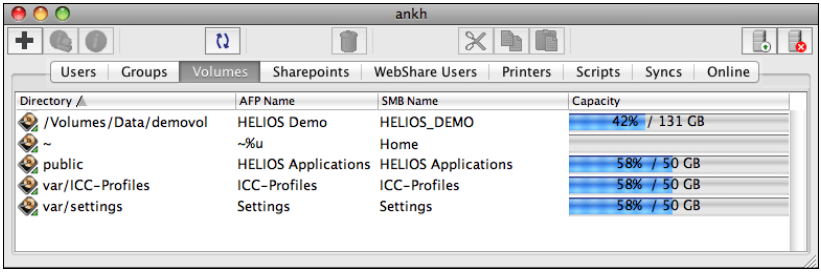

Fig. 3.2: `Volumes` list on host “ankh”

Changing AFP volume data

Before changing AFP volume data, make sure that the volume is not in use. All users should unmount the volume, because changes take effect immediately and this could lead to strange effects.

➢ Select the volume name, and choose `Open` from the `File` menu (or double-click the volume name).

The `Mac` tab displays the AFP information about the selected volume (Fig. 3.3).

The `Mac Visible` checkbox determines whether the volume is visible at all in the Mac `Connect To Server...` dialog.

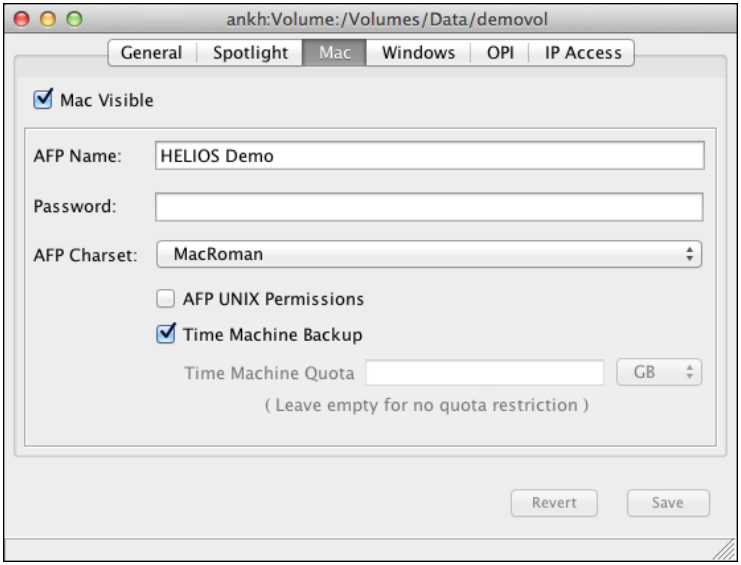

Fig. 3.3: `Mac` tab on host “ankh”

The `AFP Name` field allows specifying the name by which the volume is published in an AFP environment, and which is visible in the “AFP Name” column (Fig. 3.2). The AFP volume name can have up to 255 characters.

The `Password` field allows specifying a volume specific password, which Mac clients must enter prior to mounting the volume.

Important: The `Password` option is only valid for AFP users. In case the volume is also published via PCShare for Windows this option remains without effect for these users!

As of OS X 10.11 the AFP volume specific password feature is no longer supported. If there are clients in the network running OS X 10.11 or newer this feature should not be used anymore.

From the AFP Charset pop-up menu you can choose the AFP character encoding which is used by older clients without Unicode support:

- EUC-KR
- MacArabic
- MacCentralEurRoman
- MacCyrillic
- MacGreek
- MacIcelandic
- MacRoman
- MacRomanian
- MacTurkish
- SJIS

If AFP UNIX Permissions is *NOT* active (default), a folder inherits the permissions of the parent folder when used with OS X clients.

Note: This option is not available if EtherShare is installed on a Windows platform. However, this option can be activated using the useunixperm preference (see “Preferences” in the HELIOS Base manual).

The Time Machine Backup checkbox (see **Server setup** in 5.7 “Time Machine”) must be activated to enable Time Machine backups for the volume.

3.4 Printer spooler settings

This chapter refers to Mac related printer settings. For general information on printer settings, e.g. how to create and delete printers, see “HELIOS Admin” in the HELIOS Base manual.

The Printers list shows all HELIOS printer queues on the host (Fig. 3.4). The HELIOS Admin server automatically creates this list by inspecting printer-

related entries in the “Preferences” file (see “Printer preference keys” in the HELIOS Base manual).

➢ Choose the `Printers` tab. If it is not available, activate it in the `Lists` menu.

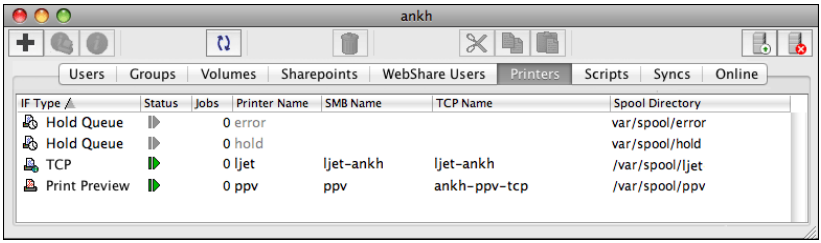

Fig. 3.4: `Printers` list on host “ankh”

Before changing printer data, make sure that the printer is currently not in use.

➢ Select the printer, and choose `Settings` from the `Printer` menu (or double-click the printer name while holding down the ⌥ key).

The `Mac` tab displays information about the selected printer (Fig. 3.5).

LPR Bonjour Registration

For basic printing without any queue setup and without PPD synchronization, the `LPR Bonjour Registration` can be enabled. Then the printers will appear automatically in the OS X printer configuration. No additional client setup is required. 6.3.2 “Create a new printer” describes the configuration of a new printer.

HELIOS TCP

The `TCP Name` field in the `TCP Printer` section specifies the name by which the TCP printer is registered by HELIOS mDNS (“Bonjour”), and by which this printer can be reached via the master TCP port. The TCP name of the printer

only becomes visible in the network if the `TCP Printer` checkbox is active.

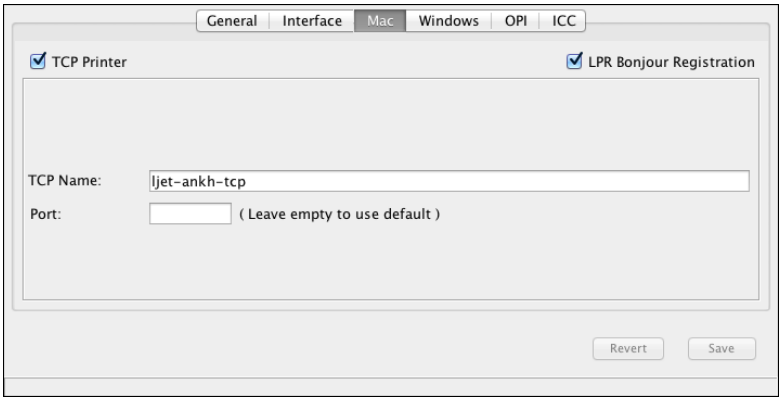

Fig. 3.5: `Mac` tab on host “ankh”

For instructions on how to create and configure a HELIOS TCP Printer see 6.3.1 “Client configuration”.

Optionally, a dedicated TCP/IP port can be set:

➢ Specify a port number for the TCP printer in the `Port` field.

Defining a port may be helpful to share a TCP/IP queue over the internet. By default all EtherShare printer queues are handled on port 2007.

4 TCP/IP configuration

4.1 AFP server access

By default, the server accepts connections from all known TCP/IP interfaces. When a client browses the network for an AFP server, it will respond with a list of all known server TCP/IP addresses.

Sometimes it may be required to hide some interfaces or TCP/IP addresses. This can be done via the **ipaddress** preference, which is described in 9.1 “AFP server preference keys”.

In addition, a TCP/IP access list allows limiting incoming connections from a list of specified TCP/IP addresses. See **ipaccess** in 9.1 “AFP server preference keys”.

4.2 IP access list

HELIOS products include many different services which can be accessed very easily for intranet usage. For using the HELIOS services on both the intranet and internet, additional security considerations must be taken into account, e.g. you do not want everyone launching OPI layout image generation by issuing commands on the “opisrv” telnet port. Another problem is that not all volumes should be available for internet users. And you certainly do not want unauthorized internet users printing to your server printer queues. Making the main server accessible from the internet bears a major problem: due to the variety of different services running on the server it is possible that there is still

a way for hackers to find some services which they can use to break into your system. If you need a 100% warranty that your system is secure you probably need to decide to run a local intranet only, and have no gateway services to or from the internet.

In addition to the HELIOS services, UNIX includes many services, NFS, telnet, ftp, rlogin, etc. A simple way to verify active services is the `netstat -a | grep -i listen` command. One option to bring some services into the internet is to use two network adapters, one for the *intranet* and a second for the *internet*, e.g.:

```
le0     172.16.0.1      Intranet network
le1     193.141.98.37   Internet network
```

Note: UNIX IP routing/forwarding is not required and should be turned off between these two networks.

The best solution to disable all HELIOS services for connections from the internet is to turn all HELIOS services off for the internet 193.141.98.x network by using the HELIOS TCP/IP access list feature, which can be managed from HELIOS Admin or by using a UNIX text editor. A sample configuration of "HELIOSDIR/var/conf/ipaccess" is:

```
allow 172.16.0.0/255.255.0.0        #Intranet Network
deny 0.0.0.0/0
```

This configuration will basically deny all access from the internet with the exception of the `172.16.x.x` network, which can use the HELIOS services.

4.2.1 Volume access list

One sample configuration is to allow internet access for one AFP server volume but deny it for all other volumes. First it is required to allow the "afpsrv" process to accept connections from the internet. This can be done in HELIOS Admin,

`Settings > Server Settings` by selecting `DEFAULT` from the pop-up menu in the `Mac` tab, and edit this file according to your needs.

Then, access on a per volume basis can be configured in the volume settings (`<volume name>` > `IP Access`) by selecting the desired access list from the pop-up menu (see Fig. 4.1).

A description of how to edit the IP access file or set up new ones, is given in the HELIOS Base manual.

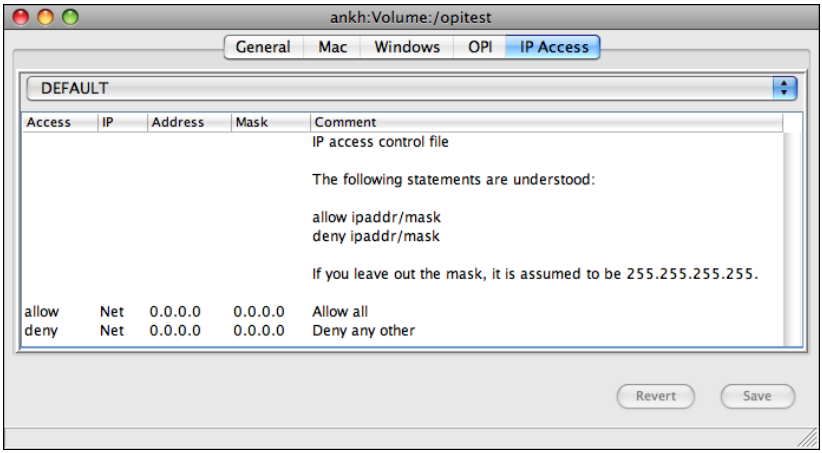

Fig. 4.1: Volume `IP Access`

5 The EtherShare file server

This chapter is devoted to the EtherShare file server. The function, the configuration and the operation of the file server is described. In addition we include information to allow the administrator to set up users, groups and volumes, create folders, and define access privileges. Finally, we describe methods for archiving data in the file server volumes to mass storage.

5.1 The file server program

The EtherShare file server system, “afpsrv”, is located in “HELIOSDIR/sbin”. The server is usually configured to start “afpsrv” automatically upon system boot.

Note: EtherShare “afpsrv” uses the default port 548. On OS X, if the native AFP services are already running on this port, EtherShare uses a random free port. See the note adjacent to **afpport** in 9.1 “AFP server preference keys” for instructions on how to assign a certain free port number for “afpsrv”.

afpsrv

“afpsrv” is the program that implements the AFP (*Apple Filing Protocol*) file server functions. It waits for filing requests from a client on the network, which are then immediately processed. Each new login request results in a separate “afpsrv” process being created. Accordingly, when a number of users access the file server at the same time, a number of “afpsrv” processes run on the host simultaneously. “afpsrv” is capable of supporting the following modern features:

- Spotlight search support
- OS X extended attributes support
- Finder permissions extension
- Finder Tags support (in Finder and Spotlight searches)
- Large file support, no 4 GB limit for archive, prepress and video data
- Unicode/UTF-8 file and volume names
- Long file name support up to 255 characters
- OS X symlink support for files allows copying application packages to/from the server, without loss of information
- Client/server reconnect and client sleep support
- Full OS X compatibility (OS X 10.3 or newer recommended)
- 2-3 times faster performance than NFS or SMB/CIFS file sharing
- UNIX file/folder permissions for OS X clients
- Apple Time Machine support

File streams

A file in the Windows/NTFS environment can have a certain number of file streams. File streams contain meta data such as creation or modification date information, icon information, etc., similar to the resource fork of a Mac file. If you manipulate files which have been created in a Windows/NTFS environment, "afpsrv" supports file streams (see **NTFS file streams support** in the HELIOS Base manual).

Welcome and shutdown message

You can specify both a welcome message and a shutdown message to be output on Mac workstations when they log in to EtherShare. There are no preferences to set for this feature. Instead, create two text files “login.msg” and “shutdown.msg”, and store them in the “MacOS” folder of the “HELIOS Applications” volume. Then the messages will automatically be used by the file server during login and shutdown. Usually, only the administrator has write privileges to this directory (volume).

For example, the two messages could be: “Welcome to the Support server of HELIOS Software GmbH” and “The Support server of HELIOS Software GmbH has now been shut down”.

Note: If you are running EtherShare on a demo license you cannot modify the default welcome message.

OS X 10.9 or newer clients do no longer support AFP messages. So there is no message displayed on such clients.

A maximum of 199 characters will be displayed (excess characters are truncated). If you want to include national accented characters such as *Umlauts* in your messages, an UTF-8 capable text editor should be used.

Long file names on Mac OS 8/9

Mac OS 8/9 has no support for AFP 3.1 or later, AFP 2.2 is used instead. As a result, file/directory names containing more than 31 characters will be truncated. In this case the file name, beginning with the 26th character, is replaced with a hashmark (“#”) followed by a four hexadecimal character checksum. It is possible to rename these files to a different file name from Mac OS 8/9. Working on files with truncated names is not recommended though.

5.2 Directory and file formats

On UNIX machines, the EtherShare file server simulates the Mac's HFS (*Hierarchical File System*) on UFS (*UNIX File System*); the latter is found in many UNIX variants. Due to the differences between these two systems, the same Mac file appears differently when it is viewed through the UNIX file system compared to when it is viewed from a Mac workstation.

The structure of volumes and files

In EtherShare, each HFS volume is mapped to a specified part of the UNIX file system and mounted at a specified directory. This directory is then the *root directory* of the volume.

You specify the volume mount point when setting up new volumes with HELIOS Admin.

In contrast to files on DOS and UNIX, all Mac files are associated with so-called "Finder info" contained in the file's directory entry, which stores among other things the file type and creator, the file creation date, etc.

Each file is split into two parts, the "data fork" and the "resource fork". This "split" is normally invisible to the Mac user; the "Finder info" in the file's directory is also invisible.

On EtherShare, the file's data fork is stored with the chosen file name in the UNIX directory corresponding to the folder.

The file's resource fork is combined with the Finder info and stored in a separate "resource file" of the same name in the so-called "resource" directory, which is the ".rsrc" subdirectory of the folder's directory.

A description of the resource file structure is available on the HELIOS website.

Mac file names invalid for UNIX are converted according to a specified algorithm. For example, the *question mark* is coded as *^3f* on the server:

Hexadecimal	Usual representation
22	"
2a	*
2f	/
3a	:
3c	<
3e	>
3f	?
5c	\
5e	^
7c	|

When you create a folder on EtherShare, which you do with the Finder in the normal way, a UNIX directory is created with the same name as the folder. Folders also have Finder info, which stores among other things the folder's window position and size, and the viewing style (Mac OS 9). The Finder info for a folder is stored in the parent's folder "resource" directory, which is created automatically when the folder is created. See **Create new folders on UNIX** in 5.5 "Access privileges" for related information.

Assumed you have a file "Test" in folder "Demo" which is in "dave's" home volume. On UNIX you will have:

```
/home/dave/Demo/Test                    File's data fork
/home/dave/Demo/.rsrc/Test              File's resource fork
/home/dave/.rsrc/Demo                   Folder's Finder info
```

Furthermore, if for example the volume mount point is "/home/apps", the volume desktop is contained in the UNIX file "/home/apps/.Desktop". The "Network Trash Folder" for the volume is contained in the UNIX directory "/home/apps/Network Trash Folder" and in the file "/home/apps/.rsrc/Network Trash Folder". Finder info for the root of the volume (viewing style, layout info etc.) is contained in "/home/apps/.rsrc/^^volrsrc". See "The desktop server" in the HELIOS Base manual for related information.

The file names ".Desktop", ".DeskServer", and the ".rsrc" folder are protected by EtherShare, and cannot be accessed from a Mac client.

Inside a HELIOS volume, ".rsrc" directories can only be missing if folders were created manually from UNIX or if ".rsrc" folders were removed manually from UNIX. "afpsrv" automatically creates missing ".rsrc" directories for every folder opened from the Mac in case a ".rsrc" directory is available in the volume root directory of the HELIOS volume. This applies to files as well; if ".rsrc" folders are available, resource files inside the ".rsrc" folder will be created automatically.

The file type and creator are used by the Finder to select the right icon to display. They are each 4 bytes long. The file creator is also used to automatically find and start the corresponding program when you double-click on the icon of a document. The icons themselves are stored in the desktop file, which exists only once for each volume. Each application is usually associated with a single file creator code (e.g. "MSWD" for Microsoft Word), but can as well have several file type codes (e.g. "WDBN" for normal Word documents, "WHLP" for Word help files, "DCT5" for the Word dictionary, etc.). See **Icon data** in "The desktop server" in the HELIOS Base manual for more information.

Safe file management

HELIOS volumes store Mac native files (including resource forks and Finder info) and Windows native files (including NTFS streams) in a format compatible with the server file system. When file operations are performed via EtherShare or PCShare clients, all of the associated file components are transparently acted upon, and the volume desktop database file (".Desktop") is updated. Hence it is always recommended to perform file operations from HELIOS clients. In situations where it is necessary to manipulate files in HELIOS volumes directly on the server, it is essential to use the HELIOS "dt" tools instead of the corresponding UNIX commands. The "dt" tools will properly perform file operations, and therefore should be used for all command line operations, in automated scripted workflows, for restoring backups, etc. Refer to the HELIOS Base manual for details.

UTF-8 encoded file names

HELIOS volumes use Unicode based file names in UTF-8 encoding. Therefore special characters such as Umlauts can be used on different platforms (Mac and PC clients) because modern clients offer full Unicode support. Exceptions are listed in the **The structure of volumes and files** conversion table.

Non-UTF-8 encoded file names

In a non-UTF-8 volume, Mac special characters are automatically translated by the EtherShare file server into a three-character escape sequence, but in this case led by a leading colon (:) instead of the caret (^). For instance, the special character “ä” is translated into “:8a” (MacRoman encoding).

However, accented characters (Umlauts) are not recommended for user names and passwords (otherwise you will need to remember different passwords for Mac and UNIX logins). Your UNIX host name must never include a slash character (for example “my_rs/6000”).

Note: It is not possible for an AFP 3 client to mount a non-UTF-8 volume from the EtherShare file server in the Finder. Any attempt will fail and the following message is written to the syslog file:

```
volume: <volume name> without UTF8, unsupported, disabled
```

Generic file types

Finder info for UNIX files, which do not have resource files, are simulated automatically as “generic file types” by EtherShare. EtherShare automatically recognizes about 20 UNIX file types (shell script, socket etc.), and simulates the Mac file type and creator. EtherShare will create a suitable resource file when the corresponding folder is first opened. The resource file will be ignored by UNIX applications, but allows EtherShare to recognize the file type immediately the next time the folder is opened. EtherShare also recognizes TIFF and EPSF files, but it cannot automatically create the PICT resource for EPSF files. The following special UNIX file types are recognized directly (type and creator are also shown):

Description	Type	Creator
Block device	BDEV	UNIX
Character device	CDEV	UNIX
Socket	SCKT	UNIX
Named pipe	PIPE	UNIX

With normal UNIX data files, the file server tries to determine the file type by examining the first 512 bytes of the file, in order to place it into one of the following groups:

Description	Type	Creator
Executable file	EXEC	UNIX
Executable SCRIPT file	TEXT	UXSC
Object file	OBJ	UNIX
Archive file	AR	UNIX
CPIO archive file	CPIO	UNIX
Lempel-Zev compressed file	COMP	UNIX
Huffmann packed file	PACK	UNIX
SUN raster image file	RAS	UNIX
PostScript file (including EPS)	TEXT	UXPS
Mailbox file	TEXT	UXMB
TIFF file	TIFF	UNIX
Gnu Zip file	Gzip	UNIX
PDF file	PDF /TEXT	CARO
EPSF file	EPSF	UNIX
Text file	TEXT	UNIX
Binary data file	DATA	UNIX
No permission	NOPE	UNIX
Unreadable file	????	UNIX

If the UNIX file does not correspond to any of these types, a differentiation is solely made between either text or binary data files. A binary data file is defined as a file where at least 30% of the characters are not contained in the 7-Bit ASCII code. All other files, including empty files, are classified as type TEXT.

If the user does not have sufficient access privileges to read a particular file, the file is classified as type “NOPE”.

If a file cannot be read by a particular user because a physical read error has occurred, the file is classified as type unreadable.

You can also create or modify the file type or creator manually. See **Automatic extension mapping** in 5.4 “Public and private volumes” for related information.

Note: If a file type is assigned the code “UNKN/UNIX” the file server automatically enforces a file type conversion.

If necessary, the generic file types feature can be disabled (see **binonly** in 9.1 “AFP server preference keys”). In that case all UNIX files are classified as binary data files (DATA/UNIX).

File and record locking

The EtherShare file server supports file and record locking between Mac workstations. Likewise, PCShare – a TCP/IP-based Windows networking product developed by HELIOS – supports file and record locking between Windows workstations. Locks of both file servers are shared by accessing the same “locktable” file which is in the “HELIOSDIR/var/run” directory. Hence, if a volume is shared by both EtherShare and PCShare, cross-platform file and record locking is enabled.

“afpsrv” supports mandatory locking used by Apple AFP or Windows SMB clients.

UNIX advisory locking is not compatible with the mandatory locking method, and UNIX applications should not manipulate files at times they are in use by HELIOS AFP or SMB clients.

Symbolic links

Symbolic links allow copying application packages to, or from the server, without loss of information.

5.3 Users and groups

User and groups are authorized by use of the HELIOS authentication server. Details on the authentication server can be obtained in the HELIOS Base manual.

Guest access

Users that are not registered in the system but still need access to the network from time to time can log on to the file server as a guest. The administrator can configure EtherShare to either accept or reject guest access.

During logging on, guests are not required to enter user name or password. Guests only have access to public volumes, and do not have a private volume. If necessary, guests can be denied access to specific public volumes by suitably configuring the access privileges of the respective volumes.

Although guest users do not need to enter any user name, guest access must still be declared in the "Preferences" file via the **guest** preference (see "Authentication server preference keys" in the HELIOS Base manual), in order to allow guests group membership.

In order to ensure that guests do not have access to protected applications or documents of other users, the administrator should assign the guest a primary group which has no other members. Folders and files are protected against

access by guests as long as access for the user category “Others” has been explicitly disabled.

Since user volumes are only available for registered users, a home directory for guests is ignored by the file server.

5.4 Public and private volumes

A volume (in the Mac file system) can be stored on both a removable disk or a hard disk. A hard disk can also be subdivided into several volumes, i.e. several separate file systems. The file system used by Mac computers is called HFS (*Hierarchical File System*) or HFS+, respectively.

The UFS (*UNIX File System*) is able to use storage capacity which is available through the network remotely in another computer via NFS (*Network File System*). Such remote storage can also be used by EtherShare.

On EtherShare, the UNIX file system can be treated like an Apple hard disk: one or more volumes containing folders and files can be mounted at a particular UNIX directory and made available to a group of users.

Volumes can be set up by using “prefvalue” (see “HELIOS utility programs” in the HELIOS Base manual), but we strongly recommend that you do this with HELIOS Admin instead.

Note: Please see 3.3 “Volume AFP settings” for related information, especially if you are using file systems mounted remotely through NFS.

Public volumes

When a volume is created, it is automatically available to all users/groups. Such volumes are called public volumes (even if not all users/groups have

the right to access them). Public volumes can optionally be protected with a password.

During the installation the public volume "demovol" is created. The installation program also creates a volume "HELIOS Applications" in "HELIOSDIR/public". It is used for HELIOS tools and user manuals.

If you want to deny guest access to a public volume, set the **Guest** preference to `FALSE` (see "Volume preference keys" in the HELIOS Base manual). No other configuration changes are necessary.

Private volumes

Each time you log on to EtherShare, if a home directory has been specified, you are automatically assigned a private "home" volume by the file server. The name of the home volume is shown abbreviated on the Mac workstation by using the *tilde* ("~") character together with the user name (e.g. "~david"). It can be used to store the user's private files.

Deny access to private volumes

If a particular user should only be allowed access to public HELIOS volumes, and not to a home volume, the `Home Directory` field in HELIOS Admin can be left empty when creating the user (which is equivalent to omitting the home directory entry in the system file "/etc/passwd"). This may – depending on the UNIX system – disable the login to the UNIX shell, but is not the same as unchecking `Mac Visible` in the `Volumes:~` window in HELIOS Admin, which simply makes home volumes invisible to (all) Mac users.

"afpsrv" very extensively checks for overlapping HELIOS volumes during each mount request. If an already mounted volume does include (or is included inside) a volume to be mounted, this will be invisible in the `Connect To Server...` dialog and an appropriate system error message, which contains the names of the overlapping directories, will be logged from "desksrv".

Please make sure that no single HELIOS volume overlaps any other HELIOS volume. If in doubt, please consult your HELIOS dealer to implement a safe volume configuration.

Duplicate volume names

Volume names must be unique. If the user or administrator defines the same volume name more than once, the entry encountered last during user login is ignored because no two volumes on the file server can have the same name. Otherwise, it would not be possible for workstations to uniquely access a particular volume. The new volume must be given another name.

The administrator should be particularly careful not to create a volume with the same name as a user's home volume (e.g. "~rita"), because the user will then no longer be able to access their home volume any more.

Automatic extension mapping

The file server supports automatic mapping of file name extensions. This simplifies file sharing between EtherShare, UNIX and PCShare, by simulating an appropriate Mac type and creator, allowing Mac users to open files created on Windows or UNIX with a double-click.

Note: This feature allows you to allocate specified file name extensions to application or document icons that already reside on the file server, but it does not allow creating new icons.

Extension mapping can be defined by editing the "suffixes" file or by means of HELIOS Admin (see "Extension Mappings" in the HELIOS Base manual).

5.5 Access privileges

Access privileges – on UNIX called “permissions” – define which users are allowed to work with which folders and files. Access privileges are assigned by the administrator or the owner of a file or folder.

5.5.1 HFS access privileges (Mac OS 9/AFP 2.2)

On Apple’s HFS (*Hierarchical File System*), no access limitation mechanisms are available for individual files, because the concept of user authorization is not known. A file can only be “locked” (write-protected) to prevent unintended writing/deleting operations. This attribute, however, can be disabled by any user at will. Furthermore, write-protection is not available for folders.

In a file server environment, considerably more sophisticated access privilege mechanisms are necessary. Apple’s AFP specification for sharing files differentiates between four different types of privileges:

Read only

This attribute specifies whether a particular folder is visible to the user. If a particular file is visible it can also be read.

Read & Write

This attribute additionally allows modifications applied to the files in the folder.

Write only (Drop Box)

This attribute allows only files being “dropped” into a specific folder.

No access

Any form of access to that folder is denied; neither reading the included files, nor applying changes to them is possible. See Fig. 5.4.

Individual file permissions:

UNIX file system permissions

Read and/or write permissions can be set for the file owner, group members, and others.

AFP 2.2 access privileges

Historically, using AFP 2.2 to access server volumes, it was not possible to specify different access privileges for individual files in the same folder. This is still true for Mac OS 8/9 clients, which use AFP 2.2. If it is necessary to allow a user to change a particular file, but not change another file, the two files need be stored in separate folders. If this is not possible, your only choice is to use the "dt chmod" (see HELIOS Base manual) command to change the privileges for individual files on the server. While AFP 2.2 does not allow granular control of access rights, it does facilitate file sharing and collaboration.

HELIOS AFP smart permissions active (default)

Using HELIOS AFP smart permissions, files saved to the server inherit the permissions of the parent folder. This is the preferred option for workgroup file sharing. When this option is active, the Finder of OS X clients is not allowed to change access privileges for individual files. However, changing access modes from the Finder can be toggled on/off as described below.

HELIOS AFP UNIX permissions

If "smart permissions" are not active, server volumes will use UNIX permissions. UNIX command line utilities in AFP volumes will create files according to "umask" and work as expected. However, many OS X GUI applications create all new files and directories with default permissions of:

- Read/write for the owner
- Read-only for the group and others

So "UNIX permissions" have the advantage to be changed in an easier way but the disadvantage of default permissions that are not optimal for file sharing and collaboration.

Extreme care should be taken when changing access privileges of AFP files on the UNIX server directly (do not forget the resource part). Or, in order to avoid such problems, use the "dt chmod" program. Incompatible combinations of privileges could lead to EtherShare access problems, e.g. no read or write access to a file anymore, or it may no longer be possible to use a folder.

5.5.2 EtherShare privileges (OS X)

Note: This description only applies to OS X clients up to 10.4.

OS X 10.6 clients and later can use the HELIOS Permissions tool to change server file permissions in the Finder of connected Mac workstations.

See 8.1 "HELIOS Permissions".

OS X is a UNIX-based operating system, so AFP file/directory access permissions are identical to the UNIX permissions. However, HELIOS AFP 3.1 and newer supports two (mutually exclusive, serverwide) permission modes for saving files and folders: HELIOS AFP smart permissions and UNIX permissions. As mentioned above, the default setting is to use smart permissions, so that files saved to the server will inherit the permissions of the parent folder. When smart permissions are turned off, standard UNIX permissions will be used when saving files and folders. See checkbox `AFP UNIX Permissions` in the HELIOS Admin volume configuration window (Fig. 3.3) and the `useunixperm` volume preference in the HELIOS Base manual.

Change access modes from the Finder

With enabled UNIX permissions, permissions can be changed using the "Get Info" dialog from the OS X Finder as usual.

With disabled UNIX permissions, which is the default, permissions cannot be changed directly. This feature is only available with active UNIX permissions. However, to allow an authorized user to change the permissions, do the following:

➢ Open the Finder's "Get Info" dialog for a file/folder in the server volume. Then open the permission details, enter the new user name **unixperm** and press the TAB key.

A Finder message pops up ("invalid user name"), together with the following AFP message (Fig. 5.1):

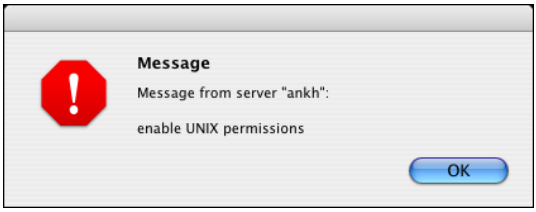

Fig. 5.1: Enable UNIX permissions

Now the UNIX permissions are enabled for the AFP server client process, irrespective of the volumes' smart permissions status, so you can change the permissions as required. The owner can change the *read/write* mode within the Finder for *owner*, *group* and *others*.

Note: AFP 2.2 allows the owner of directories to transfer the ownership to a different user. AFP 3.1 and newer does not support changing the owner unless you are the user "root".

The UNIX permissions for the particular client are enabled until the client disconnects from all server volumes or the UNIX permissions are switched off. Switching off the UNIX permissions is done by entering the user name **reset** in the `Get Info` dialog, followed by pressing the TAB key. Then again, a Finder error ("invalid user name") pops up, together with the following AFP message (Fig. 5.2):

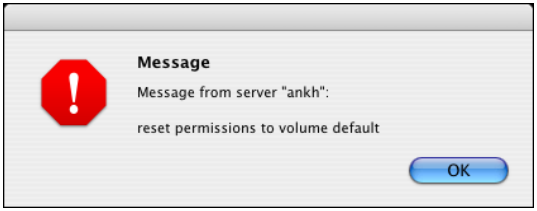

Fig. 5.2: Reset permissions to volume default

Create new folders on UNIX

As discussed earlier, a folder in a volume is represented as a directory in the UNIX file system, which is also associated with a (usually invisible) resource directory. The EtherShare file server uses the resource directory to store the Mac's resource fork and the Finder info for the files. If it is required to create a folder directly from UNIX use the "dt mkdir" program, so both the main and the resource directory will be created. The "dt chown" and "dt chgrp" commands are used to set the owner and group of the folder.

The "dt chmod" command sets appropriate access privileges:

```
$ dt mkdir Folder
$ ls -ld Folder Folder/.rsrc/
drwxrwsr-x  3 root  root  512 Jul 20 16:01 Folder
drwxrwsrwx  2 root  root  512 Jul 20 16:01 Folder/.rsrc/
```

Please refer to the UNIX system documentation for more details of the "mkdir", "chown", "chgrp", "chmod", and "ls" commands. Also refer to the "dt mkdir", "dt chown", "dt chgrp", "dt chmod", and "dt ls" commands in the HELIOS Base manual, respectively.

We recommend that network folders are always created by using the Mac Finder, in the same way as local folders. This guarantees that all of the above considerations are handled automatically.

Delete folders

A folder can be deleted in an analogous way by using the UNIX command `dt rm -r`, provided that the user has sufficient privileges. If the folder contains further folders and/or files, these are also deleted.

Create new volumes on UNIX

IBM and Sun operating systems set or clear the "setgid" bit on directories to indicate whether files created in that directory should follow BSD semantics or System V semantics, respectively. The "setgid" bit is then automatically propagated to nested directories. Mac users expect the BSD style, thus HELIOS Admin ensures that the "setgid" bit is set if it creates a directory for a new volume or a new user. The "dt" utility will automatically make sure that the "setgid" bit is set.

5.5.3 EtherShare privileges (Mac OS 8/9)

The four modes of privileges are separately defined for four categories of AFP users: the owner of the folder ("Owner:"), group members ("User/Group:"), all other users of the system ("Everyone", equivalent to "Other" on UNIX), and the administrator. This allows access privileges to be individually tailored. With the exception of the administrator, the owner of a folder is the only one who is allowed to change the privileges of the folder (if necessary, you can allow "Owner:" to be any user, by just leaving the field blank).

Read & Write

The folder is visible and all files can be read, changed and deleted. New files and folders can be created.

Read only

The folder is visible and all files can be read. Amendment or deleting of files is not allowed. New files and folders cannot be created.

Write only

The directory content is not visible and files in the folder cannot be read, amended or deleted. However, new files and folders can still be created since the folder acts as a drop folder (Drop Box).

None

Access to the files and folders is not possible. New files and folders cannot be created and the folder cannot be deleted.

Correlation to UNIX access privileges

The following table shows the four combinations of access privileges for the EtherShare file server, and the corresponding rights in the UNIX file system. Remember that the files that are stored in the folders have always the same access privileges as the folders themselves:

EtherShare file server		**UNIX file system**
Read & Write	(rw-)	read write execute
Read only	(r--)	read execute
Write only (Drop Box)	(-w-)	write
None	(---)	

Note: The System V UNIX semantics use “x” on directories, whereas “s” provides an additional bit in BSD UNIX for setting group IDs. For more detailed information see also **Create new volumes on UNIX** above. You may also refer to your UNIX documentation.

The Finder’s sharing section (in `File > Get Info > Sharing...`) can be used to display and edit the access privileges. Fig. 5.3 shows the privileges for a folder.

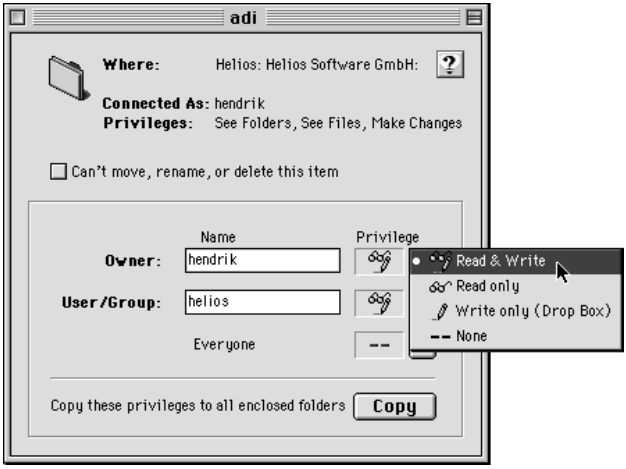

Fig. 5.3: Folder access privileges

The corresponding directory listing for this folder, made with the UNIX program `ls` is:

```
$ ls -ld adi adi/.rsrc
drwxrws--- 3 hendrik helios  512 Jul 20 16:16 adi
drwxrws--- 2 hendrik helios  512 Jul 20 16:16 adi/.rsrc/
```

Only the folder's owner or the system administrator ("root") can change the access privileges of the folder. The corresponding fields and checkboxes are grayed out when another user asks for privileges information (Fig. 5.4).

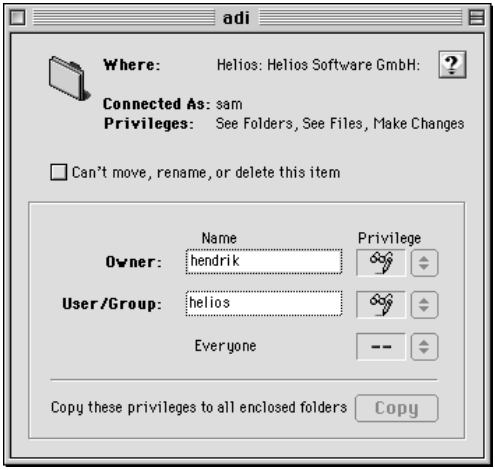

Fig. 5.4: Access privileges for user not being the owner

5.5.4 Creating a drop box

HELIOS supports the idea of drop boxes for folders with mode "733" (*others* and the *group* can drop files/folders) or "773" (only *others* can drop files/folders). The dropped files and folders will have read/write permissions and can be opened by the folder *owner* or folder *group members* only. This feature is active for volumes with smart permissions enabled.

A drop folder can be created using the "dt mkdir" command, e.g.:

```
# dt mkdir -m 733 dropfolder
# dt chmod g+s dropfolder
# dt chown michael dropfolder
# dt chgrp adminusers dropfolder
```

The folder list will look like this:

```
# dt ls -l
drwx-ws-wx  4 michael    adminusers     136 Mar 13 08:25 dropfolder
```

The `chmod g+s` command enforces that files/folders created within this folder will inherit the group “adminusers” from the drop folder.

5.6 EtherShare compatibility notes

When compared to the Apple file server using HFS, EtherShare has a few minor limitations but also offers powerful additional features which result in part from specific features of the UNIX environment on which EtherShare is based.

Case-sensitivity

The following table compares the behavior of different operating systems regarding the file name case sensitivity.

	Preserve	Ignore
OS X (HFS default)	√	√
OS X (UFS/Xsan)	√	–
Mac OS 8/9	√	√
Windows	√	√
UNIX	√	–
MS-DOS	–	√

Table 5.1: Operating systems and the case-sensitivity of file names

As Table 5.1 shows, there is no case preserving on MS-DOS, i.e. file names entered in lowercase will appear uppercase in the directory listing. In contrast to UNIX, the Mac and Windows operating systems are not case-sensitive when looking for files or creating or opening them. If your application looks for

"Dave", they will also find "dave", and you cannot create a file "Dave" and a file "dave" in the same folder in a local volume. Due to its UNIX heritage, this is not true for HELIOS volumes. This distinction is normally not a problem – if an application has created a file called e.g. "Editor Prefs" and needs to open this file again, it usually tries to open it using the same name and not "EDITOR PREFS". If an application cannot find a file which it has created, and the file is visible on UNIX and in the Finder, it is likely that case-sensitivity is to blame. If you are able to determine the name of the file which the application is trying to open, you can often provide a workaround by using a Mac *Alias* or by renaming the file. Contact your application vendor for assistance.

ASCII "0"

A file system error is issued if files whose names contain ASCII "0" (zero) are copied to the server or if application programs or tools try to create such files. This restriction also applies to all AFP compatible file server products (including those from Apple).

5.7 Time Machine

HELIOS EtherShare in combination with the OS X built-in "Time Machine" feature enables backups of networked Mac workstations and laptops. EtherShare AFP volumes can be used as backup disks for Time Machine backups from OS X.

Backed-up data is accessible from anywhere within the local network and can easily be restored by Mac users. Enabling HELIOS EtherShare support for "Time Machine Backup" takes less than a minute and requires no additional software installation. Even the restoration of a crashed Mac or the transfer of a saved system to a new Mac is supported directly from the OS X install DVD, or with the Mac "Migration Assistant".

Entire Mac networks can do Time Machine backups to a central HELIOS server volume. The main advantages of the HELIOS server support for Time Machine backups are:

- Automatic hourly, daily and weekly backups, with no configuration required
- Easy restore by users using the Time Machine Finder interface
- Optimized automated backups of mobile MacBooks (Time Machine keeps track of any files changed since the last backup)
- Mac backups are stored as HFS disk images on the server (no trouble with millions of files)
- No client software installation required
- Excellent backup performance
- Easy and fast Mac recovery by users
- Central client backup repository, which in turn is backed up as part of the server backup plan
- Disaster recovery from the OS X install DVD or recovery partition

Server setup

In general, a dedicated EtherShare volume should be created to use as a backup disk for Time Machine backups. Use HELIOS Admin to enable `Time Machine Backup` (see Fig. 5.5) in the volume configuration. This enables the volume to be selected in the Time Machine preferences. In addition, you should activate the `AFP UNIX Permissions` checkbox, to enforce security so that one user cannot access backups from other users.

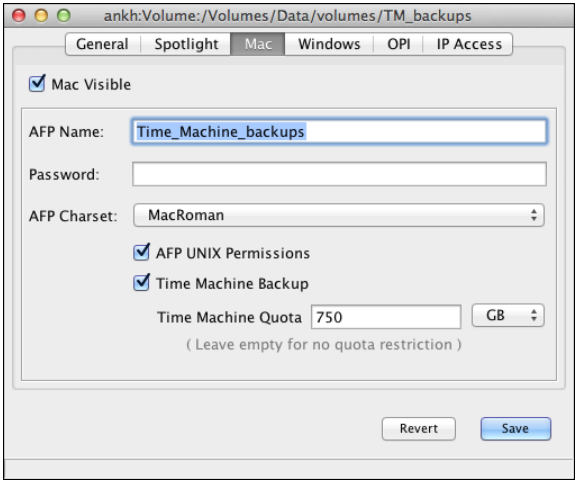

Fig. 5.5: HELIOS Admin – Volume configuration

6 The EtherShare print server

This chapter describes the EtherShare print services via HELIOS TCP. For possible print server (output) interfaces refer to chapter “The HELIOS printing system” in the HELIOS Base manual.

A suitable configuration allows any combination of input and output options.

6.1 The print server programs

papsrv

“papsrv” is the program that implements network communication functionality for the print server. TCP is used for the communication with most types of printers and print servers, or via HELIOS TCP printing (see 6.3 “HELIOS TCP Printer”). Once started, “papsrv” continuously monitors the network for printing requests. When a print job is received, it is first stored in the host file system before being passed to the HELIOS “lpr” program, which transfers the job to “lpd”. The latter calls the appropriate interface program (“tcpif”, etc.) and the optional output filter (“psof”). The interface program then passes the job to the printer.

6.2 The print server in operation

Each print job consists of the print data itself and one or more so-called “prep” files (PostScript print procedures and dictionaries, also called “control files”

or “inits”), which precede the print data. It may also be necessary to download fonts and a banner page to the printer.

The originator of the print job (the application’s printer driver in the workstation) communicates automatically with the print server, to agree which “prep” files must be sent to the printer before printing can start. After being sent by the workstation for the first time, “prep” files are copied automatically by the print server to the so-called “prep directory” (“HELIOSDIR/var/spool/dicts”). This is called “dictionary caching”.

If they are needed again, the “prep” files can be sent from the UNIX host directly, rather than from the workstation. This reduces network loading and increases throughput. See 6.5 “Adobe Document Structuring Conventions” for related information.

Font including (Mac OS 9 clients only!)

Fonts required by a particular print job which are usually not supported by the printer (downloaded PostScript fonts) must also be included in each job before sending it to the printer. In order to let the print server know which fonts to send, those fonts that are permanently available on each printer (resident fonts) are specified in the “FONTS” file (usually “var/spool/qmeta/<printername>/FONTS”).

Furthermore, HELIOS Admin can install Adobe “Type 1” and “Type 3” printer fonts (not screen fonts or TrueType fonts) directly from the font manufacturer’s original font disk into a central font directory on the host (“HELIOSDIR/var/spool/psfonts”). The print server only sends those fonts to the printer that are not already resident. Missing fonts are sent preferentially from the central font directory, and are not requested from the originating workstation. This reduces network load, increases throughput and allows the central administration of printer fonts.

The printer’s resident font list is created automatically by interrogating the printer when you install a new printer with the HELIOS Admin program. The

list must be updated (with `Update Fonts` in the HELIOS Admin `Printer` menu) if new fonts have been installed on the printer.

If your printer is not fully LaserWriter compatible, and font interrogation does not work, a standard font list is supplied automatically. For "Remote LPR" printers, the copying is done automatically if you set them up with HELIOS Admin. The "FONTS" file may subsequently need manual editing if your printer's font selection is different from those of the Apple printers.

As soon as "papsrv" has received and spooled the entire print job, the job is passed to the host system program "lpr". "lpr" then queues it and passes control to "lpd". "lpd" is responsible for passing the job to the output filter "psof" and to the specified interface program, such as "tcpif", which makes the connection to the printer itself: "lpd" determines how the printer is connected to the server by examining the entry for the printer in the system file "HELIOSDIR/var/conf/printcap". This printer configuration file also specifies (with the "sh" *suppress headers* flag) whether a title page ("banner") is required.

The specified interface program includes the needed fonts, resolves any references to external images if you have HELIOS ImageServer installed, resolves "%%Include…" references (see 6.5 "Adobe Document Structuring Conventions"), transfers the job to the printer, and waits for messages that may be returned. It is also responsible for interrogating the printer's page count before and after the job.

If an error message is returned, it is sent to the user by the UNIX system program "mail". Read also about **mail** and **clientmessages** and **User and document names in print jobs** for related information (see HELIOS Base manual).

Several types of error messages, e.g. "out of paper" or "paper jam" are also sent to the program "syslogd", which can be configured by the administrator (in "/etc/syslog.conf") to specify the route that the message then takes (e.g. output to console). This allows rapid response to those error conditions that demand immediate attention.

If the print server detects that the printer has refused the print job completely, e.g. due to a syntax error in the PostScript code, the rest of the job is immediately aborted with an appropriate error message and, depending on the settings in HELIOS Admin, e.g. forwarded to an error queue.

Since print jobs are temporarily stored in the server file system, they can be rapidly transmitted from the workstation to the host without the workstation having to wait for the printer (spooling function). Further processing of each print job is carried out automatically by the print server, while the user can continue with other jobs.

As described above, the print server stores all "prep" files in the "prep directory" and only transfers them to the printer when they are required. The "prep" files are not made resident on the printer. This allows switching between different incompatible "prep" files, without having to manually reset the printer. The print server appends the "prep" files in non-resident form to the beginning of the print job, and sends the complete file to the printer as a single job.

Restarting the print server

If the server shuts down while print jobs are running, you will need to restart the affected printers using the `lpc restart all` command. This can also be done with the `Restart Queue` option in the HELIOS Admin `Printer` menu.

restart-pap

The shell script "HELIOSDIR/sbin/restart-pap" is used internally by EtherShare to reconfigure all printer queues. This is necessary to enable printer configuration changes in the "Preferences" file to come into effect immediately. See 7.1 "restart-pap".

Note: "restart-pap" just notifies "papsrv" to refresh its configuration. The same can be achieved via:

```
"HELIOSDIR/bin/srvutil reconf papsrv"
```

6.3 HELIOS TCP Printer

The HELIOS TCP printer driver is the preferred method to print jobs from OS X clients to the EtherShare spooler. The benefit is that the HELIOS TCP printer driver will synchronize the PPD during the printer queue setup, it registers printer queues via Bonjour for easy browsing, and it handles job sizes larger than 4 GByte. Alternatively, print jobs can be spooled via Remote LPR which is supported by HELIOS Base. For Mac clients, it is recommended to use the HELIOS TCP printer driver clients, which is supported by OS X clients and allows easy printer browsing via Bonjour.

6.3.1 Client configuration

➢ Mount the "HELIOS Applications" volume and open *MacOS* > *EtherShare Tools* > *HELIOS TCP Printer*.

➢ Double-click the "HELIOSTCPPrinter.pkg" icon.

➢ Authenticate, click OK and follow the instructions until the installer has successfully installed the software.

6.3.2 Create a new printer

➢ In the OS X "System Preferences" open the printer configuration and click on the + icon in the menu list (see arrow in Fig. 6.1).

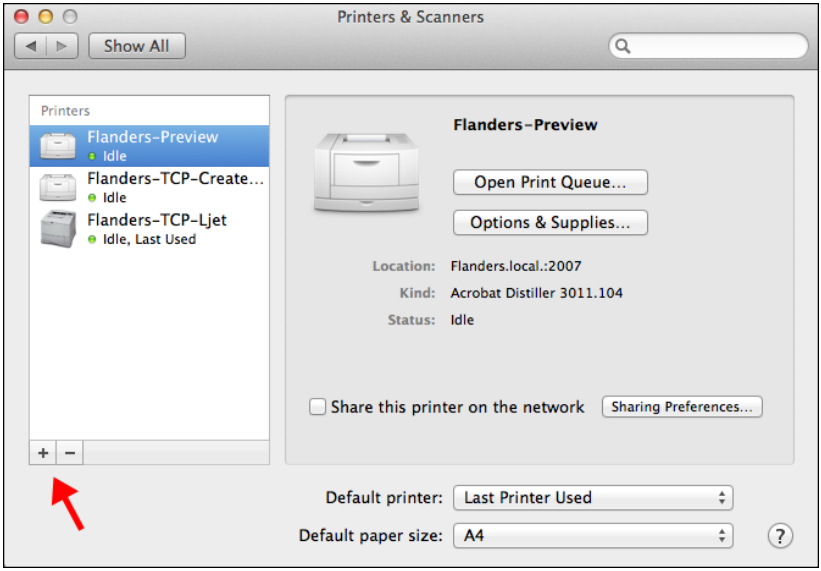

Fig. 6.1: Apple “Printers & Scanners” system preferences

➢ Select a “HELIOS TCP” printer queue and confirm your selection with the `Add` button (see Fig. 6.2).

Printers that are not visible via Bonjour, e.g on remote networks can be configured in “/Library/Preferences/de.helios.tcpprint.conf”. Entries in this file are of the form `host:printer` or `host:printer:port`. All printer configured in this file are listed in the “Add Printer” dialog (see Fig. 6.2).

The “HELIOS TCP Printer” is now available in the printers list in the system preferences and is ready to use.

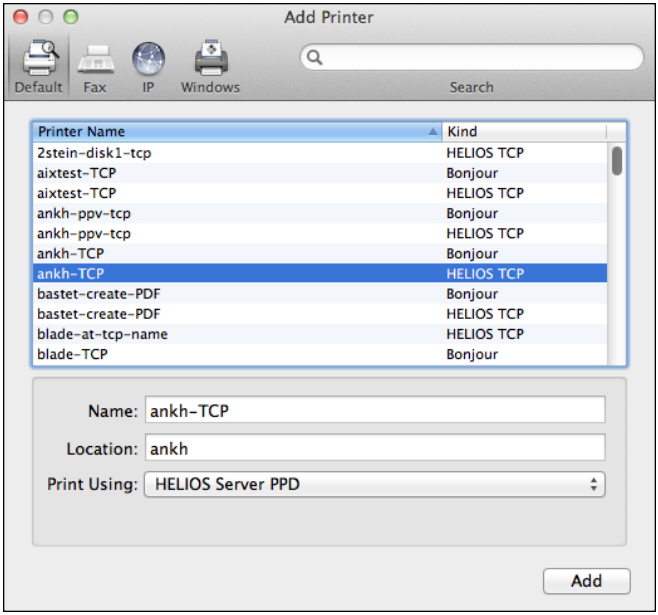

Fig. 6.2: Select printer queue for “HELIOS TCP Printer” (OS X)

6.3.3 Synchronize PPDs

➢ In case the server PPD is changed at a later date, just remove the printer and create it anew, according to the steps described before.

The changed server PPD will then be used for the queue.

6.3.4 Remove the printing plug-ins

During the installation of the HELIOS TCP/IP printer the following files are created on the client:

File location	Function
/Library/Printers/PPDs/Contents/Resources/HELIOSTCP.ppd	PPD file
/usr/libexec/cups/backend/heliostcp	“CUPS” compatible printer driver for communication with “papsrv”

Table 6.1: Files created on the client

➢ To remove the HELIOS TCP/IP printer just delete the TCP printer queue(s) from the Apple “Print & Fax” system preferences, then the files listed in the table above.

6.4 Configure printers manually

Note: Generally, it is more convenient and safer to set up printers with the HELIOS Admin program.

If more than one printer queue is serviced by the print server, a separate “papsrv” process must be configured for each of them.

The program “papsrv”, which implements TCP printing functions for the network, has no way of knowing how each printer is physically connected. All communication with the printer is coordinated through the HELIOS program “lpd”, which extracts information about the printer from “HELIOSDIR/var/conf/printcap”, using the logical (UNIX) printer name received from “papsrv” as the key. “lpd”

then routes the job through the output filter program “psof” (to generate an optional banner page) and sends it to the appropriate interface program (“tcpif”, etc.).

Each printer queue requires an entry in the “printcap” file to describe in detail the way in which the associated physical printer is connected.

The entry in the “printcap” file specifies which interface program and output filter program are required. The output filter is used to print a banner page, and the interface program implements the connection to the physical printer. The output filter for all PostScript printers is the “psof” program.

6.5 Adobe Document Structuring Conventions

The HELIOS print server system has been designed to meet Adobe’s DSC (*Document Structuring Conventions*). The following paragraphs describe some of the more important features. Please refer to Adobe’s “Guidelines for a Distributed Printing Environment” for more details.

“ProcSet queries” are handled as follows by the print server program “papsrv”:

“procsets” sent by a Mac application with a print job are captured automatically by “papsrv” and stored in “HELIOSDIR/var/spool/dicts” with a name similar to the original “procset” name. If a following application needs the same “procset”, it is sent from the “dicts” directory rather than transferring it again from the Mac to the print server via the network.

Certain PostScript comments are recognized and reacted on by the EtherShare printer interface programs as follows:

```
%%IncludeProcSet
%%IncludeResource: procset
```

If possible, the specified procset will be included in the print job from the "HELIOSDIR/var/spool/dicts" directory. Otherwise you will get a warning.

```
%%DocumentProcSets
%%DocumentNeededProcSets
%%DocumentNeededResources: procset
```

All procsets needed – but not supplied – by the document will be included from the "HELIOSDIR/var/spool/dicts" directory in the print job.

```
%%IncludeFont (obligatory includes)
%%IncludeResource: font
```

If possible, the specified font will be included in the print job from the "HELIOSDIR/var/spool/psfonts" directory, which contains downloaded PostScript fonts that have been installed there manually with HELIOS Admin.

```
%%DocumentFonts
%%DocumentNeededFonts
%%DocumentNeededResources: font
```

All fonts needed by the document that are not resident on the printer are included with the print job: The print server checks the corresponding printer resident font list "HELIOSDIR/var/spool/qmeta/<printername>/FONTS". This file can be updated using HELIOS Admin if you install new resident fonts on your printer. In case the resident font list cannot be determined, the font information from the chosen PPD is used instead.

In case a requested font cannot be included, the respective interface program sends an error message to the user via "srvmsg". Users can additionally receive the message on their workstation via e-mail.

```
%%IncludeFile
%%IncludeResource: file
%%IncludeDocument
```

If possible, the specified file (e.g. an EPS picture) will be included in the print job. The file can be specified with either UNIX or Mac file and path name

conventions. In the latter case, the print server determines the corresponding UNIX directory by inspecting the "Preferences" file for valid AFP volumes.

```
%%IncludeFeature
```

If possible, the specified feature from the printer queue's PPD file will be included in the print job. The printer interface program accepts messages from each printer while printing. The messages are checked for errors, which are forwarded to the originating user.

EtherShare's automatic font downloader also supports all programs that print PostScript containing "Adobe Document Structuring" comments. TrueType fonts are passed transparently from the Mac to the printer through the print server but cannot be installed in the font downloader.

Linotype Color Separation Extensions

The print server also supports "Linotype Color Separation Extensions" – the print server interface programs act as an ICS (*Included Color Separation*) includer. A special PostScript dictionary "LinoDict 1.0" is provided in "HELIOSDIR/var/spool/dicts" for this purpose. This functionality can also co-exist with the ImageServer option without conflict. Please contact HELIOS if you need more details.

7 EtherShare utility programs

7.1 restart-pap

The shell script “HELIOSDIR/sbin/restart-pap” is used internally by EtherShare to enable – via “srvutil” (see the HELIOS Base manual) – printer configuration changes to come into effect immediately, without restarting the entire HELIOS system.

7.2 rmtrash

The “rmtrash” command allows emptying a particular network trash can that is specified with the `<path_to_volume>` parameter.

Note: You should be logged-in as “root” when calling “rmtrash” from the command line, and the volume should not be mounted.

“rmtrash” can also be called from HELIOS Admin, with the respective volume highlighted in the Volumes list and then choosing `Empty Trash...` from the `Volume` menu. This method is recommended.

Usage:

```
rmtrash [-f] <path_to_volume>
```

7.2.1 Option

-f Deletes the whole “Network Trash Folder” in the volume. With `-f` not specified, only the files in the “Network Trash Folder” are deleted.

Example:

```
# cd /usr/local/helios
# sbin/rmtrash /home/macuser
```

8 EtherShare client applications

8.1 HELIOS Permissions

The HELIOS Permissions tool allows changing the server file and folder permissions in the Finder of a connected Mac workstation. This omits the need to do it directly on the server via command line.

Users with administrative rights can also change owner and groups for files and folders and their permissions. Creating “Drop Folders” and recursive permissions changes are also supported (see pop-up menu in Fig. 8.2).

Note: Since it handles UNIX permissions, the HELIOS Permissions tool only works with UNIX-based servers. It supports files and folders in HELIOS volumes. When editing local files you will receive an error message (“Some items were skipped”).

8.1.1 Features

Regular users

Apart from their own files, users *cannot* change owner or groups of a file or folder, or their permissions. This is only possible for “root” or members of the “SysAdm” group.

However, users *can* change the group membership of a file or folder they own to any group *they are member of*.

“root” and members of the “SysAdm” group

In addition to the owner and mode settings, “root” and members of the “SysAdm” group can also change the group membership of a file or folder to any existing group.

8.1.2 Installation

➢ Mount the “HELIOS Applications” volume and open “MacOS > EtherShare Tools”.

➢ Open the “HELIOS Permissions” folder, double-click the “HELIOS Permissions.pkg” package file and follow the instructions for installation.

The HELIOS Permissions tool (“HELIOS Permissions.service”) gets installed in “/Library/Services”.

8.1.3 Usage

Inspect and change permissions

➢ To inspect the permissions of a server file right-click on the name and select `Services > HELIOS Permissions`.

A window displays the permissions for the owner and the group as well as for everyone (see Fig. 8.1). Changes become active immediately.

➢ Select the desired permissions from the corresponding pop-up menu.

Change owner or group

➢ To change the owner of a file or folder type the new owner name into the text field.

➢ Press the TAB or RETURN key to apply the changes.

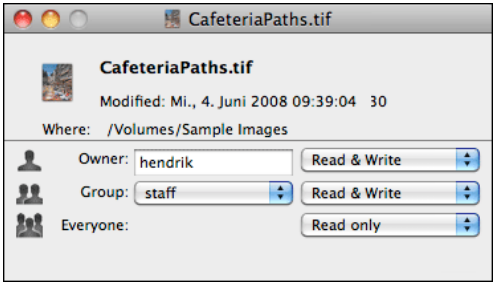

Fig. 8.1: HELIOS Permissions

➢ To change the group of a file or folder select the group name from the pop-up menu.

If it is a folder, the window contains the additional menu (see Fig. 8.2).

➢ Choose `Apply Drop Folder permissions` if you wish to make the selected folder a "drop folder". A drop folder merely allows moving or copying items into it but does not provide read or write permissions (except for the owner of the drop folder).

Instead of using the `Apply Drop Folder permissions` option, you can assign drop folder permissions for "Group" or "Everyone" individually by selecting `Write only (Drop Box)` from the pop-up menu.

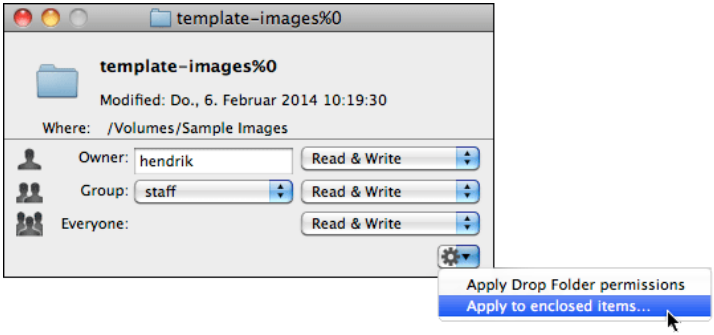

Fig. 8.2: Additional options for folders

➢ Select `Apply to enclosed items...` if you wish to apply the folder privileges to all files and subfolders within this folder (see Fig. 8.3).

If the selected folder contains many objects, this can take quite some time.

Note: You must be allowed to make changes on a folder. Otherwise the menu is not available in the permissions window.

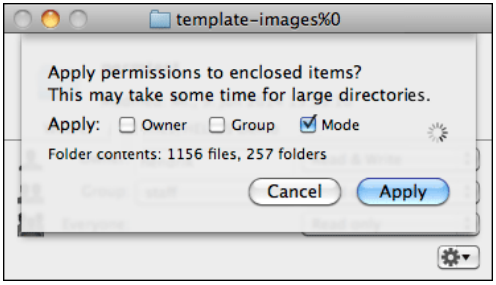

Fig. 8.3: Apply permissions to enclosed items

8.2 HELIOS TCP Printer driver

The HELIOS TCP Printer driver is described in 6.3 “HELIOS TCP Printer”.

8.3 HELIOS Admin application

The HELIOS Admin application is described in 3 “HELIOS Admin”.

8.4 The HELIOS Meta plug-in

The “HELIOS Meta” plug-in allows OS X users to add and edit file comments for files and folders residing on mounted HELIOS volumes. These comments work cross-platform, i.e. they can also be added and edited:

- from Mac OS 9 clients
- from any web client, directly in a HELIOS WebShare sharepoint
- from Windows clients via the “HELIOS Meta” feature in HELIOS PCShare

OS	By HELIOS Meta plug-in	By operating system
Mac OS 9		✓
OS X	✓	

Table 8.1: OS and file comments management

8.4.1 Installation

➢ Mount the “HELIOS Applications” volume and open “MacOS > EtherShare Tools”.

➢ Open the “HELIOS Meta” folder, double-click the “HELIOS Meta.pkg” package file and follow the instructions in the installation menu.

The plug-in is installed as “HELIOS Meta.service” in “/Library/Services”.

➢ Log out from OS X and log in again.

The “HELIOS Meta” plug-in is now ready to use.

8.4.2 Adding, viewing, and editing file comments from within OS X

➢ To add a file comment to a file or folder, right-click on the file or folder name and select the `Edit comment` or `Services > Edit comment` item from the pop-up menu.

➢ In the “HELIOS Meta” window highlight the file or folder that you wish to add a comment to, make a double-click in the “Comment” column (Fig. 8.4) and enter your comment. Then click with the mouse outside the editable field, e.g. on the file name, and close the dialog window. In the same way, existing comments can be edited.

Fig. 8.4: File comment in OS X

8.4.3 Adding, viewing, and editing file comments from within Mac OS 9

➢ In the Mac OS 9 Finder highlight the desired file or folder and open “File > Get Info > General Information” to edit the comment.

8.5 HELIOS LanTest

HELIOS LanTest is a tool for testing and measuring the performance of file system and print system services. It offers detailed evaluations for file and record locking on file server volumes, as well as for many typical file system operations. LanTest results can be used to find bottlenecks, for troubleshooting, or just for maintenance purposes.

Mac Finder copy block size

The Mac automatically increases the Finder copy read/write block size up to several megabytes, until there is no additional performance gain, and continues with the most stable performance. This is a dynamic process. HELIOS LanTest uses a static block size during the entire test depending on the selected network speed, e.g. for Gigabit networks it uses 128 kByte buffers (see Table 8.2). The HELIOS LanTest approach is more realistic because no application uses a dynamic adjustment and there is no API doing so automatically. Another reason is that HELIOS LanTest should measure the network performance and the server latency and doing super large block sizes would not include the server latency. Network and server may be capable to offer additional performance when multiple threads are reading/writing in parallel and when super large blocks are being used. However, this is not realistic because it causes drawdowns on slower network connections and limited network switch buffering as well as limited socket I/O buffers on the server and client.

Network	Block size	Test file
Slow networks, e.g. Standard Ethernet/DSL	32 kBytes	3 MB
Fast networks, e.g. Fast Ethernet	64 kBytes	30 MB
Very fast networks, e.g. Gigabit Ethernet	128 kBytes	300 MB
Enterprise networks, e.g. 10 Gigabit Ethernet	1024 kBytes	3000 MB
Backbone networks, e.g. 40 Gigabit Ethernet	4096 kBytes	12000 MB

Table 8.2: Block sizes used in HELIOS LanTest

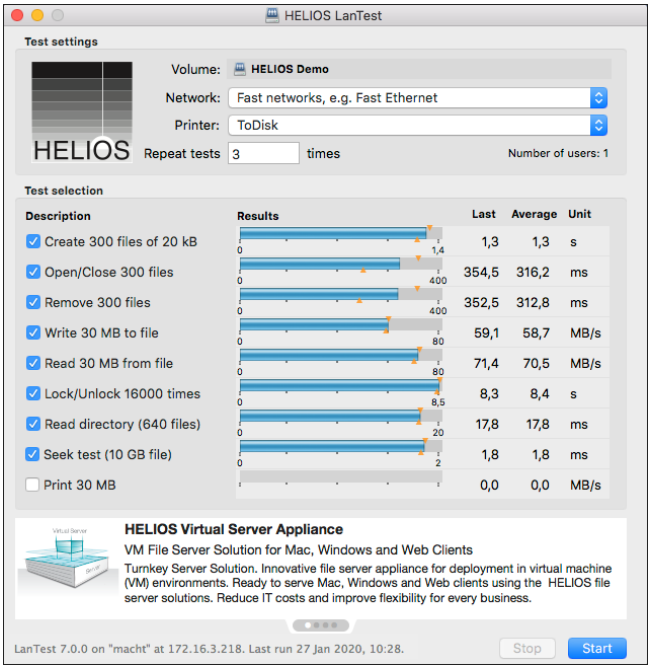

Fig. 8.5: HELIOS LanTest dialog

The HELIOS LanTest tool is available in the “HELIOS Applications” volume in *MacOS > EtherShare Tools > HELIOS LanTest*.

➢ Double click “HELIOS LanTest.dmg” and copy the “HELIOS LanTest.app” to your Mac.

➢ Start HELIOS LanTest (Fig. 8.5). From the `File` menu select `Choose Test Volume...` and click the `Choose` button.

➢ Next, click on the `Network` pop-up menu, and select the network type you are connected to (Fig. 8.6). Depending on the network specified in this window, LanTest determines the test load, i.e. the size of test files that are processed at a time.

This makes sense because Fast Ethernet (100 Mbit/s) networks have a higher data throughput than the standard Ethernet (10 Mbit/s). Gigabit Ethernet reaches a data throughput of up to 1 Gbit/s (1000 Mbit/s), 10 Gigabit Ethernet up to 10 Gbit/s (10000 Mbit/s), and 40 Gigabit Ethernet up to 40 Gbit/s (40000 Mbit/s).

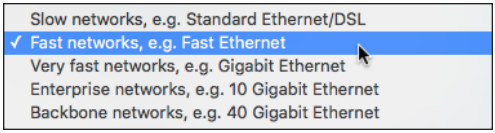

Fig. 8.6: Other settings dialog

8.6 HELIOS Spotlight search

Spotlight searches range from simple queries to complex combinations of attributes. Search options may include Boolean logic (and/or/not), quoted phrases, keywords and values, and range support. For details refer to the HELIOS Index Server user manual.

9 Preferences

This chapter lists all the preferences that are pertinent to EtherShare. Find a description of how to set, view, change or delete preferences, with the HELIOS utility programs “prefdump”, “prefvalue”, and “prefrestore”, in the HELIOS Base manual.

Important: Make sure that preference keys *DO NOT* start or end with a slash (“/”) character, and note that they are case-sensitive! Also, if any preference key or preference value includes spaces, that key or value must be enclosed in quotes.

9.1 AFP server preference keys

The following keys require a restart (see “srvutil” in the HELIOS Base manual) of the service to take effect:

```
Key:  Programs/afpsrv/<preference>
```

afp3 `bool` `TRUE`

This preference allows disabling the AFP 3.3 features for OS X clients. Setting it to `FALSE` causes the server to connect OS X clients via the AFP 2.2 protocol version.

dhx128uam `bool` `TRUE`

This preference allows using dhx128 encrypted passwords on login.

dhx2uam `bool` `TRUE`

This preference allows using DHX2 encrypted passwords on login.

dhx2PrimeBits `int` `512`

The login security number of bits, the minimum value is 512, more than 128 is secure.

cleartextuam `bool` `TRUE`

This preference allows using clear text passwords on login. For Mac OS 7/8 compatibility reasons, the default is `TRUE` which means that these Mac clients will be able to log on to the server.

allowchangepasswd `bool` `TRUE`

If set to `FALSE`, the `Change Password...` option in the Mac `Connect To Server...` dialog will not be available. If the authentication server uses authentication against a system that does not support changing passwords, PDC or LDAP, this preference will automatically change to `FALSE`.

directorycache `int` `64`

This preference determines how many directories are cached by "afpsrv" at a maximum. In volumes containing many directories, each containing few files, it can be advisable to increase this value. If the machine is fitted with little memory, and the volume contains fewer directories, each with a high number of files, a smaller value reduces the memory requirement of "afpsrv".

enableguest `bool` `FALSE`

If set to `TRUE`, the "Guest" option in the Mac `Connect To Server...` dialog becomes available. Otherwise it will appear grayed out and cannot be selected.

dnsSrvName `str` `""`

Allows specifying a fully qualified DNS name for the server, e.g. `<hostname.yourdomain.com>`.

inheritowner `bool` `FALSE`

By default, new files and folders which were created via AFP will keep the ownership of the user who created it. As AFP 2.2 for Mac OS 8/9 clients does not support individual file permissions, changing this preference to `TRUE` brings back the EtherShare 2.6/3.1 behavior which inherits the file owner from its parent directory. `TRUE`/`FALSE` will only affect AFP 2.2 and AFP 3.1 and newer volumes with disabled `useunixperm` preference (see "Preferences" in the HELIOS Base manual).

locks `int` `see description`

Specifies the number of "file and region locks" that the server allows simultaneously (if PCShare is installed on the same server it must be allocated the same settings).

The default for this parameter is `sessions*(files+20)`, where "sessions" is equal to the number of units (clients) for which you bought your license and "files" is the maximum number of of files (see **files** preference).

Do not set this preference to an unnecessarily high value because this would increase HELIOS Services' requirement for UNIX system resources.

sessions `int` `(see description)`

Specifies the maximum number of workstations (clients) that are permitted to work on the file server simultaneously. This value should normally be the same as the total number of Mac workstations that are connected to the AFP server. The value you choose should be less than or equal to the number of sessions allowed by your software license. The maximum tolerable number of workstations depends on the type of Mac applications you mostly use (whether they are file-intensive or client-server applications), on the configuration of your server system, and on its expansion stage. The default value for `sessions` is the number of sessions allowed by your software license.

useindex `bool` `TRUE`

Allows the Spotlight search for text document content and image metadata.

Keep in mind that this preference has a server-wide effect so that every AFP volume on the server supports the HELIOS index server search.

hidedotfiles `bool` `FALSE`

Files which start with a dot (“.”) in their file name are marked to be “hidden” for all volumes on connected clients.

files `int` `512`

This preference specifies the maximum number of files that can be opened by one file server process simultaneously. The achievable maximum cannot exceed the maximum number of open files per process currently allowed by the host. To save system resources, do not set this value larger than set by the “ulimit” UNIX command.

suffixes `str` `"var/conf/suffixes"`

“afpsrv” normally simulates Finder info (such as file type and creator) automatically for files without Mac resource. The file type is determined by inspecting the file’s contents. This allows about 20 different icons to be shown for non-Mac files.

In the case of files created by Windows applications, the file type is typically indicated by adding a suffix to the file name, the so-called file name “extension”. For example, DOS executable programs have the extension “.COM” or “.EXE” and DOS batch files have the extension “.BAT”. Under EtherShare, suitable icons can be displayed for such files by specifying them in the extension mapping table. This is particularly useful in the case of Mac applications which are able to directly read documents created by the MS-DOS version without prior conversion. This preference allows you to specify the location and name of the extension mapping table.

binonly `bool` `FALSE`

"afpsrv" normally simulates Finder info (such as file type and creator) automatically for files without Mac resource. The type of file is determined by inspecting the file's contents. This allows about 20 different icons to be shown for non-Mac files. Set `binonly` to `TRUE` if this feature is not required. This will prevent the AFP server from reading the header of each non-Mac file to determine its document type, in which case all non-Mac files will be treated as type DATA/UNIX. This means that UNIX text files will then become invisible to most Mac text editors.

minpwlen `int` `0`

The login dialog in `Connect to Server...` accepts passwords of any length from 0 byte to max. 8 bytes. Short passwords may represent a security risk. A password of zero length is equivalent to no password. Specify `minpwlen` as a numeric value between 0 and 8. To improve security, a meaningful minimum value for this preference is `5`.

savepasswd `bool` `TRUE`

As a time-saving feature when logging on, the `Connect to Server...` dialog on the Mac lets you save your file server user name and/or user password on the Mac's local hard disk.

To improve security, set this flag to `FALSE` to disable the saving of user passwords in this way, in which case all users have to enter their password manually each time they log on to EtherShare.

Note: This preference has only effect for Mac clients prior to OS X.

---

findercache `int` `16384`

The file server caches Finder information in RAM memory to optimize performance. `findercache` specifies the number of Finder

entries to cache, and thus the amount of RAM needed that should be allocated for this purpose. Higher values require more RAM but lead to a file server speed improvement for some Finder operations.

Note: Each entry requires about 100 bytes of RAM. The cache is used by only one single “afpsrv” (i.e. client) at a time, since it cannot be shared.

---

allowfpsync `bool` `FALSE`

Synchronize files to the file system when requested by Apple Time Machine. The default is `FALSE` because server volumes are considered as stable storage, and synchronizing many times per second slows down the overall server performance.

filedatesync `bool` `FALSE`

Whenever you modify a Mac file, the changes you make do not necessarily affect both the data file and resource file, and in many cases only the data file is changed. “afpsrv” only checks the modification date of the data file when it needs to display date and time information in the Finder. However, “afpsrv” does normally not update the modification date of the resource file if only the data fork has been modified. The modification date of the resource file is usually not important, even to incremental backup procedures, and updating it would waste system resources and slow down the file server somewhat. Nonetheless, situations may exist where differences between the modification date of the data and resource files can cause difficulties.

Such situations are typically those involving automatic data migration to slower external storage.

Specify the `filedatesync` flag to cause “afpsrv” to always synchronize the modification date of the resource and data files, even if only the data fork has been modified.

sortdirs `bool` `FALSE`

This preference sorts the directories coming from the server to the Mac clients by name.

dirmode `int` `(see description)`

This preference specifies the permissions for new directories. If not set or set with the value "0", it has no effect. If set with a value that is different from zero it overrides the HELIOS smart permissions as well as the `useunixperm` preference (see HELIOS Base manual).

Example:

Permissions for all newly created directories: `drwxr-x--` (750):

```
$ prefvalue -k 'Programs/afpsrv/dirmode' -t int 0750
```

Specifying the permissions similar to the "chmod" command, it is important to add a leading zero to the number:

```
$ chmod 700 mydir
$ prefvalue -k 'Programs/afpsrv/dirmode' -t int 0700
```

Note: On UNIX systems, directory file permissions (not only of new directories) are also affected by "umask". If directories are created with unexpected permissions, it it advisable to check the "umask" of "afpsrv".

---

groupwriteisowner `bool` `FALSE`

In the Mac OS file system only the owner of a folder or volume can permanently change the folder's layout, e.g. sorting order, icon placement, and label settings. This feature has been added to allow workgroups, e.g. users who are all members of the same group, to change layout settings or labels according to the organization of their work.

fakeoffspring `bool` `TRUE`

By default, "afpsrv" will return the number of offsprings (entries in a subdirectory) as 9999 when enumerating a directory. This

option can be turned off by using this flag set to `FALSE`. Then, the AFP call "GetFileDirParms" on a directory gives the real number of entries.

This feature is especially useful if folders containing many subfolders, which on their part may contain many files, are in use. The Mac Finder or the application program, will not only request file information in the current folder but also on files in subfolders, although this information is currently not used. Therefore, this option may accelerate the opening and displaying of folders with many subfolders. There are few Mac applications which rely on the exact offspring count. For those, disabling of this preference may be required.

fullfakeoffspring `bool` `FALSE`

Allows further aggressive caching but is turned off by default because some applications may have problems with it. Affected applications are some JavaScript apps, some Basic apps, and the OS X 10.6 Finder as well as Mac OS 9.

translateany `bool` `FALSE`

This preference will cause line end translation for all files of type "TEXT", without regard to creator.

texttran `bool` `FALSE`

The `texttran` flag has been added to "afpsrv" in order to turn off the newline translation for all types of text files. `texttran` set to `FALSE` will disable line end translation for all files of type "TEXT", without regard to creator.

This feature may be helpful in case Mac applications do write binary data into text files.

Note: Starting with Mac OS 9, client applications including “Finder”, do create/copy files on a server volume with a temporary type instead of the final type “TEXT”. Only after writing the file completely, the temporary type is set to the final “TEXT” type. Due to this changed behavior, EtherShare can convert line endings only when they are read from the server, but not when files are stored on the server.

connectlimit `int` `0 (i.e. ∞)`

Specifies the time in seconds a Mac client is allowed to stay logged-on to “afpsrv”.

afpport `int` `548`

Specifies the AFP port number via TCP/IP.

If port 548 is busy because the Apple file server runs also on this server, “afpsrv” uses a random free port, which is logged in the system messages where you can connect to.

dsiblocksize `int` `131072 (128 x 1024)`

Specifies the maximum size of AFP TCP/IP data packets that are passed from “afpsrv” to workstations through the network during a transaction.

volstatinterval `int` `10`

Specifies the time interval in seconds how often “afpsrv” checks the amount of free space on the server.

volcheckinterval `int` `10`

Specifies (in seconds) how often `volstatinterval` is communicated to the Mac client.

ipaddress `str` `""`

Specifies the IP address the “afpsrv” program offers to the Mac clients for logging in via IP-protocol. (If this value remains un-

specified, i.e. empty, all IP addresses on all network interfaces are offered.)

ipaddresses `str` `""`

This preference is applied for handling more than one IP address, and is given out in a string in which the addresses are specified comma-separated.

ip `bool` `TRUE`

This flag switches the AFP TCP/IP on or off, depending on its setting.

ipaccess `str` `"var/conf/ipaccess"`

Specifies the path of the file containing the access list with the IP addresses which are permitted to log on to "afpsrv".

logdenied `bool` `FALSE`

If set to `TRUE`, this preference lets "afpsrv" append a record to the system messages if, due to the IP access list, access to one or more users has been denied.

dsitickletime `int` `30`

Specifies the time interval in seconds after which "afpsrv" sends a tickle packet to signal that the server is still running.

xferlog `str` `""`

Specifies the path to the "xfer.log" log file. If set, the file names of all files edited (written, read, saved, etc.) in HELIOS volumes are recorded and stored sequentially in an "xfer.log" file. In general, folder operations (new, move, rename), file moves within a volume, file name changes, and file deletions are not logged. Nor are operations under UNIX or from PC clients.

Use this option with care since it causes considerable load on the server. This information is stored in the "xfer.log" file, in the same format as used by FTP server log files. Each server entry

is composed of a single line, consisting of the fields described in the following table, with the fields separated by spaces. If the path to the file "xfer.log" points to the same log file (typically in "/usr/adm") as used by the FTP server daemon (ftpd(8)), and "ftpd" logging is enabled, then both FTP and "afpsrv" file operations can be recorded in the same log.

Make sure an empty "xfer.log" file exists at the specified location and set file permissions sufficiently so that "owner", "group", and "others" can write to that file.

`current-time`

Current local time in the form `DDD MMM dd hh:mm:ss YYYY`. Where `DDD` is the day of the week, `MMM` the month, `dd` the day of the month, `hh` the hour, `mm` the minutes, `ss` the seconds, and `YYYY` the year

`transfer-time`

Total time in seconds for the transfer

`remote-host`

Remote host name.

`file-size`

Size of the transferred file in bytes

`filename`

Name of the transferred file

`transfer-type`

Single character indicating the type of transfer. Can be one of:

a *for an ASCII transfer*
b *for a binary transfer*

`special-action-flag`

One or more single character flags indicating any special action taken. Can be one or more of:

C *file was compressed*
U *file was uncompressed*
T *file was tar'ed*
_ *no action was taken*

`direction`

Direction of the transfer. Can be one of:
o *outgoing*
i *incoming*

`access-mode`

Method by which the user is logged-in:
a *(anonymus) Anonymus guest user*
g *(guest) Passworded guest user*
r *(real) Local authenticated user*

`username`

Local username or if guest, the ID string given

`service-name`

Name of the service being logged, usually AFP

`authentication-method`

Method of authentication used. Can be one of:
0 *none*
1 *RFC931 Athentication*

`authentication-user-id`

User ID returned by the authentication method. An * is used if an authenticated user ID is not available.

`completion-status`

Single character indicating the status of the transfer. Can be one of:
c *complete transfer*
i *incomplete transfer*

lowdelay `bool` `FALSE`

Setting this preference to `TRUE` (IP type of service: Low Delay) will let the host send IP-datagrams for "afpsrv" processes with higher priority and lower delay compared to IP-datagrams of other processes which did not set lowdelay. The exact behavior depends on the protocols configured queueing discipline.

usexattrs `bool` `TRUE`

This preference decides if the AFP server uses extended attributes ("xattrs") for Finder tags, file metadata, file and folder security information, etc. The attributes are saved as an extra file stream, therefore Mac, Windows and "dt copy" will preserve this additional information when copying files.

9.2 PAP server preference keys

The following keys require a restart (see "srvutil" in the HELIOS Base manual) of the service to take effect:

`Key: Programs/papsrv/<preference>`

tcpport `int` `2007`

Address of the master TCP port. All active TCP printers (printers with active `tcpname` and `TCPPublish` flag) can be reached via this port. If the port number is set to `0` the master TCP port is deactivated.

interfaces `str` `""`

Specifies an IP address for the master TCP port. The "papsrv" will listen on this interface for TCP connections to the printers and registers its TCP printers for this address.

A Files in the HELIOS directory

The following directory listing shows all files pertaining to EtherShare:

Note: Not all items described below are available on all supported platforms.

HELIOSDIR/bin

The “HELIOSDIR/bin” directory contains all available applications and tools, e.g. the user utility program: “copy2x” (on macosx86 platforms only!).

HELIOSDIR/etc

The “HELIOSDIR/etc” directory contains additional installation files in the subdirectories “install”, “uninstall”, “licversions”, “modes”, “prefs”, “runonce”, “startstop”, and “updates”.

HELIOSDIR/lib

“HELIOSDIR/lib” contains library files and other resources which are shared by all applications.

HELIOSDIR/public

The “HELIOSDIR/public” directory contains Mac applications in the directory “MacOS”. The applications are available to remote Mac users via the “HELIOS Applications” volume.

HELIOSDIR/sbin

The “HELIOSDIR/sbin” directory contains applications which are automatically started by the server: “mount-afp”, “rmtrash”, “afpsrv”, “convertvol”, “converthome”, and “papsrv”.

HELIOSDIR/var/spool/dicts

The “dicts” directory contains the corrected Apple dictionaries:

```
_AppleDict_md__68_0
_AppleDict_md__70_0
```

B Glossary

AFP server

File server using the *Apple Filing Protocol* (AFP).

Connect to Server

A program provided by Apple for Mac computers under OS X which allows the user to choose a server for a particular service such as storing files. For choosing a printer from the workstation, the Apple *Printer Setup Utility* (see below) is used.

Finder

A part of the Mac operating system provided by Apple for Mac computers.

ImageServer

ImageServer is a HELIOS product that can do server-based OPI image conversion, ICC color transformation as well as OPI replacement and printing. In addition, it incorporates a powerful script server to automate workflows.

NVE

A *Network Visible Entity* (NVE) is a resource that is addressable through a network. Typically, the NVE is a socket client for a service available in a node.

PCShare

PCShare is a high-end SMB-based file server and print server software for Windows computers which are attached to UNIX computers through Ethernet, etc. Since PCShare is compatible with EtherShare and WebShare, Windows users can share network printers and files with Mac, Web, and UNIX users, too.

TCP/IP

An internet network is a virtual data network specification based on a packet-oriented protocol (the internet protocol) which allows data to be transferred between otherwise incompatible networks. Thus, the internet specification describes a hardware-independent data protocol that lies above the hardware protocol (such as Ethernet). The *Internet Protocol* (IP), however, is only able to exchange data packets between computers. The *Transmission Control Protocol* (TCP) extends this ability to allow processes to be addressed on the target computer and to improve the reliability of the inter-process communication. TCP/IP has been implemented by all major software and hardware providers.

WebShare

WebShare is a high-performance HELIOS file server which enables fast and secure real-time file access via any web browser. Since WebShare is compatible with EtherShare and PCShare, intranet web users can share files with Mac, Windows, and UNIX users.

HELIOS WebShare enables fast and secure real time remote file access via any web browser. Now authorized users can easily use your file server wherever they are, without exposing the server to the Internet.

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